GEORG-AUGUST-UNIVERSITÄT
GÖTTINGEN

– CENTRE OF BIODIVERSITY AND SUSTAINABLE LAND USE –
SECTION: BIODIVERSITY, ECOLOGY AND NATURE CONSERVATION

Effects of temperature and body mass on soil communities

Dissertation zur Erlangung des Doktorgrades der Mathematisch–Naturwissenschaftlichen Fakultäten der Georg–August–Universität Göttingen

vorgelegt von

Diplom-Biologin

Birgit Lang
aus Bad Schwalbach

Göttingen, November 2012

Referent: Prof. Dr. Ulrich Brose
Koreferent: Prof. Dr. Stefan Scheu
Tag der mündlichen Prüfung:

"You don't know much," said the Duchess, "and that's a fact."

(Lewis Carroll, Alice's adventures in wonderland)

Contents

Part I.

Summary

Summary

The Earth is undergoing a climate change with predicted increases in temperature by up to 6° C until 2100. How this warming affects soil food webs is of fundamental interest for mankind as it may influence global food production. Due to the complexity of soil systems and species' interactions, simplifications are required in search for general patterns. One simplification used in this thesis is the categorization of species into consumer types such as carnivores, herbivores and detritivores, as physiological traits such as assimilation efficiencies and respiration rates are thought to differ between consumer types. As an additional explanatory parameter in all chapters, I used body mass which was shown to be of high importance for food-web structure and dynamics due to its influence on respiration rates, species abundances, consumption rates and interference competition.

The aim of this thesis was to investigate the impact of environmental warming on soil communities starting with physiological reactions of respiration rates and assimilation efficiencies which influence the individual's consumption rates (Chapter 2). Therefore, I performed a metastudy of published studies on respiration rates and assimilation efficiencies to investigate how the influence of temperature and body mass differs between consumer types. Based on that, I calculated maintenance consumption rates (i.e. amount of energy required to balance life maintenance) in dependence on temperature, body mass and consumer types by dividing respiration rates by assimilation efficiencies. The scaling of respiration rates and assimilation efficiencies with temperature and body mass differed between consumer types with the strongest impact of temperature on carnivores and the strongest body-mass effect for herbivores. Considering assimilation efficiencies, I found a temperature effect on herbivores and a body-mass effect on detritivores. The resulting maintenance consumption rates increased with temperature and body mass for all consumer types with the strongest increase with temperature for carnivores whereas the body-mass effect was most pronounced for detritivores. Therefore, climate change will have profound energetic consequences for natural communities by increasing turnover rates at the detritivore level due to their accelerated consumption rates and by strongly increasing consumption rates of carnivores. Comparison with experimentally measured consumption rates showed that calculated maintenance consumption rates increased less under warming for lower trophic levels. Therefore, they should be able to increase their biomass under warming. In contrast, calculated maintenance consumption of carnivores

increased stronger under environmental warming than realized consumption rates which should leave them struggling to consume enough energy for maintenance and increase their risk of extinction.

In a next step, I used a functional-response approach to investigate how consumption rates of differently-sized predators are affected by intraspecific interference competition (Chapter 3). Generally, I expected warming to increase the speed of movement, encounter rates and in consequence interference among predator individuals. This expectation was supported by the results obtained for the larger predator, whereas the opposite pattern characterized the interference behaviour of the smaller predator. The explanation I propose is based on the differing sensitivity to warming of respiration rates of both species. As expected, increasing temperature led to stronger interference competition of the larger species which exhibited a weaker increase in their respiration rates with increasing temperature. However, the stronger increase in the respiration rates of the smaller predator had to be compensated by increased searching activity for prey, which did not leave time for increasing interference. These results contribute to my previous findings of the strong susceptibility of carnivores to environmental warming. Also, generalizations of how interference competition responds to warming should take the species' metabolic response to temperature in dependence on its body mass into account.

Finally, I raised the complexity of the system to a soil community spanning four trophic levels and introducing a second climate-change factor, soil dryness (Chapter 4). In order to have a system mimicking a natural community under controlled climatic conditions, I transferred soil cores with their natural pore structure and a natural microorganism community into the laboratory. The community investigated consisted of fungi, springtails (collembolans), mites and geophilids with maize litter as resource. As body-mass structure is of high importance for communities, I incorporated a body-size aspect for the higher trophic levels by using two differently-sized collembolan species which were preyed on by a small and a large predator species. My results show that predicting the outcome of climate change is far from trivial and emphasize the importance of taking multiple climate change factors into account. For a climate change scenario with increasing temperature and soil dryness I found that consumption rates increased, thus climate change amplified the negative influence of the consumer population on the resource. However, trophic cascades may neutralize this negative influence of increased consumption rates under climate change. Of high importance for carbon cycling are increased decomposition rates resulting in accelerated nutrient turnover. Investigation of body-mass effects showed that for geophilid's the consumption rates decreased with increasing body mass. I presume this to be caused by decreasing capture efficiency as the experimental habitat structure was more supportive of smaller individuals.

Most parts of this thesis only include one climate change factor, temperature, due to it's high importance for all biological interactions. However, climate change contains far more factors which may influence a species' physiology and interactions. In Chapter 4, I could not only show the importance of taking multiple climate change factors into account but also experienced the difficulties in doing so. As it is impossible to quantify every single interaction in natural communities due to the high complexity, I tried to find general patterns in this thesis by starting with a simple system and increasing complexity. The findings of this thesis can now be incorporated into theoretical-modelling approaches on the impact of climate change on populations and food-web stability. Also, they provide important insights for nature conservation strategies as I could show the outcome of environmental warming to differ between trophic levels.

Zusammenfassung

Die Erde ist einem Klimawandel ausgesetzt mit einem vorhergesagten Temperaturanstieg von bis zu 6° C bis zum Jahr 2100. Diese Erderwärmung kann durch ihren Einfluß auf Bodennahrungsnetze einen großen Einfluss auf die globale Nahrungsmittelproduktion haben. Da das Ökosystem Boden und die Interaktionen der darin lebenden Tiere sehr komplex sind, muß mit vereinfachten Annahmen gearbeitet werden um generelle Muster zu erkennen. Eine Vereinfachung, welche ich in dieser Arbeit nutze, ist die Einteilung von Tierarten in ihre Fraßtypen (z.B. Carnivore, Herbivore und Detritivore), da physiologische Eigenschaften (z.B. Assimilationseffizienzen und Respirationsraten) sich vermutlich zwischen den Fraßtypen unterscheiden. Als zusätzlichen Parameter nutzte ich Körpermasse, da diese durch ihren Einfluß auf Respirationsraten, Abundanzen und Interaktionen zwischen Arten (z.B. Fraßraten und Konkurrenz) von großer Bedeutung für die Struktur und Dynamiken von Nahrungsnetzen sein kann.

Ziel dieser Arbeit war die Untersuchung von Temperatureinflüssen auf Bodengemeinschaften. Wegen ihrer enormen Wichtigkeit für Fraßraten von Tieren, habe ich mit physiologischen Reaktionen von Respirationsraten und Assimilationseffizienzen auf Temperaturerhöhung begonnen (Kapitel 2). Dazu habe ich eine Metastudie durchgeführt, in welcher ich Literaturdaten zu beiden Parametern gesammelt und die Einflüsse von Temperatur und Körpermasse in Abhängigkeit von den verschiedenen Fraßtypen untersucht. Darauf basierend konne ich minimale Fraßraten berechnen (d.h. Fraßraten, welche die nötige Energie zur Aufrechterhaltung des Lebens liefern), indem die Respirationsraten durch die Assimilationseffizienzen des entsprechenden Fraßtypen geteilt wurden. Da sowohl Respirationsraten als auch Assimilationseffizienzen unter Berücksichtigung von Temperatur- und Körpermasseneinflüssen betrachtet wurden, spiegelte sich die Abhängigkeit von diesen beiden Parametern auch in den Fraßraten wieder.

Die Abhängigkeit der Respirationsraten und Assimilationseffizienzen von Temperatur und Körpermasse unterschied sich zwischen den einzelnen Fraßtypen, mit dem stärksten Temperatureinfluss auf Respirationsraten von Carnivorne und dem stärksten Körpermasseneffekt auf Herbivore. Assimilationseffizienzen hingegen waren nur für Herbivore temperaturabhängig. Die einzige Körpermassenabhängigkeit lag hier für Detritivore vor. Die daraus resultierenden minimalen Fraßraten stiegen für alle Fraßtypen mit Temperatur und Körpermasse. Dabei hatte Temperatur die größten Auswirkungen auf Carnivore während der Körpermasseneffekt bei Detritivoren am stärksten ausgeprägt

war. Somit wird Klimawandel tiefgreifende Auswirkungen auf natürliche Gemeinschaften haben, da durch die hohen Fraßraten der Detritivoren und den starken Anstieg der Fraßraten von Carnivoren mit Temperatur die Stoffumsatzraten ansteigen. Ein Vergleich mit experimentell gemessenen Fraßraten zeigte, dass die kalkulierten Fraßraten der niedrigeren trophischen Ebenen weniger stark durch Klimaerwärmung anstiegen als die gemessenen Fraßraten, was zum Aufbau von Biomasse führen sollte (Populationswachstum). Für Carnivore hingegen traf dies nicht zu: Hier stiegen die kalkulierten Fraßraten stärker mit Temperatur als die experimentell gemessenen, was bedeutet, dass Carnivore kaum genug Energie zum Überleben konsumieren können und damit ein erhöhtes Aussterberisiko haben.
Als zweites habe ich Fraßraten verschieden großer Räuber unter Berücksichtigung von intraspezifischer Konkurrenz (Interferenz) experimentell gemessen (Kapitel 3). Prinzipiell habe ich erwartet, dass die Bewegungsgeschwindigkeit und somit die Wahrscheinlichkeit einen Konkurrenten zu treffen mit Temperaturerwärmung ansteigt, was zu erhöhter Interferenz führen sollte. Dies traf jedoch nur für den größeren Räuber ein, für den Kleineren war das Gegenteil der Fall. Meine Erklärung für dieses Verhalten basiert auf dem verschieden starken Anstieg der Respirationsraten beider Räuber mit Temperatur: Dieser war geringer für den größeren Räuber, dessen erhöhte Aktivität somit zu verstärker Interferenz führte. Die Respirationsrate des kleineren Räubers stieg jedoch viel stärker an und der Räuber musste somit seine Fraßrate um ein vielfaches erhöhen. Dadurch blieb jedoch keine Zeit für Interaktionen mit Konkurrenten. Dieses Ergebnis passt auch zu meiner vorherigen Schlußfolgerung, dass Carnivore sehr anfällig für Klimaerwärmung sind. Zusätzlich zeigt es jedoch, dass Generalisierungen schwierig sind und den Anstieg der Respirationsrate mit Temperatur in Abhängigkeit von der Körpermasse mit einbeziehen sollten.
Schließlich habe ich die Komplexität des Systems noch einmal erhöht und mir den Einfluss von einem zusätzlichen Parameter, Bodentrockenheit, auf eine Bodengemeinschaft mit vier trophischen Ebenen angeschaut (Kapitel 4). Um ein möglichst natürliches System unter kontrollierten Bedingungen im Labor zu untersuchen, habe ich Bodenkerne mit ihrer natürlichen Porenstruktur und Mikroflora verwendet. Die untersuchte Gemeinschaft bestand aus Pilzen, Springschwänzen (Collembolen), Milben und Geophiliden. Als basale Ressource wurde Maisstreu verwendet. Zusätzlich wurde auf den höheren trophischen Ebenen ein Körpergrößenaspekt miteinbezogen indem zwei verschieden große Collembolenarten eingesetzt wurden und eine kleine (Milben) sowie eine große (Geophiliden) Räuberart. Meine Ergebnisse zeigen, dass es schwierig ist die Auswirkungen des Klimawandels vorherzusagen und betonen die Wichtigkeit von Studien mit mehr als einem Klimafaktor. Ein Klimawandel-Szenario mit steigender Temperatur und Bodentrockenheit zeigte, dass durch ansteigende Fraßraten der negative Einfluß der Räuberpopulation

auf die Beute noch verstärkt wurde. Dieser negative Einfluss wurde durch trophische Kaskaden mit steigender Temperatur neutralisiert. Auf niedrigeren trophischen Ebenen bedeuten erhöhte Fraßraten schnellere Streuabbau, was Auswirkungen auf den Kohlenstoffkreislauf hat. Für Geophiliden zeigte sich des Weiteren ein starker Einfluß der Körpermasse auf die Fraßraten, welche mit zunehmender Körpermasse abnahmen. Dies lag vermutlich an der sinkenden Effizienz beim Beutefang mit zunehmender Räubergröße, da die Habitatstruktur größere Individuen benachteiligte.
Die meisten Teile dieser Arbeit beinhalten nur einen Klimaparameter, Temperatur, welcher von großer Wichtigkeit für alle biologischen Interaktionen ist. Jedoch ist Temperatur nicht der einzige Faktor der mit Klimawandel in Verbindung gebracht wird und die Physiologie und Interaktionen von Arten beeinflussen kann. In Kapitel 4 konnte ich nicht nur aufzeigen wie wichtig es ist, sich mehrere (potentiell interagierende) Faktoren gleichzeitig anzuschauen, sondern auch feststellen wie schwierig die Betrachtung multipler Faktoren ist. Da es unmöglich ist jede Interaktion zwischen Arten in einer natürlichen Gemeinschaft zu betrachten, habe ich versucht generelle Muster zu finden indem ich mit einem einfachen System begonnen und die Komplexität erhöht habe. Die Ergebnisse dieser Arbeit können nun in theoretische Modelle eingebracht werden welche die Auswirkungen von Klimawandel auf Populationen und Nahrungsnetzstabilität untersuchen. Zusätzlich bietet diese Arbeit wichtige Erkenntnisse für Naturschutzstrategien.

Part II.

General Introduction

Chapter 1.

Introduction

1.1. Aims and scope of this thesis

Our planet is undergoing a climate change: over the last 100 years atmospheric temperature has continuously increased, mostly due to anthropogenic greenhouse gas emissions. Until 2100, annual mean temperature is predicted to increase by 1.1 to 6.4° C (IPCC, 2007). How this affects soil food webs is of fundamental interest for mankind as it may influence global food production. Civilization depends on soils as a source of nutrients for crop production, but mainly due to the complexity of investigating the soil ecosystem, our scientific understanding of soil and soil-associated processes remains limited (Wolters, 2001; Albers et al., 2006; Kutsch et al., 2009; Ruess and Chamberlain, 2010). These processes accomplished by a great diversity of soil organisms are fundamental to terrestrial life and span for example nutrient cycling, carbon sequestration, litter decomposition, soil stabilization and soil structuring.

Investigation of how environmental warming affects these processes is far from trivial as belowground processes are difficult to examine due to the complex habitat structure and the cryptic lifestyle of many species (Wolters, 2001; Albers et al., 2006; Ruess and Chamberlain, 2010). Therefore, it is necessary to start with a simple system and try to find general patterns. Knowledge of how environmental warming affects the physiology of species and species' interactions can then be used by theoretical modelling approaches for predictions of the outcome of environmental warming.

Nature comprises a huge number of species and food webs of a specific ecosystem still contain hundreds of species and thousands of interactions between these species. Investigating how environmental warming affects food webs thus requires simplification of nature in search for general patterns. One simplification used in this thesis is the categorization of species into consumer types such as carnivores, herbivores and detritivores, as physiological traits such as assimilation efficiencies and respiration rates are thought to differ between consumer types (Odum, 1968; Peters, 1983; Castro et al., 1989; Hilton et al., 1999; Downs et al., 2008; Ehnes et al., 2011).

For some species traits, the dependency on temperature has been in the focus of research over many years. Metabolism may be the most fundamental biological rate as it determines the demands an organism places on its environment (Brown et al., 2004) and thus

determines consumption rates. However, a species' metabolism does not only increase with temperature due to accelerated biochemical reactions, but is also dependent on its body mass (Gillooly et al., 2001; Brown et al., 2004; Downs et al., 2008; Ehnes et al., 2011). Similar relationships were found for consumption rates which increase with temperature and depend on the body-mass ratio between predator and prey (Brose et al., 2008; Petchey et al., 2008; Vucic-Pestic et al., 2010b, 2011; Riede et al., 2011; Ott et al., 2012; Rall et al., 2012), interference competition (Kratina et al., 2009; Lang et al., 2012), and interaction strength (Emmerson et al., 2004; Berlow et al., 2009; Rall et al., 2011).
The aim of this thesis was to investigate the impact of environmental warming on soil communities starting with physiological reactions of respiration rates and assimilation efficiencies which influence the consumption rates of individuals (Chapter 2). In a next step, I used a predator-prey system to investigate how consumption rates are affected by intraspecific interference competition, thus experimentally simulating a small predator population (Chapter 3). Finally, I raised the complexity of the system to a complex soil community spanning four trophic levels and introducing a second climate change factor, soil dryness (Chapter 4). As an additional explanatory parameter in all chapters, I used body mass which was shown to be of high importance for food-web structure and dynamics (Woodward et al., 2005; Brose et al., 2006b; Otto et al., 2007; Brose, 2010; Yvon-Durocher et al., 2011b; Heckmann et al., 2012), thus affecting metabolic rates (Gillooly et al., 2001; Brown et al., 2004; Ehnes et al., 2011), species abundances (Meehan, 2006; Hayward et al., 2010), and interactions between species such as consumption rates (Brose et al., 2008; Vucic-Pestic et al., 2010b; Rall et al., 2011) or interference competition (Lang et al., 2012).

1.2. Future predictions of climate change

Since the preindustrial era, anthropogenic emissions of greenhouse gases have continuously increased, leading to environmental warming between 0.3 and 0.6° C over the last 100 years (McCarthy, 2001; Sanderson et al., 2011). Already in 1896, Svante Arrhenius calculated that a doubled atmospheric carbondioxide concentration would raise temperature on the Earth's surface by 6° C (Arrhenius, 1896). Actual climate change scenarios for the 21st century predict ongoing environmental warming between 1.1 and 6.4° C with the greatest projected increase for northern high-latitude sites (Aerts, 2006; IPCC, 2007).
This global warming will be accompanied by spatial and temporal shifts in the distribution of various climatic elements, such as precipitation, temperature and soil moisture. Organisms and communities do not respond to global averages but to these spatially heterogenous regional changes (McCarthy, 2001; Walther et al., 2002) with for exam-

ple decreased precipitation in spring and summer and increased precipitation in winter (Tsiafouli et al., 2005; Sanderson et al., 2011; Trnka et al., 2011b). Additionally, the average surface temperature is not only the product of seasonality with for example temperatures in northern regions increasing most strongly in summer (McCarthy, 2001), but also of daily fluctuations with daily minimum temperatures increasing at a faster rate than daily maxima (Easterling et al., 1997).
Overall, the predicted extent of climate change may lead to a shift in agroclimatic zones with an increased area suffering severe water deficits (Trnka et al., 2011a) thus affecting global food production. The soil environment may buffer changes in temperature to a certain extent, but reduced soil moisture can have a strong impact on soil fauna (Pflug and Wolters, 2001; Lindberg and Bengtsson, 2005; Tsiafouli et al., 2005; Staley et al., 2007) thus endangering important ecosystem functions provided by soils (e.g. carbon sequestration, nutrient cycling and decomposition). Especially agricultural systems may be highly sensitive to climatic changes because of a low vegetation cover leading to locally high temperatures and drought (Kutsch et al., 2009).

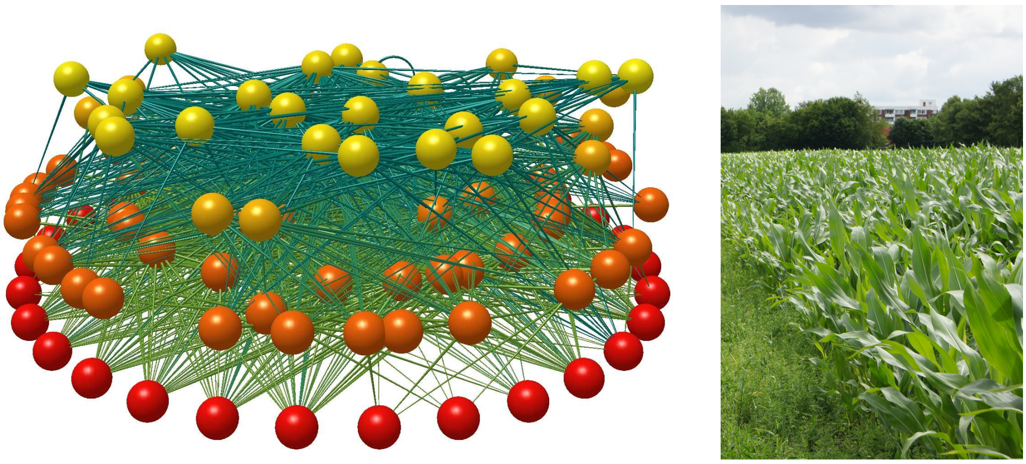


Figure 1.1.: Left side: Soil food web of a cornfield, Holtensen (Göttingen, Germany), created in the framework of the DFG research unit "Carbon flow in belowground food webs assessed by stable isotope tracers". Nodes represent species which are linked by their trophic interactions. The food web consists of plant litter, dead and living plantroots, dead animals, living plants and plant exudates as basal resources. The food web built upon this base comprises bacteria, fungi, protozoans, nematodes, mesofauna (e.g. collembolans, mites) and macrofauna (e.g. beetles, spiders).
Right side: Cornfield in Holtensen, Göttingen, for which the food web was compiled.

1.3. Food webs

Food webs are complex arrangements of interconnected species. In natural communities, these food webs comprise hundreds of species and thousands of links between species (Fig. 1.1). The relationships between species can be of different nature: either trophic interactions (i.e. feeding interactions between a consumer and its resource) or non-trophic interactions such as pollination, facilitation or competition. Most published examples of ecological networks focus on feeding relationships between species (trophic interactions), and the integration of trophic and non-trophic interactions is only beginning (Kéfi et al., 2012). However, trophic and non-trophic interactions both determine the dynamics of communities as all species must acquire resources to survive and reproduce (Brose et al., 2012).

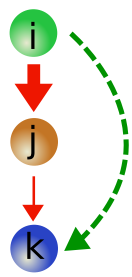
Box 1
Competition is a relationship in which two or more species negatively influence each other (Tokeshi, 1999). **Interference competition** refers to direct competitive behaviour (e.g. territoriality, attacking, guarding behaviour) where one individual prevents others from accessing a shared resource, thereby negatively affecting the opponent's fitness (Park, 1962; Keddy, 1989; Tokeshi, 1999; Scharf et al., 2008). In contrast, exploitative competition occurs when species reduce the amount of a shared resource of limited availability without active interference (i.e. removal of a resource) (Park, 1962; Tokeshi, 1999; Scharf et al., 2008).

During the last century, food webs were contemplated from varying perspectives: Lindeman (1942) used an energetic approach in which he viewed food webs as networks of energy pathways in ecosystems. Initially, ecosystems attain energy via photosynthesis of plants. Solar energy is converted into chemical energy and matter which is consumed by higher trophic levels and thus fuels all living. Later, food-web models started to incorporate body mass as a fundamental ecological characteristic of species (Cohen, 1990; Williams and Martinez, 2000; Petchey et al., 2008), defining ecological interactions such as consumption rates and their strengths (Emmerson and Raffaelli, 2004; Brose et al., 2006b, 2008; Vucic-Pestic et al., 2010b) and influencing the structure of food webs (Elton, 1927; Cohen et al., 1993; Brose et al., 2006a; Rall et al., 2008). Generally, a predator will be larger than its prey (Cohen et al., 1993; Brose et al., 2006b; Riede et al., 2011) and feed on taxa in a specific size range (Petchey et al., 2008; Brose, 2010). With increasing trophic level, body masses increase whereas predator-prey size ratios decrease (i.e. predators and their prey become more similarly sized) (Riede et al., 2011; Brose et al., 2012). This intrinsic body-mass structure is fundamental to food-web stability and persistence (i.e. the likelihood to persist through changes) (Brose et al., 2006b; Otto et al., 2007; Rall et al., 2008; Berlow et al., 2009; Brose et al., 2012; Heckmann et al., 2012), especially due to its implications for interaction strengths and intraspecific competition (Kartascheff et al., 2010).

Direct investigation of the impact of climate change on whole food webs is impossible due to their high complexity and the large number of species and links. Therefore, it is necessary to start with simple modules such as single consumer-resource interactions and gain complexity by incorporating interference or exploitative competition (Box 1, Holt et al., 1994; Tilman, 1997; Huisman and Weissing, 2001; Skalski and Gilliam, 2001; Kratina et al., 2009; Lang et al., 2012), omnivory (Kuijper et al., 2003; Tanabe and Namba, 2005; Vandermeer, 2006) and trophic cascades (Box 2, Hairston et al., 1960; Paine, 1980; Polis, 1994; Polis et al., 2000; Schmitz et al., 2000; Shurin et al., 2002; Borer et al., 2005). The knowledge obtained this way can thereby be scaled up to complex networks.

Box 2

Trophic cascades describe an indirect effect of one species on another in which a predator suppresses the abundance of its prey, thereby releasing the species two feeding links below from predation pressure (Hairston et al., 1960). For example, species i has a positive cascading effect (green arrow) on species k due to it's direct negative effect (thick red arrow) on j. Thereby, i releases k from its predation pressure by j (thin red arrow).



Temperature may directly affect the physiology of species and therefore change the biomass and abundance of species (Yvon-Durocher et al., 2011a), causing further changes at the population and community level (Brose et al., 2012). Additionally, environmental temperature affects digestion, movement, behaviour and encounter rates which drive interaction strengths between species by modifying the species' consumption rates directly (Thompson, 1978; Jeschke et al., 2002; Kruse et al., 2008; Englund et al., 2011; Brose et al., 2012; Sentis et al., 2012) or indirectly by interference competition (Lang et al., 2012). In consequence, environmental warming may exert a long-lasting influence on food webs by altering food-web properties and rates of ecological processes (e.g. increasing decomposition rates with warming (Aerts, 2006; Dossena et al., 2012; Ott et al., 2012)), shifts in community size structure (Daufresne et al., 2009; Yvon-Durocher et al., 2011a; Dossena et al., 2012) or causing a spatial or temporal mismatch which uncouples trophic interactions (Harrington et al., 1999; Walther et al., 2002; Winder and Schindler, 2004; Visser et al., 2006; Durant et al., 2007). Therefore, environmental warming has the potential to weaken consumer-resource interactions because metabolic demands of consumers often increase faster with temperature than their consumption rates (Kratina et al., 2012; Rall et al., 2012). This only superficially touches the complexity of how climate change affects ecosystems and shows the importance of finding general ecological principles which can be used by theoretical modelling approaches to predict the impact of climate change on complex food webs.

1.4. Energy fluxes

Understanding how food webs and ecosystem functions are affected by environmental warming requires a combined knowledge of food-web structure and interaction strengths (i.e. the magnitude of energy flowing from resource to consumer, Berlow et al., 1999) which are fundamental to food-web stability (Berlow et al., 2004). The idea of looking at nature as an energy-flow system is deeply rooted in early history of ecology (Elton, 1927; Lindeman, 1942; Odum, 1968; Reichle, 1968; de Ruiter et al., 1998). Energy transfer and carbon turnover rates are directly linked as energy is released from organic compounds by carbon oxidation (Berg and Laskowski, 2006), therefore most research on energy fluxes in food webs concentrated on carbon fluxes (Hunt et al., 1987; de Ruiter et al., 1993; Berg et al., 2001; Schröter et al., 2003). Pioneering works on soil food webs used aggregated functional groups (i.e. organisms within the same taxon or with similar diets and shared predators, Berg et al., 2001) and constant biological rates within trophic groups to calculate carbon and nutrient fluxes through a food web (Hunt et al., 1987; de Ruiter et al., 1994a,b; Schröter et al., 2003). These quantitative food-web models estimated annual consumption rates of a population by assuming that it needs to balance its respiration R, biomass changes due to natural death and population growth ΔB and consumption C by its predators (Fig. 1.2, de Ruiter et al., 1994a,b). As not all energy consumed is assimilated, it is important also to incorporate assimilation efficiencies $A_{\%}$ into these models, thus accounting for energetic losses at each trophic level. Calculations of energy flows based on these considerations usually start with the consumption rates of the top predators which only lose biomass due to natural death (Hunt et al., 1987; de Ruiter et al., 1993). The predatory losses of one trophic level lower can then be calculated from the consumption rates of the top predators, thus working back to the primary consumers (Hunt et al., 1987; de Ruiter et al., 1993).

Biological rates depend on body mass and due to the underlying chemical reactions on temperature. Nevertheless, classical energy flux models completely ignore the temperature and body-mass dependency of metabolic rates (Gillooly et al., 2001; Brown et al., 2004; Ehnes et al., 2011), consumption rates (Vucic-Pestic et al., 2010b, 2011; Ott et al., 2012; Rall et al., 2012) and assimilation efficiencies (Heiman and Knight, 1975; Mathavan, 1990).

The allometric scaling of metabolism now occupies scientists for more than a century,

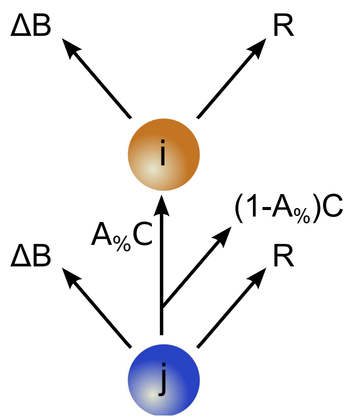


Figure 1.2: Energy fluxes between species can be calculated by assuming that biomass changes over time (ΔB) which represent natural death and biomass gains, and energy losses due to respiration (R) are balanced by consumption (C) and assimilation efficiency ($A_{\%}$). Predatory losses of one trophic level lower are calculated from the consumption rates of their predators.

with early concepts based on the proportion of surface area to volume postulating a scaling with a 2/3 power law (Rubner, 1883). This theory was replaced half a century later by Kleiber's law (Kleiber, 1947) which proposed a 3/4 power-law relationship explained by the fractal transport networks within organisms (West et al., 1997). This model was extended by the universal temperature dependency of metabolism, forming the metabolic theory of ecology which predicts that metabolism follows a 3/4 power law scaling with body mass and an exponential scaling with temperature with an exponent (i.e. activation energy) between 0.6 and 0.7 eV (West et al., 1997; Gillooly et al., 2001; Brown et al., 2004). However, alternative metabolic scaling theories challenged this fixed allometric exponent by finding allometric exponents to depend on phylogenetic group, lifestyle or developmental stage (Dodds et al., 2001; White et al., 2007; McNab, 2008; Isaac and Carbone, 2010; Ehnes et al., 2011).

Assimilation efficiencies are assumed to differ between consumer types (Odum, 1968; Peters, 1983) with high assimilation efficiencies meaning that an organism can use more of the consumed material for respiration, growth and reproduction. Generally, assimilation efficiencies are thought to increase with trophic level (Kozlovsky, 1968) but their dependency on temperature and body mass is unclear with some studies finding temperature-dependency (Heiman and Knight, 1975; Mathavan, 1990) and others not (Richardson, 1975; Hamilton, 1985; Pandian and Marian, 1985, 1986). The influence of body mass is less investigated and no influence of body mass on assimilation efficiencies was found so far (Buhr, 1976; Gerald, 1976a; Pandian and Marian, 1985, 1986).

Investigations of the impact of temperature and body mass on metabolism and assimilation efficiencies so far indicate differences between consumer types (e.g. carnivores, herbivores, detritivores) (Odum, 1968; Castro et al., 1989; Hilton et al., 1999; Isaac and Carbone, 2010; Ehnes et al., 2011). This is the background for Chapter 2 where I investigated how temperature and body mass affect respiration rates and assimilation efficiencies and by that the consumption rates of different consumer types. Knowledge on how respiration rates and assimilation efficiencies are affected by temperature and body mass allows us to calculate maintenance consumption rates for different consumer types, i.e. the consumption rate which exactly balances energy loss. Trophic interactions between consumers and their resources build the energetic backbone of natural communities and can be described by functional-response models quantifying consumer *per capita* consumption rates depending on prey abundance (Holling, 1959). Classical functional response models include the consumer's attack rate (or capture rate) and the handling time necessary to ingest and digest a resource. Prior studies demonstrated systematic effects of environmental temperature and species' body masses on functional response parameters to strongly affect consumption rates (Brose et al., 2008; Petchey et al., 2010; Vucic-Pestic et al., 2010b, 2011; Englund et al., 2011; Ott et al., 2012; Rall et al., 2012). Fundamental to this influence of temperature is the increased activity of ectotherm organisms with warming, which enables them to search a larger area and encounter a higher number of prey (Dreisig, 1981; Honek, 1997; Kruse et al., 2008). However, this increased activity also results in a higher encounter probability of conspecifics with interference competition (e.g. attacking of conspecifics, threat behaviour) reducing the consumption rate (Skalski and Gilliam, 2001; Kratina et al., 2009; Lang et al., 2012). In Chapter 3, I examine the impact of temperature and body mass on interference competition using a functional response approach.

Box 3 - Glossary

Basal species	Species feeding on no other species in a food web (e.g. plants, detritus)
Intermediate species	Species that feed on other species and are fed on by higher trophic levels
Top predator	A species on which nothing else feeds
Detritus	Nonliving organic matter
Detritivore	Consumer feeding on detritus
Herbivore	Consumer feeding on plants
Carnivore	Species feeding on other animals
Omnivore	Species feeding on more than one trophic level
Trophic Level (TL)	The position of an organism in a food chain or food web with basal species at the bottom (TL = 1), followed by primary consumers such as herbivores or detritivores (TL = 2) and consumers of higher order (TL ≥ 3)

1.5. Complex soil communities

Soils provide the foundation for terrestrial life. As they are the largest terrestrial storage of carbon (Kutsch et al., 2009; Nielsen et al., 2011) and the most species-rich component in many terrestrial ecosystems (Tsiafouli et al., 2005; Nielsen et al., 2011), they play an important role in ecosystem functioning by affecting decomposition and primary production. The enormous diversity of organisms living in soils is central to important ecosystem services such as nutrient cycling, carbon sequestration, litter decomposition, delocation of material, stabilization of soils or earth structuring. However, despite their importance for energy and carbon flows through the terrestrial system, trophic relationships in soils are still poorly understood (Wolters, 2001; Ruess and Chamberlain, 2010). Studying trophic interactions of soil animals and microorganisms is difficult as the soil habitat impedes direct observations. During the last decades, further development of molecular techniques such as stable isotope analysis (Ponsard and Arditi, 2000; Post, 2002; Traugott et al., 2007, 2008; Pollierer et al., 2009; Maraun et al., 2011), molecular gut content analysis (Staudacher et al., 2010; Eitzinger and Traugott, 2011; Sint et al., 2011) and phospholipid fatty acid analysis (Pollierer et al., 2010; Ruess and Chamberlain, 2010) was a great step forward for soil food web research as they enable assigning animals to trophic levels or feeding guilds and tracking of energy flows through ecological communities (Scheu and Falca, 2000; Post, 2002; Pollierer et al., 2009, 2010; Maraun et al., 2011).

Figure 1.1 (page 15) shows an example of a soil food web of an agricultural field where the nodes represent species and the links connecting these species represent trophic interactions. This food web was compiled for the top soil (upper 10 cm) of a cornfield at Holtensen, Göttingen (Germany, N 51° 33.613 E 009° 53.823) and comprises 141 species with 2339 links and a connectance of 0.12. The connectance describes how many of all possible links are realized in a food web ($\sum$ Links/($\sum$ Species^2)) and is seen as a measurement for food-web stability as the number of secondary extinctions following the extinction of a first species decreases with increasing connectance (Dunne et al., 2002). However, if connectance exceeds a critical value the system may become unstable again (May, 1972). The connectance of 0.12 found for this soil food web lies well in the range observed for other empirical food webs (Dunne et al., 2002, 2004; Riede et al., 2010; Staniczenko et al., 2010).

The predominant organism group in soil ecosystems, both in abundance and biomass, are microorganisms (bacteria and fungi) which decompose the accumulating organic material (Sparling, 1985; Kilham, 1994; Berg et al., 2001; Crowther et al., 2011; Nielsen et al., 2011). Furthermore, based on these microorganisms a typical soil food web (Fig. 1.3) comprises microfauna (protozoa and nematodes), mesofauna (e.g. mites, collembolans)

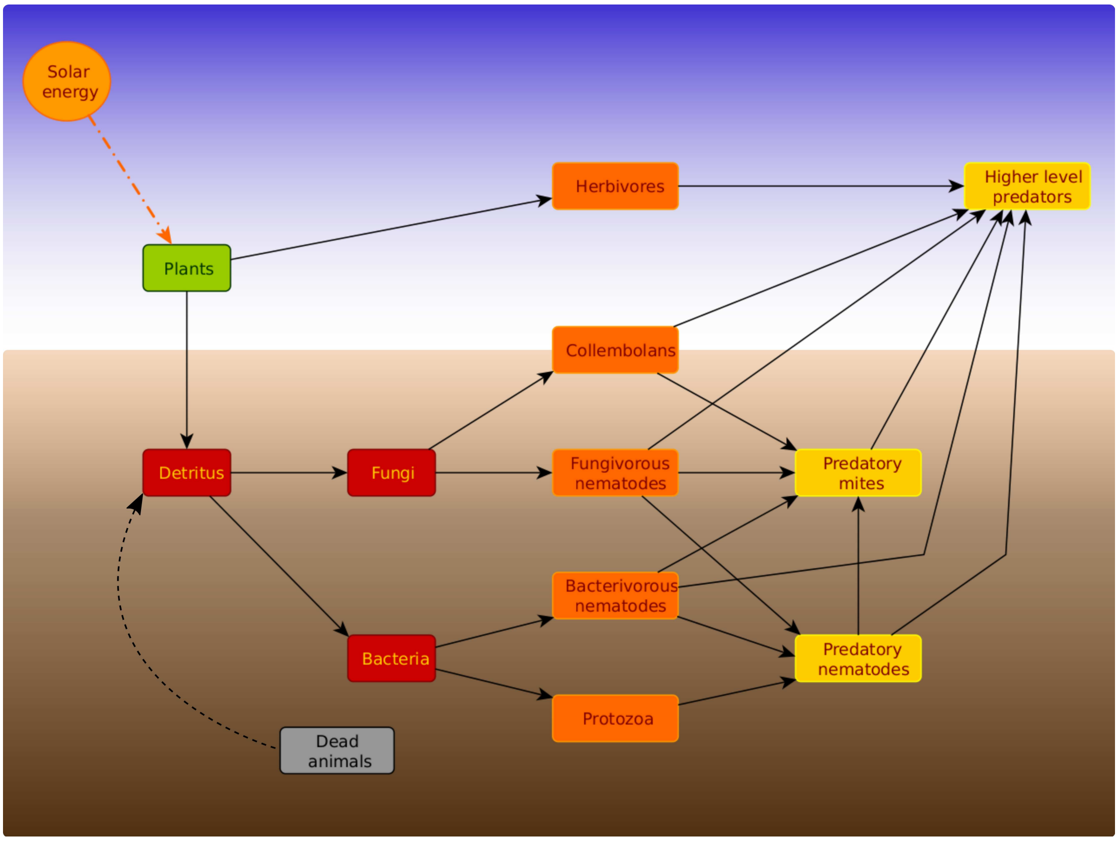


Figure 1.3.: Example of a soil food web with aggregated functional groups. The dashed arrow symbolizes the input of dead animal matter into the detritus pool for all trophic levels. The aboveground and the belowground system are coupled by species dwelling between both systems.

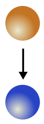
and macrofauna (e.g. beetles, earthworms) of differing trophic groups (i.e. bacterivores, fungivores, detritivores, herbivores and carnivores). The composition of this soil faunal community is an important determinant of carbon dynamics (Bradford et al., 2007; Ruess and Chamberlain, 2010) as soil fauna affects decomposition rates by regulating microbial populations, inoculation of litter and stimulation of microflora activity (Kilham, 1994; Brussaard, 1998; Hedlund and Öhrn, 2000; Berg et al., 2001). Additionally, decomposition rates are affected by biochemical and physical properties of organic matter such as cellulose and lignin content (Swift et al., 1979; Pflug and Wolters, 2001; Ott et al., 2012) and environmental conditions (Sparling, 1985; Berg et al., 2001; Aerts, 2006; Kutsch et al., 2009).

Traditionally, aboveground and belowground components of ecosystems have been considered in isolation from one another but they are interdependent with plants indirectly interacting with decomposers and directly with root-associated organisms and herbivores.

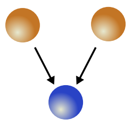
More precisely, soils are part of larger ecosystems and not an ecosystem of their own. As most of the carbon turnover occurs belowground (Briones et al., 2009), knowledge of belowground processes is crucial to understand the impact of climate change on the aboveground system. The solar energy which is transformed into molecules by photosynthesis is mainly transferred into the belowground system by root exudates and litter which are utilized by microorganisms and other primary decomposers (Albers et al., 2006). Especially the decomposer community strongly influences the aboveground system through its role in the breakdown and transformation of organic matter (Bardgett and Wardle, 2010). Based on these primary decomposers is a complex community with connections to the aboveground system by mobile animals and nutrient uptake by plants. This system is no one-way road and does not end with the death of the top predators but the energy circles back as all dead animals are decomposed again (Fig. 1.3).
Due to the sensitivity of soil organisms to abiotic factors, carbon and nutrient cycling by the soil community may be directly or indirectly altered by climate change (Davidson and Janssens, 2006; Bardgett et al., 2008; Briones et al., 2009; Bardgett and Wardle, 2010). Especially at the soil surface, temperatures show large temporal and spatial variations. Several studies found soil communities to be sensitive to increasing temperature but soil moisture also strongly affects the activity of soil animals, as many organisms depend on a water film to move through (e.g. protozoa, bacteria, nematodes) or are prone to dessication (Verhoef and Witteveen, 1980; Frampton et al., 2000; Lindberg and Bengtsson, 2005; Tsiafouli et al., 2005; Davidson and Janssens, 2006; Staley et al., 2007; Andresen et al., 2011). Therefore, investigation of the impact of climate change on agricultural systems should integrate the community across trophic levels and interactions. So far, the majority of studies only explored the impact of single factors of climate change on soil communities, but predictions of future responses to climate change require a greater understanding of the simultaneous effects of multiple climate change factors (Bardgett and Wardle, 2010). In Chapter 4, I try to overcome this lack of studies by exploring how a size-structured soil communitiy is affected by climate change. Taking a simplified soil community spanning four trophic levels I investigate how temperature and drought in combination affect decomposition processes and feeding interactions between species. As the experiment was run in the framework of the DFG research unit "Carbon flow in belowground food webs assessed by stable isotope tracers", the experimental soil community was based on the community of the temperate agricultural field described above (Fig. 1.1, Kramer et al., 2012; Scharroba et al., 2012).

1.6. Outline of this thesis

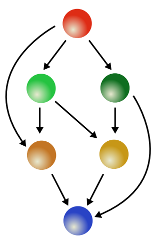
This thesis discusses different aspects of climate change (single and multiple factors) and body mass on varying levels of organization of food webs.



Chapter 2 begins with a simple predator-prey system as the lowest level of organization. Using a metastudy approach I investigated how temperature and body mass influence respiration rates and assimilation efficiencies of different consumer types (carnivores, herbivores and detritivores). With this knowledge of the temperature and body-mass dependencies I then calculated maintenance consumption rates (i.e. the consumption rate balancing metabolic demands) and examined how these consumption rates in a food web are shifting under global warming.



In natural communities, species do not only interact directly by trophic interactions but a large amount of activity is spend on competition for food which potentially alters consumption rates. In **Chapter 3** I investigate intraspecific interference competition of arthropod predators using a functional-response framework. The experiment was conducted for two differently sized predator species and replicated over two temperatures to incorporate body-mass and climate-change aspects.



Chapter 4 explores the impact of temperature and soil moisture on a size-structured community spanning four trophic levels. The experiment was carried out using intact soil cores from an agricultural field, thus preserving the compaction and pore structure the community faces in nature. The community consisted of bacteria, fungi, protozoans, nematodes, fungivorous collembolans, and mites or geophilids as top predators and reflected a natural community of agricultural fields. This incorporates simultaneous investigation of two climate change parameters and a body mass aspect into a community ecology approach.

1.7. Contributions to publications

Chapter 2: Respiration rates, assimilation efficiencies and maintenance consumption rates depend on consumer types: energetic implications of environmental warming

Authors: **Birgit Lang**, Roswitha B. Ehnes, Björn C. Rall, Ulrich Brose
Manuscript in preparation
Contributions: Idea and analyses by all authors, database work by R.B.E. and B.L., text by B.L., B.C.R and U.B.

Chapter 3: Warming effects on consumption and intraspecific interference competition depend on predator metabolism

Authors: **Birgit Lang**, Björn C. Rall, Ulrich Brose
Published in: Journal of Animal Ecology (2012), Volume 81(3), pages 516–523
Contributions: Idea and analyses by all authors, empirical work by B.L., text by B.L. and U.B.

Chapter 4: Effects of environmental warming and drought on a size-structured soil community

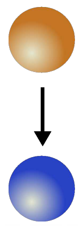
Authors: **Birgit Lang**, Björn C. Rall, Stefan Scheu, Ulrich Brose
Manuscript in preparation
Contributions: Idea by B.L., S.S. and U.B., analyses by B.L., B.C.R. and U.B., empirical work by B.L., text by B.L., B.C.R. and U.B.

Part III.

Research Chapters

Chapter 2.

Respiration rates, assimilation efficiencies and maintenance consumption rates depend on consumer types: energetic implications of environmental warming



2.1. Abstract

With the world continuously warming, a mechanistic understanding how food webs react to climate change gains importance. Biological rates fundamental to the energy distribution in food webs such as respiration rates and consumption rates are accelerated by warming but no studies so far investigated if this temperature dependency differs between trophic levels or consumer types. Here, we performed a meta-analysis of published studies on respiration rates and assimilation efficiencies to investigate how the influence of temperature and body mass differs between consumer types. Based on that we calculated the maintenance consumption rates (i.e. amount of energy required to balance life maintenance) in dependence on temperature, body mass and consumer type by dividing respiration rates by assimilation efficiencies.

The scaling of respiration rates and assimilation efficiencies with temperature and body mass differed between consumer types. Respiration rates increased with temperature and body mass for all consumer types with the strongest impact of temperature on carnivores and the strongest body-mass effect for herbivores. While assimilation efficiencies of herbivores increased with warming, they were not affected by temperature for all other consumer types. Moreover, body mass did not affect assimilation efficiencies except for a decrease that we found for detritivores. The resulting maintenance consumption rates increased with temperature and body mass for all consumer types with the strongest increase with temperature for carnivores whereas the body-mass effect was most pronounced for detritivores.

Overall, our results suggest non-trivial effects of temperature on food-web stability and biomass distribution in food webs. Climate change will have profound energetic consequences for natural communities (1) by increasing turnover rates at the detritivore level due to their accelerated consumption rates and (2) by strongly increasing maintenance consumption rates of carnivores. Interestingly, consumption rates of lower trophic levels increased less under warming than experimentally measured consumption rates published in literature. In contrast, calculated predator maintenance consumption rates increased stronger under environmental warming than realized consumption rates. This suggests that lower trophic levels should be able to increase their biomass under warming whereas predators should struggle to consume enough energy for maintenance and have no resources left for population growth.

2.2. Introduction

Species in natural communities are linked to one another by their feeding interactions which drive the flow of energy and nutrients, thus forming a highly complex network with hundreds of species and thousands of links between these species. Natural food webs display a characteristic body-mass structure which may account for the specific link structure defining who eats whom and determines the stability and dynamics of ecological systems (Brose et al., 2006b; Otto et al., 2007; Rall et al., 2008; Brose, 2010; Riede et al., 2011; Yvon-Durocher et al., 2011b; Heckmann et al., 2012).

As the world is continuously warming due to climate change (IPCC, 2007; Sanderson et al., 2011), a mechanistic understanding how food webs react to environmental warming is a major challenge for ecologists. Warming directly accelerates chemical reactions and thereby alters biological processes fundamental to the energy distribution in food webs, such as respiration rates (Gillooly et al., 2001; Brown et al., 2004; Ehnes et al., 2011) or consumption rates (Brose et al., 2008; Vucic-Pestic et al., 2010b; Lang et al., 2012; Ott et al., 2012; Rall et al., 2012) with higher trophic levels being more sensitive to climatic conditions (Daufresne et al., 2009; Sentis et al., 2012).

Understanding how food webs and ecosystem functions are affected by environmental warming requires a combined knowledge of food-web structure and interaction strengths (i.e. the magnitude of energy flowing from resource to consumer) which are fundamental to food-web stability (Berlow et al., 2004). The patterns of interaction strengths within communities are determined by the distribution of energy (de Ruiter et al., 1998; Brose et al., 2008), with weak interactions having a stabilizing effect (Berlow, 1999). The idea of treating nature as an energy-flow system is deeply rooted in early history of science (Elton, 1927; Lindeman, 1942; Odum, 1968; Reichle, 1968; de Ruiter et al., 1998). Classical quantitative food-web models estimated the annual consumption rates C of a population by assuming that it needs to balance its respiration, its biomass loss due to consumption by predators and its change in biomass by natural death and population growth (Hunt et al., 1987; de Ruiter et al., 1994a,b). In a steady-state system (i.e. without biomass change), the consumption necessary to balance the metabolic demand (i.e. equilibrium energy flow) therefore can be calculated by

$$C \sim \frac{R}{A_{\%}} \tag{2.1}$$

where C is the organism's consumption, R its respiration rate and $A_{\%}$ the assimilation efficiency. The respiration rate describes the rate at which an organism transforms energy and material and may be the most fundamental biological rate as it determines the demands an organism places on its environment (Brown et al., 2004). Assimilation efficiency expresses how much energy is being extracted from the food consumed and can be used for metabolism and production (Fig. 2.1).

Biological rates depend on body mass and due to the underlying chemical reactions on temperature. The metabolic theory of ecology (Brown et al., 2004) explains how body mass and temperature affect respiration rates. Originally, a fixed allometric exponent

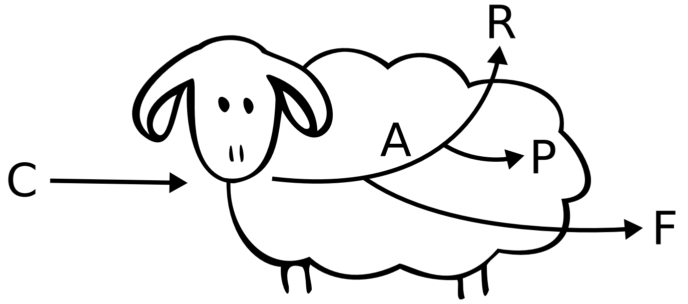


Figure 2.1.: Schematic diagram of the energy pathways through an organism. Part of the consumed energy (C) is assimilated (A). The part which cannot be utilized is egested as faeces (F). The assimilated energy is used for production (P) and the organism's respiration (R). Assimilation efficiency describes the proportion of assimilation to consumption ($\frac{A}{C}$).

(0.75) was used, but Downs et al. (2008) enhanced the model by allowing group-specific allometric exponents and activation energies:

$$I = i_0 M^a e^{\frac{-E}{kT}} \tag{2.2}$$

where I is the respiration rate, i_0 a normalization factor, M the body mass (mg), a the allometric exponent, E the activation energy (eV), k the Boltzmann's constant (8.62×10^{-5} eV/K) and T environmental temperature (K). Respiration rates increase with temperature and body mass (Gillooly et al., 2001; Brown et al., 2004), but these scaling relationships differ between phylogenetic groups (Downs et al., 2008; Isaac and Carbone, 2010; Ehnes et al., 2011). As phylogenetic groups often comprise animals of the same consumer type we expected to also find a correlation between respiration rates and consumer types as proposed by Ehnes et al. (2011) who observed higher respiration rates in groups consisting mainly of active hunters and lower respiration rates in detritivorous groups. By re-analyzing their database on standard respiration rates of terrestrial invertebrates we explored how the allometric and temperature scaling of respiration rates differs between consumer types.

Assimilation efficiencies vary between consumer types (e.g. carnivores, herbivores, detritivores) depending on the amount of material which cannot be utilized such as chitinous exoskeletons and lignin (Odum, 1968; Peters, 1983). Usually, it is calculated by dividing the assimilated energy by the consumed energy (Fig. 2.1):

$$A_{\%} = \frac{R + P}{C} \tag{2.3}$$

or

$$A_{\%} = \frac{C - F}{C}. \tag{2.4}$$

Equation 2.3 assumes that the assimilated energy becomes available for metabolism R (life maintenance, activity) and production P (growth and reproduction). A second way of calculating the assimilated energy is by subtracting the excreted energy F (faeces) from the consumed energy (Equation 2.4). Some studies investigating assimilation efficiencies found an impact of temperature (Heiman and Knight, 1975; Mathavan, 1990) whereas others found assimilation efficiencies to be temperature independent (Richardson, 1975; Hamilton, 1985; Pandian and Marian, 1985, 1986). Furthermore, body mass showed no effect on assimilation efficiencies (Buhr, 1976; Gerald, 1976a; Pandian and Marian, 1985, 1986). However, most of these studies were conducted for a small set of species and replicated over small temperature or body-mass gradients. Metastudies so far concentrated on the influence of nitrogen content on assimilation efficiencies of aquatic insects and fish (Pandian and Marian, 1985, 1986) and consumer types of birds (Castro et al., 1989; Hilton et al., 1999) while not accounting for temperature and body mass. Generally, assimilation efficiencies are assumed to increase with trophic level (Kozlovsky, 1968) which indicates differences between consumer types (Odum, 1968; Peters, 1983). Here, we compiled a database for assimilation efficiencies using literature research to investigate the impact of temperature, body mass and consumer type over a broader range.

Knowledge on how respiration rates and assimilation efficiencies for different consumer types are affected by temperature and body mass allowed us to calculate the consumption rates which exactly balance energy loss (i.e. maintenance consumption rates). Prior studies using a functional-response approach (Holling, 1959) showed that consumption rates increase with temperature and body mass (Brose et al., 2008; Vucic-Pestic et al., 2010b, 2011; Ott et al., 2012; Rall et al., 2012). Our approach allows investigation of the impact of climate change on food webs by assigning consumer types to species and accounting for consumer-type specific scaling with temperature and body mass.

The questions we address in this study are (1) whether the impact of temperature and body mass on respiration rates differs between consumer types and (2) if assimilation efficiencies are affected by temperature, body mass and consumer type. Based on these results we then (3) investigated how maintenance consumption rates which exactly balances energy loss scale with temperature depending on consumer types.

2.3. Materials and methods

Datasets

To address the scaling of standard respiration with temperature and body mass for different consumer types, we used the database of terrestrial invertebrates by Ehnes et al. (2011). For our analysis, only species which could be clearly categorized into a con-

sumer type were included, resulting in a database with 2683 experimental observations (Appendix 1). Data were transformed into joule per hour (J h^{-1}) for respiration rates, Kelvin (K) for temperature and milligram (mg) for body mass (wet weight).
For assimilation efficiencies, we combined data from 53 published studies with 376 experimental observations where assimilation efficiencies were measured under a controlled temperature regime (Appendix 2). Studies using the Conover ash ratio method or radioactive labelling of the resource were excluded as they seemed to be unreliable (Prus, 1971; Lasenby and Langford, 1973; Richardson, 1975; Nielsen and Olsen, 1989). If no information on body mass was provided, we used average body masses from secondary literature. Dry weight of body mass was converted into wet weight by a conversion factor of 4 (Peters, 1983). Data were transformed into Kelvin (K) for temperature and milligram (mg) for wet weight.
Species were classified by their consumer type as carnivores, herbivores or detritivores. Bacterivores and fungivores were not included in the analyses as the data records were poor.

Statistical analyses

Data were analysed using the statistical program R (R Development Core Team, 2010) with the additional package "nlme" (Pinheiro et al., 2010) employing linear mixed effects models with maximum likelihood (function "lme" with "method=ML" within the "nlme" package). Study identity was entered as a random effect in these models to account for systematic differences among studies. Assimilation efficiencies were arcsine square root transformed (Sokal and Rohlf, 1995) as they are a percentage.
To analyse the influence of temperature and body mass on respiration rates for different consumer types, we included consumer type and the two-way interaction terms between consumer type and body mass and consumer type and temperature in the linear model (Equation 2.2, Ehnes et al. 2011). Temperature was normalized to a standard temperature of 20° C (293.15 K) by incorporation of an extended Arrhenius term (Gillooly et al., 2001; Vasseur and McCann, 2005; Rall et al., 2010). Natural-logarithm transformation of the consumer-type model allowed calculation of consumer-type specific intercepts, allometric exponents and activation energies

$$\ln I = \ln i_{0\mathrm{C}} + a_{\mathrm{C}} \ln M - E_{\mathrm{C}} \frac{T - T_0}{kTT_0} \tag{2.5}$$

where I is the respiration rate, i_{0C}, a_C and E_C are the consumer-type specific intercepts, allometric exponents and activation energies, respectively, M is the body mass (mg), k the Boltzmann's constant (8.62×10^{-5} eV/K), T the absolute temperature (K) and T_0 the standard temperature (K).

For investigation of the influence of temperature and body mass on assimilation efficiencies $A_{\%}$ a linear model was used with temperature normalized as above, yielding

$$\arcsin\sqrt{A_{\%}} = i_{0\mathrm{C}} + a_{\mathrm{C}}\ln M + E_{\mathrm{C}}\frac{T - T_0}{kTT_0}. \tag{2.6}$$

Simulation of maintenance consumption rates

The values estimated by fitting of respiration rates and assimilation efficiencies were used to simulate 1000 hypothetical data points of maintenance consumption. We sampled 1000 body mass (ln) and temperature values using a normal distribution (function "rnorm", R Development Core Team 2010) with a mean of zero and a standard deviation of 3 for natural logarithmic body mass, and a mean of 20° C with a standard deviation of 5 for temperature. To create reproducible data, the random number generator used to generate the 1000 hypothetical data points was initialised with a fixed seed of 667 (function "set.seed", R Development Core Team 2010). Subsequently, we used the intercepts, slopes and activation energies from the fittings of respiration rates and assimilation efficiencies and their standard errors to calculate the 1000 corresponding respiration rates and assimilation efficiencies. The resulting respiration rates were multiplied by 3 for approximate conversion into field respiration rates (Savage et al., 2004).
Finally, we calculated maintenance consumption rates C following equation 2.1 by fitting a multiple linear model to obtain consumer-type specific intercepts, allometric exponents and activation energies:

$$C = i_{0\mathrm{C}} + a_{\mathrm{C}}\ln M + E_{\mathrm{C}}\frac{T - T_0}{kTT_0}. \tag{2.7}$$

2.4. Results

Respiration rates

Respiration rates increased with temperature and body mass with activation energies and allometric exponents depending on the consumer type (Tab. 2.1). For herbivores, the temperature relationship was not significant as only a small temperature range was covered by the data (19° C - 25° C). Respiration rates of carnivores were higher than respiration rates of detritivores and showed the strongest increase with temperature (Fig. 2.2A). The influence of body mass on respiration rates was highest for herbivores and least pronounced for carnivores (Fig. 2.2B).

Table 2.1.: Results of the fits for consumer-type specific respiration rates (Equation 2.5) and assimilation efficiencies (Equation 2.6) with intercepts normalized to 20° C. Note that values for assimilation efficiencies were arcsine square root transformed.

	Estimate	Standard error	P
Respiration rate			
ln i_0 (Carnivore)	−4.1417	0.095	< 0.001
ln i_0 (Herbivore)	−3.9353	0.576	< 0.001
ln i_0 (Detritivore)	−4.9138	0.106	< 0.001
a (Carnivore)	0.6944	0.01	< 0.001
a (Herbivore)	0.8158	0.061	< 0.001
a (Detritivore)	0.7216	0.013	< 0.001
E (Carnivore)	0.6997	0.014	< 0.001
E (Herbivore)	0.5373	0.818	0.511
E (Detritivore)	0.6074	0.02	< 0.001
Assimilation efficiency			
i_0 (Carnivore)	69.219	3.178	< 0.001
i_0 (Herbivore)	46.1244	2.377	< 0.001
i_0 (Detritivore)	37.1643	3.226	< 0.001
a (Carnivore)	−0.0209	0.326	0.949
a (Herbivore)	0.2762	0.258	0.286
a (Detritivore)	−2.3806	0.73	0.012
E (Carnivore)	1.3351	0.9	0.139
E (Herbivore)	5.2132	1.03	< 0.001
E (Detritivore)	1.6425	1.689	0.332

Assimilation efficiencies

Assimilation efficiencies differed widely between consumer types. Carnivores had the highest assimilation efficiencies (88 % ± 6.4, mean ± STD) and detritivores the lowest (19.9 % ± 13.3, mean ± STD) whereas herbivores showed a large variance between 14 and 95 % (55.3 % ± 19.2, mean ± STD). Assimilation efficiencies of carnivores and detritivores were independent of temperature but herbivores exhibited a strong increase in their assimilation efficiencies with warming (Tab. 2.1, Fig. 2.3A). Body mass did not affect assimilation efficiencies of carnivores and herbivores but influenced detritivorous assimilation efficiencies negatively (Tab. 2.1, Fig. 2.3B).

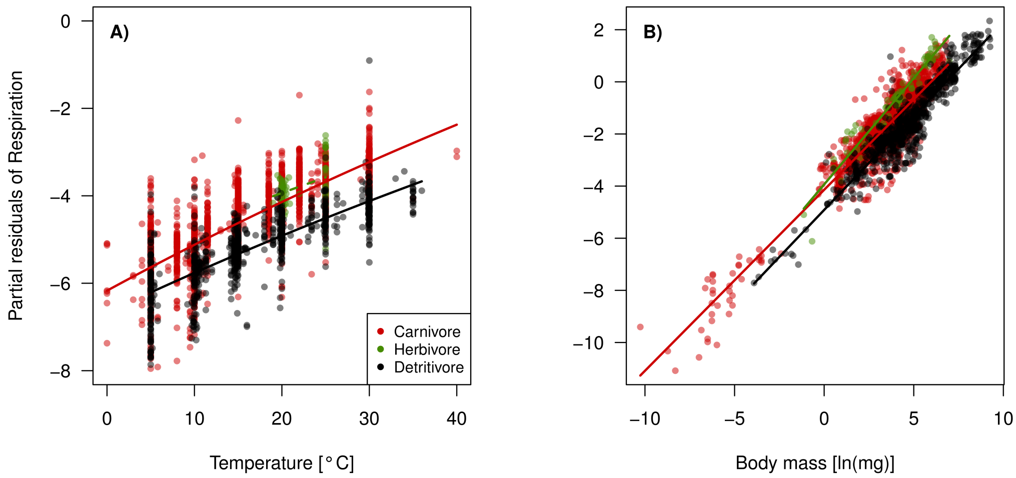


Figure 2.2.: Partial residual plots of the natural logarithm of respiration rates in dependence on (A) temperature and (B) body mass. In these plots, respiration rates are plotted against one of the independent variables while accounting for the effect of the other. Dotted lines indicate non-significant regressions.

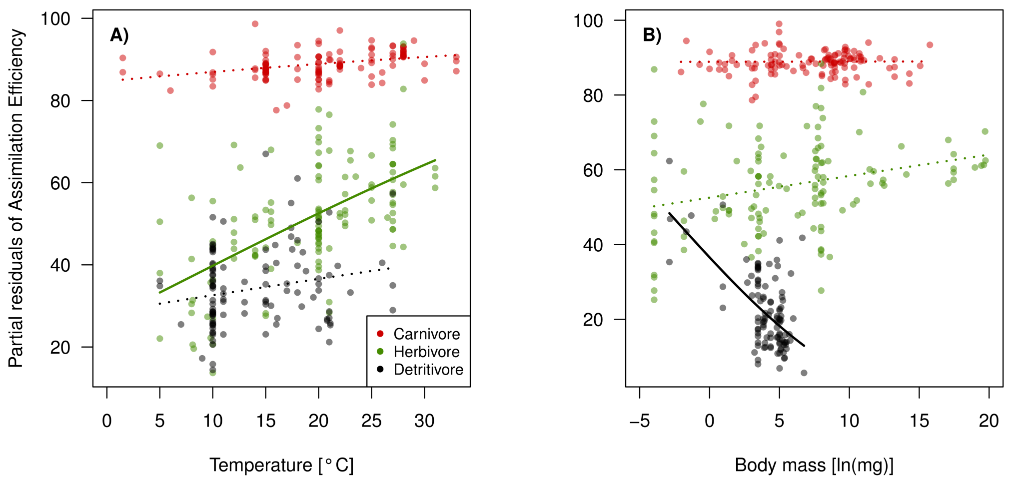


Figure 2.3.: Partial residual plots of assimilation efficiencies in dependence on (A) temperature and (B) body mass. Dotted lines are not significant. Note: Tab. 2.1 shows the arcsine square root transformed assimilation efficiency but plotted here are the regressions and residuals of the actual values.

Table 2.2.: Simulated group-specific intercepts, activation energies and allometric exponents for maintenance consumption rates of carnivores, herbivores and detritivores.

	Estimate	Standard error	P
i_0 (Carnivore)	−2.9014	0.016	< 0.001
i_0 (Herbivore)	−2.1669	0.016	< 0.001
i_0 (Detritivore)	−2.7561	0.016	< 0.001
a (Carnivore)	0.6967	0.006	< 0.001
a (Herbivore)	0.8038	0.006	< 0.001
a (Detritivore)	0.8334	0.006	< 0.001
E (Carnivore)	0.6811	0.024	< 0.001
E (Herbivore)	0.3611	0.024	< 0.001
E (Detritivore)	0.5013	0.024	< 0.001

Maintenance consumption rates

Maintenance consumption rates increased with temperature across all consumer types (Tab. 2.2). For carnivores and detritivores, assimilation efficiencies were temperature independent (Tab. 2.1) and the increasing maintenance consumption rates under warming are only caused by their increasing respiration rates (Tab. 2.1). Carnivorous maintenance consumption rates showed a stronger reaction to warming as their respiration rates increased rapidly with temperature whereas consumption rates of detritivores increased at a lower rate as their respiration rates increased more slowly. Herbivorous maintenance consumption rates showed the lowest increase with temperature as their assimilation efficiencies increased with temperature. In contrast, investigation of body mass effects showed a stronger increase of detritivorous maintenance consumption rates with increasing body mass as assimilation efficiencies decreased with body mass and thereby intensified the effect of higher respiration rates with increasing body mass.

2.5. Discussion

In this study, we used a literature research to investigate the impact of temperature and body mass on respiration rates and assimilation efficiencies and subsequently calculated maintenance consumption rates of different consumer types. Based on that, we discuss implications of environmental warming for the distribution of energy flows and stability of food webs. Especially carnivores showed a strong reaction to environmental warming which may substantially change food web structure and dynamics.

For respiration rates, we found activation energies and allometric exponents to differ between consumer types, thus supporting the hypothesis of Ehnes et al. (2011) of lower respiration rates in detritivorous groups in comparison to actively hunting animals. Respiration rates of carnivores showed the strongest reaction to temperature as they expend much more energy for active searching and hunting than herbivores and detritivores feeding on immobile resources (Tab. 2.1, Fig. 2.2A). The values of activation energies for carnivores and detritivores lie well in the expected range between 0.6 and 0.7 eV (Gillooly et al., 2001), whereas herbivores exhibited somewhat lower activation energies lying in the wider range of 0.46 to 0.96 eV proposed by Downs et al. (2008). Our database only contains data of resting animals, measurements of stressed or feeding animals were not included. However, the physiology of actively hunting animals is still reflected in their increased respiration rates. This energy consuming life strategy is balanced by carnivores preying on food of higher quality as animal tissue is of higher calorific value than plants or detritus (Golley, 1961) resulting in significantly higher assimilation efficiencies (Tab. 2.1).

Assimilation efficiencies of carnivores and detritivores were independent of temperature thus supporting other studies (Richardson, 1975; Hamilton, 1985; Pandian and Marian, 1985, 1986) whereas herbivorous assimilation efficiencies were scattered over a broad range and increased with temperature (Fig. 2.3A). Depending on the habitat and light or nutrient limitation within a habitat, plants can differ widely in their stoichiometry (Frost et al., 2005; Fink et al., 2006). Aquatic primary producers contain a higher amount of nutrient-rich (high nitrogen and phosphorous content) photosynthetic material in comparison to terrestrial plants with their carbon-rich structural and transport tissues (Elser et al., 2000; Shurin et al., 2006). As heterotrophs have high nitrogen and phosphorous demands, terrestrial herbivores face a greater nutritional imbalance than aquatic consumers (Elser et al., 2000; Frost et al., 2005; Shurin and Seabloom, 2005). However, animals have the ability to change their ingestion rate and degree of food selectivity to alter the balance of elements and may also reduce their assimilation efficiencies for elements ingested in excess (Logan et al., 2004; Frost et al., 2005; Frost and Tuchman, 2005). This explains the high variability in herbivorous assimilation efficiencies and may also be responsible for the temperature dependency if the plant's stoichiometry is changed under environmental warming (Aerts et al., 2009; Finkel et al., 2010; Sardans et al., 2012). To disentangle effects of different nutrient quality on assimilation efficiencies, future research should therefore include the resource's stoichiometry.

Investigation of the impact of body mass on respiration rates showed the strongest body-mass effect in herbivores and the lowest in carnivores (Tab. 2.1, Fig. 2.2B). For assimilation efficiencies we found a different pattern: the assimilation efficiencies of detritivores decreased with increasing body mass but we found no body-mass relationship for carnivores and herbivores (Tab. 2.1, Fig. 2.3B). We propose an explanation for the body-mass relationship of detritivores based on the smooth transition between primary decomposers feeding on litter and secondary decomposers feeding on fragmented litter and microorganisms (Scheu and Falca, 2000; Schneider et al., 2004; Chahartaghi et al., 2005; Pollierer et al., 2009). Most studies did not sterilize detritus prior to experiments, therefore decomposers could directly feed on litter and also on bacteria and fungi. Only recent studies were able to disentangle the trophic ecology of small organisms (Scheu and Falca, 2000; Schneider et al., 2004; Chahartaghi et al., 2005; Crotty et al., 2011; Maraun et al., 2011) showing that a high number of detritivores mainly feed on microorganisms. Our literature research did not reveal sufficient data of bacterivorous and fungivorous assimilation efficiencies to include them in the analysis, but the small number available showed distinctly higher assimilation efficiencies for both consumer types in comparison to detritivores, with 68 % ± 19.1 (mean ± STD, n = 16) and 71.8 % ± 13.1 (mean ± STD, n = 12) for bacterivores and fungivores, respectively. The decrease of detritivorous assimilation efficiencies with body mass in our dataset is mainly caused by few very small oribatid mites which were identified as secondary decomposers also feeding on fungi (Maraun et al., 2011) and thus exhibit high assimilation efficiencies. To figure out whether detritivorous assimilation efficiencies truly decrease with body mass or if this effect is completely mediated by additional feeding on fungi, additional measurements of primary and secondary decomposers over a broader body mass range are needed.

Knowledge of the dependency of respiration rates and assimilation efficiencies on temperature and body mass of different consumer types enabled us to simulate maintenance consumption rates. The increased energetic demand metabolism places on any ectothermic organism under warming resulted in increased maintenance consumption rates of all consumer types (Tab. 2.2) with higher consumption rates (i.e. higher intercepts) at the detritivore and herbivore level due to their low assimilation efficiencies and high respiration rates, respectively. Simulated maintenance consumption rates of carnivores showed the strongest reaction to temperature due to the strong temperature dependency of their respiration rates with their assimilation efficiencies staying on the same level. Therefore, their consumption has to increase rapidly under environmental warming thus confirming the high sensitivity of higher trophic levels to climate change (Daufresne et al., 2009; Sentis et al., 2012). However, comparison with experimentally measured consumption rates shows that the simulated high activation energies are not fulfilled by actual consumption rates for carnivores (Tab. 2.3). In contrast, herbivorous and detritivorous consumption rates increased faster with temperature than their energetic demand (Tab. 2.3, Tab. 2.2). This resulting net-energy gain may cause population growth (Ott et al., 2012) whereas carnivores fail to cover their increasing demand and thus face a higher risk of extinction under environmental warming (Petchey et al., 1999; Brose et al., 2012; Kratina et al., 2012; Rall et al., 2012). The increased maintenance consumption rates of detritivores should cause accelerated decomposition rates under warming and may create positive or negative feedbacks to global climate change as carbon-dioxide fluxes to the atmosphere are stimulated as well as primary productivity due to higher nutrient availability (Aerts, 2006; Davidson and Janssens, 2006; Kutsch et al., 2009; Nielsen et al., 2011; Dossena et al., 2012).

The theoretical approach we have chosen here focussed on calculation of maintenance consumption rates in a steady-state system and completely ignored changes in biomass due to consumption by higher trophic levels, natural death and population growth, which are important parts of energy flows in natural systems and can be integrated by estimation of biomass changes over time (mirroring biomass losses due to consumption and natural death and biomass accumulation by population growth, de Ruiter et al. 1998). This more precise calculation of non-equilibrium energy flows, however, can only be achieved for specific communities if data on food-web topology (i.e. the links defining who is consuming whom), and biomass densities replicated in time are available for all populations (de Ruiter et al., 1994b). While studies based on these non-equilibrium energy flows have unraveled astonishing patterns in the energetic structure of natural communities (de Ruiter et al., 1998; Neutel et al., 2002, 2007), approximation of energy flows based on equilibrium assumptions such as in our study allows generalizing energy-flow patterns across communities and ecosystems. Our approach thus enables broad, large-scale predictions at the cost of precision in predicting specific energy flows.

Additionally, in complex food webs a large number of other factors play a role which were not taken into account here, such as habitat structure, multiple prey (preference, switching) or predator interference which can modify consumption rates (Kratina et al., 2009; Vucic-Pestic et al., 2010a; Kalinkat et al., 2011; Lang et al., 2012; Sentis et al., 2012). As these factors may also be influenced by temperature and body mass (Kalinkat et al., 2011; Lang et al., 2012) they may be of high importance for energy distribution in food webs and food-web stability.

Overall, we have shown that the impact of temperature and body mass on respiration rates and assimilation efficiencies differs between consumer types which has important implications for the distribution of energy flows in food webs. Approximation of energy flows based on equilibrium assumptions such as in our study allows generalizing energy-flow patterns across communities and ecosystems. In this vein, we have shown how environmental warming changes the energetic requirements of organisms of different consumer types which have to be met for survival. The high maintenance consumption rates of detritivores due to low assimilation efficiencies may strongly affect carbon and nutrient turnover and thus feed back to global climate change. Carnivorous maintenance consumption rates showed the strongest reaction to increasing temperature as their respiration rates were strongly temperature dependent. This may have strong implications for food-web stability due to changed interaction strengths under environmental warming. However, as natural populations are subject to biomass changes, the actual energy flows for the populations to persist have to be higher than the calculated maintenance consumption rates. Our results thus represent lower boundaries of energy flows and how they are affected by warming. Comparison of the temperature relationship of estimated consumption rates and experimental data strongly stresses the importance of environmental warming for ecosystems as higher trophic levels fail to increase their consumption rates strong enough to counterbalance increased metabolic demands.

2.6. Acknowledgements

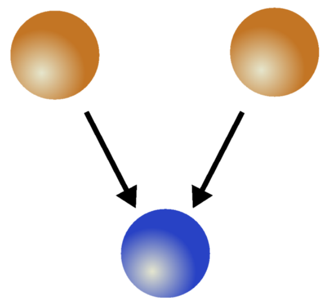
Thanks to all the people who provided help and suggestions, especially Antonia Liess for the stimulating talk about assimilation efficiencies and stoichiometry. This study was performed within the framework of the Research Unit "Carbon flow in belowground food webs assessed by stable isotope tracers" of the DFG (FOR 918). Financial support has been provided by the German Research Foundation (BR 2315/8-1, BR 2315/13). B.L. is additionally funded by the Fazit foundation.

Table 2.3.: Realized maximum consumption rates for different consumer types. Temp. gives the temperature range in °C and E_C the activation energy of maximum consumption. In some cases, activation energies were calculated from Q_{10}-values by $E_C = 0.1(kT_0^2)\ln Q_{10}$, where k is the boltzman's constant and T_0 the arithmetic mean of the temperature range (Vasseur and McCann, 2005).

Consumer	Resource	Temp.	E_C	Source	Comments
Carnivores					
Carabid beetles	*Alphitobius diaperinus* larvae	5–30	0.230	Vucic-Pestic et al. (2011)	
Carabid beetles	flightless *Drosophila hydei*	5–30	0.240	Vucic-Pestic et al. (2011)	
Coleomegilla maculata lengi	*Myzus persicae*	13.9 –32.8	0.900	Sentis et al. (2012)	
Ischnura elegans	*Daphnia magna*	5–27.5	0.709	Thompson (1978); Petchey et al. (2010)	
Amblyseius longispinosus	*Aponychus corpuzae*	15– 35	0.226	Zhang et al. (1998); Petchey et al. (2010)	
Amblyseius longispinosus	*Schizotetranychus nanjingensis*	10– 35	0.439	Zhang et al. (1999); Petchey et al. (2010)	
Coccinella septempunctata	*Aphis gossypii*	15– 35	0.133	Xia et al. (2003); Petchey et al. (2010)	
Herbivores					
Tintinnopsis sp.	phytoplankton	5–25	0.711	Verity (1985); Hansen et al. (1997)	calculated by Q_{10}
Acartia hudsonica	*Thalassiosira constricta*	4.5–16	0.606	Durbin and Durbin (1992); Hansen et al. (1997)	calculated by Q_{10}
Ostrea edulis	*Pavlova lutheri*	10–20	0.876	Crisp et al. (1985); Hansen et al. (1997)	calculated by Q_{10}
Mytilus edulis	*Isochrysis galbana*	6–18	0.770	Sprung (1984); Hansen et al. (1997)	calculated by Q_{10}
Centropages hamatus	*Ditylum brightwelli*	1–15	0.927	Kiørboe et al. (1985); Hansen et al. (1997)	calculated by Q_{10}
Manduca sexta	low-protein artificial diet	14–34	0.906	Kingsolver and Woods (1998)	data from Fig. 1
Manduca sexta	high-protein artificial diet	14–34	0.798	Kingsolver and Woods (1998)	data from Fig. 1
Manduca sexta	low-protein artificial diet	14–34	0.541	Kingsolver and Woods (1998)	data from Fig. 2
Manduca sexta	high-protein artificial diet	14–34	0.589	Kingsolver and Woods (1998)	data from Fig. 2
Malacosoma disstria	*Acer saccharum*	18–30	0.456	Levesque et al. (2002)	re-analysed from Tab. 1, data from 1997
Malacosoma disstria	*Acer saccharum*	18–30	0.275	Levesque et al. (2002)	re-analysed from Tab. 1, data from 1998
Detritivores					
Oniscus asellus	*Carpinus betulus*	10– 20	0.860	Ott et al. (2012)	
Oniscus asellus	*Fraxinus excelsior*	10– 20	1.360	Ott et al. (2012)	
Porotermes adamsoni	*Eucalyptus regans*	11.5–24	0.740	Lenz et al. (1982); Dell et al. (2011)	
Porotermes adamsoni	*Eucalyptus viminalis*	11.5– 24	0.650	Lenz et al. (1982); Dell et al. (2011)	
Porotermes adamsoni	*Pinus radiata*	9–26	0.770	Lenz et al. (1982); Dell et al. (2011)	

Chapter 3.

Warming effects on consumption and intraspecific interference competition depend on predator metabolism



3.1. Abstract

1. Model analyses show that the stability of population dynamics and food web persistence increase with the strength of interference competition. Despite this critical importance for community stability, little is known about how external factors such as the environmental temperature affect intraspecific interference competition.

2. We aimed to fill this void by studying the functional responses of two ground beetle species of different body size, *Pterostichus melanarius* and *Poecilus versicolor*. These functional response experiments were replicated across four predator densities and two temperatures to address the impact of temperature on intraspecific interference competition.

3. We generally expected that warming should increase the speed of movement, encounter rates and in consequence interference among predator individuals. In our experiment, this expectation was supported by the results obtained for the larger predator, *P. melanarius*, whereas the opposite pattern characterized the interference behaviour of the smaller predator *P. versicolor*.

4. These results suggest potentially nontrivial implications for the effects of environmental temperature on intraspecific interference competition, for which we propose an explanation based on the different sensitivity to warming of metabolic rates of both species. As expected, increasing temperature led to stronger interference competition of the larger species, *P. melanarius*, which exhibited a weaker increase in metabolic rate with increasing temperature. The stronger increase in the metabolic rate of the smaller predator, *P. versicolor*, had to be compensated by increasing searching activity for prey, which did not leave time for increasing interference.

5. Together, these results suggest that any generalization how interference competition responds to warming should also take the species' metabolic response to temperature increases into account.

3.2. Introduction

One of the most important scientific challenges we currently face is the prediction of the effects of global climate change on ecosystems, communities and the trophic interactions between species in a complex web. As ecosystems are highly complex, predicting the impact of climate change remains notoriously difficult (Poloczanska et al., 2008) and scaling from pairwise interactions to whole interaction networks is required (McCann, 2007; Cohen et al., 2009; Montoya and Raffaelli, 2010). In particular, the strength of interactions determines food web stability and biodiversity (McCann et al., 1998; Williams and Martinez, 2004; Otto et al., 2007; Rall et al., 2008; Berlow et al., 2009), critically important ecosystem functions (Petchey et al., 1999; Voigt et al., 2003; Logan et al., 2006; Brose, 2008; Poloczanska et al., 2008; Berlow et al., 2009) and can thus modify the response of populations and communities to climate change in a complex way (Ives, 1995; Fox and Morin, 2001; Montoya and Raffaelli, 2010). Hence, predicting the consequences of global warming for complex food webs requires understanding mechanistic principles of how temperature affects the strength of pairwise interactions.

Trophic interactions between consumers and their resources build the energetic backbone of natural communities and are generally described by functional-response models quantifying consumer per capita consumption rates depending on prey abundance. Holling's (1959) classical functional response models include the predator's attack rate (i.e. instantaneous search rate) and the handling time necessary to ingest a prey. However, predator individuals often encounter each other, and interference competition including direct interactions such as attacking conspecifics or threat behaviour (Park, 1962) may reduce the consumption rate (Skalski and Gilliam, 2001; Kratina et al., 2009). This has considerable implications for populations and communities (Skalski and Gilliam, 2001; Scharf et al., 2008; Kratina et al., 2009) such as a decrease in fitness and survivorship, and the resulting reduction in per capita interaction strength can strongly increase the stability of population and food web dynamics (Brose et al., 2006b; Rall et al., 2008).

Several predator-dependent functional response models were developed to account for interference behaviour (Abrams and Ginzburg, 2000; Skalski and Gilliam, 2001) including the Beddington–DeAngelis functional response (hereafter the BDA model, Beddington, 1975; DeAngelis et al., 1975) and the Crowley–Martin functional response (hereafter the CM model, Crowley and Martin, 1989).

The BDA model assumes that (i) handling of prey and interfering with conspecifics are mutually exclusive activities and (ii) interference effects on consumption become negligible at high prey abundances when predators are occupied handling prey, whereas in the CM model (i), handling and interfering are not exclusive and (ii) interference also affects the feeding rate at high prey abundances (Skalski and Gilliam, 2001).

In contrast to the CM model, both the Holling functional response and the BDA model do not include digestion in their derivation of handling time. To directly disentangle handling time and digestion time in empirical experiments, it is thus necessary to visually monitor the animals and measure the time needed to attack and ingest a prey. As in many prior experiments, handling time and the background process of digesting prey could not be disentangled here, and we follow a broader definition of handling time that includes digestion (Jeschke et al., 2002). In consequence, the BDA and Holling functional responses were used as purely statistical models.

Prior studies showed that environmental temperature can have an important influence on functional responses because of effects on handling time and attack rate (Petchey et al., 2010; Englund et al., 2011; Vucic-Pestic et al., 2011). As warming increases the activity of ectotherm organisms, they are able to search a larger area and encounter a higher number of prey (Dreisig, 1981; Honek, 1997; Kruse et al., 2008) as well as conspecifics, the former leading to higher attack rates and the latter to higher interference competition. Additionally, the speed of digestion increases with temperature, and thus, the maximum feeding rate, the inverse of handling time, should increase with warming (Thompson, 1978; Vucic-Pestic et al., 2011). Despite this wealth of studies on warming effects on functional responses, its consequences for the dynamically important interference behaviour remain uncertain.

In prior studies, we demonstrated systematic effects of predator and prey body masses on functional-response parameters for terrestrial invertebrate predators (Vucic-Pestic et al., 2010b; Rall et al., 2011), which allows predicting interaction strengths based on body-mass measurements (Brose, 2010). Subsequently, we added a temperature dimension to these models by studying warming effects on interaction strengths (Rall et al., 2010; Vucic-Pestic et al., 2011). While all of the prior studies excluded interactions amongst predator individuals, the present study is the first to address effects of temperature on the strength of intraspecific interference competition in a functional response approach. Summarized, we generally expected that (i) attack rates increase, (ii) handling time decreases and (iii) intraspecific interference competition increases with temperature.

3.3. Materials and methods

Study organisms

The predators of our experiments were carabid beetles of the species *Pterostichus melanarius* and *Poecilus versicolor* (Coleoptera: Carabidae). Both are generalist predators that are common and widespread in Northern and Central Europe and were sampled alive by pitfall traps. This choice of two species differing widely in body masses (average weight: *P. melanarius* = 142.99 ± 23.36 mg, n = 189; *P. versicolor* = 60.7 ± 8.56 mg, n = 113) was motivated by prior experiments documenting systematic effects of body masses on handling time and attack rates of terrestrial predators (Brose et al., 2008; Vucic-Pestic et al., 2010b; Rall et al., 2011).

In temperate regions, carabid beetles are one of the most important invertebrate predator groups of soil food webs (Loreau, 1990) contributing a major part to the overall energy turnover (Weidemann, 1971), and their population dynamics are heavily influenced by competitive behaviour (Currie et al., 1996). While several field studies and laboratory experiments show the occurrence of competition for resources in carabid beetles (Lenski, 1982; Griffith and Poulsen, 1993), none of these studies addressed the strength of in-

traspecific interference competition under a functional-response framework.
As dipterans are part of the natural diet of ground beetles (Hengeveld, 1980), we used the flightless fruitfly *Drosophila hydei* (Diptera: Drosophilidae) as prey in our experiments. *D. hydei* were kept in laboratory cultures on Formula 4-24 Instant Drosophila medium (Carolina Biological Supply Company, Burlington, NC, USA). The predators were kept individually in plastic jars with moist sand. Prior to experiments, they were starved for 4 days and allowed 1 day of acclimatization to the experimental temperature.

Experimental design

For the experiments, Perspex (Degussa AG, Darmstadt, Germany) arenas with an area of 0.04 m^2 (20 × 20 × 10 cm) were used. The ground was covered with a layer of dental cast, which was moistened before the experiments to maintain constant humidity and the arenas were covered with lids with gauze-sealed holes for aeration. For habitat structure, moss (*Polytrichum formosum*, 2.35 ± 0.2 g dry weight) was used. The moss was dried for 3 days at 40° C to exclude animals and then remoistened and dispersed evenly in the arena. The experiments lasted 24 h with a 12:12 h light:dark cycle. For both predators, experiments were replicated full-factorially across four predator densities (1, 2, 3 or 4 predator individuals per arena), two temperatures (10 and 20° C) and 11 prey densities (1, 2, 5, 10, 20, 40, 80, 120, 160, 320 and 640 prey individuals per arena) with four replicates for each combination of the independent variables. In cases where the results varied widely, up to six replicates were conducted.
In addition, short-time behavioural experiments were set up, in which up to four predator individuals with 10–80 prey individuals were visually monitored for *c.* 1 h to document interference behaviour. The monitoring was done at room temperature, distraction from preying because of encounters with other predators, resulting in fights or pursuit of conspecifics, was interpreted as clear interference competition.

Statistical analyses

Four functional response models were compared, the Holling type 2 functional response (Equation 3.1), Holling type 3 (Equation 3.2), the BDA (Equation 3.3) and the CM (Equation 3.4) models:

$$N_e = \frac{aN_0}{1 + aT_hN_0} \tag{3.1}$$

$$N_e = \frac{bN_0^2}{1 + bT_hN_0^2} \tag{3.2}$$

$$N_e = \frac{aN_0}{1 + aT_hN_0 + c(P-1)} \tag{3.3}$$

$$N_e = \frac{aN_0}{1 + aT_hN_0 + c(P-1) + aT_hcN_0(P-1)} \tag{3.4}$$

where N_0 is the initial prey density in individuals, P the predator density in individuals, a the attack rate of the predator, T_h the handling time (including the time needed for digestion), b the slope of the prey-density dependent attack rate, a, describing the sigmoidal shape of a Holling type 3 functional response (i.e. $a = bN_0$) and c the predator interference coefficient.

As it was logistically impossible to replace each prey consumed during the experiment, exploitation of prey was accounted for by adjusting the functional response models to Rogers' random predator equation (Royama, 1971; Rogers, 1972):

$$N_e = N_0(1 - \exp(\alpha(N_eT_h - PT))) \tag{3.5}$$

with N_e the number of individuals consumed, T the total time of the experiment (here: 24 h) and

$$\alpha = a \tag{3.6}$$

$$\alpha = bN_0 \tag{3.7}$$

$$\alpha = \frac{a}{1 + c(P-1)} \tag{3.8}$$

$$\alpha = \frac{a}{1 + c(P-1) + aT_hc(P-1)N_0} \tag{3.9}$$

for the Holling type 2 (Equation 3.6), Holling type 3 (Equation 3.7), BDA (Equation 3.8) and the CM model (Equation 3.9), respectively.

Equation 3.5, which assumes that the predator searches randomly, relates the number of prey eaten to the initial prey density while correcting for prey depletion during the experiment. As this is an implicit function, the Lambert W function (see Bolker 2008 and references therein for detailed description) was used for solving, yielding:

$$N_e = N_0 - \frac{\mathrm{W}(\alpha T_hN_0\exp(-\alpha(PT - T_hN_0)))}{\alpha T_h} \tag{3.10}$$

where W is the Lambert W function and the other parameters as defined previously.

To estimate the temperature effect on the functional response parameters, we included temperature as factor in our models (Rall et al. 2011; but see Ritz and Streibig 2008 for detailed description on computational methods). All analyses were performed using

the statistical software R 2.11.1 (R Development Core Team, 2010) with the additional package 'emdbook' (Bolker, 2011).
To find the most parsimonious model, we used the Akaike's Information Criterion (AIC, see Bolker 2008, Chapter 6.6.2 and references therein for detailed discussion).

3.4. Results

In the initial monitoring experiment, both beetle species exhibited aggressive interference behaviour, and after an encounter, some beetle individuals continuously followed their conspecifics while ignoring prey individuals encountered.

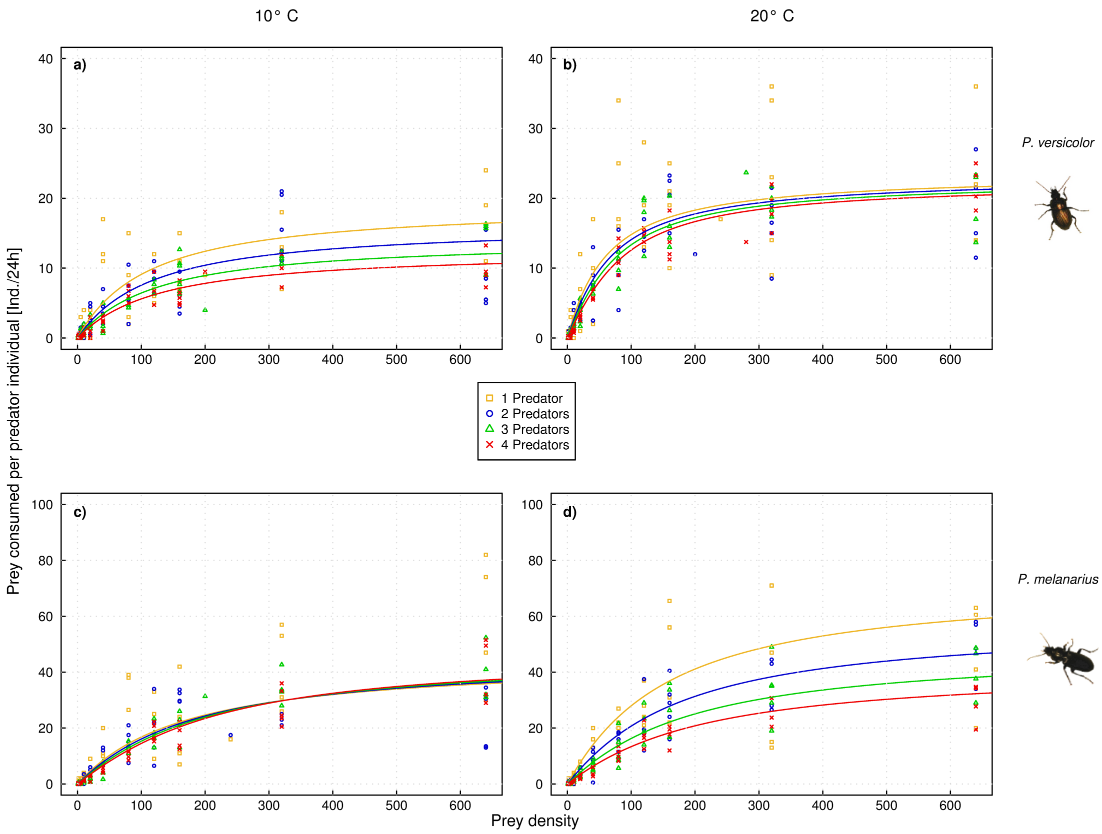


Figure 3.1.: Functional responses of two predator species at two temperatures with four to six replicates. Experimental *per capita* consumption data (dots) and fitted Crowley–Martin functional response model (Equation 3.4, lines) at different prey (x-axis) and predator (colours) densities. (a) *Poecilus versicolor*, 10° C, (b) *P. versicolor*, 20° C, (c) *Pterostichus melanarius*, 10° C, (d) *Pterostichus melanarius*, 20° C.

Generally, the consumption rates followed a hyperbolic shape with increasing prey density (Fig. 3.1). Handling times for both predator species were significantly different from zero at both temperatures, regardless of the model used (Tab. 3.1). These significant handling times imply that the *per capita* consumption rates do not follow a linear functional response.

In comparison with the four functional response models, Holling type 2 and type 3, BDA and CM, the CM functional response model yielded the best fit to the consumption data (Tab. 3.1, Fig. 3.1). Thus, all subsequent analyses were based on the CM functional response model (Equation 3.4).

We found that handling time decreased significantly with increasing temperature for both predator species (Fig. 3.2a). In contrast, attack rates increased significantly with warming for both predator species (Fig. 3.2b).

For *P. versicolor*, interference competition effects on consumption were significant at 10° C, whereas at 20° C, the interference coefficient was not significantly different from zero (Tab. 3.1). In contrast, for *P. melanarius*, interference competition showed a significant effect only at the higher temperature (Tab. 3.1). However, the interference coefficient changed significantly with temperature for both beetle species (Fig. 3.2 c).

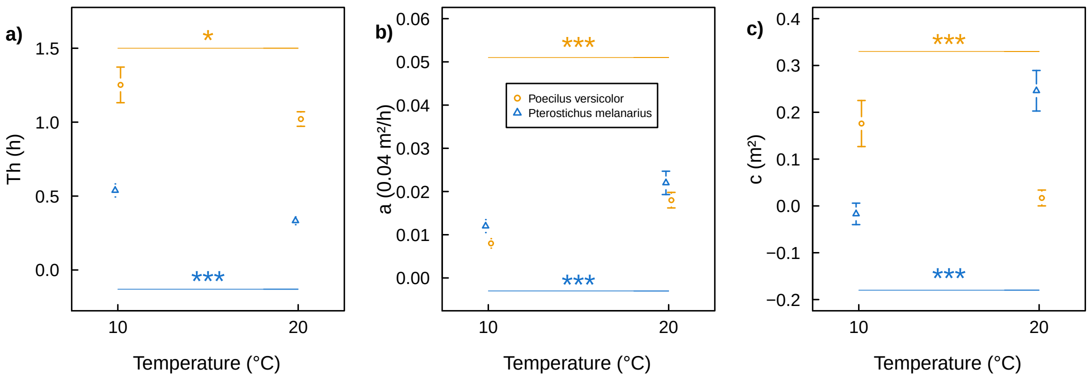


Figure 3.2.: Functional response parameters of Crowley–Martin model fitting for (a) handling time, T_h, (b) attack rate, a, and (c) interference coefficient, c, for *Poecilus versicolor* (yellow circles) and *Pterostichus melanarius* (blue triangles) at 10 and 20° C. Asterisks indicate levels of significance between the temperatures as estimated by F-tests ($*P = 0.05$, $**P = 0.01$, $***P < 0.001$).

Table 3.1.: Functional response parameters: attack rate, a, attack slope, b, handling time, T_h, and interference coefficient, c, estimated by fitting the Holling type 2, Holling type 3, BDA and CM model (Equation 3.1-3.4) to the experimental data.

	Temp. (° C)	a (0.04 m^2/h) ± SE	P (a)	b [0.04 m^4/(Ind_{Prey} h^{-1})] ± SE	P (b)	T_h (h) ± SE	P (T_h)	c (m^2) ± SE	P (c)	ΔAIC	n
Poecilus versicolor											
Holling type 2	10	0.005 ± 0.0007	***			1.766 ± 0.1077	***		***	17.797	185
	20	0.017 ± 0.0015	***			1.063 ± 0.0314	***		***		181
Holling type 3	10			0.00008 ± 0.00001	***	2.191 ± 0.09	***			50.433	185
	20			0.0003 ± 0.00004	***	1.246 ± 0.03	***				181
BDA	10	0.015 ± 0.0057	*			1.7 ± 0.1019	***	0.889 ± 0.4952	-	2.115	185
	20	0.023 ± 0.0047	***			1.059 ± 0.0305	***	0.172 ± 0.1148	-		181
CM	10	0.008 ± 0.0011	***			1.252 ± 0.1204	***	0.176 ± 0.0492	***	0	185
	20	0.018 ± 0.0018	***			1.021 ± 0.0492	***	0.017 ± 0.0169	-		181
Pterostichus melanarius											
Holling type 2	10	0.013 ± 0.0014	***			0.519 ± 0.0321	***			53.605	184
	20	0.014 ± 0.0016	***			0.528 ± 0.0311	***				186
Holling type 3	10			0.00014 ± 0.00002	***	0.6781 ± 0.0241	***			73.582	184
	20			0.00017 ± 0.00002	***	0.6780 ± 0.0242	***				186
BDA	10	0.016 ± 0.0036	***			0.523 ± 0.304	***	0.112 ± 0.1107	-	18.904	184
	20	0.041 ± 0.0126	**			0.48 ± 0.0282	***	1.127 ± 0.4632	***		186
CM	10	0.012 ± 0.0015	***			0.538 ± 0.0442	***	−0.017 ± 0.0229	-	0	184
	20	0.022 ± 0.0027	***			0.333 ± 0.0265	***	0.246 ± 0.0433	***		186

Values are given per individual. ΔAIC values show the difference from the best model. Asterisks indicate levels of significance (*P = 0.05, **P = 0.01, ***P < 0.001), n gives the number of replicates. BDA, Beddington–DeAngelis; CM, Crowley–Martin.

3.5. Discussion

In this study, we addressed temperature effects on intraspecific interference competition in the functional responses of two carabid beetle species. While prior studies with the same experimental design demonstrated systematic effects of body masses on handling time and attack rates in the functional response models (Brose et al., 2008; Vucic-Pestic et al., 2010b; Rall et al., 2011) and temperature effects on linear interaction strengths and functional responses without predator encounters (Rall et al., 2010; Vucic-Pestic et al., 2011), the results presented here extend these findings across levels of predator densities to include interference competition. Consistent with our expectations, both predator species exhibited significant interference competition, which reduced their per capita consumption rates. Surprisingly, warming effects on interference competition were not independent of predator identity: while interference increased with warming for the larger predator species, it decreased for the smaller predator species (Fig. 3.2c).

The increases in attack rates and the decreases in handling time with warming in our study are consistent with prior functional response studies (Petchey et al., 2010; Englund et al., 2011; Vucic-Pestic et al., 2011). Moreover, these findings are also consistent with the general framework of metabolic theory predicting that metabolism, consumption and activity patterns should increase with environmental temperature (Honek, 1997; Gillooly et al., 2001; Brown et al., 2004; Kruse et al., 2008; Ehnes et al., 2011). As handling time is inversely proportional to maximum per capita consumption (Koen-Alonso, 2007), increases in consumption with warming imply decreases in handling time as documented by our data. In consequence, the lower handling time increases the time available for searching prey at higher temperature (Gilbert and Raworth, 1996; Kruse et al., 2008; Vucic-Pestic et al., 2011), but the higher metabolism of the predators also increases their energetic demands that need to be met by consumption (Brose et al., 2008). Together, increases in time available for searching prey and higher metabolic demands explain the increases in attack rates with warming in our experiment.

Consistent with prior studies (Griffith and Poulsen, 1993; Skalski and Gilliam, 2001; Elliott, 2003; Kratina et al., 2009), we found that per capita consumption of both predators decreased with their density. While the functional responses for single predator individuals showed a steep hyperbolic increase until the consumption curves reached a plateau, the per capita consumption curves at higher predator densities increased with a slightly more gradual slope and saturated at lower maximum consumption rates (Fig. 3.1).

Initially, we expected that increasing temperature should lead to a higher interference coefficient, because the predators do not only search a larger area and encounter a higher number of prey but also encounter other predators more often (Kruse, Toft & Sunderland 2008). However, this hypothesis was only partly confirmed: while the interference coefficient of the larger predator, *P. melanarius*, increased with warming, it decreased for the smaller predator, *P. versicolor*. This result is particularly surprising, because *P. versicolor* is more active at higher temperatures (Kruse, Toft & Sunderland 2008). Therefore, the hypothesis that a higher activity generally leads to stronger interference competition has to be rejected, which suggests that interference competition is driven by more complex mechanisms than initially supposed.

We propose an explanation for our results that is based on the different temperature effects on the metabolic rates of the two predator species. Increases in temperature (from T_{low} to T_{high} on the y-axis of Fig. 3.3) cause increases in respiration and mobility (from R_{low} to R_{high} and M_{low} to M_{high} on the y- axis of Fig. 3.3). The latter will lead to increased encounter rates with prey and conspecifics. Interestingly, in our experiment, we found that whether this increased mobility and encounter rates lead to higher per capita consumption rates or higher interference competition depends on the strength of the respiration's increase. Respiration measurements in closed oxygen chambers of an automated electrolytic micro-respirometer (Scheu, 1992; Ehnes et al., 2011) showed that temperature increases lead to increases in respiration rates depending on body mass. For the larger predator, *P. melanarius*, temperature increases from 10 to 20° C doubled the respiration rates (0.3 and 0.61 J/h at 10 and 20° C, respectively; Ehnes et al. 2011), whereas they increased by a factor of four for the smaller predator, *P. versicolor* (0.06 and 0.24 J/h 10 and 20° C, respectively; Ehnes et al. 2011). As a consequence of this stronger increase in energy loss by respiration, the smaller predator responded to warming by increasing its searching activity for prey at the cost of the time for interfering with conspecifics (Fig. 3.3, right pathway). In contrast, the larger predator experienced a weaker increase in respiration under warming, and its increased activity at higher temperatures went partially into increased interference competition (Fig. 3.3, left pathway). Interestingly, this pattern in warming effects on respiration rates corresponds to our experimental results. We caution, however, that this is only an a-posteriori explanation, which needs further replicated testing in subsequent experiments with more predator species.

As in any laboratory study, the simplified experimental conditions precluded analyses of all factors that influence populations in natural communities. While we addressed effects of temperature using experimental arenas with a habitat structure provided by moss as in many of the predators' natural habitats, we have excluded temporal fluctuations in temperature or variance in habitat structure and ignored effects of arena size or co-occurrence of multiple prey species (Kalinkat et al., 2011). However, the predator densities of one to four individuals per 0.04 m^2 correspond to densities of 25–100 individuals per m^2, which is consistent with densities in natural ecosystems (Lövei and Sunderland, 1996).

In conclusion, we found systematic effects of environmental temperature on handling time and attack rates, which is consistent with prior studies (Petchey et al., 2010; Vucic-Pestic et al., 2011 and references therein). This will allow addressing warming effects in model studies on food web topology (Beckerman et al., 2006; Berlow et al., 2008; Petchey et al., 2008, 2010), their dynamic stability (Brose et al., 2006b; Otto et al., 2007; Brose, 2008; Rall et al., 2008), and consequences of species loss (Brose et al., 2005; Berlow et al., 2009). The decreasing handling times and increasing attack rates under environmental warming cause increases in consumption rates and may increase interaction strengths (Vasseur and McCann, 2005) which should potentially destabilize population and food web dynamics (Brose et al., 2006b; Rall et al., 2008).

Interestingly, increasing interference competition dampens population oscillations (Brose et al., 2006b; Rall et al., 2008), thus potentially counteracting destabilizing effects of warming. Additionally, population densities decrease with warming (Meehan, 2006). Thus, combined effects of interference competition and reduced prey densities may reduce population oscillations.

This suggests that understanding the relationship between temperature and predator interference behaviour is crucially important for predicting effects of warming on natural ecosystems. Our experiment aimed at providing this critically important information, but our results show that the two predator species responded differently in their interference to increasing temperature, thus preventing simple conclusions. This demonstrates that investigating warming effects on intraspecific interference competition and functional responses is far from trivial, because many factors have to be taken into account. In addition to variation in body masses, our results also suggest that differences in allometric constraints on metabolic rates should be considered. Extending the functional response framework presented here across a body-mass gradient while accounting for varying warming effects on respiration rates should yield a conclusive understanding on interference competition, which is critically important for predicting the response of complex food webs to environmental warming.

3.6. Acknowledgements

We are grateful to Benjamin M. Bolker for help with the R-Code and developing the Lambert W function for predator interference shown in equation 4. We also thank Roswitha Ehnes for providing data on respiration rates, Florian Schneider for providing the fruitfly pictogram, and Olivera Vucic-Pestic and Gregor Kalinkat, Jose M. Montoya and two anonymous reviewers for help and suggestions. Financial support has been provided by the German Research Foundation (BR 2315/6-1, BR 2315/8-1, BR 2315/13).

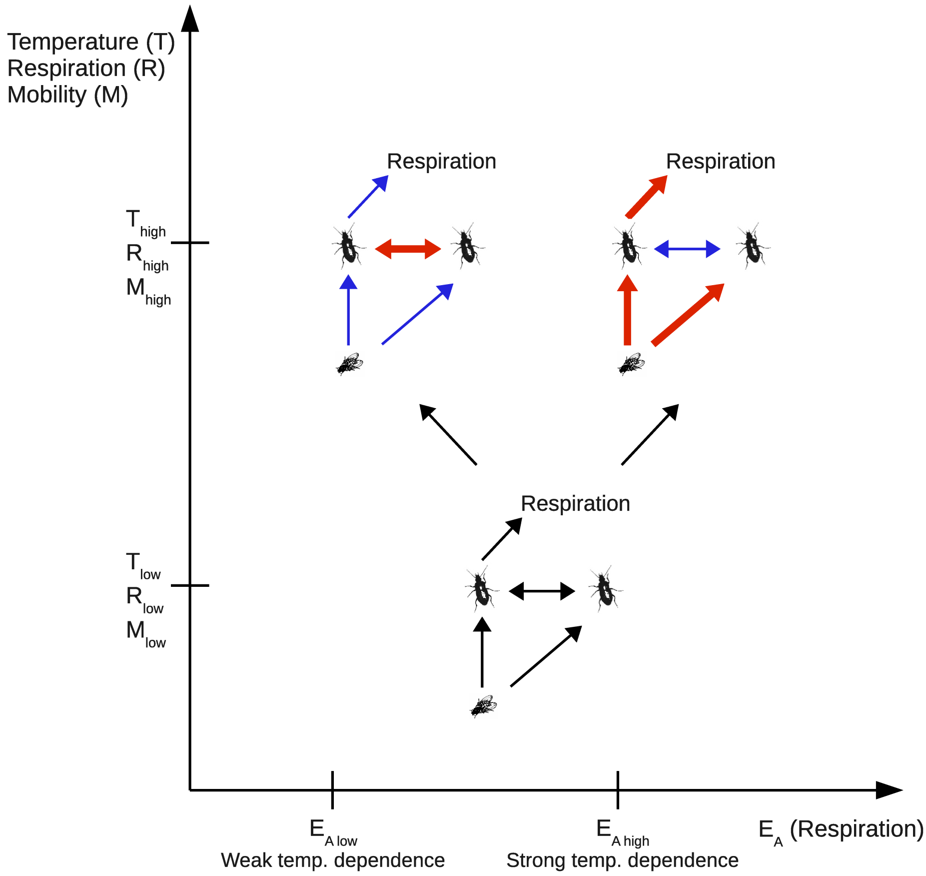
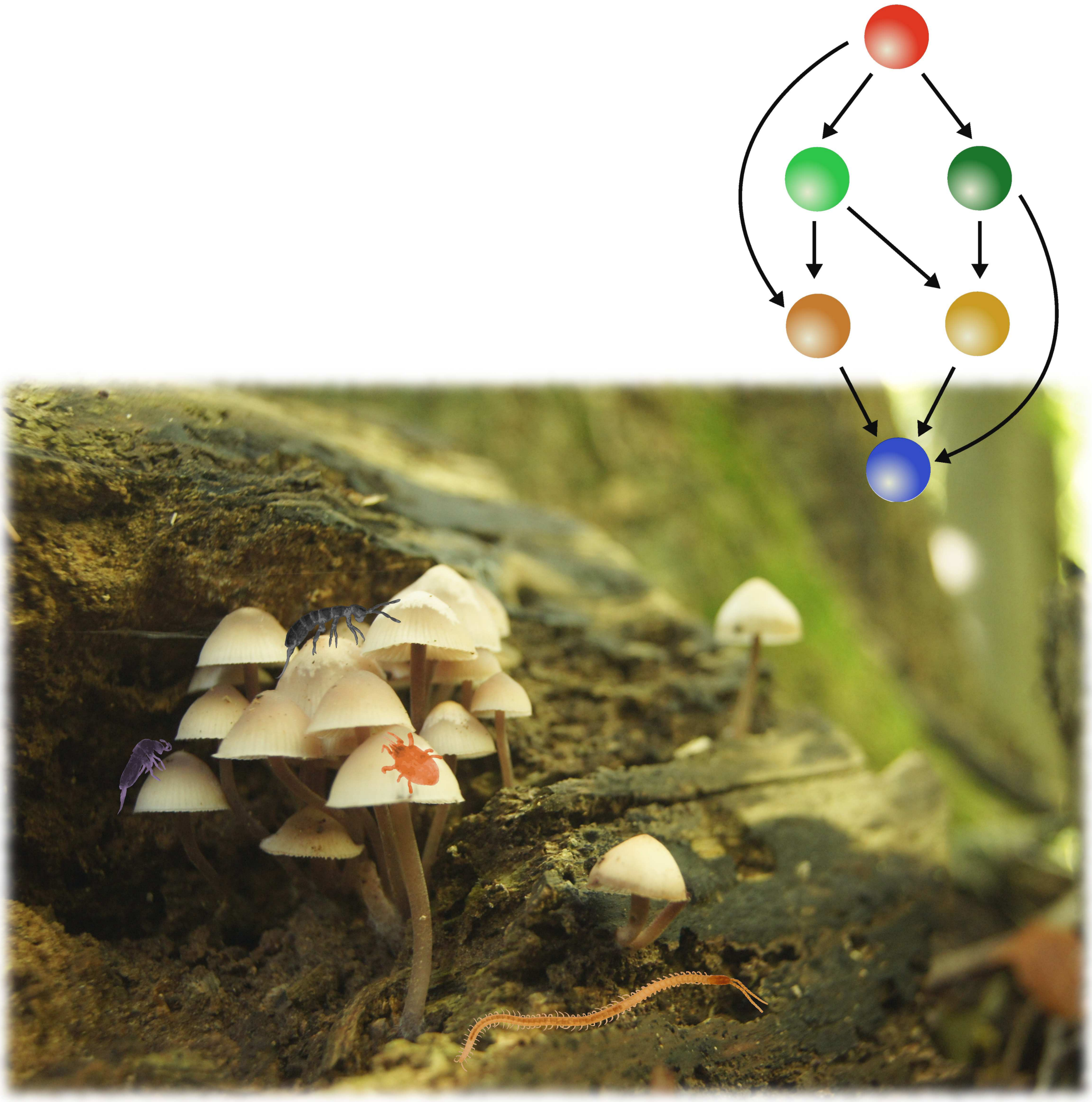


Figure 3.3.: Hypothesized temperature effects on interference competition and consumption. Thick red arrows implicate a strong response, thin blue arrows a weak response. Warming (from T_{low} to T_{high}) increases individual respiration (from R_{low} to R_{high}), mobility (from M_{low} to M_{high}) and encounter rates among predator and prey individuals. If increases in respiration are strong ($E_{A\mathrm{high}}$), higher encounter rates yield increased consumption to balance the metabolic loss (right pathway). If increases in respiration are weak ($E_{A\mathrm{low}}$), consumption rates do not need to increase substantially and higher encounter rates can cause increased interference among predator individuals (left pathway).

Chapter 4.

Effects of environmental warming and drought on a size-structured soil community



4.1. Abstract

Soil ecosystems are the foundation of our living as they maintain a number of important ecosystem processes crucial for plant life and food production. Especially agricultural systems may be highly affected by climate change because of low vegetation cover leading to high temperatures and drought. Nevertheless, the reaction of the soil ecosystem to climate change is still mostly unexplored.

Here, we used microcosms with a simplified soil community to address effects of climate change using independent temperature and dryness gradients. The community consisted of fungi, collembolans, mites and geophilids with maize litter as resource. As body-size structure is of high importance for communities, we incorporated a body-size aspect for the higher trophic levels by using two differently-sized collembolan species which were preyed on by a small and a large predator species. After 7 weeks the experiment was terminated, and the impact of climate change on direct feeding interactions and indirect effects was analysed.

Our results show that predicting the outcome of climate change is far from trivial and emphasize the importance of taking multiple climate change factors into account. For a climate change scenario with increasing temperature and dryness we found that consumption rates increased, thus climate change amplified the negative influence of the consumer population on the resource. Of high importance for carbon cycling are the increased decomposition rates resulting in accelerated nutrient turnover. However, trophic cascades may neutralize the negative influence of increased consumption rates under climate change. Investigation of body-size effects showed that for geophilids' consumption rates decreased with increasing body size. We presume this to be caused by decreasing capture efficiency as the experimental habitat structure was more supportive of smaller individuals. For mites we found the expected higher consumption rates with increasing biomass.

4.2. Introduction

The Earth is changing: over the last 100 years the Earth's temperature has continuously increased, mostly due to anthropogenic greenhouse gas emissions. Until 2100, temperature may increase by 1.1 to 6.4° C and precipitation patterns may change (IPCC, 2007). Many regions may face decreased precipitation in spring and summer leading to longer and stronger drought events (Tsiafouli et al., 2005; Sanderson et al., 2011; Trnka et al., 2011b). In consequence, the area and location of agroclimatic zones are predicted to shift (Trnka et al., 2011a) and as many areas will face severe water deficits climate change may also influence global food production (Trnka et al., 2011b).

Soils are essential for agriculture, as they are a large storage of organic carbon and provide the foundation for terrestrial life. The soil's pore structure provides biota with water, air and living space, thus enabling belowground living of an enormous diversity of organisms central to nutrient cycling and other important ecosystem services such as carbon sequestration, litter decomposition, delocation of material, stabilization of soils and earth structuring. Despite their importance, soil organisms and their interactions are still poorly understood (Wolters, 2001; Ruess and Chamberlain, 2010). However, because of their high importance for terrestrial life, they should be taken into account when investigating effects of climate change.

The main sources of soil carbon input in terrestrial ecosystems are root exudates and litter (Kutsch et al., 2009) which are utilized by microorganisms. As the performance of microorganisms can be affected by temperature and soil moisture (Sparling, 1985; Aerts, 2006; Kutsch et al., 2009), climate change may influence carbon turnover rates. Soil animals also affect the structure and activity of microorganisms for example by grazing or inoculum dispersal (Kilham, 1994). As the soil fauna itself also may respond to climate change, investigation of the impact of climate change on agricultural systems should integrate the community across trophic levels and interactions.

Ecological communities consist of species interacting with each other directly (e.g. feeding interactions) or indirectly (e.g. trophic cascades), thereby forming a complex network. The structure and dynamics of such a food web are mainly determined by the distributions of body sizes across species acting at all levels of ecological organization from the individual to the ecosystem (Woodward et al., 2005; Brose et al., 2006b; Otto et al., 2007; Brose, 2010; Yvon-Durocher et al., 2011b; Heckmann et al., 2012), thus affecting metabolic rates (Gillooly et al., 2001; Brown et al., 2004; Ehnes et al., 2011), species abundances (Meehan, 2006; Hayward et al., 2010), and interactions between species such as ingestion rates (Brose et al., 2008; Vucic-Pestic et al., 2010b; Rall et al., 2011) or interference competition (Lang et al., 2012). Also, predator-prey feeding interactions are subject to a clear pattern where a predators' size determines the size range in which it may feed (Brose et al., 2008; Petchey et al., 2008; Riede et al., 2011). Therefore, body size is one of the main contributors to the stability of complex food webs (Otto et al., 2007; Rall et al., 2008; Brose, 2010; Heckmann et al., 2012), especially due to its implications for interaction strengths and intraspecific competition (Kartascheff et al., 2010).

Besides their allometric scaling, several of the above mentioned ecological variables also depend on temperature: e.g. metabolic rates (Brown et al., 2004; Ehnes et al., 2011), ingestion rates (Rall et al., 2010; Vucic-Pestic et al., 2011) or interaction strengths (Rall et al., 2010; Vucic-Pestic et al., 2011; Kratina et al., 2012). In consequence, environmental warming may exert a dominating influence on food webs by altering food web properties and rates of ecological processes (e.g. increasing decomposition rates with warming: Aerts 2006; Dossena et al. 2012). Recent studies of aquatic communities have shown that warming may alter community size structure, favouring smaller species in warmed environments (Daufresne et al., 2009; Yvon-Durocher et al., 2011a; Dossena et al., 2012) and enhancing trophic cascades (Kratina et al., 2012; Shurin et al., 2012) but similar studies addressing temperature effects on soil interaction strengths are scarce. Only few studies of multi-trophic soil communities take more than one environmental factor into account but the amount and seasonality of precipitation may be at least as important for the distribution and abundance of organisms as temperature (McCarthy, 2001) and may heavily influence nutrient-turnover rates (Aerts 2006 and references therein). Here, we try to overcome this lack of studies by exploring how a size-structured soil communitiy is affected by climate change. Taking a simplified soil community spanning four trophic levels we investigated how temperature and dryness in combination affect decomposition processes and feeding interactions between species. The experimental soil community represents a community of a temperate agricultural field (Kramer et al., 2012).

In order to have a system mimicking a natural community under controlled climatic conditions, we transferred soil cores with their natural pore structure and a natural microorganism community consisting of bacteria, fungi, protozoans and nematodes into the laboratory. As basal resource, maize litter was introduced which was decomposed by the fungi present, thus providing both a microhabitat and food to fungi-feeding collembolans. The collembolans were preyed on by either mites or geophilids, two predators differing in their body size (Fig. 4.1).

The experiment was run over independent temperature and soil-moisture gradients to simulate the impact of climate change. Furthermore, two differently-sized collembolan species served as prey for either a small or a large predator (Fig. 4.2), to investigate the interactive effects of top-predator body size and climate change. We addressed how temperature and dryness affect (1) the feeding interactions between differently-sized predators and collembolans, (2) collembolan grazing on fungi and (3) litter decomposition by fungi. Additionally, we investigated the cascading effects of predators on fungal biomass and of predators and collembolan biomass on litter decomposition.

4.3. Methods

The soil community

The soil community was composed of species typical for a temperate agricultural field and represents part of a community investigated on a cornfield in Holtensen, Göttingen (Germany, N 51° 33.613 E 009° 53.823, see Kramer et al. (2012) for further details on soil properties). Therefore, maize litter was used as a basal resource for fungi and bacteria. The third trophic level consisted of fungivorous collembolans which were preyed on by either mites or centipedes (Fig. 4.1).

As one of the aims of this study was to look at a size-structured soil community, two differently-sized collembolan species were used: *Lepidocyrtus cyaneus* (Entomobryidae, length: 0.8 mm, 0.014 mg, Mercer et al. 2001) and *Isotoma viridis* (Isotomidae, length: 1.39 mm, 0.05 mg, Mercer et al. 2001). Both collembolan species are surface living and sexually reproducing, but *I. viridis* is stronger affected by dryness than *L. cyaneus* (Joose, 1969; Lindberg and Bengtsson, 2005).

The collembolans were preyed on either by mesostigmatid mites of the species *Hypoaspis aculeifer* (hereafter: mite treatment) or the geophilid *Geophilus flavus* (hereafter: geophilid treatment). Thereby we also introduced a body-size aspect at the highest trophic level as *Hypoaspis aculeifer* are small predators with a small body-size range (length: 0.5 – 0.7 mm, 0.032 mg, Mercer et al. 2001) whereas the larger *Geophilus flavus* spanned a wider size range (length: 8 – 40 mm, weight: 0.96 – 19.74 mg, n = 12). The resulting predator-prey body-mass ratios were 0.64 for *Hypoaspis aculeifer* preying on *I. viridis* and 2.28 on *L. cyaneus*. *Geophilus flavus* was in the mean 211 times larger than *I. viridis* and 754 times larger than *L. cyaneus*.

Animal abundances were calculated using an abundance-mass regression for soil animals where abundance (individuals/m^2) scales with mass (mg) raised to the power of -0.51 (Ehnes *unpublished*). Due to the small microcosm size (diameter: 5 cm, depth: 10 cm), the abundances were normalized to the mean body mass of *Geophilus flavus*, therefore the microcosms contained 12 individuals of *I. viridis* (6108 individuals/m^2), 36 *L. cyaneus* (18,324 individuals/m^2), 13 *Hypoaspis aculeifer* (6617 individuals/m^2) and 1 *Geophilus flavus* (509 individuals/m^2). Individuals of *Hypoaspis aculeifer* were obtained from prime factory GmbH & Co. KG, Hennstedt, Germany. All other animals were collected on the above-mentioned agricultural field near Göttingen (Kramer et al., 2012).

Experimental setup and treatments

In order to have a soil system with natural pore structure and the same compaction as on an agricultural field we took soil cores (diameter 5 cm, depth: 10 cm) from the cornfield in Holtensen. These soil cores were autoclaved to eliminate the fauna and microflora. Then, they were transferred into PVC tubes sealed with 45 μm gauze on both sides, thus allowing exchange of air and water. The tubes were put onto moist dental cast to give the soil the opportunity to drain water. For watering, a system consisting of a glass fibre cable connecting the soil microcosm with a water tank was used.

A natural mixture of soil microflora containing both fungi and bacteria was extracted from soil samples from Holtensen. For extraction, soil was mixed with mineral water

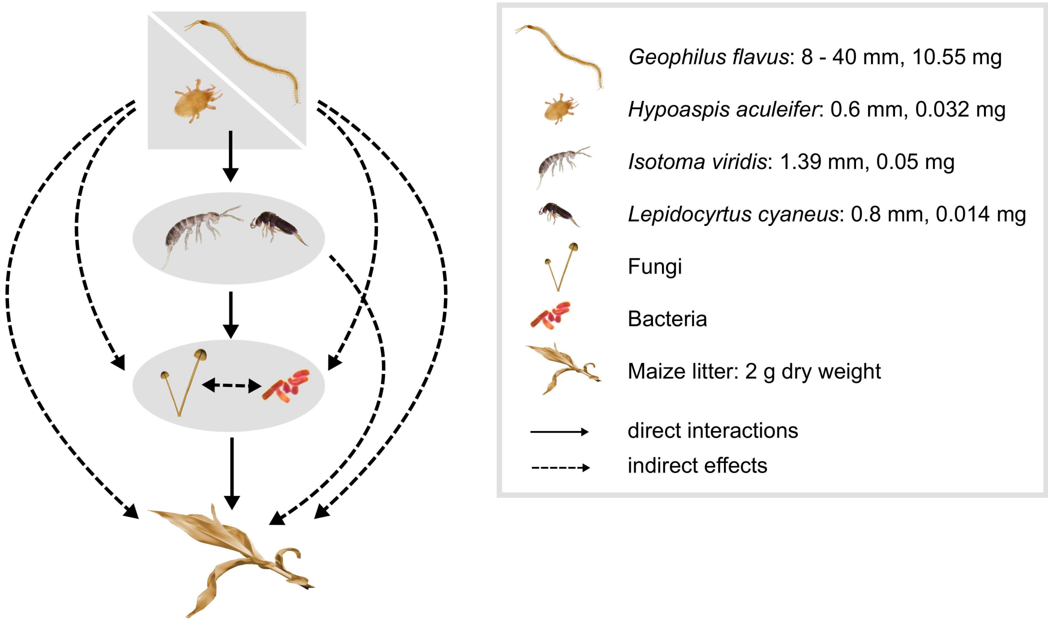


Figure 4.1.: The food web used in the experiment consisting of a resource (maize litter), microflora (fungi and bacteria), fungivorous collembolans (*Lepidocyrtus cyaneus* and *Isotoma viridis*), and a predator (either mites or a centipede). Arrows indicate possible interactions between the species with dashed lines resembling indirect interactions.

(1:2 w/v, ions: calcium 11.5 mg/l, magnesium 8 mg/l, sodium 11.6 mg/l, potassium 6.2 mg/l, chloride 13.5 mg/l, silicium 31.7 mg/l, sulphate 8.1 mg/l, hydrogen carbonate 71 mg/l, pH=7) and shaken for 30 minutes. Each microcosm was inoculated with 10 ml of the supernatant. On top of the soil, maize litter (*Zea mays*, 2 g dry weight) was introduced as resource for the fungi. The maize litter was dried at 70 °C for 5 days and was moisturized prior to the experiment. Before the addition of collembolans, the microcosms were incubated at 20 °C for 2 weeks, giving the microflora the opportunity to spread and grow. The collembolans were introduced 5 days before predators were added to enable their adaption to the new environment.

The treatments were 1) a litter control containing only the maize litter and microflora (hereafter: control, Fig. 4.2A), 2) a treatment where collembolans were added (hereafter: collembolan treatment, Fig. 4.2B) and 3) predator treatments with either a mite population or a centipede (hereafter: mite (Fig. 4.2C) and geophilid treatment (Fig. 4.2D), respectively). The experiment was replicated over a temperature gradient from 7 °C to 22 °C in 3 °C steps with two replicates per temperature. Soil moisture varied between a soil water content from 3 % to 30 % of dry weight soil. Dry and wet treatments were distributed randomly over the temperature gradient resulting in a total of 48 microcosms (Fig 4.2).

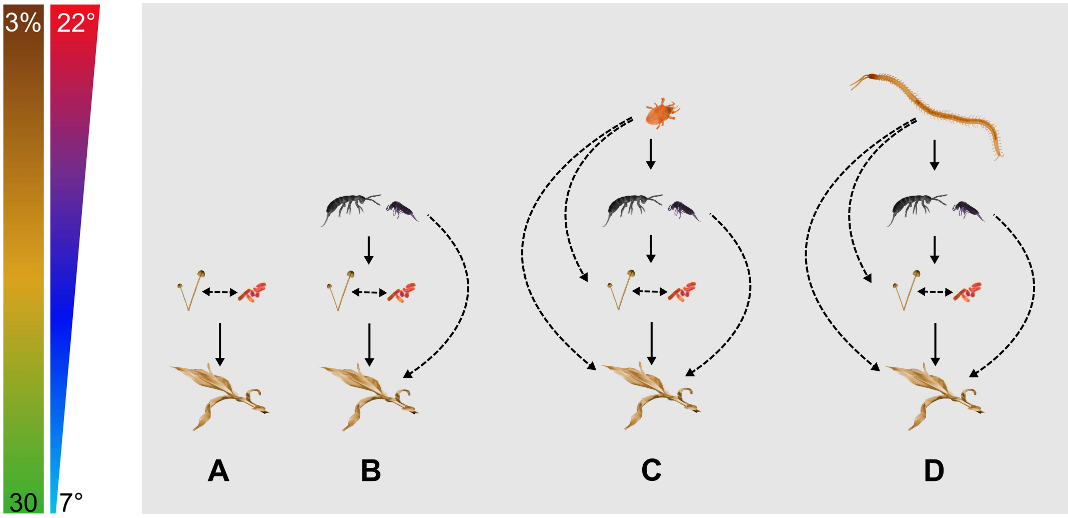


Figure 4.2.: Conceptual graph showing the four different treatments (right side) which were replicated over a temperature gradient and an independent soil-dryness gradient (left side). All treatments contained maize litter and microflora. A) Control consisting only of maize litter and microflora, B) collembolan treatment where collembolans (*Lepidocyrtus cyaneus* and *Isotoma viridis*) were added, C) mite treatment with collembolans and the predatory mite *Hypoaspis aculeifer* and D) geophilid treatment with collembolans and the centipede *Geophilus flavus* as top predator.

After 7 weeks the experiment was terminated. Soil samples of approximately 3 g wet weight were taken for analysis of phospholipid fatty acids to measure the biomass of fungi and bacteria (see below for details). Maize litter was dried at 70 °C for 5 days and weighed. The difference in dry weight between the start and the end of the experiment was used as a measurement of litter decomposition. Soil samples (2 g wet weight) were taken, dried at 70 °C for 7 days and reweighed to estimate soil water content (expressed as % of dry weight).
Animals were extracted by heat extraction (MacFadyen, 1961) with a controlled temperature gradient from 25 to 50 °C over a period of 10 days, collected in diluted glycerol (1:1 v/v), and stored in 70 % ethanol until counting.

Analysis of microflora

The microbial community was characterized by analysis of phospholipid fatty acids (PLFAs) following the protocol of Frostegård et al. (1993). Briefly, PLFAs from 2 g (wet weight) soil were extracted in Bligh & Dyer reagent consisting of chloroform, methanol

and citrate buffer (1:2:0.8 v/v/v). Phases were separated with chloroform as organic solvent. Lipids were fractionated into neutral lipids, glycolipids and phospholipids using silica acid columns (HF BOND ELUT - SI, Agilent Technologies Inc.) and eludet with chloroform, acetone and methanol, respectively. As an internal standard, methyl-nondecanoate (19:0) was added to the phospholipid fractions that were then subjected to mild alkaline methanolysis using methanolic KOH. The resulting fatty acid methyl esters (FAMEs) were analyzed by gas chromatography (CLARUS 500, Perkin Elmer, Waltham, USA) and identified by retention time comparison with a standard mixture composed of FAMEs ranging from C4 to C24 (Sigma-Aldrich, St Louis, USA). The gas chromatograph was equipped with a flame ionisation detector (PE-5 capillary column, Perkin Elmer, Waltham, USA; 30 m × 0.32 mm i.d.; film thickness 0.25 μm) and as carrier gas helium was used. Measurements started at a temperature of 60° C, increased to 160° C (30° C/min) and then to 260° C (3° C/min).
The PFLAs 18:1ω9c and 18:2ω6 were designated as fungal fatty acids (Frostegård, 1996; Zelles, 1999; Ruess and Chamberlain, 2010). 18:1ω9c can also be found in plant tissue (Ruess and Chamberlain, 2010), but as the experiment did not comprise plants and other plant marker PLFAs were absent it was presumed to be of fungal origin. The abundance of fatty acids was calculated in absolute amounts of C (nmol/g dry weight soil) for each sample and is hereafter referred to as fungal biomass.

Statistical analysis

To investigate the impact of climate change on the different food-web compartments (Fig. 4.1) we analyzed the interactive effects of increasing temperature and dryness on the mite population, collembolan biomass, fungal biomass and litter decomposition. Additionally, we included consumer biomass as an explanatory variable in the analyses. For the geophilids, the impact of the abiotic parameters could not be analyzed as each microcosm only contained one individual and population dynamics were not measurable. All statistical analyses were performed using the statistical software R 2.12.1 (R Development Core Team, 2010). Soil dryness was arcsine square root transformed (Sokal and Rohlf, 1995) and normalized using the additional package 'som' so that each row had a mean of 0 and a variance of 1 (Yan, 2010). Temperature was normalized to the mean experimental temperature of 14.5° C using the equation

$$T = \frac{(T_{\mathrm{k}} - T_0)}{(kT_{\mathrm{k}}T_0)} \tag{4.1}$$

where T is the normalized temperature in Kelvin, T_{k} the experimental temperature in Kelvin, T_0 the mean experimental temperature in Kelvin (287.65 K) and k the Boltzmann constant (8.62×10^{-5} eV/K). As dryness across all treatments was independent of temperature ($F_{0.05}(7{,}36) = 1.55$, $P = 0.1822$) both could be implemented in the model as independent variables at the same time. To achieve approximately normal distribution of the data, animal biomasses (mg + 0.1), litter decomposition (mg + 0.1) and abundance of fungal PLFA (nmol C/g DW + 0.1) were *ln*-transformed. Additionally, if used as independent variables they were normalized using the R package 'som' to get all independent variables on the same scaling.

Interactions between the two collembolan species as well as between microorganism groups could not be disentangled due to the experimental setup. Thus, total collembolan biomasses were used for statistical analyses. For microorganisms, it was assumed that collembolans mainly fed on fungi (Berg et al., 2004) and that fungi were the main contributors to litter decomposition (Schneider et al., 2012). However, interactions between microorganism groups which may also affect fungal biomass (i.e. competition, facilitation) cannot be excluded.

Four direct feeding interactions (mites and geophilids on collembolans, collembolans on fungi, and fungi on maize litter (i.e. litter decomposition)) and five indirect effects (i.e. trophic cascade: mites and geophilids on fungi and litter decomposition and collembolans on litter decomposition) were analyzed for the impact of climate change parameters by accounting for statistically significant interaction terms (Fig. 4.1). The direct interactions were analyzed using multiple linear regression models with temperature, dryness and consumer biomass as independent variables and resource biomass or litter mass loss as dependent variables. For the indirect effects, ANCOVAs were applied with treatment type (control, collembolan, mite and geophilid treatment) as a factorial variable. Additionally, the influence of temperature and dryness on the mite population was analyzed using multiple linear regressions with temperature and dryness as continuous variables. Two models (collembolans feeding on fungi, treatment effects on fungi) were simplified by removing nonsignificant variables after comparing the models based on their AIC.

4.4. Results

The trophic links of the food web were analyzed from top to bottom starting with the interaction between predators and collembolans and ending at the base with litter decomposition. Not every trophic level exerted significant influence on lower trophic levels in terms of biomass effects. Also, the individual food-web compartments showed differing responses to increasing temperature and dryness.

We first examined the impact of abiotic factors on the mite population, finding that temperature and dryness interactively influenced mite biomasses (temperature × dryness: $F = 7.5$, $p = 0.03$). At the lowest temperature of 7° C the mite populations died out in both replicates. For the temperature range between 10 and 22° C, 38 % of the ini-

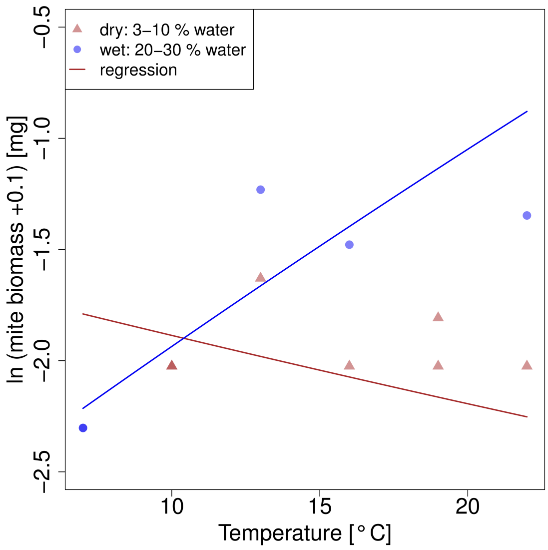


Figure 4.3.: Mite biomasses were interactively affected by temperature and dryness. Shown are the experimental data (points) and the predicted change in mite biomass with temperature for dry (red line, 3 % water content) and wet conditions (blue line, 30 % water content).

tially introduced mites survived in wet treatments and only 11 % in dry treatments. In treatments with high soil moisture mite biomasses increased with temperature whereas temperature had a negative effect in dry treatments (Fig. 4.3). This shows the high sensitivity of *Hypoaspis aculeifer* to dryness as the positive impact of temperature on the mite biomass is changed to a negative impact in dry treatments. However, the temperature effect is only exhibited if the 7° C treatments which are an extreme temperature for this species (Karg, 1993) are included, and it completely disappears when excluding these two treatments from the statistics (dryness: $F = 14.62$, $p = 0.009$).
This impact of the abiotic factors was reflected in the feeding relationship of mites on collembolans. Here, we found a significant combined effect of temperature, dryness and mite biomass on collembolan biomass (Tab. 4.1). Collembolan biomass decreased with temperature in dry treatments with low mite biomass and in wet treatments with high mite biomass (Fig. 4.4) thus reflecting the predator's increased feeding rates at higher temperatures. However, if excluding the 7° C treatments from the analysis where the mite population became extinct, the predator biomass and dryness effects disappeared and collembolan biomass was only negatively affected by temperature (temperature: $F = 64.16$, $p = 0.02$). In contrast, collembolan biomass in the control treatments without

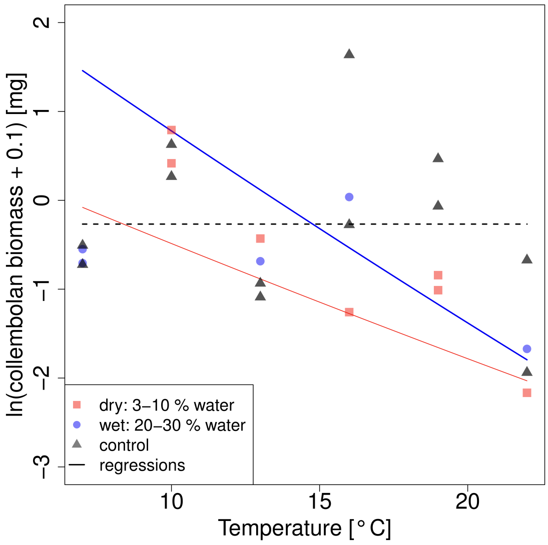


Figure 4.4.: Collembolan biomasses in the mite treatment were affected by temperature, dryness and mite biomass. Points show experimental data for mite treatments with low soil water content (red: 3 - 10 %) and high water content (blue: 20 - 30 %) and for comparison data for the collembola treatment in black (here, no temperature or dryness effects were found). Lines show the predicted changes in collembolan biomass for the experimentally found low mite biomass in treatments with low soil water content (red: 3 % water content, mite biomass: 0.06 mg, see Fig. 4.3) and with high mite biomass at high soil water content (blue: 30 % water content, mite biomass: 0.14 mg).

predators was unaffected by dryness and temperature (dashed line in Fig. 4.4) resulting in mean collembolan biomasses of 1.07 mg after the experimental duration of 7 weeks.
Looking at the larger predators, the geophilids, concordantly with the control treatment we found no effect of temperature and dryness on collembolan biomass. The only factor influencing collembolan biomass was the predator's body mass which in this case reflected biomass as only one geophilid individual per treatment was present. Surprisingly, collembolan biomass increased with predator body mass (Tab. 4.1, Fig. 4.5). In treatments with predator body mass over 15 mg the mean collembolan biomass was 1.13 mg which is in the same order of magnitude as in collembola treatments without predators. However, in the presence of small predators (body masses below 15 mg) collembolan biomasses decreased to a third (0.34 mg).
In the next step, we analyzed the impact of collembolan grazing, temperature and dryness on fungal biomass. Fungal biomass (i.e. the amount of fungal carbon measured

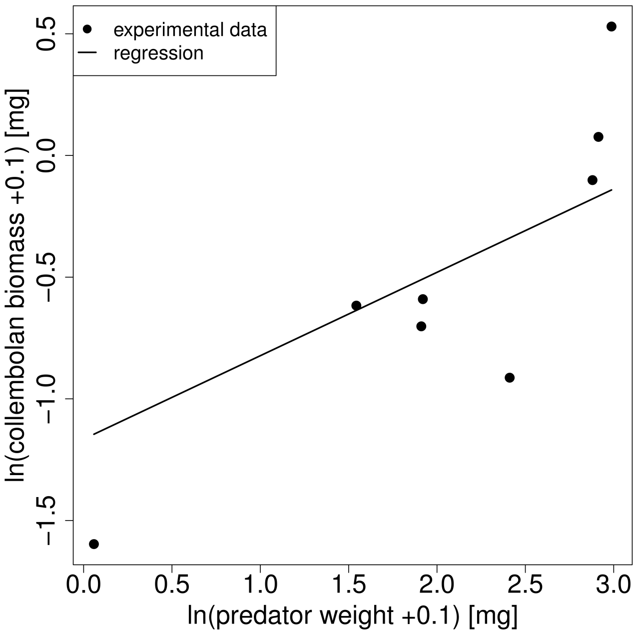


Figure 4.5.: Collembolan biomasses in the geophilid treatment were unaffected by abiotic parameters but significantly affected by geophilid body mass. Plotted are the experimental data (points) and the linear regression.

by PLFA analyses) ranged from 0.42 to 8.03 nmol carbon/g dry weight soil. Unexpectedly, fungal biomass was not affected by collembolan biomass and dryness (Tab. 4.1). The only factor influencing fungal biomass was temperature which surprisingly had a negative impact (Fig. 4.6).

As we assumed fungi to be the main contributors to litter decomposition, we examined the influence of temperature, dryness and fungal biomass on litter decomposition leaving other microbial groups aside. During the experiment, up to 45 % of the litter was decomposed, and litter decomposition was interactively affected by the climate change parameters and fungal biomass (Tab. 4.1). Decomposition rates increased with dryness and temperature (Fig. 4.7A). The influence of fungal biomass differed between temperatures: decomposition rates increased with fungal biomass at high temperatures and decreased with fungal biomass at intermediate to low temperatures (Fig. 4.7B).

Finally, we analyzed the assumed indirect effects of mites, geophilids and collembolans on litter decomposition and of predators on fungal biomass by investigation of treatment effects finding that litter decomposition did not differ between treatments (Tab. 4.2).

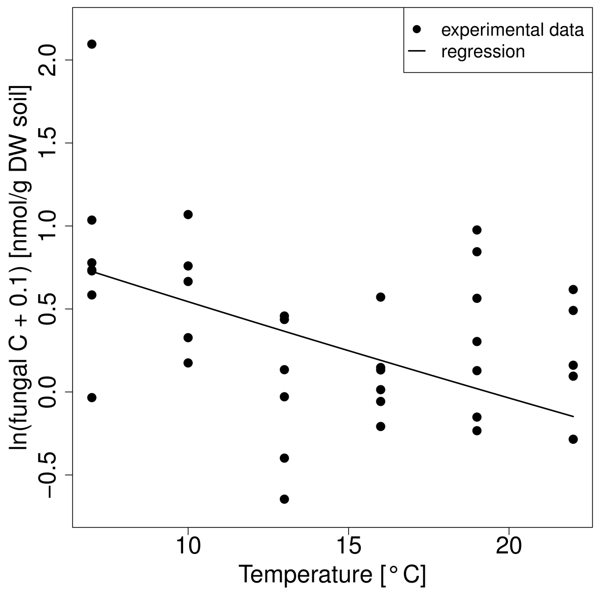


Figure 4.6.: Influence of temperature on fungal biomass with experimental data (points) and fitted model (multiple linear regression).

For fungal biomass, we found a treatment effect caused by the collembolan treatment (Tab. 4.2). Here, fungal biomass showed a significant decrease with temperature. This temperature effect was not found for the control treatment and the predator treatments. Thus, the predators had a positive cascading effect on fungal biomass.

Table 4.1.: Multiple linear regressions for temperature and dryness effects and the impact of the consumer's biomass on its resource. For geophilids, the three way interaction was left excluded due to a lack of degrees of freedom. ⸓ shows that the model was simplified by removing nonsignificant variables based on comparison of AICs. Asterisks denote levels of significance (*: P = 0.05, **: P = 0.01, ***: P < 0.001).

	Mites → Collembola			Geophilids → Collembola			Collembola → Fungi			Fungi → Litter		
	df	F	P	df	F	P	df	F	P	df	F	P
Predator biomass (P)	1	8.17	0.05 *	1	248.54	0.04 *						
Collembolan biomass (C)							⸓	⸓	⸓			
Fungal C (F)										1	0.14	0.71
Temperature (T)	1	29.67	0.006 **	1	7.25	0.23	1	6.49	0.02 *	1	35.37	< 0.001 ***
Dryness (D)	1	0.91	0.39	1	28.73	0.11	1	1.14	0.3	1	1.86	0.18
T × D	1	10.33	0.03 *	1	55.24	0.09	1	1.95	0.18	1	0.34	0.56
T × P/C/F	1	3.05	0.16	1	3.15	0.33	⸓	⸓	⸓	1	1.08	0.31
D × P/C/F	1	0.64	0.47	1	4.88	0.27	⸓	⸓	⸓	1	2.66	0.11
T × D × P/C/F	1	8.76	0.04 *				⸓	⸓	⸓	1	10.91	0.003 **
R^2			0.95			0.99			0.29			0.65

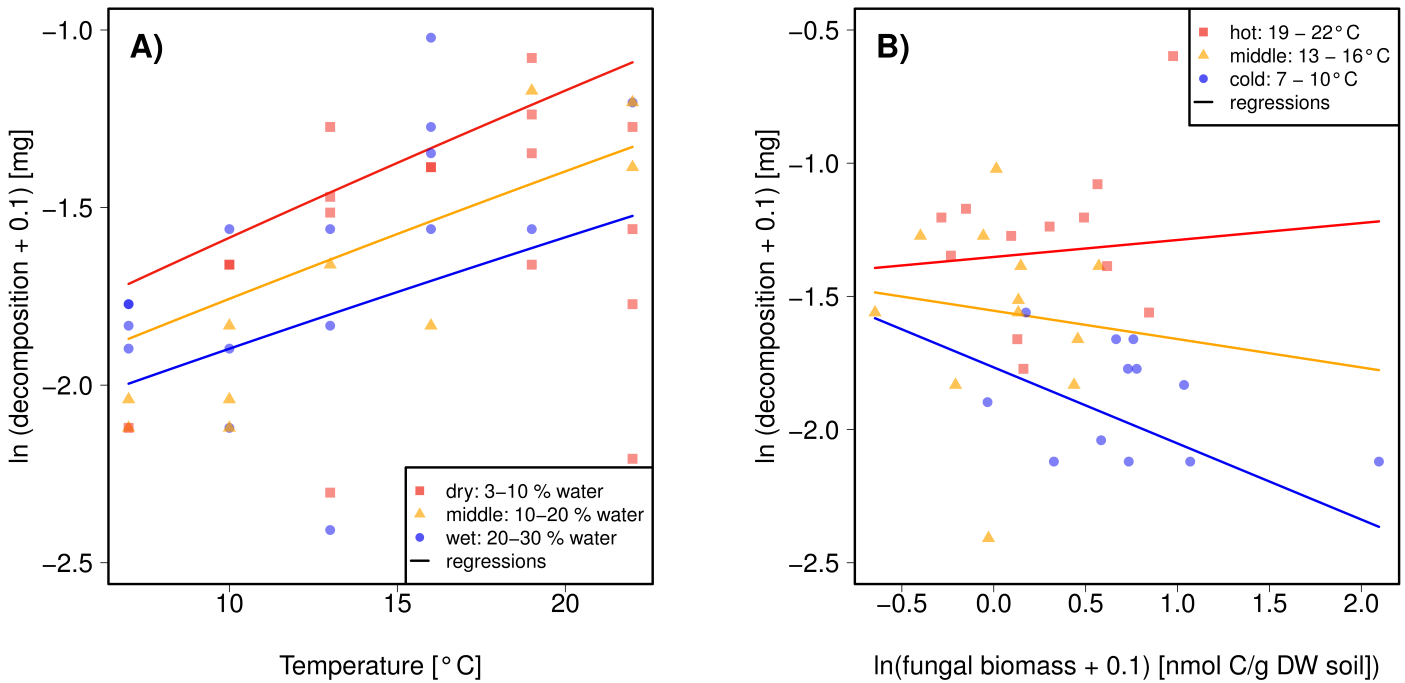


Figure 4.7.: Influence of temperature, dryness and fungal biomass on litter decomposition. Points show the experimentally measured litter decomposition in different soil-moisture (A) or temperature ranges (B). Lines show the predictions for (A) the corresponding mean soil-water contents and a fixed fungal biomass (1.57 nmol C/g DW soil) and (B) temperatures of 7° C (blue), 14.5° C (orange) and 22° C (red) at mean soil water content (15 % water content).

Table 4.2.: ANCOVA for the potential trophic cascades. ⁒ indicates that the model was simplified by removing nonsignificant variables based on comparison of AICs. Asterisks indicate levels of significance (*: $P = 0.05$, **: $P = 0.01$, ***: $P < 0.001$).

	Treatment → Litter			Treatment → Fungi		
	df	F	P	df	F	P
Treatment effect	3	0.62	0.61	3	1.62	0.23
Temperature	1	21.05	< 0.001 ***	1	7.27	0.01 *
Dryness	1	0.11	0.75	1	1.39	0.25
Temperature × Dryness	1	0.39	0.54	1	0.47	0.5
Temperature × Treatment	3	2.55	0.08	3	3.06	0.05 *
Dryness × Treatment	3	1.93	0.15	⁒	⁒	⁒
Temperature × Dryness × Treatment	3	1.08	0.38	⁒	⁒	⁒
R^2			0.59			0.47

4.5. Discussion

Investigation of the impact of temperature, dryness and consumer biomass on the associated resource's biomass in a complex community showed that for some trophic interactions all three factors acted in concert (feeding link between mites and collembolans, litter decomposition by fungi) whereas other interactions were only determined by temperature (trophic cascades between predators and fungi). Soil dryness never acted as the sole factor affecting the resource's biomass but always worked in combination with temperature.

Surprisingly, no direct consumer biomass effects were found between the second and third trophic level, thus decoupling the community. However, the decomposer system consisting of maize litter and fungi and the predator-prey system with collembolans, mites and geophilids were reconnected by a trophic cascade between the predators and fungi.

Predator-prey system

Analyzing the predator-prey system, we found that reactions of collembolan biomass to temperature, dryness and predator biomass differed between predator treatments. In the control treatment without predators, collembolan biomass was unaffected by temperature and dryness which is surprising as we expected growth rates to increase with temperature. Also, we found no consequences of the different drought tolerance of both collembolan species (Joose, 1969; Lindberg and Bengtsson, 2005) when looking on total collembolan biomass. However, abundances of the large and drought sensitive *I. viridis* were generally low thus contributing only a small fraction to the total collem-

bolan biomass.
This temperature and dryness independency was also found for the geophilid treatment where collembolan biomass merely increased with the predator's body mass (i.e. biomass). Usually, consumption rates increase with increasing predator body mass to a certain threshold above which predators are no longer able to efficiently exploit their prey (Brose et al., 2008; Rall et al., 2011). For large geophilids, this specific size range was exceeded as their predator-prey body mass ratio of 395 for *I. viridis* and 1420 for *L. cyaneus* are far above the predator-prey body-mass ratio of 100 found for terrestrial ecosystems in natural food webs (Cohen et al., 1993; Brose et al., 2006b). Increasing body masses of geophilids should thus lead to lower consumption rates and higher collembolan biomasses. Nevertheless, the large geophilids were still able to catch a sufficient amount of prey for survival. Another factor potentially influencing predation by large geophilids is the habitat: a soil ecosystem with high compaction and few large pores, which might provide collembolans with a refuge from larger predators thus leading to decreased predation efficiency with predator body size. These two factors alone or in combination might account for the increased collembolan biomass with the geophilid's body mass.
In contrast, in the mite treatment temperature, dryness and the predator's biomass interactively influenced collembolan biomasses, passing on the strong response of the mite population itself to temperature and especially to dryness. Collembolan biomass decreased with temperature in the mite treatments reflecting increased consumption rates of the predators with the increased metabolic demand at higher temperatures (Rall et al., 2010; Vucic-Pestic et al., 2011). Surprisingly, collembolan biomasses increased with increasing soil-water content despite the higher mite biomasses in wet treatments. However, this effect was only pronounced if including the 7° C treatments with predator extinction in the analysis. The time of extinction is unknown but as the activity of *Hypoaspis aculeifer* is heavily reduced at low temperatures (Karg, 1993) consumption rates presumably were already low before extinction. This becomes apparent when comparing the collembolan biomasses in the collembola and the mite treatment at 7° C which do not deviate between treatments. If only taking higher temperatures into account, mite biomass and dryness did not affect collembolan biomass and we only found reduced collembolan biomasses due to increased consumption rates of the mites with increasing temperature.

Decomposer system

Microbial biomass composition in the experiment quantified by phospholipid fatty acid analysis reflected the natural composition of the field in Holtensen (Scharroba et al., 2012). As fungi were assumed to be the main decomposers in the system, effects of gram positive and negative bacteria were not analysed. Other studies showed increasing fungal growth rates in agricultural soils with temperature with optimal growth temperatures between 25 to 30° C (Pietikäinen et al., 2005). In our experiment fungal biomass decreased with temperature irrespective of dryness or collembolan biomass. However, investigation of cascading effects of the predators showed that this negative impact of temperature was only pronounced in the collembolan treatment and was neutralized if predators were present. Nevertheless, the absence of an impact of collembolan biomass is still surprising but the increased collembolan grazing with increased biomass may be counterbalanced by compensatory fungal growth (Mikola and Setälä, 1998). In their study, Pietikäinen et al. (2005) also found stronger temperature dependencies for fungal growth rates in comparison to bacteria, therefore fungi were more negatively affected at high temperatures and bacteria at low. This indicates that higher competitiveness of bacteria at high temperatures leads to decreased fungal biomass which we can confirm by looking at the bacteria:fungi ratios in our experiment. There, we found a shift to higher bacterial biomass with increasing temperature (ratio below 10° C: 3.88, over 19° C: 5.37).

Litter decomposition increased with temperature thus matching other studies (Wang et al., 2012). Unexpectedly, dryness had a positive impact on litter decomposition. This is contrary to other studies showing that litter decomposition only increases with temperature if there is sufficient soil moisture (Aerts 2006 and references therein). However, as the fungal community was taken from an agricultural field where the soil temporarily may be extremely dry due to low vegetation cover leading to high evapotranspiration, the community may already have been well adapted to dryness. Also, fungi show much weaker correlations to dryness than bacteria but their activity is strongly restricted by temperature (Bell et al., 2008).

Additionally, litter decomposition was affected by fungal biomass with decomposition rates increasing with fungal biomass in warm treatments and decreased decomposition in treatments of intermediate or low temperature. This indicates that litter decomposition is strongly temperature dependent and fungal breakdown increases with temperature. Also, fungal diversity is an important element influencing decomposition with higher diversity increasing decomposition (Bell et al., 2008). Thus, if the high fungal biomass in cold treatments is comprised of few dominant species decomposition may decrease despite the high fungal biomass, especially if this are lignolytic species for which a suppressed overall decomposition was shown (Osono et al., 2011).

Conclusions assuming a warmer and drier world

Overall, this study supports the call for research taking more than one factor into account when investigating the impact of climate change on complex communities. As we have

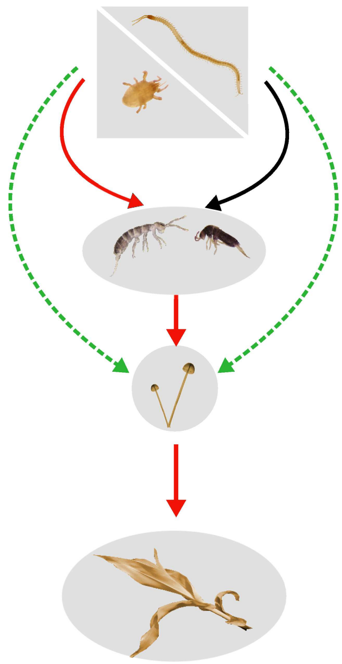


Figure 4.8: The soil community under a climate change scenario with increased temperature and dryness. Arrows indicate a significant influence of the consumer on the resource's biomass with the dashed arrows representing a trophic cascade. Increased predation is shown by red arrows. Green arrows show a positive influence, in this case the neutralization of a negative effect by a trophic cascade. The feeding interaction of geophilids on collembolans was unaffected by climate change (black arrow).

shown here, predictions of the impact of climate change on soil food webs are far from trivial and in many cases no clear statement can be made as the impact of one factor often correlates with another factor. Climate change scenarios predict warming and increased dryness for many agricultural areas. Therefore, we want to shortly illustrate how our experimental community is affected by increased temperature and dryness (Fig. 4.8).

By their increased consumption rates due to their higher metabolism with increasing temperature, the mite population negatively affects the collembolan population. Predation by geophilids, on the other hand, was unaffected by climate change and only size dependent. However, if climate change shifts the size structure within the natural geophilid population to smaller individuals (Daufresne et al., 2009; Yvon-Durocher et al., 2011a; Dossena et al., 2012) we also expect a negative impact on the collembolan population as smaller geophilids have a higher capture efficiency.

For the feeding of collembolans on fungi, we expect higher consumption rates by collembolans leading to lower fungal biomasses. However, in a complex community the negative impact of temperature is neutralized by cascading effects of the predators and thus fungal biomass is unaffected by climate change. For decomposition of organic material by fungi, we expect decomposition rates to accelerate under climate change leading to faster nutrient turnover.

Our experiment shows that size structure is of great importance for ecosystems and should not be left aside when investigating climate change. If the predator-prey body

mass ratio became too large, the predator's capture efficiency decreased and the habitat's structure gained importance as it was more supportive of smaller organisms and provided refuges for the prey species. For clarification of the importance of size structure in soil communities under the aspect of climate change further experiments spanning a larger size spectrum of predators are needed. For the decomposer system we could show the importance of trophic cascades releasing a resource from predation pressure in conjunction with temperature.
Overall, the results here are for an experimental system comprising only few trophic levels in a food chain design. For systems of higher complexity other factors such as omnivory, intraguild predation or competition may come into play. Therefore, future research should also integrate these food web modules.

Acknowledgements

This study was performed within the framework of the Research Unit "Carbon flow in berlowground food webs assessed by stable isotope tracers" of the DFG (FOR 918). Financial support has been provided by the German research foundation DFG (BR 2315/8-1, BR 2315/13). B.L. is additionally funded by the Fazit foundation. The project would not have been possible without the help of many students: Armin Scheeben, Lena Rohde, Steffen Mumme and Anina Vogt. We would also like to thank all the other people involved in running the experiment and the analyses, especially Alexandre Jousset for the watering system and Guido Humpert, Melanie Maraun and Liliane Ruess for help with PLFA analyses. Alexandre Jousset, Roswitha B. Ehnes, Florian D. Schneider and Florian Schwarzmüller gave many helpful comments. We also want to thank Dieter Nünchert for technical support during the construction of the experiment.

Part IV.

General Discussion

Chapter 5.

General Discussion

Soils are fundamental to terrestrial life as many important ecosystem functions take place below ground, thus supplying plants with nutrients and enabling crop production. Increasing temperatures during growth season in combination with severe droughts caused by altered precipitation patterns (IPCC, 2007) may influence soil systems and thereby global food production. However, due to the complexity of soil ecosystems, scientific understanding of soil and soil-associated processes necessary to predict the outcome of climate change remains limited. Therefore, the aim of this thesis was to focus on the unsolved question of how environmental warming affects soil communities and the ecosystem functions our civilization depends on.

The complexity of natural ecosystems with their high number of species and species' interactions constrains ecologist to search for general patterns in less complex motifs. These can the be applied to more complex communities. One example is the use of allometric approaches to describe the dynamics of a food web by its implications for species abundances (Meehan, 2006; Hayward et al., 2010), respiration rates (Gillooly et al., 2001; Brown et al., 2004; Ehnes et al., 2011), food-web structure (Elton, 1927; Cohen et al., 1993; Brose et al., 2006a; Petchey et al., 2008; Rall et al., 2008; Brose, 2010; Riede et al., 2011) and for ecological interactions such as consumption rates (Brose et al., 2008; Vucic-Pestic et al., 2010b; Rall et al., 2011) or interference competition (Lang et al., 2012).

The studies presented here demonstrate how environmental warming influences species and their trophic interactions at different levels of food-web organization, starting with the influence of temperature on a single individual's respiration rate and assimilation efficiency and the resulting consumption rate (Chapter 2). In the next step I added predator individuals to investigate the impact of temperature on intraspecific interference competition (Chapter 3). Here, I used a functional-response approach with a simple predator-prey system. In Chapter 4, I tried to disentangle how temperature in combination with a second climate-change factor, soil dryness, affects a simplified soil community spanning four trophic levels. Due to its importance for food-web stability and persistence, I also incorporated a body-mass aspect into my research.

Environmental warming may directly affect the physiology of species and therefore change their biomass and abundance (Yvon-Durocher et al., 2011a), causing further changes at the population and community level (Brose et al., 2012). Biological rates are generally accelerated by warming as they are all based on chemical reactions. The metabolic theory of ecology (Brown et al., 2004) explains how body mass and temperature affect respiration rates. In Chapter 2, I used literature research to explore how this allometric and temperature scaling of respiration rates differs between consumer types (carnivores, herbivores and detritivores) finding the strongest impact of temperature on carnivores and the strongest body-mass effect for herbivores. In combination with assimilation efficiencies determining how much of the energy consumed by an organism can be used for respiration and biomass production, respiration rates can be used to calculate the organism's maintenance consumption rate. Assimilation efficiencies are assumed to differ between consumer types (Odum, 1968; Peters, 1983), and to increase with trophic level (Kozlovsky, 1968). However, previous metastudies did not incorporate body-mass and temperature effects. Only herbivorous assimilation efficiencies showed an effect of temperature. I assume this to be caused by the large variance in plant stoichiometry which depends on the habitat and light or nutrient limitation within a habitat. Usually, aquatic primary producers have higher nitrogen and phosphorous contents than terrestrial plants which are rich in carbon (Elser et al., 2000; Shurin et al., 2006). As heterotrophs have high nitrogen and phosphorous demands, especially terrestrial herbivores face a great nutritional imbalance (Elser et al., 2000; Frost et al., 2005; Shurin and Seabloom, 2005). However, animals may reduce their assimilation efficiencies for elements ingested in excess (Logan et al., 2004; Frost et al., 2005; Frost and Tuchman, 2005) which explains the high variability I found for herbivorous assimilation efficiencies. Additionally, if a plant's stoichiometry is influenced by environmental temperature (Aerts et al., 2009; Finkel et al., 2010; Sardans et al., 2012) it may account for increasing assimilation efficiencies under warming. However, this is only an preliminary explanation which needs further testing by including the resource's stoichiometry into future research.

Based on these two databases and the scaling of respiration rates and assimilation efficiencies with temperature and body mass, I calculated maintenance consumption rates (i.e. the amount of energy required to balance life maintenance disregarding of biomass production). The increased energetic demand metabolism places on any ectothermic organism under warming resulted in increased consumption rates of all consumer types with higher consumption rates at the detritivore and herbivore level due to their low assimilation efficiencies and high respiration rates. Carnivores showed the strongest reaction to temperature due to the strong temperature dependency of their respiration rates. Their consumption rates therefore have to increase rapidly under environmental warming. Comparison with experimentally measured consumption rates showed a steeper increase of calculated consumption rates with temperature. Thus, carnivores may fail to cover their increasing energetic demand and face a high risk of extinction under environmental warming. In contrast, herbivorous and detritivorous consumption rates increased faster with temperature than their energetic demand, resulting in a net-energy gain which may cause population growth. These increased consumption rates of detritivores should cause accelerated decomposition rates under warming and may thus create a positive feedback to global climate change by increased release of carbon dioxide. However, accelerated decomposition rates also increase nutrient availability for plants, thus higher primary productivity may counterbalance these increases in atmospheric carbon dioxide by increasing soil-carbon input (Kirschbaum, 1995, 2000).

The theoretical approach I have chosen here focussed on calculation of consumption rates in a steady-state system, completely ignoring changes in biomass due to consumption by higher trophic levels, natural death or population growth. In complex communities, additional factors play a role which can modify consumption rates, such as habitat structure (Vucic-Pestic et al., 2010a), multiple prey (Colton, 1987; Elliott, 2004, 2006; Kalinkat et al., 2011) or predator interference (Skalski and Gilliam, 2001; Kratina et al., 2009), but these were not taken into account here. In Chapter 3, I investigated how temperature and body mass affect one of these factors, intraspecific interfence competion, which was shown to be of high importance for food-web stability (Kartascheff et al., 2010). Trophic interactions between consumers and their resources build the energetic backbone of natural communities and can be described by functional-response models quantifying consumer *per capita* consumption rates depending on prey abundance (Holling, 1959). Prior functional-response studies demonstrated systematic effects of environmental temperature and predator and prey body masses on consumption rates (Brose et al., 2008; Petchey et al., 2010; Vucic-Pestic et al., 2010b, 2011; Englund et al., 2011; Ott et al., 2012; Rall et al., 2012). Ectotherm organisms increase their activity with warming leading to a higher encounter probability of conspecifics and in consequence interference among predator individuals. In my experiment, this expectation was supported for the larger predator where increasing temperature led to stronger interference competition whereas I found the opposite pattern for the smaller predator. These results suggest non-trivial implications for the effects of environmental temperature on intraspecific interference competition. Consideration of the predator's respiration rates showed that the larger predator exhibited a weaker increase in its respiration rates with temperature. In contrast, the smaller predator's respiration rates were more sensitive to warming. This stronger increase in the metabolic demand of the smaller predator had to be compensated by increasing search activity for prey which did not leave time for increasing interference whereas the larger predator's increased activity at higher temperatures went partially into increased interference competition. This result also support my findings

from Chapter 2 of the high susceptibility of carnivores to environmental warming.
These two approaches (Chapter 2 and Chapter 3) using single individuals and simple predator-prey systems were able to show that incorporating temperature into complex food web models is far from trivial as other factors such as body mass (Chapter 2 and Chapter 3), consumer type (Chapter 2) or interference competition (Chapter 3) can heavily affect consumption rates. In Chapter 4, I raised my system's complexity to a size-structured soil community within a natural habitat spanning four trophic levels. As there is more to climate change than increasing temperature, I added a second climate change factor, soil dryness, and explored how temperature and soil dryness interactively affect a soil community. My results stress the importance of taking multiple climate change factors into account, as both factors could interactively influence consumption rates. Especially accelerated decomposition rates may be of high importance for carbon cycling due to increased release of carbon dioxide and accelerated nutrient turnover. This is in line with my results of Chapter 2, showing strong increases in detritivorous consumption rates under environmental warming. Additionally, I found evidence of a trophic cascade by which the top predators neutralized the negative effect of collembolans on fungal biomass under climate change. The experiment also corroborated the importance of size structure in complex communities, as the larger predator's capture efficiency decreased as predator-prey body-mass ratios became too large. These higher consumption rates of smaller predators gain importance since climate change is presumed shift cause a shift to smaller body sizes (Daufresne et al., 2009; Yvon-Durocher et al., 2011a; Dossena et al., 2012)
Finally, I want to emphasize the conceptual approach of this thesis in trying to disentangle how climate change may affect complex communities. Most parts of this thesis only include one climate-change factor, temperature, due to it's high importance for all biological interactions. Climate change contains far more factors which may influence a species' physiology and interactions, such as atmospheric carbon dioxide content, soil dryness or changed availability of nitrogen to name only a few. However, in Chapter 4 I could not only show the importance of taking multiple climate change factors into account but also experience the difficulties in doing so. As it is impossible to quantify every single interaction in natural communities due to the high complexity, I tried to find general patterns in this thesis by starting with a simple system and increasing complexity. Overall, this thesis provides important findings for nature conservation as it shows that sensitivity to climate change differs between consumer types with higher trophic levels facing a higher risk of extinction. Additionally, the results presented in this thesis can be used to improve theoretical modelling approaches and may provide important insights into the effects of climate change on populations and food-web stability.

Part V.

Appendix

References

Abe, A. S. and Buck, N. (1985). Oxygen uptake of active and aestivating earthworm *Glossoscolex paulistus* (Oligochaeta, Glossoscolecidae). *Comparative Biochemistry and Physiology*, 81A(1):63–66.

Abrams, P. A. and Ginzburg, L. R. (2000). The nature of predation: prey dependent, ratio dependent or neither? *Trends in Ecology & Evolution*, 15:303–346.

Aerts, R. (2006). The freezer defrosting: global warming and litter decomposition rates in cold biomes. *Journal of Ecology*, 94:713–724.

Aerts, R., Callaghan, T. V., Dorrepaal, E., Logtestijn, R. S. P. V., and Cornelissen, J. H. C. (2009). Seasonal climate manipulations result in species-specific changes in leaf nutrient levels and isotopic composition in a sub-arctic bog. *Functional Ecology*, 23:680–688.

Al-Dabbagh, K. Y. (1976). *Population Dynamics and Bioenergetics of the Terrestrial Isopod Armadillidium vulgare (Latr.) in Grassland Ecosystems.* PhD thesis, University of Leicester.

Al-Dabbagh, K. Y. and Marina, B. A. (1986). Relationships between oxygen uptake and temperature in the terrestrial isopod *Porcellionides pruinosus*. *Journal of Arid Environments*, 11(3):227–233.

Albers, D., Schaefer, M., and Scheu, S. (2006). Incorporation of plant carbon into the soil animal food web of an arable system. *Ecology*, 87(1):235–245.

Aldrich, J. C. (1974). Allometric studies on energy relationships in the spider crab *Libinia emarginata* (Leach). *Biological Bulletin*, 147(2):257–273.

Anderson, J. F. (1970). Metabolic rates of spiders. *Comparative Biochemistry and Physiology*, 33(1):51–72.

Anderson, J. F. (1996). Metabolic rates of resting salticid and thomisid spiders. *Journal of Arachnology*, 24(2):129–134.

Anderson, J. F. and Prestwich, K. N. (1982). Respiratory gas exchange in spiders. *Physiological Zoology*, 55(1):72–90.

Andresen, L. C., Konestabo, H. S., Maraldo, K., Holmstrup, M., Ambus, P., Beier, C., and Michelsen, A. (2011). Organic matter flow in the food web at a temperate heath under multifactorial climate change. *Rapid Communications in Mass Spectrometry*, 25:1485–1496.

Arrhenius, S. (1896). On the influence of carbonic acid in the air upon the temperature of the ground. *The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science, 5th series*, 41:237–276.

Arunachalam, S. (1979). Effect of feeding levels on surfacing activity and food utilization in the catfish *Heteropneustes fossilis*. *Indian Journal of Experimental Biology*, 17:496–499.

Austreng, E. and Gjefren, T. (1981). Fish oils with different contents of free fingerlings and salmon parr. *Aquaculture*, 25:173–183.

Bardgett, R. D., Freeman, C., and Ostle, N. J. (2008). Microbial contributions to climate change through carbon cycle feedbacks. *The ISME Journal*, 2:805–814.

Bardgett, R. D. and Wardle, D. A. (2010). *Aboveground - Belowground linkages: Biotic interactions, ecosystem processes, and global change.* Oxford Series in Ecology and Evolution.

Beamish, F. W. H. (1972). Ration, size and digestion in largemouth bass, *Micropterus salmoides* lacepde. *Canadian Journal of Zoology*, 50:153–164.

Beckerman, A. P., Petchey, O. L., and Warren, P. H. (2006). Foraging biology predicts food web complexity. *Proceedings of the National Academy of Sciences*, 103(37):13745–13749.

Beddington, J. R. (1975). Mutual interference between parasites or predators and its effect on searching efficiency. *Journal of Animal Ecology*, 44:331–340.

Bell, J. R., Traugott, M., Sunderland, K. D., Skirvin, D. J., Mead, A., Kravar-Garde, L., Reynolds, K., Fenlon, J. S., and Symondson, W. O. C. (2008). Beneficial links for the control of aphids: the effects of compost applications on predators and prey. *Journal of Applied Ecology*, 45:1266–1273.

Berg, B. and Laskowski, R. (2006). *Litter decomposition: a guide to carbon and nutrient turnover*. Academic Press.

Berg, M., de Ruiter, P., Didden, W., Janssen, M., Schouten, T., and Verhoef, H. (2001). Community food web, decomposition and nitrogen mineralisation in a stratified scots pine forest soil. *Oikos*, 94:130–142.

Berg, M. P., Stoffer, M., and van den Heuvel, H. H. (2004). Feeding guilds in collembola based on digestive enzymes. *Pedobiologia*, 48:589–601.

Berlow, E., Navarrete, S. A., Briggs, C. J., Power, M. E., and Menge, B. A. (1999). Quantifiying variation in the strengths of species interactions. *Ecology*, 80(7):2206–2224.

Berlow, E. L. (1999). Strong effects of weak interactions in ecological communities. *Nature*, 398:330–334.

Berlow, E. L., Brose, U., and Martinez, N. D. (2008). The "goldilocks factor" in food webs. *Proceedings of the National Academy of Sciences*, 105(11):4079–4080.

Berlow, E. L., Dunne, J. A., Martinez, N. D., Stark, P. B., Williams, R. J., and Brose, U. (2009). Simple prediction of interaction strengths in complex food webs. *Proceedings of the National Academy of Sciences*, 106(1):187–191.

Berlow, E. L., Neutel, A.-M., Cohen, J. E., De Ruiter, P. C., Ebenman, B., Emmerson, M., Fox, J. W., Jansen, V. A. A., Jones, J. I., Kokkoris, G. D., Logofet, D. O., McKane, A. J., Montoya, J. M., and Petchey, O. (2004). Interaction strengths in food webs: issues and opportunities. *Journal of Animal Ecology*, 73:585–598.

Birch, L. C. (1947). The oxygen consumption of the small strain of *Calandra oryzae* L. and *Rhizopertha dominica* Fab. as affected by temperature and humidity. *Ecology*, 28(1):17–25.

Blackburn, J. M. (1968). Digestive efficiency and growth in largemouth black bass. Master's thesis, University of California.

Block, W. (1976). Oxygen uptake by *Nanorchestes antarcticus* (Acari). *Oikos*, 27(2):320–323.

Bocock, K. L. (1963). *Soil Organisms*, chapter The digestion and assimilation of food by Glomeris, pages 85–91. North-Holland, Amsterdam.

Bolker, B. (2011). *emdbook: Ecological Models and Data in R.* R package version 1.3.1.

Bolker, B. M. (2008). *Ecological Models and Data in R.* Princeton University Press.

Bolton, P. J. and Phillipson, J. (1976). Burrowing, feeding, egestion and energy budgets of *Allolobophora rosea* (Savigny) (Lumbridae). *Oecologia*, 23:225–245.

Borer, E. T., Seabloom, E. W., Shurin, J. B., Anderson, K. E., Blanchette, C. A., Broitman, B., Cooper, S. D., and Halpern, B. S. (2005). What determines the strength of a trophic cascade? *Ecology*, 86(2):528–537.

Bradford, M. A., Tordoff, G. M., Black, H. I. J., Cook, R., Eggers, T., Garnett, M. H., Grayston, S. J., Hutcheson, K. A., Ineson, P., Newington, J. E., Ostle, N., Sleep, D., Stott, A., and Jones, T. H. (2007). Carbon dynamics in a model grassland with functionally different soil communities. *Functional Ecology*, 21(4):690–697.

Briones, M. J. I., Ostle, N. J., McNamara, N. P., and Poskitt, J. (2009). Functional shifts of grassland soil communities in response to soil warming. *Soil Biology & Biochemistry*, 41:315–322.

Brisbin, I. L. (1966). Energy-utilization in a captive hoary bat. *Journal of Mammalogy*, 47(4):719–720.

Brocksen, R. W., Davis, G. E., and Warren, C. E. (1968). Competition, food consumption and production on sculpins and trout in laboratory stream communities. *Journal of Wildlife Management*, 32:51–75.

Brose, U. (2008). Complex food webs prevent competitive exclusion among producer species. *Proceedings of the Royal Society B*, 275:2507–2514.

Brose, U. (2010). Body-mass constraints on foraging behaviour determine population and food-web dynamics. *Functional Ecology*, 24:28–34.

Brose, U., Berlow, E. L., and Martinez, N. D. (2005). Scaling up keystone effects from simple to complex ecological networks. *Ecology Letters*, 8(12):1317–1325.

Brose, U., Dunne, J. A., Montoya, J. M., Petchey, O. L., Schneider, F. D., and Jacob, U. (2012). Climate change in size-structured ecosystems. *Philosophical Transactions of the Royal Society B*, 367:2903–2912.

Brose, U., Ehnes, R. B., Rall, B. C., Vucic-Pestic, O., Berlow, E. L., and Scheu, S. (2008). Foraging theory predicts predator-prey energy fluxes. *Journal of Animal Ecology*, 77:1072–1078.

Brose, U., Jonsson, T., Berlow, E. L., Warren, P., Banasek-Richter, C., Bersier, L.-F., Blanchard, J. L., Brey, T., Carpenter, S. R., Blandenier, M.-F. C., Cushing, L., Dawah, H. A., Dell, T., Edwards, F., Harper-Smith, S., Jacob, U., Ledger, M. E., Martinez, N. D., Memmott, J., Mintenbeck, K., Pinnegar, J. K., Rall, B. C., Rayner, T. S., Reuman, D. C., Ruess, L., Ulrich, W., Williams, R. J., Woodward, G., and Cohen, J. E. (2006a). Consumer-resource body-size relationships in natural food webs. *Ecology*, 87(10):2411–2417.

Brose, U., Williams, R. J., and Martinez, N. D. (2006b). Allometric scaling enhances stability in complex food webs. *Ecology Letters*, 9:1228–1236.

Brown, J. H., Gillooly, J. F., Allen, A. P., Savage, V. M., and West, G. B. (2004). Toward a metabolic theory of ecology. *Ecology*, 85:1771–1789.

Brussaard, L. (1998). Soil fauna, guilds, functional groups and ecosystem processes. *Applied Soil Ecology*, 9:123–135.

Brüggl, G. (1992). Gut passage, respiratory rate and assimilation efficiency of three millipedes from a deciduous wood in the Alps. In Meyer, E., Thaler, K., and Schedl, W., editors, *Advances in Myriapodology*, pages 319–325. Proceedings of the 8th International Congress of Myriapodology, Universitätsverlag Wagner, Innsbruck.

Buhr, K. J. (1976). Suspension-feeding and assimilation efficiency in *Lanice conchilega* (Polychaeta). *Marine Biology*, 38:373–383.

Byzova, J. B. (1965). Comparative rate of respiration in some earthworms (Lumbricidae, Oligochaeta). *Revue d'ecologie et de biologie du sol*, 2:207–216.

Bärlocher, F. and Kendrick, B. (1975). Assimilation efficiency of *Gammarus pseudolimnaeus* (Amphipoda) feeding on fungal mycelium or autumn-shed leaves. *Oikos*, 26(1):55–59.

Campbell, A., Singh, N. B., and Sinha, R. N. (1976). Bioenergetics of the granary weevil, *Sitophilus granarius* (L.) (Coleoptera: Curculionidae). *Canadian Journal of Zoology*, 54(5):786–798.

Campbell, K. L. and MacArthur, R. A. (1996). Digestibility of animal tissue by muskrats. *Journal of Mammalogy*, 77(3):755–760.

Caruso, T., Garlaschelli, D., Bargagli, R., and Convey, P. (2010). Testing metabolic scaling theory using intraspecific allometries in antarctic microarthropods. *Oikos*, 119(6):935–945.

Castro, G., Stoyan, N., and Myers, J. P. (1989). Assimilation efficiency in birds: A function of taxon or food type? *Comparative Biochemistry and Physiology Part A: Physiology*, 92(3):271–278.

Chahartaghi, M., Langel, R., Scheu, S., and Ruess, L. (2005). Feeding guilds in collembola based on nitrogen stable isotope ratios. *Soil Biology & Biochemistry*, 37:1718–1725.

Charles, P. M., Sebastian, S. M., Raj, M. C. V., and Marian, M. P. (1984). Effect of feeding frequency on growth and food conversion of *Cyprinus carpio* fry. *Aquaculture*, 40:293–300.

Chown, S. L., Marais, E., Terblanche, J. S., Klok, C. J., Lighton, J. R. B., and Blackburn, T. M. (2007). Scaling of insect metabolic rate is inconsistent with the nutrient supply network model. *Functional Ecology*, 21:282–290.

Chown, S. L., Merwe, M. v. d., and Smith, V. R. (1997). The influence of habitat and altitude on oxygen uptake in Sub-Antarctic weevils. *Physiological Zoology*, 70(1):116–124.

Clarke, A. (1979). Assimilation efficiency of the antarctic marine isopod *Glyptonotus antarcticus*. *Marine Biology*, 52:157–160.

Cloudsley-Thompson, J. L. (2009). Acclimation, water and temperature relations of the woodlice *Metoponorthus pruinosus* and *Periscyphis jannonei* in the Sudan. *Journal of Zoology*, 158(3):267–276.

Cohen, J. E. (1990). A stochastic theory of community food webs. VI. Heterogenous alternatives to the cascade model. *Theoretical Population Biology*, 37:55–90.

Cohen, J. E., Pimm, S. L., Yodzis, P., and Saldana, J. (1993). Body sizes of animal predators and animal prey in food webs. *Journal of Animal Ecology*, 62:67–78.

Cohen, J. E., Schittler, D. N., Raffaelli, D. G., and Reuman, D. C. (2009). Food webs are more than the sum of their tritrophic parts. *Proceedings of the National Academy of Sciences*, 106(52):22335 –22340.

Colton, T. F. (1987). Extending functional response models to include a second prey type: An experimental test. *Ecology*, 68(4):900–912.

Cork, S. J. and Kenagy, G. J. (1989). Nutritional value of hypogeous fungus for a forest-dwelling ground squirrel. *Ecology*, 70(3):577–586.

Crisp, D. J., Yule, A. B., and White, K. N. (1985). Feeding by oyster larvae: the functional response, energy budget and a comparison with mussel larvae. *Journal of the Marine Biological Association of the United Kingdom*, 65:759–783.

Crotty, F. V., Blackshaw, R. P., and Murray, P. J. (2011). Tracking the flow of bacterially derived 13C and 15N through soil faunal feeding channels. *Rapid Communications in Mass Spectrometry*, 25:1503–1513.

Crowley, P. H. and Martin, E. K. (1989). Functional responses and interference within and between year classes of a dragonfly population. *Journal of the North American Benthological Society*, 8:211–221.

Crowther, T. W., Boddy, L., and Jones, T. H. (2011). Species-specific effects of soil fauna on fungal foraging and decomposition. *Oecologia*, 167:535–545.

Currie, C. R., Spence, J. R., and Niemelä, J. (1996). Competition, cannibalism and intraguild predation among ground beetles (Coleoptera: Carabidae): A laboratory study. *The Coleopterists Bulletin*, 50:135–148.

Damuth, J. (1981). Population density and body size in mammals. *Nature*, 290:699–700.

Daufresne, M., Lengfellner, K., and Sommer, U. (2009). Global warming benefits the small in aquatic ecosystems. *Proceedings of the National Academy of Sciences*, 106(31):12788–12793.

David, J.-F. and Gillon, D. (2002). Annual feeding rate of the millipede *Glomeris marginata* on holm oak (*Quercus ilex*) leaf litter under Mediterranean conditions. *Pedobiologia*, 46:42–52.

Davidson, E. A. and Janssens, I. A. (2006). Temperature sensitivity of soil carbon decomposition and feedbacks to climate change. *Nature*, 440:165–173.

de Ruiter, P. C., Bloem, J., Bouwman, L. A., Didden, W. A. M., Hoenderboom, G. H. J., Lebbink, G., Marinissen, J. C. Y., de Vos, J. A., Vreeken-Buijs, M. J., Zwart, K. B., and Brussaard, L. (1994a). Simulation of dynamics in nitrogen mineralisation in the belowground food webs of two arable farming systems. *Agriculture, Ecosystems and Environment*, 51:199–208.

de Ruiter, P. C., Neutel, A.-M., and Moore, J. C. (1994b). Modelling food webs and nutrient cycling in agro-ecosystems. *Trends in Ecology & Evolution*, 9(10):378–383.

de Ruiter, P. C., Neutel, A.-M., and Moore, J. C. (1998). Biodiversity in soil ecosystems: the role of energy flow and community stability. *Applied Soil Ecology*, 10:217–228.

de Ruiter, P. C., van Veen, J. A., Moore, J. C., Brussaard, L., and Hunt, H. W. (1993). Calculation of nitrogen mineralization in soil food webs. *Plant and Soil*, 157:263–273.

DeAngelis, D. L., Goldstein, R. A., and O'Neill, R. V. (1975). A model for trophic interaction. *Ecology*, 56:881–892.

deCarvalho, T. N., Watson, P. J., and Field, S. A. (2004). Costs increase as ritualized fighting progresses within and between phases in the sierra dome spider, *Neriene litigiosa*. *Animal Behaviour*, 68(3):473–482.

Dell, A. I., Pawrar, S., and Savage, V. M. (2011). Systematic variation in the temperature dependence of physiological and ecological traits. *Proceedings of the National Academy of Sciences*, 108(26):10591–10596.

DeSilva, S. S. and Perera, M. K. (1983). Digestibility of an aquatic macrophyte by the cichlid *Etroplus suratensis* (Bloch) with observation on the relative merits of three indigenous components as markers and daily changes in protein digestibility. *Journal of Fish Biology*, 23:273–278.

Dickschen, F. and Topp, W. (1987). Feeding activities and assimilation efficiencies of *Lumbricus rubellus* (Lumbricidae) on a plant-only diet. *Pedobiologia*, 30:31–37.

Dodds, P. S., Rothman, D. H., and Weitz, J. S. (2001). Re-examination of the "3/4-law" of metabolism. *Journal of Theoretical Biology*, 209:9–27.

Dossena, M., Yvon-Durocher, G., Grey, J., Montoya, J. M., Perkins, D. M., Trimmer, M., and Woodward, G. (2012). Warming alters community size structure and ecosystem functioning. *Proceedings of the Royal Society B*.

Downs, C. J., Hayes, J. P., and Tracy, C. R. (2008). Scaling metabolic rate with body mass and inverse body temperature: a test of the arrhenius fractal supply model. *Functional Ecology*, 22:239–244.

Dreisig, H. (1981). The rate of predation and its temperature dependence in a tiger beetle, *Cicindela hybrida*. *Oikos*, 36:196–202.

Duke, G. E., Ciganek, J. G., and Evanson, O. A. (1973). Food consumption and energy, water, and nitrogen budgets in captive great-horned owls (*Bubo virginianus*). *Comparative Biochemistry and Physiology*, 44A:283–292.

Dunne, J. A., Williams, R. J., and Martinez, N. D. (2002). Network structure and biodiversity loss in food webs: robustness increases with connectance. *Ecology Letters*, 5:558–567.

Dunne, J. A., Williams, R. J., and Martinez, N. D. (2004). Network structure and robustness of marine food webs. *Marine Ecology - Progress Series*, 273:291–302.

Durant, J. M., Hjermann, D. Ø., Ottersen, G., and Stenseth, N. C. (2007). Climate and the match or mismatch between predator requirements and resource availability. *Climate Research*, 33:271–283.

Durbin, E. G. and Durbin, A. G. (1992). Effects of temperature and food abundance on grazing and short-term weight change in the marine copepod *Acartia hudsonica*. *Limnology and Oceanography*, 37(2):361–378.

Dutton, R. H., Fitzpatrick, L. C., and Hughes, J. L. (1975). Energetics of the rusty lizard *Sceloporus olivaceus*. *Ecology*, 56(6):1378–1387.

Easterling, D. R., Horton, B., Jones, P. D., Peterson, T. C., Karl, T. R., Parker, D. E., Salinger, M. J., Razuvayev, V., Plummer, N., Jamason, P., and Folland, C. K. (1997). Maximum and minimum temperature trends for the globe. *Science*, 277:364–367.

Edney, E. B. (1964). Acclimation to temperature in terrestrial isopods: II. Heart rate and standard metabolic rate. *Physiological Zoology*, 37(4):378–394.

Edwards, P. B. and Wightman, J. A. (1984). Energy and nitrogen budgets for larval and adult *Paropsis charybdis* Stål (Coleoptera: Chrysomelidae) feeding on *Eucalyptus viminalis*. *Oecologia*, 61(3):302–310.

Edwards, R. R. C., Blaxter, J. H. S., Gopalon, U. K., Mathews, C. V., and Finlayson, D. M. (1971). Feeding, metabolism, and growth of tropical flatfish. *Journal of Experimental Marine Biology and Ecology*, 6:279–300.

Edwards, R. R. C., Finlayson, D. M., and Steele, J. H. (1969). The ecology of 0-group plaice and common dabs in Loch Ewe. II. Experimental studies on metabolism. *Journal of Experimental Marine Biology and Ecology*, 3:1–17.

Ehnes, R. B., Rall, B. C., and Brose, U. (2011). Phylogenetic grouping, curvature and metabolic scaling in terrestrial invertebrates. *Ecology Letters*, 14(10):993–1000.

Eitzinger, B. and Traugott, M. (2011). Which prey sustains cold-adapted invertebrate generalist predators in arable land? Examining prey choices by molecular gut-content analysis. *Journal of Applied Ecology*, 48:591–599.

Elliott, J. M. (2003). A comparative study of the functional response of four species of carnivorous stoneflies. *Freshwater Biology*, 48:191–202.

Elliott, J. M. (2004). Prey switching in four species of carnivorous stoneflies. *Freshwater Biology*, 49(6):709–720.

Elliott, J. M. (2006). Prey switching in *Rhyacophila dorsalis* (trichoptera) alters with larval instar. *Freshwater Biology*, 51(5):913–924.

Elser, J. J., Fagan, W. F., Denno, R. F., Dobberfuhl, D. R., Folarin, A., Huberty, A., Interlandi, S., Kilham, S. S., McCauley, E., Schulz, K. L., Siemann, E. H., and Sterner, R. W. (2000). Nutritional constraints in terrestrial and freshwater food webs. *Nature*, 408:578–580.

Elton, C. S. (1927). *Animal Ecology*. MacMillan, New York.

Emmerson, M., Bezemer, T. M., Hunter, M. D., Jones, T. H., Masters, G., and van Dam, N. M. (2004). How does global change affect the strength of trophic interactions? *Basic and Applied Ecology*, 5:505–514.

Emmerson, M. and Raffaelli, D. (2004). Predator-prey body size, interaction strength and the stability of a real food web. *Journal of Animal Ecology*, 73(3):399–409.

Engelmann, M. D. (1961). The role of soil arthropods in the energetics of an old field community. *Ecological Monographs*, 31(3):221–238.

Englund, G., Öhlund, G., Hein, C. L., and Diehl, S. (2011). Temperature dependence of the functional response. *Ecology Letters*, 14:914–921.

Fenchel, T. (1974). Intrinsic rate of natural increase: The relationship with body size. *Oecologia*, 14:317–326.

Fink, P., Peters, L., and von Elert, E. (2006). Stoichiometric mismatch between littoral invertebrates and their periphyton food. *Archiv für Hydrobiologie*, 165(2):145–165.

Finkel, Z. V., Beardall, J., Flynn, K. J., Quigg, A., Rees, T. A. V., and Raven, J. A. (2010). Phytoplankton in a changing world: cell size and elemental stoichiometry. *Journal of Plankton Research*, 32(1):119–137.

Fischer, Z. (1970). The elements of energy balance in grass carp (*Ctenopharygodon idella* val.) Part I. *Polskie Archiwum Hydrobiologii*, 17:421–434.

Fitzpatrick, L. C. (1973). Energy allocation in the allegheny mountain salamander, *Desmognathus ochrophaeus*. *Ecological Monographs*, 43(1):43–58.

Fitzpatrick, L. C., Goven, A. J., Earle, B., Rodriguez, J., Briceno, J., and Venables, B. J. (1987). Thermal acclimation, preference and effects on VO_2 in the earthworm *Lumbricus terrestris*. *Comparative Biochemistry and Physiology*, 87A(4):1015–1016.

Ford, M. J. (1977a). Energy costs of the predation strategy of the web-spinning spider *Lepthyphantes zimmermanni* Bertkau (Linyphiidae). *Oecologia*, 28(4):341–349.

Ford, M. J. (1977b). Metabolic costs of the predation strategy of the spider *Pardosa amentata* (Clerck) (Lycosidae). *Oecologia*, 28(4):333–340.

Fox, J. W. and Morin, P. J. (2001). Effects of intra- and interspecific interactions on species responses to environmental change. *Journal of Animal Ecology*, 70:80–90.

Frampton, G. K., van den Brink, P. J., and Gould, P. J. L. (2000). Effects of spring drought and irrigation on farmland arthropods in southern Britain. *Journal of Applied Ecology*, 37:865–883.

Frost, P. C., Evans-White, M. A., Finkel, Z. V., Jensen, T. C., and Matzek, V. (2005). Are you what you eat? Physiological constraints on organismal stoichiometry in an elementally imbalanced world. *Oikos*, 109:18–28.

Frost, P. C. and Tuchman, N. C. (2005). Nutrient release rates and ratios by two stream detritivores fed leaf litter grown under elevated atmospheric CO_2. *Archiv für Hydrobiologie*, 163(4):463–477.

Frostegård, Å., Bååth, E., and Tunlid, A. (1993). Shifts in the structure of soil microbial communities in limed forests as revealed by phospholipid fatty acid analysis. *Soil Biology & Biochemistry*, 25(6):723–730.

Frostegård, Å., B. E. (1996). The use of phospholipid fatty acid analysis to estimate bacterial and fungal biomass in soil. *Biology and Fertility of Soils*, 22:59–65.

Garnett, S. (1988). Digestion, assimilation and metabolism of captive estuarine crocodiles, *Crocodylus porosus*. *Comparative Biochemistry and Physiology*, 90A(1):23–29.

Gerald, V. M. (1976a). The effect of size on the consumption absorption and conversion of food in *Ophiocephalus punctatus* Bloch. *Hydrobiologia*, 49(1):77–85.

Gerald, V. M. (1976b). The effect of temperature on the consumption, absorption and conversion of food in *Ophiocephalus punctatus* bloch. *Hydrobiologia*, 49(1):87–93.

Gere, G. (1956). The examination of the feeding biology and the humificative function of diplopoda and isopoda. *Acta Biologica*, 6:257–271.

Gilbert, N. and Raworth, D. A. (1996). Insects and temperature - a general theory. *Canadian Entomologist*, 128(1):1–13.

Gillooly, J. F., Brown, J. H., West, G. B., Savage, V. M., and Charnov, E. L. (2001). Effects of size and temperature on metabolic rate. *Science*, 293:2248–2251.

Goddard, D. G. (1977). The signy island terrestrial reference sites. VIII. oxygen uptake of some Antarctic prostigmatid mites (Acari Prostigmata). *British Antarctic Survey Bulletin*, 45:101–115.

Golley, F. B. (1961). Energy values of ecological materials. *Ecology*, 42(3):581–584.

Grahame, J. (1973). Assimilation efficiency of *Littorina littorea* (L.) (Gastropoda: Prosobranchiata). *Journal of Animal Ecology*, 42(2):383–389.

Greenstone, M. H. and Bennett, A. F. (1980). Foraging strategy and metabolic rate in spiders. *Ecology*, 61(5):1255–1259.

Griffith, D. M. and Poulsen, T. L. (1993). Mechanisms and consequences of intraspecific competition in a carabid cave beetle. *Ecology*, 74(5):1373–1383.

Gromadska, M. (1962). Changes in respiratory metabolism of *Lumbricus castaneus* Sav. under influence of various constant and alternating temperatures. *Studia Societatis Scientiarum Torunensis*, 6:179–189.

Gromadzka, J. (1968). Respiratory metabolism of the colorado beetle (*Leptinotarsa decemlineata* Say). *Ekologia Polska A*, 16:1–9.

Hadley, N. F., Ahearn, G. A., and Howarth, F. G. (1981). Water and metabolic relations of cave-adapted and epigean lycosid spiders in Hawaii. *Journal of Arachnology*, 9(2):215–222.

Hagstrum, D. W. (1970). Physiology of food utilization by the spider *Tarentula kochi* (Araneae: Lycosidae). *Annals of the Entomological Society of America*, 63:1305–1308.

Hairston, N. G., Smith, F. E., and Slobodkin, L. B. (1960). Community structure, population control, and competition. *American Naturalist*, 94:145–159.

Hamilton, K. L. (1985). Food and energy requirements of captive barn owls *Tyto alba*. *Comparative Biochemistry and Physiology*, 80A(3):355–358.

Hansen, P. J., Bjørnsen, P. K., and Hansen, B. W. (1997). Zooplankton grazing and growth: Scaling within the 2-2,000-μm body size range. *Limnology and Oceanography*, 42(4):687–704.

Harrington, R., Woiwod, I., and Sparks, T. (1999). Climate change and trophic interactions. *Trends in Ecology & Evolution*, 14(4):146–150.

Hartenstein, R. (1964). Feeding, digestion, glycogen, and the environmental conditions of the digestive system in *Oniscus asellus*. *Journal of Insect Physiology*, 10(4):611–621.

Hassall, M. (1983). Population metabolism of the terrestrial isopod *Philoscia muscorum* in a dune grassland ecosystem. *Oikos*, 41(1):17–26.

Hayward, A., Kolasa, J., and Stone, J. R. (2010). The scale-dependence of population density-body mass allometry: statistical artefact or biological mechanism? *Ecological Complexity*, 7(1):115–124.

Heatwole, H., Muir, R., and Davison, E. (1986). Oxygen consumption of some terrestrial invertebrates from the Pre-Saharan steppe of Tunisia. *Journal of Arid Environments*, 11(3):219–226.

Heckmann, L., Drossel, B., Brose, U., and Guill, C. (2012). Interactive effects of body-size structure and adaptive foraging on food-web stability. *Ecology Letters*, 15(3):243–250.

Hedlund, K. and Öhrn, M. S. (2000). Tritrophic interactions in a soil community enhance decomposition rates. *Oikos*, 88:585–591.

Heiman, D. R. and Knight, A. W. (1975). The influence of temperature on the bioenergetics of the carnivorous stonefly nymph, *Acroneuria californica* banks (Plecoptera: Perlidae). *Ecology*, 56(1):105–116.

Hengeveld, R. (1980). Polyphagy, oligophagy and food specialization in ground beetles (Coleoptera, Carabidae). *Netherlands Journal of Zoology*, 30:564–584.

Hilton, G. M., Houston, D. C., Barton, N. W. H., Furness, R. W., and Ruxton, G. D. (1999). Ecological constraints on digestive physiology in carnivorous and piscivorous birds. *Journal of Experimental Zoology*, 283:365–376.

Hogendoorn, H. (1983). Growth and production of the African catfish, *Clarius lezena* (C & V). III. bioenergetic relations of body weight and feeding level. *Aquaculture*, 35:1–17.

Holling, C. S. (1959). Some characteristics of simple types of predation and parasitism. *The Canadian Entomologist*, 7:385–398.

Holt, R. D., Grover, J., and Tilman, D. (1994). Simple rules for interspecific dominance in systems with exploitative and apparent competition. *American Naturalist*, 144(5):741–771.

Honek, A. (1997). The effect of temperature on the activity of Carabidae (Coleoptera) in a fallow field. *European Journal of Entomology*, 94:97–104.

Huisman, J. and Weissing, F. J. (2001). Biological conditions for oscillations and chaos generated by multispecies competition. *Ecology*, 82(10):2682–2695.

Humphreys, W. F. (1977). Respiration studies on *Geolycosa godeffroyi* (Araneae: Lycosidae) and their relationship to field estimates of metabolic heat loss. *Comparative Biochemistry and Physiology Part A: Physiology*, 57(2):255–263.

Humphreys, W. F. and Collis, G. (1990). Water loss and respiration of cave arthropods from cape range, Western Australia. *Comparative Biochemistry and Physiology Part A: Physiology*, 95(1):101–107.

Hunt, H. W., Coleman, D. C., Ingham, E. R., Ingham, R. E., Elliott, E. T., Moore, J. C., Rose, S. L., Reid, C. P. P., and Morley, C. R. (1987). The detrital food web in a shortgrass prairie. *Biology and Fertility of Soils*, 3:57–68.

IPCC (2007). *Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, chapter Climate change and its impacts in the near and long term under different scenarios, pages 43–54. IPCC, Geneva, Switzerland.

Isaac, N. J. B. and Carbone, C. (2010). Why are metabolic scaling exponents so controversial? Quantifiying variance and testing hypotheses. *Ecology Letters*, 13:728–735.

Ito, Y. (1964). Preliminary studies on the respiratory energy loss of a spider, *Lycosa pseudoannulata*. *Researches on Population Ecology*, 6(1):13–21.

Ives, A. R. (1995). Predicting the response of populations to environmental change. *Ecology*, 76(3):926–941.

Jeschke, J. M., Kopp, M., and Tollrian, R. (2002). Predator functional responses: Discriminating between handling and digesting prey. *Ecological Monographs*, 72(1):95–112.

Joose, E. N. G. (1969). Population structure of some surface dwelling collembola in a coniferous forest soil. *Netherlands Journal of Zoology*, 19(4):621–634.

Kalinkat, G., Rall, B. C., Vucic-Pestic, O., and Brose, U. (2011). The allometry of prey preferences. *PLoS One*, 6:e25937. doi:10.1371/journal.pone.0025937.

Karasov, W. H. (1982). Energy assimilation, nitrogen requirement, and diet in free-living antelope ground squirrels *Ammospermophilus leucurus*. *Physiological Zoology*, 55(4):378–392.

Karasov, W. H., Petrossian, E., Rosenberg, L., and Diamond, J. M. (1986). How do food passage rate and assimilation differ between herbivorous lizards and nonruminant mammals? *Journal of Comparative Physiology B*, 156:599–609.

Karg, W. (1993). *Raubmilben*, volume 59 of *Die Tierwelt Deutschlands*. Gustav Fischer Verlag, 2nd edition.

Kartascheff, B., Heckmann, L., Drossel, B., and Guill, C. (2010). Why allometric scaling enhances stability in food web models. *Theoretical Ecology*, 3:195–208.

Kay, D. G. and Brafield, A. E. (1973). The energy relations of the polychaete *Neanthes* (= *Nereis*) *virens* (Sars). *Journal of Animal Ecology*, 42(3):673–692.

Keddy, P. A. (1989). *Competition*. Chapman and Hall.

Kennedy, P. M., McSweeney, C. S., and Welch, J. G. (1992). Influence of dietary particle size on intake, digestion, and passage rate of digesta in goats and sheep fed wheaten (*Triticum aestivum*) hay. *Small Ruminant Research*, 9(2):125–138.

Kilham, K. (1994). *Soil Ecology*. Cambridge University Press.

Kingsolver, J. G. and Woods, H. A. (1998). Interactions of temperature and dietary protein concentrations in growth and feeding of *Manduca sexta* caterpillars. *Physiological Entomology*, 23:354–359.

Kiørboe, T., Møhlenberg, F., and Hamburger, K. (1985). Bioenergetics of the planktonic copepod *Acartia tonsa*: relation between feeding, egg production and respiration, and composition of specific dynamic action. *Marine Ecology - Progress Series*, 26:85–97.

Kirschbaum, M. U. F. (1995). The temperature dependence of soil organic matter decomposition, and the effect of global warming on soil organic C storage. *Soil Biology & Biochemistry*, 27(6):753–760.

Kirschbaum, M. U. F. (2000). Will changes in soil organic matter act as a positive or negative feedback on global warming? *Biogeochemistry*, 48:21–51.

Kleiber, M. (1947). Body size and metabolic rate. *Physiological Reviews*, 27:511–541.

Klok, C. J. and Chown, S. L. (2005). Temperature- and body mass-related variation in cyclic gas exchange characteristics and metabolic rate of seven weevil species: Broader implications. *Journal of Insect Physiology*, 51(7):789–801.

Knoz, J. (1957). Über den Einfluß einer kurzfristigen Wirkung der Temperatur auf den Sauerstoffverbrauch bei einigen Oligochaeten. *Acta Societatis Zoologicae Bohemoslovenicae*, 21(3):203–208.

Koen-Alonso, M. (2007). *From energetics to ecosystems: The dynamics and structure of ecological systems*, chapter A process-oriented approach to the multispecies functional response, pages 1–36. Springer.

Kotiaho, J. S. (1998). Sexual differences in metabolic rates of spiders. *Journal of Arachnology*, 26(3):401–404.

Kotiaho, J. S., Alatalo, R. V., Mappes, J., Nielsen, M. G., Parri, S., and Rivero, A. (1998). Energetic costs of size and sexual signalling in a wolf spider. *Proceedings of the Royal Society B: Biological Sciences*, 265(1411):2203–2203.

Kozlovsky, D. G. (1968). A critical evaluation of the trophic level concept. I. Ecological efficiencies. *Ecology*, 49(1):48–60.

Kramer, S., Marhan, S., Ruess, L., Armbruster, W., Butenschoen, O., Haslwimmer, H., Kuzyakov, Y., Pausch, J., Scheunemann, N., Schoene, J., Schmalwasser, A., Totsche, K. U., Walker, F., Scheu, S., and Kandeler,

E. (2012). Carbon flow into microbial and fungal biomass as a basis for the belowground food web of agroecosystems. *Pedobiologia*, 55:111–119.

Kratina, P., Greig, H. A., Thompson, P. L., Carvalho-Pereira, S. A., and Shurin, J. B. (2012). Warming modifies trophic cascades and eutrophication in experimental freshwater communities. *Ecology*, 93(6):1421–1430.

Kratina, P., Vos, M., Bateman, A., and Anholt, B. R. (2009). Functional responses modified by predator density. *Oecologia*, 159:425–433.

Kruse, P. D., Toft, S., and Sunderland, K. D. (2008). Temperature and prey capture: opposite relationships in two predator taxa. *Ecological Entomology*, 33:305–312.

Krüger (1958). Größenabhängigkeit des Sauerstoffverbrauchs einheimischer Grillen. *Biologisches Zentralblatt*, 77(5):581–588.

Kuijper, L. D. J., Kooi, B. W., Zonneveld, C., and Kooijman, S. A. L. M. (2003). Omnivory and food web dynamics. *Ecological Modelling*, 163(1-2):19–32.

Kukor, J. J. and Martin, M. M. (1986). The effect of acquired microbial enzymes on assimilation efficiency in the common woodlouse, *Tracheoniscus rathkei*. *Oecologia*, 69:360–366.

Kutsch, W. L., Bahn, M., and Heinemeyer, A. (2009). *Soil carbon dynamics: an integrated methodology*, chapter 1. Soil carbon relations: an overview, pages 1–15. Cambridge University Press.

Kéfi, S., Berlow, E., Wieters, E., Navarrete, S., Petchey, O., Wood, S., Boit, A., Joppa, L., Lafferty, K., Williams, R., Martinez, N., Menge, B., Blanchette, C., Iles, A., and Brose, U. (2012). More than a meal... integrating non-feeding interactions into food webs. *Ecology Letters*, 15(4):291–300.

Köhler, H.-R., Alberti, G., and Storch, V. (1991). The influence of the mandibles of diplopoda on the food - a dependence of fine structure and assimilation efficiency. *Pedobiologia*, 35:108–116.

Lam, P. K. S., Dudgeon, D., and Ma, H. H. T. (1991). Ecological energetics of populations of four sympatric isopods in a hong kong forest. *Journal of Tropical Ecology*, 7(4):475–490.

Lang, B., Rall, B. C., and Brose, U. (2012). Warming effects on consumption and intraspecific interference competition depend on predator metabolism. *Journal of Animal Ecology*, 81:516–523.

Lardies, M. A., Catalán, T. P., and Bozinovic, F. (2004). Metabolism and life-history correlates in a lowland and highland population of a terrestrial isopod. *Canadian Journal of Zoology*, 82(5):677–687.

Lasenby, D. C. and Langford, R. R. (1973). Feeding and assimilation of *Mysis relicta*. *Limnology and Oceanography*, 18(2):280–285.

Lenski, R. E. (1982). Effects of forest cutting on two carabus species: Evidence for competition for food. *Ecology*, 63:1211–1217.

Lenz, M., Barrett, R. A., and Williams, E. R. (1982). Influence of diet on the survival and wood consumption of *Porotermes adamsoni* (Froggatt) (Isoptera: Termopsidae) at different temperatures. *Bulletin of Entomological Research*, 72(3):423–435.

Levesque, K. R., Fortin, M., and Mauffette, Y. (2002). Temperature and food quality effects on growth, consumption and post-ingestive utilization efficiencies of the forest tent caterpillar *Malacosoma disstria* (Lepidoptera: Lasiocampidae). *Bulletin of Entomological Research*, 92(2):127–136.

Lindberg, N. and Bengtsson, J. (2005). Population responses of oribatid mites and collembolans after drought. *Applied Soil Ecology*, 28:163–174.

Lindeman, R. L. (1942). The trophic-dynamic aspect of ecology. *Ecology*, 23:399–418.

Logan, D. T. and Epifanio, C. E. (1978). A laboratory energy balance for the larvae and juveniles of the american lobster *Homarus americanus*. *Marine Biology*, 47:381–389.

Logan, J. D., Joern, A., and Wolesensky, W. (2004). Control of cnp homeostasis in herbivore consumers through differential assimilation. *Bulletin of Mathematical Biology*, 66(4):707–725.

Logan, J. D., Wolesensky, W., and Joern, A. (2006). Temperature-dependent phenology and predation in arthropod systems. *Ecological Modelling*, 196:471–482.

Loreau, M. (1990). Competition in a carabid beetle community: A field experiment. *Oikos*, 58:25–38.

Lövei, G. L. and Sunderland, K. D. (1996). Ecology and behavior of ground beetles (Coleoptera: Carabidae). *Annual Review of Entomology*, 41:231–256.

MacFadyen, A. (1961). Improved funnel-type extractors for soil arthropods. *Journal of Animal Ecology*, 30(1):171–184.

Mackey, A. P. (1978). Growth and bioenergetics of the moth *Cyclophragma leucosticta* Grünberg. *Oecologia*, 32(3):367–376.

Maraun, M., Erdmann, G., Fischer, B. M., Pollierer, M. M., Norton, R. A., Schneider, K., and Scheu, S. (2011). Stable isotopes resvisited: Their use and limits for oribatid mite trophic ecology. *Soil Biology & Biochemistry*, 43:877–882.

Marian, M. P., Ponniah, A. G., Pitchiraj, R., and Narayanan, M. (1982). Effect of feeding frequency on surfacing activity and growth in the air-breathing fish, *Heteropneustes fossilis*. *Aquaculture*, 26:237–244.

Mason, C. F. (1970). Food, feeding rates and assimilation in woodland snails. *Oecologia*, 4(4):358–373.

Mathavan, S. (1990). Effect of temperature on the bio-energetics of the larvae of *Brachythemis contaminata* (Fabricius) and *Orthetrum sabina* (Drury) (Anisoptera: Libellulidae). *Odonatologica*, 19(2):153–165.

Mathis, A. and Hoback, W. W. (1997). The influence of chemical stimuli from predators on precopulatory pairing by the amphipod, *Gammarus pseudolimnaeus*. *Ethology*, 103:33–40.

May, M. L., Pearson, D. L., and Casey, T. M. (1986). Oxygen consumption of active and inactive adult tiger beetles. *Physiological Entomology*, 11(2):171–179.

May, R. M. (1972). Will a large complex system be stable? *Nature*, 238:413–414.

McCann, K. (2007). Protecting biostructure. *Nature*, 446:29.

McCann, K., Hastings, A., and Huxel, G. R. (1998). Weak trophic interactions and the balance of nature. *Nature*, 395:794–798.

McCarthy, J. P. (2001). Ecological consequences of recent climate change. *Conservation Biology*, 15(2):320–331.

McDiffett, W. F. (1970). The transformation of energy by a stream detritivore, *Pteronarcys scotti* (Plecoptera). *Ecology*, 51(6):975–988.

McNab, B. K. (2008). An analysis of the factors that influence the level and scaling of mammalian BMR. *Comp. Biochem. Physiol. Part A: Molecular & Integrative physiology*, 151(1):5–28.

McQueen, D. J. (1980). Active respiration rates for the burrowing wolf spider *Geolycosa domifex* (Hancock). *Canadian Journal of Zoology*, 58(6):1066–1074.

Meehan, T. D. (2006). Energy use and animal abundance in litter and soil communities. *Ecology*, 87(7):1650–1658.

Mercer, R. D., Gabriel, A. G. A., Barendse, J., Marshall, D. J., and Chown, S. L. (2001). Invertebrate body sizes from Marion Island. *Antarctic Science*, 13(2):135–143.

Meyer, E. and Phillipson, J. (1983). Respiratory metabolism of the isopod *Trichoniscus pusillus provisorius*. *Oikos*, 40(1):69–74.

Mikola, J. and Setälä, H. (1998). No evidence of trophic cascades in an experimental microbial-based soil food web. *Ecology*, 79(1):153–164.

Mispagel, M. E. (1981). Relation of oxygen consumption to size and temperature in desert arthropods. *Ecological Entomology*, 6(4):423–431.

Mitchell, M. J. (1979). Functional relationships of macroinvertebrates in heterotrophic systems with emphasis on sewage sludge decomposition. *Ecology*, 60(6):1270–1283.

Miyashita, K. (1969). Effects of locomotory activity, temperature and hunger on the respiratory rate of *Lycosa T-insignita* Boes. et Str. (Araneae: Lycosidae). *Applied Entomological Zoology*, 4:105–113.

Moeur, J. E. and Eriksen, C. H. (1972). Metabolic responses to temperature of a desert spider, *Lycosa* (*Pardosa*) *carolinensis* (Lycosidae). *Physiological Zoology*, 45(4):290–301.

Montoya, J. M. and Raffaelli, D. (2010). Climate change, biotic interactions and ecosystem services. *Philosophical transactions of the Royal Society B*, 365:2013–2018.

Moulder, B. C. and Reichle, D. E. (1972). Significance of spider predation in the energy dynamics of forest-floor arthropod communities. *Ecological Monographs*, 42(4):473–498.

Myrcha, A. and Stejgwillo-Laudanska, B. (1973). Changes in the metabolic rate of starved Lycosidae spiders. *Bulletin de l'Académie Polonaise des Sciences / Série des Sciences biologiques*, 21:209–213.

Nakamura, K. (1972). The ingestion in wolf spiders II. the expression of degree of hunger and amount of ingestion in relation to spider's hunger. *Researches on Population Ecology*, 14(1):82–96.

Neutel, A.-M., Heesterbeek, J. A. P., and de Ruiter, P. C. (2002). Stability in real food webs: Weak links in long loops. *Science*, 296:1120–1123.

Neutel, A.-M., Heesterbeek, J. A. P., van de Koppel, J., Hoenderboom, G., Vos, A., Kaldeway, C., Berendse, F., and de Ruiter, P. C. (2007). Reconciling complexity with stability in naturally assembling food webs. *Nature*, 449:599–602.

Nielsen, M. V. and Olsen, Y. (1989). The dependence of the assimilation efficiency in *Daphnia magna* on the 14C-labeling period of the food alga *Scenedesmus acutus*. *Limnology and Oceanography*, 34(7):1311–1315.

Nielsen, U. N., Ayres, E., Wall, D. H., and Bardgett, R. D. (2011). Soil biodiversity and carbon cycling: a review and synthesis of studies examining diversity–function relationships. *European Journal of Soil Science*, 62:105–116.

Nirmala, A. R. C. (1981). *Energy transformation in chosen tropical air-breathing fish.* PhD thesis, Madurai Kamaraj University.

O'Connor, F. B. (1963). *Soil Organisms*, chapter Oxygen consumption and population metabolism of some populations of Enchytraeidae from North Wales, pages 32–48. North-Holland Publishing Company, Amsterdam.

Odum, E. P. (1968). Energy flow in ecosystems: a historical review. *American Zoologist*, 8:11–18.

Osono, T., Hagiwara, Y., and Masuya, H. (2011). Effects of temperature and litter type on fungal growth and decomposition of leaf litter. *Mycoscience*, 52:327–332.

Ott, D., Rall, B. C., and Brose, U. (2012). Climate change effects on macrofaunal litter decomposition: the interplay of temperature, body masses and stoichiometry. *Philosophical transactions of the Royal Society B*, 367:3025–3032.

Otto, S. B., Rall, B. C., and Brose, U. (2007). Allometric degree distributions facilitate food-web stability. *Nature*, 450:1226–1229.

Paine, R. T. (1980). Food webs: Linkage, interaction strength and community infrastructure. *Journal of Animal Ecology*, 49:667–685.

Palavesam, A., Somanath, B., and Immanuel, G. (2009). Effect of detritus quality on energy allocation in chironomids. *European Journal of Biological Sciences*, 1:1–9.

Pandian, T. J. (1967a). Food intake, absorption and conversion in the fish *Ophiocephalus striatus*. *Helgoländer Wissenschaftliche Meeresuntersuchungen*, 15:637–647.

Pandian, T. J. (1967b). Intake, digestion, absorption and conversion of food in the fishes *Megalops cyprinoides* and *Ophiocephalus striatus*. *Marine Biology*, 1(1):16–32.

Pandian, T. J. (1967c). Transformation of food in the fish *Megalops cyprinoides*. *Marine Biology*, 1:60–64.

Pandian, T. J., Bhaskaran, R., and Vivekanandan, E. (1977). Effects of PO_2 on surfacing activity and food utilization in the climbing perch, *Anabas scandens*. *Polskie Archiwum Hydrobiologii*, 23:191–201.

Pandian, T. J. and Marian, M. P. (1985). Nitrogen content of food as an index of absorption efficiency in fishes. *Marine Biology*, 85:301–311.

Pandian, T. J. and Marian, M. P. (1986). An indirect procedure for the estimation of assimilation efficiency of aquatic insects. *Freshwater Biology*, 16:93–98.

Park, T. (1962). Beetles, competition and populations. *Science*, 138:1369–1375.

Petchey, O. L., Beckerman, A. P., Riede, J. O., and Warren, P. H. (2008). Size, foraging, and food web structure. *Proceedings of the National Academy of Sciences*, 105(11):4191–4196.

Petchey, O. L., Brose, U., and Rall, B. C. (2010). Predicting the effects of temperature on food web connectance. *Philosophical transactions of the Royal Society B*, 365(1549):2081–2091.

Petchey, O. L., McPhearson, P. T., Casey, T. M., and Morin, P. J. (1999). Environmental warming alters food-web structure and ecosystem function. *Nature*, 402:69–72.

Peters, R. H. (1983). *The ecological implications of body size*. Cambridge University Press.

Pflug, A. and Wolters, V. (2001). Influence of drought and litter age on collembola communities. *European Journal of Soil Biology*, 37:305–308.

Phillipson, J. and Bolton, P. J. (1976). The respiratory metabolism of selected Lumbricidae. *Oecologia*, 22(2):135–152.

Phillipson, J. and Watson, J. (1965). Respiratory metabolism of the terrestrial isopod *Oniscus asellus* L. *Oikos*, 16(1/2):78–87.

Pietikäinen, J., Petterson, M., and Bååth, E. (2005). Comparison of temperature effects on soil respiration and bacterial and fungal growth rates. *FEMS Microbiology Ecology*, 52:49–58.

Pinheiro, J., Bates, D., DebRoy, S., Sarkar, D., and R Development Core Team (2010). *nlme: Linear and Nonlinear Mixed Effects Models*. R package version 3.1-97.

Pobozsny, M. (1988). Die Bedeutung von *Glomeris hexasticha* (Diplopoda) beim Abbau von Detritus-Driften am Ufer des Balaton-Sees. *Opuscula Zoologica Budapest*, XXIII:177–188.

Pobozsny, M. (1992). Fütterungsversuche zum Abbau von Nadelstreu durch Diplopoden. In Meyer, E., Thaler, K., and Schedl, W., editors, *Advances in Myriapodology*, volume Suppl. 10, pages 313–317. Proceedings of the 8th International Congress of Myriapodology, Universitätsverlag Wagner, Innsbruck.

Pobozsny, M. (1997). Vergleichende Untersuchungen des Konsums bei Männchen und Weibchen von Diplopoden. *Opuscula Zoologica Budapest*, XXIX-XXX:117–123.

Polis, G. A. (1994). Food webs, trophic cascades and community structure. *Australian Journal of Ecology*, 19:121–136.

Polis, G. A., Sears, A., Huxel, G. R., Strong, D. R., and Maron, J. (2000). When is a trophic cascade a trophic cascade? *Trends in Ecology & Evolution*, 15:473–476.

Pollierer, M. M., Langel, R., Scheu, S., and Maraun, M. (2009). Compartmentalization of the soil animal food web as indicated by dual analysis of stable isotope ratios (15N/14N and 13C/12C). *Soil Biology & Biochemistry*, 41:1221–1226.

Pollierer, M. M., Scheu, S., and Haubert, D. (2010). Taking it to the next level: Trophic transfer of marker fatty acids from basal resource to predators. *Soil Biology & Biochemistry*, 42:919–925.

Poloczanska, E. S., Hawkins, S. J., Southward, A. J., and Burrows, M. T. (2008). Modeling the response of populations of competing species to climate change. *Ecology*, 89(11):3138–3149.

Ponsard, S. and Arditi, R. (2000). What can stable isotopes (δ15N and δ13C) tell about the food web of soil macro-invertebrates? *Ecology*, 81(3):852–864.

Post, D. M. (2002). The long and short of food-chain length. *Trends in Ecology & Evolution*, 17(6):269–277.

Prestwich, K. N. (1977). The energetics of web-building in spiders. *Comparative Biochemistry and Physiology Part A: Physiology*, 57(3):321–326.

Prus, T. (1971). The assimilation efficiency of *Asellus aquaticus* L. (Crustacea, Isopoda). *Freshwater Biology*, 1(3):287–305.

R Development Core Team (2010). *R: A language and environment for statistical computing*. R Foundation for statistical computing, Vienna, Austria. ISBN 3-900051-07-0.

Rall, B. C., Brose, U., Hartvig, M., Kalinkat, G., Schwarzmüller, F., Vucic-Pestic, O., and Petchey, O. L. (2012). Universal temperature and body-mass scaling of feeding rates. *Philosophical transactions of the Royal Society B*, 367:2923–2934.

Rall, B. C., Guill, C., and Brose, U. (2008). Food-web connectance and predator interference dampen the paradox of enrichment. *Oikos*, 117(2):202–213.

Rall, B. C., Kalinkat, G., Ott, D., Vucic-Pestic, O., and Brose, U. (2011). Taxonomic versus allometric constraints on non-linear interaction strengths. *Oikos*, 120(4):483–492.

Rall, B. C., Vucic-Pestic, O., Ehnes, R. B., Emmerson, M., and Brose, U. (2010). Temperature, predator-prey interaction strength and population stability. *Global Change Biology*, 16:2145–2157.

Reichle, D. E. (1968). Relation of body size to food intake, oxygen comnsumption, and trace element metabolism in forest floor arthropods. *Ecology*, 49(3):538–542.

Richardson, A. M. M. (1975). Food, feeding rates and assimilation in the land snail *Cepaea nemoralis* L. *Oecologia*, 19:59–70.

Richman, S. (1958). The transformation of energy by *Daphnia pulex*. *Ecological Monographs*, 28(3):273–291.

Riede, J. O., Brose, U., Ebenman, B., Jacob, U., Thompson, R., Townsend, C. R., and Jonsson, T. (2011). Stepping in elton's footprints: a general scaling model for body masses and trophic levels across ecosystems. *Ecology Letters*, 14(2):169–178.

Riede, J. O., Rall, B. C., Banasek-Richter, C., Navarrete, S. A., Wieters, E. A., Emmerson, M. C., Jacob, U., and Brose, U. (2010). Scaling of food-web properties with diversity and complexity across ecosystems. *Advances in Ecological Research*, 42:139–170.

Ritz, C. and Streibig, J. C. (2008). *Nonlinear Regression with R*. Springer Science + Business Media, New York, NY.

Rogers, D. (1972). Random search and insect population models. *Journal of Animal Ecology*, 41:369–383.

Royama, T. (1971). A comparative study of models for predation and parasitism. *Researches on Population Ecology*, 13(Suppl. 1):1–91.

Rubner, M. (1883). Über den Einfluss der Körpergröße auf Stoff- und Kraftwechsel. *Zeitschrift für Biologie*, 9:535–562.

Ruess, L. and Chamberlain, P. M. (2010). The fat that matters: Soil food web analysis using fatty acids and their carbon stable isotope signature. *Soil Biology & Biochemistry*, 42:1898–1910.

Saito, S. (1969). Energetics of isopod populations in a forest of central Japan. *Researches on Population Ecology*, 11:229–258.

Sampath, K. and Pandian, T. J. (1980). Effects of density on food utilization and surfacing behaviour in the obligatory air-breathing fish *Channa striatus*. *Hydrobiologia*, 68:113–117.

Sanderson, M. G., Hemming, D. L., and Betts, R. A. (2011). Regional temperature and precipitation changes under high-end (≥ 4° C) global warming. *Philosophical transactions of the Royal Society A*, 369:85–98.

Sardans, J., Rivas-Ubach, A., and Peñuelas, J. (2012). The C:N:P stoichiometry of organisms and ecosystems in a changing world: A review and perspectives. *Perspectives in Plant Ecology, Evolution and Systematics*, 14:33–47.

Saroja, K. (1959). Studies on the oxygen consumption in tropical poikilotherms. *Proceedings: Plant Sciences*, 49(3):183–193.

Savage, V. M., Gillooly, J. F., Woodruff, W. H., West, G. B., Allen, A. P., and Enquist, B. J. (2004). The predominance of quarter-power scaling in biology. *Functional Ecology*, 18(2):257–282.

Schaefer, A. L., Young, B. A., and Chimwano, A. M. (1978). Ration digestion and retention times of digesta in domestic cattle (*Bos taurus*), American bison (*Bison bison*), and Tibetan yak (*Bos grunniens*). *Canadian Journal of Zoology*, 56(11):2355–2358. PMID: 751705.

Scharf, I., Filin, I., and Ovadia, O. (2008). An experimental design and a statistical analysis separating interference from exploitation competition. *Population Ecology*, 50:319–324.

Scharroba, A., Dibbern, D., Hünninghaus, M., Kramer, S., Moll, J., Butenschoen, O., Bonkowski, M., Buscot, F., Kandeler, E., Koller, R., Krüger, D., Lueders, T., Scheu, S., and Ruess, L. (2012). Effects of resource availability and quality on the structure of the micro-food web of an arable soil across depth. *Soil Biology & Biochemistry*, 50:1–11.

Scheu, S. (1992). Automated measurement of the respiratory response of soil microcompartments - active microbial biomass in earthworm faeces. *Soil Biology & Biochemistry*, 24:1113–1118.

Scheu, S. and Falca, M. (2000). The soil food web of two beech forests (*Fagus sylvatica*) of contrasting humus type: stable isotope analysis of a macro- and a mesofauna-dominated community. *Oecologia*, 123:285–296.

Schmitz, A. (2004). Metabolic rates during rest and activity in differently tracheated spiders (Arachnida, Araneae): *Pardosa lugubris* (Lycosidae) and *Marpissa muscosa* (Salticidae). *Journal of Comparative Physiology B*, 174(7):519–526.

Schmitz, A. and Perry, S. F. (2001). Bimodal breathing in jumping spiders: morphometric partitioning of the lungs and tracheae in *Salticus scenicus* (Arachnida, Araneae, Salticidae). *The Journal of Experimental Biology*, 204(24):4321–4334.

Schmitz, O. J., Hambäck, P. A., and Beckerman, A. P. (2000). Trophic cascades in terrestial systems: a review of the effects of carnivore removals on plants. *The American Naturalist*, 155:141–153.

Schneider, K., Migge, S., Norton, R. A., Scheu, S., Langel, R., Reineking, A., and Maraun, M. (2004). Trophic niche differentiation in soil microarthropods (Oribatida, Acari): evidence from stable isotope ratios (15N/14N). *Soil Biology & Biochemistry*, 36:1769–1774.

Schneider, T., Keiblinger, K., Schmid, E., Sterflinger-Gleixner, K., Ellersdorfer, G., Roschitzki, B., Richter, A., Eberl, L., Zechenmeister-Boltenstern, S., and Riedel, K. (2012). Who is who in litter decomposition? Metaproteomics reveals major microbial players and their biogeochemical functions. *The ISME Journal*, pages 1–14.

Scholander, P. F., Flagg, W., Walters, V., and Irving, L. (1953). Climatic adaptation in arctic and tropical poikilotherms. *Physiological Zoology*, 26(1):67–92.

Schröter, D., Wolters, V., and de Ruiter, P. C. (2003). C and N mineralisation in the decomposer food webs of a European forest transect. *Oikos*, 102:294–308.

Schultz, T. D., Quinlan, M. C., and Hadley, N. F. (1992). Preferred body temperature, metabolic physiology, and water balance of adult *Cicindela longilabris*: A comparison of populations from boreal habitats and climatic refugia. *Physiological Zoology*, 65(1):226–242.

Sentis, A., Hemptinne, J.-L., and Brodeur, J. (2012). Using functional response modeling to investigate the effect of temperature on predator feeding rate and energetic efficiency. *Oecologia*, 169(4):1117–1125.

Sharma, P. C. and Pant, M. C. (1984). An energy budget for *Simocephalus vetulus* (O. F. Muller) (Crustacea: Cladocera). *Hydrobiologia*, 111:37–42.

Shurin, J. and Seabloom, E. (2005). The strength of trophic cascades across ecosystems: predictions from allometry and energetics. *Journal of Animal Ecology*, 74:1029–1038.

Shurin, J. B., Borer, E. T., Seabloom, E. W., Anderson, K., Blanchette, C. A., Broitman, B., Cooper, S. D., and Halpern, B. S. (2002). A cross-ecosystem comparison of the strength of trophic cascades. *Ecology Letters*, 5:785–791.

Shurin, J. B., Clasen, J. L., Greig, H. S., Kratina, P., and Thompson, P. L. (2012). Warming shifts top-down and bottom-up control of pond food web structure and function. *Philosophical transactions of the Royal Society B*, 367:3008–3017.

Shurin, J. B., Gruner, D. S., and Hillebrand, H. (2006). All wet or dried up? Real differences between aquatic and terrestrial food webs. *Proceedings of the Royal Society B*, 273:1–9.

Sibul, I., Kuusik, A., and Voolma, K. (2004). Monitoring of gas exchange cycles and ventilatory movements in the pine weevil *Hylobius abietis*: respiratory failures evoked by a botanical insecticide. *Entomologia Experimentalis et Applicata*, 110:173–179.

Singh, C. S. and Bhanot, K. K. (1970). Nutritive food value of algal feeds for common carp *Cyprinus carpio* (Linnaeus). *Inland Fisheries Society of India*, 2:121–127.

Sint, D., Raso, L., Kaufmann, R., and Traugott, M. (2011). Optimizing methods for pcr-based analysis of predation. *Molecular Ecology Resources*, 11(5):795–801.

Skalski, G. T. and Gilliam, J. F. (2001). Functional responses with predator interference: viable alternatives to the holling type II model. *Ecology*, 82:3083–3092.

Sokal, R. R. and Rohlf, F. J. (1995). *Biometry: The principles and practice of statistics in biological research.* W.H. Freeman and company, New York, 3. edition.

Soldatova, I. N., Tsikhon-Lukanina, Y. A., Nikolayeva, G. G., and Lukasheva, T. A. (1969). The conversion of food energy by marine crustaceans. *Oceanology*, 9:875–882.

Solomon, D. J. and Brafield, A. E. (1972). The energetics of feeding, metabolism and growth of perch (*Perca fluviatilis* l.). *Journal of Animal Ecology*, 41:699–718.

Soo Hoo, C. F. and Fraenkel, G. (1966). The consumption, digestion, and utilization of food plants by a polyphagous insect, *Prodenia eridania* (Cramer). *Journal of Insect Physiology*, 12(6):711–730.

Sparling, G. P. (1985). *Soil Organic Matter and Biological Activity, Developments in Plant and Soil Sciences*, chapter The Soil biomass, pages 223–262. Nijhoff, The Hague.

Sprung, M. (1984). Physiological energetics of mussel larvae (*Mytilus edulis*). II. Food uptake. *Marine Ecology - Progress Series*, 17:295–305.

Staley, J. T., Hodgson, C. J., Mortimer, S. R., Morecroft, M. D., Masters, G. J., Brown, V. K., and Taylor, M. E. (2007). Effects of summer rainfall manipulations on the abundance and vertical distribution of herbivorous soil macro-invertebrates. *European Journal of Soil Biology*, 43:189–198.

Staniczenko, P. P. A., Lewis, O. T., Jones, N. S., and Reed-Tsochas, F. (2010). Structural dynamics and robustness of food webs. *Ecology Letters*, 13(7):891–899.

Stanley, J. G. (1974). Energy balance of white amur fed *Egeria*. *Hyacinth Control Journal*, 12:62–66.

Staudacher, K., Wallinger, C., Schallhart, N., and Traugott, M. (2010). Detecting ingested plant DNA in soil-living insect larvae. *Soil Biology & Biochemistry*, in press:xxx.

Steigen, A. L. (1975). Energetics in a population of *Pardosa palustris* L. (Araneae, Lycosidae) on Hardangervidda. *Ecological Studies*, 17:129–144.

Strømme, J. A., Ngari, T. W., and Zachariassen, K. E. (1986). Physiological adaptations in Coleoptera on Spitsbergen. *Polar Research*, 4(2):199–204.

Suemoto, T., Kawai, K., and Imabayashi, H. (2004). A comparison of desiccation tolerance among 12 species of chironomid larvae. *Hydrobiologia*, 515:107–114.

Sustr, V. and Simek, M. (2009). Methane release from millipedes and other soil invertebrates in central europe. *Soil Biology & Biochemistry*, 41:1684–1688.

Swift, M. J., Heal, O. W., and Anderson, J. M. (1979). *Decomposition in terrestrial ecosystems*. University of California Press.

Tajovsky, K. (1992). Feeding biology of the millipede *Glomeris hexasticha*. In Meyer, E., Thaler, K., and Schedl, W., editors, *Advances in Myriapodology*, volume Suppl. 10, pages 305–311. Proceedings of the 8th International Congress of Myriapodology, Universitätsverlag Wagner, Innsbruck.

Tanabe, K. and Namba, T. (2005). Omnivory creates chaos in simple food web models. *Ecology*, 86(12):3411–3414.

Tanaka, K., Ito, Y., and Saito, T. (1985). Reduced respiratory quotient by starvation in a wolf spider, *Pardosa astrigera* (L. Koch). *Comparative Biochemistry and Physiology A: Physiology*, 80(3):415–418.

Tenore, K. R. and Dunstan, W. M. (1973). Comparison of feeding and biodeposition of three bivalves at different food levels. *Marine Biology*, 21:190–195.

Thomas, J. O. M. (1979). An energy budget for a woodland population of oribatid mites. *Pedobiologia*, 19:346–378.

Thompson, D. J. (1978). Towards a realistic predator-prey model: The effect of temperature on the functional response and life history of larvae of the damselfly, *Ishnura elegans*. *Journal of Animal Ecology*, 47:757–767.

Thurling, D. J. (1980). Metabolic rate and life stage of the mites *Tetranychus cinnabarinus* boisd. (Prostigmata) and *Phytoseiulus persimilis* A-H. (Mesostigmata). *Oecologia*, 46(3):391–396.

Tilman, D. (1997). *Plant Ecology*, chapter 8: Mechanisms of Plant competition, pages 239–261. Blackwell Science, Oxford, England.

Tokeshi, M. (1999). *Species coexistence: Ecological and evolutionary perspectives*. Blackwell Science Ltd.

Tombes, A. S. (1964). Respiratory and compositional study on the aestivating insect, *Hypera postica* (Gyll.) (Curculionidae). *Journal of Insect Physiology*, 10(6):997–1003.

Traugott, M., Pazmandi, C., Kaufmann, R., and Juen, A. (2007). Evaluating 15N/14N and 13C/12C isotope ratio analysis to investigate trophic relationships of elaterid larvae (Coleoptera: Elateridae). *Soil Biology & Biochemistry*, 39:1023–1030.

Traugott, M., Schallhart, N., Kaufmann, R., and Juen, A. (2008). The feeding ecology of elaterid larvae in central european arable land: New perspectives based on naturally occurring stable isotopes. *Soil Biology & Biochemistry*, 40:342–349.

Trnka, M., Eitzinger, J., Semeradova, D., Hlavinka, P., Balek, J., Dubrovsky, M., Kubu, G., Stepanek, P., Thaler, S., Mozny, M., and Zdenek, Z. (2011a). Expected changes in agroclimatic conditions in Central Europe. *Climate Change*, 108:261–289. T11.

Trnka, M., Olesen, J. E., Kersebaum, K. C., Skjelvåg, A. O., Eitzinger, J., Seguin, B., Peltonen-Sainio, P., Rötter, R., Iglesias, A., Orlandini, S., Dubrovskz, M., Hlavinka, P., Balek, J., Eckersten, H., Cloppet, E., Calanca, P., Gobin, A., Vucetic, V., Nejedlik, P., Kumar, S., Lalic, B., Mestre, A., Rossi, F., Kozyra, J., Alexandrov, V., Semeradova, D., and Zalud, Z. (2011b). Agroclimatic conditions in Europe under climate change. *Global Change Biology*, 17:2298–2318. T13.

Troyer, K. (1984). Diet selection and digestion in *Iguana iguana*: the importance of age and nutrient requirements. *Oecologia*, 61(2):201–207.

Tsiafouli, M. A., Kallimanis, A. S., Katana, E., Stamou, G. P., and Sgardelis, S. P. (2005). Responses of soil microarthropods to experimental short-term manipulations of soil moisture. *Applied Soil Ecology*, 29:17–26.

van Hook, R. I. (1971). Energy and nutrient dynamics of spider and orthopteran populations in a grassland ecosystem. *Ecological Monographs*, 41(1):1–26.

Vandermeer, J. (2006). Omnivory and the stability of food webs. *Journal of Theoretical Biology*, 238:497–504.

Vasseur, D. A. and McCann, K. S. (2005). A mechanistic approach for modeling temperature-dependent consumer-resource dynamics. *The American Naturalist*, 166(2):184–198.

Verhoef, H. A. and Witteveen, J. (1980). Water balance in collembola and its relation to habitat selection; cuticular water loss and water uptake. *Journal of Insect Physiology*, 26:201–208.

Verity, P. G. (1985). Grazing, respiration, excretion, and growth rates of tintinnids. *Limnology and Oceanography*, 30:1268–1282.

Visser, M. E., Holleman, L. J. M., and Gienapp, P. (2006). Shifts in caterpillar biomass phenology due to climate change and its impact on the breeding biology of an insectivorous bird. *Oecologia*, 147:164–172.

Vivekanandan, E. (1976). Effects of feeding on the swimming activity and growth of *Ophiocephalus striatus*. *Journal of Fish Biology*, 8:321–330.

Vivekanandan, E. (1977). Surfacing activity and food utilization in the obligatory air-breathing fish *Ophiocephalus striatus* as a function of body weight. *Hydrobiologia*, 55:99–112.

Vivekanandan, E., Pandian, T. J., and Visalam, N. (1977). Effects of algal and animal food combinations on surfacing activity and food utilization in the climbing perch, *Anabas scandens*. *Polskie Archiwum Hydrobiologii*, 24:553–562.

Voigt, W., Perner, J., Davis, A., Eggers, T., Schumacher, J., Bährmann, R., Fabian, B., Heinrich, W., Köhler, G., Lichter, D., Marstaller, R., and Sander, F. W. (2003).

Trophic levels are differentially sensitive to climate. *Ecology*, 84(9):2444–2453.

Vucic-Pestic, O., Birkhofer, K., Rall, B. C., Scheu, S., and Brose, U. (2010a). Habitat structure and prey aggregation determine the functional response in a soil predator-prey interaction. *Pedobiologia*, 53:307–312.

Vucic-Pestic, O., Ehnes, R. B., Rall, B. C., and Brose, U. (2011). Warming up the system: higher predator feeding rates but lower energetic efficiencies. *Global Change Biology*, 17(3):1301–1310.

Vucic-Pestic, O., Rall, B. C., Kalinkat, G., and Brose, U. (2010b). Allometric functional response model: body masses constrain interaction strengths. *Journal of Animal Ecology*, 79:249–256.

Waldbauer, G. P. (1968). The consumption and utilization of food by insects. *Advances in Insect Physiology*, 5:229–288.

Walkey, M. and Meakings, R. H. (1969). Energy transformation in a host-parasite system. *Parasitology*, 59:1–26.

Wallace, J. C. (1973). Observations on the relationship between the food consumption and metabolic rate on *Blennius pholis* L. *Comparative Biochemistry and Physiology*, 45 A:293–306.

Walther, G. R., Post, E., Convey, P., Menzel, A., Parmesan, C., Beebee, T. J. C., Fromentin, J. M., Hoegh-Guldberg, O., and Bairlein, F. (2002). Ecological responses to recent climate change. *Nature*, 416(6879):389–395.

Wang, X. Y., Sun, B., Mao, J. D., Sui, Y. Y., and Cao, X. Y. (2012). Structural convergence of maize and wheat straw during two-year decomposition under different climate conditions. *Environmental Science & Technology*, 46(13):7159–7165.

Weidemann, G. (1971). Food and energy turnover of predatory arthropods of the soil surface. *Ecological Studies*, 2:110–118.

West, G. B., Brown, J. H., and Enquist, B. J. (1997). A general model for the origin of allometric scaling laws in biology. *Science*, 276:122–126.

White, C. R., Cassey, P., and Blackburn, T. M. (2007). Allometric exponents do not support a universal metabolic allometry. *Ecology*, 88(2):315–323.

Wieser, W. (1965). Untersuchungen über die Ernährung und denn Gesamtstoffwechsel von *Porcellio scaber* (Crustacea: Isopoda). *Pedobiologia*, 5:304–331.

Williams, R. J. and Martinez, N. D. (2000). Simple rules yield complex food webs. *Nature*, 404:180–183.

Williams, R. J. and Martinez, N. D. (2004). Stabilization of chaotic and non-permanent food-web dynamics. *European Physical Journal B*, 38(2):297–303.

Winder, M. and Schindler, D. E. (2004). Climate change uncouples trophic interactions in an aquatic ecosystem. *Ecology*, 85(8):2100–2106.

Wolters, V. (2001). Biodiversity of soil animals and its function. *European Journal of Soil Biology*, 37:221–227.

Woodward, G., Ebenman, B., Emmerson, M., Montoya, J. M., Olesen, J. M., Valido, A., and Warren, P. H. (2005). Body size in ecological networks. *Trends in Ecology & Evolution*, 20(7):402–409.

Xia, J. Y., Rabbinge, R., and van der Werf, W. (2003). Multistage functional responses in a ladybeetle-aphid system: Scaling up from the laboratory to the field. *Quantitative Ecology*, 32(1):151–162.

Yan, J. (2010). *som: Self-Organizing Map.*

Yvon-Durocher, G., Montoya, J. M., Trimmer, M., and Woodward, G. (2011a). Warming alters the size spectrum and shifts the distribution of biomass in freshwater ecosystems. *Global Change Biology*, 17:1681–1694.

Yvon-Durocher, G., Reiss, J., Blanchard, J., Ebenman, B., Perkins, D. M., Reuman, D. C., Thierry, A., Woodward, G., and Petchey, O. L. (2011b). Across ecosystem comparisons of size structure: methods, approaches and prospects. *Oikos*, 120:550–563.

Zachariassen, K. E., Andersen, J., Kamau, J. M. Z., and Maloiy, G. M. O. (1988). Water loss in insects from arid and humid habitats in East Africa. *Acta Entomologica Bohemoslovaca*, 85:81–93.

Zelles, L. (1999). Fatty acid patterns of phospholipids and lipopolysaccharides in the characterisation of microbial communities in soil: a review. *Biology and Fertility of Soils*, 29:111–129.

Zhang, X., Zhang, Z.-Q., Ji, J., and Lin, J. (1999). Predation of *Amblyseius longispinosus* (Acari: Phytoseiidae) on *Schizotetranychus nanjingensis* (Acari: Tetranychidae), a spider mite injurious to bamboo in Fujian, China. *Systematic and Applied Acarology*, 4:63–68.

Zhang, X., Zhang, Z.-Q., Lin, J., and Liu, Q. (1998). Predation of *Amblyseius longispinosus* (Acari: Phytoseiidae) on *Aponychus corpuzae* (Acari: Tetranychidae). *Systematic and Applied Acarology*, 3:53–58.

Appendix 1: Respiration rates

Table 1.: Dataset on respiration rates. Weight is given as wet weight in mg. The data are also included in other metastudies: [1] Ehnes et al. (2011), [2] Meehan (2006), [3] Chown et al. (2007), [4] Caruso et al. (2010). Abbreviations: CT: Consumer type, C: carnivores, H: herbivores, D: detritivores, Temp.:Temperature [°C].

No.	Class	Order/Family	Species	CT	J/h	Weight	Temp.	Original study	
1	Insecta	Coleoptera	*Bembidion* sp.	C	0.006412	2.444	10	Ehnes et al. (2011)	[1]
2	Insecta	Coleoptera	*Bembidion* sp.	C	0.009326	2.306	10	Ehnes et al. (2011)	[1]
3	Insecta	Coleoptera	*Bembidion* sp.	C	0.009326	2.508	10	Ehnes et al. (2011)	[1]
4	Insecta	Coleoptera	*Bembidion sp.*	C	0.006995	2.578	10	Ehnes et al. (2011)	[1]
5	Insecta	Coleoptera	*Bembidion sp.*	C	0.016904	2.636	10	Ehnes et al. (2011)	[1]
6	Insecta	Coleoptera	*Bembidion sp.*	C	0.012241	2.662	10	Ehnes et al. (2011)	[1]
7	Insecta	Coleoptera	*Bembidion sp.*	C	0.003497	2.348	10	Ehnes et al. (2011)	[1]
8	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.102008	156.64	5	Ehnes et al. (2011)	[1]
9	Insecta	Coleoptera	*Poecilus versicolor*	C	0.104922	83.94	5	Ehnes et al. (2011)	[1]
10	Insecta	Coleoptera	*Poecilus versicolor*	C	0.128238	76.9	5	Ehnes et al. (2011)	[1]
11	Insecta	Coleoptera	*Poecilus versicolor*	C	0.139896	85.01	5	Ehnes et al. (2011)	[1]
12	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.128238	113.38	5	Ehnes et al. (2011)	[1]
13	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.131153	131.5	5	Ehnes et al. (2011)	[1]
14	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.189443	175.15	5	Ehnes et al. (2011)	[1]
15	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.1807	104.17	5	Ehnes et al. (2011)	[1]
16	Insecta	Coleoptera	*Poecilus versicolor*	C	0.183614	80.95	5	Ehnes et al. (2011)	[1]
17	Insecta	Coleoptera	*Poecilus versicolor*	C	0.087435	80.47	5	Ehnes et al. (2011)	[1]
18	Insecta	Coleoptera	*Calathus fuscipes*	C	0.110751	66.1	5	Ehnes et al. (2011)	[1]
19	Insecta	Coleoptera	*Calathus fuscipes*	C	0.064119	68.98	5	Ehnes et al. (2011)	[1]
20	Insecta	Coleoptera	*Nebria brevicollis*	C	0.221503	50.48	5	Ehnes et al. (2011)	[1]
21	Insecta	Coleoptera	*Calathus fuscipes*	C	0.087435	63.59	5	Ehnes et al. (2011)	[1]
22	Insecta	Coleoptera	*Nebria brevicollis*	C	0.241904	72.21	5	Ehnes et al. (2011)	[1]
23	Insecta	Coleoptera	*Nebria brevicollis*	C	0.154469	55.49	5	Ehnes et al. (2011)	[1]
24	Insecta	Coleoptera	*Nebria brevicollis*	C	0.1807	50.5	5	Ehnes et al. (2011)	[1]
25	Insecta	Coleoptera	*Nebria brevicollis*	C	0.186529	59.2	5	Ehnes et al. (2011)	[1]
26	Insecta	Coleoptera	*Nebria brevicollis*	C	0.154469	45.26	5	Ehnes et al. (2011)	[1]
27	Insecta	Coleoptera	*Nebria brevicollis*	C	0.102008	43.7	5	Ehnes et al. (2011)	[1]
28	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.154469	116.79	5	Ehnes et al. (2011)	[1]
29	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.142811	194.7	5	Ehnes et al. (2011)	[1]
30	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.163213	95.81	5	Ehnes et al. (2011)	[1]
31	Insecta	Coleoptera	*Bembidion sp.*	C	0.005246	2.85	5	Ehnes et al. (2011)	[1]
32	Insecta	Coleoptera	*Bembidion sp.*	C	0.005246	2.87	5	Ehnes et al. (2011)	[1]
33	Insecta	Coleoptera	*Nebria brevicollis*	C	0.102008	43.25	5	Ehnes et al. (2011)	[1]
34	Insecta	Coleoptera	*Nebria brevicollis*	C	0.177785	45.61	5	Ehnes et al. (2011)	[1]
35	Insecta	Coleoptera	*Nebria brevicollis*	C	0.273964	68.01	5	Ehnes et al. (2011)	[1]
36	Insecta	Coleoptera	*Nebria brevicollis*	C	0.273964	55.24	5	Ehnes et al. (2011)	[1]
37	Insecta	Coleoptera	*Nebria brevicollis*	C	0.306023	48.27	5	Ehnes et al. (2011)	[1]
38	Insecta	Coleoptera	*Nebria brevicollis*	C	0.26522	70.61	5	Ehnes et al. (2011)	[1]
39	Insecta	Coleoptera	*Nebria brevicollis*	C	0.151554	45.52	5	Ehnes et al. (2011)	[1]
40	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.192358	59.49	5	Ehnes et al. (2011)	[1]
41	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.17	171.66	5	Ehnes et al. (2011)	[1]
42	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.2	162.43	5	Ehnes et al. (2011)	[1]

43	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.19	169.72	5	Ehnes et al. (2011)	[1]
44	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.2	148.92	5	Ehnes et al. (2011)	[1]
45	Insecta	Coleoptera	*Harpalus sp.*	C	0.11	102.6	5	Ehnes et al. (2011)	[1]
46	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.09	136.5	5	Ehnes et al. (2011)	[1]
47	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.14	116.31	5	Ehnes et al. (2011)	[1]
48	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.07	121.06	5	Ehnes et al. (2011)	[1]
49	Insecta	Coleoptera	*Harpalus sp.*	C	0.13	94.62	5	Ehnes et al. (2011)	[1]
50	Insecta	Coleoptera	*Platynus dorsalis*	C	0.034974	12.16	5	Ehnes et al. (2011)	[1]
51	Insecta	Coleoptera	*Platynus dorsalis*	C	0.046632	11.9	5	Ehnes et al. (2011)	[1]
52	Insecta	Coleoptera	*Platynus dorsalis*	C	0.029145	13.98	5	Ehnes et al. (2011)	[1]
53	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.157383	203.87	5	Ehnes et al. (2011)	[1]
54	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.169042	136.01	5	Ehnes et al. (2011)	[1]
55	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.186529	153.55	5	Ehnes et al. (2011)	[1]
56	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.128238	114.94	5	Ehnes et al. (2011)	[1]
57	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.093264	189.31	5	Ehnes et al. (2011)	[1]
58	Insecta	Coleoptera	*Nebria brevicollis*	C	0.078692	36.44	5	Ehnes et al. (2011)	[1]
59	Insecta	Coleoptera	*Nebria brevicollis*	C	0.09035	40.7	5	Ehnes et al. (2011)	[1]
60	Insecta	Coleoptera	*Nebria brevicollis*	C	0.145725	45.8	5	Ehnes et al. (2011)	[1]
61	Insecta	Coleoptera	*Nebria brevicollis*	C	0.128238	57	5	Ehnes et al. (2011)	[1]
62	Insecta	Coleoptera	*Nebria brevicollis*	C	0.169042	38.97	5	Ehnes et al. (2011)	[1]
63	Insecta	Coleoptera	*Bembidion sp.*	C	0.006412	2.218	5	Ehnes et al. (2011)	[1]
64	Insecta	Coleoptera	*Bembidion sp.*	C	0.004372	2.23	5	Ehnes et al. (2011)	[1]
65	Insecta	Coleoptera	*Bembidion sp.*	C	0.010201	2.24	5	Ehnes et al. (2011)	[1]
66	Insecta	Coleoptera	*Platynus dorsalis*	C	0.008744	16.12	5	Ehnes et al. (2011)	[1]
67	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.064119	14.4	5	Ehnes et al. (2011)	[1]
68	Insecta	Coleoptera	*Platynus dorsalis*	C	0.002915	11.66	5	Ehnes et al. (2011)	[1]
69	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.029145	15.46	5	Ehnes et al. (2011)	[1]
70	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.151554	132.76	5	Ehnes et al. (2011)	[1]
71	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.055376	11.76	5	Ehnes et al. (2011)	[1]
72	Insecta	Coleoptera	*Bembidion sp.*	C	0.006995	2.436	5	Ehnes et al. (2011)	[1]
73	Insecta	Coleoptera	*Bembidion sp.*	C	0.005246	2.435	5	Ehnes et al. (2011)	[1]
74	Insecta	Coleoptera	*Platynus dorsalis*	C	0.052461	9.29	5	Ehnes et al. (2011)	[1]
75	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.189443	127	5	Ehnes et al. (2011)	[1]
76	Insecta	Coleoptera	*Bembidion sp.*	C	0.002915	2.532	5	Ehnes et al. (2011)	[1]
77	Insecta	Coleoptera	*Bembidion sp.*	C	0.004372	2.196	5	Ehnes et al. (2011)	[1]
78	Insecta	Coleoptera	*Calathus fuscipes*	C	0.096179	54.87	5	Ehnes et al. (2011)	[1]
79	Insecta	Coleoptera	*Calathus fuscipes*	C	0.107837	70.43	5	Ehnes et al. (2011)	[1]
80	Insecta	Coleoptera	*Loricera pilicornis*	C	0.064119	16.29	5	Ehnes et al. (2011)	[1]
81	Insecta	Coleoptera	*Poecilus versicolor*	C	0.154469	94.63	5	Ehnes et al. (2011)	[1]
82	Insecta	Coleoptera	*Calathus fuscipes*	C	0.358485	62.41	5	Ehnes et al. (2011)	[1]
83	Insecta	Coleoptera	*Loricera pilicornis*	C	0.037889	18.15	5	Ehnes et al. (2011)	[1]
84	Insecta	Coleoptera	*Loricera pilicornis*	C	0.046632	14.72	5	Ehnes et al. (2011)	[1]
85	Insecta	Coleoptera	*Poecilus versicolor*	C	0.119495	79.76	5	Ehnes et al. (2011)	[1]
86	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.166127	60.46	5	Ehnes et al. (2011)	[1]
87	Insecta	Coleoptera	*Calathus fuscipes*	C	0.160298	63.21	5	Ehnes et al. (2011)	[1]
88	Insecta	Coleoptera	*Poecilus versicolor*	C	0.084521	76.87	5	Ehnes et al. (2011)	[1]
89	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.072863	24.12	5	Ehnes et al. (2011)	[1]
90	Insecta	Coleoptera	*Calathus fuscipes*	C	0.14864	71.52	5	Ehnes et al. (2011)	[1]
91	Insecta	Coleoptera	*Loricera pilicornis*	C	0.052461	15.25	5	Ehnes et al. (2011)	[1]

92	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.011658	15.46	5	Ehnes et al. (2011)	[1]
93	Insecta	Coleoptera	*Calathus fuscipes*	C	0.276878	75.14	5	Ehnes et al. (2011)	[1]
94	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.052461	23.33	5	Ehnes et al. (2011)	[1]
95	Insecta	Coleoptera	*Poecilus versicolor*	C	0.075777	87.67	5	Ehnes et al. (2011)	[1]
96	Insecta	Coleoptera	*Platynus dorsalis*	C	0.023316	15.31	5	Ehnes et al. (2011)	[1]
97	Insecta	Coleoptera	*Platynus dorsalis*	C	0.005829	16.68	5	Ehnes et al. (2011)	[1]
98	Insecta	Coleoptera	*Platynus dorsalis*	C	0.029145	18.14	5	Ehnes et al. (2011)	[1]
99	Insecta	Coleoptera	*Platynus dorsalis*	C	0.017487	15.38	5	Ehnes et al. (2011)	[1]
100	Insecta	Coleoptera	*Platynus dorsalis*	C	0.034974	18.45	5	Ehnes et al. (2011)	[1]
101	Insecta	Coleoptera	*Calathus fuscipes*	C	0.163213	56	10	Ehnes et al. (2011)	[1]
102	Insecta	Coleoptera	*Calathus fuscipes*	C	0.020402	52.99	10	Ehnes et al. (2011)	[1]
103	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.26522	141.45	10	Ehnes et al. (2011)	[1]
104	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.215674	166.96	10	Ehnes et al. (2011)	[1]
105	Insecta	Coleoptera	*Calathus fuscipes*	C	0.332254	79.33	10	Ehnes et al. (2011)	[1]
106	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.326425	160.39	10	Ehnes et al. (2011)	[1]
107	Insecta	Coleoptera	*Bembidion sp.*	C	0.013698	2.321	10	Ehnes et al. (2011)	[1]
108	Insecta	Coleoptera	*Bembidion sp.*	C	0.010492	2.161	10	Ehnes et al. (2011)	[1]
109	Insecta	Coleoptera	*Platynus dorsalis*	C	0.081606	13.87	10	Ehnes et al. (2011)	[1]
110	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.262306	137.74	10	Ehnes et al. (2011)	[1]
111	Insecta	Coleoptera	*Calathus fuscipes*	C	0.215674	69.71	10	Ehnes et al. (2011)	[1]
112	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.104922	18.48	10	Ehnes et al. (2011)	[1]
113	Insecta	Coleoptera	*Calathus fuscipes*	C	0.1807	67.35	10	Ehnes et al. (2011)	[1]
114	Insecta	Coleoptera	*Bembidion sp.*	C	0.012824	2.156	10	Ehnes et al. (2011)	[1]
115	Insecta	Coleoptera	*Bembidion sp.*	C	0.009909	2.248	10	Ehnes et al. (2011)	[1]
116	Insecta	Coleoptera	*Bembidion sp.*	C	0.010492	2.392	10	Ehnes et al. (2011)	[1]
117	Insecta	Coleoptera	*Calathus fuscipes*	C	0.47215	58.85	10	Ehnes et al. (2011)	[1]
118	Insecta	Coleoptera	*Bembidion sp.*	C	0.011075	2.378	10	Ehnes et al. (2011)	[1]
119	Insecta	Coleoptera	*Bembidion sp.*	C	0.008744	2.102	10	Ehnes et al. (2011)	[1]
120	Insecta	Coleoptera	*Bembidion sp.*	C	0.017196	2.077	10	Ehnes et al. (2011)	[1]
121	Insecta	Coleoptera	*Nebria brevicollis*	C	0.201101	70.86	10	Ehnes et al. (2011)	[1]
122	Insecta	Coleoptera	*Calathus fuscipes*	C	0.160298	51.52	10	Ehnes et al. (2011)	[1]
123	Insecta	Coleoptera	*Nebria brevicollis*	C	0.577073	65.29	10	Ehnes et al. (2011)	[1]
124	Insecta	Coleoptera	*Nebria brevicollis*	C	0.195272	66.41	10	Ehnes et al. (2011)	[1]
125	Insecta	Coleoptera	*Nebria brevicollis*	C	0.1807	73.19	10	Ehnes et al. (2011)	[1]
126	Insecta	Coleoptera	*Nebria brevicollis*	C	0.378886	66.55	10	Ehnes et al. (2011)	[1]
127	Insecta	Coleoptera	*Calathus fuscipes*	C	0.154469	64.62	10	Ehnes et al. (2011)	[1]
128	Insecta	Coleoptera	*Calathus fuscipes*	C	0.212759	73.35	10	Ehnes et al. (2011)	[1]
129	Insecta	Coleoptera	*Calathus fuscipes*	C	0.23899	52.14	10	Ehnes et al. (2011)	[1]
130	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.157383	126.99	15	Ehnes et al. (2011)	[1]
131	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.186529	115.36	15	Ehnes et al. (2011)	[1]
132	Insecta	Coleoptera	*Bembidion sp.*	C	0.024482	2.1	15	Ehnes et al. (2011)	[1]
133	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.795661	122.44	25	Ehnes et al. (2011)	[1]
134	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.906412	128.73	25	Ehnes et al. (2011)	[1]
135	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	1.101684	70.82	25	Ehnes et al. (2011)	[1]
136	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	1.503887	158.47	25	Ehnes et al. (2011)	[1]
137	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.425518	77.29	25	Ehnes et al. (2011)	[1]
138	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.702397	134.62	25	Ehnes et al. (2011)	[1]
139	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.480894	84.24	25	Ehnes et al. (2011)	[1]
140	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.629534	67.33	25	Ehnes et al. (2011)	[1]

141	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.836464	124.64	25	Ehnes et al. (2011)	[1]
142	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.256477	112.35	15	Ehnes et al. (2011)	[1]
143	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.501296	105.02	15	Ehnes et al. (2011)	[1]
144	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.947215	137.09	15	Ehnes et al. (2011)	[1]
145	Insecta	Coleoptera	*Loricera pilicornis*	C	0.09035	15.12	15	Ehnes et al. (2011)	[1]
146	Insecta	Coleoptera	*Loricera pilicornis*	C	0.081606	14.1	15	Ehnes et al. (2011)	[1]
147	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.11658	11.81	15	Ehnes et al. (2011)	[1]
148	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.096179	13.2	15	Ehnes et al. (2011)	[1]
149	Insecta	Coleoptera	*Nebria brevicollis*	C	0.340998	77.63	15	Ehnes et al. (2011)	[1]
150	Insecta	Coleoptera	*Nebria brevicollis*	C	0.314767	72.82	15	Ehnes et al. (2011)	[1]
151	Insecta	Coleoptera	*Nebria brevicollis*	C	0.259391	42.76	15	Ehnes et al. (2011)	[1]
152	Insecta	Coleoptera	*Nebria brevicollis*	C	0.256477	54.65	15	Ehnes et al. (2011)	[1]
153	Insecta	Coleoptera	*Nebria brevicollis*	C	0.399288	53.84	15	Ehnes et al. (2011)	[1]
154	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.107837	16.37	15	Ehnes et al. (2011)	[1]
155	Insecta	Coleoptera	*Platynus dorsalis*	C	0.075777	10.97	15	Ehnes et al. (2011)	[1]
156	Insecta	Coleoptera	*Platynus dorsalis*	C	0.107837	12.04	15	Ehnes et al. (2011)	[1]
157	Insecta	Coleoptera	*Platynus dorsalis*	C	0.075777	11.34	15	Ehnes et al. (2011)	[1]
158	Insecta	Coleoptera	*Platynus dorsalis*	C	0.119495	13.5	15	Ehnes et al. (2011)	[1]
159	Insecta	Coleoptera	*Platynus dorsalis*	C	0.084521	11.49	15	Ehnes et al. (2011)	[1]
160	Insecta	Coleoptera	*Platynus dorsalis*	C	0.163213	15.43	15	Ehnes et al. (2011)	[1]
161	Insecta	Coleoptera	*Loricera pilicornis*	C	0.171956	15.16	15	Ehnes et al. (2011)	[1]
162	Insecta	Coleoptera	*Loricera pilicornis*	C	0.186529	16.53	15	Ehnes et al. (2011)	[1]
163	Insecta	Coleoptera	*Loricera pilicornis*	C	0.145725	17.73	15	Ehnes et al. (2011)	[1]
164	Insecta	Coleoptera	*Loricera pilicornis*	C	0.122409	12.28	15	Ehnes et al. (2011)	[1]
165	Insecta	Coleoptera	*Loricera pilicornis*	C	0.119495	13.35	15	Ehnes et al. (2011)	[1]
166	Insecta	Coleoptera	*Loricera pilicornis*	C	0.125324	13.73	15	Ehnes et al. (2011)	[1]
167	Insecta	Coleoptera	*Loricera pilicornis*	C	0.142811	14.98	15	Ehnes et al. (2011)	[1]
168	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.585816	126.98	20	Ehnes et al. (2011)	[1]
169	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.658679	131.72	20	Ehnes et al. (2011)	[1]
170	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.428433	79.39	20	Ehnes et al. (2011)	[1]
171	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.641192	139.32	20	Ehnes et al. (2011)	[1]
172	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.378886	90.16	20	Ehnes et al. (2011)	[1]
173	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.961788	104.78	20	Ehnes et al. (2011)	[1]
174	Insecta	Coleoptera	*Abax paralellepipedus*	C	1.168718	241.6	20	Ehnes et al. (2011)	[1]
175	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.649936	266.67	20	Ehnes et al. (2011)	[1]
176	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.454663	181.85	20	Ehnes et al. (2011)	[1]
177	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.38763	276.74	20	Ehnes et al. (2011)	[1]
178	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.556671	263.6	20	Ehnes et al. (2011)	[1]
179	Insecta	Coleoptera	*Abax paralellepipedus*	C	1.745791	244.73	20	Ehnes et al. (2011)	[1]
180	Insecta	Coleoptera	*Bembidion sp.*	C	0.024045	2.3125	20	Ehnes et al. (2011)	[1]
181	Insecta	Coleoptera	*Platynus dorsalis*	C	0.253562	12.76	25	Ehnes et al. (2011)	[1]
182	Insecta	Coleoptera	*Platynus dorsalis*	C	0.247733	13.11	25	Ehnes et al. (2011)	[1]
183	Insecta	Coleoptera	*Bembidion sp.*	C	0.034391	2.266	25	Ehnes et al. (2011)	[1]
184	Insecta	Coleoptera	*Bembidion sp.*	C	0.037889	2.306	25	Ehnes et al. (2011)	[1]
185	Insecta	Coleoptera	*Platynus dorsalis*	C	0.714055	16.4	30	Ehnes et al. (2011)	[1]
186	Insecta	Coleoptera	*Platynus dorsalis*	C	0.367228	14.39	30	Ehnes et al. (2011)	[1]
187	Insecta	Coleoptera	*Platynus dorsalis*	C	0.367228	12.42	30	Ehnes et al. (2011)	[1]
188	Insecta	Coleoptera	*Platynus dorsalis*	C	0.163213	10.62	30	Ehnes et al. (2011)	[1]
189	Insecta	Coleoptera	*Platynus dorsalis*	C	0.443005	17.29	30	Ehnes et al. (2011)	[1]

190	Insecta	Coleoptera	*Platynus dorsalis*	C	0.32934	12.42	30	Ehnes et al. (2011)	[1]
191	Insecta	Coleoptera	*Platynus dorsalis*	C	0.276878	9.07	30	Ehnes et al. (2011)	[1]
192	Insecta	Coleoptera	*Loricera pilicornis*	C	0.215674	14.78	30	Ehnes et al. (2011)	[1]
193	Insecta	Coleoptera	*Loricera pilicornis*	C	0.375972	18.13	30	Ehnes et al. (2011)	[1]
194	Insecta	Coleoptera	*Loricera pilicornis*	C	0.477979	18.34	30	Ehnes et al. (2011)	[1]
195	Insecta	Coleoptera	*Loricera pilicornis*	C	0.754858	17.13	30	Ehnes et al. (2011)	[1]
196	Insecta	Coleoptera	*Loricera pilicornis*	C	0.443005	16.74	30	Ehnes et al. (2011)	[1]
197	Insecta	Coleoptera	*Loricera pilicornis*	C	0.349741	12.26	30	Ehnes et al. (2011)	[1]
198	Insecta	Coleoptera	*Loricera pilicornis*	C	0.571244	15.72	30	Ehnes et al. (2011)	[1]
199	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.151554	122.61	10	Ehnes et al. (2011)	[1]
200	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.134067	127.19	10	Ehnes et al. (2011)	[1]
201	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.113666	75.16	10	Ehnes et al. (2011)	[1]
202	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.160298	127.58	10	Ehnes et al. (2011)	[1]
203	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.087435	87.46	10	Ehnes et al. (2011)	[1]
204	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.110751	102.83	10	Ehnes et al. (2011)	[1]
205	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.131153	135.27	10	Ehnes et al. (2011)	[1]
206	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.186529	168.38	10	Ehnes et al. (2011)	[1]
207	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.582902	97.63	30	Ehnes et al. (2011)	[1]
208	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.830635	119.35	30	Ehnes et al. (2011)	[1]
209	Insecta	Coleoptera	*Pseudophonus rufipes*	C	1.072539	100.29	30	Ehnes et al. (2011)	[1]
210	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.475065	65.51	30	Ehnes et al. (2011)	[1]
211	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.475065	44.17	30	Ehnes et al. (2011)	[1]
212	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.41386	52.008	30	Ehnes et al. (2011)	[1]
213	Insecta	Coleoptera	*Platynus dorsalis*	C	0.160298	10.82	30	Ehnes et al. (2011)	[1]
214	Insecta	Coleoptera	*Platynus dorsalis*	C	0.201101	13.07	30	Ehnes et al. (2011)	[1]
215	Insecta	Coleoptera	*Platynus dorsalis*	C	0.233161	16	30	Ehnes et al. (2011)	[1]
216	Insecta	Coleoptera	*Loricera pilicornis*	C	0.364314	15.78	30	Ehnes et al. (2011)	[1]
217	Insecta	Coleoptera	*Loricera pilicornis*	C	0.530441	17.87	30	Ehnes et al. (2011)	[1]
218	Insecta	Coleoptera	*Loricera pilicornis*	C	0.233161	15.19	30	Ehnes et al. (2011)	[1]
219	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.993848	158.03	20	Ehnes et al. (2011)	[1]
220	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.247733	89.31	20	Ehnes et al. (2011)	[1]
221	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.291451	114.73	20	Ehnes et al. (2011)	[1]
222	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.241904	87.46	20	Ehnes et al. (2011)	[1]
223	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.282707	90.83	20	Ehnes et al. (2011)	[1]
224	Insecta	Coleoptera	*Bembidion sp.*	C	0.021567	2.098	20	Ehnes et al. (2011)	[1]
225	Insecta	Coleoptera	*Bembidion sp.*	C	0.019819	1.98	20	Ehnes et al. (2011)	[1]
226	Insecta	Coleoptera	*Bembidion sp.*	C	0.020402	2.368	20	Ehnes et al. (2011)	[1]
227	Insecta	Coleoptera	*Bembidion sp.*	C	0.01807	2.094	20	Ehnes et al. (2011)	[1]
228	Insecta	Coleoptera	*Bembidion sp.*	C	0.016321	1.962	20	Ehnes et al. (2011)	[1]
229	Insecta	Coleoptera	*Bembidion sp.*	C	0.027396	2.036	20	Ehnes et al. (2011)	[1]
230	Insecta	Coleoptera	*Loricera pilicornis*	C	0.099093	12.16	20	Ehnes et al. (2011)	[1]
231	Insecta	Coleoptera	*Loricera pilicornis*	C	0.131153	17	20	Ehnes et al. (2011)	[1]
232	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.390544	255.82	15	Ehnes et al. (2011)	[1]
233	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.460492	272.44	15	Ehnes et al. (2011)	[1]
234	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.533355	232.09	15	Ehnes et al. (2011)	[1]
235	Insecta	Coleoptera	*Abax paralellepipedus*	C	1.326102	276.1	15	Ehnes et al. (2011)	[1]
236	Insecta	Coleoptera	*Abax paralellepipedus*	C	1.09877	332.85	15	Ehnes et al. (2011)	[1]
237	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.658679	380.75	15	Ehnes et al. (2011)	[1]
238	Insecta	Coleoptera	*Abax paralellepipedus*	C	1.812825	367.4	15	Ehnes et al. (2011)	[1]

239	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.475065	272.92	15	Ehnes et al. (2011)	[1]
240	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.807319	252.06	15	Ehnes et al. (2011)	[1]
241	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.7432	284.71	15	Ehnes et al. (2011)	[1]
242	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.35557	131.27	15	Ehnes et al. (2011)	[1]
243	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.457578	143.01	15	Ehnes et al. (2011)	[1]
244	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.635363	131.48	15	Ehnes et al. (2011)	[1]
245	Insecta	Coleoptera	*Pterostichus niger*	C	1.882773	218.44	20	Ehnes et al. (2011)	[1]
246	Insecta	Coleoptera	*Pterostichus niger*	C	1.704988	218.48	20	Ehnes et al. (2011)	[1]
247	Insecta	Coleoptera	*Pterostichus niger*	C	3.05732	322.89	20	Ehnes et al. (2011)	[1]
248	Insecta	Coleoptera	*Pterostichus niger*	C	1.754534	279.85	20	Ehnes et al. (2011)	[1]
249	Insecta	Coleoptera	*Pterostichus niger*	C	1.366905	191.5	20	Ehnes et al. (2011)	[1]
250	Insecta	Coleoptera	*Pterostichus niger*	C	1.684586	219.31	20	Ehnes et al. (2011)	[1]
251	Insecta	Coleoptera	*Pterostichus niger*	C	3.447864	331.98	20	Ehnes et al. (2011)	[1]
252	Insecta	Coleoptera	*Poecilus versicolor*	C	0.247733	49.2	20	Ehnes et al. (2011)	[1]
253	Insecta	Coleoptera	*Poecilus versicolor*	C	0.288536	63.08	20	Ehnes et al. (2011)	[1]
254	Insecta	Coleoptera	*Poecilus versicolor*	C	0.174871	47.32	20	Ehnes et al. (2011)	[1]
255	Insecta	Coleoptera	*Poecilus versicolor*	C	0.177785	61.05	20	Ehnes et al. (2011)	[1]
256	Insecta	Coleoptera	*Poecilus versicolor*	C	0.233161	61.82	20	Ehnes et al. (2011)	[1]
257	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.317681	104.77	25	Ehnes et al. (2011)	[1]
258	Insecta	Coleoptera	*Calathus fuscipes*	C	0.279793	74.52	25	Ehnes et al. (2011)	[1]
259	Insecta	Coleoptera	*Calathus fuscipes*	C	0.306023	59.86	25	Ehnes et al. (2011)	[1]
260	Insecta	Coleoptera	*Calathus fuscipes*	C	0.448834	69.93	25	Ehnes et al. (2011)	[1]
261	Insecta	Coleoptera	*Calathus fuscipes*	C	0.335169	62.74	25	Ehnes et al. (2011)	[1]
262	Insecta	Coleoptera	*Calathus fuscipes*	C	0.268135	52.14	25	Ehnes et al. (2011)	[1]
263	Insecta	Coleoptera	*Calathus fuscipes*	C	0.317681	56.27	25	Ehnes et al. (2011)	[1]
264	Insecta	Coleoptera	*Calathus fuscipes*	C	0.233161	65.72	25	Ehnes et al. (2011)	[1]
265	Insecta	Coleoptera	*Calathus fuscipes*	C	0.262306	72.23	25	Ehnes et al. (2011)	[1]
266	Insecta	Coleoptera	*Nebria brevicollis*	C	0.303109	44.33	25	Ehnes et al. (2011)	[1]
267	Insecta	Coleoptera	*Nebria brevicollis*	C	0.256477	53.49	25	Ehnes et al. (2011)	[1]
268	Insecta	Coleoptera	*Nebria brevicollis*	C	0.198187	52.02	25	Ehnes et al. (2011)	[1]
269	Insecta	Coleoptera	*Nebria brevicollis*	C	0.271049	68	25	Ehnes et al. (2011)	[1]
270	Insecta	Coleoptera	*Nebria brevicollis*	C	0.26522	52.49	25	Ehnes et al. (2011)	[1]
271	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.177785	134.9	10	Ehnes et al. (2011)	[1]
272	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.23899	140.7	10	Ehnes et al. (2011)	[1]
273	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.104922	118.86	10	Ehnes et al. (2011)	[1]
274	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.131153	137.19	10	Ehnes et al. (2011)	[1]
275	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.198187	148.21	10	Ehnes et al. (2011)	[1]
276	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.268135	158.18	10	Ehnes et al. (2011)	[1]
277	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.107837	96.2	10	Ehnes et al. (2011)	[1]
278	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.081606	94.87	10	Ehnes et al. (2011)	[1]
279	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.034974	14.84	10	Ehnes et al. (2011)	[1]
280	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.125324	21.19	10	Ehnes et al. (2011)	[1]
281	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.026231	16.1	10	Ehnes et al. (2011)	[1]
282	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.113666	20.96	10	Ehnes et al. (2011)	[1]
283	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.046632	13.61	10	Ehnes et al. (2011)	[1]
284	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.014573	22.12	10	Ehnes et al. (2011)	[1]
285	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.064119	40.98	10	Ehnes et al. (2011)	[1]
286	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.061205	60.07	10	Ehnes et al. (2011)	[1]
287	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.055376	66.7	10	Ehnes et al. (2011)	[1]

288	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.067034	50.47	10	Ehnes et al. (2011)	[1]
289	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.064119	52.13	10	Ehnes et al. (2011)	[1]
290	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.067034	53.24	10	Ehnes et al. (2011)	[1]
291	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.075777	65.88	10	Ehnes et al. (2011)	[1]
292	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.05829	46.42	10	Ehnes et al. (2011)	[1]
293	Insecta	Coleoptera	*Poecilus versicolor*	C	0.075777	77.74	10	Ehnes et al. (2011)	[1]
294	Insecta	Coleoptera	*Poecilus versicolor*	C	0.151554	66.71	10	Ehnes et al. (2011)	[1]
295	Insecta	Coleoptera	*Poecilus versicolor*	C	0.040803	49.93	10	Ehnes et al. (2011)	[1]
296	Insecta	Coleoptera	*Poecilus versicolor*	C	0.043718	59.66	10	Ehnes et al. (2011)	[1]
297	Insecta	Coleoptera	*PSeudophonus rufipes*	C	0.883096	106.34	25	Ehnes et al. (2011)	[1]
298	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.428433	60.58	25	Ehnes et al. (2011)	[1]
299	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.358485	56.08	25	Ehnes et al. (2011)	[1]
300	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.842293	142.82	25	Ehnes et al. (2011)	[1]
301	Insecta	Coleoptera	*Pterostichus melanarius*	C	1.107513	173.27	25	Ehnes et al. (2011)	[1]
302	Insecta	Coleoptera	*Poecilus versicolor*	C	0.32934	42.19	25	Ehnes et al. (2011)	[1]
303	Insecta	Coleoptera	*Poecilus versicolor*	C	0.399288	61.86	25	Ehnes et al. (2011)	[1]
304	Insecta	Coleoptera	*Poecilus versicolor*	C	0.308938	46.29	25	Ehnes et al. (2011)	[1]
305	Insecta	Coleoptera	*Loricera pilicornis*	C	0.273964	17	25	Ehnes et al. (2011)	[1]
306	Insecta	Coleoptera	*Loricera pilicornis*	C	0.227332	13.62	25	Ehnes et al. (2011)	[1]
307	Insecta	Coleoptera	*Loricera pilicornis*	C	0.189443	14.41	25	Ehnes et al. (2011)	[1]
308	Insecta	Coleoptera	*Loricera pilicornis*	C	0.271049	14.65	25	Ehnes et al. (2011)	[1]
309	Insecta	Coleoptera	*Loricera pilicornis*	C	0.259391	17.33	25	Ehnes et al. (2011)	[1]
310	Insecta	Coleoptera	*Loricera pilicornis*	C	0.285622	15.89	25	Ehnes et al. (2011)	[1]
311	Insecta	Coleoptera	*Loricera pilicornis*	C	0.250648	12.38	25	Ehnes et al. (2011)	[1]
312	Insecta	Coleoptera	*Pterostichus niger*	C	0.944301	267.07	15	Ehnes et al. (2011)	[1]
313	Insecta	Coleoptera	*Pterostichus niger*	C	0.827721	330.34	15	Ehnes et al. (2011)	[1]
314	Insecta	Coleoptera	*Pterostichus niger*	C	1.611724	378.18	15	Ehnes et al. (2011)	[1]
315	Insecta	Coleoptera	*Carabus violaceus*	C	2.273317	972.85	15	Ehnes et al. (2011)	[1]
316	Insecta	Coleoptera	*Calathus fuscipes*	C	0.410946	85.12	15	Ehnes et al. (2011)	[1]
317	Insecta	Coleoptera	*Calathus fuscipes*	C	0.358485	71.23	15	Ehnes et al. (2011)	[1]
318	Insecta	Coleoptera	*Calathus fuscipes*	C	2.515221	76.83	15	Ehnes et al. (2011)	[1]
319	Insecta	Coleoptera	*Calathus fuscipes*	C	0.317681	67.06	15	Ehnes et al. (2011)	[1]
320	Insecta	Coleoptera	*Calathus fuscipes*	C	0.343912	101.46	15	Ehnes et al. (2011)	[1]
321	Insecta	Coleoptera	*Calathus fuscipes*	C	0.1807	56.48	15	Ehnes et al. (2011)	[1]
322	Insecta	Coleoptera	*Calathus fuscipes*	C	0.215674	54.92	15	Ehnes et al. (2011)	[1]
323	Insecta	Coleoptera	*Calathus fuscipes*	C	0.1807	72.43	15	Ehnes et al. (2011)	[1]
324	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.104922	17.78	20	Ehnes et al. (2011)	[1]
325	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.093264	21.82	20	Ehnes et al. (2011)	[1]
326	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.064119	9.4	20	Ehnes et al. (2011)	[1]
327	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.067034	18.66	20	Ehnes et al. (2011)	[1]
328	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.078692	19.79	20	Ehnes et al. (2011)	[1]
329	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.104922	20.97	20	Ehnes et al. (2011)	[1]
330	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.131153	19.41	20	Ehnes et al. (2011)	[1]
331	Insecta	Coleoptera	*Platynus dorsalis*	C	0.037889	9.9	20	Ehnes et al. (2011)	[1]
332	Insecta	Coleoptera	*Platynus dorsalis*	C	0.142811	12.85	20	Ehnes et al. (2011)	[1]
333	Insecta	Coleoptera	*Platynus dorsalis*	C	0.145725	12.05	20	Ehnes et al. (2011)	[1]
334	Insecta	Coleoptera	*Platynus dorsalis*	C	0.163213	10.19	20	Ehnes et al. (2011)	[1]
335	Insecta	Coleoptera	*Platynus dorsalis*	C	0.128238	11.79	20	Ehnes et al. (2011)	[1]
336	Insecta	Coleoptera	*Platynus dorsalis*	C	0.096179	11.33	20	Ehnes et al. (2011)	[1]

337	Insecta	Coleoptera	*Platynus dorsalis*	C	0.113666	16.07	20	Ehnes et al. (2011)	[1]
338	Insecta	Coleoptera	*Abax paralellepipedus*	C	2.911595	376.43	20	Ehnes et al. (2011)	[1]
339	Insecta	Coleoptera	*Abax paralellepipedus*	C	2.812501	390.45	20	Ehnes et al. (2011)	[1]
340	Insecta	Coleoptera	*Abax paralellepipedus*	C	1.09877	286.72	20	Ehnes et al. (2011)	[1]
341	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.83355	310.59	20	Ehnes et al. (2011)	[1]
342	Insecta	Coleoptera	*Abax paralellepipedus*	C	2.121763	271.47	20	Ehnes et al. (2011)	[1]
343	Insecta	Coleoptera	*Ocypus olens*	C	0.102008	74.38	10	Ehnes et al. (2011)	[1]
344	Insecta	Coleoptera	*Ocypus olens*	C	0.040803	86.7	10	Ehnes et al. (2011)	[1]
345	Insecta	Coleoptera	*Ocypus olens*	C	0.134067	100.28	10	Ehnes et al. (2011)	[1]
346	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.204016	227.06	10	Ehnes et al. (2011)	[1]
347	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.262306	300.65	10	Ehnes et al. (2011)	[1]
348	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.306023	267.16	10	Ehnes et al. (2011)	[1]
349	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.279793	250.97	10	Ehnes et al. (2011)	[1]
350	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.308938	283.51	10	Ehnes et al. (2011)	[1]
351	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.314767	257.9	10	Ehnes et al. (2011)	[1]
352	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.288536	257.95	10	Ehnes et al. (2011)	[1]
353	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.495467	289.39	10	Ehnes et al. (2011)	[1]
354	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.361399	284.95	10	Ehnes et al. (2011)	[1]
355	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.667423	135.9	25	Ehnes et al. (2011)	[1]
356	Insecta	Coleoptera	*Pterostichus melanarius*	C	1.087112	119.5	25	Ehnes et al. (2011)	[1]
357	Insecta	Coleoptera	*Pterostichus melanarius*	C	1.329016	155.42	25	Ehnes et al. (2011)	[1]
358	Insecta	Coleoptera	*Pterostichus niger*	C	1.194949	207.49	25	Ehnes et al. (2011)	[1]
359	Insecta	Coleoptera	*Pterostichus niger*	C	2.188796	201.19	25	Ehnes et al. (2011)	[1]
360	Insecta	Coleoptera	*Pterostichus niger*	C	2.215027	217.95	25	Ehnes et al. (2011)	[1]
361	Insecta	Coleoptera	*Pterostichus niger*	C	1.378563	203.86	25	Ehnes et al. (2011)	[1]
362	Insecta	Coleoptera	*Pterostichus niger*	C	2.454017	176.86	25	Ehnes et al. (2011)	[1]
363	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.224417	14.39	25	Ehnes et al. (2011)	[1]
364	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.218588	13.24	25	Ehnes et al. (2011)	[1]
365	Insecta	Coleoptera	*Platynus dorsalis*	C	0.209845	15.12	25	Ehnes et al. (2011)	[1]
366	Insecta	Coleoptera	*Platynus dorsalis*	C	0.1807	13.32	25	Ehnes et al. (2011)	[1]
367	Insecta	Coleoptera	*Bembidion sp.*	C	0.20693	10.1	25	Ehnes et al. (2011)	[1]
368	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	1.565091	140.48	30	Ehnes et al. (2011)	[1]
369	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	1.792423	140.79	30	Ehnes et al. (2011)	[1]
370	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	1.253239	88.53	30	Ehnes et al. (2011)	[1]
371	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	1.553433	147.54	30	Ehnes et al. (2011)	[1]
372	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	1.844884	106.28	30	Ehnes et al. (2011)	[1]
373	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	1.460169	121.6	30	Ehnes et al. (2011)	[1]
374	Insecta	Coleoptera	*Abax paralellepipedus*	C	2.002268	323.43	30	Ehnes et al. (2011)	[1]
375	Insecta	Coleoptera	*Abax paralellepipedus*	C	1.707902	279.21	30	Ehnes et al. (2011)	[1]
376	Insecta	Coleoptera	*Abax paralellepipedus*	C	1.943978	281.35	30	Ehnes et al. (2011)	[1]
377	Insecta	Coleoptera	*Abax paralellepipedus*	C	1.978952	251.81	30	Ehnes et al. (2011)	[1]
378	Insecta	Coleoptera	*Abax paralellepipedus*	C	1.757449	281.76	30	Ehnes et al. (2011)	[1]
379	Insecta	Coleoptera	*Abax paralellepipedus*	C	2.013926	275.53	30	Ehnes et al. (2011)	[1]
380	Insecta	Coleoptera	*Abax paralellepipedus*	C	2.019755	270.82	30	Ehnes et al. (2011)	[1]
381	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.932643	65.1	25	Ehnes et al. (2011)	[1]
382	Insecta	Coleoptera	*Ocypus ophtalmicus*	C	0.667423	65.01	25	Ehnes et al. (2011)	[1]
383	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.719884	220.19	25	Ehnes et al. (2011)	[1]
384	Insecta	Coleoptera	*Abax paralellepipedus*	C	2.115934	258.75	25	Ehnes et al. (2011)	[1]
385	Insecta	Coleoptera	*Abax paralellepipedus*	C	1.13083	244.49	25	Ehnes et al. (2011)	[1]

386	Insecta	Coleoptera	*Abax paralellepipedus*	C	1.323187	241.57	25	Ehnes et al. (2011)	[1]
387	Insecta	Coleoptera	*Abax paralellepipedus*	C	1.052138	241.16	25	Ehnes et al. (2011)	[1]
388	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.932643	240.43	25	Ehnes et al. (2011)	[1]
389	Insecta	Coleoptera	*Abax paralellepipedus*	C	1.057967	224.3	25	Ehnes et al. (2011)	[1]
390	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.970532	248.67	25	Ehnes et al. (2011)	[1]
391	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.781088	215.2	25	Ehnes et al. (2011)	[1]
392	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.169042	18.56	20	Ehnes et al. (2011)	[1]
393	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.151554	11.75	20	Ehnes et al. (2011)	[1]
394	Insecta	Coleoptera	*Platynus dorsalis*	C	0.008744	14.81	10	Ehnes et al. (2011)	[1]
395	Insecta	Coleoptera	*Platynus dorsalis*	C	0.049547	13.4	10	Ehnes et al. (2011)	[1]
396	Insecta	Coleoptera	*Platynus dorsalis*	C	0.046632	14.02	10	Ehnes et al. (2011)	[1]
397	Insecta	Coleoptera	*Pterostichus niger*	C	0.335169	219.85	10	Ehnes et al. (2011)	[1]
398	Insecta	Coleoptera	*Pterostichus niger*	C	0.396373	211.33	10	Ehnes et al. (2011)	[1]
399	Insecta	Coleoptera	*Pterostichus niger*	C	0.422604	216.32	10	Ehnes et al. (2011)	[1]
400	Insecta	Coleoptera	*Pterostichus niger*	C	0.326425	189.66	10	Ehnes et al. (2011)	[1]
401	Insecta	Coleoptera	*Pterostichus niger*	C	0.373057	166.08	10	Ehnes et al. (2011)	[1]
402	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.055376	12.71	10	Ehnes et al. (2011)	[1]
403	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.072863	17.09	10	Ehnes et al. (2011)	[1]
404	Insecta	Coleoptera	*Poecilus versicolor*	C	0.052461	57.73	10	Ehnes et al. (2011)	[1]
405	Insecta	Coleoptera	*Poecilus versicolor*	C	0.037889	49.85	10	Ehnes et al. (2011)	[1]
406	Insecta	Coleoptera	*Poecilus versicolor*	C	0.046632	39.6	10	Ehnes et al. (2011)	[1]
407	Insecta	Coleoptera	*Poecilus versicolor*	C	0.05829	63.54	10	Ehnes et al. (2011)	[1]
408	Insecta	Coleoptera	*Loricera pilicornis*	C	0.023316	15.75	10	Ehnes et al. (2011)	[1]
409	Insecta	Coleoptera	*Loricera pilicornis*	C	0.046632	16.67	10	Ehnes et al. (2011)	[1]
410	Insecta	Coleoptera	*Loricera pilicornis*	C	0.049547	14.87	10	Ehnes et al. (2011)	[1]
411	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.020402	14.68	10	Ehnes et al. (2011)	[1]
412	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.049547	16.58	10	Ehnes et al. (2011)	[1]
413	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.107837	69.1	10	Ehnes et al. (2011)	[1]
414	Insecta	Coleoptera	*Calathus fuscipes*	C	0.049547	15.99	10	Ehnes et al. (2011)	[1]
415	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.50421	66.15	25	Ehnes et al. (2011)	[1]
416	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.454663	52.22	25	Ehnes et al. (2011)	[1]
417	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.658679	59.33	25	Ehnes et al. (2011)	[1]
418	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.635363	67.59	25	Ehnes et al. (2011)	[1]
419	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.629534	65.03	25	Ehnes et al. (2011)	[1]
420	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.163213	13.3	25	Ehnes et al. (2011)	[1]
421	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.183614	10.47	25	Ehnes et al. (2011)	[1]
422	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.174871	16.27	25	Ehnes et al. (2011)	[1]
423	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.303109	10.46	25	Ehnes et al. (2011)	[1]
424	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.174871	17.44	25	Ehnes et al. (2011)	[1]
425	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.134067	12.81	25	Ehnes et al. (2011)	[1]
426	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.166127	16.13	25	Ehnes et al. (2011)	[1]
427	Insecta	Coleoptera	*Pterostichus niger*	C	0.20693	196.4	10	Ehnes et al. (2011)	[1]
428	Insecta	Coleoptera	*Pterostichus niger*	C	0.250648	208.94	10	Ehnes et al. (2011)	[1]
429	Insecta	Coleoptera	*Pterostichus niger*	C	0.26522	214.78	10	Ehnes et al. (2011)	[1]
430	Insecta	Coleoptera	*Pterostichus niger*	C	0.393459	192.2	10	Ehnes et al. (2011)	[1]
431	Insecta	Coleoptera	*Pterostichus niger*	C	0.174871	154.07	10	Ehnes et al. (2011)	[1]
432	Insecta	Coleoptera	*Poecilus versicolor*	C	0.072863	69.66	10	Ehnes et al. (2011)	[1]
433	Insecta	Coleoptera	*Poecilus versicolor*	C	0.078692	41.5	10	Ehnes et al. (2011)	[1]
434	Insecta	Coleoptera	*Nebria brevicollis*	C	0.043718	46.95	10	Ehnes et al. (2011)	[1]

435	Insecta	Coleoptera	*Nebria brevicollis*	C	0.107837	48.06	10	Ehnes et al. (2011)	[1]
436	Insecta	Coleoptera	*Calathus fuscipes*	C	0.338083	104.8	10	Ehnes et al. (2011)	[1]
437	Insecta	Coleoptera	*Calathus fuscipes*	C	0.189443	70.24	10	Ehnes et al. (2011)	[1]
438	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.096179	21.24	10	Ehnes et al. (2011)	[1]
439	Insecta	Coleoptera	*Pterostichus niger*	C	0.495467	206.47	15	Ehnes et al. (2011)	[1]
440	Insecta	Coleoptera	*Pterostichus niger*	C	0.883096	233.23	15	Ehnes et al. (2011)	[1]
441	Insecta	Coleoptera	*Pterostichus niger*	C	0.737371	197.17	15	Ehnes et al. (2011)	[1]
442	Insecta	Coleoptera	*Pterostichus niger*	C	0.492552	176.58	15	Ehnes et al. (2011)	[1]
443	Insecta	Coleoptera	*Pterostichus niger*	C	0.71114	239.1	15	Ehnes et al. (2011)	[1]
444	Insecta	Coleoptera	*Platynus dorsalis*	C	0.046632	12.33	10	Ehnes et al. (2011)	[1]
445	Insecta	Coleoptera	*Platynus dorsalis*	C	0.055376	9.92	10	Ehnes et al. (2011)	[1]
446	Insecta	Coleoptera	*Platynus dorsalis*	C	0.029145	14.07	10	Ehnes et al. (2011)	[1]
447	Insecta	Coleoptera	*Platynus dorsalis*	C	0.067034	17.55	10	Ehnes et al. (2011)	[1]
448	Insecta	Coleoptera	*Platynus dorsalis*	C	0.03206	14.31	10	Ehnes et al. (2011)	[1]
449	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.151554	102.38	10	Ehnes et al. (2011)	[1]
450	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.198187	110.79	10	Ehnes et al. (2011)	[1]
451	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.253562	131.18	10	Ehnes et al. (2011)	[1]
452	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.221503	189.52	10	Ehnes et al. (2011)	[1]
453	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.244819	142.46	10	Ehnes et al. (2011)	[1]
454	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.282707	144.91	10	Ehnes et al. (2011)	[1]
455	Insecta	Coleoptera	*Poecilus versicolor*	C	0.609132	51.41	30	Ehnes et al. (2011)	[1]
456	Insecta	Coleoptera	*Poecilus versicolor*	C	0.539184	51.59	30	Ehnes et al. (2011)	[1]
457	Insecta	Coleoptera	*Poecilus versicolor*	C	0.906412	72.1	30	Ehnes et al. (2011)	[1]
458	Insecta	Coleoptera	*Pseudophonus rufipes*	C	1.212436	94.67	30	Ehnes et al. (2011)	[1]
459	Insecta	Coleoptera	*Poecilus versicolor*	C	0.381801	48.55	30	Ehnes et al. (2011)	[1]
460	Insecta	Coleoptera	*Poecilus versicolor*	C	0.515868	49.05	30	Ehnes et al. (2011)	[1]
461	Insecta	Coleoptera	*Poecilus versicolor*	C	0.539184	71.5	30	Ehnes et al. (2011)	[1]
462	Insecta	Coleoptera	*Poecilus versicolor*	C	0.358485	42.3	30	Ehnes et al. (2011)	[1]
463	Insecta	Coleoptera	*Pterostichus niger*	C	1.704988	193.93	30	Ehnes et al. (2011)	[1]
464	Insecta	Coleoptera	*Pterostichus niger*	C	1.565091	210.11	30	Ehnes et al. (2011)	[1]
465	Insecta	Coleoptera	*Pterostichus niger*	C	1.888602	249.33	30	Ehnes et al. (2011)	[1]
466	Insecta	Coleoptera	*Pterostichus niger*	C	1.640869	175.08	30	Ehnes et al. (2011)	[1]
467	Insecta	Coleoptera	*Pterostichus niger*	C	1.667099	205.25	30	Ehnes et al. (2011)	[1]
468	Insecta	Coleoptera	*Pterostichus niger*	C	1.801167	311.97	30	Ehnes et al. (2011)	[1]
469	Insecta	Coleoptera	*Bembidion sp.*	C	0.008744	2.132	15	Ehnes et al. (2011)	[1]
470	Insecta	Coleoptera	*Bembidion sp.*	C	0.012824	2.186	15	Ehnes et al. (2011)	[1]
471	Insecta	Coleoptera	*Bembidion sp.*	C	0.014573	2.386	15	Ehnes et al. (2011)	[1]
472	Insecta	Coleoptera	*Bembidion sp.*	C	0.008744	2.262	15	Ehnes et al. (2011)	[1]
473	Insecta	Coleoptera	*Bembidion sp.*	C	0.012824	2.434	15	Ehnes et al. (2011)	[1]
474	Insecta	Coleoptera	*Loricera pilicornis*	C	0.043718	14.48	10	Ehnes et al. (2011)	[1]
475	Insecta	Coleoptera	*Loricera pilicornis*	C	0.046632	14.45	10	Ehnes et al. (2011)	[1]
476	Insecta	Coleoptera	*Loricera pilicornis*	C	0.040803	17.49	10	Ehnes et al. (2011)	[1]
477	Insecta	Coleoptera	*Loricera pilicornis*	C	0.055376	15.19	10	Ehnes et al. (2011)	[1]
478	Insecta	Coleoptera	*Nebria brevicollis*	C	0.052461	57.88	10	Ehnes et al. (2011)	[1]
479	Insecta	Coleoptera	*Nebria brevicollis*	C	0.122409	50.56	10	Ehnes et al. (2011)	[1]
480	Insecta	Coleoptera	*Nebria brevicollis*	C	0.043718	56.37	10	Ehnes et al. (2011)	[1]
481	Insecta	Coleoptera	*Nebria brevicollis*	C	0.072863	52.49	10	Ehnes et al. (2011)	[1]
482	Insecta	Coleoptera	*Nebria brevicollis*	C	0.119495	61.93	10	Ehnes et al. (2011)	[1]
483	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.294365	17.78	30	Ehnes et al. (2011)	[1]

484	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.244819	21.82	30	Ehnes et al. (2011)	[1]
485	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.192358	9.4	30	Ehnes et al. (2011)	[1]
486	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.250648	18.66	30	Ehnes et al. (2011)	[1]
487	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.189443	19.79	30	Ehnes et al. (2011)	[1]
488	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.221503	15.71	30	Ehnes et al. (2011)	[1]
489	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.233161	18.17	30	Ehnes et al. (2011)	[1]
490	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.932643	52.15	30	Ehnes et al. (2011)	[1]
491	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	1.15706	73.83	30	Ehnes et al. (2011)	[1]
492	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	1.005506	73.63	30	Ehnes et al. (2011)	[1]
493	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.749029	63.75	30	Ehnes et al. (2011)	[1]
494	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.789832	63.33	30	Ehnes et al. (2011)	[1]
495	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.690739	56.87	30	Ehnes et al. (2011)	[1]
496	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	1.218265	67.82	30	Ehnes et al. (2011)	[1]
497	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.483809	74.68	30	Ehnes et al. (2011)	[1]
498	Insecta	Coleoptera	*Nebria brevicollis*	C	0.139896	73.18	20	Ehnes et al. (2011)	[1]
499	Insecta	Coleoptera	*Nebria brevicollis*	C	0.104922	63.77	20	Ehnes et al. (2011)	[1]
500	Insecta	Coleoptera	*Loricera pilicornis*	C	0.099093	14.06	20	Ehnes et al. (2011)	[1]
501	Insecta	Coleoptera	*Loricera pilicornis*	C	0.084521	15.16	20	Ehnes et al. (2011)	[1]
502	Insecta	Coleoptera	*Loricera pilicornis*	C	0.134067	16.33	20	Ehnes et al. (2011)	[1]
503	Insecta	Coleoptera	*Platynus dorsalis*	C	0.145725	14.28	20	Ehnes et al. (2011)	[1]
504	Insecta	Coleoptera	*Platynus dorsalis*	C	0.107837	11.09	20	Ehnes et al. (2011)	[1]
505	Insecta	Coleoptera	*Poecilus versicolor*	C	0.253562	47.83	20	Ehnes et al. (2011)	[1]
506	Insecta	Coleoptera	*Poecilus versicolor*	C	0.20693	54.97	20	Ehnes et al. (2011)	[1]
507	Insecta	Coleoptera	*Poecilus versicolor*	C	0.201101	60.17	20	Ehnes et al. (2011)	[1]
508	Insecta	Coleoptera	*Poecilus versicolor*	C	0.338083	76.81	20	Ehnes et al. (2011)	[1]
509	Insecta	Coleoptera	*Poecilus versicolor*	C	0.279793	58.41	20	Ehnes et al. (2011)	[1]
510	Insecta	Coleoptera	*Poecilus versicolor*	C	0.311852	53.64	20	Ehnes et al. (2011)	[1]
511	Insecta	Coleoptera	*Poecilus versicolor*	C	0.189443	63.45	20	Ehnes et al. (2011)	[1]
512	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.999677	141.88	20	Ehnes et al. (2011)	[1]
513	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.909327	161.75	20	Ehnes et al. (2011)	[1]
514	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.795661	155.88	20	Ehnes et al. (2011)	[1]
515	Insecta	Coleoptera	*Pterostichus melanarius*	C	1.323187	211.48	20	Ehnes et al. (2011)	[1]
516	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.772345	155.36	20	Ehnes et al. (2011)	[1]
517	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.378886	50.02	20	Ehnes et al. (2011)	[1]
518	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.227332	48.74	20	Ehnes et al. (2011)	[1]
519	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.160298	55.01	20	Ehnes et al. (2011)	[1]
520	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.192358	53.96	20	Ehnes et al. (2011)	[1]
521	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.040803	49.52	20	Ehnes et al. (2011)	[1]
522	Insecta	Coleoptera	*Calathus fuscipes*	C	0.399288	56.29	20	Ehnes et al. (2011)	[1]
523	Insecta	Coleoptera	*Calathus fuscipes*	C	0.425518	74.73	20	Ehnes et al. (2011)	[1]
524	Insecta	Coleoptera	*Calathus fuscipes*	C	0.457578	52.44	20	Ehnes et al. (2011)	[1]
525	Insecta	Coleoptera	*Calathus fuscipes*	C	0.291451	73.12	20	Ehnes et al. (2011)	[1]
526	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.23899	93.12	20	Ehnes et al. (2011)	[1]
527	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.201101	138.18	20	Ehnes et al. (2011)	[1]
528	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.125324	114.91	20	Ehnes et al. (2011)	[1]
529	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.236075	149.77	20	Ehnes et al. (2011)	[1]
530	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.072863	157.97	20	Ehnes et al. (2011)	[1]
531	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.317681	170.96	20	Ehnes et al. (2011)	[1]
532	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.093264	157.78	20	Ehnes et al. (2011)	[1]

533	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.227332	162.08	20	Ehnes et al. (2011)	[1]
534	Insecta	Coleoptera	*Calathus fuscipes*	C	0.559586	55.17	25	Ehnes et al. (2011)	[1]
535	Insecta	Coleoptera	*Calathus fuscipes*	C	0.419689	49	25	Ehnes et al. (2011)	[1]
536	Insecta	Coleoptera	*Calathus fuscipes*	C	0.480894	72.51	25	Ehnes et al. (2011)	[1]
537	Insecta	Coleoptera	*Calathus fuscipes*	C	0.489638	56.3	25	Ehnes et al. (2011)	[1]
538	Insecta	Coleoptera	*Calathus fuscipes*	C	0.515868	54.04	25	Ehnes et al. (2011)	[1]
539	Insecta	Coleoptera	*Calathus fuscipes*	C	0.443005	64.1	25	Ehnes et al. (2011)	[1]
540	Insecta	Coleoptera	*Calathus fuscipes*	C	0.475065	71.5	25	Ehnes et al. (2011)	[1]
541	Insecta	Coleoptera	*Nebria brevicollis*	C	0.681995	66.48	25	Ehnes et al. (2011)	[1]
542	Insecta	Coleoptera	*Nebria brevicollis*	C	0.480894	56.28	25	Ehnes et al. (2011)	[1]
543	Insecta	Coleoptera	*Nebria brevicollis*	C	0.515868	57.4	25	Ehnes et al. (2011)	[1]
544	Insecta	Coleoptera	*Nebria brevicollis*	C	0.553757	76.86	25	Ehnes et al. (2011)	[1]
545	Insecta	Coleoptera	*Nebria brevicollis*	C	0.166127	41.24	25	Ehnes et al. (2011)	[1]
546	Insecta	Coleoptera	*Nebria brevicollis*	C	0.273964	47.21	25	Ehnes et al. (2011)	[1]
547	Insecta	Coleoptera	*Loricera pilicornis*	C	0.151554	16.81	20	Ehnes et al. (2011)	[1]
548	Insecta	Coleoptera	*Loricera pilicornis*	C	0.128238	15.6	20	Ehnes et al. (2011)	[1]
549	Insecta	Coleoptera	*Loricera pilicornis*	C	0.244819	15.42	20	Ehnes et al. (2011)	[1]
550	Insecta	Coleoptera	*Loricera pilicornis*	C	0.110751	15.27	20	Ehnes et al. (2011)	[1]
551	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.215674	66.91	20	Ehnes et al. (2011)	[1]
552	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.600389	81.37	20	Ehnes et al. (2011)	[1]
553	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.41386	90.53	20	Ehnes et al. (2011)	[1]
554	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.664508	92.95	20	Ehnes et al. (2011)	[1]
555	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.122409	64.04	20	Ehnes et al. (2011)	[1]
556	Insecta	Coleoptera	*Pterostichus melanarius*	C	2.098447	156.14	30	Ehnes et al. (2011)	[1]
557	Insecta	Coleoptera	*Pterostichus melanarius*	C	2.474418	123.51	30	Ehnes et al. (2011)	[1]
558	Insecta	Coleoptera	*Pterostichus melanarius*	C	3.124354	192.51	30	Ehnes et al. (2011)	[1]
559	Insecta	Coleoptera	*Pterostichus melanarius*	C	2.532708	210.61	30	Ehnes et al. (2011)	[1]
560	Insecta	Coleoptera	*Pterostichus melanarius*	C	5.683293	172.44	30	Ehnes et al. (2011)	[1]
561	Insecta	Coleoptera	*Pterostichus melanarius*	C	3.328369	172.07	30	Ehnes et al. (2011)	[1]
562	Insecta	Coleoptera	*Pterostichus melanarius*	C	2.640545	167.18	30	Ehnes et al. (2011)	[1]
563	Insecta	Coleoptera	*Pterostichus melanarius*	C	2.64346	164.35	30	Ehnes et al. (2011)	[1]
564	Insecta	Coleoptera	*Pseudophonus rufipes*	C	1.017164	97.29	30	Ehnes et al. (2011)	[1]
565	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.868524	113.85	30	Ehnes et al. (2011)	[1]
566	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.839379	133.79	30	Ehnes et al. (2011)	[1]
567	Insecta	Coleoptera	*Pseudophonus rufipes*	C	1.078368	167.04	30	Ehnes et al. (2011)	[1]
568	Insecta	Coleoptera	*Pseudophonus rufipes*	C	1.442682	121.41	30	Ehnes et al. (2011)	[1]
569	Insecta	Coleoptera	*Pseudophonus rufipes*	C	2.550195	144.14	30	Ehnes et al. (2011)	[1]
570	Insecta	Coleoptera	*Calathus fuscipes*	C	0.804405	47.98	30	Ehnes et al. (2011)	[1]
571	Insecta	Coleoptera	*Calathus fuscipes*	C	0.603303	76.32	30	Ehnes et al. (2011)	[1]
572	Insecta	Coleoptera	*Calathus fuscipes*	C	0.705311	75.49	30	Ehnes et al. (2011)	[1]
573	Insecta	Coleoptera	*Calathus fuscipes*	C	0.588731	47.77	30	Ehnes et al. (2011)	[1]
574	Insecta	Coleoptera	*Calathus fuscipes*	C	0.644107	79.87	30	Ehnes et al. (2011)	[1]
575	Insecta	Coleoptera	*Calathus fuscipes*	C	0.836464	57.63	30	Ehnes et al. (2011)	[1]
576	Insecta	Coleoptera	*Calathus fuscipes*	C	0.807319	51.47	30	Ehnes et al. (2011)	[1]
577	Insecta	Coleoptera	*Nebria brevicollis*	C	0.428433	50.78	30	Ehnes et al. (2011)	[1]
578	Insecta	Coleoptera	*Nebria brevicollis*	C	0.352656	56.89	30	Ehnes et al. (2011)	[1]
579	Insecta	Coleoptera	*Nebria brevicollis*	C	0.463407	58.11	30	Ehnes et al. (2011)	[1]
580	Insecta	Coleoptera	*Nebria brevicollis*	C	0.440091	46.84	30	Ehnes et al. (2011)	[1]
581	Insecta	Coleoptera	*Nebria brevicollis*	C	0.390544	60	30	Ehnes et al. (2011)	[1]

582	Insecta	Coleoptera	*Nebria brevicollis*	C	0.437176	66.92	30	Ehnes et al. (2011)	[1]
583	Insecta	Coleoptera	*Nebria brevicollis*	C	0.323511	47.73	30	Ehnes et al. (2011)	[1]
584	Insecta	Coleoptera	*Calathus fuscipes*	C	0.361399	67.48	20	Ehnes et al. (2011)	[1]
585	Insecta	Coleoptera	*Calathus fuscipes*	C	0.408031	52.75	20	Ehnes et al. (2011)	[1]
586	Insecta	Coleoptera	*Calathus fuscipes*	C	0.247733	48.74	20	Ehnes et al. (2011)	[1]
587	Insecta	Coleoptera	*Calathus fuscipes*	C	0.204016	65.72	20	Ehnes et al. (2011)	[1]
588	Insecta	Coleoptera	*Calathus fuscipes*	C	0.288536	65.9	20	Ehnes et al. (2011)	[1]
589	Insecta	Coleoptera	*Calathus fuscipes*	C	0.29728	54.44	20	Ehnes et al. (2011)	[1]
590	Insecta	Coleoptera	*Nebria brevicollis*	C	0.195272	54.4	20	Ehnes et al. (2011)	[1]
591	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.198187	51.92	20	Ehnes et al. (2011)	[1]
592	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.326425	45.56	20	Ehnes et al. (2011)	[1]
593	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.343912	53.55	20	Ehnes et al. (2011)	[1]
594	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.314767	49.54	20	Ehnes et al. (2011)	[1]
595	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.294365	62.38	20	Ehnes et al. (2011)	[1]
596	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.308938	66.32	20	Ehnes et al. (2011)	[1]
597	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.463407	110.57	25	Ehnes et al. (2011)	[1]
598	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.378886	118.06	25	Ehnes et al. (2011)	[1]
599	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.521697	114.87	25	Ehnes et al. (2011)	[1]
600	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.486723	99.41	25	Ehnes et al. (2011)	[1]
601	Insecta	Coleoptera	*Pseudophonus rufipes*	C	1.626296	134.37	25	Ehnes et al. (2011)	[1]
602	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.821892	113.46	25	Ehnes et al. (2011)	[1]
603	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.498381	103.54	25	Ehnes et al. (2011)	[1]
604	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.340998	205.86	25	Ehnes et al. (2011)	[1]
605	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.635363	196.81	25	Ehnes et al. (2011)	[1]
606	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.559586	168.34	25	Ehnes et al. (2011)	[1]
607	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.985104	166.2	25	Ehnes et al. (2011)	[1]
608	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.198187	212.06	25	Ehnes et al. (2011)	[1]
609	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.714055	180.92	25	Ehnes et al. (2011)	[1]
610	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.410946	170.56	25	Ehnes et al. (2011)	[1]
611	Insecta	Coleoptera	*Pterostichus melanarius*	C	1.186205	202.97	15	Ehnes et al. (2011)	[1]
612	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.751943	129.72	15	Ehnes et al. (2011)	[1]
613	Insecta	Coleoptera	*Pterostichus melanarius*	C	1.407708	228.33	15	Ehnes et al. (2011)	[1]
614	Insecta	Coleoptera	*Pterostichus melanarius*	C	1.154146	254.26	15	Ehnes et al. (2011)	[1]
615	Insecta	Coleoptera	*Pterostichus melanarius*	C	1.302786	249.2	15	Ehnes et al. (2011)	[1]
616	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.888925	199.88	15	Ehnes et al. (2011)	[1]
617	Insecta	Coleoptera	*Pterostichus melanarius*	C	1.069625	174.45	15	Ehnes et al. (2011)	[1]
618	Insecta	Coleoptera	*Abax ovalis*	C	0.332254	168.81	15	Ehnes et al. (2011)	[1]
619	Insecta	Coleoptera	*Abax ovalis*	C	0.253562	155.07	15	Ehnes et al. (2011)	[1]
620	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.373057	258.44	15	Ehnes et al. (2011)	[1]
621	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.314767	131.51	15	Ehnes et al. (2011)	[1]
622	Insecta	Coleoptera	*Abax paralellepipedus*	C	0.262306	139.21	15	Ehnes et al. (2011)	[1]
623	Insecta	Coleoptera	*Nebria brevicollis*	C	0.221503	51.95	15	Ehnes et al. (2011)	[1]
624	Insecta	Coleoptera	*Nebria brevicollis*	C	0.224417	56.48	15	Ehnes et al. (2011)	[1]
625	Insecta	Coleoptera	*Calathus fuscipes*	C	0.343912	69.27	15	Ehnes et al. (2011)	[1]
626	Insecta	Coleoptera	*Calathus fuscipes*	C	0.443005	30.07	15	Ehnes et al. (2011)	[1]
627	Insecta	Coleoptera	*Calathus fuscipes*	C	0.294365	65.94	15	Ehnes et al. (2011)	[1]
628	Insecta	Coleoptera	*Calathus fuscipes*	C	0.542099	96.23	15	Ehnes et al. (2011)	[1]
629	Insecta	Coleoptera	*Calathus fuscipes*	C	0.545013	94.1	15	Ehnes et al. (2011)	[1]
630	Insecta	Coleoptera	*Abax ovalis*	C	0.320596	154.6	15	Ehnes et al. (2011)	[1]

631	Insecta	Coleoptera	*Abax ovalis*	C	0.443005	254.42	15	Ehnes et al. (2011)	[1]
632	Insecta	Coleoptera	*Abax ovalis*	C	0.338083	244.6	15	Ehnes et al. (2011)	[1]
633	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.069948	9.05	15	Ehnes et al. (2011)	[1]
634	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.096179	15.03	15	Ehnes et al. (2011)	[1]
635	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.075777	12.48	15	Ehnes et al. (2011)	[1]
636	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.142811	14.47	15	Ehnes et al. (2011)	[1]
637	Insecta	Coleoptera	*Calathus fuscipes*	C	0.300194	77.53	15	Ehnes et al. (2011)	[1]
638	Insecta	Coleoptera	*Calathus fuscipes*	C	0.440091	74.34	15	Ehnes et al. (2011)	[1]
639	Insecta	Coleoptera	*Calathus fuscipes*	C	0.352656	91.64	15	Ehnes et al. (2011)	[1]
640	Insecta	Coleoptera	*Calathus fuscipes*	C	0.134067	74.55	10	Ehnes et al. (2011)	[1]
641	Insecta	Coleoptera	*Calathus fuscipes*	C	0.171956	80.62	10	Ehnes et al. (2011)	[1]
642	Insecta	Coleoptera	*Calathus fuscipes*	C	0.166127	86.71	10	Ehnes et al. (2011)	[1]
643	Insecta	Coleoptera	*Calathus fuscipes*	C	0.177785	80.44	10	Ehnes et al. (2011)	[1]
644	Insecta	Coleoptera	*Calathus fuscipes*	C	0.084521	55.96	10	Ehnes et al. (2011)	[1]
645	Insecta	Coleoptera	*Calathus fuscipes*	C	0.227332	89.28	10	Ehnes et al. (2011)	[1]
646	Insecta	Coleoptera	*Calathus fuscipes*	C	0.093264	62.77	10	Ehnes et al. (2011)	[1]
647	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.253562	122.97	10	Ehnes et al. (2011)	[1]
648	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.291451	141.32	10	Ehnes et al. (2011)	[1]
649	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.524612	173.73	10	Ehnes et al. (2011)	[1]
650	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.326425	191.64	10	Ehnes et al. (2011)	[1]
651	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.466321	154.34	10	Ehnes et al. (2011)	[1]
652	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.466321	163.87	10	Ehnes et al. (2011)	[1]
653	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.14864	130.41	5	Ehnes et al. (2011)	[1]
654	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.087435	166.81	5	Ehnes et al. (2011)	[1]
655	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.104922	139.76	5	Ehnes et al. (2011)	[1]
656	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.096179	136.03	5	Ehnes et al. (2011)	[1]
657	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.119495	156.6	5	Ehnes et al. (2011)	[1]
658	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.104922	143.6	5	Ehnes et al. (2011)	[1]
659	Insecta	Coleoptera	*Calathus fuscipes*	C	0.011658	77.63	5	Ehnes et al. (2011)	[1]
660	Insecta	Coleoptera	*Calathus fuscipes*	C	0.113666	68.58	5	Ehnes et al. (2011)	[1]
661	Insecta	Coleoptera	*Calathus fuscipes*	C	0.023316	61.14	5	Ehnes et al. (2011)	[1]
662	Insecta	Coleoptera	*Calathus fuscipes*	C	0.023316	60.32	5	Ehnes et al. (2011)	[1]
663	Insecta	Coleoptera	*Poecilus versicolor*	C	0.332254	44.61	25	Ehnes et al. (2011)	[1]
664	Insecta	Coleoptera	*Poecilus versicolor*	C	0.410946	72.35	25	Ehnes et al. (2011)	[1]
665	Insecta	Coleoptera	*Poecilus versicolor*	C	0.32934	75.49	25	Ehnes et al. (2011)	[1]
666	Insecta	Coleoptera	*Poecilus versicolor*	C	0.979275	78.76	25	Ehnes et al. (2011)	[1]
667	Insecta	Coleoptera	*Poecilus versicolor*	C	0.708226	56.02	25	Ehnes et al. (2011)	[1]
668	Insecta	Coleoptera	*Poecilus versicolor*	C	0.375972	49.6	25	Ehnes et al. (2011)	[1]
669	Insecta	Coleoptera	*Platynus dorsalis*	C	0.186529	11.67	25	Ehnes et al. (2011)	[1]
670	Insecta	Coleoptera	*Platynus dorsalis*	C	0.227332	10.49	25	Ehnes et al. (2011)	[1]
671	Insecta	Coleoptera	*Platynus dorsalis*	C	0.317681	15.7	25	Ehnes et al. (2011)	[1]
672	Insecta	Coleoptera	*Platynus dorsalis*	C	0.294365	10.42	25	Ehnes et al. (2011)	[1]
673	Insecta	Coleoptera	*Platynus dorsalis*	C	0.285622	14.33	25	Ehnes et al. (2011)	[1]
674	Insecta	Coleoptera	*Platynus dorsalis*	C	0.384715	16.4	25	Ehnes et al. (2011)	[1]
675	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.034974	43.67	5	Ehnes et al. (2011)	[1]
676	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.09035	89.67	5	Ehnes et al. (2011)	[1]
677	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.037889	114.88	5	Ehnes et al. (2011)	[1]
678	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.104922	129.58	5	Ehnes et al. (2011)	[1]
679	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.107837	117.59	5	Ehnes et al. (2011)	[1]

680	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.247733	118.08	5	Ehnes et al. (2011)	[1]
681	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.136982	98.4	5	Ehnes et al. (2011)	[1]
682	Insecta	Coleoptera	*Loricera pilicornis*	C	0.061205	19.46	5	Ehnes et al. (2011)	[1]
683	Insecta	Coleoptera	*Loricera pilicornis*	C	0.040803	18.02	5	Ehnes et al. (2011)	[1]
684	Insecta	Coleoptera	*Loricera pilicornis*	C	0.037889	16.74	5	Ehnes et al. (2011)	[1]
685	Insecta	Coleoptera	*Nebria brevicollis*	C	0.037889	55.31	5	Ehnes et al. (2011)	[1]
686	Insecta	Coleoptera	*Platynus dorsalis*	C	0.03206	13.3	8	Ehnes et al. (2011)	[1]
687	Insecta	Coleoptera	*Platynus dorsalis*	C	0.064119	17.8	8	Ehnes et al. (2011)	[1]
688	Insecta	Coleoptera	*Platynus dorsalis*	C	0.043718	16.7	8	Ehnes et al. (2011)	[1]
689	Insecta	Coleoptera	*Platynus dorsalis*	C	0.081606	13.3	8	Ehnes et al. (2011)	[1]
690	Insecta	Coleoptera	*Platynus dorsalis*	C	0.037889	10.7	8	Ehnes et al. (2011)	[1]
691	Insecta	Coleoptera	*Platynus dorsalis*	C	0.029145	12.8	8	Ehnes et al. (2011)	[1]
692	Insecta	Coleoptera	*Platynus dorsalis*	C	0.043718	11.2	8	Ehnes et al. (2011)	[1]
693	Insecta	Coleoptera	*Abax sp.*	C	0.335169	249.5	8	Ehnes et al. (2011)	[1]
694	Insecta	Coleoptera	*Abax sp.*	C	0.323511	298.4	8	Ehnes et al. (2011)	[1]
695	Insecta	Coleoptera	*Abax sp.*	C	0.271049	158.3	8	Ehnes et al. (2011)	[1]
696	Insecta	Coleoptera	*Abax sp.*	C	0.212759	177.7	8	Ehnes et al. (2011)	[1]
697	Insecta	Coleoptera	*Abax sp.*	C	0.294365	152.3	8	Ehnes et al. (2011)	[1]
698	Insecta	Coleoptera	*Abax sp.*	C	0.32934	125.7	8	Ehnes et al. (2011)	[1]
699	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.128238	117.5	8	Ehnes et al. (2011)	[1]
700	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.250648	149.4	8	Ehnes et al. (2011)	[1]
701	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.192358	111.3	8	Ehnes et al. (2011)	[1]
702	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.139896	108.9	8	Ehnes et al. (2011)	[1]
703	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.11658	116.9	8	Ehnes et al. (2011)	[1]
704	Insecta	Coleoptera	*Carabus auratus*	C	0.469236	575.4	8	Ehnes et al. (2011)	[1]
705	Insecta	Coleoptera	*Carabus auratus*	C	0.609132	455	8	Ehnes et al. (2011)	[1]
706	Insecta	Coleoptera	*Carabus auratus*	C	0.338083	609.1	8	Ehnes et al. (2011)	[1]
707	Insecta	Coleoptera	*Carabus auratus*	C	0.714055	688.3	8	Ehnes et al. (2011)	[1]
708	Insecta	Coleoptera	*Carabus auratus*	C	0.68491	497.7	8	Ehnes et al. (2011)	[1]
709	Insecta	Coleoptera	*Carabus auratus*	C	0.734456	735.2	8	Ehnes et al. (2011)	[1]
710	Insecta	Coleoptera	*Harpalus sp.*	C	0.067034	44.4	8	Ehnes et al. (2011)	[1]
711	Insecta	Coleoptera	*Harpalus sp.*	C	0.099093	40.1	8	Ehnes et al. (2011)	[1]
712	Insecta	Coleoptera	*Harpalus sp.*	C	0.067034	35.4	8	Ehnes et al. (2011)	[1]
713	Insecta	Coleoptera	*Harpalus sp.*	C	0.064119	48.2	8	Ehnes et al. (2011)	[1]
714	Insecta	Coleoptera	*Notiophilus sp.*	C	0.005829	4.7	8	Ehnes et al. (2011)	[1]
715	Insecta	Coleoptera	*Notiophilus sp.*	C	0.011658	5.5	8	Ehnes et al. (2011)	[1]
716	Insecta	Coleoptera	*Philonthus sp.*	C	0.026231	16.3	8	Ehnes et al. (2011)	[1]
717	Insecta	Coleoptera	*Philonthus sp.*	C	0.049547	21.8	8	Ehnes et al. (2011)	[1]
718	Insecta	Coleoptera	*Philonthus sp.*	C	0.05829	17.6	8	Ehnes et al. (2011)	[1]
719	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.171956	101.9	8	Ehnes et al. (2011)	[1]
720	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.1807	96.6	8	Ehnes et al. (2011)	[1]
721	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.122409	62.1	8	Ehnes et al. (2011)	[1]
722	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.163213	71.6	8	Ehnes et al. (2011)	[1]
723	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.099093	74.9	8	Ehnes et al. (2011)	[1]
724	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.145725	61.5	8	Ehnes et al. (2011)	[1]
725	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.160298	62.3	8	Ehnes et al. (2011)	[1]
726	Insecta	Coleoptera	*Harpalus sp.*	C	0.125324	33.6	8	Ehnes et al. (2011)	[1]
727	Insecta	Coleoptera	*Poecilus sp.*	C	0.104922	53.4	8	Ehnes et al. (2011)	[1]
728	Insecta	Coleoptera	*Poecilus sp.*	C	0.134067	61.5	8	Ehnes et al. (2011)	[1]

729	Insecta	Coleoptera	*Poecilus sp.*	C	0.11658	59.8	8	Ehnes et al. (2011)	[1]
730	Insecta	Coleoptera	*Poecilus sp.*	C	0.084521	44.8	8	Ehnes et al. (2011)	[1]
731	Insecta	Coleoptera	*Poecilus sp.*	C	0.198187	42.5	8	Ehnes et al. (2011)	[1]
732	Insecta	Coleoptera	*Poecilus sp.*	C	0.113666	58.5	8	Ehnes et al. (2011)	[1]
733	Insecta	Coleoptera	*Poecilus sp.*	C	0.113666	49.8	8	Ehnes et al. (2011)	[1]
734	Insecta	Coleoptera	*Abax sp.*	C	0.47215	297.5	11.5	Ehnes et al. (2011)	[1]
735	Insecta	Coleoptera	*Abax sp.*	C	0.483809	215.5	11.5	Ehnes et al. (2011)	[1]
736	Insecta	Coleoptera	*Abax sp.*	C	0.527526	259.8	11.5	Ehnes et al. (2011)	[1]
737	Insecta	Coleoptera	*Abax sp.*	C	0.550842	283.5	11.5	Ehnes et al. (2011)	[1]
738	Insecta	Coleoptera	*Abax sp.*	C	0.259391	155.2	11.5	Ehnes et al. (2011)	[1]
739	Insecta	Coleoptera	*Abax sp.*	C	0.419689	295.9	11.5	Ehnes et al. (2011)	[1]
740	Insecta	Coleoptera	*Abax sp.*	C	0.294365	148.8	11.5	Ehnes et al. (2011)	[1]
741	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.460492	163.6	11.5	Ehnes et al. (2011)	[1]
742	Insecta	Coleoptera	*Carabus auratus*	C	0.760687	420.2	11.5	Ehnes et al. (2011)	[1]
743	Insecta	Coleoptera	*Carabus auratus*	C	2.55311	883.5	11.5	Ehnes et al. (2011)	[1]
744	Insecta	Coleoptera	*Carabus auratus*	C	1.460169	717.2	11.5	Ehnes et al. (2011)	[1]
745	Insecta	Coleoptera	*Carabus auratus*	C	2.078045	610.4	11.5	Ehnes et al. (2011)	[1]
746	Insecta	Coleoptera	*Carabus auratus*	C	0.545013	356.7	11.5	Ehnes et al. (2011)	[1]
747	Insecta	Coleoptera	*Carabus auratus*	C	0.932643	466.3	11.5	Ehnes et al. (2011)	[1]
748	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.326425	116.3	11.5	Ehnes et al. (2011)	[1]
749	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.183614	136.3	11.5	Ehnes et al. (2011)	[1]
750	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.212759	105.6	11.5	Ehnes et al. (2011)	[1]
751	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.314767	116.1	11.5	Ehnes et al. (2011)	[1]
752	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.20693	114.7	11.5	Ehnes et al. (2011)	[1]
753	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.276878	146.5	11.5	Ehnes et al. (2011)	[1]
754	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.169042	73.4	11.5	Ehnes et al. (2011)	[1]
755	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.154469	49.5	11.5	Ehnes et al. (2011)	[1]
756	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.145725	65.8	11.5	Ehnes et al. (2011)	[1]
757	Insecta	Coleoptera	*Poecilus sp.*	C	0.145725	76	11.5	Ehnes et al. (2011)	[1]
758	Insecta	Coleoptera	*Poecilus sp.*	C	0.099093	42.9	11.5	Ehnes et al. (2011)	[1]
759	Insecta	Coleoptera	*Poecilus sp.*	C	0.306023	65.5	11.5	Ehnes et al. (2011)	[1]
760	Insecta	Coleoptera	*Poecilus sp.*	C	0.233161	62	11.5	Ehnes et al. (2011)	[1]
761	Insecta	Coleoptera	*Poecilus sp.*	C	0.128238	59.1	11.5	Ehnes et al. (2011)	[1]
762	Insecta	Coleoptera	*Poecilus sp.*	C	0.131153	55	11.5	Ehnes et al. (2011)	[1]
763	Insecta	Coleoptera	*Philonthus sp.*	C	0.075777	15.6	11.5	Ehnes et al. (2011)	[1]
764	Insecta	Coleoptera	*Philonthus sp.*	C	0.107837	21.1	11.5	Ehnes et al. (2011)	[1]
765	Insecta	Coleoptera	*Poecilus sp.*	C	0.29728	53	11.5	Ehnes et al. (2011)	[1]
766	Insecta	Coleoptera	*Notiophilus sp.*	C	0.040803	4.6	11.5	Ehnes et al. (2011)	[1]
767	Insecta	Coleoptera	*Notiophilus sp.*	C	0.005829	5.2	11.5	Ehnes et al. (2011)	[1]
768	Insecta	Coleoptera	*Notiophilus sp.*	C	0.026231	7.2	11.5	Ehnes et al. (2011)	[1]
769	Insecta	Coleoptera	*Harpalus sp.*	C	0.169042	46.9	11.5	Ehnes et al. (2011)	[1]
770	Insecta	Coleoptera	*Harpalus sp.*	C	0.448834	59	11.5	Ehnes et al. (2011)	[1]
771	Insecta	Coleoptera	*Harpalus sp.*	C	0.136982	39.7	11.5	Ehnes et al. (2011)	[1]
772	Insecta	Coleoptera	*Harpalus sp.*	C	0.236075	52.1	11.5	Ehnes et al. (2011)	[1]
773	Insecta	Coleoptera	*Harpalus sp.*	C	0.169042	44.7	11.5	Ehnes et al. (2011)	[1]
774	Insecta	Coleoptera	*Harpalus sp.*	C	0.157383	63.7	11.5	Ehnes et al. (2011)	[1]
775	Insecta	Coleoptera	*Harpalus sp.*	C	0.157383	39.6	11.5	Ehnes et al. (2011)	[1]
776	Insecta	Coleoptera	*Harpalus sp.*	C	0.096179	37.9	11.5	Ehnes et al. (2011)	[1]
777	Insecta	Coleoptera	*Platynus dorsalis*	C	0.084521	9.9	11.5	Ehnes et al. (2011)	[1]

778	Insecta	Coleoptera	*Platynus dorsalis*	C	0.110751	13	11.5	Ehnes et al. (2011)	[1]
779	Insecta	Coleoptera	*Platynus dorsalis*	C	0.093264	15.8	11.5	Ehnes et al. (2011)	[1]
780	Insecta	Coleoptera	*Platynus dorsalis*	C	0.069948	13.6	11.5	Ehnes et al. (2011)	[1]
781	Insecta	Coleoptera	*Platynus dorsalis*	C	0.064119	10.9	11.5	Ehnes et al. (2011)	[1]
782	Insecta	Coleoptera	*Platynus dorsalis*	C	0.128238	16.2	11.5	Ehnes et al. (2011)	[1]
783	Insecta	Coleoptera	*Platynus dorsalis*	C	0.075777	13.1	11.5	Ehnes et al. (2011)	[1]
784	Insecta	Coleoptera	*Platynus dorsalis*	C	0.061205	10.6	11.5	Ehnes et al. (2011)	[1]
785	Insecta	Coleoptera	*Platynus dorsalis*	C	0.061205	12.4	11.5	Ehnes et al. (2011)	[1]
786	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.218588	110.9	11.5	Ehnes et al. (2011)	[1]
787	Insecta	Coleoptera	*Poecilus sp.*	C	0.125324	40.3	11.5	Ehnes et al. (2011)	[1]
788	Insecta	Coleoptera	*Carabus auratus*	C	0.492552	658.4	11.5	Ehnes et al. (2011)	[1]
789	Insecta	Coleoptera	*Carabus auratus*	C	0.425518	843.3	11.5	Ehnes et al. (2011)	[1]
790	Insecta	Coleoptera	*Notiophilus sp.*	C	0.052461	7.6	11.5	Ehnes et al. (2011)	[1]
791	Insecta	Coleoptera	*Notiophilus sp.*	C	0.05829	6	11.5	Ehnes et al. (2011)	[1]
792	Insecta	Coleoptera	*Notiophilus sp.*	C	0.067034	7.2	11.5	Ehnes et al. (2011)	[1]
793	Insecta	Coleoptera	*Notiophilus sp.*	C	0.023316	5.5	11.5	Ehnes et al. (2011)	[1]
794	Insecta	Coleoptera	*Platynus dorsalis*	C	0.236075	22	15	Ehnes et al. (2011)	[1]
795	Insecta	Coleoptera	*Poecilus sp.*	C	0.244819	63.6	15	Ehnes et al. (2011)	[1]
796	Insecta	Coleoptera	*Poecilus sp.*	C	0.285622	51.9	15	Ehnes et al. (2011)	[1]
797	Insecta	Coleoptera	*Pterostichus melanarius*	C	1.145402	127.4	15	Ehnes et al. (2011)	[1]
798	Insecta	Coleoptera	*Poecilus sp.*	C	0.227332	46.1	15	Ehnes et al. (2011)	[1]
799	Insecta	Coleoptera	*Dyschirius sp.*	C	0.034974	3.56	15	Ehnes et al. (2011)	[1]
800	Insecta	Coleoptera	*Bembidion sp.*	C	0.134067	11.7	15	Ehnes et al. (2011)	[1]
801	Insecta	Coleoptera	*Notiophilus sp.*	C	0.069948	8.8	15	Ehnes et al. (2011)	[1]
802	Insecta	Coleoptera	*Notiophilus sp.*	C	0.05829	7.3	15	Ehnes et al. (2011)	[1]
803	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.428433	72.6	15	Ehnes et al. (2011)	[1]
804	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.609132	71.2	15	Ehnes et al. (2011)	[1]
805	Insecta	Coleoptera	*Poecilus sp.*	C	0.384715	64.7	15	Ehnes et al. (2011)	[1]
806	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.460492	51.9	15	Ehnes et al. (2011)	[1]
807	Insecta	Coleoptera	*Abax sp.*	C	0.71114	303.1	15	Ehnes et al. (2011)	[1]
808	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.489638	77.5	15	Ehnes et al. (2011)	[1]
809	Insecta	Coleoptera	*Abax sp.*	C	1.092941	265.5	15	Ehnes et al. (2011)	[1]
810	Insecta	Coleoptera	*Abax sp.*	C	0.306023	249	15	Ehnes et al. (2011)	[1]
811	Insecta	Coleoptera	*Abax sp.*	C	0.641192	310	15	Ehnes et al. (2011)	[1]
812	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.370143	81	15	Ehnes et al. (2011)	[1]
813	Insecta	Coleoptera	*Carabus auratus*	C	1.684586	566.7	15	Ehnes et al. (2011)	[1]
814	Insecta	Coleoptera	*Carabus auratus*	C	1.401879	517.8	15	Ehnes et al. (2011)	[1]
815	Insecta	Coleoptera	*Carabus auratus*	C	2.182967	688.6	15	Ehnes et al. (2011)	[1]
816	Insecta	Coleoptera	*Carabus auratus*	C	1.614638	510.2	15	Ehnes et al. (2011)	[1]
817	Insecta	Coleoptera	*Carabus auratus*	C	2.104276	460.5	15	Ehnes et al. (2011)	[1]
818	Insecta	Coleoptera	*Carabus auratus*	C	1.739962	530.1	15	Ehnes et al. (2011)	[1]
819	Insecta	Coleoptera	*Poecilus sp.*	C	0.285622	60.8	15	Ehnes et al. (2011)	[1]
820	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.477979	66.9	15	Ehnes et al. (2011)	[1]
821	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.568329	69	15	Ehnes et al. (2011)	[1]
822	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.422604	66.9	15	Ehnes et al. (2011)	[1]
823	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.498381	112.7	15	Ehnes et al. (2011)	[1]
824	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.14864	100.1	15	Ehnes et al. (2011)	[1]
825	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.373057	88.9	15	Ehnes et al. (2011)	[1]
826	Insecta	Coleoptera	*Pseudophonus rufipes*	C	1.084197	128.2	15	Ehnes et al. (2011)	[1]

827	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.192358	109	15	Ehnes et al. (2011)	[1]
828	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.489638	101.8	15	Ehnes et al. (2011)	[1]
829	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.47215	94.8	15	Ehnes et al. (2011)	[1]
830	Insecta	Coleoptera	*Abax sp.*	C	1.710817	315.3	15	Ehnes et al. (2011)	[1]
831	Insecta	Coleoptera	*Abax sp.*	C	0.778174	363	15	Ehnes et al. (2011)	[1]
832	Insecta	Coleoptera	*Abax sp.*	C	0.288536	185.6	15	Ehnes et al. (2011)	[1]
833	Insecta	Coleoptera	*Abax sp.*	C	0.422604	216.5	15	Ehnes et al. (2011)	[1]
834	Insecta	Coleoptera	*Poecilus sp.*	C	0.340998	66.9	15	Ehnes et al. (2011)	[1]
835	Insecta	Coleoptera	*Poecilus sp.*	C	0.273964	78.8	15	Ehnes et al. (2011)	[1]
836	Insecta	Coleoptera	*Platynus dorsalis*	C	0.163213	13.3	15	Ehnes et al. (2011)	[1]
837	Insecta	Coleoptera	*Platynus dorsalis*	C	0.119495	10.3	15	Ehnes et al. (2011)	[1]
838	Insecta	Coleoptera	*Platynus dorsalis*	C	0.107837	12.1	15	Ehnes et al. (2011)	[1]
839	Insecta	Coleoptera	*Platynus dorsalis*	C	0.125324	13.3	15	Ehnes et al. (2011)	[1]
840	Insecta	Coleoptera	*Platynus dorsalis*	C	0.128238	11	15	Ehnes et al. (2011)	[1]
841	Insecta	Coleoptera	*Platynus dorsalis*	C	0.186529	17.1	15	Ehnes et al. (2011)	[1]
842	Insecta	Coleoptera	*Platynus dorsalis*	C	0.107837	14.2	15	Ehnes et al. (2011)	[1]
843	Insecta	Coleoptera	*Harpalus sp.*	C	0.160298	51.7	15	Ehnes et al. (2011)	[1]
844	Insecta	Coleoptera	*Harpalus sp.*	C	0.186529	53	15	Ehnes et al. (2011)	[1]
845	Insecta	Coleoptera	*Harpalus sp.*	C	0.113666	54.8	15	Ehnes et al. (2011)	[1]
846	Insecta	Coleoptera	*Harpalus sp.*	C	0.346827	53	15	Ehnes et al. (2011)	[1]
847	Insecta	Coleoptera	*Harpalus sp.*	C	0.154469	57.1	15	Ehnes et al. (2011)	[1]
848	Insecta	Coleoptera	*Harpalus sp.*	C	0.142811	48.3	15	Ehnes et al. (2011)	[1]
849	Insecta	Coleoptera	*Philonthus sp.*	C	0.087435	16.6	15	Ehnes et al. (2011)	[1]
850	Insecta	Coleoptera	*Philonthus sp.*	C	0.139896	22.2	15	Ehnes et al. (2011)	[1]
851	Insecta	Coleoptera	*Philonthus sp.*	C	0.151554	18.4	15	Ehnes et al. (2011)	[1]
852	Insecta	Coleoptera	*Harpalus sp.*	C	0.381801	45.2	15	Ehnes et al. (2011)	[1]
853	Insecta	Coleoptera	*Notiophilus sp.*	C	0.026231	4.9	15	Ehnes et al. (2011)	[1]
854	Insecta	Coleoptera	*Notiophilus sp.*	C	0.037889	5.6	15	Ehnes et al. (2011)	[1]
855	Insecta	Coleoptera	*Harpalus sp.*	C	0.134067	47.1	15	Ehnes et al. (2011)	[1]
856	Insecta	Coleoptera	*Harpalus sp.*	C	0.177785	53.9	15	Ehnes et al. (2011)	[1]
857	Insecta	Coleoptera	*Carabus auratus*	C	0.958874	359.7	15	Ehnes et al. (2011)	[1]
858	Insecta	Coleoptera	*Carabus auratus*	C	1.349418	468.3	15	Ehnes et al. (2011)	[1]
859	Insecta	Coleoptera	*Poecilus sp.*	C	0.160298	55.1	15	Ehnes et al. (2011)	[1]
860	Insecta	Coleoptera	*Poecilus sp.*	C	0.171956	56.6	15	Ehnes et al. (2011)	[1]
861	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.227332	120.29	15	Ehnes et al. (2011)	[1]
862	Insecta	Coleoptera	*Nebria brevicollis*	C	0.425518	66.42	15	Ehnes et al. (2011)	[1]
863	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.361399	106.43	15	Ehnes et al. (2011)	[1]
864	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.813148	145.86	15	Ehnes et al. (2011)	[1]
865	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.323511	127.61	15	Ehnes et al. (2011)	[1]
866	Insecta	Coleoptera	*Nebria brevicollis*	C	0.425518	58.93	15	Ehnes et al. (2011)	[1]
867	Insecta	Coleoptera	*Nebria brevicollis*	C	0.731542	67.23	15	Ehnes et al. (2011)	[1]
868	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.577073	159.24	15	Ehnes et al. (2011)	[1]
869	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.731542	189.13	15	Ehnes et al. (2011)	[1]
870	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.049547	15.16	15	Ehnes et al. (2011)	[1]
871	Insecta	Coleoptera	*Calathus melanocephalus*	C	0.096179	13.5	15	Ehnes et al. (2011)	[1]
872	Insecta	Coleoptera	*Calathus piceus*	C	0.113666	35.25	15	Ehnes et al. (2011)	[1]
873	Insecta	Coleoptera	*Calathus piceus*	C	0.256477	41.19	15	Ehnes et al. (2011)	[1]
874	Insecta	Coleoptera	*Calathus piceus*	C	0.14864	30.56	15	Ehnes et al. (2011)	[1]
875	Insecta	Coleoptera	*Calathus piceus*	C	0.285622	38.84	15	Ehnes et al. (2011)	[1]

876	Insecta	Coleoptera	*Calathus piceus*	C	0.236075	40.76	15	Ehnes et al. (2011)	[1]
877	Insecta	Coleoptera	*Calathus piceus*	C	0.201101	30.96	15	Ehnes et al. (2011)	[1]
878	Insecta	Coleoptera	*Nebria brevicollis*	C	0.623705	93.45	15	Ehnes et al. (2011)	[1]
879	Insecta	Coleoptera	*Nebria brevicollis*	C	0.501296	52.6	15	Ehnes et al. (2011)	[1]
880	Insecta	Coleoptera	*Nebria brevicollis*	C	0.612047	81.35	15	Ehnes et al. (2011)	[1]
881	Insecta	Coleoptera	*Nebria brevicollis*	C	0.396373	62.29	15	Ehnes et al. (2011)	[1]
882	Insecta	Coleoptera	*Pterostichus melanarius*	C	0.419689	127.64	15	Ehnes et al. (2011)	[1]
883	Insecta	Coleoptera	*Ocypus olens*	C	0.763601	283.37	15	Ehnes et al. (2011)	[1]
884	Insecta	Coleoptera	*Ocypus olens*	C	1.186205	239.55	15	Ehnes et al. (2011)	[1]
885	Insecta	Coleoptera	*Ocypus olens*	C	1.259068	231.82	15	Ehnes et al. (2011)	[1]
886	Insecta	Coleoptera	*Poecilus sp.*	C	0.343912	63	18.5	Ehnes et al. (2011)	[1]
887	Insecta	Coleoptera	*Poecilus sp.*	C	0.335169	58.5	18.5	Ehnes et al. (2011)	[1]
888	Insecta	Coleoptera	*Poecilus sp.*	C	0.512954	56.1	18.5	Ehnes et al. (2011)	[1]
889	Insecta	Coleoptera	*Poecilus sp.*	C	0.507125	68.3	18.5	Ehnes et al. (2011)	[1]
890	Insecta	Coleoptera	*Poecilus sp.*	C	0.574158	52.8	18.5	Ehnes et al. (2011)	[1]
891	Insecta	Coleoptera	*Poecilus sp.*	C	0.53627	45	18.5	Ehnes et al. (2011)	[1]
892	Insecta	Coleoptera	*Poecilus sp.*	C	0.47215	65.3	18.5	Ehnes et al. (2011)	[1]
893	Insecta	Coleoptera	*Pseudophonus rufipes*	C	1.375648	170.9	18.5	Ehnes et al. (2011)	[1]
894	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.62079	101.1	18.5	Ehnes et al. (2011)	[1]
895	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.571244	108.7	18.5	Ehnes et al. (2011)	[1]
896	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.250648	97.6	18.5	Ehnes et al. (2011)	[1]
897	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.279793	106.8	18.5	Ehnes et al. (2011)	[1]
898	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.59456	151.1	18.5	Ehnes et al. (2011)	[1]
899	Insecta	Coleoptera	*Pseudophonus rufipes*	C	1.489314	112.8	18.5	Ehnes et al. (2011)	[1]
900	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.288536	65.6	18.5	Ehnes et al. (2011)	[1]
901	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.273964	74.1	18.5	Ehnes et al. (2011)	[1]
902	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.259391	73.7	18.5	Ehnes et al. (2011)	[1]
903	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.5625	51.2	18.5	Ehnes et al. (2011)	[1]
904	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.306023	65.8	18.5	Ehnes et al. (2011)	[1]
905	Insecta	Coleoptera	*Carabus auratus*	C	4.403823	506.2	18.5	Ehnes et al. (2011)	[1]
906	Insecta	Coleoptera	*Carabus auratus*	C	3.864639	531	18.5	Ehnes et al. (2011)	[1]
907	Insecta	Coleoptera	*Carabus auratus*	C	2.623058	742	18.5	Ehnes et al. (2011)	[1]
908	Insecta	Coleoptera	*Carabus auratus*	C	2.573512	466.2	18.5	Ehnes et al. (2011)	[1]
909	Insecta	Coleoptera	*Carabus auratus*	C	3.844238	592.9	18.5	Ehnes et al. (2011)	[1]
910	Insecta	Coleoptera	*Carabus auratus*	C	2.439444	465.7	18.5	Ehnes et al. (2011)	[1]
911	Insecta	Coleoptera	*Carabus auratus*	C	2.576426	629.2	18.5	Ehnes et al. (2011)	[1]
912	Insecta	Coleoptera	*Harpalus sp.*	C	0.346827	53.6	18.5	Ehnes et al. (2011)	[1]
913	Insecta	Coleoptera	*Harpalus sp.*	C	0.262306	53.1	18.5	Ehnes et al. (2011)	[1]
914	Insecta	Coleoptera	*Harpalus sp.*	C	0.224417	37.2	18.5	Ehnes et al. (2011)	[1]
915	Insecta	Coleoptera	*Notiophilus sp.*	C	0.052461	7.6	18.5	Ehnes et al. (2011)	[1]
916	Insecta	Coleoptera	*Poecilus sp.*	C	0.399288	46.2	18.5	Ehnes et al. (2011)	[1]
917	Insecta	Coleoptera	*Poecilus sp.*	C	0.361399	53.1	18.5	Ehnes et al. (2011)	[1]
918	Insecta	Coleoptera	*Abax sp.*	C	0.85978	299.5	18.5	Ehnes et al. (2011)	[1]
919	Insecta	Coleoptera	*Abax sp.*	C	1.291128	317.2	18.5	Ehnes et al. (2011)	[1]
920	Insecta	Coleoptera	*Abax sp.*	C	1.288213	302.9	18.5	Ehnes et al. (2011)	[1]
921	Insecta	Coleoptera	*Abax sp.*	C	1.081283	268.1	18.5	Ehnes et al. (2011)	[1]
922	Insecta	Coleoptera	*Abax sp.*	C	0.68491	285.2	18.5	Ehnes et al. (2011)	[1]
923	Insecta	Coleoptera	*Abax sp.*	C	0.463407	170.3	18.5	Ehnes et al. (2011)	[1]
924	Insecta	Coleoptera	*Abax sp.*	C	1.407708	348.2	18.5	Ehnes et al. (2011)	[1]

925	Insecta	Coleoptera	*Abax sp.*	C	1.017164	180.1	18.5	Ehnes et al. (2011)	[1]
926	Insecta	Coleoptera	*Abax sp.*	C	0.518783	214.8	18.5	Ehnes et al. (2011)	[1]
927	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.364314	65.9	18.5	Ehnes et al. (2011)	[1]
928	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.273964	76.3	18.5	Ehnes et al. (2011)	[1]
929	Insecta	Coleoptera	*Platynus dorsalis*	C	0.189443	16.4	18.5	Ehnes et al. (2011)	[1]
930	Insecta	Coleoptera	*Platynus dorsalis*	C	0.119495	11.2	18.5	Ehnes et al. (2011)	[1]
931	Insecta	Coleoptera	*Platynus dorsalis*	C	0.122409	12.2	18.5	Ehnes et al. (2011)	[1]
932	Insecta	Coleoptera	*Platynus dorsalis*	C	0.154469	16	18.5	Ehnes et al. (2011)	[1]
933	Insecta	Coleoptera	*Platynus dorsalis*	C	0.113666	13.1	18.5	Ehnes et al. (2011)	[1]
934	Insecta	Coleoptera	*Platynus dorsalis*	C	0.09035	9.4	18.5	Ehnes et al. (2011)	[1]
935	Insecta	Coleoptera	*Harpalus sp.*	C	0.26522	50.9	18.5	Ehnes et al. (2011)	[1]
936	Insecta	Coleoptera	*Harpalus sp.*	C	0.480894	62	18.5	Ehnes et al. (2011)	[1]
937	Insecta	Coleoptera	*Harpalus sp.*	C	0.434262	50.1	18.5	Ehnes et al. (2011)	[1]
938	Insecta	Coleoptera	*Harpalus sp.*	C	0.679081	54.8	18.5	Ehnes et al. (2011)	[1]
939	Insecta	Coleoptera	*Harpalus sp.*	C	0.373057	43.8	18.5	Ehnes et al. (2011)	[1]
940	Insecta	Coleoptera	*Carabus auratus*	C	1.209521	658.4	18.5	Ehnes et al. (2011)	[1]
941	Insecta	Coleoptera	*Carabus auratus*	C	1.547604	843.3	18.5	Ehnes et al. (2011)	[1]
942	Insecta	Coleoptera	*Notiophilus sp.*	C	0.087435	7.6	18.5	Ehnes et al. (2011)	[1]
943	Insecta	Coleoptera	*Notiophilus sp.*	C	0.081606	6	18.5	Ehnes et al. (2011)	[1]
944	Insecta	Coleoptera	*Notiophilus sp.*	C	0.113666	7.2	18.5	Ehnes et al. (2011)	[1]
945	Insecta	Coleoptera	*Notiophilus sp.*	C	0.043718	5.5	18.5	Ehnes et al. (2011)	[1]
946	Insecta	Coleoptera	*Bembidion sp.*	C	0.048964	2.08	22	Ehnes et al. (2011)	[1]
947	Insecta	Coleoptera	*Dyschirius sp.*	C	0.023316	0.78	22	Ehnes et al. (2011)	[1]
948	Insecta	Coleoptera	*Platynus dorsalis*	C	0.346827	17.3	22	Ehnes et al. (2011)	[1]
949	Insecta	Coleoptera	*Platynus dorsalis*	C	0.399288	16.9	22	Ehnes et al. (2011)	[1]
950	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.722798	58.8	22	Ehnes et al. (2011)	[1]
951	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	1.270726	73	22	Ehnes et al. (2011)	[1]
952	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.944301	53.9	22	Ehnes et al. (2011)	[1]
953	Insecta	Coleoptera	*Abax sp.*	C	2.381154	197.6	22	Ehnes et al. (2011)	[1]
954	Insecta	Coleoptera	*Abax sp.*	C	2.150908	245.6	22	Ehnes et al. (2011)	[1]
955	Insecta	Coleoptera	*Abax sp.*	C	1.256153	174.6	22	Ehnes et al. (2011)	[1]
956	Insecta	Coleoptera	*Poecilus sp.*	C	0.699482	57.2	22	Ehnes et al. (2011)	[1]
957	Insecta	Coleoptera	*Poecilus sp.*	C	0.690739	55.7	22	Ehnes et al. (2011)	[1]
958	Insecta	Coleoptera	*Poecilus sp.*	C	0.606218	67.1	22	Ehnes et al. (2011)	[1]
959	Insecta	Coleoptera	*Carabus auratus*	C	3.395403	751	22	Ehnes et al. (2011)	[1]
960	Insecta	Coleoptera	*Carabus auratus*	C	2.812501	471.5	22	Ehnes et al. (2011)	[1]
961	Insecta	Coleoptera	*Carabus auratus*	C	2.806672	554.1	22	Ehnes et al. (2011)	[1]
962	Insecta	Coleoptera	*Poecilus sp.*	C	0.708226	58.1	22	Ehnes et al. (2011)	[1]
963	Insecta	Coleoptera	*Poecilus sp.*	C	0.845208	59.8	22	Ehnes et al. (2011)	[1]
964	Insecta	Coleoptera	*Poecilus sp.*	C	0.647021	64.5	22	Ehnes et al. (2011)	[1]
965	Insecta	Coleoptera	*Poecilus sp.*	C	0.647021	69	22	Ehnes et al. (2011)	[1]
966	Insecta	Coleoptera	*Harpalus sp.*	C	0.384715	51.1	22	Ehnes et al. (2011)	[1]
967	Insecta	Coleoptera	*Harpalus sp.*	C	0.746114	53.4	22	Ehnes et al. (2011)	[1]
968	Insecta	Coleoptera	*Harpalus sp.*	C	0.381801	55.7	22	Ehnes et al. (2011)	[1]
969	Insecta	Coleoptera	*Harpalus sp.*	C	0.393459	53.4	22	Ehnes et al. (2011)	[1]
970	Insecta	Coleoptera	*Harpalus sp.*	C	0.343912	52.6	22	Ehnes et al. (2011)	[1]
971	Insecta	Coleoptera	*Harpalus sp.*	C	0.326425	50.7	22	Ehnes et al. (2011)	[1]
972	Insecta	Coleoptera	*Pterostichus melanarius*	C	1.110428	118	22	Ehnes et al. (2011)	[1]
973	Insecta	Coleoptera	*Notiophilus sp.*	C	0.087435	5.3	22	Ehnes et al. (2011)	[1]

974	Insecta	Coleoptera	*Pterostichus melanarius*	C	1.020078	94.2	22	Ehnes et al. (2011)	[1]
975	Insecta	Coleoptera	*Abax sp.*	C	1.806996	157.7	22	Ehnes et al. (2011)	[1]
976	Insecta	Coleoptera	*Abax sp.*	C	1.122086	299.4	22	Ehnes et al. (2011)	[1]
977	Insecta	Coleoptera	*Abax sp.*	C	1.448511	348.7	22	Ehnes et al. (2011)	[1]
978	Insecta	Coleoptera	*Abax sp.*	C	1.224094	180.4	22	Ehnes et al. (2011)	[1]
979	Insecta	Coleoptera	*Abax sp.*	C	1.541775	156.8	22	Ehnes et al. (2011)	[1]
980	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.7432	101.1	22	Ehnes et al. (2011)	[1]
981	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.883096	94.6	22	Ehnes et al. (2011)	[1]
982	Insecta	Coleoptera	*Pseudophonus rufipes*	C	1.025907	105.5	22	Ehnes et al. (2011)	[1]
983	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.524612	99.8	22	Ehnes et al. (2011)	[1]
984	Insecta	Coleoptera	*Pseudophonus rufipes*	C	0.757772	102.6	22	Ehnes et al. (2011)	[1]
985	Insecta	Coleoptera	*Pseudophonus rufipes*	C	1.261982	144.34	22	Ehnes et al. (2011)	[1]
986	Insecta	Coleoptera	*Carabus auratus*	C	3.634393	645.5	22	Ehnes et al. (2011)	[1]
987	Insecta	Coleoptera	*Carabus auratus*	C	2.535623	510.4	22	Ehnes et al. (2011)	[1]
988	Insecta	Coleoptera	*Pterostichus melanarius*	C	1.046309	102.8	22	Ehnes et al. (2011)	[1]
989	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.448834	46.5	22	Ehnes et al. (2011)	[1]
990	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.699482	67.6	22	Ehnes et al. (2011)	[1]
991	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	1.197863	67.2	22	Ehnes et al. (2011)	[1]
992	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.751943	58	22	Ehnes et al. (2011)	[1]
993	Insecta	Coleoptera	*Pterostichus oblongopunctatus*	C	0.894754	45.7	22	Ehnes et al. (2011)	[1]
994	Insecta	Coleoptera	*Platynus dorsalis*	C	0.09035	10	22	Ehnes et al. (2011)	[1]
995	Insecta	Coleoptera	*Notiophilus sp.*	C	0.055376	4.4	22	Ehnes et al. (2011)	[1]
996	Insecta	Coleoptera	*Notiophilus sp.*	C	0.110751	4.2	22	Ehnes et al. (2011)	[1]
997	Insecta	Coleoptera	*Notiophilus sp.*	C	0.163213	5.2	22	Ehnes et al. (2011)	[1]
998	Insecta	Coleoptera	*Notiophilus sp.*	C	0.145725	6.4	22	Ehnes et al. (2011)	[1]
999	Insecta	Coleoptera	*Notiophilus sp.*	C	0.03206	7.9	22	Ehnes et al. (2011)	[1]
1000	Insecta	Coleoptera	*Platynus dorsalis*	C	0.224417	12.1	22	Ehnes et al. (2011)	[1]
1001	Insecta	Coleoptera	*Platynus dorsalis*	C	0.136982	9.8	22	Ehnes et al. (2011)	[1]
1002	Insecta	Coleoptera	*Platynus dorsalis*	C	0.1807	12	22	Ehnes et al. (2011)	[1]
1003	Insecta	Coleoptera	*Platynus dorsalis*	C	0.241904	16.5	22	Ehnes et al. (2011)	[1]
1004	Insecta	Coleoptera	*Platynus dorsalis*	C	0.230246	13.7	22	Ehnes et al. (2011)	[1]
1005	Insecta	Coleoptera	*Platynus dorsalis*	C	0.177785	9.3	22	Ehnes et al. (2011)	[1]
1006	Insecta	Coleoptera	*Platynus dorsalis*	C	0.157383	14.2	22	Ehnes et al. (2011)	[1]
1007	Insecta	Coleoptera	*Platynus dorsalis*	C	0.250648	11.7	22	Ehnes et al. (2011)	[1]
1008	Insecta	Coleoptera	*Platynus dorsalis*	C	0.256477	19.2	22	Ehnes et al. (2011)	[1]
1009	Insecta	Coleoptera	*Carabus auratus*	C	2.270403	953.2	22	Ehnes et al. (2011)	[1]
1010	Insecta	Coleoptera	*Carabus auratus*	C	3.946245	635.6	22	Ehnes et al. (2011)	[1]
1011	Insecta	Coleoptera	*Carabus auratus*	C	1.670014	770.8	22	Ehnes et al. (2011)	[1]
1012	Insecta	Coleoptera	*Carabus auratus*	C	3.555701	446.9	22	Ehnes et al. (2011)	[1]
1013	Insecta	Coleoptera	*Carabus auratus*	C	3.004859	713.1	22	Ehnes et al. (2011)	[1]
1014	Insecta	Coleoptera	*Pterostichus melanarius*	C	1.078368	92.2	22	Ehnes et al. (2011)	[1]
1015	Insecta	Coleoptera	*Philonthus sp.*	C	0.288536	17	22	Ehnes et al. (2011)	[1]
1016	Insecta	Coleoptera	*Philonthus sp.*	C	0.338083	22.3	22	Ehnes et al. (2011)	[1]
1017	Insecta	Coleoptera	*Philonthus sp.*	C	0.361399	19.2	22	Ehnes et al. (2011)	[1]
1018	Insecta	Coleoptera	*Platynus dorsalis*	C	0.244819	17	22	Ehnes et al. (2011)	[1]
1019	Insecta	Coleoptera	*Poecilus sp.*	C	0.440091	59.9	22	Ehnes et al. (2011)	[1]
1020	Insecta	Orthoptera	*Gryllus domesticus*	H	0.165741	18	19.8	Krüger (1958)	[1]
1021	Insecta	Orthoptera	*Gryllus domesticus*	H	0.300581	31	19.9	Krüger (1958)	[1]
1022	Insecta	Orthoptera	*Gryllus domesticus*	H	0.317436	33	20.2	Krüger (1958)	[1]

1023	Insecta	Orthoptera	*Gryllus domesticus*	H	0.398901	35	19.8	Krüger (1958)	[1]
1024	Insecta	Orthoptera	*Gryllus domesticus*	H	0.426993	49	20	Krüger (1958)	[1]
1025	Insecta	Orthoptera	*Gryllus domesticus*	H	0.415756	49	19.9	Krüger (1958)	[1]
1026	Insecta	Orthoptera	*Gryllus domesticus*	H	0.469131	53	20.1	Krüger (1958)	[1]
1027	Insecta	Orthoptera	*Gryllus domesticus*	H	0.356764	61	20.9	Krüger (1958)	[1]
1028	Insecta	Orthoptera	*Gryllus domesticus*	H	0.559024	68	20	Krüger (1958)	[1]
1029	Insecta	Orthoptera	*Gryllus domesticus*	H	0.426993	80	20.2	Krüger (1958)	[1]
1030	Insecta	Orthoptera	*Gryllus domesticus*	H	0.736001	125	20	Krüger (1958)	[1]
1031	Insecta	Orthoptera	*Gryllus domesticus*	H	0.648917	132	20.2	Krüger (1958)	[1]
1032	Insecta	Orthoptera	*Gryllus domesticus*	H	0.986017	143	20.1	Krüger (1958)	[1]
1033	Insecta	Orthoptera	*Gryllus domesticus*	H	0.783757	203	20.4	Krüger (1958)	[1]
1034	Insecta	Orthoptera	*Gryllus domesticus*	H	1.536613	267	20	Krüger (1958)	[1]
1035	Insecta	Orthoptera	*Gryllus domesticus*	H	2.022599	267	20.4	Krüger (1958)	[1]
1036	Insecta	Orthoptera	*Gryllus domesticus*	H	2.151821	289	20	Krüger (1958)	[1]
1037	Insecta	Orthoptera	*Gryllus domesticus*	H	1.632125	300	19.8	Krüger (1958)	[1]
1038	Insecta	Orthoptera	*Gryllus domesticus*	H	2.174294	324	20	Krüger (1958)	[1]
1039	Insecta	Orthoptera	*Gryllus domesticus*	H	2.160248	330	20	Krüger (1958)	[1]
1040	Insecta	Orthoptera	*Gryllus domesticus*	H	1.494476	330	20.1	Krüger (1958)	[1]
1041	Insecta	Orthoptera	*Gryllus domesticus*	H	1.935515	357	20	Krüger (1958)	[1]
1042	Insecta	Orthoptera	*Gryllus domesticus*	H	2.460829	366	20.2	Krüger (1958)	[1]
1043	Insecta	Orthoptera	*Gryllus domesticus*	H	2.882204	390	19.8	Krüger (1958)	[1]
1044	Insecta	Orthoptera	*Gryllus domesticus*	H	2.438356	404	20.5	Krüger (1958)	[1]
1045	Insecta	Orthoptera	*Gryllus domesticus*	H	1.896187	428	20.3	Krüger (1958)	[1]
1046	Insecta	Orthoptera	*Gryllus domesticus*	H	1.896187	430	20	Krüger (1958)	[1]
1047	Insecta	Orthoptera	*Gryllus domesticus*	H	3.677198	480	19.5	Krüger (1958)	[1]
1048	Insecta	Orthoptera	*Gryllus domesticus*	H	3.312006	502	20	Krüger (1958)	[1]
1049	Insecta	Orthoptera	*Gryllus domesticus*	H	2.840066	513	20	Krüger (1958)	[1]
1050	Insecta	Orthoptera	*Gryllus domesticus*	H	2.25576	543	20.1	Krüger (1958)	[1]
1051	Insecta	Orthoptera	*Nemobius silvestris*	H	0.151695	29.7	20.3	Krüger (1958)	[1]
1052	Insecta	Orthoptera	*Nemobius silvestris*	H	0.219115	36.4	20	Krüger (1958)	[1]
1053	Insecta	Orthoptera	*Nemobius silvestris*	H	0.421375	56.4	20.5	Krüger (1958)	[1]
1054	Insecta	Orthoptera	*Nemobius silvestris*	H	0.514077	57.2	20.2	Krüger (1958)	[1]
1055	Insecta	Orthoptera	*Nemobius silvestris*	H	0.3371	57.8	20.4	Krüger (1958)	[1]
1056	Insecta	Orthoptera	*Nemobius silvestris*	H	0.446657	62.3	20	Krüger (1958)	[1]
1057	Insecta	Orthoptera	*Nemobius silvestris*	H	0.415756	64.2	20.5	Krüger (1958)	[1]
1058	Insecta	Orthoptera	*Nemobius silvestris*	H	0.474749	65.8	22	Krüger (1958)	[1]
1059	Insecta	Orthoptera	*Nemobius silvestris*	H	0.396092	66.5	20	Krüger (1958)	[1]
1060	Insecta	Orthoptera	*Nemobius silvestris*	H	0.396092	68	19	Krüger (1958)	[1]
1061	Insecta	Orthoptera	*Nemobius silvestris*	H	0.530932	74.6	20.2	Krüger (1958)	[1]
1062	Insecta	Orthoptera	*Nemobius silvestris*	H	0.601161	78.6	20.4	Krüger (1958)	[1]
1063	Insecta	Orthoptera	*Nemobius silvestris*	H	0.817467	80.8	20.8	Krüger (1958)	[1]
1064	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.087435	107.28	10	Ehnes et al. (2011)	[1]
1065	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.09035	197.81	10	Ehnes et al. (2011)	[1]
1066	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.029145	21.91	10	Ehnes et al. (2011)	[1]
1067	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.134067	179.71	10	Ehnes et al. (2011)	[1]
1068	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.11658	130.58	10	Ehnes et al. (2011)	[1]
1069	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.096179	130.49	10	Ehnes et al. (2011)	[1]
1070	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.110751	122.78	10	Ehnes et al. (2011)	[1]
1071	Clitellata	Lumbricina	*Aporectodea rosea*	D	0.043718	109.08	10	Ehnes et al. (2011)	[1]

1072	Clitellata	Lumbricina	*Aporectodea rosea*	D	0.084521	43.02	10	Ehnes et al. (2011)	[1]
1073	Clitellata	Lumbricina	*Aporectodea rosea*	D	0.064119	69.1	10	Ehnes et al. (2011)	[1]
1074	Clitellata	Lumbricina	*Aporectodea rosea*	D	0.064119	53.1	10	Ehnes et al. (2011)	[1]
1075	Clitellata	Lumbricina	*Aporectodea rosea*	D	0.218588	165.95	15	Ehnes et al. (2011)	[1]
1076	Clitellata	Lumbricina	*Aporectodea rosea*	D	0.104922	59.51	15	Ehnes et al. (2011)	[1]
1077	Clitellata	Lumbricina	*Aporectodea rosea*	D	0.099093	58.88	15	Ehnes et al. (2011)	[1]
1078	Clitellata	Lumbricina	*Aporectodea rosea*	D	0.20693	146.41	15	Ehnes et al. (2011)	[1]
1079	Clitellata	Lumbricina	*Aporectodea rosea*	D	0.247733	134.26	15	Ehnes et al. (2011)	[1]
1080	Clitellata	Lumbricina	*Aporectodea rosea*	D	0.139896	97.68	15	Ehnes et al. (2011)	[1]
1081	Clitellata	Lumbricina	*Aporectodea rosea*	D	0.096179	54.41	15	Ehnes et al. (2011)	[1]
1082	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.177785	96.61	15	Ehnes et al. (2011)	[1]
1083	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.250648	168.42	15	Ehnes et al. (2011)	[1]
1084	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.256477	133.72	15	Ehnes et al. (2011)	[1]
1085	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.209845	165.55	15	Ehnes et al. (2011)	[1]
1086	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.093264	18.35	15	Ehnes et al. (2011)	[1]
1087	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.233161	329.68	15	Ehnes et al. (2011)	[1]
1088	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.142811	69.26	15	Ehnes et al. (2011)	[1]
1089	Clitellata	Lumbricina	*Aporectodea rosea*	D	0.306023	104.06	20	Ehnes et al. (2011)	[1]
1090	Clitellata	Lumbricina	*Aporectodea rosea*	D	0.099093	41.34	20	Ehnes et al. (2011)	[1]
1091	Clitellata	Lumbricina	*Aporectodea rosea*	D	0.134067	90.47	20	Ehnes et al. (2011)	[1]
1092	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.311852	219.1	20	Ehnes et al. (2011)	[1]
1093	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.139896	81.74	20	Ehnes et al. (2011)	[1]
1094	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.107837	76.05	20	Ehnes et al. (2011)	[1]
1095	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.142811	253.39	20	Ehnes et al. (2011)	[1]
1096	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.279793	153.43	20	Ehnes et al. (2011)	[1]
1097	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.218588	103.2	20	Ehnes et al. (2011)	[1]
1098	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.113666	79.43	20	Ehnes et al. (2011)	[1]
1099	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.340998	175.61	25	Ehnes et al. (2011)	[1]
1100	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.195272	121.6	25	Ehnes et al. (2011)	[1]
1101	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.262306	145.76	25	Ehnes et al. (2011)	[1]
1102	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.23899	122.05	25	Ehnes et al. (2011)	[1]
1103	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.311852	106.85	25	Ehnes et al. (2011)	[1]
1104	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.174871	166.64	25	Ehnes et al. (2011)	[1]
1105	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.285622	166.1	30	Ehnes et al. (2011)	[1]
1106	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.705311	230	30	Ehnes et al. (2011)	[1]
1107	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.550842	235.19	30	Ehnes et al. (2011)	[1]
1108	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.402202	107.37	30	Ehnes et al. (2011)	[1]
1109	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.664508	344.57	30	Ehnes et al. (2011)	[1]
1110	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.338083	104.74	30	Ehnes et al. (2011)	[1]
1111	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.306023	74.31	30	Ehnes et al. (2011)	[1]
1112	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.233161	236.14	5	Ehnes et al. (2011)	[1]
1113	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.250648	454.54	5	Ehnes et al. (2011)	[1]
1114	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.23899	191.6	5	Ehnes et al. (2011)	[1]
1115	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.317681	324.96	5	Ehnes et al. (2011)	[1]
1116	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.215674	449.37	5	Ehnes et al. (2011)	[1]
1117	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.332254	592.8	5	Ehnes et al. (2011)	[1]
1118	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.338083	577.02	5	Ehnes et al. (2011)	[1]
1119	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.215674	82.9	11.3	Ehnes et al. (2011)	[1]
1120	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.574158	687.58	11.3	Ehnes et al. (2011)	[1]

1121	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.399288	371.15	11.3	Ehnes et al. (2011)	[1]
1122	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.609132	781.8	11.3	Ehnes et al. (2011)	[1]
1123	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.577073	409.7	11.3	Ehnes et al. (2011)	[1]
1124	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.119495	61.27	11.3	Ehnes et al. (2011)	[1]
1125	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.113666	83.3	11.3	Ehnes et al. (2011)	[1]
1126	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.093264	43.36	11.3	Ehnes et al. (2011)	[1]
1127	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.428433	481.02	11.3	Ehnes et al. (2011)	[1]
1128	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.457578	593.81	11.3	Ehnes et al. (2011)	[1]
1129	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.381801	606.4	5	Ehnes et al. (2011)	[1]
1130	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.303109	578.2	5	Ehnes et al. (2011)	[1]
1131	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.332254	551.33	5	Ehnes et al. (2011)	[1]
1132	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.250648	471.48	5	Ehnes et al. (2011)	[1]
1133	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.189443	112.79	5	Ehnes et al. (2011)	[1]
1134	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.166127	198.19	5	Ehnes et al. (2011)	[1]
1135	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.125324	162.67	5	Ehnes et al. (2011)	[1]
1136	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.023316	54.12	5	Ehnes et al. (2011)	[1]
1137	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.040803	245.59	5	Ehnes et al. (2011)	[1]
1138	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.209845	60.88	24.9	Ehnes et al. (2011)	[1]
1139	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.230246	88.89	24.9	Ehnes et al. (2011)	[1]
1140	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.189443	174	10.6	Ehnes et al. (2011)	[1]
1141	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.35557	387.15	10.6	Ehnes et al. (2011)	[1]
1142	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.311852	386.64	10.6	Ehnes et al. (2011)	[1]
1143	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.23899	261.58	10.6	Ehnes et al. (2011)	[1]
1144	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.326425	345.75	10.6	Ehnes et al. (2011)	[1]
1145	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.122409	89.3	10.6	Ehnes et al. (2011)	[1]
1146	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.157383	109.28	10.6	Ehnes et al. (2011)	[1]
1147	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.157383	157.15	10.6	Ehnes et al. (2011)	[1]
1148	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.154469	176.2	10.6	Ehnes et al. (2011)	[1]
1149	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.099093	68.18	10.6	Ehnes et al. (2011)	[1]
1150	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.078692	84.38	5	Ehnes et al. (2011)	[1]
1151	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.014573	41.9	5	Ehnes et al. (2011)	[1]
1152	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.011658	59.43	5	Ehnes et al. (2011)	[1]
1153	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.023316	110.01	5	Ehnes et al. (2011)	[1]
1154	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.055376	164.27	5	Ehnes et al. (2011)	[1]
1155	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.037889	79.49	5	Ehnes et al. (2011)	[1]
1156	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.081606	157	5	Ehnes et al. (2011)	[1]
1157	Clitellata	Lumbricina	*Aporectodea caliginosa*	D	0.029145	140.95	5	Ehnes et al. (2011)	[1]
1158	Clitellata	Lumbricina	*Lumbricus terrestris*	D	1.349418	2468	5	Ehnes et al. (2011)	[1]
1159	Clitellata	Lumbricina	*Lumbricus terrestris*	D	2.013926	4013.1	5	Ehnes et al. (2011)	[1]
1160	Clitellata	Lumbricina	*Lumbricus terrestris*	D	0.848122	4672.41	5	Ehnes et al. (2011)	[1]
1161	Clitellata	Lumbricina	*Lumbricus terrestris*	D	1.93232	6237.6	5	Ehnes et al. (2011)	[1]
1162	Clitellata	Lumbricina	*Lumbricus terrestris*	D	1.964379	2575.2	5	Ehnes et al. (2011)	[1]
1163	Clitellata	Lumbricina	*Lumbricus terrestris*	D	2.013926	6277.7	5	Ehnes et al. (2011)	[1]
1164	Clitellata	Lumbricina	*Dendrobaena veneta*	D	0.886011	1089.7	5	Ehnes et al. (2011)	[1]
1165	Clitellata	Lumbricina	*Dendrobaena veneta*	D	0.976361	1249.3	5	Ehnes et al. (2011)	[1]
1166	Clitellata	Lumbricina	*Dendrobaena veneta*	D	0.542099	707.8	5	Ehnes et al. (2011)	[1]
1167	Clitellata	Lumbricina	*Dendrobaena veneta*	D	0.393459	789.5	5	Ehnes et al. (2011)	[1]
1168	Clitellata	Lumbricina	*Lumbricus terrestris*	D	4.15609	4441.6	25	Ehnes et al. (2011)	[1]
1169	Clitellata	Lumbricina	*Lumbricus terrestris*	D	6.344886	5254.2	25	Ehnes et al. (2011)	[1]

1170	Clitellata	Lumbricina	*Lumbricus terrestris*	D	4.561207	4766.4	25	Ehnes et al. (2011)	[1]
1171	Clitellata	Lumbricina	*Lumbricus terrestris*	D	4.587437	5907.2	25	Ehnes et al. (2011)	[1]
1172	Clitellata	Lumbricina	*Lumbricus terrestris*	D	4.587437	6508.9	25	Ehnes et al. (2011)	[1]
1173	Clitellata	Lumbricina	*Dendrobaena veneta*	D	0.792746	914.8	25	Ehnes et al. (2011)	[1]
1174	Clitellata	Lumbricina	*Dendrobaena veneta*	D	2.710493	1165.2	25	Ehnes et al. (2011)	[1]
1175	Clitellata	Lumbricina	*Eisenia foetida*	D	2.220856	500.3	25	Ehnes et al. (2011)	[1]
1176	Clitellata	Lumbricina	*Eisenia foetida*	D	1.148317	323.4	25	Ehnes et al. (2011)	[1]
1177	Clitellata	Lumbricina	*Eisenia foetida*	D	1.244495	440.4	25	Ehnes et al. (2011)	[1]
1178	Clitellata	Lumbricina	*Eisenia foetida*	D	1.206607	307.3	25	Ehnes et al. (2011)	[1]
1179	Clitellata	Lumbricina	*Eisenia foetida*	D	1.742876	544.9	25	Ehnes et al. (2011)	[1]
1180	Clitellata	Lumbricina	*Eisenia foetida*	D	1.110428	443	25	Ehnes et al. (2011)	[1]
1181	Clitellata	Lumbricina	*Lumbricus terrestris*	D	4.284328	3807.4	25	Ehnes et al. (2011)	[1]
1182	Clitellata	Lumbricina	*Dendrobaena veneta*	D	2.663861	866.5	25	Ehnes et al. (2011)	[1]
1183	Clitellata	Lumbricina	*Dendrobaena veneta*	D	3.022346	1177.6	25	Ehnes et al. (2011)	[1]
1184	Clitellata	Lumbricina	*Dendrobaena veneta*	D	6.994822	873.3	25	Ehnes et al. (2011)	[1]
1185	Clitellata	Lumbricina	*Lumbricus terrestris*	D	2.337436	5394.4	10	Ehnes et al. (2011)	[1]
1186	Clitellata	Lumbricina	*Lumbricus terrestris*	D	1.804081	3441.1	10	Ehnes et al. (2011)	[1]
1187	Clitellata	Lumbricina	*Lumbricus terrestris*	D	2.270403	5537.4	10	Ehnes et al. (2011)	[1]
1188	Clitellata	Lumbricina	*Lumbricus terrestris*	D	2.497734	4718.1	10	Ehnes et al. (2011)	[1]
1189	Clitellata	Lumbricina	*Lumbricus terrestris*	D	2.276232	4300.7	10	Ehnes et al. (2011)	[1]
1190	Clitellata	Lumbricina	*Lumbricus terrestris*	D	2.911595	3575.1	10	Ehnes et al. (2011)	[1]
1191	Clitellata	Lumbricina	*Eisenia foetida*	D	0.507125	428.58	10	Ehnes et al. (2011)	[1]
1192	Clitellata	Lumbricina	*Eisenia foetida*	D	0.405117	544.01	10	Ehnes et al. (2011)	[1]
1193	Clitellata	Lumbricina	*Eisenia foetida*	D	0.174871	266.8	10	Ehnes et al. (2011)	[1]
1194	Clitellata	Lumbricina	*Eisenia foetida*	D	0.23899	417.95	5	Ehnes et al. (2011)	[1]
1195	Clitellata	Lumbricina	*Eisenia foetida*	D	0.215674	265.38	5	Ehnes et al. (2011)	[1]
1196	Clitellata	Lumbricina	*Dendrobaena veneta*	D	1.366905	1213.13	5	Ehnes et al. (2011)	[1]
1197	Clitellata	Lumbricina	*Dendrobaena veneta*	D	1.063796	953.69	5	Ehnes et al. (2011)	[1]
1198	Clitellata	Lumbricina	*Lumbricus terrestris*	D	2.054729	5245.62	5	Ehnes et al. (2011)	[1]
1199	Clitellata	Lumbricina	*Lumbricus terrestris*	D	1.69333	2652.76	5	Ehnes et al. (2011)	[1]
1200	Clitellata	Lumbricina	*Lumbricus terrestris*	D	1.827397	3101.52	5	Ehnes et al. (2011)	[1]
1201	Clitellata	Lumbricina	*Dendrobaena veneta*	D	1.917747	1297.64	20	Ehnes et al. (2011)	[1]
1202	Clitellata	Lumbricina	*Dendrobaena veneta*	D	1.716646	1178.26	20	Ehnes et al. (2011)	[1]
1203	Clitellata	Lumbricina	*Dendrobaena veneta*	D	0.862695	290.44	20	Ehnes et al. (2011)	[1]
1204	Clitellata	Lumbricina	*Dendrobaena veneta*	D	1.381477	730.59	20	Ehnes et al. (2011)	[1]
1205	Clitellata	Lumbricina	*Lumbricus terrestris*	D	2.357838	3560.38	20	Ehnes et al. (2011)	[1]
1206	Clitellata	Lumbricina	*Lumbricus terrestris*	D	3.482838	4837.76	20	Ehnes et al. (2011)	[1]
1207	Clitellata	Lumbricina	*Lumbricus terrestris*	D	2.550195	3824.67	20	Ehnes et al. (2011)	[1]
1208	Clitellata	Lumbricina	*Lumbricus terrestris*	D	4.054082	6234.1	20	Ehnes et al. (2011)	[1]
1209	Clitellata	Lumbricina	*Lumbricus terrestris*	D	2.931996	4085.95	20	Ehnes et al. (2011)	[1]
1210	Clitellata	Lumbricina	*Lumbricus terrestris*	D	6.994822	4653.3	20	Ehnes et al. (2011)	[1]
1211	Clitellata	Lumbricina	*Dendrobaena veneta*	D	1.043394	1482.51	10	Ehnes et al. (2011)	[1]
1212	Clitellata	Lumbricina	*Dendrobaena veneta*	D	0.851037	1569.2	10	Ehnes et al. (2011)	[1]
1213	Clitellata	Lumbricina	*Eisenia foetida*	D	0.378886	406.93	10	Ehnes et al. (2011)	[1]
1214	Clitellata	Lumbricina	*Eisenia foetida*	D	0.475065	458.03	10	Ehnes et al. (2011)	[1]
1215	Clitellata	Lumbricina	*Lumbricus terrestris*	D	2.19754	2682.14	10	Ehnes et al. (2011)	[1]
1216	Clitellata	Lumbricina	*Lumbricus terrestris*	D	2.264574	6610.04	10	Ehnes et al. (2011)	[1]
1217	Clitellata	Lumbricina	*Lumbricus terrestris*	D	2.480247	4411.2	15	Ehnes et al. (2011)	[1]
1218	Clitellata	Lumbricina	*Lumbricus terrestris*	D	3.034004	5808.3	15	Ehnes et al. (2011)	[1]

1219	Clitellata	Lumbricina	*Lumbricus terrestris*	D	2.386983	4841	15	Ehnes et al. (2011)	[1]
1220	Clitellata	Lumbricina	*Lumbricus terrestris*	D	3.375002	5191.1	15	Ehnes et al. (2011)	[1]
1221	Clitellata	Lumbricina	*Lumbricus terrestris*	D	3.240934	4054.7	15	Ehnes et al. (2011)	[1]
1222	Clitellata	Lumbricina	*Lumbricus terrestris*	D	2.978628	2459.8	15	Ehnes et al. (2011)	[1]
1223	Clitellata	Lumbricina	*Dendrobaena veneta*	D	1.352332	940.1	15	Ehnes et al. (2011)	[1]
1224	Clitellata	Lumbricina	*Dendrobaena veneta*	D	1.352332	1168	15	Ehnes et al. (2011)	[1]
1225	Clitellata	Lumbricina	*Dendrobaena veneta*	D	2.299548	1184.1	15	Ehnes et al. (2011)	[1]
1226	Clitellata	Lumbricina	*Dendrobaena veneta*	D	1.541775	782.5	15	Ehnes et al. (2011)	[1]
1227	Clitellata	Lumbricina	*Dendrobaena veneta*	D	2.331607	1090.2	20	Ehnes et al. (2011)	[1]
1228	Clitellata	Lumbricina	*Dendrobaena veneta*	D	2.442359	1081.4	20	Ehnes et al. (2011)	[1]
1229	Clitellata	Lumbricina	*Lumbricus terrestris*	D	3.229276	2176.2	20	Ehnes et al. (2011)	[1]
1230	Clitellata	Lumbricina	*Lumbricus terrestris*	D	3.010688	1632.8	20	Ehnes et al. (2011)	[1]
1231	Clitellata	Lumbricina	*Eisenia foetida*	D	1.186205	364.2	20	Ehnes et al. (2011)	[1]
1232	Clitellata	Lumbricina	*Eisenia foetida*	D	1.142488	382.1	20	Ehnes et al. (2011)	[1]
1233	Clitellata	Lumbricina	*Eisenia foetida*	D	0.955959	344	20	Ehnes et al. (2011)	[1]
1234	Clitellata	Lumbricina	*Eisenia foetida*	D	1.011335	402.4	20	Ehnes et al. (2011)	[1]
1235	Clitellata	Lumbricina	*Dendrobaena veneta*	D	0.83355	679.8	10	Ehnes et al. (2011)	[1]
1236	Clitellata	Lumbricina	*Dendrobaena veneta*	D	1.911918	1348.5	10	Ehnes et al. (2011)	[1]
1237	Clitellata	Lumbricina	*Dendrobaena veneta*	D	0.734456	898.7	10	Ehnes et al. (2011)	[1]
1238	Clitellata	Lumbricina	*Dendrobaena veneta*	D	1.847799	1127.9	10	Ehnes et al. (2011)	[1]
1239	Clitellata	Lumbricina	*Eisenia foetida*	D	1.014249	377.9	10	Ehnes et al. (2011)	[1]
1240	Clitellata	Lumbricina	*Eisenia foetida*	D	0.29728	253.91	14.6	Ehnes et al. (2011)	[1]
1241	Clitellata	Lumbricina	*Eisenia foetida*	D	0.346827	235.19	14.6	Ehnes et al. (2011)	[1]
1242	Clitellata	Lumbricina	*Eisenia foetida*	D	0.396373	355.43	14.6	Ehnes et al. (2011)	[1]
1243	Clitellata	Lumbricina	*Eisenia foetida*	D	0.204016	65.18	14.6	Ehnes et al. (2011)	[1]
1244	Clitellata	Lumbricina	*Eisenia foetida*	D	1.177462	624.49	14.6	Ehnes et al. (2011)	[1]
1245	Clitellata	Lumbricina	*Dendrobaena veneta*	D	0.588731	232.67	14.6	Ehnes et al. (2011)	[1]
1246	Clitellata	Lumbricina	*Lumbricus terrestris*	D	2.153822	2644.1	14.6	Ehnes et al. (2011)	[1]
1247	Clitellata	Lumbricina	*Dendrobaena veneta*	D	3.170986	835.43	24.8	Ehnes et al. (2011)	[1]
1248	Clitellata	Lumbricina	*Dendrobaena veneta*	D	2.663861	1675.72	24.8	Ehnes et al. (2011)	[1]
1249	Clitellata	Lumbricina	*Dendrobaena veneta*	D	2.133421	1442.86	24.8	Ehnes et al. (2011)	[1]
1250	Clitellata	Lumbricina	*Eisenia foetida*	D	1.291128	334.03	24.8	Ehnes et al. (2011)	[1]
1251	Clitellata	Lumbricina	*Lumbricus terrestris*	D	4.572865	4995.3	24.8	Ehnes et al. (2011)	[1]
1252	Clitellata	Lumbricina	*Eisenia foetida*	D	0.09035	42.2	14.6	Ehnes et al. (2011)	[1]
1253	Clitellata	Lumbricina	*Eisenia foetida*	D	0.20693	94.5	14.6	Ehnes et al. (2011)	[1]
1254	Clitellata	Lumbricina	*Eisenia foetida*	D	0.556671	406.56	14.6	Ehnes et al. (2011)	[1]
1255	Clitellata	Lumbricina	*Dendrobaena veneta*	D	1.941063	1119.35	14.6	Ehnes et al. (2011)	[1]
1256	Clitellata	Lumbricina	*Eisenia foetida*	D	0.80149	200.34	24.8	Ehnes et al. (2011)	[1]
1257	Clitellata	Lumbricina	*Eisenia foetida*	D	0.754858	188.64	24.8	Ehnes et al. (2011)	[1]
1258	Clitellata	Lumbricina	*Eisenia foetida*	D	0.326425	107.89	24.8	Ehnes et al. (2011)	[1]
1259	Clitellata	Lumbricina	*Dendrobaena veneta*	D	2.745468	873.51	26.3	Ehnes et al. (2011)	[1]
1260	Clitellata	Lumbricina	*Dendrobaena veneta*	D	2.284975	587.98	26.3	Ehnes et al. (2011)	[1]
1261	Clitellata	Lumbricina	*Dendrobaena veneta*	D	2.500649	936.51	26.3	Ehnes et al. (2011)	[1]
1262	Clitellata	Lumbricina	*Lumbricus terrestris*	D	6.703371	5750.01	26.3	Ehnes et al. (2011)	[1]
1263	Clitellata	Lumbricina	*Lumbricus terrestris*	D	4.494173	4217.05	26.3	Ehnes et al. (2011)	[1]
1264	Clitellata	Lumbricina	*Lumbricus terrestris*	D	4.0978	4416.59	26.3	Ehnes et al. (2011)	[1]
1265	Clitellata	Lumbricina	*Eisenia foetida*	D	0.125324	36.67	5.4	Ehnes et al. (2011)	[1]
1266	Clitellata	Lumbricina	*Eisenia foetida*	D	0.189443	67.56	5.4	Ehnes et al. (2011)	[1]
1267	Clitellata	Lumbricina	*Eisenia foetida*	D	0.177785	318.66	5.4	Ehnes et al. (2011)	[1]

1268	Clitellata	Lumbricina	*Eisenia foetida*	D	0.166127	256.83	5.4	Ehnes et al. (2011)	[1]
1269	Clitellata	Lumbricina	*Eisenia foetida*	D	0.737371	111.87	24.9	Ehnes et al. (2011)	[1]
1270	Clitellata	Lumbricina	*Allolobophora caliginosa*	D	1.4	875	19	Byzova (1965)	[2]
1271	Clitellata	Lumbricina	*Allolobophora caliginosa*	D	0.461	335	6	Phillipson and Bolton (1976)	[2]
1272	Clitellata	Lumbricina	*Allolobophora caliginosa*	D	0.692	335	10	Phillipson and Bolton (1976)	[2]
1273	Clitellata	Lumbricina	*Allolobophora caliginosa*	D	0.879	335	15	Phillipson and Bolton (1976)	[2]
1274	Clitellata	Lumbricina	*Dendrobaena octaedra*	D	0.847	230	19	Byzova (1965)	[2]
1275	Clitellata	Lumbricina	*Eisenia foetida*	D	0.704	335	15	Mitchell (1979)	[2]
1276	Clitellata	Lumbricina	*Eisenia foetida*	D	0.631	335	19	Byzova (1965)	[2]
1277	Clitellata	Lumbricina	*Eisenia rosea*	D	0.629	335	19	Byzova (1965)	[2]
1278	Clitellata	Lumbricina	*Eiseniella tetraedra*	D	0.312	110	19	Byzova (1965)	[2]
1279	Clitellata	Lumbricina	*Glossoscolex paulistus*	D	8.65	10200	15	Abe and Buck (1985)	[2]
1280	Clitellata	Lumbricina	*Glossoscolex paulistus*	D	8.87	9500	20	Abe and Buck (1985)	[2]
1281	Clitellata	Lumbricina	*Glossoscolex paulistus*	D	10.5	10000	25	Abe and Buck (1985)	[2]
1282	Clitellata	Lumbricina	*Glossoscolex paulistus*	D	14.3	10400	30	Abe and Buck (1985)	[2]
1283	Clitellata	Lumbricina	*Glossoscolex paulistus*	D	15.7	10500	35	Abe and Buck (1985)	[2]
1284	Clitellata	Lumbricina	*Lumbricus castaneus*	D	2.05	1500	11	Gromadska (1962)	[2]
1285	Clitellata	Lumbricina	*Lumbricus castaneus*	D	1.67	1500	14	Gromadska (1962)	[2]
1286	Clitellata	Lumbricina	*Lumbricus castaneus*	D	2.2	1500	17	Gromadska (1962)	[2]
1287	Clitellata	Lumbricina	*Lumbricus castaneus*	D	0.697	240	19	Byzova (1965)	[2]
1288	Clitellata	Lumbricina	*Lumbricus castaneus*	D	1.75	1500	20	Gromadska (1962)	[2]
1289	Clitellata	Lumbricina	*Lumbricus castaneus*	D	2.12	1500	23	Gromadska (1962)	[2]
1290	Clitellata	Lumbricina	*Lumbricus castaneus*	D	2.72	1500	26	Gromadska (1962)	[2]
1291	Clitellata	Lumbricina	*Lumbricus rubellus*	D	1.47	745	19	Byzova (1965)	[2]
1292	Clitellata	Lumbricina	*Lumbricus terrestris*	D	2.44	4300	5	Fitzpatrick et al. (1987)	[2]
1293	Clitellata	Lumbricina	*Lumbricus terrestris*	D	3.28	4300	10	Fitzpatrick et al. (1987)	[2]
1294	Clitellata	Lumbricina	*Lumbricus terrestris*	D	3.77	4300	15	Fitzpatrick et al. (1987)	[2]
1295	Clitellata	Lumbricina	*Lumbricus terrestris*	D	3.32	2600	19	Byzova (1965)	[2]
1296	Clitellata	Lumbricina	*Lumbricus terrestris*	D	5.61	4300	20	Fitzpatrick et al. (1987)	[2]
1297	Clitellata	Lumbricina	*Octolasium lacteum*	D	1.52	1075	19	Byzova (1965)	[2]
1298	Clitellata	Lumbricina	*Eisenia foetida*	D	0.589925	780	12	Knoz (1957)	[1]
1299	Clitellata	Lumbricina	*Eisenia foetida*	D	0.603971	670	15	Knoz (1957)	[1]
1300	Clitellata	Lumbricina	*Eisenia foetida*	D	0.884887	750	18	Knoz (1957)	[1]
1301	Clitellata	Lumbricina	*Eisenia foetida*	D	0.927025	610	21	Knoz (1957)	[1]
1302	Clitellata	Lumbricina	*Eisenia foetida*	D	1.27817	660	24	Knoz (1957)	[1]
1303	Clitellata	Lumbricina	*Eisenia foetida*	D	1.629316	630	27	Knoz (1957)	[1]
1304	Clitellata	Lumbricina	*Eisenia foetida*	D	2.443974	680	30	Knoz (1957)	[1]
1305	Clitellata	Lumbricina	*Eisenia foetida*	D	3.286724	760	33	Knoz (1957)	[1]
1306	Clitellata	Lumbricina	*Eisenia foetida*	D	2.443974	740	36	Knoz (1957)	[1]
1307	Clitellata	Lumbricina	*Eiseniella tetraedra*	D	0.120794	140	12	Knoz (1957)	[1]
1308	Clitellata	Lumbricina	*Eiseniella tetraedra*	D	0.130626	130	15	Knoz (1957)	[1]
1309	Clitellata	Lumbricina	*Eiseniella tetraedra*	D	0.160122	110	18	Knoz (1957)	[1]
1310	Clitellata	Lumbricina	*Eiseniella tetraedra*	D	0.221924	110	21	Knoz (1957)	[1]
1311	Clitellata	Lumbricina	*Eiseniella tetraedra*	D	0.292153	120	24	Knoz (1957)	[1]
1312	Clitellata	Lumbricina	*Eiseniella tetraedra*	D	0.422779	150	27	Knoz (1957)	[1]
1313	Clitellata	Lumbricina	*Eiseniella tetraedra*	D	0.282321	110	30	Knoz (1957)	[1]
1314	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.140458	150	15	Saroja (1959)	[1]
1315	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.224733	250	15	Saroja (1959)	[1]
1316	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.421375	300	15	Saroja (1959)	[1]

1317	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.421375	400	15	Saroja (1959)	[1]
1318	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.646108	500	15	Saroja (1959)	[1]
1319	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.77252	600	15	Saroja (1959)	[1]
1320	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.84275	700	15	Saroja (1959)	[1]
1321	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.84275	800	15	Saroja (1959)	[1]
1322	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.702291	800	15	Saroja (1959)	[1]
1323	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.983208	900	15	Saroja (1959)	[1]
1324	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.264124	1100	15	Saroja (1959)	[1]
1325	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.84275	1200	15	Saroja (1959)	[1]
1326	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.264124	1300	15	Saroja (1959)	[1]
1327	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.84275	1300	15	Saroja (1959)	[1]
1328	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.264124	1400	15	Saroja (1959)	[1]
1329	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.123666	1500	15	Saroja (1959)	[1]
1330	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.421375	600	15	Saroja (1959)	[1]
1331	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.280917	150	20	Saroja (1959)	[1]
1332	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.421375	250	20	Saroja (1959)	[1]
1333	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.77252	300	20	Saroja (1959)	[1]
1334	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.84275	400	20	Saroja (1959)	[1]
1335	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.786566	500	20	Saroja (1959)	[1]
1336	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.123666	600	20	Saroja (1959)	[1]
1337	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.264124	700	20	Saroja (1959)	[1]
1338	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.404583	800	20	Saroja (1959)	[1]
1339	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.983208	800	20	Saroja (1959)	[1]
1340	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.264124	900	20	Saroja (1959)	[1]
1341	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.545041	1100	20	Saroja (1959)	[1]
1342	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.685499	1200	20	Saroja (1959)	[1]
1343	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.685499	1300	20	Saroja (1959)	[1]
1344	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.545041	1300	20	Saroja (1959)	[1]
1345	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.685499	1400	20	Saroja (1959)	[1]
1346	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.825958	1500	20	Saroja (1959)	[1]
1347	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.067483	600	20	Saroja (1959)	[1]
1348	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.50565	150	25	Saroja (1959)	[1]
1349	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.632062	250	25	Saroja (1959)	[1]
1350	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.84275	400	25	Saroja (1959)	[1]
1351	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.983208	500	25	Saroja (1959)	[1]
1352	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.348399	600	25	Saroja (1959)	[1]
1353	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.404583	700	25	Saroja (1959)	[1]
1354	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.61527	800	25	Saroja (1959)	[1]
1355	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.264124	900	25	Saroja (1959)	[1]
1356	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.825958	1100	25	Saroja (1959)	[1]
1357	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.966416	1200	25	Saroja (1959)	[1]
1358	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.825958	1300	25	Saroja (1959)	[1]
1359	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.896187	1300	25	Saroja (1959)	[1]
1360	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.825958	1400	25	Saroja (1959)	[1]
1361	Clitellata	Lumbricina	*Megascolex mauritii*	D	2.106874	1500	25	Saroja (1959)	[1]
1362	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.418629	600	25	Saroja (1959)	[1]
1363	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.702291	150	30	Saroja (1959)	[1]
1364	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.702291	250	30	Saroja (1959)	[1]
1365	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.067483	400	30	Saroja (1959)	[1]

1366	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.264124	500	30	Saroja (1959)	[1]
1367	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.404583	600	30	Saroja (1959)	[1]
1368	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.685499	700	30	Saroja (1959)	[1]
1369	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.404583	800	30	Saroja (1959)	[1]
1370	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.825958	900	30	Saroja (1959)	[1]
1371	Clitellata	Lumbricina	*Megascolex mauritii*	D	2.106874	1100	30	Saroja (1959)	[1]
1372	Clitellata	Lumbricina	*Megascolex mauritii*	D	2.247332	1200	30	Saroja (1959)	[1]
1373	Clitellata	Lumbricina	*Megascolex mauritii*	D	2.528249	1300	30	Saroja (1959)	[1]
1374	Clitellata	Lumbricina	*Megascolex mauritii*	D	2.949624	1300	30	Saroja (1959)	[1]
1375	Clitellata	Lumbricina	*Megascolex mauritii*	D	2.247332	1400	30	Saroja (1959)	[1]
1376	Clitellata	Lumbricina	*Megascolex mauritii*	D	2.387791	1500	30	Saroja (1959)	[1]
1377	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.825958	600	30	Saroja (1959)	[1]
1378	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.983208	150	35	Saroja (1959)	[1]
1379	Clitellata	Lumbricina	*Megascolex mauritii*	D	0.983208	250	35	Saroja (1959)	[1]
1380	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.264124	400	35	Saroja (1959)	[1]
1381	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.825958	500	35	Saroja (1959)	[1]
1382	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.685499	600	35	Saroja (1959)	[1]
1383	Clitellata	Lumbricina	*Megascolex mauritii*	D	2.064737	700	35	Saroja (1959)	[1]
1384	Clitellata	Lumbricina	*Megascolex mauritii*	D	1.545041	800	35	Saroja (1959)	[1]
1385	Clitellata	Lumbricina	*Megascolex mauritii*	D	2.036645	900	35	Saroja (1959)	[1]
1386	Clitellata	Lumbricina	*Megascolex mauritii*	D	3.23054	1100	35	Saroja (1959)	[1]
1387	Clitellata	Lumbricina	*Megascolex mauritii*	D	2.177103	1200	35	Saroja (1959)	[1]
1388	Clitellata	Lumbricina	*Megascolex mauritii*	D	3.932832	1300	35	Saroja (1959)	[1]
1389	Clitellata	Lumbricina	*Megascolex mauritii*	D	3.722144	1300	35	Saroja (1959)	[1]
1390	Clitellata	Lumbricina	*Megascolex mauritii*	D	3.370999	1400	35	Saroja (1959)	[1]
1391	Clitellata	Lumbricina	*Megascolex mauritii*	D	2.528249	1500	35	Saroja (1959)	[1]
1392	Clitellata	Lumbricina	*Megascolex mauritii*	D	2.528249	600	35	Saroja (1959)	[1]
1393	Clitellata	Enchytraeidae	*Hemihenlea sp.*	D	0.000279	0.026	20	O'Connor (1963)	[1]
1394	Clitellata	Enchytraeidae	*Hemihenlea sp.*	D	0.000544	0.064	20	O'Connor (1963)	[1]
1395	Clitellata	Enchytraeidae	*Hemihenlea sp.*	D	0.000674	0.16	20	O'Connor (1963)	[1]
1396	Clitellata	Enchytraeidae	*Hemihenlea sp.*	D	0.000449	0.237	20	O'Connor (1963)	[1]
1397	Clitellata	Enchytraeidae	*Cognettia sp.*	D	0.000793	0.057	20	O'Connor (1963)	[1]
1398	Clitellata	Enchytraeidae	*Cognettia sp.*	D	0.001668	0.19	20	O'Connor (1963)	[1]
1399	Clitellata	Enchytraeidae	*Cognettia sp.*	D	0.001719	0.36	20	O'Connor (1963)	[1]
1400	Clitellata	Enchytraeidae	*Achaeta sp.*	D	0.000222	0.02	20	O'Connor (1963)	[1]
1401	Clitellata	Enchytraeidae	*Achaeta sp.*	D	0.000508	0.052	20	O'Connor (1963)	[1]
1402	Clitellata	Enchytraeidae	*Achaeta sp.*	D	0.000689	0.114	20	O'Connor (1963)	[1]
1403	Clitellata	Enchytraeidae	*Achaeta sp.*	D	0.000634	0.177	20	O'Connor (1963)	[1]
1404	Chilopoda	Geophilomorpha	Geophilidae	C	0.002915	10.28	5	Ehnes et al. (2011)	[1]
1405	Chilopoda	Geophilomorpha	Geophilidae	C	0.011658	11.97	5	Ehnes et al. (2011)	[1]
1406	Chilopoda	Geophilomorpha	Geophilidae	C	0.006558	2.235	10.2	Ehnes et al. (2011)	[1]
1407	Chilopoda	Geophilomorpha	Geophilidae	C	0.011658	6.18	10.2	Ehnes et al. (2011)	[1]
1408	Chilopoda	Geophilomorpha	Geophilidae	C	0.049547	10.67	10.3	Ehnes et al. (2011)	[1]
1409	Chilopoda	Geophilomorpha	Geophilidae	C	0.008744	7.3	10.3	Ehnes et al. (2011)	[1]
1410	Chilopoda	Geophilomorpha	Geophilidae	C	0.119495	18.49	15.6	Ehnes et al. (2011)	[1]
1411	Chilopoda	Geophilomorpha	Geophilidae	C	0.072863	9.69	15.6	Ehnes et al. (2011)	[1]
1412	Chilopoda	Geophilomorpha	Geophilidae	C	0.09035	11.46	15.6	Ehnes et al. (2011)	[1]
1413	Chilopoda	Geophilomorpha	Geophilidae	C	0.09035	10.32	15.6	Ehnes et al. (2011)	[1]
1414	Chilopoda	Geophilomorpha	Geophilidae	C	0.029145	3.93	15.6	Ehnes et al. (2011)	[1]

1415	Chilopoda	Geophilomorpha	Geophilidae	C	0.136982	19.5	23.4	Ehnes et al. (2011)	[1]
1416	Chilopoda	Geophilomorpha	Geophilidae	C	0.131153	13.14	23.4	Ehnes et al. (2011)	[1]
1417	Chilopoda	Geophilomorpha	Geophilidae	C	0.020402	11.86	23.4	Ehnes et al. (2011)	[1]
1418	Chilopoda	Geophilomorpha	Geophilidae	C	0.38763	109.53	23.4	Ehnes et al. (2011)	[1]
1419	Chilopoda	Geophilomorpha	Geophilidae	C	0.343912	59.46	23.4	Ehnes et al. (2011)	[1]
1420	Chilopoda	Geophilomorpha	Geophilidae	C	0.122409	11.27	23.4	Ehnes et al. (2011)	[1]
1421	Chilopoda	Geophilomorpha	Geophilidae	C	0.585816	54.17	23.4	Ehnes et al. (2011)	[1]
1422	Chilopoda	Geophilomorpha	Geophilidae	C	0.358485	44.48	23.4	Ehnes et al. (2011)	[1]
1423	Chilopoda	Geophilomorpha	Geophilidae	C	0.099093	8.51	23.4	Ehnes et al. (2011)	[1]
1424	Chilopoda	Geophilomorpha	Geophilidae	C	0.087435	23.9	14.7	Ehnes et al. (2011)	[1]
1425	Chilopoda	Geophilomorpha	Geophilidae	C	0.131153	45.43	14.7	Ehnes et al. (2011)	[1]
1426	Chilopoda	Geophilomorpha	Geophilidae	C	0.043718	11	14.7	Ehnes et al. (2011)	[1]
1427	Chilopoda	Geophilomorpha	Geophilidae	C	0.110751	39.32	14.7	Ehnes et al. (2011)	[1]
1428	Chilopoda	Geophilomorpha	Geophilidae	C	0.046632	11.55	14.7	Ehnes et al. (2011)	[1]
1429	Chilopoda	Geophilomorpha	Geophilidae	C	0.046632	11.62	14.7	Ehnes et al. (2011)	[1]
1430	Chilopoda	Geophilomorpha	Geophilidae	C	0.026231	5.69	14.7	Ehnes et al. (2011)	[1]
1431	Chilopoda	Geophilomorpha	Geophilidae	C	0.043718	11.13	14.7	Ehnes et al. (2011)	[1]
1432	Chilopoda	Geophilomorpha	Geophilidae	C	0.44592	47.22	23.4	Ehnes et al. (2011)	[1]
1433	Chilopoda	Geophilomorpha	Geophilidae	C	0.268135	52.51	23.4	Ehnes et al. (2011)	[1]
1434	Chilopoda	Geophilomorpha	Geophilidae	C	0.29728	58.64	23.4	Ehnes et al. (2011)	[1]
1435	Chilopoda	Geophilomorpha	Geophilidae	C	0.338083	59.96	14.8	Ehnes et al. (2011)	[1]
1436	Chilopoda	Geophilomorpha	Geophilidae	C	0.131153	46.76	14.8	Ehnes et al. (2011)	[1]
1437	Chilopoda	Geophilomorpha	Geophilidae	C	0.186529	78.94	14.8	Ehnes et al. (2011)	[1]
1438	Chilopoda	Geophilomorpha	Geophilidae	C	0.259391	85.11	14.8	Ehnes et al. (2011)	[1]
1439	Chilopoda	Geophilomorpha	Geophilidae	C	0.201101	78.19	14.8	Ehnes et al. (2011)	[1]
1440	Chilopoda	Geophilomorpha	Geophilidae	C	0.171956	80.26	14.8	Ehnes et al. (2011)	[1]
1441	Chilopoda	Geophilomorpha	Geophilidae	C	0.078692	11.07	14.8	Ehnes et al. (2011)	[1]
1442	Chilopoda	Geophilomorpha	Geophilidae	C	0.221503	43.86	20.2	Ehnes et al. (2011)	[1]
1443	Chilopoda	Geophilomorpha	Geophilidae	C	0.192358	56.88	20.2	Ehnes et al. (2011)	[1]
1444	Chilopoda	Geophilomorpha	Geophilidae	C	0.154469	10.32	23.4	Ehnes et al. (2011)	[1]
1445	Chilopoda	Geophilomorpha	Geophilidae	C	0.104922	14.05	23.4	Ehnes et al. (2011)	[1]
1446	Chilopoda	Geophilomorpha	Geophilidae	C	0.037889	10.57	14.9	Ehnes et al. (2011)	[1]
1447	Chilopoda	Geophilomorpha	Geophilidae	C	0.163213	60.39	14.9	Ehnes et al. (2011)	[1]
1448	Chilopoda	Geophilomorpha	Geophilidae	C	0.262306	76.19	14.9	Ehnes et al. (2011)	[1]
1449	Chilopoda	Geophilomorpha	Geophilidae	C	0.034974	11.43	14.9	Ehnes et al. (2011)	[1]
1450	Chilopoda	Geophilomorpha	Geophilidae	C	0.247733	37.96	19.9	Ehnes et al. (2011)	[1]
1451	Chilopoda	Geophilomorpha	Geophilidae	C	0.183614	23.98	19.9	Ehnes et al. (2011)	[1]
1452	Chilopoda	Geophilomorpha	Geophilidae	C	0.247733	44.55	19.9	Ehnes et al. (2011)	[1]
1453	Chilopoda	Geophilomorpha	Geophilidae	C	0.005829	41.42	5.8	Ehnes et al. (2011)	[1]
1454	Chilopoda	Geophilomorpha	Geophilidae	C	0.183614	50.91	5.8	Ehnes et al. (2011)	[1]
1455	Chilopoda	Geophilomorpha	Geophilidae	C	0.122409	54.49	11	Ehnes et al. (2011)	[1]
1456	Chilopoda	Geophilomorpha	Geophilidae	C	0.087435	76.11	11	Ehnes et al. (2011)	[1]
1457	Chilopoda	Geophilomorpha	Geophilidae	C	0.067034	21.13	11	Ehnes et al. (2011)	[1]
1458	Chilopoda	Geophilomorpha	Geophilidae	C	0.037889	53.77	11	Ehnes et al. (2011)	[1]
1459	Chilopoda	Geophilomorpha	Geophilidae	C	0.096179	45.91	11	Ehnes et al. (2011)	[1]
1460	Chilopoda	Geophilomorpha	Geophilidae	C	0.125324	105.71	11	Ehnes et al. (2011)	[1]
1461	Chilopoda	Geophilomorpha	Geophilidae	C	0.096179	75.46	11	Ehnes et al. (2011)	[1]
1462	Chilopoda	Geophilomorpha	Geophilidae	C	0.05829	54.5	11	Ehnes et al. (2011)	[1]
1463	Chilopoda	Geophilomorpha	Geophilidae	C	0.03206	103.88	5	Ehnes et al. (2011)	[1]

1464	Chilopoda	Geophilomorpha	Geophilidae	C	0.025502	64.69	9.5	Ehnes et al. (2011)	[1]
1465	Chilopoda	Geophilomorpha	Geophilidae	C	0.025373	57.02	9.5	Ehnes et al. (2011)	[1]
1466	Chilopoda	Geophilomorpha	Geophilidae	C	0.01399	56.19	9.5	Ehnes et al. (2011)	[1]
1467	Chilopoda	Geophilomorpha	Geophilidae	C	0.014989	61.19	9.5	Ehnes et al. (2011)	[1]
1468	Chilopoda	Geophilomorpha	Geophilidae	C	0.016427	52.13	9.5	Ehnes et al. (2011)	[1]
1469	Chilopoda	Geophilomorpha	Geophilidae	C	0.021289	42.72	9.5	Ehnes et al. (2011)	[1]
1470	Chilopoda	Geophilomorpha	Geophilidae	C	0.009715	45.08	9.5	Ehnes et al. (2011)	[1]
1471	Chilopoda	Geophilomorpha	Geophilidae	C	0.119495	67.76	9.5	Ehnes et al. (2011)	[1]
1472	Chilopoda	Geophilomorpha	Geophilidae	C	0.084521	59.8	9.5	Ehnes et al. (2011)	[1]
1473	Chilopoda	Geophilomorpha	Geophilidae	C	0.102008	49.14	9.5	Ehnes et al. (2011)	[1]
1474	Chilopoda	Geophilomorpha	Geophilidae	C	0.145725	41.09	9.5	Ehnes et al. (2011)	[1]
1475	Chilopoda	Geophilomorpha	Geophilidae	C	0.064119	50.47	9.5	Ehnes et al. (2011)	[1]
1476	Chilopoda	Geophilomorpha	Geophilidae	C	0.069948	49.69	9.5	Ehnes et al. (2011)	[1]
1477	Chilopoda	Geophilomorpha	Geophilidae	C	0.081606	45.34	9.5	Ehnes et al. (2011)	[1]
1478	Chilopoda	Geophilomorpha	Geophilidae	C	0.055376	78.72	9.5	Ehnes et al. (2011)	[1]
1479	Chilopoda	Geophilomorpha	Geophilidae	C	0.072863	51.49	9.5	Ehnes et al. (2011)	[1]
1480	Chilopoda	Geophilomorpha	Geophilidae	C	0.11658	64.16	9.5	Ehnes et al. (2011)	[1]
1481	Chilopoda	Geophilomorpha	Geophilidae	C	0.087435	35.8	9.5	Ehnes et al. (2011)	[1]
1482	Chilopoda	Geophilomorpha	Geophilidae	C	0.072863	48.84	9.5	Ehnes et al. (2011)	[1]
1483	Chilopoda	Geophilomorpha	Geophilidae	C	0.078692	47.09	9.5	Ehnes et al. (2011)	[1]
1484	Chilopoda	Geophilomorpha	Geophilidae	C	0.09035	39.68	9.5	Ehnes et al. (2011)	[1]
1485	Chilopoda	Geophilomorpha	Geophilidae	C	0.03206	55.55	5	Ehnes et al. (2011)	[1]
1486	Chilopoda	Geophilomorpha	Geophilidae	C	0.046632	78.42	9.5	Ehnes et al. (2011)	[1]
1487	Chilopoda	Geophilomorpha	Geophilidae	C	0.008744	23.99	9.5	Ehnes et al. (2011)	[1]
1488	Chilopoda	Geophilomorpha	Geophilidae	C	0.037889	18.54	9.5	Ehnes et al. (2011)	[1]
1489	Chilopoda	Geophilomorpha	Geophilidae	C	0.055376	53.88	9.5	Ehnes et al. (2011)	[1]
1490	Chilopoda	Geophilomorpha	Geophilidae	C	0.043718	41.77	9.5	Ehnes et al. (2011)	[1]
1491	Chilopoda	Geophilomorpha	Geophilidae	C	0.218588	32.08	5	Ehnes et al. (2011)	[1]
1492	Chilopoda	Geophilomorpha	Geophilidae	C	0.064119	43.77	9.7	Ehnes et al. (2011)	[1]
1493	Chilopoda	Geophilomorpha	Geophilidae	C	0.043718	35.89	9.7	Ehnes et al. (2011)	[1]
1494	Chilopoda	Geophilomorpha	Geophilidae	C	0.029145	48.98	9.7	Ehnes et al. (2011)	[1]
1495	Chilopoda	Geophilomorpha	Geophilidae	C	0.029145	64.63	5	Ehnes et al. (2011)	[1]
1496	Chilopoda	Geophilomorpha	Geophilidae	C	0.005829	24.78	5	Ehnes et al. (2011)	[1]
1497	Chilopoda	Geophilomorpha	Geophilidae	C	0.049547	55.62	9.9	Ehnes et al. (2011)	[1]
1498	Chilopoda	Geophilomorpha	Geophilidae	C	0.064119	75.89	9.9	Ehnes et al. (2011)	[1]
1499	Chilopoda	Geophilomorpha	Geophilidae	C	0.043718	62.47	5	Ehnes et al. (2011)	[1]
1500	Chilopoda	Geophilomorpha	Geophilidae	C	0.480894	45.96	29.9	Ehnes et al. (2011)	[1]
1501	Chilopoda	Geophilomorpha	Geophilidae	C	0.064119	71.94	9.9	Ehnes et al. (2011)	[1]
1502	Chilopoda	Geophilomorpha	Geophilidae	C	0.061205	63.64	9.9	Ehnes et al. (2011)	[1]
1503	Chilopoda	Geophilomorpha	Geophilidae	C	0.043718	74.93	9.9	Ehnes et al. (2011)	[1]
1504	Chilopoda	Geophilomorpha	Geophilidae	C	0.037889	45.6	9.9	Ehnes et al. (2011)	[1]
1505	Chilopoda	Geophilomorpha	Geophilidae	C	0.05829	52.4	9.9	Ehnes et al. (2011)	[1]
1506	Chilopoda	Geophilomorpha	Geophilidae	C	0.043718	50.48	9.9	Ehnes et al. (2011)	[1]
1507	Chilopoda	Geophilomorpha	Geophilidae	C	0.034974	108.41	9.9	Ehnes et al. (2011)	[1]
1508	Chilopoda	Geophilomorpha	Geophilidae	C	0.017487	9.01	9.9	Ehnes et al. (2011)	[1]
1509	Chilopoda	Geophilomorpha	Geophilidae	C	0.008744	9.2	9.9	Ehnes et al. (2011)	[1]
1510	Chilopoda	Geophilomorpha	Geophilidae	C	0.040803	9.53	5	Ehnes et al. (2011)	[1]
1511	Chilopoda	Geophilomorpha	Geophilidae	C	0.457578	40.2	30	Ehnes et al. (2011)	[1]
1512	Chilopoda	Geophilomorpha	Geophilidae	C	0.597474	108.03	30	Ehnes et al. (2011)	[1]

1513	Chilopoda	Geophilomorpha	Geophilidae	C	0.705311	53.08	30	Ehnes et al. (2011)	[1]
1514	Chilopoda	Geophilomorpha	Geophilidae	C	0.512954	37.44	30	Ehnes et al. (2011)	[1]
1515	Chilopoda	Geophilomorpha	Geophilidae	C	0.259391	11.7	30	Ehnes et al. (2011)	[1]
1516	Chilopoda	Geophilomorpha	Geophilidae	C	0.061205	11.395	5	Ehnes et al. (2011)	[1]
1517	Chilopoda	Geophilomorpha	Geophilidae	C	0.150097	9.325	30	Ehnes et al. (2011)	[1]
1518	Chilopoda	Geophilomorpha	Geophilidae	C	0.136982	10.62	29.9	Ehnes et al. (2011)	[1]
1519	Chilopoda	Geophilomorpha	Geophilidae	C	0.163213	14.235	29.9	Ehnes et al. (2011)	[1]
1520	Chilopoda	Geophilomorpha	Geophilidae	C	0.155926	11.275	29.9	Ehnes et al. (2011)	[1]
1521	Chilopoda	Geophilomorpha	Geophilidae	C	0.06	11.41	14.9	Ehnes et al. (2011)	[1]
1522	Chilopoda	Geophilomorpha	Geophilidae	C	0.1	17.51	14.9	Ehnes et al. (2011)	[1]
1523	Chilopoda	Geophilomorpha	Geophilidae	C	0.0175	4.1625	14.9	Ehnes et al. (2011)	[1]
1524	Chilopoda	Geophilomorpha	Geophilidae	C	0.05	9.12	14.9	Ehnes et al. (2011)	[1]
1525	Chilopoda	Geophilomorpha	Geophilidae	C	0.09	11.96	19.8	Ehnes et al. (2011)	[1]
1526	Chilopoda	Geophilomorpha	Geophilidae	C	0.19	25.52	19.8	Ehnes et al. (2011)	[1]
1527	Chilopoda	Geophilomorpha	Geophilidae	C	0.075	9.405	19.8	Ehnes et al. (2011)	[1]
1528	Chilopoda	Geophilomorpha	Geophilidae	C	0.07	8.22	19.8	Ehnes et al. (2011)	[1]
1529	Chilopoda	Geophilomorpha	Geophilidae	C	0.06	9.88	19.8	Ehnes et al. (2011)	[1]
1530	Chilopoda	Geophilomorpha	Geophilidae	C	0.26	9.33	10.9	Ehnes et al. (2011)	[1]
1531	Chilopoda	Geophilomorpha	Geophilidae	C	0.05	11.98	10.8	Ehnes et al. (2011)	[1]
1532	Chilopoda	Geophilomorpha	Geophilidae	C	0.03	40.97	10.8	Ehnes et al. (2011)	[1]
1533	Chilopoda	Geophilomorpha	Geophilidae	C	0.524612	70.76	30	Ehnes et al. (2011)	[1]
1534	Chilopoda	Geophilomorpha	Geophilidae	C	0.510039	50.94	30	Ehnes et al. (2011)	[1]
1535	Chilopoda	Geophilomorpha	Geophilidae	C	0.358485	58.19	30	Ehnes et al. (2011)	[1]
1536	Chilopoda	Geophilomorpha	Geophilidae	C	0.530441	75.56	30	Ehnes et al. (2011)	[1]
1537	Chilopoda	Geophilomorpha	Geophilidae	C	0.288536	22.93	30	Ehnes et al. (2011)	[1]
1538	Chilopoda	Geophilomorpha	Geophilidae	C	0.626619	81.44	30	Ehnes et al. (2011)	[1]
1539	Diplopoda	Glomerida	*Glomeris sp.*	D	0.212759	97.09	14.2	Ehnes et al. (2011)	[1]
1540	Diplopoda	Glomerida	*Glomeris sp.*	D	0.125324	135.3	14.2	Ehnes et al. (2011)	[1]
1541	Diplopoda	Glomerida	*Glomeris sp.*	D	0.084521	170.02	14.2	Ehnes et al. (2011)	[1]
1542	Diplopoda	Glomerida	*Glomeris sp.*	D	0.241904	73.18	14.6	Ehnes et al. (2011)	[1]
1543	Diplopoda	Glomerida	*Glomeris sp.*	D	0.227332	293.24	14.6	Ehnes et al. (2011)	[1]
1544	Diplopoda	Glomerida	*Glomeris sp.*	D	0.160298	133.26	14.6	Ehnes et al. (2011)	[1]
1545	Diplopoda	Glomerida	*Glomeris sp.*	D	0.236075	219.52	14.6	Ehnes et al. (2011)	[1]
1546	Diplopoda	Glomerida	*Glomeris sp.*	D	0.169042	133.79	14.6	Ehnes et al. (2011)	[1]
1547	Diplopoda	Glomerida	*Glomeris sp.*	D	0.043718	49.47	14.6	Ehnes et al. (2011)	[1]
1548	Diplopoda	Glomerida	*Glomeris sp.*	D	0.069948	48.16	14.6	Ehnes et al. (2011)	[1]
1549	Diplopoda	Glomerida	*Glomeris sp.*	D	0.008744	40.32	5	Ehnes et al. (2011)	[1]
1550	Diplopoda	Glomerida	*Glomeris sp.*	D	0.230246	156.41	16	Ehnes et al. (2011)	[1]
1551	Diplopoda	Glomerida	*Glomeris sp.*	D	0.040803	141.83	16	Ehnes et al. (2011)	[1]
1552	Diplopoda	Glomerida	*Glomeris sp.*	D	0.049547	194.38	16	Ehnes et al. (2011)	[1]
1553	Diplopoda	Glomerida	*Glomeris sp.*	D	0.160298	21.72	16	Ehnes et al. (2011)	[1]
1554	Diplopoda	Glomerida	*Glomeris sp.*	D	0.125324	64.81	9.2	Ehnes et al. (2011)	[1]
1555	Diplopoda	Glomerida	*Glomeris sp.*	D	0.020402	28.06	9.2	Ehnes et al. (2011)	[1]
1556	Diplopoda	Glomerida	*Glomeris sp.*	D	0.026231	209.31	5	Ehnes et al. (2011)	[1]
1557	Diplopoda	Glomerida	*Glomeris sp.*	D	0.052461	136.58	5	Ehnes et al. (2011)	[1]
1558	Diplopoda	Glomerida	*Glomeris sp.*	D	0.046632	172.2	9.7	Ehnes et al. (2011)	[1]
1559	Diplopoda	Glomerida	*Glomeris sp.*	D	0.113666	133.16	9.7	Ehnes et al. (2011)	[1]
1560	Diplopoda	Glomerida	*Glomeris sp.*	D	0.069948	183.14	5	Ehnes et al. (2011)	[1]
1561	Diplopoda	Glomerida	*Glomeris sp.*	D	0.03206	153.51	5	Ehnes et al. (2011)	[1]

1562	Diplopoda	Glomerida	*Glomeris sp.*	D	0.431347	253.47	30	Ehnes et al. (2011)	[1]
1563	Diplopoda	Glomerida	*Glomeris sp.*	D	0.402202	209.96	30	Ehnes et al. (2011)	[1]
1564	Diplopoda	Glomerida	*Glomeris sp.*	D	0.41386	171.61	30	Ehnes et al. (2011)	[1]
1565	Diplopoda	Glomerida	*Glomeris sp.*	D	0.037889	114.75	9.9	Ehnes et al. (2011)	[1]
1566	Diplopoda	Glomerida	*Glomeris sp.*	D	0.043718	143.84	9.9	Ehnes et al. (2011)	[1]
1567	Diplopoda	Glomerida	*Glomeris sp.*	D	0.037889	133.87	9.9	Ehnes et al. (2011)	[1]
1568	Diplopoda	Glomerida	*Glomeris sp.*	D	0.034974	120.51	9.9	Ehnes et al. (2011)	[1]
1569	Diplopoda	Glomerida	*Glomeris sp.*	D	0.055376	173.92	9.9	Ehnes et al. (2011)	[1]
1570	Diplopoda	Glomerida	*Glomeris sp.*	D	0.686265	56.96	29.9	Ehnes et al. (2011)	[1]
1571	Diplopoda	Glomerida	*Glomeris sp.*	D	0.694167	66.64	29.9	Ehnes et al. (2011)	[1]
1572	Diplopoda	Glomerida	*Glomeris sp.*	D	1.031561	178.46	29.9	Ehnes et al. (2011)	[1]
1573	Diplopoda	Glomerida	*Glomeris sp.*	D	0.454663	141.7	30	Ehnes et al. (2011)	[1]
1574	Diplopoda	Glomerida	*Glomeris sp.*	D	0.443005	110.67	30	Ehnes et al. (2011)	[1]
1575	Diplopoda	Glomerida	*Glomeris sp.*	D	0.186529	159.35	30	Ehnes et al. (2011)	[1]
1576	Diplopoda	Glomerida	*Glomeris sp.*	D	0.011658	22.13	9.9	Ehnes et al. (2011)	[1]
1577	Diplopoda	Glomerida	*Glomeris sp.*	D	0.029145	104.87	9.9	Ehnes et al. (2011)	[1]
1578	Diplopoda	Glomerida	*Glomeris sp.*	D	0.05829	185.99	9.7	Ehnes et al. (2011)	[1]
1579	Diplopoda	Glomerida	*Glomeris sp.*	D	0.03206	154.4	9.7	Ehnes et al. (2011)	[1]
1580	Diplopoda	Glomerida	*Glomeris sp.*	D	0.078692	173.26	9.7	Ehnes et al. (2011)	[1]
1581	Diplopoda	Glomerida	*Glomeris sp.*	D	0.134067	17.38	30	Ehnes et al. (2011)	[1]
1582	Diplopoda	Glomerida	*Glomeris sp.*	D	0.046632	134.05	5	Ehnes et al. (2011)	[1]
1583	Diplopoda	Glomerida	*Glomeris sp.*	D	0.169042	27.07	29.9	Ehnes et al. (2011)	[1]
1584	Diplopoda	Glomerida	*Glomeris sp.*	D	0.171956	23.17	29.9	Ehnes et al. (2011)	[1]
1585	Diplopoda	Glomerida	*Glomeris sp.*	D	0.139896	16.99	29.9	Ehnes et al. (2011)	[1]
1586	Diplopoda	Glomerida	*Glomeris sp.*	D	0.253562	73.63	30	Ehnes et al. (2011)	[1]
1587	Diplopoda	Glomerida	*Glomeris sp.*	D	0.174871	38.18	30	Ehnes et al. (2011)	[1]
1588	Diplopoda	Glomerida	*Glomeris sp.*	D	0.236075	65.42	30	Ehnes et al. (2011)	[1]
1589	Diplopoda	Glomerida	*Glomeris sp.*	D	0.728627	292.62	30	Ehnes et al. (2011)	[1]
1590	Diplopoda	Glomerida	*Glomeris sp.*	D	0.326425	65.27	30	Ehnes et al. (2011)	[1]
1591	Diplopoda	Glomerida	*Glomeris sp.*	D	0.227332	66.38	24.9	Ehnes et al. (2011)	[1]
1592	Diplopoda	Julida	Julidae	D	0.055376	13.7	14.6	Ehnes et al. (2011)	[1]
1593	Diplopoda	Julida	Julidae	D	0.096179	41.04	14.6	Ehnes et al. (2011)	[1]
1594	Diplopoda	Julida	Julidae	D	0.072863	28.18	14.6	Ehnes et al. (2011)	[1]
1595	Diplopoda	Julida	Julidae	D	0.102008	75.36	14.6	Ehnes et al. (2011)	[1]
1596	Diplopoda	Julida	Julidae	D	0.087435	21.08	14.6	Ehnes et al. (2011)	[1]
1597	Diplopoda	Julida	Julidae	D	0.011658	12.51	10	Ehnes et al. (2011)	[1]
1598	Diplopoda	Julida	Julidae	D	0.010201	8.455	10	Ehnes et al. (2011)	[1]
1599	Diplopoda	Julida	Julidae	D	0.013115	7.44	10	Ehnes et al. (2011)	[1]
1600	Diplopoda	Julida	Julidae	D	0.023316	59.61	10	Ehnes et al. (2011)	[1]
1601	Diplopoda	Julida	Julidae	D	0.142811	150.53	10.3	Ehnes et al. (2011)	[1]
1602	Diplopoda	Julida	Julidae	D	0.102008	207.16	10.3	Ehnes et al. (2011)	[1]
1603	Diplopoda	Julida	Julidae	D	0.119495	114.57	10.3	Ehnes et al. (2011)	[1]
1604	Diplopoda	Julida	Julidae	D	0.084521	159.8	10.3	Ehnes et al. (2011)	[1]
1605	Diplopoda	Julida	Julidae	D	0.131153	182.81	10.3	Ehnes et al. (2011)	[1]
1606	Diplopoda	Julida	Julidae	D	0.093264	156.42	10.3	Ehnes et al. (2011)	[1]
1607	Diplopoda	Julida	Julidae	D	0.087435	97.03	10.3	Ehnes et al. (2011)	[1]
1608	Diplopoda	Julida	Julidae	D	0.128238	85.9	10.3	Ehnes et al. (2011)	[1]
1609	Diplopoda	Julida	Julidae	D	0.233161	141.81	15.6	Ehnes et al. (2011)	[1]
1610	Diplopoda	Julida	Julidae	D	0.250648	238.55	15.6	Ehnes et al. (2011)	[1]

1611	Diplopoda	Julida	Julidae	D	0.215674	203.56	15.6	Ehnes et al. (2011)	[1]
1612	Diplopoda	Julida	Julidae	D	0.183614	101.11	15.6	Ehnes et al. (2011)	[1]
1613	Diplopoda	Julida	Julidae	D	0.131153	150.54	10.5	Ehnes et al. (2011)	[1]
1614	Diplopoda	Julida	Julidae	D	0.084521	163.13	10.5	Ehnes et al. (2011)	[1]
1615	Diplopoda	Julida	Julidae	D	0.087435	140.83	10.5	Ehnes et al. (2011)	[1]
1616	Diplopoda	Julida	Julidae	D	0.081606	136.52	10.5	Ehnes et al. (2011)	[1]
1617	Diplopoda	Julida	Julidae	D	0.160298	73.06	10.5	Ehnes et al. (2011)	[1]
1618	Diplopoda	Julida	Julidae	D	0.072863	88.66	10.5	Ehnes et al. (2011)	[1]
1619	Diplopoda	Julida	Julidae	D	0.113666	102.45	10.5	Ehnes et al. (2011)	[1]
1620	Diplopoda	Julida	Julidae	D	0.075777	63.24	10.5	Ehnes et al. (2011)	[1]
1621	Diplopoda	Julida	Julidae	D	0.03206	9.57	14.8	Ehnes et al. (2011)	[1]
1622	Diplopoda	Julida	Julidae	D	0.034974	10.43	14.8	Ehnes et al. (2011)	[1]
1623	Diplopoda	Julida	Julidae	D	0.408031	172.39	23.4	Ehnes et al. (2011)	[1]
1624	Diplopoda	Julida	Julidae	D	0.085978	10.8	23.4	Ehnes et al. (2011)	[1]
1625	Diplopoda	Julida	Julidae	D	0.069948	13.24	20.2	Ehnes et al. (2011)	[1]
1626	Diplopoda	Julida	Julidae	D	0.14864	29.92	20.2	Ehnes et al. (2011)	[1]
1627	Diplopoda	Julida	Julidae	D	0.186529	76.07	20.2	Ehnes et al. (2011)	[1]
1628	Diplopoda	Julida	Julidae	D	0.125324	20.5	23.4	Ehnes et al. (2011)	[1]
1629	Diplopoda	Julida	Julidae	D	0.119495	11.11	23.4	Ehnes et al. (2011)	[1]
1630	Diplopoda	Julida	Julidae	D	0.390544	107.35	23.4	Ehnes et al. (2011)	[1]
1631	Diplopoda	Julida	Julidae	D	0.373057	147.39	23.4	Ehnes et al. (2011)	[1]
1632	Diplopoda	Julida	Julidae	D	0.142811	12.29	19.9	Ehnes et al. (2011)	[1]
1633	Diplopoda	Julida	Julidae	D	0.09035	48.63	19.9	Ehnes et al. (2011)	[1]
1634	Diplopoda	Julida	Julidae	D	0.087435	20.43	19.9	Ehnes et al. (2011)	[1]
1635	Diplopoda	Julida	Julidae	D	0.169042	57.7	19.9	Ehnes et al. (2011)	[1]
1636	Diplopoda	Julida	Julidae	D	0.081606	14.77	19.9	Ehnes et al. (2011)	[1]
1637	Diplopoda	Julida	Julidae	D	0.11658	23.98	19.9	Ehnes et al. (2011)	[1]
1638	Diplopoda	Julida	Julidae	D	0.26522	35.73	29.9	Ehnes et al. (2011)	[1]
1639	Diplopoda	Julida	Julidae	D	0.323511	31.42	29.9	Ehnes et al. (2011)	[1]
1640	Diplopoda	Julida	Julidae	D	0.279793	29.22	29.9	Ehnes et al. (2011)	[1]
1641	Diplopoda	Julida	Julidae	D	0.256477	28.49	29.9	Ehnes et al. (2011)	[1]
1642	Diplopoda	Julida	Julidae	D	0.227332	23.32	29.9	Ehnes et al. (2011)	[1]
1643	Diplopoda	Julida	Julidae	D	0.107837	293.49	5.8	Ehnes et al. (2011)	[1]
1644	Diplopoda	Julida	Julidae	D	0.055376	188.9	5.8	Ehnes et al. (2011)	[1]
1645	Diplopoda	Julida	Julidae	D	0.081606	184.72	5	Ehnes et al. (2011)	[1]
1646	Diplopoda	Julida	Julidae	D	0.072863	140.92	5	Ehnes et al. (2011)	[1]
1647	Diplopoda	Julida	Julidae	D	0.113666	181.83	5	Ehnes et al. (2011)	[1]
1648	Diplopoda	Julida	Julidae	D	0.053918	11.22	5	Ehnes et al. (2011)	[1]
1649	Diplopoda	Julida	Julidae	D	0.043718	266.39	5	Ehnes et al. (2011)	[1]
1650	Diplopoda	Julida	Julidae	D	0.093264	197.17	5	Ehnes et al. (2011)	[1]
1651	Diplopoda	Julida	Julidae	D	0.072863	145.52	5	Ehnes et al. (2011)	[1]
1652	Diplopoda	Julida	Julidae	D	0.230246	43.12	5	Ehnes et al. (2011)	[1]
1653	Diplopoda	Julida	Julidae	D	0.046632	73.17	5	Ehnes et al. (2011)	[1]
1654	Diplopoda	Julida	Julidae	D	0.004372	7.33	5	Ehnes et al. (2011)	[1]
1655	Diplopoda	Julida	Julidae	D	0.075777	151.75	5	Ehnes et al. (2011)	[1]
1656	Diplopoda	Julida	Julidae	D	0.489638	129.58	29.9	Ehnes et al. (2011)	[1]
1657	Diplopoda	Julida	Julidae	D	0.80149	263.16	29.9	Ehnes et al. (2011)	[1]
1658	Diplopoda	Julida	Julidae	D	0.288536	63.71	29.9	Ehnes et al. (2011)	[1]
1659	Diplopoda	Julida	Julidae	D	0.192358	29.99	29.9	Ehnes et al. (2011)	[1]

1660	Diplopoda	Julida	Julidae	D	0.014573	55.85	5	Ehnes et al. (2011)	[1]
1661	Diplopoda	Julida	Julidae	D	0.530441	179.79	30	Ehnes et al. (2011)	[1]
1662	Diplopoda	Julida	Julidae	D	6.994822	40.27	30	Ehnes et al. (2011)	[1]
1663	Diplopoda	Julida	Julidae	D	0.017487	61.19	5	Ehnes et al. (2011)	[1]
1664	Diplopoda	Julida	Julidae	D	0.034974	69.47	5	Ehnes et al. (2011)	[1]
1665	Diplopoda	Julida	Julidae	D	0.154469	274.77	5	Ehnes et al. (2011)	[1]
1666	Diplopoda	Julida	Julidae	D	0.093264	155.76	5	Ehnes et al. (2011)	[1]
1667	Diplopoda	Julida	Julidae	D	0.010201	11.44	9.9	Ehnes et al. (2011)	[1]
1668	Diplopoda	Julida	Julidae	D	0.01603	16.945	9.9	Ehnes et al. (2011)	[1]
1669	Diplopoda	Julida	Julidae	D	0.081606	8.635	30	Ehnes et al. (2011)	[1]
1670	Diplopoda	Julida	Julidae	D	0.080149	7.005	30	Ehnes et al. (2011)	[1]
1671	Diplopoda	Julida	Julidae	D	0.088893	9.89	30	Ehnes et al. (2011)	[1]
1672	Diplopoda	Julida	Julidae	D	0.080149	7.805	30	Ehnes et al. (2011)	[1]
1673	Diplopoda	Julida	Julidae	D	0.209845	8.85	30	Ehnes et al. (2011)	[1]
1674	Diplopoda	Julida	Julidae	D	0.085978	9.725	30	Ehnes et al. (2011)	[1]
1675	Diplopoda	Julida	Julidae	D	0.113666	9.145	30	Ehnes et al. (2011)	[1]
1676	Diplopoda	Julida	Julidae	D	0.171956	19.41	30	Ehnes et al. (2011)	[1]
1677	Diplopoda	Julida	Julidae	D	0.123867	16.1	30	Ehnes et al. (2011)	[1]
1678	Diplopoda	Julida	Julidae	D	0.189443	19.02	30	Ehnes et al. (2011)	[1]
1679	Diplopoda	Julida	Julidae	D	0.687824	286.71	29.9	Ehnes et al. (2011)	[1]
1680	Diplopoda	Julida	Julidae	D	0.486723	205.69	29.9	Ehnes et al. (2011)	[1]
1681	Diplopoda	Julida	Julidae	D	0.52	282.08	19.8	Ehnes et al. (2011)	[1]
1682	Diplopoda	Julida	Julidae	D	0.06	140.1	19.8	Ehnes et al. (2011)	[1]
1683	Diplopoda	Julida	Julidae	D	0.39	186.06	19.8	Ehnes et al. (2011)	[1]
1684	Diplopoda	Julida	Julidae	D	0.37	146.02	19.8	Ehnes et al. (2011)	[1]
1685	Diplopoda	Julida	Julidae	D	0.31	150.77	19.8	Ehnes et al. (2011)	[1]
1686	Diplopoda	Julida	Julidae	D	0.22	187.94	19.8	Ehnes et al. (2011)	[1]
1687	Diplopoda	Julida	Julidae	D	0.22	142.38	19.8	Ehnes et al. (2011)	[1]
1688	Diplopoda	Julida	Julidae	D	0.32	106.78	19.8	Ehnes et al. (2011)	[1]
1689	Diplopoda	Julida	Julidae	D	0.29	156.84	19.8	Ehnes et al. (2011)	[1]
1690	Diplopoda	Julida	Julidae	D	0.19	104.57	19.8	Ehnes et al. (2011)	[1]
1691	Diplopoda	Julida	Julidae	D	0.13	107.84	14.9	Ehnes et al. (2011)	[1]
1692	Diplopoda	Julida	Julidae	D	0.16	133.26	14.9	Ehnes et al. (2011)	[1]
1693	Diplopoda	Julida	Julidae	D	0.33	129.04	14.9	Ehnes et al. (2011)	[1]
1694	Diplopoda	Julida	Julidae	D	0.16	101.11	14.9	Ehnes et al. (2011)	[1]
1695	Diplopoda	Julida	Julidae	D	0.27	97.64	14.9	Ehnes et al. (2011)	[1]
1696	Diplopoda	Julida	Julidae	D	0.33	280.03	14.9	Ehnes et al. (2011)	[1]
1697	Diplopoda	Julida	Julidae	D	0.17	130.28	14.9	Ehnes et al. (2011)	[1]
1698	Diplopoda	Julida	Julidae	D	0.58	205.62	14.9	Ehnes et al. (2011)	[1]
1699	Diplopoda	Julida	Julidae	D	0.29	163.25	14.9	Ehnes et al. (2011)	[1]
1700	Diplopoda	Julida	Julidae	D	0.13	165	14.9	Ehnes et al. (2011)	[1]
1701	Diplopoda	Julida	Julidae	D	0.53	191.06	14.9	Ehnes et al. (2011)	[1]
1702	Diplopoda	Julida	Julidae	D	0.08	100.35	14.9	Ehnes et al. (2011)	[1]
1703	Diplopoda	Julida	Julidae	D	0.21	118.56	14.9	Ehnes et al. (2011)	[1]
1704	Diplopoda	Julida	Julidae	D	0.14	164.52	14.9	Ehnes et al. (2011)	[1]
1705	Diplopoda	Julida	Julidae	D	0.12	121.81	14.9	Ehnes et al. (2011)	[1]
1706	Diplopoda	Julida	Julidae	D	0.21	266.42	11.3	Ehnes et al. (2011)	[1]
1707	Diplopoda	Julida	Julidae	D	0.05	116.22	11.3	Ehnes et al. (2011)	[1]
1708	Diplopoda	Julida	Julidae	D	0.19	202.59	11.3	Ehnes et al. (2011)	[1]

1709	Diplopoda	Julida	Julidae	D	0.2	155.15	11.3	Ehnes et al. (2011)	[1]
1710	Diplopoda	Julida	Julidae	D	0.09	154.6	11.3	Ehnes et al. (2011)	[1]
1711	Diplopoda	Julida	Julidae	D	0.2	176.76	11.3	Ehnes et al. (2011)	[1]
1712	Diplopoda	Julida	Julidae	D	0.19	117.36	11.3	Ehnes et al. (2011)	[1]
1713	Diplopoda	Julida	Julidae	D	0.12	150.64	11.3	Ehnes et al. (2011)	[1]
1714	Diplopoda	Julida	Julidae	D	0.12	116.07	11.3	Ehnes et al. (2011)	[1]
1715	Diplopoda	Julida	Julidae	D	0.547928	142.56	30	Ehnes et al. (2011)	[1]
1716	Diplopoda	Julida	Julidae	D	0.617876	150.36	30	Ehnes et al. (2011)	[1]
1717	Diplopoda	Julida	Julidae	D	0.340998	206.92	30	Ehnes et al. (2011)	[1]
1718	Diplopoda	Julida	Julidae	D	0.681995	291.96	30	Ehnes et al. (2011)	[1]
1719	Diplopoda	Polydesmida	Polydesmida	D	0.072898	15.29	14.5	Ehnes et al. (2011)	[1]
1720	Diplopoda	Polydesmida	Polydesmida	D	0.018224	6.2975	14.5	Ehnes et al. (2011)	[1]
1721	Diplopoda	Polydesmida	Polydesmida	D	0.020984	6.294	14.5	Ehnes et al. (2011)	[1]
1722	Diplopoda	Polydesmida	Polydesmida	D	0.049554	5.328	14.5	Ehnes et al. (2011)	[1]
1723	Diplopoda	Polydesmida	Polydesmida	D	0.025648	6.034	14.5	Ehnes et al. (2011)	[1]
1724	Diplopoda	Polydesmida	Polydesmida	D	0.021574	5.63	14.5	Ehnes et al. (2011)	[1]
1725	Diplopoda	Polydesmida	Polydesmida	D	0.011658	4.51	14.5	Ehnes et al. (2011)	[1]
1726	Diplopoda	Polydesmida	Polydesmida	D	0.125289	14.93	19.8	Ehnes et al. (2011)	[1]
1727	Diplopoda	Polydesmida	Polydesmida	D	0.104922	18.59	19.8	Ehnes et al. (2011)	[1]
1728	Diplopoda	Polydesmida	Polydesmida	D	0.034974	4.4425	19.8	Ehnes et al. (2011)	[1]
1729	Diplopoda	Polydesmida	Polydesmida	D	0.045895	6.6525	19.8	Ehnes et al. (2011)	[1]
1730	Diplopoda	Polydesmida	Polydesmida	D	0.037306	6.466	19.8	Ehnes et al. (2011)	[1]
1731	Diplopoda	Polydesmida	Polydesmida	D	0.0134	4.944	19.8	Ehnes et al. (2011)	[1]
1732	Diplopoda	Polydesmida	Polydesmida	D	0.008175	6.406	19.8	Ehnes et al. (2011)	[1]
1733	Diplopoda	Polydesmida	Polydesmida	D	0.032643	6.614	19.8	Ehnes et al. (2011)	[1]
1734	Diplopoda	Polydesmida	Polydesmida	D	0.026226	4.74	19.8	Ehnes et al. (2011)	[1]
1735	Diplopoda	Polydesmida	Polydesmida	D	0.037151	6.0325	19.8	Ehnes et al. (2011)	[1]
1736	Diplopoda	Polydesmida	Polydesmida	D	0.01399	6.066	10.8	Ehnes et al. (2011)	[1]
1737	Diplopoda	Polydesmida	Polydesmida	D	0.015731	6.278	10.8	Ehnes et al. (2011)	[1]
1738	Diplopoda	Polydesmida	Polydesmida	D	0.026238	5.298	10.8	Ehnes et al. (2011)	[1]
1739	Diplopoda	Polydesmida	Polydesmida	D	0.011658	5.874	10.8	Ehnes et al. (2011)	[1]
1740	Diplopoda	Polydesmida	Polydesmida	D	0.017501	6.264	10.8	Ehnes et al. (2011)	[1]
1741	Diplopoda	Polydesmida	Polydesmida	D	0.035564	5.442	10.8	Ehnes et al. (2011)	[1]
1742	Diplopoda	Polydesmida	Polydesmida	D	0.016321	6.086	10.8	Ehnes et al. (2011)	[1]
1743	Malacostraca	Isopoda	*Armadillidium nasatum*	D	0.0782	30	20	Reichle (1968)	[2]
1744	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.00721	6	5	Al-Dabbagh (1976)	[2]
1745	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.0159	6	10	Al-Dabbagh (1976)	[2]
1746	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.125	74	10	Edney (1964)	[2]
1747	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.0233	6	15	Al-Dabbagh (1976)	[2]
1748	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.0283	6	20	Al-Dabbagh (1976)	[2]
1749	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.207	74	20	Edney (1964)	[2]
1750	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.194	65.5	20	Reichle (1968)	[2]
1751	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.0101	2	20	Saito (1969)	[2]
1752	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.0364	6	25	Al-Dabbagh (1976)	[2]
1753	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.351	74	30	Edney (1964)	[2]
1754	Malacostraca	Isopoda	*Burmoniscus ocellatus*	D	0.0395	7.94	23	Lam et al. (1991)	[2]
1755	Malacostraca	Isopoda	*Burmoniscus sp.*	D	0.0386	7.94	23	Lam et al. (1991)	[2]
1756	Malacostraca	Isopoda	*Cylisticus convexus*	D	0.144	34.8	20	Reichle (1968)	[2]
1757	Malacostraca	Isopoda	*Oniscus asellus*	D	0.084	10.1	16	Phillipson and Watson (1965)	[2]

1758	Malacostraca	Isopoda	*Oniscus asellus*	D	0.206	56.9	16	Phillipson and Watson (1965)	[2]
1759	Malacostraca	Isopoda	*Oniscus asellus*	D	0.338	68.3	16	Phillipson and Watson (1965)	[2]
1760	Malacostraca	Isopoda	*Orodillo maculatus*	D	0.0704	15.8	23	Lam et al. (1991)	[2]
1761	Malacostraca	Isopoda	*Philoscia muscorum*	D	0.0945	20	19	Hassall (1983)	[2]
1762	Malacostraca	Isopoda	*Philosciidae*	D	0.227	45.8	25	Humphreys and Collis (1990)	[2]
1763	Malacostraca	Isopoda	*Porcellio laevis*	D	0.113	80	5	Lardies et al. (2004)	[2]
1764	Malacostraca	Isopoda	*Porcellio laevis*	D	0.0667	70	5	Lardies et al. (2004)	[2]
1765	Malacostraca	Isopoda	*Porcellio laevis*	D	0.0941	60	10	Edney (1964)	[2]
1766	Malacostraca	Isopoda	*Porcellio laevis*	D	0.208	80	12	Lardies et al. (2004)	[2]
1767	Malacostraca	Isopoda	*Porcellio laevis*	D	0.297	70	12	Lardies et al. (2004)	[2]
1768	Malacostraca	Isopoda	*Porcellio laevis*	D	0.432	60	18	Lardies et al. (2004)	[2]
1769	Malacostraca	Isopoda	*Porcellio laevis*	D	0.541	70	18	Lardies et al. (2004)	[2]
1770	Malacostraca	Isopoda	*Porcellio laevis*	D	0.177	60	20	Edney (1964)	[2]
1771	Malacostraca	Isopoda	*Porcellio laevis*	D	0.917	60	25	Lardies et al. (2004)	[2]
1772	Malacostraca	Isopoda	*Porcellio laevis*	D	1.2	70	25	Lardies et al. (2004)	[2]
1773	Malacostraca	Isopoda	*Porcellio laevis*	D	0.29	60	30	Edney (1964)	[2]
1774	Malacostraca	Isopoda	*Porcellio scaber*	D	0.0101	2	20	Saito (1969)	[2]
1775	Malacostraca	Isopoda	*Porcellio scaber*	D	0.136	60	20	Wieser (1965)	[2]
1776	Malacostraca	Isopoda	*Porcellionides pruinosus*	D	0.0594	15	15	Al-Dabbagh and Marina (1986)	[2]
1777	Malacostraca	Isopoda	*Porcellionides pruinosus*	D	0.082	15	20	Al-Dabbagh and Marina (1986)	[2]
1778	Malacostraca	Isopoda	*Porcellionides pruinosus*	D	0.157	25	20	Cloudsley-Thompson (2009)	[2]
1779	Malacostraca	Isopoda	*Porcellionides pruinosus*	D	0.124	18.4	20	Reichle (1968)	[2]
1780	Malacostraca	Isopoda	*Porcellionides pruinosus*	D	0.097	15	25	Al-Dabbagh and Marina (1986)	[2]
1781	Malacostraca	Isopoda	*Porcellionides pruinosus*	D	0.0984	15	30	Al-Dabbagh and Marina (1986)	[2]
1782	Malacostraca	Isopoda	*Porcellionides pruinosus*	D	0.556	25	34	Cloudsley-Thompson (2009)	[2]
1783	Malacostraca	Isopoda	*Porcellionides pruinosus*	D	0.186	15	35	Al-Dabbagh and Marina (1986)	[2]
1784	Malacostraca	Isopoda	*Spherillo raffaelei*	D	0.0301	10	23	Lam et al. (1991)	[2]
1785	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.014573	95.72	5	Ehnes et al. (2011)	[1]
1786	Malacostraca	Isopoda	*Oniscus asellus*	D	0.040803	47.6	5	Ehnes et al. (2011)	[1]
1787	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.014573	95.72	5	Ehnes et al. (2011)	[1]
1788	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.026231	54.78	5	Ehnes et al. (2011)	[1]
1789	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.075777	90.37	5	Ehnes et al. (2011)	[1]
1790	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.014573	92.65	5	Ehnes et al. (2011)	[1]
1791	Malacostraca	Isopoda	*Oniscus asellus*	D	0.037889	78.03	5	Ehnes et al. (2011)	[1]
1792	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.072863	59.38	5	Ehnes et al. (2011)	[1]
1793	Malacostraca	Isopoda	*Porcellio scaber*	D	0.023316	48.36	5	Ehnes et al. (2011)	[1]
1794	Malacostraca	Isopoda	*Porcellio scaber*	D	0.352656	45.01	5	Ehnes et al. (2011)	[1]
1795	Malacostraca	Isopoda	*Porcellio scaber*	D	0.043718	42.61	5	Ehnes et al. (2011)	[1]
1796	Malacostraca	Isopoda	*Porcellio scaber*	D	0.017487	40.81	5	Ehnes et al. (2011)	[1]
1797	Malacostraca	Isopoda	*Porcellio scaber*	D	0.011658	53.64	5	Ehnes et al. (2011)	[1]
1798	Malacostraca	Isopoda	*Porcellio scaber*	D	0.014573	32.44	5	Ehnes et al. (2011)	[1]
1799	Malacostraca	Isopoda	*Porcellio scaber*	D	0.008744	39.47	5	Ehnes et al. (2011)	[1]
1800	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.119495	92.5	5.4	Ehnes et al. (2011)	[1]
1801	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.078692	99.84	5.4	Ehnes et al. (2011)	[1]
1802	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.064119	102.06	5.4	Ehnes et al. (2011)	[1]
1803	Malacostraca	Isopoda	*Oniscus asellus*	D	0.034974	65.26	10	Ehnes et al. (2011)	[1]
1804	Malacostraca	Isopoda	*Porcellio scaber*	D	0.03206	1.312	10	Ehnes et al. (2011)	[1]
1805	Malacostraca	Isopoda	*Oniscus asellus*	D	0.064119	77.16	10	Ehnes et al. (2011)	[1]
1806	Malacostraca	Isopoda	*Trachelipus rathkii*	D	0.049547	37.1	10	Ehnes et al. (2011)	[1]

1807	Malacostraca	Isopoda	*Oniscus asellus*	D	0.043718	46.25	10	Ehnes et al. (2011)	[1]
1808	Malacostraca	Isopoda	*Porcellio scaber*	D	0.03206	39.99	10	Ehnes et al. (2011)	[1]
1809	Malacostraca	Isopoda	*Porcellio scaber*	D	0.023316	1.11	10	Ehnes et al. (2011)	[1]
1810	Malacostraca	Isopoda	*Oniscus asellus*	D	0.046632	79.84	10	Ehnes et al. (2011)	[1]
1811	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.05829	80.33	14.2	Ehnes et al. (2011)	[1]
1812	Malacostraca	Isopoda	*Porcellio scaber*	D	0.075777	24.79	14.2	Ehnes et al. (2011)	[1]
1813	Malacostraca	Isopoda	*Porcellio scaber*	D	0.081606	23.6	14.2	Ehnes et al. (2011)	[1]
1814	Malacostraca	Isopoda	*Porcellio scaber*	D	0.037889	26.5	14.2	Ehnes et al. (2011)	[1]
1815	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.099093	58.46	14.2	Ehnes et al. (2011)	[1]
1816	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.067034	36.89	14.2	Ehnes et al. (2011)	[1]
1817	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.14864	63.52	14.2	Ehnes et al. (2011)	[1]
1818	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.075777	59.99	14.2	Ehnes et al. (2011)	[1]
1819	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.067034	75.37	14.2	Ehnes et al. (2011)	[1]
1820	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.160298	96.82	14.2	Ehnes et al. (2011)	[1]
1821	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.096179	65.45	14.2	Ehnes et al. (2011)	[1]
1822	Malacostraca	Isopoda	*Porcellio scaber*	D	0.084521	31.74	14.2	Ehnes et al. (2011)	[1]
1823	Malacostraca	Isopoda	*Porcellio scaber*	D	0.110751	36.17	14.2	Ehnes et al. (2011)	[1]
1824	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.102008	56.53	14.2	Ehnes et al. (2011)	[1]
1825	Malacostraca	Isopoda	*Trachelipus rathkii*	D	0.081606	37.6	15	Ehnes et al. (2011)	[1]
1826	Malacostraca	Isopoda	*Trachelipus rathkii*	D	0.075777	36.38	15	Ehnes et al. (2011)	[1]
1827	Malacostraca	Isopoda	*Trachelipus rathkii*	D	0.099093	45.25	15	Ehnes et al. (2011)	[1]
1828	Malacostraca	Isopoda	*Trachelipus rathkii*	D	0.069948	46.82	15	Ehnes et al. (2011)	[1]
1829	Malacostraca	Isopoda	*Trachelipus rathkii*	D	0.099093	26.97	15	Ehnes et al. (2011)	[1]
1830	Malacostraca	Isopoda	*Trachelipus rathkii*	D	0.224417	42.09	20	Ehnes et al. (2011)	[1]
1831	Malacostraca	Isopoda	*Trachelipus rathkii*	D	0.122409	33.65	20	Ehnes et al. (2011)	[1]
1832	Malacostraca	Isopoda	*Trachelipus rathkii*	D	0.134067	50.68	20	Ehnes et al. (2011)	[1]
1833	Malacostraca	Isopoda	*Trachelipus rathkii*	D	0.087435	26.06	20	Ehnes et al. (2011)	[1]
1834	Malacostraca	Isopoda	*Trachelipus rathkii*	D	0.136982	26.27	20	Ehnes et al. (2011)	[1]
1835	Malacostraca	Isopoda	*Trachelipus rathkii*	D	0.131153	46.11	20	Ehnes et al. (2011)	[1]
1836	Malacostraca	Isopoda	*Trachelipus rathkii*	D	0.204016	29.37	20	Ehnes et al. (2011)	[1]
1837	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.612047	81.61	25	Ehnes et al. (2011)	[1]
1838	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.273964	106.81	25	Ehnes et al. (2011)	[1]
1839	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.282707	70.11	25	Ehnes et al. (2011)	[1]
1840	Malacostraca	Isopoda	*Porcellio scaber*	D	0.037889	66.74	5	Ehnes et al. (2011)	[1]
1841	Malacostraca	Isopoda	*Porcellio scaber*	D	0.134067	53.53	5	Ehnes et al. (2011)	[1]
1842	Malacostraca	Isopoda	*Porcellio scaber*	D	0.008744	38.67	5	Ehnes et al. (2011)	[1]
1843	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.011658	87.36	5	Ehnes et al. (2011)	[1]
1844	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.151554	92.31	5	Ehnes et al. (2011)	[1]
1845	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.425518	71.84	29.2	Ehnes et al. (2011)	[1]
1846	Malacostraca	Isopoda	*Porcellio scaber*	D	0.247733	18.33	29.2	Ehnes et al. (2011)	[1]
1847	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.451749	54.26	29.2	Ehnes et al. (2011)	[1]
1848	Malacostraca	Isopoda	*Oniscus asellus*	D	0.408031	57.3	29.2	Ehnes et al. (2011)	[1]
1849	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.23899	73.66	29.2	Ehnes et al. (2011)	[1]
1850	Malacostraca	Isopoda	*Porcellio scaber*	D	0.055376	22.34	14.6	Ehnes et al. (2011)	[1]
1851	Malacostraca	Isopoda	*Porcellio scaber*	D	0.134067	21.51	14.6	Ehnes et al. (2011)	[1]
1852	Malacostraca	Isopoda	*Porcellio scaber*	D	0.078692	37.31	14.6	Ehnes et al. (2011)	[1]
1853	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.052461	60.26	14.6	Ehnes et al. (2011)	[1]
1854	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.084521	56.46	14.6	Ehnes et al. (2011)	[1]
1855	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.069948	77.39	14.6	Ehnes et al. (2011)	[1]

1856	Malacostraca	Isopoda	*Porcellio scaber*	D	0.037889	16.53	14.6	Ehnes et al. (2011)	[1]
1857	Malacostraca	Isopoda	*Porcellio scaber*	D	0.069948	25.81	14.6	Ehnes et al. (2011)	[1]
1858	Malacostraca	Isopoda	*Porcellio scaber*	D	0.069948	20.7	14.6	Ehnes et al. (2011)	[1]
1859	Malacostraca	Isopoda	*Porcellio scaber*	D	0.05829	23.58	14.6	Ehnes et al. (2011)	[1]
1860	Malacostraca	Isopoda	*Porcellio scaber*	D	0.017487	43.15	5	Ehnes et al. (2011)	[1]
1861	Malacostraca	Isopoda	*Porcellio scaber*	D	0.014573	33.52	5	Ehnes et al. (2011)	[1]
1862	Malacostraca	Isopoda	*Porcellio scaber*	D	0.011658	28.53	5	Ehnes et al. (2011)	[1]
1863	Malacostraca	Isopoda	*Porcellio scaber*	D	0.35557	32.18	29.6	Ehnes et al. (2011)	[1]
1864	Malacostraca	Isopoda	*Porcellio scaber*	D	0.26522	26.24	29.6	Ehnes et al. (2011)	[1]
1865	Malacostraca	Isopoda	*Porcellio scaber*	D	0.145725	4.72	29.6	Ehnes et al. (2011)	[1]
1866	Malacostraca	Isopoda	*Porcellio scaber*	D	0.072863	30.06	14.6	Ehnes et al. (2011)	[1]
1867	Malacostraca	Isopoda	*Porcellio scaber*	D	0.075777	40.75	14.6	Ehnes et al. (2011)	[1]
1868	Malacostraca	Isopoda	*Porcellio scaber*	D	0.087435	33.39	14.6	Ehnes et al. (2011)	[1]
1869	Malacostraca	Isopoda	*Porcellio scaber*	D	0.046632	17.95	14.6	Ehnes et al. (2011)	[1]
1870	Malacostraca	Isopoda	*Porcellio scaber*	D	0.107837	31.94	14.6	Ehnes et al. (2011)	[1]
1871	Malacostraca	Isopoda	*Porcellio scaber*	D	0.043718	15.36	14.6	Ehnes et al. (2011)	[1]
1872	Malacostraca	Isopoda	*Porcellio scaber*	D	0.055376	25.53	14.6	Ehnes et al. (2011)	[1]
1873	Malacostraca	Isopoda	*Oniscus asellus*	D	0.046632	71.87	5.2	Ehnes et al. (2011)	[1]
1874	Malacostraca	Isopoda	*Oniscus asellus*	D	0.049547	98.34	5.2	Ehnes et al. (2011)	[1]
1875	Malacostraca	Isopoda	*Oniscus asellus*	D	0.011658	51.85	5.2	Ehnes et al. (2011)	[1]
1876	Malacostraca	Isopoda	*Oniscus asellus*	D	0.03206	47.97	5.2	Ehnes et al. (2011)	[1]
1877	Malacostraca	Isopoda	*Oniscus asellus*	D	0.142811	97.75	14.6	Ehnes et al. (2011)	[1]
1878	Malacostraca	Isopoda	*Oniscus asellus*	D	0.055376	39.32	14.6	Ehnes et al. (2011)	[1]
1879	Malacostraca	Isopoda	*Oniscus asellus*	D	0.107837	54.4	14.6	Ehnes et al. (2011)	[1]
1880	Malacostraca	Isopoda	*Oniscus asellus*	D	0.064119	45.22	14.6	Ehnes et al. (2011)	[1]
1881	Malacostraca	Isopoda	*Oniscus asellus*	D	0.093264	78.25	14.6	Ehnes et al. (2011)	[1]
1882	Malacostraca	Isopoda	*Oniscus asellus*	D	0.037889	81.18	5	Ehnes et al. (2011)	[1]
1883	Malacostraca	Isopoda	*Oniscus asellus*	D	0.067034	75.95	5	Ehnes et al. (2011)	[1]
1884	Malacostraca	Isopoda	*Oniscus asellus*	D	0.020402	17.75	5	Ehnes et al. (2011)	[1]
1885	Malacostraca	Isopoda	*Oniscus asellus*	D	0.040803	19.51	5	Ehnes et al. (2011)	[1]
1886	Malacostraca	Isopoda	*Porcellio scaber*	D	0.034974	70.09	5	Ehnes et al. (2011)	[1]
1887	Malacostraca	Isopoda	*Porcellio scaber*	D	0.020402	60.52	5	Ehnes et al. (2011)	[1]
1888	Malacostraca	Isopoda	*Porcellio scaber*	D	0.034974	43.44	5	Ehnes et al. (2011)	[1]
1889	Malacostraca	Isopoda	*Porcellio scaber*	D	0.011658	33.58	5	Ehnes et al. (2011)	[1]
1890	Malacostraca	Isopoda	*Oniscus asellus*	D	0.303109	60.52	30	Ehnes et al. (2011)	[1]
1891	Malacostraca	Isopoda	*Oniscus asellus*	D	0.052461	44	14.7	Ehnes et al. (2011)	[1]
1892	Malacostraca	Isopoda	*Oniscus asellus*	D	0.055376	48.75	14.7	Ehnes et al. (2011)	[1]
1893	Malacostraca	Isopoda	*Oniscus asellus*	D	0.05829	39.51	14.7	Ehnes et al. (2011)	[1]
1894	Malacostraca	Isopoda	*Oniscus asellus*	D	0.093264	37.55	14.7	Ehnes et al. (2011)	[1]
1895	Malacostraca	Isopoda	*Oniscus asellus*	D	0.093264	31.17	14.7	Ehnes et al. (2011)	[1]
1896	Malacostraca	Isopoda	*Oniscus asellus*	D	0.361399	43.77	29.9	Ehnes et al. (2011)	[1]
1897	Malacostraca	Isopoda	*Oniscus asellus*	D	0.361399	71.72	29.9	Ehnes et al. (2011)	[1]
1898	Malacostraca	Isopoda	*Oniscus asellus*	D	0.425518	66.24	29.9	Ehnes et al. (2011)	[1]
1899	Malacostraca	Isopoda	*Oniscus asellus*	D	0.346827	56.62	29.9	Ehnes et al. (2011)	[1]
1900	Malacostraca	Isopoda	*Oniscus asellus*	D	0.067034	45.28	14.9	Ehnes et al. (2011)	[1]
1901	Malacostraca	Isopoda	*Porcellio scaber*	D	0.186529	38.14	14.9	Ehnes et al. (2011)	[1]
1902	Malacostraca	Isopoda	*Porcellio scaber*	D	0.139896	37.88	14.9	Ehnes et al. (2011)	[1]
1903	Malacostraca	Isopoda	*Porcellio scaber*	D	0.020402	37.28	14.9	Ehnes et al. (2011)	[1]
1904	Malacostraca	Isopoda	*Porcellio scaber*	D	0.125324	45.31	14.9	Ehnes et al. (2011)	[1]

1905	Malacostraca	Isopoda	*Oniscus asellus*	D	0.09035	44.63	14.9	Ehnes et al. (2011)	[1]
1906	Malacostraca	Isopoda	*Oniscus asellus*	D	0.078692	53.5	14.9	Ehnes et al. (2011)	[1]
1907	Malacostraca	Isopoda	*Oniscus asellus*	D	0.119495	72.95	14.6	Ehnes et al. (2011)	[1]
1908	Malacostraca	Isopoda	*Oniscus asellus*	D	0.166127	69.21	14.6	Ehnes et al. (2011)	[1]
1909	Malacostraca	Isopoda	*Oniscus asellus*	D	0.145725	78.54	14.6	Ehnes et al. (2011)	[1]
1910	Malacostraca	Isopoda	*Oniscus asellus*	D	0.174871	89.41	14.6	Ehnes et al. (2011)	[1]
1911	Malacostraca	Isopoda	*Oniscus asellus*	D	0.259391	66.85	14.6	Ehnes et al. (2011)	[1]
1912	Malacostraca	Isopoda	*Oniscus asellus*	D	0.320596	108.04	14.6	Ehnes et al. (2011)	[1]
1913	Malacostraca	Isopoda	Isopoda	D	0.093264	28.02	15	Ehnes et al. (2011)	[1]
1914	Malacostraca	Isopoda	Isopoda	D	0.067034	31.78	15	Ehnes et al. (2011)	[1]
1915	Malacostraca	Isopoda	Isopoda	D	0.037889	21.46	15	Ehnes et al. (2011)	[1]
1916	Malacostraca	Isopoda	Isopoda	D	0.011658	1.679167	5	Ehnes et al. (2011)	[1]
1917	Malacostraca	Isopoda	*Oniscus asellus*	D	0.084521	25.47	18	Ehnes et al. (2011)	[1]
1918	Malacostraca	Isopoda	*Oniscus asellus*	D	0.078692	21.43	18	Ehnes et al. (2011)	[1]
1919	Malacostraca	Isopoda	*Oniscus asellus*	D	0.104922	20.14	18	Ehnes et al. (2011)	[1]
1920	Malacostraca	Isopoda	*Porcellio scaber*	D	0.087435	10.36	18	Ehnes et al. (2011)	[1]
1921	Malacostraca	Isopoda	*Oniscus asellus*	D	0.104922	14.35	18	Ehnes et al. (2011)	[1]
1922	Malacostraca	Isopoda	*Oniscus asellus*	D	0.072863	10.56	18	Ehnes et al. (2011)	[1]
1923	Malacostraca	Isopoda	*Oniscus asellus*	D	0.011658	7.43	18	Ehnes et al. (2011)	[1]
1924	Malacostraca	Isopoda	*Oniscus asellus*	D	0.093264	27.05	18	Ehnes et al. (2011)	[1]
1925	Malacostraca	Isopoda	*Oniscus asellus*	D	0.128238	17.72	19.5	Ehnes et al. (2011)	[1]
1926	Malacostraca	Isopoda	*Oniscus asellus*	D	0.107837	18.58	19.5	Ehnes et al. (2011)	[1]
1927	Malacostraca	Isopoda	*Oniscus asellus*	D	0.134067	21.86	19.5	Ehnes et al. (2011)	[1]
1928	Malacostraca	Isopoda	*Oniscus asellus*	D	0.142811	22.16	19.5	Ehnes et al. (2011)	[1]
1929	Malacostraca	Isopoda	*Oniscus asellus*	D	0.209845	23.83	19.5	Ehnes et al. (2011)	[1]
1930	Malacostraca	Isopoda	*Porcellio scaber*	D	0.192358	27.8	19.5	Ehnes et al. (2011)	[1]
1931	Malacostraca	Isopoda	*Oniscus asellus*	D	0.080149	8.89	19.5	Ehnes et al. (2011)	[1]
1932	Malacostraca	Isopoda	*Porcellio scaber*	D	0.291451	30.48	19.5	Ehnes et al. (2011)	[1]
1933	Malacostraca	Isopoda	*Oniscus asellus*	D	0.125324	11.76	19.5	Ehnes et al. (2011)	[1]
1934	Malacostraca	Isopoda	*Oniscus asellus*	D	0.110751	21.7	19.5	Ehnes et al. (2011)	[1]
1935	Malacostraca	Isopoda	*Oniscus asellus*	D	0.011658	3.376667	5	Ehnes et al. (2011)	[1]
1936	Malacostraca	Isopoda	*Philoscia sp.*	D	0.05829	11.46	15.8	Ehnes et al. (2011)	[1]
1937	Malacostraca	Isopoda	*Philoscia sp.*	D	0.037889	6.09	15.8	Ehnes et al. (2011)	[1]
1938	Malacostraca	Isopoda	*Oniscus asellus*	D	0.008327	1.404286	15.8	Ehnes et al. (2011)	[1]
1939	Malacostraca	Isopoda	*Oniscus asellus*	D	0.025259	6.256667	15.8	Ehnes et al. (2011)	[1]
1940	Malacostraca	Isopoda	*Oniscus asellus*	D	0.011658	2.168571	15.8	Ehnes et al. (2011)	[1]
1941	Malacostraca	Isopoda	*Oniscus asellus*	D	0.055376	24.02	9.2	Ehnes et al. (2011)	[1]
1942	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.020402	53.2	10.2	Ehnes et al. (2011)	[1]
1943	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.029145	63.4	10.2	Ehnes et al. (2011)	[1]
1944	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.078692	62.92	10.2	Ehnes et al. (2011)	[1]
1945	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.084521	68.3	10.2	Ehnes et al. (2011)	[1]
1946	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.023316	74.26	10.2	Ehnes et al. (2011)	[1]
1947	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.136982	65.14	10.2	Ehnes et al. (2011)	[1]
1948	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.023316	104.79	10.2	Ehnes et al. (2011)	[1]
1949	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.061205	22.44	10.2	Ehnes et al. (2011)	[1]
1950	Malacostraca	Isopoda	*Armadillidium vulgare*	D	0.037889	24.85	10.2	Ehnes et al. (2011)	[1]
1951	Malacostraca	Isopoda	*Porcellio scaber*	D	0.023316	18.75	10.2	Ehnes et al. (2011)	[1]
1952	Malacostraca	Isopoda	*Porcellio scaber*	D	0.026231	16.37	10.3	Ehnes et al. (2011)	[1]
1953	Malacostraca	Isopoda	*Oniscus asellus*	D	0.03206	12.29	10.3	Ehnes et al. (2011)	[1]

1954	Malacostraca	Isopoda	*Oniscus asellus*	D	0.014573	8.81	10.3	Ehnes et al. (2011)	[1]
1955	Malacostraca	Isopoda	*Porcellio scaber*	D	0.008744	18.05	10.3	Ehnes et al. (2011)	[1]
1956	Malacostraca	Isopoda	*Oniscus asellus*	D	0.043718	24.6	10.3	Ehnes et al. (2011)	[1]
1957	Malacostraca	Isopoda	*Oniscus asellus*	D	0.052461	21.49	10.3	Ehnes et al. (2011)	[1]
1958	Malacostraca	Isopoda	*Porcellio scaber*	D	0.020402	7.99	10.3	Ehnes et al. (2011)	[1]
1959	Malacostraca	Isopoda	*Porcellio scaber*	D	0.007286	5.075	10.3	Ehnes et al. (2011)	[1]
1960	Malacostraca	Isopoda	Isopoda	D	0.066062	5.436667	23.4	Ehnes et al. (2011)	[1]
1961	Malacostraca	Isopoda	*Oniscus asellus*	D	0.241904	73.72	23.4	Ehnes et al. (2011)	[1]
1962	Malacostraca	Isopoda	*Oniscus asellus*	D	0.209845	45.39	23.4	Ehnes et al. (2011)	[1]
1963	Malacostraca	Isopoda	*Porcellio scaber*	D	0.273964	37.77	23.4	Ehnes et al. (2011)	[1]
1964	Malacostraca	Isopoda	*Porcellio scaber*	D	0.230246	69.04	23.4	Ehnes et al. (2011)	[1]
1965	Malacostraca	Isopoda	Isopoda	D	0.041775	3.596667	23.4	Ehnes et al. (2011)	[1]
1966	Malacostraca	Isopoda	Isopoda	D	0.025398	1.697143	23.4	Ehnes et al. (2011)	[1]
1967	Malacostraca	Isopoda	Isopoda	D	0.10978	5.98	30	Ehnes et al. (2011)	[1]
1968	Malacostraca	Isopoda	Isopoda	D	0.095207	4.126667	30	Ehnes et al. (2011)	[1]
1969	Malacostraca	Isopoda	Isopoda	D	0.085492	5.83	29.9	Ehnes et al. (2011)	[1]
1970	Malacostraca	Isopoda	Isopoda	D	0.104922	5.685	30	Ehnes et al. (2011)	[1]
1971	Malacostraca	Isopoda	Isopoda	D	0.03716	2.455	30	Ehnes et al. (2011)	[1]
1972	Malacostraca	Isopoda	Isopoda	D	0.103465	5.46	30	Ehnes et al. (2011)	[1]
1973	Malacostraca	Isopoda	Isopoda	D	0.040075	2.535	30	Ehnes et al. (2011)	[1]
1974	Malacostraca	Isopoda	Isopoda	D	0.055376	2.6325	30	Ehnes et al. (2011)	[1]
1975	Malacostraca	Isopoda	Isopoda	D	0.041532	2.0925	30	Ehnes et al. (2011)	[1]
1976	Malacostraca	Isopoda	Isopoda	D	0.069948	5.285	30	Ehnes et al. (2011)	[1]
1977	Malacostraca	Isopoda	Isopoda	D	0.09035	5.96	30	Ehnes et al. (2011)	[1]
1978	Malacostraca	Isopoda	Isopoda	D	0.05149	4.61	30	Ehnes et al. (2011)	[1]
1979	Malacostraca	Isopoda	Isopoda	D	0.056347	3.473333	30	Ehnes et al. (2011)	[1]
1980	Malacostraca	Isopoda	Isopoda	D	0.065091	4.416667	30	Ehnes et al. (2011)	[1]
1981	Malacostraca	Isopoda	Isopoda	D	0.062176	3.513333	30	Ehnes et al. (2011)	[1]
1982	Malacostraca	Isopoda	*Armadillidium sp.*	D	0.241904	70.02	29.9	Ehnes et al. (2011)	[1]
1983	Malacostraca	Isopoda	Isopoda	D	0.03206	3.496667	29.9	Ehnes et al. (2011)	[1]
1984	Malacostraca	Isopoda	Isopoda	D	0.030602	2.72	29.9	Ehnes et al. (2011)	[1]
1985	Arachnida	Prostigmata	*Tetranychus cinnabarinus*	C	0.000066	0.00494	25	Thurling (1980)	[1]
1986	Arachnida	Prostigmata	*Tetranychus cinnabarinus*	C	0.000251	0.00998	25	Thurling (1980)	[1]
1987	Arachnida	Araneae	*Pardosa palustris*	C	0.03206	31	8	Ehnes et al. (2011)	[1]
1988	Arachnida	Araneae	*Pardosa palustris*	C	0.011658	31	8	Ehnes et al. (2011)	[1]
1989	Arachnida	Araneae	*Pardosa palustris*	C	0.020402	29	8	Ehnes et al. (2011)	[1]
1990	Arachnida	Araneae	*Pardosa palustris*	C	0.055376	38	8	Ehnes et al. (2011)	[1]
1991	Arachnida	Araneae	*Pardosa palustris*	C	0.03206	30	8	Ehnes et al. (2011)	[1]
1992	Arachnida	Araneae	*Pardosa palustris*	C	0.067034	22	8	Ehnes et al. (2011)	[1]
1993	Arachnida	Araneae	*Alopecosa sp.*	C	0.055376	44	8	Ehnes et al. (2011)	[1]
1994	Arachnida	Araneae	*Alopecosa sp.*	C	0.046632	36	8	Ehnes et al. (2011)	[1]
1995	Arachnida	Araneae	*Alopecosa sp.*	C	0.078692	39	8	Ehnes et al. (2011)	[1]
1996	Arachnida	Araneae	*Alopecosa sp.*	C	0.005829	34	8	Ehnes et al. (2011)	[1]
1997	Arachnida	Araneae	*Alopecosa sp.*	C	0.110751	57	8	Ehnes et al. (2011)	[1]
1998	Arachnida	Araneae	*Alopecosa sp.*	C	0.064119	37	8	Ehnes et al. (2011)	[1]
1999	Arachnida	Araneae	*Alopecosa sp.*	C	0.067034	58	8	Ehnes et al. (2011)	[1]
2000	Arachnida	Araneae	*Pirata latitans*	C	0.055376	19	8	Ehnes et al. (2011)	[1]
2001	Arachnida	Araneae	*Pirata latitans*	C	0.026231	20	8	Ehnes et al. (2011)	[1]
2002	Arachnida	Araneae	*Pirata latitans*	C	0.023316	18	8	Ehnes et al. (2011)	[1]

2003	Arachnida	Araneae	*Pirata latitans*	C	0.061205	23	8	Ehnes et al. (2011)	[1]
2004	Arachnida	Araneae	*Pirata latitans*	C	0.017487	26	8	Ehnes et al. (2011)	[1]
2005	Arachnida	Araneae	*Pardosa lugubris*	C	0.037889	10	8	Ehnes et al. (2011)	[1]
2006	Arachnida	Araneae	*Pardosa lugubris*	C	0.040803	8	8	Ehnes et al. (2011)	[1]
2007	Arachnida	Araneae	*Pardosa lugubris*	C	0.017487	29	8	Ehnes et al. (2011)	[1]
2008	Arachnida	Araneae	*Pardosa lugubris*	C	0.03206	10	8	Ehnes et al. (2011)	[1]
2009	Arachnida	Araneae	*Pardosa lugubris*	C	0.017487	29	8	Ehnes et al. (2011)	[1]
2010	Arachnida	Araneae	*Pardosa lugubris*	C	0.052461	17	8	Ehnes et al. (2011)	[1]
2011	Arachnida	Araneae	*Pisaura mirabilis*	C	0.119495	86	8	Ehnes et al. (2011)	[1]
2012	Arachnida	Araneae	*Pisaura mirabilis*	C	0.09035	85	8	Ehnes et al. (2011)	[1]
2013	Arachnida	Araneae	*Pisaura mirabilis*	C	0.081606	104	8	Ehnes et al. (2011)	[1]
2014	Arachnida	Araneae	*Pisaura mirabilis*	C	0.075777	79	8	Ehnes et al. (2011)	[1]
2015	Arachnida	Araneae	*Pisaura mirabilis*	C	0.087435	77	8	Ehnes et al. (2011)	[1]
2016	Arachnida	Araneae	*Pisaura mirabilis*	C	0.29728	116	8	Ehnes et al. (2011)	[1]
2017	Arachnida	Araneae	*Pisaura mirabilis*	C	0.215674	109	8	Ehnes et al. (2011)	[1]
2018	Arachnida	Araneae	*Pisaura mirabilis*	C	0.154469	114	8	Ehnes et al. (2011)	[1]
2019	Arachnida	Araneae	*Pisaura mirabilis*	C	0.075777	68	8	Ehnes et al. (2011)	[1]
2020	Arachnida	Araneae	*Salticus scenicus*	C	0.043718	10	8	Ehnes et al. (2011)	[1]
2021	Arachnida	Araneae	*Salticus scenicus*	C	0.046632	11	8	Ehnes et al. (2011)	[1]
2022	Arachnida	Araneae	*Salticus scenicus*	C	0.087435	11	8	Ehnes et al. (2011)	[1]
2023	Arachnida	Araneae	*Salticus scenicus*	C	0.03206	9	8	Ehnes et al. (2011)	[1]
2024	Arachnida	Araneae	*Salticus scenicus*	C	0.029145	8	8	Ehnes et al. (2011)	[1]
2025	Arachnida	Araneae	*Salticus scenicus*	C	0.075777	7	8	Ehnes et al. (2011)	[1]
2026	Arachnida	Opiliones	*Opiliones sp.*	C	0.020402	3	8	Ehnes et al. (2011)	[1]
2027	Arachnida	Araneae	*Trochosa sp.*	C	0.224417	97.7	11.5	Ehnes et al. (2011)	[1]
2028	Arachnida	Araneae	*Trochosa sp.*	C	0.236075	70.3	11.5	Ehnes et al. (2011)	[1]
2029	Arachnida	Araneae	*Trochosa sp.*	C	0.282707	178	11.5	Ehnes et al. (2011)	[1]
2030	Arachnida	Araneae	*Alopecosa juv.*	C	0.023316	1.8	11.5	Ehnes et al. (2011)	[1]
2031	Arachnida	Araneae	*Alopecosa juv.*	C	0.020402	1.8	11.5	Ehnes et al. (2011)	[1]
2032	Arachnida	Araneae	*Alopecosa juv.*	C	0.043718	1.7	11.5	Ehnes et al. (2011)	[1]
2033	Arachnida	Araneae	*Pardosa palustris*	C	0.131153	31.7	11.5	Ehnes et al. (2011)	[1]
2034	Arachnida	Araneae	*Pardosa palustris*	C	0.119495	34.5	11.5	Ehnes et al. (2011)	[1]
2035	Arachnida	Araneae	*Pardosa palustris*	C	0.151554	34.9	11.5	Ehnes et al. (2011)	[1]
2036	Arachnida	Araneae	*Pardosa palustris*	C	0.145725	31.9	11.5	Ehnes et al. (2011)	[1]
2037	Arachnida	Araneae	*Pardosa lugubris*	C	0.11658	47.1	11.5	Ehnes et al. (2011)	[1]
2038	Arachnida	Araneae	*Pardosa lugubris*	C	0.136982	40.6	11.5	Ehnes et al. (2011)	[1]
2039	Arachnida	Araneae	*Pardosa lugubris*	C	0.139896	49.5	11.5	Ehnes et al. (2011)	[1]
2040	Arachnida	Araneae	*Pardosa lugubris*	C	0.075777	30.2	11.5	Ehnes et al. (2011)	[1]
2041	Arachnida	Araneae	*Pardosa lugubris*	C	0.034974	27.1	11.5	Ehnes et al. (2011)	[1]
2042	Arachnida	Araneae	*Pardosa lugubris*	C	0.052461	29.1	11.5	Ehnes et al. (2011)	[1]
2043	Arachnida	Araneae	*Trochosa sp.*	C	0.171956	82.9	11.5	Ehnes et al. (2011)	[1]
2044	Arachnida	Araneae	*Pisaura mirabilis*	C	0.291451	122.5	11.5	Ehnes et al. (2011)	[1]
2045	Arachnida	Araneae	*Pisaura mirabilis*	C	0.250648	128.1	11.5	Ehnes et al. (2011)	[1]
2046	Arachnida	Araneae	*Alopecosa sp.*	C	0.163213	50.5	11.5	Ehnes et al. (2011)	[1]
2047	Arachnida	Araneae	*Alopecosa sp.*	C	0.233161	93.5	11.5	Ehnes et al. (2011)	[1]
2048	Arachnida	Araneae	*Pirata latitans*	C	0.104922	40.1	11.5	Ehnes et al. (2011)	[1]
2049	Arachnida	Araneae	*Pirata latitans*	C	0.072863	41.2	11.5	Ehnes et al. (2011)	[1]
2050	Arachnida	Araneae	*Pirata latitans*	C	0.163213	51.8	11.5	Ehnes et al. (2011)	[1]
2051	Arachnida	Araneae	*Pirata latitans*	C	0.113666	31.2	11.5	Ehnes et al. (2011)	[1]

2052	Arachnida	Araneae	*Pirata latitans*	C	0.107837	32.8	11.5	Ehnes et al. (2011)	[1]
2053	Arachnida	Araneae	*Pirata latitans*	C	0.087435	27.9	11.5	Ehnes et al. (2011)	[1]
2054	Arachnida	Araneae	*Salticus scenicus*	C	0.136982	37.1	11.5	Ehnes et al. (2011)	[1]
2055	Arachnida	Araneae	*Trochosa sp.*	C	0.221503	109.7	11.5	Ehnes et al. (2011)	[1]
2056	Arachnida	Araneae	*Trochosa sp.*	C	0.227332	83.9	11.5	Ehnes et al. (2011)	[1]
2057	Arachnida	Araneae	*Pardosa palustris*	C	0.081606	31	15	Ehnes et al. (2011)	[1]
2058	Arachnida	Araneae	*Pardosa palustris*	C	0.087435	31	15	Ehnes et al. (2011)	[1]
2059	Arachnida	Araneae	*Pardosa palustris*	C	0.064119	29	15	Ehnes et al. (2011)	[1]
2060	Arachnida	Araneae	*Pardosa palustris*	C	0.093264	38	15	Ehnes et al. (2011)	[1]
2061	Arachnida	Araneae	*Pardosa palustris*	C	0.078692	30	15	Ehnes et al. (2011)	[1]
2062	Arachnida	Araneae	*Pardosa palustris*	C	0.096179	22	15	Ehnes et al. (2011)	[1]
2063	Arachnida	Araneae	*Pardosa palustris*	C	0.043718	22	15	Ehnes et al. (2011)	[1]
2064	Arachnida	Araneae	*Alopecosa sp.*	C	0.078692	57	15	Ehnes et al. (2011)	[1]
2065	Arachnida	Araneae	*Alopecosa sp.*	C	0.145725	36	15	Ehnes et al. (2011)	[1]
2066	Arachnida	Araneae	*Alopecosa sp.*	C	0.221503	39	15	Ehnes et al. (2011)	[1]
2067	Arachnida	Araneae	*Alopecosa sp.*	C	0.183614	34	15	Ehnes et al. (2011)	[1]
2068	Arachnida	Araneae	*Alopecosa sp.*	C	0.142811	57	15	Ehnes et al. (2011)	[1]
2069	Arachnida	Araneae	*Alopecosa sp.*	C	0.157383	52	15	Ehnes et al. (2011)	[1]
2070	Arachnida	Araneae	*Alopecosa sp.*	C	0.104922	28	15	Ehnes et al. (2011)	[1]
2071	Arachnida	Araneae	*Alopecosa sp.*	C	0.078692	40	15	Ehnes et al. (2011)	[1]
2072	Arachnida	Araneae	*Alopecosa sp.*	C	0.119495	37	15	Ehnes et al. (2011)	[1]
2073	Arachnida	Araneae	*Alopecosa sp.*	C	0.139896	42	15	Ehnes et al. (2011)	[1]
2074	Arachnida	Araneae	*Alopecosa sp.*	C	0.163213	57	15	Ehnes et al. (2011)	[1]
2075	Arachnida	Araneae	*Alopecosa sp.*	C	0.099093	58	15	Ehnes et al. (2011)	[1]
2076	Arachnida	Araneae	*Pirata latitans*	C	0.037889	19	15	Ehnes et al. (2011)	[1]
2077	Arachnida	Araneae	*Pirata latitans*	C	0.084521	27	15	Ehnes et al. (2011)	[1]
2078	Arachnida	Araneae	*Pirata latitans*	C	0.049547	20	15	Ehnes et al. (2011)	[1]
2079	Arachnida	Araneae	*Pirata latitans*	C	0.046632	18	15	Ehnes et al. (2011)	[1]
2080	Arachnida	Araneae	*Pirata latitans*	C	0.119495	23	15	Ehnes et al. (2011)	[1]
2081	Arachnida	Araneae	*Pirata latitans*	C	0.043718	21	15	Ehnes et al. (2011)	[1]
2082	Arachnida	Araneae	*Pirata latitans*	C	0.061205	26	15	Ehnes et al. (2011)	[1]
2083	Arachnida	Araneae	*Pardosa lugubris*	C	0.072863	11	15	Ehnes et al. (2011)	[1]
2084	Arachnida	Araneae	*Pardosa lugubris*	C	0.09035	13	15	Ehnes et al. (2011)	[1]
2085	Arachnida	Araneae	*Pardosa lugubris*	C	0.081606	10	15	Ehnes et al. (2011)	[1]
2086	Arachnida	Araneae	*Pardosa lugubris*	C	0.084521	8	15	Ehnes et al. (2011)	[1]
2087	Arachnida	Araneae	*Pardosa lugubris*	C	0.102008	25	15	Ehnes et al. (2011)	[1]
2088	Arachnida	Araneae	*Pardosa lugubris*	C	0.087435	12	15	Ehnes et al. (2011)	[1]
2089	Arachnida	Araneae	*Pardosa lugubris*	C	0.09035	18	15	Ehnes et al. (2011)	[1]
2090	Arachnida	Araneae	*Pardosa lugubris*	C	0.084521	11	15	Ehnes et al. (2011)	[1]
2091	Arachnida	Araneae	*Pardosa lugubris*	C	0.081606	29	15	Ehnes et al. (2011)	[1]
2092	Arachnida	Araneae	*Pardosa lugubris*	C	0.046632	10	15	Ehnes et al. (2011)	[1]
2093	Arachnida	Araneae	*Pardosa lugubris*	C	0.110751	29	15	Ehnes et al. (2011)	[1]
2094	Arachnida	Araneae	*Pardosa lugubris*	C	0.142811	10	15	Ehnes et al. (2011)	[1]
2095	Arachnida	Araneae	*Pardosa lugubris*	C	0.067034	12	15	Ehnes et al. (2011)	[1]
2096	Arachnida	Araneae	*Pardosa lugubris*	C	0.078692	17	15	Ehnes et al. (2011)	[1]
2097	Arachnida	Araneae	*Pisaura mirabilis*	C	0.227332	86	15	Ehnes et al. (2011)	[1]
2098	Arachnida	Araneae	*Pisaura mirabilis*	C	0.1807	85	15	Ehnes et al. (2011)	[1]
2099	Arachnida	Araneae	*Pisaura mirabilis*	C	0.1807	104	15	Ehnes et al. (2011)	[1]
2100	Arachnida	Araneae	*Pisaura mirabilis*	C	0.247733	65	15	Ehnes et al. (2011)	[1]

2101	Arachnida	Araneae	*Pisaura mirabilis*	C	0.160298	79	15	Ehnes et al. (2011)	[1]
2102	Arachnida	Araneae	*Pisaura mirabilis*	C	0.192358	77	15	Ehnes et al. (2011)	[1]
2103	Arachnida	Araneae	*Pisaura mirabilis*	C	0.62079	116	15	Ehnes et al. (2011)	[1]
2104	Arachnida	Araneae	*Pisaura mirabilis*	C	0.399288	109	15	Ehnes et al. (2011)	[1]
2105	Arachnida	Araneae	*Pisaura mirabilis*	C	0.44592	114	15	Ehnes et al. (2011)	[1]
2106	Arachnida	Araneae	*Pisaura mirabilis*	C	0.040803	68	15	Ehnes et al. (2011)	[1]
2107	Arachnida	Araneae	*Salticus scenicus*	C	0.040803	9	15	Ehnes et al. (2011)	[1]
2108	Arachnida	Araneae	*Salticus scenicus*	C	0.069948	11	15	Ehnes et al. (2011)	[1]
2109	Arachnida	Araneae	*Salticus scenicus*	C	0.107837	9	15	Ehnes et al. (2011)	[1]
2110	Arachnida	Araneae	*Salticus scenicus*	C	0.075777	4	15	Ehnes et al. (2011)	[1]
2111	Arachnida	Araneae	*Salticus scenicus*	C	0.072863	8	15	Ehnes et al. (2011)	[1]
2112	Arachnida	Araneae	*Salticus scenicus*	C	0.069948	6	15	Ehnes et al. (2011)	[1]
2113	Arachnida	Araneae	*Salticus scenicus*	C	0.093264	8	15	Ehnes et al. (2011)	[1]
2114	Arachnida	Araneae	*Salticus scenicus*	C	0.081606	7	15	Ehnes et al. (2011)	[1]
2115	Arachnida	Araneae	*Salticus scenicus*	C	0.078692	3	15	Ehnes et al. (2011)	[1]
2116	Arachnida	Araneae	*Salticidae*	C	0.03206	4	15	Ehnes et al. (2011)	[1]
2117	Arachnida	Araneae	*Salticidae*	C	0.026231	7	15	Ehnes et al. (2011)	[1]
2118	Arachnida	Araneae	*Salticidae*	C	0.023316	4	15	Ehnes et al. (2011)	[1]
2119	Arachnida	Araneae	*Pisaura mirabilis*	C	0.778174	146	15	Ehnes et al. (2011)	[1]
2120	Arachnida	Araneae	*Pisaura mirabilis*	C	0.204016	116	15	Ehnes et al. (2011)	[1]
2121	Arachnida	Araneae	*Linyphiidae*	C	0.009909	0.72	15	Ehnes et al. (2011)	[1]
2122	Arachnida	Araneae	*Alopecosa juv.*	C	0.029145	1.1	15	Ehnes et al. (2011)	[1]
2123	Arachnida	Araneae	*Alopecosa juv.*	C	0.026231	0.8	15	Ehnes et al. (2011)	[1]
2124	Arachnida	Araneae	*Alopecosa juv.*	C	0.014573	0.9	15	Ehnes et al. (2011)	[1]
2125	Arachnida	Araneae	*Alopecosa juv.*	C	0.043718	1.2	15	Ehnes et al. (2011)	[1]
2126	Arachnida	Araneae	*Trochosa sp.*	C	0.221503	97.7	15	Ehnes et al. (2011)	[1]
2127	Arachnida	Araneae	*Trochosa sp.*	C	0.253562	70.3	15	Ehnes et al. (2011)	[1]
2128	Arachnida	Araneae	*Trochosa sp.*	C	0.370143	178	15	Ehnes et al. (2011)	[1]
2129	Arachnida	Araneae	*Trochosa sp.*	C	0.1807	82.9	15	Ehnes et al. (2011)	[1]
2130	Arachnida	Araneae	*Trochosa sp.*	C	0.230246	109.7	15	Ehnes et al. (2011)	[1]
2131	Arachnida	Araneae	*Trochosa sp.*	C	0.250648	83.9	15	Ehnes et al. (2011)	[1]
2132	Arachnida	Araneae	*Trochosa sp.*	C	0.221503	97.7	18.5	Ehnes et al. (2011)	[1]
2133	Arachnida	Araneae	*Trochosa sp.*	C	0.271049	70.3	18.5	Ehnes et al. (2011)	[1]
2134	Arachnida	Araneae	*Trochosa sp.*	C	0.422604	178	18.5	Ehnes et al. (2011)	[1]
2135	Arachnida	Araneae	*Alopecosa juv.*	C	0.040803	1.8	18.5	Ehnes et al. (2011)	[1]
2136	Arachnida	Araneae	*Alopecosa juv.*	C	0.037889	1.8	18.5	Ehnes et al. (2011)	[1]
2137	Arachnida	Araneae	*Alopecosa juv.*	C	0.061205	1.5	18.5	Ehnes et al. (2011)	[1]
2138	Arachnida	Araneae	*Alopecosa juv.*	C	0.046632	1.7	18.5	Ehnes et al. (2011)	[1]
2139	Arachnida	Araneae	*Alopecosa juv.*	C	0.017487	2.1	18.5	Ehnes et al. (2011)	[1]
2140	Arachnida	Araneae	*Pardosa palustris*	C	0.1807	31.7	18.5	Ehnes et al. (2011)	[1]
2141	Arachnida	Araneae	*Pardosa palustris*	C	0.177785	34.5	18.5	Ehnes et al. (2011)	[1]
2142	Arachnida	Araneae	*Pardosa palustris*	C	0.186529	34.9	18.5	Ehnes et al. (2011)	[1]
2143	Arachnida	Araneae	*Pardosa palustris*	C	0.20693	31.9	18.5	Ehnes et al. (2011)	[1]
2144	Arachnida	Araneae	*Pardosa lugubris*	C	0.218588	47.1	18.5	Ehnes et al. (2011)	[1]
2145	Arachnida	Araneae	*Pardosa lugubris*	C	0.198187	40.6	18.5	Ehnes et al. (2011)	[1]
2146	Arachnida	Araneae	*Pardosa lugubris*	C	0.189443	49.5	18.5	Ehnes et al. (2011)	[1]
2147	Arachnida	Araneae	*Pardosa lugubris*	C	0.154469	30.2	18.5	Ehnes et al. (2011)	[1]
2148	Arachnida	Araneae	*Pardosa lugubris*	C	0.078692	27.1	18.5	Ehnes et al. (2011)	[1]
2149	Arachnida	Araneae	*Pardosa lugubris*	C	0.139896	29.1	18.5	Ehnes et al. (2011)	[1]

2150	Arachnida	Araneae	*Trochosa sp.*	C	0.107837	82.9	18.5	Ehnes et al. (2011)	[1]
2151	Arachnida	Araneae	*Pisaura mirabilis*	C	0.370143	122.5	18.5	Ehnes et al. (2011)	[1]
2152	Arachnida	Araneae	*Pisaura mirabilis*	C	0.273964	128.1	18.5	Ehnes et al. (2011)	[1]
2153	Arachnida	Araneae	*Alopecosa sp.*	C	0.192358	50.5	18.5	Ehnes et al. (2011)	[1]
2154	Arachnida	Araneae	*Alopecosa sp.*	C	0.241904	93.5	18.5	Ehnes et al. (2011)	[1]
2155	Arachnida	Araneae	*Pirata latitans*	C	0.157383	40.1	18.5	Ehnes et al. (2011)	[1]
2156	Arachnida	Araneae	*Pirata latitans*	C	0.174871	41.2	18.5	Ehnes et al. (2011)	[1]
2157	Arachnida	Araneae	*Pirata latitans*	C	0.189443	51.8	18.5	Ehnes et al. (2011)	[1]
2158	Arachnida	Araneae	*Pirata latitans*	C	0.20693	31.2	18.5	Ehnes et al. (2011)	[1]
2159	Arachnida	Araneae	*Pirata latitans*	C	0.1807	32.8	18.5	Ehnes et al. (2011)	[1]
2160	Arachnida	Araneae	*Pirata latitans*	C	0.157383	27.9	18.5	Ehnes et al. (2011)	[1]
2161	Arachnida	Araneae	*Salticus scenicus*	C	0.110751	26.3	18.5	Ehnes et al. (2011)	[1]
2162	Arachnida	Araneae	*Salticus scenicus*	C	0.186529	37.1	18.5	Ehnes et al. (2011)	[1]
2163	Arachnida	Araneae	*Trochosa sp.*	C	0.236075	109.7	18.5	Ehnes et al. (2011)	[1]
2164	Arachnida	Araneae	*Trochosa sp.*	C	0.26522	83.9	18.5	Ehnes et al. (2011)	[1]
2165	Arachnida	Araneae	*Pardosa palustris*	C	0.215674	31	22	Ehnes et al. (2011)	[1]
2166	Arachnida	Araneae	*Pardosa palustris*	C	0.157383	29	22	Ehnes et al. (2011)	[1]
2167	Arachnida	Araneae	*Pardosa palustris*	C	0.160298	38	22	Ehnes et al. (2011)	[1]
2168	Arachnida	Araneae	*Pardosa palustris*	C	0.160298	30	22	Ehnes et al. (2011)	[1]
2169	Arachnida	Araneae	*Pardosa palustris*	C	0.122409	21	22	Ehnes et al. (2011)	[1]
2170	Arachnida	Araneae	*Alopecosa sp.*	C	0.285622	44	22	Ehnes et al. (2011)	[1]
2171	Arachnida	Araneae	*Alopecosa sp.*	C	0.227332	57	22	Ehnes et al. (2011)	[1]
2172	Arachnida	Araneae	*Alopecosa sp.*	C	0.096179	38	22	Ehnes et al. (2011)	[1]
2173	Arachnida	Araneae	*Alopecosa sp.*	C	0.367228	36	22	Ehnes et al. (2011)	[1]
2174	Arachnida	Araneae	*Alopecosa sp.*	C	0.256477	31	22	Ehnes et al. (2011)	[1]
2175	Arachnida	Araneae	*Alopecosa sp.*	C	0.314767	39	22	Ehnes et al. (2011)	[1]
2176	Arachnida	Araneae	*Alopecosa sp.*	C	0.314767	62	22	Ehnes et al. (2011)	[1]
2177	Arachnida	Araneae	*Alopecosa sp.*	C	0.268135	34	22	Ehnes et al. (2011)	[1]
2178	Arachnida	Araneae	*Alopecosa sp.*	C	0.282707	48	22	Ehnes et al. (2011)	[1]
2179	Arachnida	Araneae	*Alopecosa sp.*	C	0.373057	52	22	Ehnes et al. (2011)	[1]
2180	Arachnida	Araneae	*Alopecosa sp.*	C	0.233161	28	22	Ehnes et al. (2011)	[1]
2181	Arachnida	Araneae	*Alopecosa sp.*	C	0.236075	40	22	Ehnes et al. (2011)	[1]
2182	Arachnida	Araneae	*Alopecosa sp.*	C	0.253562	37	22	Ehnes et al. (2011)	[1]
2183	Arachnida	Araneae	*Alopecosa sp.*	C	0.425518	42	22	Ehnes et al. (2011)	[1]
2184	Arachnida	Araneae	*Alopecosa sp.*	C	0.375972	57	22	Ehnes et al. (2011)	[1]
2185	Arachnida	Araneae	*Alopecosa sp.*	C	0.326425	58	22	Ehnes et al. (2011)	[1]
2186	Arachnida	Araneae	*Pirata latitans*	C	0.192358	27	22	Ehnes et al. (2011)	[1]
2187	Arachnida	Araneae	*Pirata latitans*	C	0.177785	20	22	Ehnes et al. (2011)	[1]
2188	Arachnida	Araneae	*Pirata latitans*	C	0.338083	23	22	Ehnes et al. (2011)	[1]
2189	Arachnida	Araneae	*Pirata latitans*	C	0.128238	21	22	Ehnes et al. (2011)	[1]
2190	Arachnida	Araneae	*Pirata latitans*	C	0.160298	22	22	Ehnes et al. (2011)	[1]
2191	Arachnida	Araneae	*Pirata latitans*	C	0.134067	26	22	Ehnes et al. (2011)	[1]
2192	Arachnida	Araneae	*Pardosa lugubris*	C	0.163213	11	22	Ehnes et al. (2011)	[1]
2193	Arachnida	Araneae	*Pardosa lugubris*	C	0.157383	13	22	Ehnes et al. (2011)	[1]
2194	Arachnida	Araneae	*Pardosa lugubris*	C	0.151554	10	22	Ehnes et al. (2011)	[1]
2195	Arachnida	Araneae	*Pardosa lugubris*	C	0.134067	8	22	Ehnes et al. (2011)	[1]
2196	Arachnida	Araneae	*Pardosa lugubris*	C	0.166127	25	22	Ehnes et al. (2011)	[1]
2197	Arachnida	Araneae	*Pardosa lugubris*	C	0.169042	12	22	Ehnes et al. (2011)	[1]
2198	Arachnida	Araneae	*Pardosa lugubris*	C	0.192358	18	22	Ehnes et al. (2011)	[1]

2199	Arachnida	Araneae	*Pardosa lugubris*	C	0.198187	11	22	Ehnes et al. (2011)	[1]
2200	Arachnida	Araneae	*Pardosa lugubris*	C	0.375972	29	22	Ehnes et al. (2011)	[1]
2201	Arachnida	Araneae	*Pardosa lugubris*	C	0.174871	10	22	Ehnes et al. (2011)	[1]
2202	Arachnida	Araneae	*Pardosa lugubris*	C	0.204016	29	22	Ehnes et al. (2011)	[1]
2203	Arachnida	Araneae	*Pardosa lugubris*	C	0.171956	12	22	Ehnes et al. (2011)	[1]
2204	Arachnida	Araneae	*Pardosa lugubris*	C	0.177785	17	22	Ehnes et al. (2011)	[1]
2205	Arachnida	Araneae	*Pisaura mirabilis*	C	0.364314	86	22	Ehnes et al. (2011)	[1]
2206	Arachnida	Araneae	*Pisaura mirabilis*	C	0.396373	85	22	Ehnes et al. (2011)	[1]
2207	Arachnida	Araneae	*Pisaura mirabilis*	C	0.279793	104	22	Ehnes et al. (2011)	[1]
2208	Arachnida	Araneae	*Pisaura mirabilis*	C	0.425518	65	22	Ehnes et al. (2011)	[1]
2209	Arachnida	Araneae	*Pisaura mirabilis*	C	0.437176	79	22	Ehnes et al. (2011)	[1]
2210	Arachnida	Araneae	*Pisaura mirabilis*	C	0.460492	77	22	Ehnes et al. (2011)	[1]
2211	Arachnida	Araneae	*Pisaura mirabilis*	C	0.830635	116	22	Ehnes et al. (2011)	[1]
2212	Arachnida	Araneae	*Pisaura mirabilis*	C	0.938472	109	22	Ehnes et al. (2011)	[1]
2213	Arachnida	Araneae	*Pisaura mirabilis*	C	0.708226	114	22	Ehnes et al. (2011)	[1]
2214	Arachnida	Araneae	*Pisaura mirabilis*	C	0.419689	68	22	Ehnes et al. (2011)	[1]
2215	Arachnida	Araneae	*Salticus scenicus*	C	0.160298	9	22	Ehnes et al. (2011)	[1]
2216	Arachnida	Araneae	*Salticus scenicus*	C	0.250648	10	22	Ehnes et al. (2011)	[1]
2217	Arachnida	Araneae	*Salticus scenicus*	C	0.087435	6	22	Ehnes et al. (2011)	[1]
2218	Arachnida	Araneae	*Salticus scenicus*	C	0.186529	11	22	Ehnes et al. (2011)	[1]
2219	Arachnida	Araneae	*Salticus scenicus*	C	0.189443	11	22	Ehnes et al. (2011)	[1]
2220	Arachnida	Araneae	*Salticus scenicus*	C	0.163213	4	22	Ehnes et al. (2011)	[1]
2221	Arachnida	Araneae	*Salticus scenicus*	C	0.189443	8	22	Ehnes et al. (2011)	[1]
2222	Arachnida	Araneae	*Salticus scenicus*	C	0.14864	6	22	Ehnes et al. (2011)	[1]
2223	Arachnida	Araneae	*Salticus scenicus*	C	0.198187	8	22	Ehnes et al. (2011)	[1]
2224	Arachnida	Araneae	*Salticus scenicus*	C	0.136982	3	22	Ehnes et al. (2011)	[1]
2225	Arachnida	Araneae	*Salticus scenicus*	C	0.134067	8	22	Ehnes et al. (2011)	[1]
2226	Arachnida	Araneae	*Salticidae*	C	0.081606	7	22	Ehnes et al. (2011)	[1]
2227	Arachnida	Araneae	*Salticidae*	C	0.052461	2	22	Ehnes et al. (2011)	[1]
2228	Arachnida	Araneae	*Trochosa sp.*	C	0.198187	5.98	30	Ehnes et al. (2011)	[1]
2229	Arachnida	Araneae	*Trochosa sp.*	C	0.183614	4.01	30	Ehnes et al. (2011)	[1]
2230	Arachnida	Araneae	*Trochosa sp.*	C	0.113666	5.4	30	Ehnes et al. (2011)	[1]
2231	Arachnida	Araneae	*Trochosa sp.*	C	0.218588	6.29	30	Ehnes et al. (2011)	[1]
2232	Arachnida	Araneae	*Trochosa sp.*	C	0.186529	4.51	30	Ehnes et al. (2011)	[1]
2233	Arachnida	Araneae	*Trochosa sp.*	C	0.157383	4.82	30	Ehnes et al. (2011)	[1]
2234	Arachnida	Araneae	*Trochosa sp.*	C	0.189443	6.66	30	Ehnes et al. (2011)	[1]
2235	Arachnida	Araneae	*Trochosa sp.*	C	0.160298	3.71	30	Ehnes et al. (2011)	[1]
2236	Arachnida	Araneae	*Trochosa sp.*	C	0.192358	5.53	30	Ehnes et al. (2011)	[1]
2237	Arachnida	Araneae	*Trochosa sp.*	C	0.134067	4.11	30	Ehnes et al. (2011)	[1]
2238	Arachnida	Araneae	*Trochosa sp.*	C	0.081606	4.28	20	Ehnes et al. (2011)	[1]
2239	Arachnida	Araneae	*Trochosa sp.*	C	0.064119	5.3	20	Ehnes et al. (2011)	[1]
2240	Arachnida	Araneae	*Trochosa sp.*	C	0.072863	5	20	Ehnes et al. (2011)	[1]
2241	Arachnida	Araneae	*Trochosa sp.*	C	0.05829	4.28	20	Ehnes et al. (2011)	[1]
2242	Arachnida	Araneae	*Trochosa sp.*	C	0.069948	4.34	20	Ehnes et al. (2011)	[1]
2243	Arachnida	Araneae	*Trochosa sp.*	C	0.084521	5.22	20	Ehnes et al. (2011)	[1]
2244	Arachnida	Araneae	*Trochosa sp.*	C	0.069948	4.62	20	Ehnes et al. (2011)	[1]
2245	Arachnida	Araneae	*Trochosa sp.*	C	0.081606	5.49	20	Ehnes et al. (2011)	[1]
2246	Arachnida	Araneae	*Trochosa sp.*	C	0.122409	4.98	25	Ehnes et al. (2011)	[1]
2247	Arachnida	Araneae	*Trochosa sp.*	C	0.145725	6.44	25	Ehnes et al. (2011)	[1]

2248	Arachnida	Araneae	*Trochosa sp.*	C	0.122409	5.7	25	Ehnes et al. (2011)	[1]
2249	Arachnida	Araneae	*Trochosa sp.*	C	0.131153	5.23	25	Ehnes et al. (2011)	[1]
2250	Arachnida	Araneae	*Trochosa sp.*	C	0.154469	6.31	25	Ehnes et al. (2011)	[1]
2251	Arachnida	Araneae	*Trochosa sp.*	C	0.099093	5.61	25	Ehnes et al. (2011)	[1]
2252	Arachnida	Araneae	*Trochosa sp.*	C	0.110751	3.02	25	Ehnes et al. (2011)	[1]
2253	Arachnida	Araneae	*Trochosa sp.*	C	0.037889	4.65	15	Ehnes et al. (2011)	[1]
2254	Arachnida	Araneae	*Trochosa sp.*	C	0.03206	2.74	15	Ehnes et al. (2011)	[1]
2255	Arachnida	Araneae	*Trochosa sp.*	C	0.029145	4.15	15	Ehnes et al. (2011)	[1]
2256	Arachnida	Araneae	*Trochosa sp.*	C	0.03206	3.38	15	Ehnes et al. (2011)	[1]
2257	Arachnida	Araneae	*Trochosa sp.*	C	0.040803	4.79	15	Ehnes et al. (2011)	[1]
2258	Arachnida	Araneae	*Trochosa sp.*	C	0.03206	5.27	15	Ehnes et al. (2011)	[1]
2259	Arachnida	Araneae	*Trochosa sp.*	C	0.043718	5.44	15	Ehnes et al. (2011)	[1]
2260	Arachnida	Araneae	*Trochosa sp.*	C	0.037889	4.37	15	Ehnes et al. (2011)	[1]
2261	Arachnida	Araneae	*Trochosa sp.*	C	0.037889	5.21	15	Ehnes et al. (2011)	[1]
2262	Arachnida	Araneae	*Trochosa sp.*	C	0.064119	6.06	15	Ehnes et al. (2011)	[1]
2263	Arachnida	Araneae	*Pardosa lugubris*	C	0.160298	16.61	29.9	Ehnes et al. (2011)	[1]
2264	Arachnida	Araneae	*Pardosa lugubris*	C	0.405117	30.61	29.9	Ehnes et al. (2011)	[1]
2265	Arachnida	Araneae	*Pardosa lugubris*	C	0.20693	20.81	29.9	Ehnes et al. (2011)	[1]
2266	Arachnida	Araneae	*Pardosa amenatata*	C	0.0246	55	3	Ford (1977b)	[2]
2267	Arachnida	Araneae	*Tenuiphantes zimmernanni*	C	0.00798	4	3	Ford (1977a)	[2]
2268	Arachnida	Araneae	*Tenuiphantes zimmernanni*	C	0.00775	4	3	Ford (1977a)	[2]
2269	Arachnida	Araneae	*Lycosa godeffroyi*	C	0.149	200	4	Humphreys (1977)	[2]
2270	Arachnida	Araneae	*Pardosa amenatata*	C	0.0367	55	4	Ford (1977b)	[2]
2271	Arachnida	Araneae	*Tenuiphantes zimmernanni*	C	0.00854	4	4	Ford (1977a)	[2]
2272	Arachnida	Araneae	*Pardosa amenatata*	C	0.0476	55	5	Ford (1977b)	[2]
2273	Arachnida	Araneae	*Tenuiphantes zimmernanni*	C	0.00991	4	5	Ford (1977a)	[2]
2274	Arachnida	Araneae	*Pardosa amenatata*	C	0.0491	55	7	Ford (1977b)	[2]
2275	Arachnida	Araneae	*Tenuiphantes zimmernanni*	C	0.011	4	7	Ford (1977a)	[2]
2276	Arachnida	Araneae	*Pardosa amenatata*	C	0.0801	55	9	Ford (1977b)	[2]
2277	Arachnida	Araneae	*Tenuiphantes zimmernanni*	C	0.0131	4	9	Ford (1977a)	[2]
2278	Arachnida	Araneae	*Hogna lenta*	C	0.549	970	10	Anderson (1970)	[2]
2279	Arachnida	Araneae	*Lycosa godeffroyi*	C	0.236	200	10	Humphreys (1977)	[2]
2280	Arachnida	Araneae	*Pardosa amenatata*	C	0.0852	55	10	Ford (1977b)	[2]
2281	Arachnida	Araneae	*Pardosa amenatata*	C	0.0926	55	10	Ford (1977b)	[2]
2282	Arachnida	Araneae	*Phidippus regius*	C	0.493	568	10	Anderson (1970)	[2]
2283	Arachnida	Araneae	*Tenuiphantes zimmernanni*	C	0.0139	4	10	Ford (1977a)	[2]
2284	Arachnida	Araneae	*Tenuiphantes zimmernanni*	C	0.0162	4	10	Ford (1977a)	[2]
2285	Arachnida	Araneae	*Pardosa amenatata*	C	0.117	55	13	Ford (1977b)	[2]
2286	Arachnida	Araneae	*Tenuiphantes zimmernanni*	C	0.0183	4	13	Ford (1977a)	[2]
2287	Arachnida	Araneae	*Pardosa amenatata*	C	0.134	55	14	Ford (1977b)	[2]
2288	Arachnida	Araneae	*Tenuiphantes zimmernanni*	C	0.0191	4	14	Ford (1977a)	[2]
2289	Arachnida	Araneae	*Geolycosa domifex*	C	0.278	400	15	McQueen (1980)	[2]
2290	Arachnida	Araneae	*Lycosidae*	C	0.863	226	15	Moulder and Reichle (1972)	[2]
2291	Arachnida	Araneae	*Pardosa amenatata*	C	0.14	55	15	Ford (1977b)	[2]
2292	Arachnida	Araneae	*Rabidosa rabida*	C	1.04	286	15	van Hook (1971)	[2]
2293	Arachnida	Araneae	*Tenuiphantes zimmernanni*	C	0.0199	4	15	Ford (1977a)	[2]
2294	Arachnida	Araneae	*Geolycosa domifex*	C	0.636	400	18	McQueen (1980)	[2]
2295	Arachnida	Araneae	*Lycosa sp.*	C	0.432	123	19	Hadley et al. (1981)	[2]
2296	Arachnida	Araneae	*Alopecosa kochi*	C	0.343	100	20	Hagstrum (1970)	[2]

2297	Arachnida	Araneae	*Hentzia palmarum*	C	0.104	23.5	20	Anderson (1996)	[2]
2298	Arachnida	Araneae	*Hogna lenta*	C	1.96	970	20	Anderson (1970)	[2]
2299	Arachnida	Araneae	*Hogna lenta*	C	1.07	498	20	Anderson and Prestwich (1982)	[2]
2300	Arachnida	Araneae	*Lycosa godeffroyi*	C	1.02	200	20	Humphreys (1977)	[2]
2301	Arachnida	Araneae	*Lycosa godeffroyi*	C	0.567	200	20	Humphreys (1977)	[2]
2302	Arachnida	Araneae	*Lycosa sp.*	C	1.01	200	20	Scholander et al. (1953)	[2]
2303	Arachnida	Araneae	*Lycosidae*	C	1.04	198	20	Moulder and Reichle (1972)	[2]
2304	Arachnida	Araneae	*Marpissa bina*	C	0.525	168	20	Anderson (1996)	[2]
2305	Arachnida	Araneae	*Marpissa muscosa*	C	0.11	39.1	20	Schmitz (2004)	[2]
2306	Arachnida	Araneae	*Marpissa muscosa*	C	0.0792	27.5	20	Schmitz (2004)	[2]
2307	Arachnida	Araneae	*Misumenoides formosipes*	C	0.275	82.5	20	Anderson (1996)	[2]
2308	Arachnida	Araneae	*Misumenops celer*	C	0.144	40	20	Anderson (1996)	[2]
2309	Arachnida	Araneae	*Nephila clavipes*	C	3.03	848	20	Anderson and Prestwich (1982)	[2]
2310	Arachnida	Araneae	*Pardosa astrigera*	C	0.223	60	20	Miyashita (1969)	[2]
2311	Arachnida	Araneae	*Pardosa lugubris*	C	0.0788	22.4	20	Schmitz (2004)	[2]
2312	Arachnida	Araneae	*Pardosa lugubris*	C	0.0729	21.7	20	Schmitz (2004)	[2]
2313	Arachnida	Araneae	*Pardosa pullata*	C	0.144	16.2	20	Myrcha and Stejgwillo-Laudanska (1973)	[2]
2314	Arachnida	Araneae	*Pardosa pullata*	C	0.0309	9	20	Myrcha and Stejgwillo-Laudanska (1973)	[2]
2315	Arachnida	Araneae	*Pelegrina galathea*	C	0.0352	8.3	20	Anderson (1996)	[2]
2316	Arachnida	Araneae	*Phidippus audax*	C	0.65	171	20	Anderson (1996)	[2]
2317	Arachnida	Araneae	*Phidippus clarus*	C	0.929	260	20	Anderson (1996)	[2]
2318	Arachnida	Araneae	*Phidippus otiosus*	C	0.97	337	20	Anderson (1996)	[2]
2319	Arachnida	Araneae	*Phidippus pulcherrimus*	C	0.356	104	20	Anderson (1996)	[2]
2320	Arachnida	Araneae	*Phidippus regius*	C	1.01	568	20	Anderson (1996)	[2]
2321	Arachnida	Araneae	*Pirata latitans*	C	0.0822	9	20	Myrcha and Stejgwillo-Laudanska (1973)	[2]
2322	Arachnida	Araneae	*Pirata latitans*	C	0.0943	9	20	Myrcha and Stejgwillo-Laudanska (1973)	[2]
2323	Arachnida	Araneae	*Rabidosa rabida*	C	0.991	204	20	van Hook (1971)	[2]
2324	Arachnida	Araneae	*Salticus scenicus*	C	0.0259	4.34	20	Schmitz and Perry (2001)	[2]
2325	Arachnida	Araneae	*Salticus scenicus*	C	0.0877	4.49	20	Schmitz and Perry (2001)	[2]
2326	Arachnida	Araneae	*Sarinda hentzi*	C	0.0404	4.6	20	Anderson (1996)	[2]
2327	Arachnida	Araneae	*Schizocosa sp.*	C	0.119	23.4	20	Reichle (1968)	[2]
2328	Arachnida	Araneae	*Thiodina sylvana*	C	0.278	67	20	Anderson (1996)	[2]
2329	Arachnida	Araneae	*Trochosa ruricola*	C	0.633	121	20	Myrcha and Stejgwillo-Laudanska (1973)	[2]
2330	Arachnida	Araneae	*Trochosa ruricola*	C	0.366	101	20	Myrcha and Stejgwillo-Laudanska (1973)	[2]
2331	Arachnida	Araneae	*Xysticus funestus*	C	0.117	29.9	20	Anderson (1996)	[2]
2332	Arachnida	Araneae	*Zygoballus rufipes*	C	0.0121	3	20	Anderson (1996)	[2]
2333	Arachnida	Araneae	*Aglelenopsis aperta*	C	2.47	556	22	Greenstone and Bennett (1980)	[2]
2334	Arachnida	Araneae	*Frontinella communis*	C	0.774	5.67	22	Greenstone and Bennett (1980)	[2]
2335	Arachnida	Araneae	*Geolycosa domifex*	C	0.916	400	22	McQueen (1980)	[2]
2336	Arachnida	Araneae	*Menemerus bivittatus*	C	0.204	27.9	22	Greenstone and Bennett (1980)	[2]
2337	Arachnida	Araneae	*Misumenoides formosipes*	C	0.347	48.7	22	Greenstone and Bennett (1980)	[2]
2338	Arachnida	Araneae	*Misumenops sp.*	C	0.118	34.1	22	Greenstone and Bennett (1980)	[2]
2339	Arachnida	Araneae	*Phiddipus johnsoni*	C	0.463	173	22	Greenstone and Bennett (1980)	[2]
2340	Arachnida	Araneae	*Sassacus vitis*	C	0.0525	5.7	22	Greenstone and Bennett (1980)	[2]
2341	Arachnida	Araneae	*Schizocosa mccooki*	C	1.71	512	22	Greenstone and Bennett (1980)	[2]
2342	Arachnida	Araneae	*Urozelotes rusticus*	C	0.127	52.5	22	Greenstone and Bennett (1980)	[2]
2343	Arachnida	Araneae	*Hygrolycosa rubrofasciata*	C	0.159	19.9	25	Kotiaho (1998)	[2]
2344	Arachnida	Araneae	*Hygrolycosa rubrofasciata*	C	0.115	21.2	25	Kotiaho (1998)	[2]
2345	Arachnida	Araneae	*Hygrolycosa rubrofasciata*	C	0.291	18.6	25	Kotiaho et al. (1998)	[2]

2346	Arachnida	Araneae	*Lycosidae*	C	1.43	231	25	Moulder and Reichle (1972)	[2]
2347	Arachnida	Araneae	*Neriene litigiosa*	C	0.0936	19	25	deCarvalho et al. (2004)	[2]
2348	Arachnida	Araneae	*Pardosa astrigera*	C	0.482	52.7	25	Tanaka et al. (1985)	[2]
2349	Arachnida	Araneae	*Pardosa astrigera*	C	0.388	43.7	25	Tanaka et al. (1985)	[2]
2350	Arachnida	Araneae	*Pardosa astrigera*	C	0.455	52.5	25	Tanaka et al. (1985)	[2]
2351	Arachnida	Araneae	*Pardosa astrigera*	C	0.266	39.8	25	Tanaka et al. (1985)	[2]
2352	Arachnida	Araneae	*Pardosa laura*	C	0.45	30	25	Nakamura (1972)	[2]
2353	Arachnida	Araneae	*Rabidosa rabida*	C	1.56	207	25	van Hook (1971)	[2]
2354	Arachnida	Araneae	*Sosippus janus*	C	0.815	360	25	Prestwich (1977)	[2]
2355	Arachnida	Araneae	*Pardosa pseudoannulata*	C	0.625	100	29	Ito (1964)	[2]
2356	Arachnida	Araneae	*Alopecosa kochi*	C	0.727	100	30	Hagstrum (1970)	[2]
2357	Arachnida	Araneae	*Hogna lenta*	C	3.9	970	30	Anderson (1970)	[2]
2358	Arachnida	Araneae	*Lycosa godeffroyi*	C	1.28	200	30	Humphreys (1977)	[2]
2359	Arachnida	Araneae	*Lycosa godeffroyi*	C	0.87	200	30	Humphreys (1977)	[2]
2360	Arachnida	Araneae	*Pardosa astrigera*	C	0.542	60	30	Miyashita (1969)	[2]
2361	Arachnida	Araneae	*Phidippus regius*	C	2.72	568	30	Anderson (1970)	[2]
2362	Arachnida	Araneae	*Lycosa godeffroyi*	C	0.606	200	35	Humphreys (1977)	[2]
2363	Arachnida	Araneae	*Hogna carolinensis*	C	4.65	1000	40	Moeur and Eriksen (1972)	[2]
2364	Arachnida	Araneae	*Lycosa godeffroyi*	C	1.33	200	40	Humphreys (1977)	[2]
2365	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.043718	187.46	4	Ehnes et al. (2011)	[1]
2366	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.052461	127.96	4	Ehnes et al. (2011)	[1]
2367	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.049547	96.92	4	Ehnes et al. (2011)	[1]
2368	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.169042	47.44	4	Ehnes et al. (2011)	[1]
2369	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.037889	131.88	4	Ehnes et al. (2011)	[1]
2370	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.043718	149.78	5	Ehnes et al. (2011)	[1]
2371	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.008744	40.58	5	Ehnes et al. (2011)	[1]
2372	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.046632	136.86	5	Ehnes et al. (2011)	[1]
2373	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.020402	27.28	5	Ehnes et al. (2011)	[1]
2374	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.052461	181.37	5	Ehnes et al. (2011)	[1]
2375	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.010201	19.215	5	Ehnes et al. (2011)	[1]
2376	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.300194	24.26	5	Ehnes et al. (2011)	[1]
2377	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.612047	75.35	5	Ehnes et al. (2011)	[1]
2378	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.498381	79.53	5	Ehnes et al. (2011)	[1]
2379	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.040803	17.41	5	Ehnes et al. (2011)	[1]
2380	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.052461	49.11	5	Ehnes et al. (2011)	[1]
2381	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.011658	118.55	5	Ehnes et al. (2011)	[1]
2382	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.087435	114.51	5	Ehnes et al. (2011)	[1]
2383	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.046632	67.1	5	Ehnes et al. (2011)	[1]
2384	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.09035	134.61	5	Ehnes et al. (2011)	[1]
2385	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.03206	30.03	5	Ehnes et al. (2011)	[1]
2386	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.134067	33.69	5	Ehnes et al. (2011)	[1]
2387	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.046632	72.06	5	Ehnes et al. (2011)	[1]
2388	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.422604	49.63	5	Ehnes et al. (2011)	[1]
2389	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.020402	46.95	5	Ehnes et al. (2011)	[1]
2390	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.107837	55.59	5	Ehnes et al. (2011)	[1]
2391	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.104922	145.1	5	Ehnes et al. (2011)	[1]
2392	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.075777	21.53	5	Ehnes et al. (2011)	[1]
2393	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.029145	41.01	10	Ehnes et al. (2011)	[1]
2394	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.192358	162.55	10	Ehnes et al. (2011)	[1]

2395	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.046632	88.38	10	Ehnes et al. (2011)	[1]
2396	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.107837	83.09	10	Ehnes et al. (2011)	[1]
2397	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.078692	24.79	10	Ehnes et al. (2011)	[1]
2398	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.218588	120.97	10	Ehnes et al. (2011)	[1]
2399	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.026231	12.56	10	Ehnes et al. (2011)	[1]
2400	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.023316	10.04	10	Ehnes et al. (2011)	[1]
2401	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.195272	34.31	10	Ehnes et al. (2011)	[1]
2402	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.052461	31.11	10	Ehnes et al. (2011)	[1]
2403	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.096179	29.33	10	Ehnes et al. (2011)	[1]
2404	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.043718	16.16	10	Ehnes et al. (2011)	[1]
2405	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.014573	8.96	10	Ehnes et al. (2011)	[1]
2406	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.075777	21.45	10	Ehnes et al. (2011)	[1]
2407	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.055376	33.28	10	Ehnes et al. (2011)	[1]
2408	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.107837	23.81	10	Ehnes et al. (2011)	[1]
2409	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.069948	28.55	10	Ehnes et al. (2011)	[1]
2410	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.05829	49.13	10	Ehnes et al. (2011)	[1]
2411	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.03206	26.25	10	Ehnes et al. (2011)	[1]
2412	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.040803	54.83	10	Ehnes et al. (2011)	[1]
2413	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.053109	99.26	10	Ehnes et al. (2011)	[1]
2414	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.093264	102.58	10	Ehnes et al. (2011)	[1]
2415	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.049547	28.71	10	Ehnes et al. (2011)	[1]
2416	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.91807	126.1	10	Ehnes et al. (2011)	[1]
2417	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.067034	132.58	10	Ehnes et al. (2011)	[1]
2418	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.201101	48.32	10	Ehnes et al. (2011)	[1]
2419	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.131153	109.28	10	Ehnes et al. (2011)	[1]
2420	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.087435	97.9	10	Ehnes et al. (2011)	[1]
2421	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.169042	180.74	10	Ehnes et al. (2011)	[1]
2422	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.212759	151.3	10	Ehnes et al. (2011)	[1]
2423	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.05829	128.91	10	Ehnes et al. (2011)	[1]
2424	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.027688	71.55	10	Ehnes et al. (2011)	[1]
2425	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.122409	133.59	10	Ehnes et al. (2011)	[1]
2426	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.314767	130.96	10	Ehnes et al. (2011)	[1]
2427	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.845208	140.83	10	Ehnes et al. (2011)	[1]
2428	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.647021	39.75	10	Ehnes et al. (2011)	[1]
2429	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.113666	118.37	10	Ehnes et al. (2011)	[1]
2430	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.008327	23.94	10	Ehnes et al. (2011)	[1]
2431	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.020402	7.46	10	Ehnes et al. (2011)	[1]
2432	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.037889	63.08	10	Ehnes et al. (2011)	[1]
2433	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.078692	85.5	10	Ehnes et al. (2011)	[1]
2434	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.064119	25.21	10	Ehnes et al. (2011)	[1]
2435	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.052461	15.51	10	Ehnes et al. (2011)	[1]
2436	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.055376	147.51	10	Ehnes et al. (2011)	[1]
2437	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.014573	16.93	10	Ehnes et al. (2011)	[1]
2438	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.171956	136.22	10	Ehnes et al. (2011)	[1]
2439	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.081606	30.2	10	Ehnes et al. (2011)	[1]
2440	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.081606	18.25	10	Ehnes et al. (2011)	[1]
2441	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.061205	29.75	10	Ehnes et al. (2011)	[1]
2442	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.119495	29.95	10	Ehnes et al. (2011)	[1]
2443	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.064119	13.4	10	Ehnes et al. (2011)	[1]

2444	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.037889	12.06	10	Ehnes et al. (2011)	[1]
2445	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.008744	8.08	10	Ehnes et al. (2011)	[1]
2446	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.064119	26.45	14.6	Ehnes et al. (2011)	[1]
2447	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.422604	135.31	14.6	Ehnes et al. (2011)	[1]
2448	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.099093	17.47	14.6	Ehnes et al. (2011)	[1]
2449	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.119495	63.05	14.6	Ehnes et al. (2011)	[1]
2450	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.268135	51.94	14.6	Ehnes et al. (2011)	[1]
2451	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.14864	82.76	14.6	Ehnes et al. (2011)	[1]
2452	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.647021	93.42	14.6	Ehnes et al. (2011)	[1]
2453	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.107837	55.88	14.6	Ehnes et al. (2011)	[1]
2454	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.338083	128.73	14.6	Ehnes et al. (2011)	[1]
2455	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.647021	65.54	14.6	Ehnes et al. (2011)	[1]
2456	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.05829	5.59	15	Ehnes et al. (2011)	[1]
2457	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.026231	0.96	15	Ehnes et al. (2011)	[1]
2458	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.317681	149.38	15	Ehnes et al. (2011)	[1]
2459	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.078692	38.31	15	Ehnes et al. (2011)	[1]
2460	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.040803	2.67	15	Ehnes et al. (2011)	[1]
2461	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.268135	123.9	15	Ehnes et al. (2011)	[1]
2462	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.087435	26	15	Ehnes et al. (2011)	[1]
2463	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.023316	1.55	15	Ehnes et al. (2011)	[1]
2464	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.227332	58.11	15	Ehnes et al. (2011)	[1]
2465	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.384715	103.76	15	Ehnes et al. (2011)	[1]
2466	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.221503	121.68	15	Ehnes et al. (2011)	[1]
2467	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.209845	99.77	15	Ehnes et al. (2011)	[1]
2468	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.437176	104.75	15	Ehnes et al. (2011)	[1]
2469	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.023316	1.1	15	Ehnes et al. (2011)	[1]
2470	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.288536	109.99	15	Ehnes et al. (2011)	[1]
2471	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.052461	1.72	20	Ehnes et al. (2011)	[1]
2472	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.256477	73.34	20	Ehnes et al. (2011)	[1]
2473	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.043718	1.39	20	Ehnes et al. (2011)	[1]
2474	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.306023	145.85	20	Ehnes et al. (2011)	[1]
2475	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.641192	167.93	20	Ehnes et al. (2011)	[1]
2476	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.521696	143.36	20	Ehnes et al. (2011)	[1]
2477	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.03206	1.13	20	Ehnes et al. (2011)	[1]
2478	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.186529	91.8	20	Ehnes et al. (2011)	[1]
2479	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.151554	21.51	20	Ehnes et al. (2011)	[1]
2480	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.378885	83.33	20	Ehnes et al. (2011)	[1]
2481	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.443004	82.94	20	Ehnes et al. (2011)	[1]
2482	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.34974	74.12	20	Ehnes et al. (2011)	[1]
2483	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.34974	75.26	20	Ehnes et al. (2011)	[1]
2484	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.361398	145.12	20	Ehnes et al. (2011)	[1]
2485	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.501294	141.2	20	Ehnes et al. (2011)	[1]
2486	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.702395	161.44	20	Ehnes et al. (2011)	[1]
2487	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.358484	79.46	20	Ehnes et al. (2011)	[1]
2488	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.44009	129.1	20	Ehnes et al. (2011)	[1]
2489	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.410946	62.82	20	Ehnes et al. (2011)	[1]
2490	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	1.763278	134.02	20	Ehnes et al. (2011)	[1]
2491	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.533355	160.46	20	Ehnes et al. (2011)	[1]
2492	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.308937	143.16	20	Ehnes et al. (2011)	[1]

2493	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.268134	134.6	20	Ehnes et al. (2011)	[1]
2494	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.061205	23.06	20	Ehnes et al. (2011)	[1]
2495	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.139896	65.78	20	Ehnes et al. (2011)	[1]
2496	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.813146	155.05	20	Ehnes et al. (2011)	[1]
2497	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.370142	79.45	20	Ehnes et al. (2011)	[1]
2498	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.568328	106.35	20	Ehnes et al. (2011)	[1]
2499	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.29145	15.84	20	Ehnes et al. (2011)	[1]
2500	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.087435	18.2	20	Ehnes et al. (2011)	[1]
2501	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.512952	139.67	20	Ehnes et al. (2011)	[1]
2502	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.163212	21.07	20	Ehnes et al. (2011)	[1]
2503	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.139896	67.86	20	Ehnes et al. (2011)	[1]
2504	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.434261	92.06	20	Ehnes et al. (2011)	[1]
2505	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.084521	19.2	20	Ehnes et al. (2011)	[1]
2506	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.113666	17.94	20	Ehnes et al. (2011)	[1]
2507	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.198186	22.26	20	Ehnes et al. (2011)	[1]
2508	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.684908	166.29	20	Ehnes et al. (2011)	[1]
2509	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.034974	2.03	20	Ehnes et al. (2011)	[1]
2510	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.131153	20.06	20	Ehnes et al. (2011)	[1]
2511	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.119495	14.42	20	Ehnes et al. (2011)	[1]
2512	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.399287	127.67	20	Ehnes et al. (2011)	[1]
2513	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.454662	95.22	20	Ehnes et al. (2011)	[1]
2514	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.367227	85.68	20	Ehnes et al. (2011)	[1]
2515	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.34974	69.08	20	Ehnes et al. (2011)	[1]
2516	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.102008	15.49	20	Ehnes et al. (2011)	[1]
2517	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.725711	144.7	20	Ehnes et al. (2011)	[1]
2518	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.373056	144.33	20	Ehnes et al. (2011)	[1]
2519	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.486722	134.09	20	Ehnes et al. (2011)	[1]
2520	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.145725	20.89	20	Ehnes et al. (2011)	[1]
2521	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.212759	23.11	20	Ehnes et al. (2011)	[1]
2522	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.049547	1.63	20	Ehnes et al. (2011)	[1]
2523	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.373057	82.72	20	Ehnes et al. (2011)	[1]
2524	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.399288	122.38	20	Ehnes et al. (2011)	[1]
2525	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.037889	2.88	20	Ehnes et al. (2011)	[1]
2526	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.44592	111.59	20	Ehnes et al. (2011)	[1]
2527	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.393459	39.73	24.1	Ehnes et al. (2011)	[1]
2528	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.486723	41.03	24.1	Ehnes et al. (2011)	[1]
2529	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.308938	42.78	24.1	Ehnes et al. (2011)	[1]
2530	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.507125	40.99	24.1	Ehnes et al. (2011)	[1]
2531	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.198187	16.3	24.1	Ehnes et al. (2011)	[1]
2532	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.958874	178.39	24.1	Ehnes et al. (2011)	[1]
2533	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.492552	28.99	24.1	Ehnes et al. (2011)	[1]
2534	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	2.054729	123.35	24.1	Ehnes et al. (2011)	[1]
2535	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.483809	27	24.5	Ehnes et al. (2011)	[1]
2536	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.340998	11.67	24.5	Ehnes et al. (2011)	[1]
2537	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.845208	38.09	24.5	Ehnes et al. (2011)	[1]
2538	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.696568	35.9	24.5	Ehnes et al. (2011)	[1]
2539	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.314767	12.08	24.5	Ehnes et al. (2011)	[1]
2540	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.448834	42	25	Ehnes et al. (2011)	[1]
2541	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.702397	72.95	25	Ehnes et al. (2011)	[1]

2542	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	1.451426	85.16	25	Ehnes et al. (2011)	[1]
2543	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.469236	128.66	25	Ehnes et al. (2011)	[1]
2544	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.469236	148.21	25	Ehnes et al. (2011)	[1]
2545	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.970532	105.8	25	Ehnes et al. (2011)	[1]
2546	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.498381	69.65	25	Ehnes et al. (2011)	[1]
2547	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.647021	96.49	25	Ehnes et al. (2011)	[1]
2548	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.845208	78.84	25	Ehnes et al. (2011)	[1]
2549	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	1.355247	85.48	25	Ehnes et al. (2011)	[1]
2550	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.612047	79.47	25	Ehnes et al. (2011)	[1]
2551	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.294365	24.85	25	Ehnes et al. (2011)	[1]
2552	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.483809	126.69	25	Ehnes et al. (2011)	[1]
2553	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.340998	35.38	25	Ehnes et al. (2011)	[1]
2554	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.68491	104.6	25	Ehnes et al. (2011)	[1]
2555	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.486723	112.5	25	Ehnes et al. (2011)	[1]
2556	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.512954	96.61	25	Ehnes et al. (2011)	[1]
2557	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.47215	127.52	25	Ehnes et al. (2011)	[1]
2558	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.888925	83.37	25	Ehnes et al. (2011)	[1]
2559	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.533355	121.47	25	Ehnes et al. (2011)	[1]
2560	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.285622	32.17	25	Ehnes et al. (2011)	[1]
2561	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.32934	98.69	25	Ehnes et al. (2011)	[1]
2562	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.273964	31.38	25	Ehnes et al. (2011)	[1]
2563	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.370143	34.54	30	Ehnes et al. (2011)	[1]
2564	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.317681	2.6	30	Ehnes et al. (2011)	[1]
2565	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	5.619174	95.52	30	Ehnes et al. (2011)	[1]
2566	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.463407	37	30	Ehnes et al. (2011)	[1]
2567	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.195272	2.41	30	Ehnes et al. (2011)	[1]
2568	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.230246	3.44	30	Ehnes et al. (2011)	[1]
2569	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.326425	3.23	30	Ehnes et al. (2011)	[1]
2570	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	1.159975	81.26	30	Ehnes et al. (2011)	[1]
2571	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	1.075454	107.67	30	Ehnes et al. (2011)	[1]
2572	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.658679	121.66	30	Ehnes et al. (2011)	[1]
2573	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.731542	105.6	30	Ehnes et al. (2011)	[1]
2574	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.629534	89.39	30	Ehnes et al. (2011)	[1]
2575	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.422604	86.32	30	Ehnes et al. (2011)	[1]
2576	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.518783	89.85	30	Ehnes et al. (2011)	[1]
2577	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.568329	55.84	30	Ehnes et al. (2011)	[1]
2578	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.460492	78.24	30	Ehnes et al. (2011)	[1]
2579	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.909327	124.81	30	Ehnes et al. (2011)	[1]
2580	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	1.976037	128.24	30	Ehnes et al. (2011)	[1]
2581	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	1.964379	135.94	30	Ehnes et al. (2011)	[1]
2582	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	1.731218	117.54	30	Ehnes et al. (2011)	[1]
2583	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.069948	10.51	5	Ehnes et al. (2011)	[1]
2584	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.466321	31.72	29.6	Ehnes et al. (2011)	[1]
2585	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.011658	0.75	14.6	Ehnes et al. (2011)	[1]
2586	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.049547	13.38	14.6	Ehnes et al. (2011)	[1]
2587	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.020402	7.33	5.2	Ehnes et al. (2011)	[1]
2588	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.486723	33.71	30	Ehnes et al. (2011)	[1]
2589	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.38763	27.63	30	Ehnes et al. (2011)	[1]
2590	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.35557	40.56	30	Ehnes et al. (2011)	[1]

2591	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.023316	2.78	14.6	Ehnes et al. (2011)	[1]
2592	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.017487	2.41	14.6	Ehnes et al. (2011)	[1]
2593	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.026231	0.85	14.7	Ehnes et al. (2011)	[1]
2594	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.029145	0.85	14.7	Ehnes et al. (2011)	[1]
2595	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.029145	0.94	14.7	Ehnes et al. (2011)	[1]
2596	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.166127	5.59	29.9	Ehnes et al. (2011)	[1]
2597	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.189443	6.05	29.9	Ehnes et al. (2011)	[1]
2598	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.224417	6.56	29.9	Ehnes et al. (2011)	[1]
2599	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.186529	6.68	29.9	Ehnes et al. (2011)	[1]
2600	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.177785	7.1	29.9	Ehnes et al. (2011)	[1]
2601	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.204016	9.04	29.9	Ehnes et al. (2011)	[1]
2602	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.049547	11.31	5.8	Ehnes et al. (2011)	[1]
2603	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.008744	15.02	5.8	Ehnes et al. (2011)	[1]
2604	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.008744	14.35	5.8	Ehnes et al. (2011)	[1]
2605	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.201101	18.352	5	Ehnes et al. (2011)	[1]
2606	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.062662	13.61	5	Ehnes et al. (2011)	[1]
2607	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.055376	19.61	9.5	Ehnes et al. (2011)	[1]
2608	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.113666	14.57	9.5	Ehnes et al. (2011)	[1]
2609	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.008744	12.3	5	Ehnes et al. (2011)	[1]
2610	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.017487	8.14	5	Ehnes et al. (2011)	[1]
2611	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.052461	30.97	5	Ehnes et al. (2011)	[1]
2612	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.014573	8.395	5	Ehnes et al. (2011)	[1]
2613	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.029145	10.18	10.2	Ehnes et al. (2011)	[1]
2614	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.002915	9.265	5	Ehnes et al. (2011)	[1]
2615	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.100551	3.375	30	Ehnes et al. (2011)	[1]
2616	Chilopoda	Lithobiomorpha	*Lithobius forficatus*	C	0.017487	9.215	5	Ehnes et al. (2011)	[1]
2617	Malacostraca	Isopoda	*Trichoniscus pusillus*	D	0.00315	1.2	5	Meyer and Phillipson (1983)	[2]
2618	Malacostraca	Isopoda	*Trichoniscus pusillus*	D	0.00509	1.2	10	Meyer and Phillipson (1983)	[2]
2619	Malacostraca	Isopoda	*Trichoniscus pusillus*	D	0.00776	1.2	15	Meyer and Phillipson (1983)	[2]
2620	Insecta	Coleoptera	Species 3	C	0.00108	0.09	25	Engelmann (1961)	[3]
2621	Insecta	Coleoptera	*Diplocapsis sp.*	H	0.32076	5.34	25	Mispagel (1981)	[3]
2622	Insecta	Coleoptera	*Griburius sp. 1*	H	0.21636	3.31	25	Mispagel (1981)	[3]
2623	Insecta	Coleoptera	*Griburius sp. 2*	H	0.15732	9.42	25	Mispagel (1981)	[3]
2624	Insecta	Coleoptera	*Leptinotarsa decemlineata*	H	2.49804	150	25	Gromadzka (1968)	[3]
2625	Insecta	Coleoptera	*Monoxia sp.*	H	0.28512	4.63	25	Mispagel (1981)	[3]
2626	Insecta	Coleoptera	*Smicronyx imbricata*	H	0.01296	0.32	25	Mispagel (1981)	[3]
2627	Insecta	Coleoptera	*Ectemnorhinus marioni*	H	0.09828	9.6	25	Klok and Chown (2005)	[3]
2628	Insecta	Coleoptera	*Ectemnorhinus similis*	H	0.117	13.4	25	Klok and Chown (2005)	[3]
2629	Insecta	Coleoptera	*Calandra oryzae*	H	0.06372	1.7	25	Birch (1947)	[3]
2630	Insecta	Coleoptera	*Sitophilus granarius*	H	0.50256	3.68	25	Campbell et al. (1976)	[3]
2631	Insecta	Coleoptera	*Microcerus sp.*	H	0.68256	132	25	Zachariassen et al. (1988)	[3]
2632	Insecta	Coleoptera	*Ophryastes varius*	H	0.42948	27.26	25	Mispagel (1981)	[3]
2633	Insecta	Coleoptera	*Miloderes sp.*	H	0.23652	3.4	25	Mispagel (1981)	[3]
2634	Insecta	Coleoptera	*Hylobius abietis*	H	1.50516	183	25	Sibul et al. (2004)	[3]
2635	Insecta	Coleoptera	*Hipporhinus tenuegranosus*	H	1.9728	1080	25	Zachariassen et al. (1988)	[3]
2636	Insecta	Coleoptera	*Eucyllus vagans*	H	0.11448	7.43	25	Mispagel (1981)	[3]
2637	Insecta	Coleoptera	*Eucyllus unicolor*	H	0.04752	2.59	25	Mispagel (1981)	[3]
2638	Insecta	Coleoptera	*Bothrometopus randi*	H	0.18396	24.6	25	Klok and Chown (2005)	[3]
2639	Insecta	Coleoptera	*Bothrometopus parvulus*	H	0.06984	3.6	25	Klok and Chown (2005)	[3]

2640	Insecta	Coleoptera	*Bothrometopus elongatus*	H	0.05472	1.7	25	Klok and Chown (2005)	[3]
2641	Insecta	Coleoptera	*Palirhoeus eatoni*	H	0.08748	6.7	25	Chown et al. (1997)	[3]
2642	Insecta	Coleoptera	*Lixus bisulcatus*	H	4.8852	405	25	Zachariassen et al. (1988)	[3]
2643	Insecta	Coleoptera	*Rhynchaenus flagellum*	H	0.00072	0.51	25	Strømme et al. (1986)	[3]
2644	Insecta	Coleoptera	*Rhytonomus isobellina*	H	0.33732	8.1	25	Heatwole et al. (1986)	[3]
2645	Insecta	Coleoptera	*Hypera postica*	H	0.5742	5.8	25	Tombes (1964)	[3]
2646	Insecta	Coleoptera	*Canonopsis sericeus*	H	0.63036	58.9	25	Klok and Chown (2005)	[3]
2647	Insecta	Coleoptera	*Cicindela longilabris*	C	0.97056	124.3	25	Schultz et al. (1992)	[3]
2648	Insecta	Coleoptera	*Cicindela repanda*	C	0.5238	63.4	25	May et al. (1986)	[3]
2649	Arachnida	Prostigmata	*Ereynetes macquariensis*	C	0.000033	0.0015	0	Goddard (1977)	[4]
2650	Arachnida	Prostigmata	*Ereynetes macquariensis*	C	0.000039	0.002	0	Goddard (1977)	[4]
2651	Arachnida	Prostigmata	*Ereynetes macquariensis*	C	0.000052	0.002	5	Goddard (1977)	[4]
2652	Arachnida	Prostigmata	*Ereynetes macquariensis*	C	0.000055	0.002	10	Goddard (1977)	[4]
2653	Arachnida	Prostigmata	*Eupodes minutus*	C	0.00004	0.002	0	Goddard (1977)	[4]
2654	Arachnida	Prostigmata	*Eupodes minutus*	C	0.000037	0.002	5	Goddard (1977)	[4]
2655	Arachnida	Prostigmata	*Nanorchestes antarcticus*	C	0.000008	0.00261	5	Block (1976)	[4]
2656	Arachnida	Prostigmata	*Nanorchestes antarcticus*	C	0.00001	0.00509	0	Block (1976)	[4]
2657	Arachnida	Prostigmata	*Nanorchestes antarcticus*	C	0.000014	0.00509	5	Block (1976)	[4]
2658	Arachnida	Prostigmata	*Nanorchestes antarcticus*	C	0.000016	0.00509	10	Block (1976)	[4]
2659	Arachnida	Prostigmata	*Nanorchestes antarcticus*	C	0.000038	0.0085	5	Block (1976)	[4]
2660	Arachnida	Prostigmata	*Nanorchestes antarcticus*	C	0.000062	0.0085	10	Block (1976)	[4]
2661	Arachnida	Prostigmata	*Nanorchestes antarcticus*	C	0.000004	0.000035	5	Block (1976)	[4]
2662	Arachnida	Prostigmata	*Nanorchestes antarcticus*	C	0.000001	0.000162	5	Block (1976)	[4]
2663	Arachnida	Prostigmata	*Nanorchestes antarcticus*	C	0.000003	0.001055	5	Block (1976)	[4]
2664	Arachnida	Prostigmata	*Nanorchestes antarcticus*	C	0.000002	0.002515	5	Block (1976)	[4]
2665	Arachnida	Prostigmata	*Nanorchestes antarcticus*	C	0.000052	0.008748	5	Block (1976)	[4]
2666	Arachnida	Prostigmata	*Nanorchestes antarcticus*	C	0.000001	0.000927	5	Block (1976)	[4]
2667	Arachnida	Prostigmata	*Nanorchestes antarcticus*	C	0.000028	0.00607	5	Block (1976)	[4]
2668	Arachnida	Prostigmata	*Nanorchestes antarcticus*	C	0.000001	0.000247	5	Block (1976)	[4]
2669	Arachnida	Prostigmata	*Nanorchestes antarcticus*	C	0.000016	0.00131	5	Block (1976)	[4]
2670	Arachnida	Prostigmata	*Stereotydeus villosus*	C	0.00003	0.006	5	Goddard (1977)	[4]
2671	Arachnida	Prostigmata	*Stereotydeus villosus*	C	0.000035	0.006	10	Goddard (1977)	[4]
2672	Arachnida	Prostigmata	*Stereotydeus villosus*	C	0.000194	0.0155	10	Goddard (1977)	[4]
2673	Arachnida	Prostigmata	*Stereotydeus villosus*	C	0.000077	0.0266	0	Goddard (1977)	[4]
2674	Arachnida	Prostigmata	*Stereotydeus villosus*	C	0.000177	0.0266	5	Goddard (1977)	[4]
2675	Arachnida	Prostigmata	*Stereotydeus villosus*	C	0.000197	0.0266	10	Goddard (1977)	[4]
2676	Arachnida	Prostigmata	*Stereotydeus villosus*	C	0.000068	0.03018	0	Goddard (1977)	[4]
2677	Arachnida	Prostigmata	*Stereotydeus villosus*	C	0.000139	0.03018	5	Goddard (1977)	[4]
2678	Arachnida	Prostigmata	*Stereotydeus villosus*	C	0.00018	0.03018	10	Goddard (1977)	[4]
2679	Arachnida	Prostigmata	*Tydeus tilbrooki*	C	0.000003	0.0015	0	Goddard (1977)	[4]
2680	Arachnida	Prostigmata	*Tydeus tilbrooki*	C	0.000009	0.0015	10	Goddard (1977)	[4]
2681	Arachnida	Prostigmata	*Tydeus tilbrooki*	C	0.000013	0.0019	0	Goddard (1977)	[4]
2682	Arachnida	Prostigmata	*Tydeus tilbrooki*	C	0.000015	0.0019	5	Goddard (1977)	[4]
2683	Arachnida	Prostigmata	*Tydeus tilbrooki*	C	0.000019	0.0019	10	Goddard (1977)	[4]

Appendix 2: Assimilation efficiencies

Table 2.: Dataset on assimilation efficiencies. Abbreviations: CT: Consumer type, , C: carnivores, H: herbivores, D: detritivores, AE: Assimilation efficiency, Temp.:Temperature [°C], a: mean weight from paper, b: dry weight converted to wet weight, c: own average, d: Lough Hyne food web (Ute Jacob), e: Fenchel (1974), f: David and Gillon (2002), g: Sustr and Simek (2009), h: Damuth (1981), i: Moulder and Reichle (1972), j: Mathis and Hoback (1997), k: Soo Hoo and Fraenkel (1966), l: Suemoto et al. (2004), m: Pandian (1967c), n: Pobozsny (1997), o: Pobozsny (1988), p: contained in Pandian and Marian (1985).

No.	Class	Order/Family	Species	CT	AE	Weight	Temp.	Original study/Metastudy
1	Clitellata	Lumbricina	*Allolobophora rosea*	D	1.3	0.06	10	Bolton and Phillipson (1976)
2	Clitellata	Lumbricina	*Allolobophora rosea*	D	0.9	0.225	10	Bolton and Phillipson (1976)
3	Clitellata	Lumbricina	*Allolobophora rosea*	D	1.1	0.18	10	Bolton and Phillipson (1976)
4	Insecta	Lepidoptera	*Bombyx mori*	H	44.0	0.552 [b]	27	Soo Hoo and Fraenkel (1966)
5	Diplopoda	Julida	*Chromatojulus projectus*	D	14.9	0.179	15.9	Gere (1956)
6	Diplopoda	Julida	*Chromatojulus projectus*	D	5.1	0.244	18.4	Gere (1956)
7	Diplopoda	Julida	*Chromatojulus projectus*	D	20.7	0.338	17.4	Gere (1956)
8	Diplopoda	Julida	*Chromatojulus projectus*	D	12.4	0.125	21.8	Gere (1956)
9	Diplopoda	Julida	*Chromatojulus projectus*	D	19.6	0.11	17.4	Gere (1956)
10	Diplopoda	Julida	*Chromatojulus projectus*	D	5.3	0.232	15.5	Gere (1956)
11	Diplopoda	Julida	*Chromatojulus projectus*	D	16.4	0.179	17.4	Gere (1956)
12	Branchiopoda	Cladocera	*Daphnia pulex*	H	14.2	0.00016 [e]	20	Richman (1958)
13	Branchiopoda	Cladocera	*Daphnia pulex*	H	31.7	0.00016 [e]	20	Richman (1958)
14	Branchiopoda	Cladocera	*Daphnia pulex*	H	16.8	0.00016 [e]	20	Richman (1958)
15	Branchiopoda	Cladocera	*Daphnia pulex*	H	20.2	0.00016 [e]	20	Richman (1958)
16	Diplopoda	Glomerida	*Glomeris hexasticha*	D	5.9	0.054	21.1	Gere (1956)
17	Diplopoda	Glomerida	*Glomeris hexasticha*	D	6.5	0.213	19.5	Gere (1956)
18	Diplopoda	Glomerida	*Glomeris hexasticha*	D	4.9	0.199	21	Gere (1956)
19	Diplopoda	Glomerida	*Glomeris hexasticha*	D	4.5	0.161	16.1	Gere (1956)
20	Diplopoda	Glomerida	*Glomeris hexasticha*	D	17.8	0.054	17.5	Gere (1956)
21	Diplopoda	Glomerida	*Glomeris hexasticha*	D	3.9	0.215	20.8	Gere (1956)
22	Diplopoda	Glomerida	*Glomeris marginata*	D	12.5	0.27 [a]	16	David and Gillon (2002)
23	Diplopoda	Glomerida	*Glomeris marginata*	D	6.0	0.27 [a,f]	13	Bocock (1963)
24	Diplopoda	Glomerida	*Glomeris marginata*	D	8.0	0.27 [a]	23	David and Gillon (2002)
25	Diplopoda	Glomerida	*Glomeris marginata*	D	29.0	0.27 [a]	18	David and Gillon (2002)
26	Diplopoda	Glomerida	*Glomeris marginata*	D	4.0	0.27 [a]	16	David and Gillon (2002)
27	Diplopoda	Glomerida	*Glomeris marginata*	D	7.5	0.27 [a,f]	13	Bocock (1963)
28	Diplopoda	Glomerida	*Glomeris marginata*	D	10.5	0.27 [a,f]	13	Bocock (1963)
29	Diplopoda	Glomerida	*Glomeris marginata*	D	8.0	0.27 [a]	18	David and Gillon (2002)
30	Diplopoda	Glomerida	*Glomeris marginata*	D	9.0	0.27 [a]	10	David and Gillon (2002)
31	Diplopoda	Glomerida	*Glomeris marginata*	D	17.0	0.27 [a,f]	15	Köhler et al. (1991)
32	Malacostraca	Decapoda	*Homarus americanus*	C	80.7	0.18	22	Logan and Epifanio (1978)
33	Malacostraca	Decapoda	*Homarus americanus*	C	80.5	0.15	22	Logan and Epifanio (1978)
34	Malacostraca	Decapoda	*Homarus americanus*	C	80.7	0.085	22	Logan and Epifanio (1978)
35	Malacostraca	Decapoda	*Homarus americanus*	C	81.1	0.016	22	Logan and Epifanio (1978)
36	Malacostraca	Decapoda	*Homarus americanus*	C	79.6	0.025	22	Logan and Epifanio (1978)
37	Malacostraca	Decapoda	*Homarus americanus*	C	80.5	0.066	22	Logan and Epifanio (1978)
38	Malacostraca	Decapoda	*Homarus americanus*	C	81.4	0.002	22	Logan and Epifanio (1978)
39	Malacostraca	Decapoda	*Homarus americanus*	C	85.0	0.001	22	Logan and Epifanio (1978)

40	Malacostraca	Decapoda	*Homarus americanus*	C	80.7	0.007	22	Logan and Epifanio (1978)
41	Malacostraca	Decapoda	*Homarus americanus*	C	80.9	0.003	22	Logan and Epifanio (1978)
42	Diplopoda	Julida	*Julus scandinavius*	D	10.8	0.1316 [g]	15	Köhler et al. (1991)
43	Polychaeta	Canalipalpata	*Lanice conchilega*	H	72.1	0.072	12	Buhr (1976)
44	Polychaeta	Canalipalpata	*Lanice conchilega*	H	74.9	0.019	12	Buhr (1976)
45	Polychaeta	Canalipalpata	*Lanice conchilega*	H	77.2	0.007	12	Buhr (1976)
46	Polychaeta	Canalipalpata	*Lanice conchilega*	H	73.6	0.077	12	Buhr (1976)
47	Polychaeta	Canalipalpata	*Lanice conchilega*	H	70.6	0.248	12	Buhr (1976)
48	Malacostraca	Decapoda	*Libinia emarginata*	C	99.3	45	21	Aldrich (1974)
49	Malacostraca	Decapoda	*Libinia emarginata*	H	95.0	58.7	21	Aldrich (1974)
50	Malacostraca	Decapoda	*Libinia emarginata*	C	96.5	5.8	21	Aldrich (1974)
51	Malacostraca	Decapoda	*Libinia emarginata*	C	96.7	37.2	21	Aldrich (1974)
52	Gastropoda	Littorinidae	*Littorina littorea*	H	56.0	4.856 [b]	5	Grahame (1973)
53	Gastropoda	Littorinidae	*Littorina littorea*	H	68.0	3.304 [b]	5	Grahame (1973)
54	Gastropoda	Littorinidae	*Littorina littorea*	H	38.0	1.704 [b]	5	Grahame (1973)
55	Clitellata	Lumbricina	*Lumbricus rubellus*	D	68.8	0.7 [a]	15	Dickschen and Topp (1987)
56	Clitellata	Lumbricina	*Lumbricus rubellus*	D	24.3	0.7 [a]	15	Dickschen and Topp (1987)
57	Diplopoda	Julida	*Ommatoiulus rutilans*	D	9.6	0.24503 [c]	15	Köhler et al. (1991)
58	Malacostraca	Isopoda	*Oniscus asellus*	D	16.2	0.05	20	Hartenstein (1964)
59	Malacostraca	Isopoda	*Protracheoniscus politus*	D	14.9	0.038	18.8	Gere (1956)
60	Malacostraca	Isopoda	*Protracheoniscus politus*	D	18.8	0.015	18	Gere (1956)
61	Malacostraca	Isopoda	*Protracheoniscus politus*	D	20.5	0.02	18.5	Gere (1956)
62	Malacostraca	Isopoda	*Protracheoniscus politus*	D	4.9	0.025	21	Gere (1956)
63	Malacostraca	Isopoda	*Tracheoniscus rathkei*	D	30.7	0.021 [h]	26	Kukor and Martin (1986)
64	Arachnida	Oribatida	*Steganacarus magnus*	D	50.0	0.00027	5	Thomas (1979)
65	Arachnida	Oribatida	*Nothrus silvestris*	D	61.8	0.000057	20	Thomas (1979)
66	Arachnida	Oribatida	*Platynothrus peltifer*	D	46.3	0.00006	20	Thomas (1979)
67	Arachnida	Oribatida	*Hermannia gibba*	D	42.9	0.00019	20	Thomas (1979)
68	Arachnida	Oribatida	*Nothrus silvestris*	D	34.8	0.000057	20	Thomas (1979)
69	Actinopterygii	Perciformes	*Ophiocephalus punctatus*	C	95.2	5.57	28	Gerald (1976a)
70	Actinopterygii	Perciformes	*Ophiocephalus punctatus*	C	96.2	15.41	28	Gerald (1976a)
71	Actinopterygii	Perciformes	*Ophiocephalus punctatus*	C	95.6	30.39	28	Gerald (1976a)
72	Arachnida	Araneae	*Lycosa rabida*	C	93.0	0.245 [i]	20	van Hook (1971)
73	Actinopterygii	Perciformes	*Ophiocephalus punctatus*	C	94.0	7.87	20	Gerald (1976b)
74	Actinopterygii	Perciformes	*Ophiocephalus punctatus*	C	91.1	15.76	20	Gerald (1976b)
75	Actinopterygii	Perciformes	*Ophiocephalus punctatus*	C	92.8	31.01	20	Gerald (1976b)
76	Actinopterygii	Perciformes	*Ophiocephalus punctatus*	C	94.9	7.87	28	Gerald (1976b)
77	Actinopterygii	Perciformes	*Ophiocephalus punctatus*	C	95.9	15.76	28	Gerald (1976b)
78	Actinopterygii	Perciformes	*Ophiocephalus punctatus*	C	95.8	31.01	28	Gerald (1976b)
79	Actinopterygii	Perciformes	*Ophiocephalus punctatus*	C	91.0	7.87	33	Gerald (1976b)
80	Actinopterygii	Perciformes	*Ophiocephalus punctatus*	C	93.9	15.76	33	Gerald (1976b)
81	Actinopterygii	Perciformes	*Ophiocephalus punctatus*	C	93.1	31.01	33	Gerald (1976b)
82	Polychaeta	Aciculata	*Neanthes virens*	C	84.2	3.4	15	Kay and Brafield (1973)
83	Polychaeta	Aciculata	*Neanthes virens*	C	86.6	4.95	15	Kay and Brafield (1973)
84	Polychaeta	Aciculata	*Neanthes virens*	C	88.9	3.65	15	Kay and Brafield (1973)
85	Polychaeta	Aciculata	*Neanthes virens*	C	86.1	3.99	15	Kay and Brafield (1973)
86	Polychaeta	Aciculata	*Neanthes virens*	C	86.3	5.79	15	Kay and Brafield (1973)
87	Polychaeta	Aciculata	*Neanthes virens*	C	85.1	5.78	15	Kay and Brafield (1973)
88	Polychaeta	Aciculata	*Neanthes virens*	C	85.1	7.41	15	Kay and Brafield (1973)

89	Polychaeta	Aciculata	*Neanthes virens*	C	84.3	6.05	15	Kay and Brafield (1973)
90	Polychaeta	Aciculata	*Neanthes virens*	C	85.5	13.56	15	Kay and Brafield (1973)
91	Polychaeta	Aciculata	*Neanthes virens*	C	82.1	6.503	15	Kay and Brafield (1973)
92	Polychaeta	Aciculata	*Neanthes virens*	C	86.5	15.13	15	Kay and Brafield (1973)
93	Polychaeta	Aciculata	*Neanthes virens*	C	84.8	7.77	15	Kay and Brafield (1973)
94	Polychaeta	Aciculata	*Neanthes virens*	C	87.4	5.03	15	Kay and Brafield (1973)
95	Polychaeta	Aciculata	*Neanthes virens*	C	85.2	7.62	15	Kay and Brafield (1973)
96	Polychaeta	Aciculata	*Neanthes virens*	C	84.9	7.42	15	Kay and Brafield (1973)
97	Polychaeta	Aciculata	*Neanthes virens*	C	83.7	7.74	15	Kay and Brafield (1973)
98	Polychaeta	Aciculata	*Neanthes virens*	C	82.4	8.15	15	Kay and Brafield (1973)
99	Malacostraca	Amphipoda	*Gammarus pseudolimnaeus*	D	18.6	0.053 [j]	17	Bärlocher and Kendrick (1975)
100	Malacostraca	Amphipoda	*Gammarus pseudolimnaeus*	D	17.2	0.053 [j]	17	Bärlocher and Kendrick (1975)
101	Arachnida	Araneae	*Lycosa rabida*	C	85.7	0.245000	20	Moulder and Reichle (1972)
102	Mammalia	Rodentia	*Neotoma lepida*	H	54.6	125	25	Karasov et al. (1986)
103	Mammalia	Rodentia	*laboratory mouse*	H	45.8	29	25	Karasov et al. (1986)
104	Reptilia	Squamata	*Iguana iguana*	H	46.0	37.5	31	Troyer (1984)
105	Reptilia	Squamata	*Iguana iguana*	H	50.0	267	31	Troyer (1984)
106	Reptilia	Squamata	*Iguana iguana*	H	53.0	1304	31	Troyer (1984)
107	Arachnida	Araneae	*Pardosa palustris*	C	78.6	0.00013	20	Steigen (1975)
108	Arachnida	Araneae	*Pardosa palustris*	C	89.0	0.00019	20	Steigen (1975)
109	Arachnida	Araneae	*Pardosa palustris*	C	80.9	0.00049	20	Steigen (1975)
110	Arachnida	Araneae	*Pardosa palustris*	C	79.6	0.001	20	Steigen (1975)
111	Arachnida	Araneae	*Pardosa palustris*	C	79.4	0.002	20	Steigen (1975)
112	Arachnida	Araneae	*Pardosa palustris*	C	79.3	0.003	20	Steigen (1975)
113	Arachnida	Araneae	*Pardosa palustris*	C	77.3	0.004	20	Steigen (1975)
114	Arachnida	Araneae	*Pardosa palustris*	C	84.0	0.005	20	Steigen (1975)
115	Arachnida	Araneae	*Pardosa palustris*	C	82.2	0.005	20	Steigen (1975)
116	Gastropoda	Helicidae	*Helix aspersa*	H	65.6	2.1	10	Mason (1970)
117	Gastropoda	Helicidae	*Helix aspersa*	H	64.7	3.2	10	Mason (1970)
118	Insecta	Lepidoptera	*Prodenia eridania*	H	50.0	0.033 [k]	27	Waldbauer (1968)
119	Insecta	Lepidoptera	*Prodenia eridania*	H	66.0	0.033 [k]	27	Waldbauer (1968)
120	Insecta	Lepidoptera	*Prodenia eridania*	H	70.0	0.033 [k]	27	Waldbauer (1968)
121	Insecta	Lepidoptera	*Prodenia eridania*	H	60.0	0.033 [k]	27	Waldbauer (1968)
122	Insecta	Lepidoptera	*Prodenia eridania*	H	65.0	0.033 [k]	27	Waldbauer (1968)
123	Insecta	Lepidoptera	*Prodenia eridania*	H	40.0	0.033 [k]	27	Waldbauer (1968)
124	Insecta	Lepidoptera	*Prodenia eridania*	H	60.0	0.033 [k]	27	Waldbauer (1968)
125	Insecta	Lepidoptera	*Prodenia eridania*	H	64.0	0.033 [k]	27	Waldbauer (1968)
126	Insecta	Lepidoptera	*Prodenia eridania*	H	44.0	0.033 [k]	27	Waldbauer (1968)
127	Insecta	Lepidoptera	*Prodenia eridania*	H	60.0	0.033 [k]	27	Waldbauer (1968)
128	Insecta	Lepidoptera	*Prodenia eridania*	H	58.0	0.033 [k]	27	Waldbauer (1968)
129	Insecta	Lepidoptera	*Prodenia eridania*	H	44.0	0.033 [k]	27	Waldbauer (1968)
130	Insecta	Lepidoptera	*Prodenia eridania*	H	46.0	0.033 [k]	27	Waldbauer (1968)
131	Malacostraca	Isopoda	*Idothea baltica*	H	82.0	0.00052 [b]	20	Soldatova et al. (1969)
132	Malacostraca	Isopoda	*Idothea baltica*	H	86.0	0.00064 [b]	20	Soldatova et al. (1969)
133	Malacostraca	Isopoda	*Idothea baltica*	H	59.0	0.004 [b]	20	Soldatova et al. (1969)
134	Malacostraca	Isopoda	*Idothea baltica*	H	60.0	0.004 [b]	20	Soldatova et al. (1969)
135	Malacostraca	Isopoda	*Idothea baltica*	H	60.0	0.004 [b]	20	Soldatova et al. (1969)
136	Malacostraca	Isopoda	*Idothea baltica*	H	58.0	0.02 [b]	20	Soldatova et al. (1969)

137	Malacostraca	Isopoda	*Idothea baltica*	H	60.0	0.056 [b]	20	Soldatova et al. (1969)
138	Malacostraca	Isopoda	*Idothea baltica*	H	57.0	0.036 [b]	20	Soldatova et al. (1969)
139	Malacostraca	Isopoda	*Idothea baltica*	H	58.0	0.036 [b]	20	Soldatova et al. (1969)
140	Malacostraca	Isopoda	*Idothea baltica*	C	98.0	0.052 [b]	20	Soldatova et al. (1969)
141	Malacostraca	Isopoda	*Idothea baltica*	H	51.0	0.012 [b]	20	Soldatova et al. (1969)
142	Malacostraca	Isopoda	*Idothea baltica*	H	64.0	0.028 [b]	20	Soldatova et al. (1969)
143	Malacostraca	Amphipoda	*Pontogammarus maeoticus*	H	81.0	0.004 [b]	20	Soldatova et al. (1969)
144	Malacostraca	Amphipoda	*Pontogammarus maeoticus*	H	76.0	0.04 [b]	20	Soldatova et al. (1969)
145	Malacostraca	Amphipoda	*Pontogammarus maeoticus*	H	81.0	0.036 [b]	20	Soldatova et al. (1969)
146	Malacostraca	Decapoda	*Rhithropanopeus harrisii*	C	92.0	3.104 [b]	20	Soldatova et al. (1969)
147	Malacostraca	Decapoda	*Rhithropanopeus harrisii*	C	93.0	0.404 [b]	20	Soldatova et al. (1969)
148	Malacostraca	Isopoda	*Idothea baltica*	H	58.0	0.02 [b]	18	Soldatova et al. (1969)
149	Malacostraca	Isopoda	*Idothea baltica*	H	57.0	0.02 [b]	28	Soldatova et al. (1969)
150	Malacostraca	Decapoda	*Rhithropanopeus harrisii*	C	92.0	3.104 [b]	18	Soldatova et al. (1969)
151	Malacostraca	Decapoda	*Rhithropanopeus harrisii*	C	96.0	3.892 [b]	28	Soldatova et al. (1969)
152	Mammalia	Chiroptera	*Lasiurus cinereus*	C	91.0	23.61	21.1	Brisbin (1966)
153	Insecta	Coleoptera	*Paropsis charybdis*	H	26.8	0.048 [a]	20	Edwards and Wightman (1984)
154	Insecta	Coleoptera	*Paropsis charybdis*	H	38.7	0.145 [a]	20	Edwards and Wightman (1984)
155	Insecta	Lepidoptera	*Cyclophragma leucosticta*	H	43.0	0.00628 [b]	27	Mackey (1978)
156	Insecta	Lepidoptera	*Cyclophragma leucosticta*	H	41.0	0.0058 [b]	27	Mackey (1978)
157	Malacostraca	Isopoda	*Asellus aquaticus*	D	17.3	0.032	10	Prus (1971)
158	Gastropoda	Helicidae	*Cepaea nemoralis*	H	75.1	2.92 [a]	5	Richardson (1975)
159	Gastropoda	Helicidae	*Cepaea nemoralis*	H	42.3	2.92 [a]	9.8	Richardson (1975)
160	Gastropoda	Helicidae	*Cepaea nemoralis*	H	75.2	2.92 [a]	12	Richardson (1975)
161	Gastropoda	Helicidae	*Cepaea nemoralis*	H	70.0	2.92 [a]	12.6	Richardson (1975)
162	Gastropoda	Helicidae	*Cepaea nemoralis*	H	71.7	2.92 [a]	23	Richardson (1975)
163	Gastropoda	Helicidae	*Cepaea nemoralis*	H	67.9	2.92 [a]	23.5	Richardson (1975)
164	Gastropoda	Helicidae	*Cepaea nemoralis*	H	43.0	2.92 [a]	10	Richardson (1975)
165	Gastropoda	Helicidae	*Cepaea nemoralis*	H	28.1	2.92 [a]	9.8	Richardson (1975)
166	Gastropoda	Helicidae	*Cepaea nemoralis*	H	33.6	2.92 [a]	9.5	Richardson (1975)
167	Gastropoda	Helicidae	*Cepaea nemoralis*	H	25.2	2.92 [a]	8.2	Richardson (1975)
168	Gastropoda	Helicidae	*Cepaea nemoralis*	H	37.8	2.92 [a]	8.1	Richardson (1975)
169	Gastropoda	Helicidae	*Cepaea nemoralis*	H	33.2	2.92 [a]	10	Richardson (1975)
170	Gastropoda	Helicidae	*Cepaea nemoralis*	H	26.3	2.92 [a]	8.1	Richardson (1975)
171	Insecta	Plecoptera	*Acroneuria californica*	C	80.7	0.027 [a]	17	Heiman and Knight (1975)
172	Insecta	Plecoptera	*Acroneuria californica*	C	85.7	0.027 [a]	21	Heiman and Knight (1975)
173	Insecta	Plecoptera	*Acroneuria californica*	C	90.6	0.027 [a]	25	Heiman and Knight (1975)
174	Insecta	Plecoptera	*Acroneuria californica*	C	95.6	0.027 [a]	29	Heiman and Knight (1975)
175	Insecta	Plecoptera	*Acroneuria californica*	C	84.2	0.108 [a]	6	Heiman and Knight (1975)
176	Insecta	Plecoptera	*Acroneuria californica*	C	86.8	0.108 [a]	10	Heiman and Knight (1975)
177	Insecta	Plecoptera	*Acroneuria californica*	C	89.3	0.108 [a]	14	Heiman and Knight (1975)
178	Insecta	Plecoptera	*Acroneuria californica*	C	91.9	0.108 [a]	18	Heiman and Knight (1975)
179	Insecta	Plecoptera	*Acroneuria californica*	C	79.6	0.021 [a]	16	Heiman and Knight (1975)
180	Insecta	Plecoptera	*Acroneuria californica*	C	84.5	0.021 [a]	20	Heiman and Knight (1975)
181	Insecta	Plecoptera	*Acroneuria californica*	C	89.4	0.021 [a]	24	Heiman and Knight (1975)
182	Insecta	Plecoptera	*Acroneuria californica*	C	94.3	0.021 [a]	28	Heiman and Knight (1975)
183	Insecta	Plecoptera	*Acroneuria californica*	C	85.2	0.082 [a]	10	Heiman and Knight (1975)
184	Insecta	Plecoptera	*Acroneuria californica*	C	87.2	0.082 [a]	14	Heiman and Knight (1975)
185	Insecta	Plecoptera	*Acroneuria californica*	C	89.2	0.082 [a]	18	Heiman and Knight (1975)

186	Insecta	Plecoptera	*Acroneuria californica*	C	91.2	0.082 [a]	22	Heiman and Knight (1975)
187	Insecta	Plecoptera	*Acroneuria californica*	C	88.4	0.145 [a]	10	Heiman and Knight (1975)
188	Insecta	Plecoptera	*Acroneuria californica*	C	99.2	0.145 [a]	14	Heiman and Knight (1975)
189	Insecta	Plecoptera	*Acroneuria californica*	C	94.6	0.145 [a]	18	Heiman and Knight (1975)
190	Insecta	Plecoptera	*Acroneuria californica*	C	97.8	0.145 [a]	22	Heiman and Knight (1975)
191	Bivalvia	Ostreoida	*Crassostrea virginica*	H	85.7	2.344 [b]	20	Tenore and Dunstan (1973)
192	Bivalvia	Ostreoida	*Crassostrea virginica*	H	87.9	2.344 [b]	20	Tenore and Dunstan (1973)
193	Bivalvia	Ostreoida	*Crassostrea virginica*	H	83.7	2.344 [b]	20	Tenore and Dunstan (1973)
194	Bivalvia	Ostreoida	*Crassostrea virginica*	H	77.4	2.344 [b]	20	Tenore and Dunstan (1973)
195	Bivalvia	Veneroida	*Mercenaria mercenaria*	H	74.0	3.4 [b]	20	Tenore and Dunstan (1973)
196	Bivalvia	Veneroida	*Mercenaria mercenaria*	H	77.3	3.4 [b]	20	Tenore and Dunstan (1973)
197	Bivalvia	Veneroida	*Mercenaria mercenaria*	H	76.1	3.4 [b]	20	Tenore and Dunstan (1973)
198	Bivalvia	Veneroida	*Mercenaria mercenaria*	H	71.2	3.4 [b]	20	Tenore and Dunstan (1973)
199	Bivalvia	Mytiloida	*Mytilus edulis*	H	71.1	1.9 [b]	20	Tenore and Dunstan (1973)
200	Bivalvia	Mytiloida	*Mytilus edulis*	H	74.6	1.9 [b]	20	Tenore and Dunstan (1973)
201	Bivalvia	Mytiloida	*Mytilus edulis*	H	75.5	1.9 [b]	20	Tenore and Dunstan (1973)
202	Bivalvia	Mytiloida	*Mytilus edulis*	H	72.5	1.9 [b]	20	Tenore and Dunstan (1973)
203	Mammalia	Rodentia	*Ammospermophilus leucurus*	C	85.3	88.1	25	Karasov (1982)
204	Mammalia	Rodentia	*Ammospermophilus leucurus*	C	95.5	86.6	25	Karasov (1982)
205	Mammalia	Rodentia	*Ammospermophilus leucurus*	H	67.8	94.3	25	Karasov (1982)
206	Mammalia	Rodentia	*Ondatra zibethicus*	H	67.4	911.5	14	Campbell and MacArthur (1996)
207	Aves	Strigiformes	*Bubo virginianus*	C	67.9	1615	26	Duke et al. (1973)
208	Aves	Strigiformes	*Bubo virginianus*	C	71.2	1615	26	Duke et al. (1973)
209	Insecta	Plecoptera	*Pteronarcys scotti*	D	15.9	0.047 [a]	15	McDiffett (1970)
210	Insecta	Plecoptera	*Pteronarcys scotti*	D	10.2	0.047 [a]	10	McDiffett (1970)
211	Insecta	Plecoptera	*Pteronarcys scotti*	D	13.2	0.047 [a]	5	McDiffett (1970)
212	Insecta	Plecoptera	*Pteronarcys scotti*	D	8.9	0.047 [a]	10	McDiffett (1970)
213	Insecta	Plecoptera	*Pteronarcys scotti*	D	10.8	0.047 [a]	15	McDiffett (1970)
214	Insecta	Plecoptera	*Pteronarcys scotti*	D	8.5	0.047 [a]	10	McDiffett (1970)
215	Malacostraca	Isopoda	*Glyptonotus antarcticus*	C	97.5	0.15	1.5	Clarke (1979)
216	Malacostraca	Isopoda	*Glyptonotus antarcticus*	C	95.5	0.15	1.5	Clarke (1979)
217	Diplopoda	Glomerida	*Glomeris marginata*	D	4.0	0.27 [a]	7	David and Gillon (2002)
218	Diplopoda	Glomerida	*Glomeris marginata*	D	1.0	0.27 [a]	9	David and Gillon (2002)
219	Reptilia	Crocodylia	*Crocodylus porosus*	C	86.4	389.5	30	Garnett (1988)
220	Reptilia	Squamata	*Sceloporus olivaceus*	C	90.0	16.49	25	Dutton et al. (1975)
221	Reptilia	Squamata	*Sceloporus olivaceus*	C	81.0	16.49	30	Dutton et al. (1975)
222	Reptilia	Squamata	*Sceloporus olivaceus*	C	80.0	16.49	20	Dutton et al. (1975)
223	Reptilia	Squamata	*Sceloporus olivaceus*	C	89.0	16.49	15	Dutton et al. (1975)
224	Mammalia	Rodentia	*Spermophilus saturatus*	H	50.4	234	22	Cork and Kenagy (1989)
225	Mammalia	Rodentia	*Spermophilus saturatus*	H	51.3	249	22	Cork and Kenagy (1989)
226	Branchiopoda	Cladocera	*Simocephalus vetulus*	H	41.1	0.000019	8	Sharma and Pant (1984)
227	Branchiopoda	Cladocera	*Simocephalus vetulus*	H	27.0	0.000019	8	Sharma and Pant (1984)
228	Branchiopoda	Cladocera	*Simocephalus vetulus*	H	17.5	0.000019	8	Sharma and Pant (1984)
229	Branchiopoda	Cladocera	*Simocephalus vetulus*	H	15.7	0.000019	8	Sharma and Pant (1984)
230	Branchiopoda	Cladocera	*Simocephalus vetulus*	H	38.2	0.000019	15	Sharma and Pant (1984)
231	Branchiopoda	Cladocera	*Simocephalus vetulus*	H	29.5	0.000019	15	Sharma and Pant (1984)
232	Branchiopoda	Cladocera	*Simocephalus vetulus*	H	15.7	0.000019	15	Sharma and Pant (1984)
233	Branchiopoda	Cladocera	*Simocephalus vetulus*	H	15.2	0.000019	15	Sharma and Pant (1984)
234	Branchiopoda	Cladocera	*Simocephalus vetulus*	H	52.9	0.000019	21	Sharma and Pant (1984)

235	Branchiopoda	Cladocera	*Simocephalus vetulus*	H	29.3	0.000019	21	Sharma and Pant (1984)
236	Branchiopoda	Cladocera	*Simocephalus vetulus*	H	17.9	0.000019	21	Sharma and Pant (1984)
237	Branchiopoda	Cladocera	*Simocephalus vetulus*	H	15.8	0.000019	21	Sharma and Pant (1984)
238	Branchiopoda	Cladocera	*Simocephalus vetulus*	H	84.5	0.000019	28	Sharma and Pant (1984)
239	Branchiopoda	Cladocera	*Simocephalus vetulus*	H	69.9	0.000019	28	Sharma and Pant (1984)
240	Branchiopoda	Cladocera	*Simocephalus vetulus*	H	44.3	0.000019	28	Sharma and Pant (1984)
241	Aves	Strigiformes	*Tyto alba*	C	78.4	561.3	5	Hamilton (1985)
242	Aves	Strigiformes	*Tyto alba*	C	78.3	561.3	15	Hamilton (1985)
243	Aves	Strigiformes	*Tyto alba*	C	77.6	561.3	25	Hamilton (1985)
244	Insecta	Diptera	*Kiefferulus barbitarsis*	H	57.3	0.00259 [l]	27	Palavesam et al. (2009)
245	Insecta	Diptera	*Kiefferulus barbitarsis*	H	60.3	0.00259 [l]	27	Palavesam et al. (2009)
246	Mammalia	Artiodactyla	*Bos grunniens*	H	48.8	176000	14	Schaefer et al. (1978)
247	Mammalia	Artiodactyla	*Bos taurus Holstein*	H	58.9	364000	14	Schaefer et al. (1978)
248	Mammalia	Artiodactyla	*Bos taurus Hereford*	H	50.7	374000	14	Schaefer et al. (1978)
249	Mammalia	Artiodactyla	*Bos taurus Highland*	H	49.5	333000	14	Schaefer et al. (1978)
250	Mammalia	Artiodactyla	*Bison bison*	H	49.3	279000	14	Schaefer et al. (1978)
251	Mammalia	Artiodactyla	*Goats*	H	57.0	26200	22.5	Kennedy et al. (1992)
252	Mammalia	Artiodactyla	*Merino sheep*	H	53.0	38400	22.5	Kennedy et al. (1992)
253	Actinopterygii	Perciformes	*Ophiocephalus striatus*	C	91.0	63 [a]	28	Pandian (1967b,a)[p]
254	Actinopterygii	Perciformes	*Ophiocephalus striatus*	C	97.0	20.55 [a]	27	Vivekanandan (1977)[p]
255	Actinopterygii	Perciformes	*Ophiocephalus striatus*	C	86.0	0.8	27	Vivekanandan (1976)[p]
256	Actinopterygii	Perciformes	*Ophiocephalus striatus*	C	94.0	0.6	28	Sampath and Pandian (1980)[p]
257	Actinopterygii	Perciformes	*Ophiocephalus punctatus*	C	92.0	24 [a]	28	Nirmala (1981)[p]
258	Actinopterygii	Elopiformes	*Megalops cyprinoides*	C	91.5	52.2 [m]	28	Pandian (1967a)[p]
259	Actinopterygii	Elopiformes	*Megalops cyprinoides*	C	93.0	52.2 [m]	28	Pandian (1967c)[p]
260	Actinopterygii	Perciformes	*Micopterus salmoides*	C	91.2	49 [a]	21	Blackburn (1968)[p]
261	Actinopterygii	Perciformes	*Micopterus salmoides*	C	90.0	49 [a]	25	Beamish (1972)[p]
262	Actinopterygii	Salmoniformes	*Salmo clarkii*	C	85.5	2	10	Brocksen et al. (1968)[p]
263	Actinopterygii	Salmoniformes	*Salmo gairdneri*	C	85.0	3500	15	Austreng and Gjefren (1981)[p]
264	Actinopterygii	Perciformes	*Perca fluviatilis*	C	87.0	12	14	Solomon and Brafield (1972)[p]
265	Actinopterygii	Cypriniformes	*Cyprinus carpio*	C	97.0	0.2	27	Charles et al. (1984)[p]
266	Actinopterygii	Pleuronectiformes	*Cynoglossus sp.*	C	95.0	10	28	Edwards et al. (1971)[p]
267	Actinopterygii	Perciformes	*Blennius pholis*	C	96.0	19	25	Wallace (1973)[p]
268	Actinopterygii	Gasterosteiformes	*Gasterosteus aculeatus*	C	80.0	1	15	Walkey and Meakings (1969)[p]
269	Actinopterygii	Pleuronectiformes	*Pleuronectes platessa*	C	97.0	7000 [d]	10	Edwards et al. (1969)[p]
270	Actinopterygii	Perciformes	*Anabas scandens*	C	98.0	4	27	Vivekanandan et al. (1977)[p]
271	Actinopterygii	Perciformes	*Anabas scandens*	C	90.0	11	27	Pandian et al. (1977)[p]
272	Actinopterygii	Siluriformes	*Clarius lazera*	C	93.0	45.75 [a]	25	Hogendoorn (1983)[p]
273	Actinopterygii	Siluriformes	*Heteropneustes fossilis*	C	92.0	1.5	28	Arunachalam (1979)[p]
274	Actinopterygii	Siluriformes	*Heteropneustes fossilis*	C	92.0	4.5	27	Marian et al. (1982)[p]
275	Actinopterygii	Cypriniformes	*Ctenopharyngodon idella*	H	58.0	100	25	Stanley (1974)[p]
276	Actinopterygii	Cypriniformes	*Ctenopharyngodon idella*	H	87.0	45 [a]	23	Fischer (1970)[p]
277	Actinopterygii	Cypriniformes	*Cyprinus carpio*	H	80.0	0.2	25	Singh and Bhanot (1970)[p]
278	Actinopterygii	Perciformes	*Etroplus suratensis*	H	44.0	13.5 [a]	26.5	DeSilva and Perera (1983)[p]
279	Diplopoda	Glomerida	*Glomeris hexasticha*	D	43.6	0.07205	21	Tajovsky (1992)
280	Diplopoda	Glomerida	*Glomeris hexasticha*	D	29.0	0.06901	21	Tajovsky (1992)
281	Diplopoda	Glomerida	*Glomeris hexasticha*	D	20.4	0.05257	21	Tajovsky (1992)
282	Diplopoda	Julida	*Megaphyllum projectum*	D	20.1	0.2869 [a,n]	10	Pobozsny (1992)
283	Diplopoda	Julida	*Megaphyllum projectum*	D	11.5	0.2869 [a,n]	10	Pobozsny (1992)

284	Diplopoda	Julida	*Megaphyllum projectum*	D	19.0	0.2869 [a,n]	10	Pobozsny (1992)
285	Diplopoda	Julida	*Megaphyllum projectum*	D	22.4	0.2869 [a,n]	10	Pobozsny (1992)
286	Diplopoda	Julida	*Unciger foetidus*	D	17.1	0.124 [g]	10	Pobozsny (1992)
287	Diplopoda	Julida	*Unciger foetidus*	D	14.5	0.124 [g]	10	Pobozsny (1992)
288	Diplopoda	Julida	*Unciger foetidus*	D	35.0	0.124 [g]	10	Pobozsny (1992)
289	Diplopoda	Julida	*Unciger foetidus*	D	19.5	0.124 [g]	10	Pobozsny (1992)
290	Diplopoda	Glomerida	*Glomeris hexasticha*	D	14.4	0.079 [o]	10	Pobozsny (1992)
291	Diplopoda	Glomerida	*Glomeris hexasticha*	D	12.1	0.079 [o]	10	Pobozsny (1992)
292	Diplopoda	Glomerida	*Glomeris hexasticha*	D	23.9	0.079 [o]	10	Pobozsny (1992)
293	Diplopoda	Glomerida	*Glomeris hexasticha*	D	15.5	0.079 [o]	10	Pobozsny (1992)
294	Diplopoda	Julida	*Ophyiulus pilosus*	D	30.0	0.129	15	Brüggl (1992)
295	Diplopoda	Julida	*Ommatoiulus sabulosus*	D	36.6	0.19	15	Brüggl (1992)
296	Diplopoda	Glomerida	*Glomeris hexasticha*	D	17.1	0.079	10	Pobozsny (1988)
297	Diplopoda	Glomerida	*Glomeris hexasticha*	D	7.0	0.079	10	Pobozsny (1988)
298	Diplopoda	Glomerida	*Glomeris hexasticha*	D	15.1	0.079	10	Pobozsny (1988)
299	Diplopoda	Julida	*Unciger foetidus*	D	38.3	0.1319	11	Pobozsny (1997)
300	Diplopoda	Julida	*Unciger foetidus*	D	22.6	0.1518	11	Pobozsny (1997)
301	Diplopoda	Julida	*Cylindroiulus luridus*	D	13.6	0.1301	11	Pobozsny (1997)
302	Diplopoda	Julida	*Cylindroiulus luridus*	D	19.2	0.3002	11	Pobozsny (1997)
303	Diplopoda	Julida	*Megaphyllum projectum*	D	16.2	0.2021	11	Pobozsny (1997)
304	Diplopoda	Julida	*Megaphyllum projectum*	D	17.4	0.3217	11	Pobozsny (1997)
305	Diplopoda	Julida	*Megaphyllum projectum*	D	19.0	0.2244	11	Pobozsny (1997)
306	Diplopoda	Julida	*Megaphyllum projectum*	D	23.7	0.3994	11	Pobozsny (1997)
307	Malacostraca	Isopoda	*Protracheoniscus politus*	D	5.8	0.05	21.1	Gere (1956)
308	Malacostraca	Isopoda	*Protracheoniscus politus*	D	3.8	0.21	20.8	Gere (1956)
309	Malacostraca	Isopoda	*Protracheoniscus politus*	D	24.2	0.014	18	Gere (1956)
310	Gastropoda	Littorinidae	*Littorina littorea*	H	37.0	5.44 [b]	10	Grahame (1973)
311	Gastropoda	Littorinidae	*Littorina littorea*	H	28.0	2.94 [b]	10	Grahame (1973)
312	Gastropoda	Littorinidae	*Littorina littorea*	H	72.0	1.06 [b]	10	Grahame (1973)
313	Gastropoda	Littorinidae	*Littorina littorea*	H	83.0	2.016 [b]	15.5	Grahame (1973)
314	Gastropoda	Littorinidae	*Littorina littorea*	H	67.0	1.88 [b]	15.5	Grahame (1973)
315	Gastropoda	Littorinidae	*Littorina littorea*	H	70.0	2.04 [b]	15.5	Grahame (1973)
316	Gastropoda	Littorinidae	*Littorina littorea*	H	68.0	1.972 [b]	15.5	Grahame (1973)
317	Gastropoda	Littorinidae	*Littorina littorea*	H	72.0	1.936 [b]	15.5	Grahame (1973)
318	Gastropoda	Littorinidae	*Littorina littorea*	H	56.0	0.764 [b]	15.5	Grahame (1973)
319	Malacostraca	Isopoda	*Asellus aquaticus*	D	32.6	0.032	10	Prus (1971)
320	Malacostraca	Isopoda	*Asellus aquaticus*	D	19.3	0.032	10	Prus (1971)
321	Malacostraca	Isopoda	*Asellus aquaticus*	D	14.6	0.032	10	Prus (1971)
322	Malacostraca	Isopoda	*Asellus aquaticus*	D	35.9	0.032	10	Prus (1971)
323	Malacostraca	Isopoda	*Asellus aquaticus*	D	15.5	0.032	10	Prus (1971)
324	Malacostraca	Isopoda	*Asellus aquaticus*	D	36.1	0.032	10	Prus (1971)
325	Malacostraca	Isopoda	*Asellus aquaticus*	D	32.8	0.032	10	Prus (1971)
326	Malacostraca	Isopoda	*Asellus aquaticus*	D	28.6	0.032	10	Prus (1971)
327	Malacostraca	Isopoda	*Asellus aquaticus*	D	36.5	0.032	10	Prus (1971)
328	Malacostraca	Isopoda	*Asellus aquaticus*	D	10.5	0.032	10	Prus (1971)
329	Malacostraca	Isopoda	*Asellus aquaticus*	D	18.1	0.032	10	Prus (1971)
330	Malacostraca	Isopoda	*Asellus aquaticus*	D	22.4	0.032	10	Prus (1971)
331	Malacostraca	Isopoda	*Asellus aquaticus*	D	36.2	0.032	10	Prus (1971)
332	Malacostraca	Isopoda	*Asellus aquaticus*	D	21.3	0.032	10	Prus (1971)

333	Malacostraca	Isopoda	*Asellus aquaticus*	D	9.4	0.032	10	Prus (1971)
334	Malacostraca	Isopoda	*Asellus aquaticus*	D	35.5	0.032	10	Prus (1971)
335	Malacostraca	Isopoda	*Asellus aquaticus*	D	37.1	0.032	10	Prus (1971)
336	Malacostraca	Isopoda	*Asellus aquaticus*	D	31.7	0.032	10	Prus (1971)
337	Malacostraca	Isopoda	*Asellus aquaticus*	D	37.3	0.032	10	Prus (1971)
338	Malacostraca	Isopoda	*Asellus aquaticus*	D	31.1	0.032	10	Prus (1971)
339	Malacostraca	Isopoda	*Asellus aquaticus*	D	19.1	0.032	10	Prus (1971)
340	Insecta	Diptera	*Kiefferulus barbitarsis*	D	52.5	0.00259 [l]	27	Palavesam et al. (2009)
341	Insecta	Diptera	*Kiefferulus barbitarsis*	D	30.4	0.00259 [l]	27	Palavesam et al. (2009)
342	Insecta	Diptera	*Kiefferulus barbitarsis*	D	24.6	0.00259 [l]	27	Palavesam et al. (2009)
343	Mammalia	Artiodactyla	*Goats*	H	45.0	26200	22.5	Kennedy et al. (1992)
344	Mammalia	Artiodactyla	*Merino sheep*	H	46.0	384	22.5	Kennedy et al. (1992)
345	Mammalia	Artiodactyla	*Merino sheep*	H	48.0	384	22.5	Kennedy et al. (1992)
346	Mammalia	Artiodactyla	*Merino sheep*	H	49.0	384	22.5	Kennedy et al. (1992)
347	Malacostraca	Isopoda	*Idothea baltica*	H	61.0	0.024 [b]	20	Soldatova et al. (1969)
348	Amphibia	Caudata	*Desmognathus ochrophaeus*	C	87.2	1.22	15	Fitzpatrick (1973)
349	Amphibia	Caudata	*Desmognathus ochrophaeus*	C	86.3	0.78	15	Fitzpatrick (1973)
350	Amphibia	Caudata	*Desmognathus ochrophaeus*	C	88.2	1.42	15	Fitzpatrick (1973)

Curriculum vitae

Personal Information

Birgit Lang
Sophienstrasse 22
34117 Kassel
02.08.1982, Bad Schwalbach

Education

since 03/2009	**PhD Student** within the DFG research group 918: *Carbon flow on belowground food webs assessed by isotope tracers* Technische Universität Darmstadt and Georg-August-Universität Göttingen
10/2003 – 01/2009	**Diploma in biology at Technische Universität Darmstadt** study focus: ecology, microbiology, biochemistry
1995 – 2002	Pestalozzi-Schule Idstein, Germany
1993 – 1995	Limesschule Idstein, Germany

Publications

2012	**Lang, B., Rall, B.C. and Brose, U.** Warming effects on consumption and intraspecific interference competition depend on predator metabolism. *Journal of Animal Ecology* 81(3): 516-523.

Manuscripts in preparation

Lang, B., Ehnes, R. B., Rall, B.C. and Brose, U.
Respiration rates, assimilation efficiencies and maintenance consumption rates depend on consumer types: energetic implications of environmental warming.
Lang, B. and Rall, B. C., Scheu, S. and Brose, U.
Effects of environmental warming and drought on a size-structured soil community

Conferences and Workshops

Oral Presentations

09/2012	*Illuminating the dark: Effects of climate change on soil communities.* Ecological Society of Germany, Austria and Switzerland (GfÖ) annual meeting, Leuphana Universität Lüneburg, Germany
01/2012	*How does environmental warming affect trophic interactions?.* Oikos annual meeting, Karlstad University, Sweden
09/2011	*Effects of environmental warming on trophic interactions.* British Ecological Society annual meeting, University of Sheffield, UK
09/2011	*Effects of environmental warming on trophic interactions.* Ecological Society of Germany, Austria and Switzerland (GfÖ) annual meeting, Carl von Ossietzky Universität Oldenburg, Germany

Poster Presentations

06/2012	*A small world magnified: Effects of climate change on soil communities.* Web of life 2012, Montpellier, France
06/2011	*Temperature effects on interaction strengths.* Functions and services of biodiversity 2011, Georg-August-Universität Göttingen, Germany
09/2010	*Temperature effects on interaction strengths.* Annual meeting of the British Ecological Society, University of Leeds, UK

others

04/2011	Sizemic-Workshop *Changing climate, physiological adaption, ecosystem resilience & body size constraints.* ESF research network SIZEMIC, Institute for Hydrobiology and Fisheries Science, Hamburg, Germany
06/2009	Effect of global change on carbon sequestration and food web structure across ecosystems. International symposium, Carl von Ossietzky Universität Oldenburg, Germany
05/2009	Biodiversity in soils - ecosystem functions and services (Biodiversität im Boden – Funktion und Leistung des Ökosystems). GfÖ-Workshop, Humboldt-Universität zu Berlin, Germany

Scholarships

03/2012 - 10/2012	Scholarship of the Fazit Foundation

Eidesstattliche Erklärung

Hiermit erkläre ich, dass diese Arbeit weder in gleicher noch in ähnlicher Form bereits anderen Prüfungsbehörden vorgelegen hat.

Weiterhin erkläre ich, dass ich mich an keiner anderen Hochschule um einen Doktorgrad beworben habe.

Göttingen, den 7. November 2012

Birgit Lang

....

Hiermit erkläre ich eidesstattlich, dass diese Dissertation selbständig und ohne unerlaubte Hilfe angefertigt wurde.

Göttingen, den 7. November 2012

Birgit Lang

....

Acknowledgements

First of all, I want to thank my parents who always believed in me and supported me over the years. And Stefan, with whom I shared so many adventures either with our 2CVs or hiking boots.

Thanks to Ulrich Brose and Stefan Scheu for the supervision of my thesis. Despite many difficulties you always helped during the experiments and while writing this thesis, both with your knowledge and lending a hand if necessary. Especially I want to thank Uli for giving me the opportunity to go to so many conferences and meet a lot of interesting people.

Roswitha, we were a good team dealing papers to each other if it was on one of our topics. Göttingen needs more espresso breaks. And this thesis would contain much more typos without your proofreading.

Thanks to all the other members of the econetlab for the good atmosphere at university and wonderful evening and weekend activities. And of course thanks to everyone for stimulating discussions and proofreading this work. Don't take it amiss that I don't mention everyone by name, you were all great.

I also want to thank my friends for being with me for so many years, and their patience and encouragement during the last weeks. Especially, I would like to thank Ben, Christiane and Julia for legendary Canaschta evenings and Elmo, Malte, Marie and Steffen for distractive journeys to medieval Byzantium.

. . . and John, the expert I could ask at the unearthly hours of nighttime if I needed help with the english language (or the American . . .).

And finally, as it's no use for a name:
Without you my life is incomplete my days are absolutely grey
And so i try to let your heart know for sure that i have so much more
To tell you every single day
(International You Day)