Evolution of Body Mass in Coleoptera: Insights from Museum Specimens and DNA Barcodes

by

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A Thesis

presented to

The University of Guelph

In partial fulfilment of requirements
for the degree of

Master of Science

in

Integrative Biology

Guelph, Ontario, Canada

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ABSTRACT

Evolution of Body Mass in Coleoptera: Insights from Museum Specimens and DNA Barcodes

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This thesis investigates the evolution of body mass in Coleoptera, one of the most diverse orders of animals. By quantifying the mass of over 3,000 Canadian species using museum specimens stored at the Centre for Biodiversity Genomics, it describes fundamental yet under-investigated aspects of body mass variation in Coleoptera, such as species-size distributions and the partitioning of variation at different taxonomic levels. Using DNA barcode sequences and backbone phylogenies, it also illustrates trajectories of mass evolution, evaluating the influence of phylogenetic constraints and ecological specialization. Both lineage-wide patterns as well as phylogenetic parameters in Coleoptera appear to diverge strongly from trends noted in vertebrate groups, providing new insights into the evolution of a fundamental biological trait. As well, this thesis provides direction and methodologies for future studies to utilize museum specimens in investigations of arthropod body mass.

ACKNOWLEDGEMENTS

This research was funded by a Discovery Grant from the Natural Sciences and Engineering Research Council of Canada (NSERC) awarded to Dr. Paul Hebert.

I would like to thank Dr. Paul Hebert for being my advisor for this thesis, and for his feedback and advice throughout. Paul gave me considerable autonomy and freedom to explore in this project, but also provided invaluable insight and advice at every key step. It is thanks to him that I have gained essential experiences of the research process, from planning to presentation, in completing this project. I also thank the members of my advisory committee, Dr. Sarah J. Adamowicz and Dr. Jinzhong Fu, for their advice, feedback, and encouragement over the years. As well, I am grateful to Dr. Dirk Steinke, Sujeevan Ratnasingham, and Dr. Mikko Pentinsaari, for generously sharing with me their knowledge and expertise, as well as the staff and work-study students at the Centre for Biodiversity Genomics collections unit, for helping me navigate the lab and stay organized through the data collection process. Finally, thank you to members of the Hebert Lab, the Steinke Lab, and other CBG staff who have offered me help and support throughout this project.

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1 Chapter 1: Introduction

1.1 Summary

Body mass is a fundamental biological trait. Understanding the causes and consequences of its change is key to understanding past and future patterns in the evolution of animals. This chapter provides an overview of previous research on animal body mass and considers methods used to estimate it with a focus on arthropods. It highlights the limited documentation of arthropod body masses, as well as the lack of understanding of their evolutionary trends, despite the species richness and functional diversity of arthropods. This chapter concludes with an outline of the key questions and goals in the remaining chapters of this thesis, which combine the use of museum specimens and DNA barcoding to provide new insights into the evolution of body mass while also establishing protocols for future body mass quantification and prediction methods.

1.2 Introduction: body mass variation shapes diversity in animals

The body mass of an animal is one of its most important properties. From the microscopic cnidarian, *Henneguya lateolabracis*, to the blue whale, *Balaenoptera musculus*, animal species vary in body mass by more than 16 orders of magnitude. To a large extent, their incredible diversity in morphology and life history is influenced by this variation (reviewed in Smith *et al*., 2016). The mass of an animal affects its physiology, morphology, and its interaction with key aspects of the environment - gravity, air, and water (Bonner, 2006; Chown and Gaston, 2010; Smith *et al*., 2016). For example, the decreasing efficacy of passive diffusion with increasing distance means that specialized structures for gas, nutrient, and waste exchange become essential as body size increases. Conversely, lineages that miniaturize can lose their circulatory organs (e.g. Dybas, 1978). Massive species, such as elephants, need thick limbs to support themselves against gravity, as well as hearts and circulatory systems that can withstand the elevated pressure needed to deliver blood around their bodies, while insects need only thin wings and legs for locomotion. On the other hand, arthropods are more susceptible to forces such as surface tension, so they often drown upon being immersed in water, whereas large mammals can break free. In summary, basic physical and mathematical rules determine that the shapes and lifestyles of organisms change in predictable ways with their mass (Haldane, 1928).

Variation in body mass also strongly influences physiological processes (Chown and Gaston, 2010; Smith *et al.*, 2016). Most importantly, metabolic rates scale allometrically with body mass to the power

of approximately 0.75 (Kleiber, 1932), so energy requirements per unit mass decline substantially as animals become larger. For example, a species with a body mass 100 times that of another species requires only 1/3 as much energy per unit mass. This has implications for life history parameters of organisms, which in turn shape community structure and food web dynamics. Larger body mass is also associated with larger genome and cell size, resulting in slower growth, longer generation time, and lower population density (Ernest *et al*. 2003; DeLong *et al*., 2010). These correlations have profound consequences on evolutionary processes, such as speciation rate and risk of extinction (Blanckenhorn, 2000). Therefore, studying large-scale patterns of variation in body mass can provide important insights into the processes that shape biodiversity and ecosystem structure. Knowledge of the mass of each species is also key to the analysis of community structure and the construction of ecosystem models (Harfoot *et al.*, 2014).

Although to a lesser extent, body mass also varies intraspecifically. Often used as the independent variable in life history studies, intraspecific variation in mass has been linked to diverse environmental factors and life history parameters. Because changes in temperature and resource availability can affect size, body mass can rapidly change in response to climate change, habitat fragmentation, and anthropogenic activities (e.g. Tseng *et al*. 2018). Moreover, such shifts in body mass can impact traits such as fecundity, reproductive success, effectiveness of defense mechanisms, thermal tolerance, morphology, locomotion, and dispersal (Honek, 1993; Garcia-Barros, 2000; Alós *et al.*, 2014; Kang *et al.*, 2017; Waller and Svensson, 2017). Therefore, understanding the causes and consequences of variation in the body mass of animals can be key to understanding how they might adapt to environmental changes.

1.3 Measures and approximations of body mass

1.3.1 Types of mass measurement

Among many studies that examined variation in body mass as a central focus or key variable, several approaches have been used to quantify it. While body mass typically refers to the weight of organisms while they are alive, studies often target preserved specimens. In this context, wet mass refers to the weight of specimens preserved in liquids such as formalin and ethanol (Hamilton and Kingston, 1985; Wetzel *et al.*, 2005). On the other hand, dry mass is the weight of specimens held in desiccated state. It has the advantage for ecological studies of showing a stronger correlation with carbon content than does wet mass (Sage, 1982). However, dry mass can be error prone as specimens may require long periods to fully dry or they can be damaged when removed from preservatives. As well, drying temperature can impact results; oven drying at 60 °C and 100 °C can produce different mass estimates for a specimen (Dermott &

Paterson, 1974). Ash-free dry mass has also been used to strengthen the correlation of carbon content with dry mass, but it is not often employed due to its greater analytical complexity (Sládeček and Sládečková, 1963). In studies of predator-prey dynamics or life-history analyses of insectivores, researchers have also utilized consumable biomass, which excludes water and indigestible parts (e.g. exoskeleton), in estimating nutritional intake (Straus and Avilés, 2018).

Overall, while a particular measure of mass may be suitable for certain studies, the strong linear or log-linear correlation between different metrics means that one type of mass can be used to estimate the others so long as their regression coefficients are known.

1.3.2 Approximations of body mass

While direct quantification provides the most accurate estimate of body mass, it can be difficult to obtain. For example, weighing small-bodied taxa is time consuming and requires expensive precision balances. In other cases, direct measures are complicated because of difficulties in accessing species, or impossible for studies that target extinct groups. In such cases, measurements of the major body axes (length and/or width) or a major body part have been often used as proxies for mass. In arthropods, body length and wing length are the most commonly used surrogates (Miller, 1977; Ulrich, 2007; Waller and Svensson, 2017). Because they are more readily determined, linear measurements are also frequently used to estimate body mass through regression equations (Rogers *et al.*, 1976; Ganihar, 1997).

The use of any linear measurement as a proxy for mass has one major drawback. Comparisons across taxa are difficult because of shifts in body shape. Even body length, a measure that can be obtained for every animal, varies significantly in its relationship with mass depending on factors such as absolute size, body shape, and habitat (Gowing and Recher, 1984; Hodar, 1996). Moreover, these equations often use log-transformed values and exponential or power equations, amplifying any variation in linear measurements. While studies typically report a strong correlation (high R^2), (Rogers *et al.* 1976; Ganihar, 1996; Hodar, 1996), the underlying models often have wide margins of error and low predictive power. As an example, using the figures in Rogers *et al.* (1976), an accurate measurement of 10 mm predicts a dry mass that varies by an order of magnitude (3-30 mg), while allowing an error margin of ± 1 mm in length expands the prediction range to nearly two orders of magnitude (1-70 mg).

Additional information, such as width and height, a categorization of shape, taxonomy, and whether the organism is aquatic or terrestrial, can improve estimates of body mass based on length, and myriad regression equations including one or more of these factors have been used to estimate mass for specific

taxa in particular regions (Rogers *et al*., 1977; Smock, 1980; Sage, 1982; Gowing and Recher, 1984; Jarosik, 1989; Sample *et al*., 1993; Lang *et al*., 1997; Johnson and Strong, 2000; Sabo *et al.*, 2002; Gruner, 2003; Radtke and Williamson, 2005; Radtke *et al*., 2006; Wardhaugh, 2013). Several studies have also used the volume of organisms, or biovolume, as a measure of size, assuming that most organisms have roughly the same density (e.g. Heim *et al.*, 2015). Biovolume is estimated with multiple length measurements and uses geometric models to approximate animal shapes and is particularly useful for extinct or rare clades. While more time consuming, this approach is more precise than linear measurements and can be generalized across taxa. However, animals can vary in density and water content, both intraspecifically and across taxa. For example, Chown and Gaston (2010) demonstrated that wasps can be sexually dimorphic in density, leading to notably different length-weight relationships even within a single species, while Sabo *et al.* (2002) showed that water content differs substantially between terrestrial and aquatic invertebrates.

Despite warnings against the use of generalized length-mass relationships (Gowing and Recher, 1984; Hodar, 1996), they remain the most widely applied approach for estimating the body mass of arthropods (Moran and Southwood, 1982; Loder *et al.*, 1998; Kaspari and Weiser, 1999; Ulrich, 2007; Woodcock *et al*., 2010; Dillon and Frazier, 2013; Greve *et al*., 2018; Richard *et al*., 2019). The simplicity of the approach, with one equation and the same parameters for all species, has obviously led researchers to prefer this compromised method.

1.3.3 Using museum specimens to measure arthropod dry mass

Given the importance of body mass for studies of ecology and life history, accurate, easily accessible data on species mass would greatly benefit comparative studies. Compilations of mass data do exist for several groups of vertebrates - mammals (Mammal Diversity Database, 2019), birds (Dunning, 2007; Bird Life International Data Zone, 2019), and fishes (Froese and Pauly, 2019). However similar registers are not available for arthropods, likely as a joint consequence of their high species diversity and the difficulties introduced by their small size. However, it has been suggested that dry museum specimens, which are often well identified, could be used to rapidly construct a registry of mass values for arthropod species (Gilbert, 2011). To maximize the accuracy of this method, the influences of sampling, preservation, and identification on specimen mass need to be examined and quantified.

There are some barriers to this approach. Firstly, arthropods are often mounted on pins, so the pin weight must be quantified to estimate the dry mass of the specimen. Gilbert (2011) developed methods to estimate the mass of insect pins based on their dimensions and material (e.g. steel versus iron). In collections using insect pins from a particular manufacturer, estimates of their mass can be improved by directly

weighing pins to ascertain their average value and standard deviation in mass. Once such estimates are available, each specimen can be weighed on its pin and the pin mass can be subtracted, given that the variation in pin mass is much smaller than the specimen mass.

In some cases, arthropod specimens are stored in preservative fluids (e.g. ethanol, formaldehyde). These fluids can dissolve certain tissues, affecting measurements of dry mass without visible changes to the specimen (Braun *et al.* 2009; Knapp, 2012). The extent of these effects has been quantified for certain macroinvertebrates (Hamilton and Kingston, 1985; Wetzel *et al.*, 2005), but there is little information on arthropods. However, it is known that both short- and long-term storage in preservatives can change the dry mass of specimens, with the extent of these effects depending on the type of preservative, the duration of storage, and the size of the specimens (Wetzel *et al*, 2005; Knapp, 2012). Further quantification of these effects is needed to allow researchers to adjust dry weight measurements based on knowledge of storage conditions and to assign accurate error margins on specimen mass measurements. In addition, wear, damage, and infestation that may occur during storage can substantially affect specimen mass. However, since the losses of appendages or body segments are easily recognized, such specimens can be excluded.

Lastly, identification of museum specimens can affect the reliability of mass determination, as specimens are not always correctly identified. Morphological-based identifications through keys and visual inspection are error prone and often overlook cryptic species, which are common in many taxa (Knowlton, 1993). More reliable methods such as dissection or DNA-based identification often alter the specimen in a way that affects its mass. For example, abdominal contents are often removed in the process of making genitalic preparations. DNA-based identification methods, such as DNA barcoding, often involve the removal of an appendage or in the case of very small species, running the entire specimen through DNA extraction, a process that disproportionately affects small, soft-bodied specimens. These methods influence taxa that are small and/or difficult to identify and may lead to bias in estimates of mass. As with any measurement, dry mass values from museum specimens should be examined for their quality and potential inaccuracies.

1.4 Ecological and evolutionary trends in body mass:

Given the central role that body mass plays in ecological and evolutionary biology, it is not surprising that it has been studied from diverse perspectives. These range from the simple description of

patterns across lineages, space, or time, to mathematical models or to hypothesis testing in a phylogenetic framework. As a result, a wide variety of patterns have been proposed as rules for body mass variation.

1.4.1 Body size and diversity

Species-size distributions (SSDs) plot the mass of all species in a lineage or in a particular geographical region on a log-scale as a histogram, showing how species richness is distributed across body sizes. It has been argued that SSDs demonstrate how evolutionary processes that shape animal size are manifested in ecological patterns and that their documentation can help to bridge these two fields (Ulrich, 2007). The frequently right-skewed SSDs found in vertebrates have received the most attention, and various models have been proposed to explain why small-bodied animals have higher species richness (Smith *et al.*, 2004). Firstly, different constraints on mass evolution may lead to asymmetric distributions (Smith *et al.*, 2004). It has also been proposed that environments may be more variable on smaller physical scales, so small-bodied species interact with a more diverse set of environmental interfaces, creating more possible niches and opportunities for diversification (Hutchinson and MacArthur, 1959; Morse *et al*., 1985; May, 1986). As well, greater mass is typically correlated with a higher risk of extinction due to longer generation time and lower population density. Thus, skewed SSDs may be explained by directional selection towards larger mass combined with higher extinction rates in larger animals (Alroy, 2000). Lastly, the degree of skew in SSDs appears to be linked to taxonomic level as well as geographical range with larger assemblies tending to be more skewed (Bakker and Kelt, 2000; Kozlowski and Gawelczyk, 2002). While this implies a correlation between species richness and skewness in SSDs, the mechanisms underlying this correlation remain unexplored (Ulrich, 2007).

Interestingly, the prominence of right-skewed SSDs appears limited to vertebrates. In invertebrates, SSDs are often symmetrical (Chislenko, 1981; Rainford *et al.*, 2016), but can also be right- or left-skewed, or even bimodal (Ulrich, 2007). The possibility of lineage-specific SSDs has also been proposed and explored in a few taxa (Knouft & Page, 2003; Ulrich, 2006), but little effort has been devoted to explaining SSDs that are not right skewed.

1.4.2 Cope's rule and stasis

Cope's rule describes the tendency for species in a particular animal lineage to increase in size over evolutionary time (Cope, 1887; Kingsolver and Pfennig, 2004). It has been broadly used to encompass all possible underlying mechanisms that increase the body mass of organisms over time, including within-lineage tendencies as well as lineage sorting (Heim *et al.*, 2015). On the other hand, a narrow definition of Cope's rule focuses on the increase of body mass within lineages, describing the general positive selection

towards larger body mass due to increased fitness from factors such as fecundity, reproductive success, dispersal, foraging ability, and thermal tolerance (Smith *et al*., 2016).

Evidence for Cope's rule has been assessed in many clades but has been best documented in mammals (Kingsolver & Pfennig, 2004; Puttick and Thomas, 2015). However, many counterexamples have also been revealed (Gotanda *et al.*, 2015; Waller and Svensson, 2017). It is unclear whether Cope's rule holds for arthropods. While experiments and field studies suggest that larger individuals typically have higher fitness as measured by fecundity and mating success, this has not translated into a consistent increase in body mass in many lineages. This apparent paradox is referred to as stasis, although it has been debated whether it is a true phenomenon or a statistical artefact. For those who argue that stasis is real, several underlying mechanisms have been proposed. Genetic constraints or opposing selection forces are the best accepted explanations, highlighting the disadvantages of large size such as increased development times, higher rates of extinction, and increased predation risk (Hone and Benton, 2005). Another model for explaining stasis speculates that body size evolution is modeled by punctuated changes associated with lineage splitting (Mattila and Bokma 2008). Overall, stasis remains poorly investigated.

1.4.3 Spatial trends

The temperature-size rule and Bergmann's rule both show how animal body mass is influenced by changes in temperature. First noted by Bergmann (1847), organisms of different sizes are distributed differently across space. When comparisons involve widely distributed sister species, the larger species are found in colder environments (Gaston and Blackburn, 2000). This pattern also holds intra-specifically with larger individuals found at higher altitudes and latitudes where temperatures are lower. On the other hand, the temperature-size rule focuses on the mechanism that leads to this pattern, suggesting that colder environments select for species with slower growth but larger final size, while the opposite is true in warmer environments (Atkinson, 1994). Studies have also shown that with increasing global temperatures in the past century, animals have gradually decreased in body mass (Tseng *et al.*, 2018).

Additionally, the island rule has also been established for animals that experience substantial changes in body size when entering an insular habitat, often an island (Foster, 1964). Both directions of body size change have been observed from dwarfism in large-bodied lineages to gigantism in small-bodied ones. This suggests that body size is shaped by selection pressures in the environment and can change considerably when the factors that influence it change.

1.4.4 Sexual size dimorphism and Rensch's rule

Body mass differences between the sexes of a species, sexual size dimorphism, is common in many species as response to selection pressures is often sex-specific. Males are often larger in endothermic animals, such as mammals and birds, whereas the reverse is common in exothermic animals such as frogs, snakes, and invertebrates (Shine, 1979; Andersson 1994; Shine, 1994; Abouheif and Fairbairn, 1997; Fairbairn, 1997). Although these dimorphisms are shaped by a complex interaction of various evolutionary processes, macroevolutionary patterns are evident. Rensch's rule describes trends where sexual size dimorphism tends to increase with body mass in species if males are larger than females and tends to decline in the opposite circumstance (Rensch, 1950; Fairbairn, 1997). As it is particularly evident in lineages with male-biased dimorphisms, sexual selection (mate choice) has been proposed as the main driving force behind Rensch's rule (Abouheif and Fairbairn, 1997). On the other hand, species with female-biased sexual size dimorphisms often do not follow Rensch's rule, and in these groups female size is often more strongly correlated to the extent of the dimorphism (Mousseau, 1997; Liao *et al.*, 2013).

1.4.5 Mass in an evolutionary framework

The increasing availability of phylogenetic data has made it possible to study shifts in body mass within a phylogenetic framework, describing evolutionary trajectories using statistical models. These models most commonly consider the mode and rate of trait evolution, and they are often based on stochastic patterns such as Brownian motion (BM), also known as random walk (Pagel, 1997; Mooers *et al*., 1999; Pagel, 1999). Brownian motion assumes that traits are equally likely to evolve in one direction or another (e.g. either larger or smaller), and thus traits evolving under the BM model vary stochastically with no clear pattern except that closely related species are more similar than distantly related ones. When traits deviate from Brownian motion, this implies the presence of directional selection or a shift in evolutionary rate. Models can include additional parameters to better simulate such deviations. For example, the Ornstein-Uhlenbeck (OU) model and its extensions add to BM models underlying trends towards specific values (denoted as θ), with the strength of attraction towards θ denoted as α. This allows the assessment of the strength and direction of selection (Hansen, 1997; Beaulieu *et al.*, 2012; Ingram and Maler, 2013). Models such as the early-burst (EB), rate-shift (RS), or ecological release (ER) can account for non-uniform patterns by specifying a point where the rate or mode of evolution changes (Harmon, 2010; Slater, 2013). How well each model simulates the data set of interest can be compared using quality test estimators such as the Akaike Information Criterion (Sugihara, 1978). In insect lineages that have been studied, body mass is typically best modelled by the BM model or the OU model with a small α, suggesting that insect mass

evolution evolves largely through neutral evolutionary processes with high levels of phylogenetic constraint (Rainford *et al.*, 2016).

The incorporation of phylogenetic information also allows more rigorous testing of evolutionary hypotheses. It enables comparative methods, which unlike regular linear models, can account for the possibility that the apparent connection between two traits is only due to genetic relatedness and not evolutionary processes (Blomberg *et al.*, 2003). It also makes it possible to assess the correlation between ecological traits, such as diet, and evolutionary parameters, such as the direction or rate of evolution. The evolution of body mass has been linked to many other traits, with diet and habitat receiving significant attention (e.g. Smith and Lyons, 2011; Brocklehurst, 2016). Herbivory has been linked to increased body size (Reisz and Frobisch, 2014; Brocklehurst, 2016), while aquatic organisms are often larger than their terrestrial counterparts. Several theories have been developed to explain the latter trend (Biewener, 1989; Pawar *et al*., 2012; Tucker and Rogers, 2014; Gearty *et al.*, 2018). Moreover, the rate of mass evolution has been linked to abiotic factors, such as shifts in climate (e.g. Clavel and Morton, 2017). To summarize, phylogenetic analyses enable better understanding of body mass evolution by linking patterns in evolutionary trajectories to environmental and ecological factors.

1.4.6 Rules of body mass are often oversimplifications

The many rules used to describe patterns in body mass reflect the various selection pressures acting on organisms and how they are manifested in different contexts. However, it is important to emphasize that many past studies which have considered body mass variation and evolution have examined few taxa, so results may not be universal. Macroevolutionary rules based primarily on studies of mammals and birds were initially extrapolated to other vertebrates and invertebrate taxa (Evans *et al.*, 2012; Puttick and Thomas, 2015). Upon deeper investigation, these rules were often found not to apply. For example, ectothermic vertebrates, such as frogs and snakes, exhibit the converse of both Bergmann's and Rensch's rules (Fairbairn, 1997). Invertebrates, particularly insects, also seem to follow different macroevolutionary trends. Inconsistencies with Cope's rule have been often reported in insects, and larger body size has not been found to be negatively correlated with species diversification (Rainford *et al.*, 2016; Waller and Svensson, 2017). The converse of both Bergmann's and Rensch's rules has also been widely reported (Mousseau, 1997; Shelomi, 2012; Eweleit & Reinhold, 2014; Okuzaki *et al*., 2015). Furthermore, size distributions in these taxa often differ from the right-skewed SSDs typical of mammals (Orme *et al.*, 2002; Rainford *et al.*, 2016), suggesting that models for vertebrate diversification (e.g. Hutchinson *et al.* 1959) infrequently apply to invertebrates. While many clades remain to be investigated, the emerging trend is that rules for mammals and birds rarely hold for other taxa.

1.5 Trends of body mass variation are poorly understood in insects

Insects comprise over 50% of all animal species (Stork *et al.*, 2015). They span over 9 orders of magnitude in size, are abundant in most ecosystems, and are ecologically and functionally diverse. Surprisingly, rules established for vertebrates are often assumed to hold across insect lineages, even when studies suggest otherwise (Orme *et al.*, 2002). Studies on insects or invertebrates in general often note the limited in research on body mass in these groups and suggest that, as a consequence, broad-scale patterns of body mass variation remain poorly documented (Peters, 1983; Orme *et al.*, 2002; Chown and Gaston, 2010).

Many aspects of mass variation in insects have been studied in a few lineages or using model organisms (reviewed in Chown and Gaston, 2010). For example, the underlying physiological mechanisms that determine the final larval body mass before metamorphosis in holometabolous insects, as well as the relationship between larval and adult mass, has been studied in model organisms (Hodar, 1996, Nijhout *et al*., 2006; Edgar, 2006). The influence of allometric scaling on behavioral ecology is relatively well understood (reviewed in Kalinkat *et al.*, 2015). Phylogenetic constraints at different taxonomic levels, including intraspecific variation as well as variance partitioning at the family and genus levels, have been explored in a small number of species (Brandle *et al.*, 2000; Gouws *et al.*, 2011). Species-size distributions have been established for a few orders (Ulrich, 2006; Ulrich, 2007; Rainford *et al*., 2016). However, incomplete and biased sampling still limits the understanding of body mass variation in insects, particularly large-scale trends (Chown *et al.*, 2002, Chown and Gaston, 2010). Results from different studies can be conflicting and generalization is difficult. For example, several studies disagree on the shape of SSDs in Coleoptera (Chislenko, 1981; Novotny & Kindlmann, 1996; Ulrich, 2007), and mixed results have been found when determining the best-fit model of body size evolution in insects (Waller and Svensson, 2016; Rainford *et al.*, 2017). As a result, even basic aspects of mass variation, such as frequency distribution at the population level or the extent of variation among the species in each class and order, remain poorly synthesized (Chown and Gaston, 2010). Given the high taxonomic and ecological diversity of insects and other invertebrates, intensive sampling effort is the key to better evaluating patterns of mass variation and advancing the understanding of mass evolution from an invertebrate perspective.

1.6 Thesis chapters

1.6.1 Chapter 2: Coleoptera body mass data from museum specimens

Mass data are valuable to many ecological and evolutionary studies, but the high species diversity and small sizes of arthropods impede quantification and analyses of their masses. Museum specimens can provide valuable information, but few studies have made use of them for obtaining mass information. Evaluating the precision and reproducibility of mass measurements made on museum specimens is a key step in creating a registry of mass values for arthropod species. This chapter focuses on the complexities involved in weighing specimens of Coleoptera from the collection at the Centre for Biodiversity Genomics. By collecting body mass data on over 3,100 species (DNA barcode BINs), 1/500 of known animal species, this chapter provides methodological details that will aid future sampling efforts.

1.6.2 Chapter 3: Evolution of Coleoptera body mass using DNA barcodes

This chapter examines large-scale patterns in the variation of body mass in the order Coleoptera by combining newly collected mass data with DNA barcodes. By describing patterns of variation in body mass at different taxonomic levels within Coleoptera, this study helps to reveal links between mass variation and ecological specialization. It also describes evolutionary trajectories of body mass in Coleoptera using DNA barcodes and backbone phylogenies, testing two hypotheses: (1) there is significant phylogenetic signal in the evolution of body mass in the order Coleoptera, and (2) sub-groups with different diet and habitat will differ in mean mass. Finally, it explores the possibility of developing a predictive model for the mass of unknown species to aid ecological studies that require comprehensive species mass data.

1.6.3 Chapter 4: General conclusions

This chapter summarizes the main results of this thesis and their implications for future research. My work demonstrates that museum specimens can provide valuable information on the bod mass of arthropods for both basic and applied research. It shows that evolutionary trends extrapolated from vertebrate groups typically do not hold in arthropods, and that even similar studies can reach different conclusions due to methodological differences or sampling bias. Thus, similar efforts in documenting the body mass of other arthropods are necessary to advance understanding of body mass evolution. Finally, this thesis provides information that will aid future sampling efforts both in direction and in methodological detail.

2 Chapter 2: Coleoptera body mass data from museum specimens

2.1 Abstract

Biomass records of animals are required for a wide variety of ecological and evolutionary studies, but they are unavailable for most species. The lack of an accessible database of body masses of arthropod species means that studies still rely on imprecise estimates from linear measurements. Museum specimens have been proposed as a potential resource from which to obtain such data, but variation introduced by sampling and preservation methods needs to be assessed. This chapter examines the use of museum specimens to quantify the mass of Coleoptera, one of the most diverse orders of arthropods. By weighing over 3,700 specimens from the collection at the Centre for Biodiversity Genomics, this study validates the reproducibility of mass measurements on a subset of these specimens and quantifies the error introduced by factors such as variation in the weight of insect pins or from the loss of body parts. The present study connects mass data to their corresponding Barcode Index Number (BIN) in the Barcode of Life Data (BOLD) Systems, providing mass estimates for over 3,100 species (BINs) of Coleoptera occurring in Canada. As well, it develops a protocol to increase weighing efficiency and reduce sources of error, and demonstrates that museum specimens are an excellent resource for dry mass measurements that can provide more accurate accounts of species mass compared to estimates from linear measurements.

2.2 Introduction

Biomass is a crucial parameter in many ecological studies from energy and mineral transfer to community structure, foraging behavior, and predator-prey dynamics. Knowledge of species mass is also essential for studies that aim to understand the evolution of body mass. However, several factors impede direct mass measurements of arthropods, including their high species richness, their wide range in mass, their fragility, and the necessity of specialized equipment such as precise balances (Chown and Gaston, 2010; Gilbert, 2011). Thus, data of the body mass of arthropods remains rare and difficult to access.

Various estimation methods based on simpler measurements have been employed as surrogates of direct mass measurements. Most common are parabolic or exponential equations that use linear measurements to estimate mass (Rogers *et al*., 1976; Ganihar, 1997; Brady and Noske, 2006). Because generalized length-mass relationships provide a straightforward way to approximate body mass, they have been widely applied (Moran and Southwood, 1982; Loder *et al*., 1998; Ulrich, 2007; Woodcock *et al*., 2010; Dillon and Frazier, 2013). However, they have often been shown to lack accuracy, especially for

groups with marked variation in shape and density (Gowing and Recher, 1984; Hodar, 1996). The development of regionally or taxonomically specialized relationships (e.g. Rogers *et al*., 1977; Smock, 1980; Sage, 1982; Gowing and Recher, 1984), as well as estimation methods that utilize multiple linear or volumetric measurements (e.g. Sample *et al*., 1993; Heim *et al*., 2015), has been able to improve the precision of mass estimates. However, due to the extra time and effort required for these methods, simple linear estimates remain the standard method (e.g. Greve *et al*., 2018; Richard *et al.*, 2019).

The construction of a mass database for all arthropods, like those available for mammals (Mammal Diversity Database, 2019), fishes (Froese and Pauly, 2019), and birds (Bird Life International Data Zone, 2019) would provide more accurate accounts of arthropod species mass for studies that currently depend on imprecise surrogates. For this purpose, direct measurements of museum specimens, which are often dry, well preserved, and available for even rare taxa, have been proposed (Gilbert, 2011). Direct mass measurements are universally comparable and can provide accurate mass information given taxonomic or genetic identification. They can be particularly effective when paired with DNA barcodes, automating mass estimation for even sampling methods that destroy or do not involve whole specimens, such as metabarcoding and eDNA sampling.

To maximize the quality of data on body mass gathered from museum specimens, the influence of their curatorial and preservation methods must be assessed. For example, specimens are often mounted on and usually considered inseparable from insect pins which often outweigh them. Gilbert (2011) described a protocol that works around this by estimating pin mass based on key parameters (material, shape, size), allowing the subtraction of pin mass from the total weight, and demonstrated that estimates obtained in this way agree well with direct dry mass measurements. The error margins in estimates of pin mass could be further reduced if standardized pins were used to mount specimens; multiple pins of each size could be weighed directly to estimate mean and standard deviation in mass. Secondly, the collection and subsequent curation of arthropod specimens commonly involve preservative fluids, such as ethanol or formalin, which can dissolve certain tissue types and reduce mass. Both short- and long-term storage in fluid preservative can change the dry mass of specimens, and the extent of these effects depends on the type of preservative used, the duration of storage, and the size of the specimens (Wetzel *et al*, 2005; Knapp, 2012). While their effects are well documented for aquatic macroinvertebrates (e.g. Wetzel *et al*., 2005), few studies have examined terrestrial arthropods (Braun *et al.*, 2009; Knapp, 2012). Moving beyond simply identifying that there is a significant change in mass caused by preservation and towards detailed assessment of the extent of effects will allow researchers to adjust dry weight measurements based on knowledge of their sampling and storage methods or include adequate error margins on specimen masses. Additionally, the loss of body

components or general wear and tear might occur to specimens stored over long periods of time. Although mass has been shown to be generally uncorrelated with specimen age (Gilbert, 2011), it would be useful to assess if any decrease occurs in specimens over time, and how much the loss of body components such as appendages would decrease mass. Finally, the lab protocol for the drying and weighing of specimens, as well as environmental conditions such as temperature and humidity, could introduce variation. Assessing their effects could enhance the reliability of specimen measurements and establish a protocol that minimizes such variation.

This chapter aims to assess the utility of specimens held in the collection at the Centre for Biodiversity Genomics (CBG) for the estimation of species mass of Coleoptera. Mass information was collected for 3,770 specimens, including measurements repeated from 2014 to ascertain the reproducibility of specimen dry mass measurements. As well, the extent of variation caused by weighing protocol and environment, specimen damage, and variation in pin mass, was evaluated. This led to new weighing protocols at the CBG that reduce the impact of these variables and increased the efficiency of data collection. As well, mass data of specimens were linked to their corresponding Barcode Index Numbers (BINs) in the Barcode of Life Data (BOLD) Systems. The acquisition of mass information for 3,195 Coleoptera BINs provide a valuable resource for future ecological and evolutionary studies.

2.3 Materials and methods

2.3.1 Assessment of weighing methods and protocol

Specimens of Coleoptera were previously prepared for weighing through two protocols depending on their method of storage. Larger specimens, those mounted on insect pins, were weighed and their net masses were calculated by subtracting the estimated mass of their pin based on diameter measurements. I evaluated the reproducibility of specimen mass measurements by repeating the analysis of 120 specimens that were weighed in 2014. These data were used to (1) compare diameter measurements to see if pins can be consistently categorized to the same size, and (2) calculate net mass to determine if specimen mass stays relatively constant as specimens age. Mass values were compared using a paired-sample t-test. As well, based on standard deviations of the mass of insect pins, the minimum net mass for specimens to be weighed while on a pin was established, such that variation in pin mass is not significant in comparison to specimen mass.

Small specimens (typically < 1 cm body length) or those with softer bodies are preserved in 70% ethanol and need to be dried prior to dry mass measurements. To prevent softer specimens from collapsing and to preserve body parts that may be required for identification by morphology, specimens of this category were previously desiccated with a critical point dryer (CPD). While the CPD dries specimens quickly (1-2 hours), only eight specimens can be processed simultaneously. Air drying would allow an unlimited number of specimens to be dried simultaneously and is also safe for Coleoptera specimens because their hard exoskeletons are less likely to collapse than insects from some other orders. Thus, its effectiveness was assessed by ascertaining both the time required for specimens to air dry and whether the resultant mass measurements differ from specimens processed in a critical point dryer. To carry out this comparison, Coleoptera species with multiple adult specimens in the CBG fluid archives were sorted based on an estimation of body length using BOLD system images. I selected 40 specimens of various sizes, ranging from 1-12 mm in length, two from each of 20 BINs. The two drying treatments were randomized within each pair. In addition, ten other specimens > 12 mm in length, which could not fit in individual CPD drying chambers, were examined via the air-drying treatment alone to assess their drying times. Specimens selected to be air dried were placed in insect boxes and weighed after 12 hours, 24 hours, and every 24 hours afterwards for up to two weeks. After the mass stabilized, the final measurement, as well as the time taken for the specimen to dry entirely, was recorded. Specimens dried with the critical point dryer were weighed after the drying cycle was complete, and the mean masses between the two drying methods were compared using a pairwise t-test.

2.3.2 Correlation between live and dry mass

Prior studies have shown a strong correlation between the different types of mass measurements of arthropod specimens, although the relationship varies by taxon and whether the species are aquatic or terrestrial. To examine the relationship between the dry mass (the mass of desiccated specimens) and live mass (mass of organisms while they are alive) in terrestrial arthropods, particularly Coleoptera, 110 specimens, including 80 adult Coleoptera, were collected using killing jars. Live body weights of these specimens were represented by mass measured within 24 hours of collection. The specimens were then stored dry at room temperature and weighed every 60 days afterwards until their mass stabilized, and the final weight was recorded as their dry mass. A linear regression of live- and dry- masses was performed to assess their correlation.

2.3.3 Data collection

Over 8,000 species of Coleoptera species occur in Canada, and over 6,000 BIN records for Canadian Coleoptera exist on the Barcode of Life Data (BOLD) Systems (Pentinsaari *et al.*, 2014). The CBG collection has sequenced over 4,700 of these BINs, and intact specimens needed to ascertain dry mass were available for 3,195 BINs. Of these, mass was determined for a single individual of 2,861 BINs, while two or more specimen measurements were obtained for 334 BINs, often those with marked intraspecific size variation.

Representatives were selected for each BIN with at least one sequence from Canada to prepare for weighing. When available, multiple specimens of each BIN were retrieved from the CBG collections and were visually assessed for damage and size variation. If body size was relatively uniform within a BIN, the specimen in best condition was selected for weighing. In BINs that displayed considerable intraspecific variation (i.e. noticeably different in body length), multiple intact specimens were analyzed. When only one specimen was available for a BIN, it was checked against BOLD System records to ensure that it correctly represented that BIN. Specimens with missing body segments (head and thorax, or abdomen) or that had been dissected for morphological identification were not used because these parts typically compose a significant portion of their body mass (Figure S1).

The procedure for measuring dry mass was modified from a previous CBG protocol based on assessment of the air-drying method and pin mass variation:

- Fluid specimens were dried for at least 24 hours and were then weighed directly. Larger specimens that might not have dried completely in 24 hours were left to dry for up to two weeks and weighed daily to ensure their weight had stabilized.
- Pinned specimens had their labels removed but were weighed with their pins. The size of the insect pin was determined based on diameter measurements using calipers, allowing its mass to be determined based on previously obtained masses of each pin size. Variation in pin mass was relatively low, with sample standard deviation for each pin typically 1-2% of mean pin mass and < 0.5 mg in absolute value (Table S1). Net mass of each specimen was calculated by subtracting the mass of its pin from the total mass, and then checked against a pre-determined minimum which ensured that pin mass variation would be insignificant (< 12%) in comparison. If an insect weighed less than the required minimum, it was dismounted from the pin, weighed directly, and then pointed instead.

- A small proportion of the specimens (around 150) were previously mounted on insect points using water soluble adhesives. These specimens were first removed from their points by dissolving the adhesive in 70% ethanol. They were then allowed to dry for 24 hours before being weighed.

Dry masses were quantified using two balances. Specimens over 10 mg (around 950 specimens representing 600 BINs) were weighed to the nearest 0.1 mg using the Mettler Toledo™ MS104S, and smaller specimens (around 2,800 specimens representing 2,500 BINs) were weighed to the nearest 0.1 µg using the Mettler Toledo™ XP6U. Up to three significant figures were recorded.

2.4 Results

2.4.1 Data collection

Mass information was obtained for 3,770 specimen masses representing 3,195 BINs of Canadian Coleoptera. This total included 1,070 mounted specimens and 2,062 specimens retrieved from ethanol storage. Mass determinations were also made for over 638 specimens previously weighed by CBG collections staff, a task that involved either re-weighing or re-determining their pin size.

2.4.2 Variation in specimen mass measurements

The overall results indicate that specimens provide a reliable and repeatable measurement of dry mass. Standardized insect pins can be reliably discriminated based on diameter measurements, as individual pin differences and measurement error are much smaller than the difference between pin sizes (Table S1). Variation in pin mass can add +/- 0.2 to 0.9 mg in error to specimens that are weighed on their pin, but the impact of this error can be easily reduced by only weighing only larger specimens on their pins, while retrieving smaller specimens from fluid storage or removing them from pins for weighing. Fluctuations in temperature and humidity had relatively little effect, as standard error of measurements over five days was found to be 1-2% of their mean for specimens tested ($n = 20$). This concurs with results from the pair-wise t-test comparing specimen weights from 2014 and 2018, where the difference between the two measurements was within +/- 3% of their average in 117 of 120 specimens tested, and within +/- 5% in all of them. The t-test also demonstrated that specimen masses did not significantly decrease over the four years. In fact, a slight increase in mass was detected ($\bar{x} = 0.003$, $p = 0.02$), likely linked to higher humidity in the weighing environment when the second measurements were made.

The use of air-drying accelerated weighing speed without effecting measurements obtained as the pairwise t-test revealed no significant difference between mass in specimens dried with CPD and air-dried ($p = 0.35$). Although maximum drying time was high (up to two weeks), more than 95% of specimens were fully desiccated within 24 hours. Mass measurements after 24 hours of drying was a good predictor of whether a specimen had fully dried or not, as all specimens below 12 mg had stabilized after this interval.

Appendage loss in specimens, some due to tissue sampling for DNA barcoding, also contributed little to mass variation. A single leg was typically 1-2% of the total mass of a specimen, whereas the tibia and claw were around 0.5%. Thus, tissue sampling procedures that removed a whole or partial leg would not significantly decrease mass measurements. On the other hand, loss of body segments (most likely the head and pronotum or the abdomen of the specimen) or gut content would lead to larger decreases. Head and pronotum segments make up around 12% of the total mass, whereas the abdomen represents up to 50% (See Figure S1). Mass data of specimens that lost major body segments were not recorded or used.

2.4.3 Dry-mass live-mass correlations

Results from the freshly collected specimen samples agreed with previous reports of a strong linear relationship between the dry and live masses of arthropods, and that this relationship varies among taxonomic groups. The current data suggest that dry mass is approximately 33% of live mass in Arthropoda ($R^2 = 0.96$; Figure 2.1). Coleoptera appear to have lower water content than other groups as their dry mass is closer to 43% of their live mass ($R^2 = 0.95$, Figure 2.1). These relationships have strong predictive power for specimens between 0.05 mg and 70 mg, but further data sampling is needed for larger or smaller specimens.

2.5 Discussion

2.5.1 Museum specimens are a good source of mass data

Several concerns have been previously expressed regarding using museum specimens to measure dry mass, including variation or bias introduced by the insect pin, preservative fluids, or specimen age (Shreeves and Field, 2008; Knapp, 2012). The current results show that these influences are small in magnitude and can be accounted for with adequate evaluation. In Coleoptera, the loss of appendages, variation in humidity, and specimen age together add +/- 5% error margins to the obtained measurements. Variation introduced by pin mass is typically small and can be eliminated in the few exceptional cases.

Possibly the largest source of mass loss is from storage in preservative fluids. While this study does not examine the effects of ethanol storage, previous work has suggested up to 30% mass difference between specimens that have been preserved with ethanol or formaldehyde and those that have not (Knapp, 2012). However, this variation can be quite easily adjusted for in direct mass measurements. Quantification of these sources of error allow museum specimens to outperform the most widely applied estimation methods by body length (Rogers *et al*., 1976) in terms of both accuracy and precision, even in the worst-case scenarios from above. These results suggest that museum specimens can be an effective shortcut to otherwise laborious mass data collection for ecological research, reducing time of field sampling, drying, or measuring. Because specimen mass agrees well with dry mass measurements (Gilbert, 2011), they can also provide valuable mass information for comparative studies in the same way they are used for morphological analyses.

2.5.2 Suggestions for future weighing protocol

Based on experimental results and observations in the weighing process, I make several recommendations to the established weighing protocol at CBG collections that may also be applicable to weighing museum specimens in general. These adaptations were used in data collection for this study.

First, I suggest net mass calculations be estimated before recording any measurements on pinned specimens. Previously, the total mass and pin diameter were recorded by the operator and the net mass was calculated automatically in BOLD Systems (Mass Base). As a result, the operator was not aware of pin mismeasurements that led to negative mass estimates. Calculating net mass by hand or using datasheet formulae before any data are uploaded provides a simple quality control step that reduces error. I also set a minimum net mass estimate for specimens weighed on their pin; if specimens are too light, the pin mass variation may be a significant portion of their mass estimate, decreasing the accuracy of the measurement. Gilbert (2011) recommended that estimated net mass should be more than twice the 95% confidence interval of pin mass, or 7.8 times the standard error (SE) in pin mass estimations. I suggest that a similar limit could be set using SE values of insect pin measurements (Table S1). Because insect pins at CBG are standardized and have much lower SE values, this allows specimens as light as 1.5 mg to be measured on their pin. It also caps error margins introduced by pin variation at +/- 12%. When inspecting a specimen for damage before weighing, I recommend also assessing if it could be hollow or missing most of its inner contents by visual inspection under strong light.

For drying specimens stored in ethanol, I used air drying rather than the critical point dryer to process the large number of specimens measured in this study. Based on measurements made after 24 hours of drying, Coleoptera specimens that were less than 12 mg stabilized after this interval. Thus, I set an

arbitrary cut-off at 10 mg, and specimens 10 mg or lighter after 24 hours of drying were considered dry and their measurements were recorded. Those that weighed more were left to dry for another 24 hours before testing whether the mass had decreased. I repeated this process until the obtained dry mass stabilized. While this process can take up to two weeks, it is rarely necessary. I suggest that 24 hours is likely sufficient for most arthropod specimens stored in CBG fluid archives, although the specific cut-off may vary from taxon to taxon and should be tested when working with other groups. Additionally, I propose two details that should be considered in the drying protocol. One is that specimens should be rinsed with 70% ethanol before they are left to air dry to wash off any excess buffer than may have remained from the DNA sampling process; I observed that excess buffer on specimens slows down the air-drying process and can also influence the mass measurements. The other concern is to point specimens rather than pinning them with insect pins as much as possible. This is to minimize cases where pin variation is later found to be too large in comparison to specimen mass.

Finally, knowing the various factors contribute to variation in specimen mass, I suggest that only two significant figures in specimen mass measurements carry meaningful information of species mass. Although additional digits are often measured and recorded, and may be useful to keep for calculations, they should not be treated as scientifically significant figures in any estimations or downstream interpretations. Based on this, I recommend using balances that are precise enough to measure three or four significant digits in weighing specimens. Using balances with lower precision will add additional measurement error from the balance itself, whereas delicate balances are often more time consuming in obtaining a reading. When representing dry mass of a species, they would likely be measuring noise. The current balances available in the CBG collection lab, the Mettler Toledo™ MS104S and the Mettler Toledo™ XP6U, measure up to 0.1 mg and 0.0001 mg respectively. As a rule of thumb, I recommend using the MS104S to weigh specimens 10 mg or larger (> 15 mm in body length in most Coleoptera), and the XP6U for smaller specimens.

2.5.3 Additional sources of error

Several aspects of variation in specimen mass were not fully evaluated in this study. As previously mentioned, the effects of preservative fluids could be better quantified. While results from past work using terrestrial arthropods go little beyond determining that there is a significant difference caused by preservative use, studies in macroinvertebrates have suggested that the magnitude of these effects can differ based on storage time or taxonomic group of the specimen. Therefore, it should be tested whether short-term storage in ethanol from sampling procedures differ from long-term storage in fluid archives in how

they impact dry mass measurements, as well as whether the extent of decrease in mass depends on the size and taxonomy of the specimen.

Also, influences from the DNA sampling procedure on smaller specimens, particularly those that are run as a whole specimen through the lysis process rather than having a leg removed, could be better quantified. Because this procedure disproportionately affects smaller specimens, determining the reduction in mass could be key to reducing bias in mass measurements of specimens that have been barcoded.

Lastly, not all specimen damage is clearly visible, especially the loss of inner contents. In extreme cases, specimens can appear intact but be entirely hollow. This leads to a drastic decrease in the measured dry mass, to only about 20% of a specimen from the same BIN and visually similar in size. At first glance, such specimens are difficult to differentiate from regular specimens, but upon close inspection they are lighter in colour and appear more transparent due to the lack of inner contents. These specimens can be difficult to identify when only one specimen from a species or BIN is weighed but become obvious when two specimens of the same BIN and size are significantly different in mass. While such cases are rare (2 in 909 specimens), weighing multiple specimens per species could reduce variation from specimen conditions in general and improve data quality.

2.6 Tables and figures

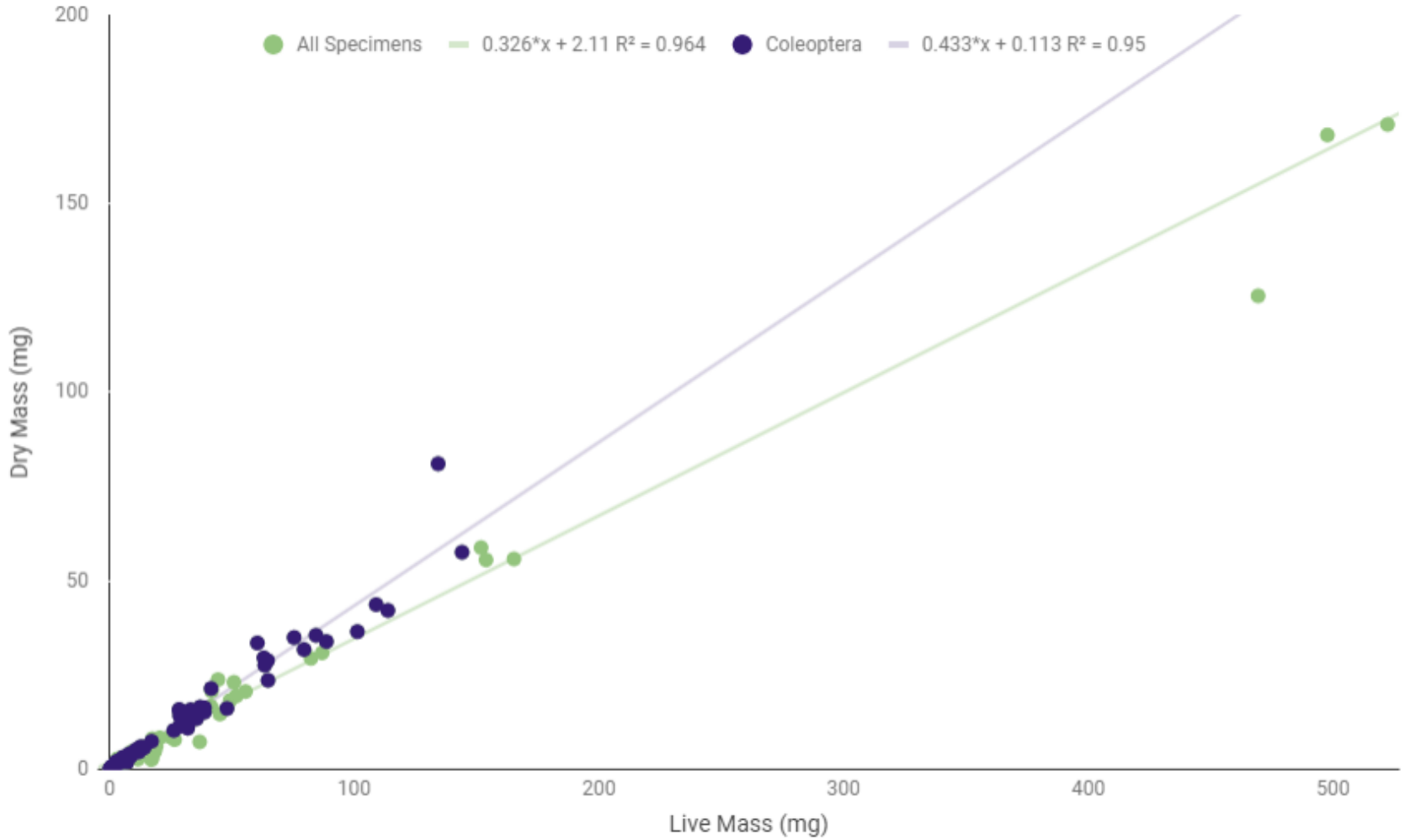

Figure 2.1. Correlation between dry mass and live mass of arthropod specimens. Regressions are performed for all specimens collected (n=110) as well as adult Coleoptera alone (n = 80).

3 Chapter 3: Evolution of Coleoptera body mass using DNA barcodes

3.1 Abstract

The high species richness and diverse ecological roles of insects facilitates the study of factors influencing the evolution of their body mass. Moreover, access to insights into taxon relationships through both phylogenetic reconstructions and nearest-neighbour analyses through DNA barcodes makes it possible to evaluate evolutionary trends in their mass. Based upon body mass data for 3,100 species (BINs) of Canadian Coleoptera, 1/500 of all known insect species, this study describes the basic patterns of size variation at different taxonomic levels. Mass information is then employed to assess differences among taxa linked to their habitat occupancy and diet to ascertain the influence of ecological specialization. Analyses of SSD distributions and evaluation of phylogenetic signal show that neutral processes have a stronger influence in the evolution of Coleoptera compared to directional constraints or selection. Results also reveal that diet can be correlated with mass, and fungivores were significantly smaller in mean mass than all other diet categories. These patterns diverge substantially from rules of body mass evolution reported for vertebrates. Lastly, exploring patterns of mass deviation between closely related species enables the use of current mass data and genetic information to estimate the mass of species that await analysis, facilitating ecological studies that employ species-typical mass data.

3.2 Introduction

Variation in the mass of animal species has long interested biologists due to its key role in shaping their morphological and ecological diversity (Haldane, 1928; Peters, 1983; Bonner 2006; Smith *et al.*, 2016). Two topics have received considerable attention in efforts to understand the processes that influence variation in animal body mass: species-size distributions and trajectories of body mass evolution. Species-size distributions (SSDs) describe the relationship between body size and taxonomic diversity by plotting species richness against log-transformed body size. It captures patterns such as the richness of small bodied animals in many lineages, which produce right-skewed SSDs (Smith *et al.*, 2004). Efforts to explain the shape of SSDs have invoked various ecological and evolutionary models, including those based on ecological niches (Hutchinson and MacArthur, 1959; May, 1986), efficiency of energy expenditure (Sokolovska, 2000), lineage-specific patterns of speciation and extinction (Alroy, 2000; Knouft and Page,

2003; Ulrich, 2007), and fractal geometry of the environment (Morse *et al*., 1985). Thus, SSDs demonstrate how evolutionary processes are reflected in ecological patterns, and their documentation can bridge these two subjects (Ulrich, 2007). On the other hand, studies examining trajectories of mass evolution have often begun with observations of patterns in extant species or fossils. For example, Cope's rule describes the tendency for animal lineages to increase in mass over evolutionary time (Cope, 1887; Kingsolver and Pfennig, 2004; Hone and Benton, 2005). As molecular data have provided newly detailed insights on taxon relationships, studies have increasingly evaluated body mass variation in a phylogenetic context, using statistical models to describe evolutionary trajectories. Most commonly used are models based on stochastic processes, including Brownian motion and Ornstein-Uhlenbeck (Hansen, 1997; Pagel, 1997; Mooers *et al.*, 1999; Pagel, 1999; Harmon *et al.*, 2010). These models and their extensions can incorporate parameters that describe the direction, rate, and association with other traits, allowing quantitative testing of evolutionary hypotheses (Harmon *et al.*, 2010; Beaulieu *et al.*, 2012; Ingram and Mahler, 2013; Slater, 2013).

While body mass evolution in animals has received widespread attention, most of this effort has been directed towards the documentation of evolutionary and ecological trends in vertebrates, particularly homeotherms (Peter, 1983; Orme *et al*., 2002; McClain and Boyer, 2009; Chown and Gaston, 2010; Rainford *et al.*, 2016). Support for Cope's rule is most common in mammal species (Alroy, 2000; Kingsolver and Pfennig, 2004; Hone and Benton, 2005), while right-skewed SSDs are predominant in mammals and birds (Peters, 1983; Kozlowski and Gawelczyk, 2002; Smith *et al.*, 2004). The study of other taxa has revealed that these rules do not fully capture mass variation and trends in other clades (Chislenko, 1981; Orme *et al.*, 2002; Gotanda *et al.*, 2015). In particular, studies on arthropods frequently challenge the standard paradigm of body mass evolution (e.g. Chislenko, 1981, Waller and Svensson, 2017). Many morphological and ecological traits of arthropods, including external thermoregulation, parasitism, tracheal respiratory systems, and metamorphosis influence the direction and extent of mass evolution, resulting in different large-scale patterns (Moulliot *et al.*, 2003; Mayhew, 2007; Harrison *et al.*, 2010; Shelomi, 2012). As arthropods account for over 80% of known species diversity, describing rules of evolutionary processes from their perspective is the next step in broadening the understanding of mass evolution in the animal kingdom.

A major challenge in evaluating mass evolution in invertebrates is the lack of data. Compared to the easy access to data for vertebrates (Froese and Pauly, 2019; Mammal Diversity Database, 2019), information on body mass variation in arthropods and other invertebrates is sparse and poorly synthesized (Chown and Gaston, 2010). As well, many past studies on arthropods have employed linear measurements

as a surrogate for mass because of its simpler quantification. However, typical metrics (wing or body length) are often weakly correlated with mass, especially when consideration extends to groups with different body shapes (Smock, 1980; Gowing and Recher, 1984; Hodar, 1996; Sabo *et al.*, 2002). Comparisons based on linear measurements among distant lineages can be heavily biased by differences in body shape and density, and in some cases are impossible due to drastically different body plans. Although taxon-specific equations can be used to estimate mass from length measurements, the wide error margins and use of power equations mean that these estimates often lack precision (Rogers *et al.* 1976; Ganihar, 1996; Hodar, 1996). The documentation of body size in units that enable cross-taxon comparisons remains a key step in understanding trajectories of mass evolution on a multi-lineage scale.

Coleoptera are a particularly suitable group for studying the evolution of body mass. They are one of the most species-rich orders of animals, exhibit marked mass variation, and occupy diverse ecological niches. The order includes some of the largest and smallest insects, spanning over eight orders of magnitude in mass (Chown and Gaston, 2010). They occur in both aquatic and terrestrial habitats, occupying diverse niches. Some groups are generalist predators or scavengers, while others are highly specialized, feeding on algae, tree roots, or even fungal spores (Hunt *et al.*, 2007; Evans, 2014; Short, 2018). This wide range of niche occupancy means that Coleoptera are subject to divergent selection pressures that may influence mass evolution. Like most other invertebrate lineages, current knowledge of body mass variation in Coleoptera is very incomplete, and previous surveys have reached mixed conclusions of their evolution (Chislenko, 1981; Novonty and Kindleman, 1996; Ulrich, 2007). However, recent molecular studies have clarified phylogenetic relationships in Coleoptera, providing a good basis for exploring large-scale trends in their evolution (McKenna *et al.*, 2015, Zhang *et al.*, 2018). A combination of information on body mass, ecological niches, and genetic data could reveal the interplay of body mass evolution and ecological diversification, shed insight into the interpretations of SSDs, and test previously developed evolutionary models.

This chapter employs newly gathered data on the body masses of over 3,100 BINs of Canadian Coleoptera as a basis for exploring patterns of mass variation among taxonomic groups and ecological roles. These data made it possible to both examine patterns of mass variation among nested taxonomic groups and to compare data distribution to previous studies to explore the interpretation of SSDs. The mass data were also combined with information on ecological traits, DNA barcode data for these taxa, and a multi-gene backbone tree to generate phylogenies. These analyses enabled the visualization of evolutionary trajectories in body mass, and permitted comparison of the fitting of commonly used models of trait evolution. As well, two hypotheses that ascertain influential factors on the evolution of body mass are tested:

(1) that there is presence of strong phylogenetic conservatism, commonly reported in trait evolution of insects (Rainford *et al.*, 2016), and (2) that the direction of mass evolution is correlated with specialization in diet and habitat. Finally, by assessing patterns of mass divergence in closely related species, it was possible to develop a predictive model that estimates the mass of species that lack this information.

3.3 Materials and methods

3.3.1 BINs as a species proxy

DNA barcoding examines a sequence of 648 base pairs in the cytochrome c oxidase subunit I gene (COI) to identify animal species (Hebert *et al.*, 2003). The Barcode of Life Data (BOLD) Systems (Ratnasingham & Hebert, 2007) clusters COI sequences into groups organized by Barcode Index Numbers (BINs), each assigned a unique identifier ('BIN URI'). These clusters correspond closely with species boundaries (Ratnasingham and Hebert, 2013). Examination of nearly 2,000 Coleoptera species of Northern Europe showed that DNA barcoding is remarkable at differentiating Coleoptera species, with perfect matches between BINs and existing species descriptions in over 90% of all cases (Pentinsaari *et al.*, 2014). Additionally, using BINs in phylogenetic studies allows the inclusion of specimens that have not been identified to a species. It also groups organisms based on genetic distance rather than visually discernible traits, reducing the bias that mass may have on species identification. As such, this study employs BINs as a species proxy.

This study began by examining all records on BOLD for Coleoptera collected in Canada (the DS-CACO dataset) accessed in March 2019. COI sequences and related taxonomic information were downloaded and read into R version 3.5.3 (R Core Team, 2019). This data set included 75,659 sequences representing 5,857 BINs, about 2/3 of the Canadian fauna. Outgroups for the analysis were selected from groups used as outgroups in published Coleoptera phylogenies (McKenna *et al.*, 2015, Zhang *et al.*, 2018), and included sequences from close neighbours (Megaloptera, Neuroptera, Strepsiptera), as well as more distant taxa (Diptera, Hymenoptera). Outgroup sequences were downloaded from the BOLD API using the 'bold' package in R (Chamberlain, 2018), and included 23,804 sequences from 632 BINs.

The downloaded data were run through several quality control filters developed by May (2017) and Orton *et al.* (2018). These filters assessed in order:

1. The presence of a sequence and BIN assignment for each record. This eliminated records that lacked a BIN assignment because of quality issues.
2. The proportion of the base calls in each sequence that were uncertain (N) or missing (gaps). Sequence terminals that were Ns and/or gaps were trimmed, and internal N and/or gap content was assessed. Sequences with >1% Ns or internal gaps were removed because these can affect sequence alignment.
3. Sequence length. Sequences that were longer than 1000 base pairs or shorter than 640 base pairs were removed.
4. Taxonomic conflicts. Sequences that were assigned to the same BIN despite different taxonomic identifications at the family, subfamily or genus level were identified. In outgroups, these were removed directly, whereas Coleoptera BINs with conflicts were assessed individually. Because taxonomic information on BOLD Systems can be assigned in multiple ways and the project data were still undergoing revision, the conflict could be due to contamination, misidentification, or barcode sharing. In most BINs with taxonomic conflict, the IDs for most specimens were consistent and the conflicts reflected one or two outliers. After consultation with taxonomic experts, sequences that reflected misidentifications were removed from the dataset instead of the entire BIN to resolve such conflicts. The identification for just one BIN (BOLD:ACG6163) could not be resolved and it was removed. Taxonomic conflicts at the species level were not addressed as species-level information was not used in this study.

A total of 29,715 sequences from 5,335 BINs remained after this process. One representative sequence was selected for each BIN to be used for tree construction. In BINs with multiple sequences available after the filtering process, a centroid sequence with minimum distance to all other sequences of the BIN was chosen (Orton *et al.*, 2018). The chosen sequences were aligned using MUSCLE (Edgar, 2004) and trimmed to 620 base pairs using a published sequence of Carabidae (BOLD:AAA1254) using code developed by May (2017) and Orton *et al.* (2018). The trimmed sequences were once again filtered for unusual gap content, and five ingroup sequences were removed, leaving a total of 5,330 sequences, each representing one BIN, 4,924 from Coleoptera and 406 from outgroups.

3.3.2 Trait data assignment

Specimens from the collection at the Centre for Biodiversity Genomics (CBG) were used to quantify Coleoptera body mass. A total of 3,770 specimens representing 3,195 BINs were weighed using protocol described in Chapter 2. Mass information was assigned at the BIN level. If multiple specimens were weighed, their mean was used to represent the mass of that BIN.

Relevant information available on BOLD Systems, including taxonomy, geographic coordinates, and elevation, were downloaded together with sequence data. Habitat and diet information was pooled from previous literature (Hunt *et al.*, 2007; Evans, 2014; Short, 2018). Diet/feeding mode was classified into five categories: (1) herbivores (including pollen and nectar feeding, burrowing, and algivorous/moss feeding species), (2) fungivores, (3) scavengers (including saprophagous and omnivorous taxa that also eat dead matter), (4) predators, and (5) parasites/parasitoids. Habitat was categorized based on literature descriptions of where specimens were commonly found or collected from, and was sorted into four categories: (1) associated with vegetation (foliage, flowers, and burrowing into trees); (2) soil and decaying matter (animal carcasses, rotten wood, leaf litter; (3) burrowing species and those found in damp environments (e.g. underneath bark); and (4) aquatic (shores, underwater substrates, and rocks or vegetation near water). In taxa where larval habitats or diets are known to differ from those of adults, larval information was used due to the stronger role larval stages play in determining adult mass (Davidowitz *et al.*, 2004; Nijhout *et al.*, 2006). This information was assigned based on taxonomic information at the family level.

3.3.3 Data exploration and initial analysis

All analyses, unless otherwise mentioned, were performed in R version 3.5.3 (R Core Team, 2019). Net mass measurements in mg and taxonomic information (family, subfamily, genus) of each BIN were combined into one data set, which was partitioned into subsets as appropriate for each analysis. Because dry mass data were log-normally distributed, they were transformed using the natural log for analyses. To account for kurtosis and skew in the data, interquartile range (IQR) was used instead of standard deviation as a measure of variance within the data.

The two-sided Agostino test was conducted to evaluate skew and kurtosis in the data, while the nested analysis of variance (ANOVA) was used to assess how existing taxonomy captured variation in the dataset. A nested ANOVA analyzes the partition of variance for groups that are completely nested within each other. Taxonomic groupings naturally satisfy this requirement, with no lower-level grouping belonging to more than one higher-level grouping. However, not all taxonomic groups sampled fulfill the assumptions of nested ANOVAs: that each group at a higher level must contain at least two groups of the level directly below it. Therefore, groups containing only one subgroup, for example, families containing only one subfamily, were excluded from analyses examining both those levels. For example, the dataset for the nested ANOVA including family and genus levels was filtered as follows: first, BINs with missing family or genus-level identification were removed. Then, the number of BINs sampled in each genus was ascertained, and genera with fewer than 2 BINs were removed from the dataset. With monotypic genera removed, the number of remaining genera represented in each family was then counted, and families with

fewer than 2 genera were also removed. The remaining data of 2,318 BINs from 49 families were used in this 2-level nested ANOVA. The data set using subfamily and genus levels, and the data set including all three taxonomic levels, were filtered similarly. The dataset using all three levels (family, subfamily, and genus) was limited to the six largest families (> 100 BINs weighed) due to computation limits, and a 2-level nested ANOVA using similar data was also conducted for comparison.

3.3.4 Phylogenetic trees and downstream analyses

A published phylogenetic tree for 173 families of Coleoptera (Zhang *et al.*, 2018) was used as a backbone constraint for tree construction. The trees were accessed through the supplementary material of Zhang *et al.* (2018), and the 'time tree' calibrated at the superfamily level using fossil records was read into R and processed using the 'ape' package (Paradis and Shliep, 2018). Species information in the DS-CACO dataset was compared with those from the backbone, and the two datasets had no overlap. Thus, the backbone was used as a family-level constraint. Tips were collapsed to the family level, and any families absent in the DS-CACO dataset were dropped. The resulting tree was set as a multifurcating constraint, restricting relationships between families but allowing BINs within each family as well as BINs from families not included in the backbone to move freely. The *modelTest* function from the 'Phangorn' package (Shliep, 2011) was used to determine the best substitution model for the dataset, and the GTR+I model was selected based on it having the lowest Bayes Information Criterion. Using the above specifications and constraints, a maximum likelihood search was performed on the centroid alignment in RAxML 8.2.0 (Stamatakis, 2014), generating a non-ultrametric COI gene tree for downstream analyses.

The COI gene tree was pruned to remove BINs without mass measurement, and BINs with mass data but no representative sequence in the phylogenetic tree were dropped from the mass dataset. The remaining 2,768 BINs were used for phylogenetic analyses of Coleoptera body mass. Two estimates of phylogenetic signal, Pagel's λ (Pagel, 1999) and Blomberg's K (Blomberg *et al.*, 2003), were estimated with the *phylosig* function from the 'phytools' package (Revell, 2012). To account for the strong influence of sister pairs or closely related species on the estimate of Pagel's λ, a separate estimate was performed on 10 subsets of the data; in each, one BIN was randomly selected from every genus, and the other tips were dropped. The influence of diet and habitat on body mass was assessed using phylogenetic least squares (PGLS) using the *pgls* function from the 'caper' package (Orme *et al.*, 2018). Three stochastic models of trait evolution, simple Brownian motion (BM), Ornstein-Uhlenbeck (OU) with one adaptive optimum, and early-burst (EB), were fitted to the data using the *fitContinuous* function from the 'geiger' package and compared based on the Akaike information Criterion (AiC) (Harmon *et al.*, 2008). Additionally, to account for the effect of branch length, the α parameter in the OU model was also separately evaluated after scaling

the total tree length to one (Cooper *et al.*, 2015). Lastly, because the COI barcode region is relatively short and the tree construction was not able to utilize branch length data from the backbone constraint, PGLS analyses and model fitting were also performed at the family level using family medians (as the tip values) and half of the family IQRs (as SE) of the mass data and the backbone tree adapted from Zhang *et al.* (2018).

3.3.5 Predictors of the mass of a new species

The potential of a genus-level identification in predicting the mass of an unmeasured species was assessed by calculating coefficients of variation (CVs) for all 297 genera with three or more BINs measured in the data set. This estimates how much the mass of a new species is expected to deviate from the genus mean. As well, 640 BINs forming 320 unique nearest-neighbour (NN) pairs that were within 10% p-distance of each other (based on BOLD records) were selected from all BINs that were weighed. These data were used to assess how well the mass of a single closely-related species can predict an unknown mass, beginning with assessing the correlation in mass between all 320 pairs. Then, the data were randomly split into training and testing sets, starting at 160 pairs in each set. Linear models were constructed with the training set, and prediction success of BIN masses in the testing set based on their NN pairs was evaluated. As well, the prediction intervals of the new models were compared to those of the model based on all 320 pairs. This process was repeated using training sets of 120, 100, 80, 60, and 40 pairs of mass data, with 20 repetitions each. Finally, the data were reduced to only include the 220 NN pairs within 5% distance and then the 89 NN pairs within 2% distance of each other, to see how prediction intervals shrink with more closely related neighbours.

The general relationship between genetic distance in the COI barcode region and the percent difference in dry mass between species was then explored. Filtered and aligned COI barcode sequences of all BINs with mass data were grouped by family, and the best model of substitution was assessed using the *modelTest* function from the 'phangorn' package (Shliep, 2011). The best substitution model available (JC) was chosen to calculate sequence divergence for all unique pairs within each family (using the *dist.dna* function from the 'ape' package, with the "JC69" model specified; Paradis and Shliep, 2018). Standardized difference in mass (calculated as $|m_1 - m_2|/m_1$, where m_1 and m_2 are the masses of the first and second BIN respectively) was also calculated. This resulted in n (n - 1)/2 data points for a family with n BINs measured. These data were then divided at intervals of 0.02 in genetic distance, and the median difference in mass for each bucket was determined. Each median was plotted against the midpoint of its respective bucket: for example, the median difference of pairs 0.02-0.04 was plotted against 0.03, producing curves that show how Coleoptera families deviate in mass as their sequence divergences increase. Finally, the data points

from all families were pooled into one group, and a curve for all Coleoptera was produced using median difference in mass at 0.01 intervals of genetic distance. Similarly, the data were also grouped by absolute size in order of magnitude to develop sigmoidal curves for each size category.

3.4 Results

3.4.1 Data distribution and variance partitioning

Based on the sampling of over 3,100 BINs, the Coleoptera fauna of Canada span over 5 orders of magnitude in mass. The largest species measured were the giant black water beetle (*Hydrophilus triangularis*, BOLD:AAQ2470), the California root borer (*Prionus californicus*, BOLD:AAH0166), and the great diving beetle (*Dytiscus dauricus*, BOLD:AAB6147), all having a dry mass of approximately 800 mg. The smallest species included several members from the subfamily Ptiliinae in the family Ptiliidae (genus- and species-level identification were not available). The lowest measurement of dry mass obtained was 0.0024 mg (BOLD:ADH5266). While there may be variation introduced by ethanol storage (Braun *et al.*, 2009; Knapp, 2012), DNA sequencing, and variability of the balance, the minimum dry mass is still expected to be lower than 0.005 mg. The median of the dataset was around 1.3 mg, represented by species such as *Bembidion nitidum* (BOLD:AAP7077, Carabidae) and *Dichelotarsus piniphilus* (BOLD:AAH0933, Cantharidae). On a log scale, the masses were approximately normally distributed; although the two-sided Agostino test suggested that their distribution was heavily tailed (Z = -7.74, p = 9.99^{-15}), there was no significant skew (Z = 1.83, p = 0.06) (Figure 3.1). The degree of skewness in Coleoptera SSDs does not appear to be positively correlated with taxonomic level (median family-level skewness = 0.11 versus overall skewness = 0.08) or correlated with the number of species in a family in either direction (t_{77} = 0.76, p = 0.45). When examining individual families, there was also no correlation between the median mass and the number of known species (t_{89} = 0.45, p = 0.65) or between median mass and sampling completion (t_{89} = 0.70, p = 0.48).

Much of the variation in dry mass was captured by existing taxonomic categories. Several nested ANOVAs all support the conclusion that family, subfamily, and genus levels are statistically significant in explaining variation in dry mass ($p < 2.22 \cdot 10^{-16}$). The partial ω^2s show that on average, about 45% of mass variation within Coleoptera is explained at the family level, another 25% at the subfamily level, and an additional 20% is captured at the genus level (Table 3.1). Correspondingly, the interquartile ranges (IQRs) for each taxonomic level shrink by about the same amount, from 3.1 log(mg) (22 times difference between the first and third quartiles) for the entire data set to 1.4 log(mg) (4.1 times difference) as the median of all

families IQRs and 1.0 log(mg) (2.8 times difference) as the median of all subfamily IQRs. Among species within a genus, masses are quite conserved, with a median IQR of 0.37 log(mg) (1.4 times difference in mass) among 494 genera with two or more BINs of which masses were quantified. As well, a general positive relationship between species richness and mass variation was found in all taxonomic groups (Figure 3.2).

3.4.2 Phylogenetic analyses

Estimates of Pagel's λ when calculated for the entire data set closely approached 1 (λ = 0.999939), and even when the data were trimmed to 1 BIN per genus, λ estimates remained high, ranging from 0.84 to 0.99. Blomberg's *K* was estimated to be 1.56. Both estimates found statistically significant phylogenetic signal ($p < 0.001$).

A total of five Brownian-motion-based models were fitted to the phylogenetic trees. Using the family-level tree adapted from Zhang *et al.* (2018), weighted AiCC values suggested that the Ornstein-Uhlenbeck model fitted significantly better than simple Brownian motion or early-burst (weighted AiCC values of BM:EB:OU was 0.04:0.02:0.94), with α in the OU model estimated to be 0.0017. After accounting for long branch lengths using adjustments designed by Cooper *et al.* (2015), α was estimated to be 0.20. On the other hand, the Brownian motion and early-burst models were fitted to the COI tree, whereas the OU model fitting was terminated at first due to limited computational time and power. Weighted AiCC values showed that the early-burst model fitted better than Brownian motion (BM:EB = 0.02:0.98). Both phylogenetic trees gave similar results when assessing the correlation between mass and ecological role: dry mass was significantly correlated with diet ($F_{4, 2536} = 14.68$, $p = 7.34^{-12}$; $F_{4, 68} = 7.08$, $p = 7.97^{-5}$), but not with habitat ($F_{4, 2532} = 1.37$, $p = 0.25$, $F_{3,67} = 2.02$, $p = 0.10$).

3.4.3 Predictors of unknown species mass

The coefficients of variation (CVs) in the 297 genera had a right skewed distribution with a mean of 0.51 and median of 0.47, meaning that members of a particular genus typically differ by 50% from the average mass of the genus. This translates to a 95% prediction interval of +/- 1. Nearest neighbours (NNs) are also strongly correlated in mass ($R^2 = 0.91$, $p < 2.66$ e-16; Figure 3.4). A model based on 320 NN pairs suggests that the median dry mass of a species can be predicted to be +/- 1.13 log(mg) of its nearest neighbour within 10% p-distance in the COI barcode region, meaning that the 95% prediction interval is just under one order of magnitude in mass. More closely related species generate better predictions, up to +/- 0.8 log(mg) for nearest neighbours within 2% p-distance. Lastly, prediction intervals generated by as

low as 80 NN pairs were comparable to those based on 320 pairs and successfully predicted masses from the test dataset. Further decreasing the training set resulted in wider prediction margins but did not lower prediction success.

3.5 Discussion

3.5.1 Coleoptera mass evolution contrasts patterns from vertebrates

Symmetry in the distribution of body masses as well as ω^2 values in the nested ANOVAs concur with expectations based on previous surveys and phylogenetic analyses of Coleoptera or other insects (Chislenko, 1981; Chown and Gaston, 2002; Ulrich, 2006; Ulrich, 2007; Rainford *et al.*, 2016). Overall, neutral patterns such as the influence of phylogenetic relationships are more reflected in the trajectories of the evolution of body mass in Coleoptera, while there appears to be a relative lack of directional changes or constraints. Furthermore, no correlation was found between assembly size and the degree of skewness in SSDs. These results all contrast patterns found in vertebrates, adding to the emerging trend that established models of body mass evolution are not universal. The immense species diversity and limited sampling in Coleoptera and other arthropods have resulted in the absence of a clear consensus of SSD shapes (Novotny and Kindlmann, 1996; Ulrich, 2006; Ulrich, 2007; Waller and Svensson, 2017). Additionally, relatively little attention has been given to explaining SSDs that are not right-skewed, and the presence and interpretation of taxon-specific, non-normal SSDs remain poorly evaluated. At lower taxonomic levels, the influence of sampling bias increases as sample sizes typically decrease. Comparisons between the present data and a survey of central European Coleoptera (Ulrich, 2007) reveals marked differences in lower-level SSDs. These differences may reflect differing analytical methods. Ulrich (2007) used the morphological identification of species and employed a generalized equation to calculate dry mass from body length, while the present study used BINs and direct mass measurements. Differences in species identification and variation in shapes or densities of Coleoptera may explain some of the discordance. However, it could also reflect regional differences in SSD shape or other unaccounted factors. Overall, SSDs appear to be highly variable and cannot be easily extrapolated. Additional data collection and understanding the influence of sampling bias is required for SSDs to be used as a link between evolutionary processes with ecological patterns (Ulrich, 2007).

3.5.2 Patterns of high or low in-group variation

While the overarching trend that much variation in mass can be explained by phylogenetic relatedness prevails throughout Coleoptera, subgroups exhibit immense diversity in their mean and extent of variation (see figure S2), and many interesting patterns can still be found. For example, while there is a general correlation between species richness and mass variation, genera are distinctly more conservative in mass than subfamilies and families. These patterns hold true both when using number of BINs weighed and known number of species in Canada (as in Bouchard *et al.*, 2013) as the independent variable. As such, it reflects how similarity in mass could have played an important role in establishing generic boundaries. From a practical standpoint, this also means that genus-level averages can better represent mass than means of families or subfamilies in Coleoptera, having the advantage of being less influenced by species richness.

As well, outliers of this general species-richness-variation relationship are often interesting points of investigation. For example, high variance sometimes identifies groups that are undersampled, such as the family Histeridae, where only 13 of 136 known species were weighed. In other cases, unusually high or low variances point to underlying ecological factors that potentially influence mass evolution (Figure 3.3 A). For example, aquatic taxa often display more variation in mass than terrestrial taxa due to larger maximum sizes. In vertebrates, aquatic invasions have typically led to increases in body mass (reviewed in Smith and Lyons, 2011). It is theorized that the higher availability of energy, the 3D nature and higher foraging efficiency of the environment, the lowered constraints on limb thickness in water, or the higher relative fitness of larger mass in aquatic environments has allowed animals to evolve to larger sizes (Biewener, 1989; Pawar *et al.*, 2012; Tucker and Rogers, 2014; Gearty *et al.*, 2018). Similar processes may influence aquatic Coleoptera. On land, many taxa that bore into wood or live underneath dead wood show marked variation in mass. Food availability during the larval stages has a strong influence on adult size in these groups, and members of a particular species varied up to four-fold in mass. This may partially be a statistical artefact of sampling few specimens per BIN and few BINs, but data from larger groups with many samples, such as Buprestidae, suggest that high intraspecific variation extends to higher family-level variation to some degree. While the underlying mechanism awaits investigation, it is likely that their habitat or diet has lowered selection pressures on larger or smaller size. Because adult size is highly associated with larval feeding time and food quality (Nijhout *et al.*, 2006), it seems likely that the long persistence of bark, compared to limited occurrences leaves or prey, as well as the concealed nature of their feeding habitat, could allow these species to extend their larval development with reduced risk of mortality. Uncoincidentally, the species with the greatest dry mass were either aquatic or wood-boring species.

On the other hand, low variation in mass was frequent in small-bodied Coleoptera, such as the families Latridiidae or Corylophidae (Figure 3.3 B). Because interquartile range was evaluated on log-scale, this is unlikely to be a statistical artifact. Many taxa with small mass are associated with and feed on fungi, and often have distinct morphological adaptations to being small, such as the loss or reduction of organs (Dybas, 1978; Evans, 2014). These traits may contribute to the limited size ranges of these taxa, as the loss of circulatory organs could pose an upper cap on mass evolution. Alternatively, there could be a lower limit on the absolute size of Coleoptera due to morphological constraints. A similar hypothesis has been proposed to explain the right-skewed distribution of mass in Odonata because their flight mechanism requires a minimum body size (Waller and Svensson, 2017). However, there is no clear right- or left-skewed pattern in SSDs of fungivorous Coleoptera, suggesting that it is unlikely a single constraint that is limiting their mass evolution. One other possibility is that there is stronger selection towards an optimum size in fungivorous groups, which lowers their overall variation. In this case, the association between small mass and lower variation could be explained by their common correlation with fungivory. This has some support from the PGLS regressions showing that they are the single category to be distinctly different in mass to other diets, but evaluation with evolutionary models would paint a clearer picture.

3.5.3 Influence from phylogenetic constraint and ecological specialization

Strong evidence of phylogenetic signal was recovered from the data. Pagel's λ closely approached is maximum possible value, and despite the tendency for Blomberg's K to decrease with increased sample size (Müenkemüeller *et al.*, 2012), it was estimated to be greater than 1 ($K = 1.56$), suggesting much stronger assemblance between closely related species than expected under pure Brownian motion (Blomberg *et al.*, 2003). On the other hand, diet and habitat appear to have a weaker influence. While fungivores had lower mean mass than species from the other dietary categories, the remaining groups showed no difference in mean mass. There was also no difference in mean mass between the four habitat categories. Combined, these results suggest that phylogenetic influences play a much larger role in the evolution of the body mass of Coleoptera.

However, it is too early to dismiss the influence of ecological role, as the present analysis may have failed to detect differences between groups for the following reasons. First, there was substantial variation within the dietary groups due to a coarse-scale categorization in diet. For example, some groups feed on mosses, algae, or only specific plant parts, so the category of 'herbivore' may not adequately differentiate how mass and diet are associated in these groups. In other cases, the diet and habitat of some groups are poorly known (Evans, 2014). Further knowledge of these traits will help to clarify how they influence mass evolution. Secondly, even if more dietary groups are defined, unbalanced sample sizes for these groups

would lower the power of statistical tests like the ANOVA. For example, the group "parasite/parasitoid" had a larger mean mass, but only had two families, with 1 and 16 BINs weighed respectively, so the difference in its group mean was not statistically significant. The same problem may arise in other small groups with highly specialized diet. Therefore, balanced groups and random sampling are key to constructing a PGLS test that best captures the relationship between diet and mass. Furthermore, the number of tips in the phylogeny, as well as which taxonomic level they represent, could affect the results obtained. When comparing the two PGLS results from the current study, the family-level tree had a much higher coefficient of determination (R^2 = 0.25) compared to the COI gene tree (R^2 = 0.02), despite the data representing the same species. Although within-family variation was accounted for in the analyses, collapsing individual species into a single tip per family still might have led to reduced variation in the data set and increased R^2 values. The taxonomic level most suitable as tree tips for PGLS analyses remains to be explored. Finally, although habitat type was not found to be significantly correlated with body mass, various other factors, such as how species distribution is influenced by post-glacial colonization, need to be incorporated into the analysis before further conclusions are made.

3.5.4 Comparison of evolutionary models

While measures of phylogenetic signal such as Blomberg's *K* suggests that non-phylogenetic processes have impacted the evolution of body mass in Coleoptera, it is difficult to reach a solid conclusion on the best model of evolution using the current data. To begin with, the two trees in this study did not strongly support any of the models tested. The COI gene tree showed that early-burst (EB) better captured mass shifts than a general Brownian motion (BM) model. However, there is lack of support for EB processes occurring in morphological traits from previous work (Harmon *et al*., 2010), and there is a more plausible explanation for the better fit of the data. Given that the COI gene tree was generated with short sequences constrained by more distant phylogenetic relationships, it may appear as an EB process because of the lack of depth in the tree. The Ornstein-Ulhenbeck (OU) model was also not successfully fitted to the COI gene tree, making comparisons difficult. While the OU model fit significantly better than EB or BM on the family-level tree, it was also only weakly supported because the α parameter was low, even after adjusting for branch length (Cooper *et al*.,2015). This suggests that the underlying process of mass evolution does not differ much from simple Brownian motion, and that significance found by the weighted AiCC values may reflect overfitting, which OU models are prone to (Cooper *et al.*, 2015). Both trees applied in this study appear to have significant shortcomings is assessing the fit of evolutionary models such as OU, given that the family-level tree had a lower number of tips (Cooper *et al.*, 2015), and the COI gene tree

utilized very short sequences. They may not have enough power to successfully separate evolutionary processes from statistical artefacts. Thus, no further model fitting was attempted.

Based on analyses from SSDs, group variance, and PGLS regressions, it appears that diet influences the direction of the evolution of body mass, whereas diet or habitat may influence its rate. Thus, several extensions of the tested models may be strong candidates in describing evolutionary trajectories of Coleoptera body mass. These including SURFACE, which allows for shifts in adaptive peaks in an OU model (Ingram and Mahler, 2013), OU-M or OU-MV models, which also extend OU models by associating adaptive peaks and/or the strength of attraction towards them with other traits (Beaulieu *et al.*, 2012), Rate Shift (RS), which allow BM models to have shifts in evolutionary rate, or ecological release (ER) models, which extend OU models to allow shifts to BM processes (Slater, 2013). Because models involving the OU process are prone to type I errors and overfitting (Cooper *et al.*, 2015), they would be best compared using a deep, multi-gene tree with a larger number of tips than what is currently available.

3.5.5 Predicting the mass of a new species

Overall, the masses of closely related species have strong predictive power of body mass. Larger genera tended to be more variable and have skewed distributions, leading to larger CV values, but overall are still very conserved. In most cases, a genus mean or median has a 95% prediction interval within +/- 1. This means that one would not expect a new genus member to be more than twice or less than half of the mass of its genus average. Even in the most variable Coleoptera genera, a genus average in mass is still a more precise predictor than calculation from a single linear measurement and generalized equation (Rogers, 1976). Similarly, prediction intervals of +/- 1.13 log(mg) in near neighbours within 10% p-distance also outperforms generalized linear equations, showing promise of predicting the mass of an unknown species even if only one close neighbour is known. Moreover, the fact that training sets using 25% of the data also demonstrates that these types of models can be generalized to utilization in a larger group with adequate data collection.

Furthermore, a model based on NNs alone makes very limited use of the available mass and genetic information. In this case, although only 25% of the data set was required to build a reasonable model, another 37.5% of species mass data was needed to predict their NN pair. However, one can expect that any closely related species could have similar predictive power in mass as the current ‘nearest’ species known. Thus, it may be possible to construct a model that uses a general pairwise relationship between genetic distance and mass difference to predict the mass of a new species based on several closely related neighbours already in the dataset. The sigmoidal curves generated by pairwise comparisons between BINs

serve as an initial step for such a model. Specifically, the shape of these curves can provide an idea of how closely related a neighbour must be in order to be useful in mass prediction, as well as how precise one can expect the prediction to be.

Over 80 curves were generated for all Coleoptera families with more than 5 BINs weighed in the study, five size categories based on order of magnitude in size, and pooled data from families and size groupings. Pairwise data were normally distributed and peaked around 21% in genetic distance, while most graphs suggested that pairs between 0 and 15% distance capture the 'curve' portion of the sigmoid function that describes how mass differs as species become more distantly related to each other. Thus, many groups appeared as stochastic due to limited data in the key range, and only those with sufficiently large sample size were interpretable. Interpretable graphs had a consensus that median difference began to increase immediately as species diverge (around 0-5%) and tapered off after around 15% in distance; the deviation from the median difference also increases as genetic distance increases, resulting in wider interquartile ranges (Figure 3.5). This suggests that neighbours within 15% distance are potentially useful in predicting species mass, and that more closely related species are expected to be better predictors. Some variation exists in the shape of the curves, but it is difficult to determine whether these are group properties or noise due to the limited sample size and resolution. As the largest families in the data all have similar patterns, it is as expected that the pooled data shows similar trends, as they are composed largely of these families. Thus, while this relationship is expected to capture a general trend for all Coleoptera, collecting data on species pairs that are closely related (i.e. within 15% distance in the COI barcode region) could improve resolution for smaller or underrepresented groups.

3.5.6 Other sources of variation and future directions

Several sources of bias that may be introduced by sample collection, specimen storage, and methods of measurement, that may affect the distribution of the data, should be discussed. Firstly, the use of ethanol in specimen curation at the CBG collection may affect mass measurements. Previous work has shown that long-term storage in ethanol decreases the wet and dry mass of arthropod specimens (Knapp, 2012), but it remains to be assessed whether short-term storage (e.g. between collection of Malaise trap bottles) differs significantly from long-term storage, or whether and how arthropods of different masses, shape, or body composition are disproportionately affected. It can be speculated that in the CBG collections, smaller specimens, which are stored in ethanol for longer periods of time, may have larger decreases in dry mass. Furthermore, tissue sampling for the DNA barcoding process will likely disproportionately affect smaller specimens, since a larger portion of their body would be removed. If these two factors significantly change mass measurements, they would bias the data towards being right-skewed. The slight right skew

found in the present data may reflect this. Secondly, sampling incompletion or bias in species collection may affect the overall data distribution. In this study, BINs were chosen entirely based on specimen availability and are thus influenced by any biases or limitations of collection methods used by the CBG collections unit. For example, there has been an effort to gain taxonomic coverage of Coleoptera families by searching for specific taxa, rather than sampling randomly. Ninety of the 111 families of Coleoptera known to occur in Canada were included in this project, thus the dataset likely covers most of the range in dry mass of Canadian Coleoptera. This at least partially explains the significant kurtosis in the data, and additional measurements are expected to accumulate within the current data range rather than expand it. On the other hand, because no correlation was found between median mass and family size nor sampling completion, it is less likely they have introduced significant skew. Of course, it is possible that species identification is biased by body mass. In other words, if a larger portion of unknown species are below or above the median, the true distribution of species is then different from the observed. While this is partially alleviated with the use of BINs to differentiate cryptic species, it is still difficult to predict how unknown species would affect the overall distribution. Additionally, limiting the population to species found in Canada may also influence data distribution, as the region does not correspond to geographic or temperate zones. Thus, conclusions can only be made for known extant Coleoptera species of Canada, and broader generalizations would require ascertaining the above factors.

Further data collection would also greatly benefit evolutionary analyses. This includes more detailed categorization of diet and habitat and a balanced ANOVA design to improve understanding of how ecological specialization influences mass evolution. Historical factors such as post-glacial colonization could be better accounted for, and analyses could be expanded to a geographical or temperate zone, rather than be determined by political borders. As well, constructing a phylogenetic tree that better suits model fitting, for example, by barcoding or weighing the species used in previous multigene phylogenies (McKenna *et al.*, 2015; Zhang *et al*, 2018), or by sequencing BINs from the current study to generate a multi-gene tree, could enable better evaluation of evolutionary hypotheses.

The predictive model for the mass of unknown species could be further explored in several ways. First is to use a more complex substitution model to better evaluate the relationship between genetic distance and mass divergence. Exploration of sigmoidal curves using various models available (JC69, TN93, K80, raw distance) revealed no strong difference in the pattern of divergence, which could be further confirmed in the best model of substitution (GTR+I). The best-fit model of substitution could also more accurately determine the best genetic distance for further data sampling or model construction. Secondly, it could be tested whether using a multivariate model would improve the accuracy or precision of predictions. Because

the most common distance between pairs was around 20% using the current substitution model, which is further than the ideal range of interpreting mass divergence (within 15%), a multivariate model could make more efficient use of the collected data if it could employ more distantly related species. Lastly, further data collection on mass, focussing on closely-related species in underrepresented groups, would be beneficial in discerning divergence patterns in more detail. Mass data from other invertebrate groups, evaluating phylogenetic signal as well as intraspecific variation, would be needed to assess the efficacy of a predictive model beyond the order Coleoptera.

This study presents a novel dataset of the body mass of over 1/500 of described animal species, which enabled documentation of patterns such as the extent of variation at different taxonomic levels, as well as revealed the strong influence of phylogenetic constraints and the impact of ecological specialization in the evolution of body mass in Coleoptera. It showed that trends found in Canadian Coleoptera diverge strongly from trends in vertebrates, and can differ from previous surveys of other arthropods as well. Thus, further quantification of the body mass of arthropod species is required to better understand their evolution. The present study also established the possibility of using available mass data to predict the mass of unknown species more precisely than the methods currently being applied. Through demonstrating the feasibility of the assembly of precise data on the body mass of arthropods, and its value in both theoretical and applied research, results presented by this study serve to stimulate future efforts in quantifying the body masses of arthropods, and improve understanding of the evolution of body mass in animals from a broader perspective.

3.6 Tables and figures

Table 3.1. Nested ANOVA results for various combinations of taxonomic levels from R output. Results consider all families and the six most species-rich families. Partial omega squared (ω^2) is calculated as (SSE - DFE*MSR) / (SSE+(N-dfE)MSR)).

Factor	Df	Sum Sq.	Mean Sq.	F Stat.	p	ω^2
Using family & genus as nested levels and all 49 families						
Family	48	5303	110	279	$p < 2.22 \cdot 10^{-16}$	0.576
Family:Genus	425	3147	87.4	18.7	$p < 2.22 \cdot 10^{-16}$	0.324
Residuals	1843	730	0.4			
Using subfamily and genus as nested levels for all 49 families						
Subfamily	76	5490	72	181	$p < 2.22 \cdot 10^{-16}$	0.725
Subfamily:Genus	319	1412	4.4	11	$p < 2.22 \cdot 10^{-16}$	0.171
Residuals	1557	621	0.4			
Using family, subfamily, and genus as nested levels for six families with > 100 BINs						
Family	5	1762	440	954	$p < 2.22 \cdot 10^{-16}$	0.432
Family:Subfamily	25	970	38.8	84	$p < 2.22 \cdot 10^{-16}$	0.235
Family:Subfamily:Genus	175	924	5.3	11.4	$p < 2.22 \cdot 10^{-16}$	0.205
Residuals	899	415	0.5			
Using family and genus as nested levels for six families with >100 BINs						
Family	5	2281	456	1013	$p < 2.22 \cdot 10^{-16}$	0.472
Family:Genus	252	2075	8.2	18	$p < 2.22 \cdot 10^{-16}$	0.404
Residual	1041	469	0.5			

Table 3.2. Phylogenetic generalized least squares (PGLS) analyses based on the COI and backbone trees. Fungivorous species were coded as the baseline value. P values test for significant difference between other diets and the baseline. Bonferroni corrected α = 0.05/4 = 0.0125.

PGLS on COI gene tree				
Coefficient	**Mean**	**SE**	**t**	**p**
Fungivores (Intercept)	-0.77	0.45	N/A	
Herbivore	2.17	0.32	6.77	$1.61 \cdot 10^{-11}$
Omnivore/Scavenger	1.56	0.32	4.93	$8.74 \cdot 10^{-7}$
Parasite/Parasitoid	4.05	0.91	4.44	$9.58 \cdot 10^{-6}$
Predator	1.10	0.33	3.29	$1.02 \cdot 10^{-3}$

Residual standard error: 2.256 with 2536 degrees of freedom
Multiple R^2: 0.023, Adjusted R^2 = 0.021
$F_{4,2536} = 14.68$, $p = 7.34^{-12}$

PGLS on backbone tree				
Coefficient	**Mean**	**SE**	**t**	**p**
Fungivores (Intercept)	-1.00	0.70	N/A	
Herbivore	1.74	0.50	3.46	0.00093
Omnivore/Scavenger	1.97	0.49	4.05	0.00013
Parasite/Parasitoid	4.52	1.27	3.57	0.00067
Predator	1.96	0.55	3.54	0.00073

Residual standard error: 0.1022 with 68 degrees of freedom
Multiple R^2: 0.294, Adjusted R^2 = 0.252
$F_{4,68} = 7.078$, $p = 7.97^{-5}$

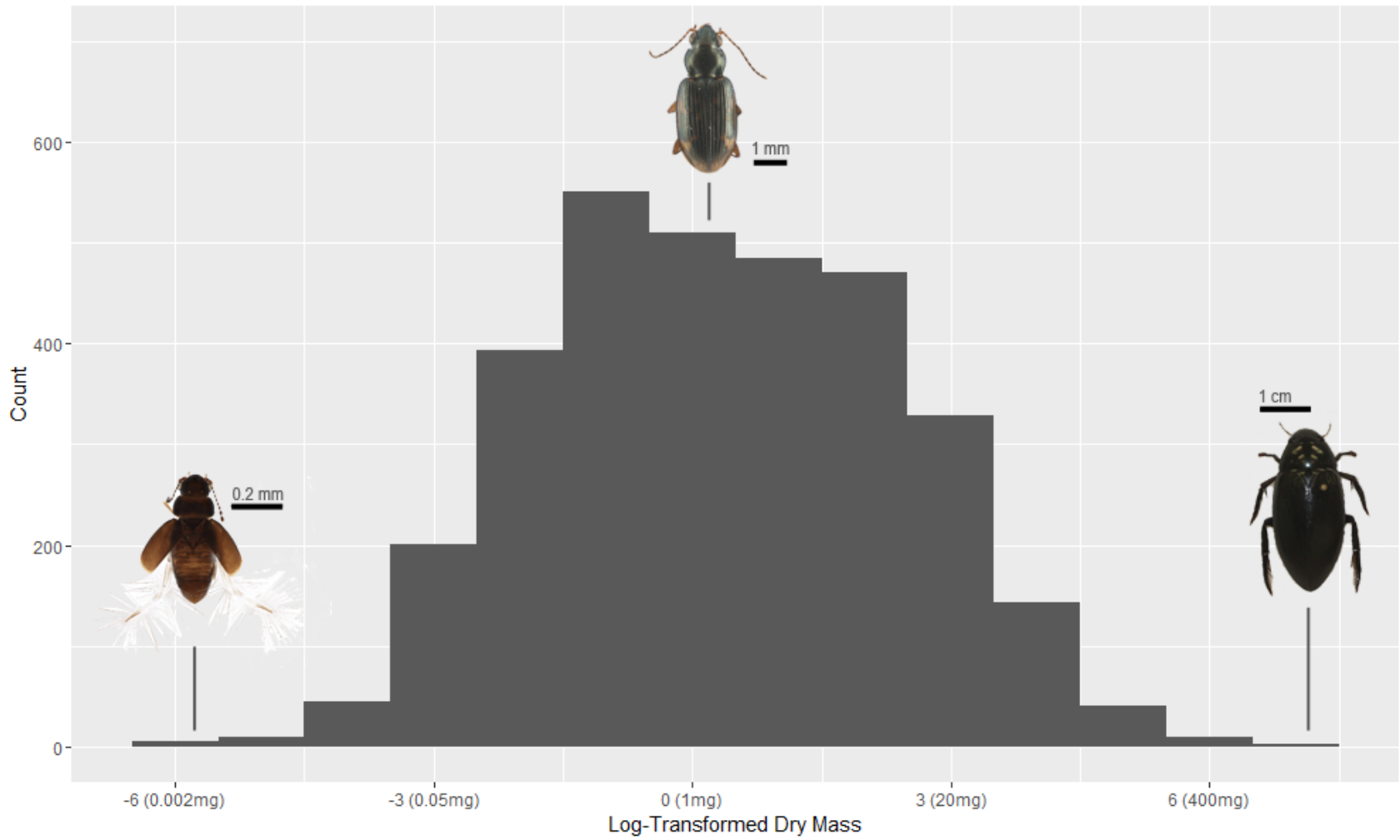

Figure 3.1. Log-scale histogram of the dry mass of 3,195 BINs of Coleoptera found in Canada. Images represent members of the smallest, median, and largest species in the data set, and are (from left to right): *Ptiliola kunzei* (BOLD:ACI8875, 0.006 mg), *Bembidion spp.* (e.g. BOLD:AAD2752, ≅ 1 mg), and *Hydrophilus triangularis* (BOLD:AAQ2470, 800 mg).

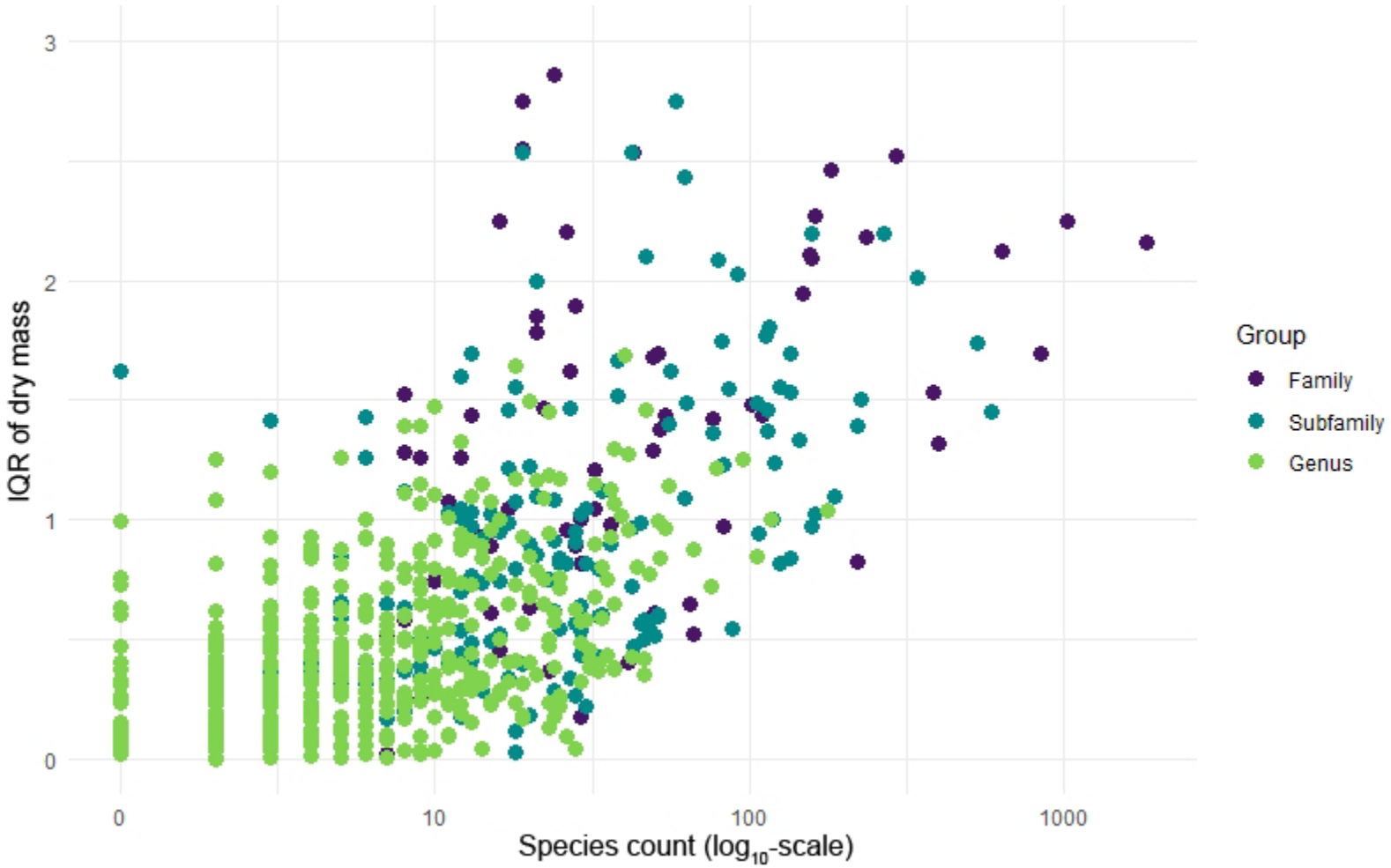

Figure 3.2. Relationship between species richness (known number of species in Canada on log_{10}-scale) and variation in mass as represented by interquartile range of log(dry mass), for Coleopteran taxa.

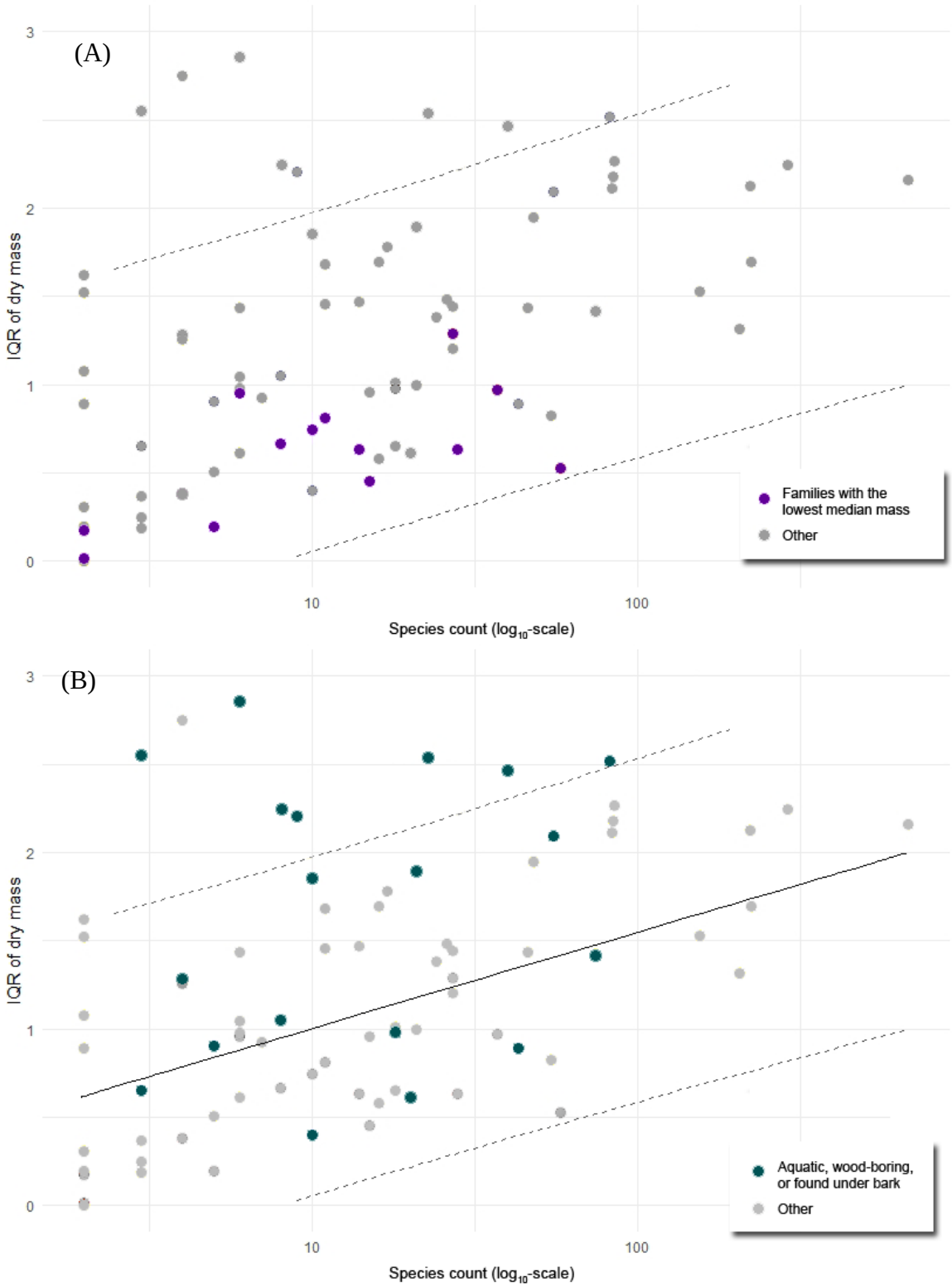

Figure 3.3. Relationship between species count and interquartile range of dry mass in 79 Coleoptera families (with more than 2 BINs weighed). Solid lines represent the means while dashed lines represent the 90% prediction interval. Colours highlight groups that appear to have high (A) or low (B) variation.

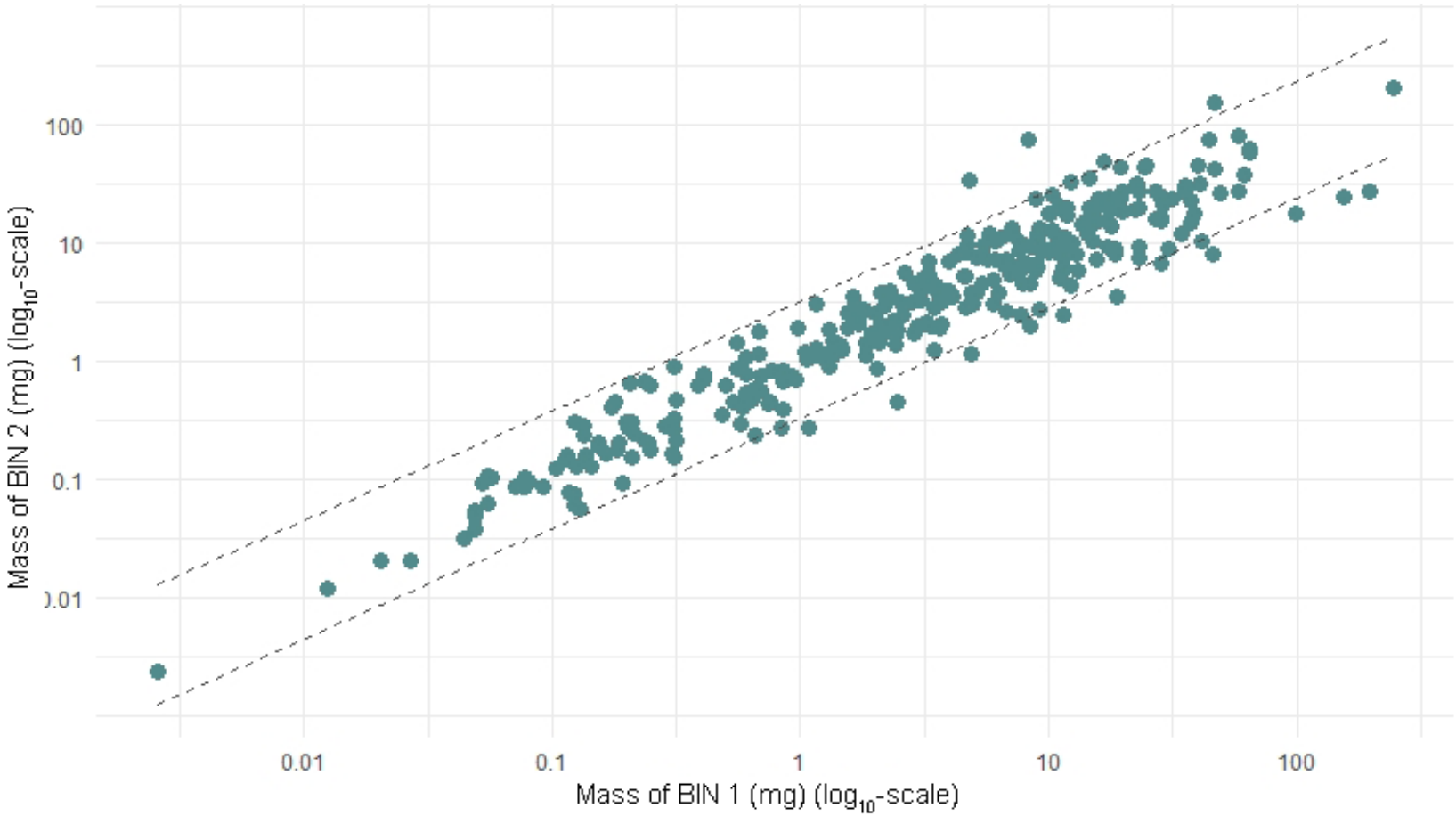

Figure 3.4. Correlation of mass between 320 nearest-neighbour pairs of Coleoptera on log_{10}-scale. Dashed lines represent the 95% prediction interval.

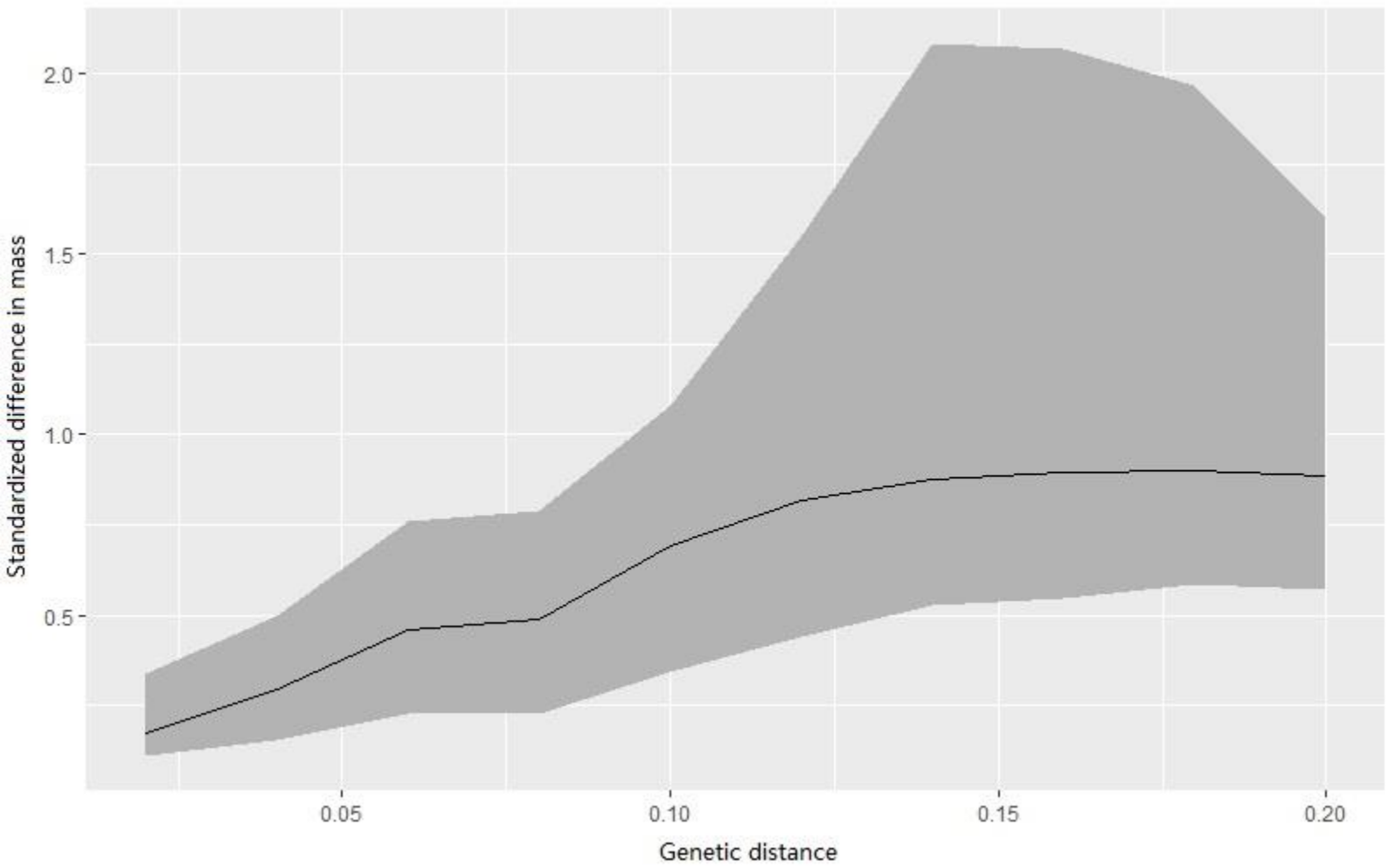

Figure 3.5. Relationship between genetic distance in the COI region and standardized difference in mass between pairs of closely related Coleoptera. Line represents median and shaded region represents the range between first and third quartiles.

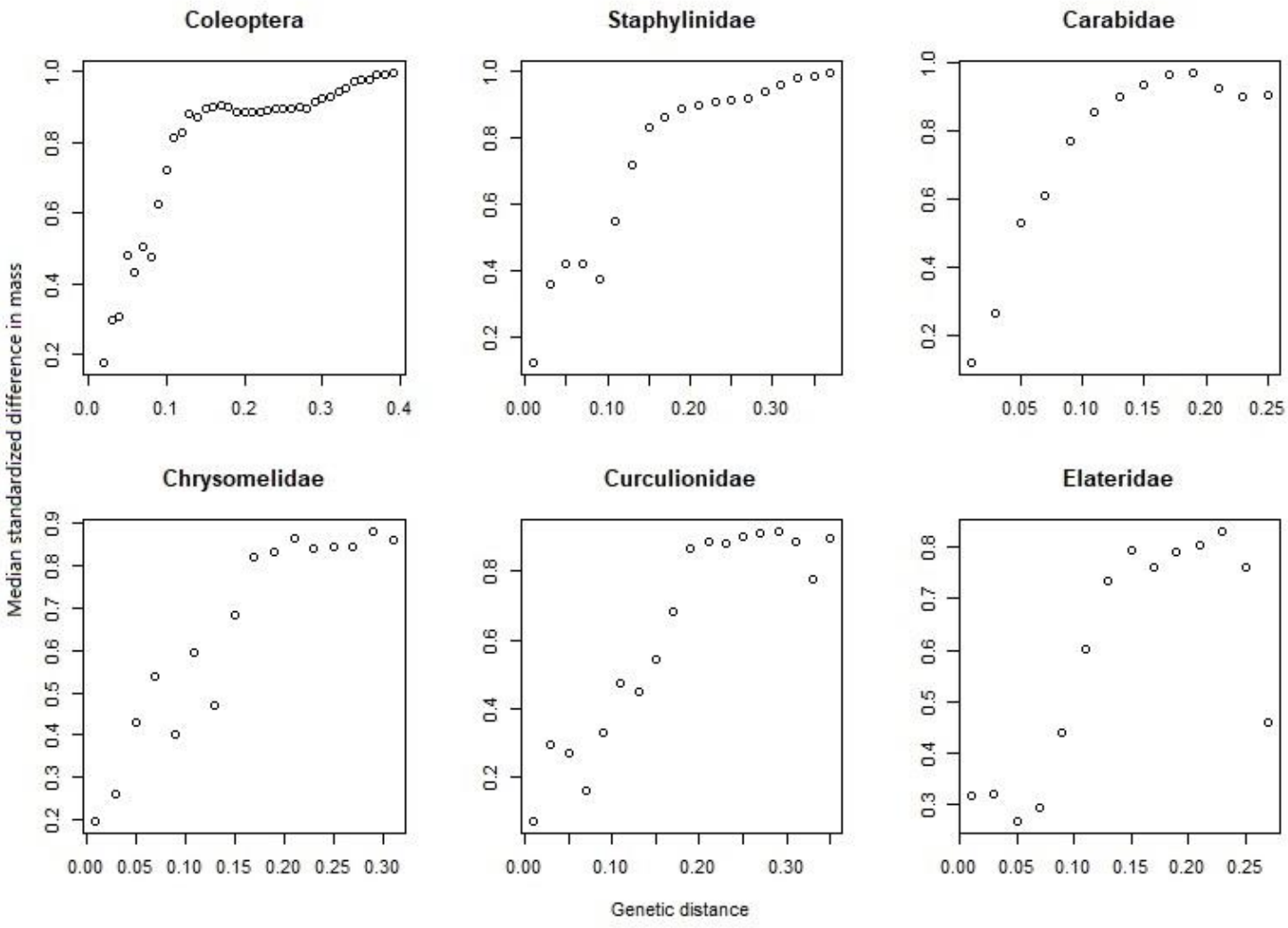

Figure 3.6. Relationship between genetic distance in the COI barcode region and median standardized deviation in mass of the five most sampled families of Coleoptera as well as pooled data.

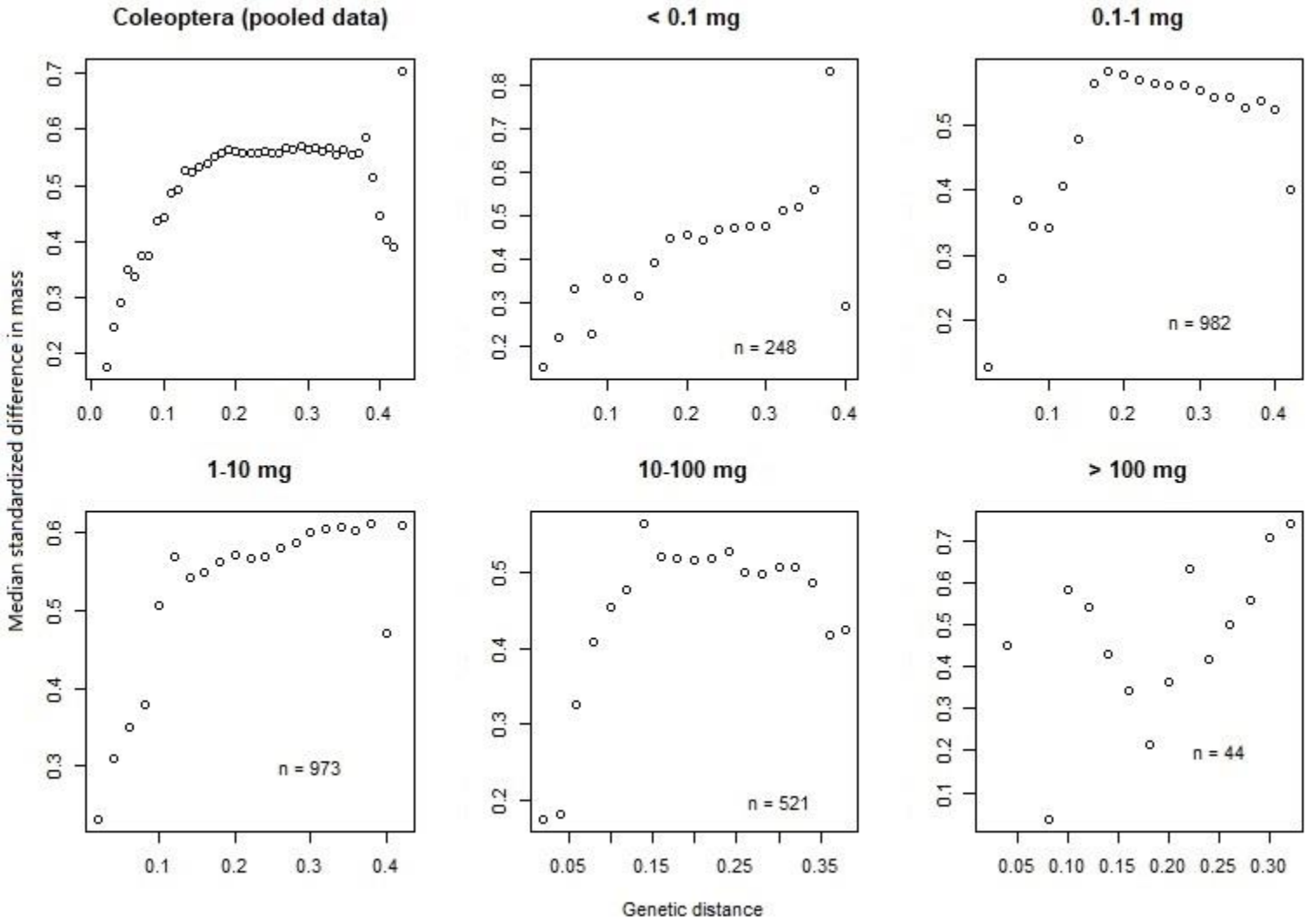

Figure 3.7. Relationship between genetic distance in the COI barcode region and median standardized difference in mass of Coleoptera BINs grouped by absolute size as well as pooled data.

4 Chapter 4: General conclusions

4.1 Summary

Because body mass influences virtually all aspects of the biology of animals, its documentation can contribute to a wide variety of ecological and evolutionary research. Knowledge of arthropod body mass is particularly valuable because of their high taxonomic and ecological diversity, their divergence from established trends of animal body mass evolution, as well as the lack of accurate information on the mass of most species.

This thesis had three primary goals: (1) document the mass of Canadian Coleoptera, (2) develop a protocol to maximize the precision and reliability of dry mass measurements obtained from museum specimens, and (3) describe evolutionary trajectories of Coleoptera by combining new mass data with DNA barcodes and backbone phylogenies. The results obtained from the analysis of 3,195 BINs reveals that Canadian beetle species span over five orders of magnitude in mass, and patterns of size variation differ among families in a predictable manner. The overall data also show that patterns of body mass variation in Canadian Coleoptera differ from trends reported for vertebrate lineages, reinforcing a conclusion reached by previous studies on arthropods. For example, SSD distributions and measures of phylogenetic signal support the dominance of phylogenetic constraints over directional selection in their evolution, and phylogenetic least square regressions reveal that ecological specialization also has some influence. When compared with previous findings on the evolution of insect body mass, this thesis also shows that much investigation remains to understand mass evolution in insects and other arthropods. Often, it is difficult to discern whether mixed results are due to differences in sampling and analytical methods, or due to varying underlying patterns. Better knowledge of the mass of arthropod species, as well as understanding how differing analytical methods can affect conclusions, is key to effective cross-taxa comparisons.

This thesis also confirms the value of museum specimens in aiding the rapid assembly of mass data. The analysis of well-preserved, accurately identified specimens greatly reduces the need for sampling, curation, and identification efforts. Moreover, evidence that the mass of a new or unknown Coleoptera species is well predicted by the mass of its nearest genetic neighbours further adds to the value of the mass data collected. A registry that compiles such data, paired with sequence information, can enable mass estimates for a large number of species, even those lacking voucher specimens, benefitting comparative studies as well as applied research. By providing mass data for 1/500 of all known animal species and summarizing the methodologies employed for data collection, the present study has established the feasibility of creating a mass registry for all members of this kingdom.

4.2 Data availability

Availability of data and methodologies used in research is key to its reproducibility. Readily accessible data can facilitate new research and combine perspectives from many different studies. In a group as diverse and species-rich as Arthropoda, combined data from various studies will be crucial to both document large-scale patterns and to evaluate of evolutionary hypotheses. Therefore, the species mass information used in this thesis has been included as an appendix to this thesis and is also available as a supplementary file. The R code used for analyses is also included as a supplementary file. In addition, the specimen mass information has also been added to the Barcode of Life Data Systems to supplement DNA barcoding data.

4.3 Future directions

This thesis shows that extensive documentation of insect body mass can provide insights into the range, distribution, and patterns of its variation. However, it is not the most effective approach for quantitative testing of evolutionary hypotheses. The many patterns found in the mass variation of Canadian Coleoptera, such as associations with diet and habitat, could be better evaluated with studies designed to assess these influences, using balanced group sizes, more detailed categorization of traits, and with a better evaluation of intraspecific variation. The fitting of evolutionary models would also be improved with phylogenetic trees that suit model fitting. Moreover, as with trends in vertebrates, patterns should be tested for their generality by examining assemblages of Coleoptera from other geographic regions and by studies on other taxonomic groups. Thus, further sampling, planned and guided by results such as those documented in this thesis, would improve our understanding of body mass evolution from an arthropod perspective.

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APPENDICES

A: Supplementary tables and figures

Table S1. Pin sizes used in the CBG collections. The mass information was used to calculate the net weight of pinned specimens. Mean and SE values are based on measurements of 100 of each pin type.

Pin Type	Diameter (mm)	Mean Mass (mg)	Mass SE (mg)
G000	0.25	14.3	0.19
G00	0.30	20.6	0.37
G0	0.35	28.6	0.28
G1	0.40	38.1	0.42
G2	0.45	47.1	0.7
G3	0.50	58.8	0.6
G4	0.55	70.7	0.9
G5	0.60	86.4	0.6
G6	0.65	103.7	0.3

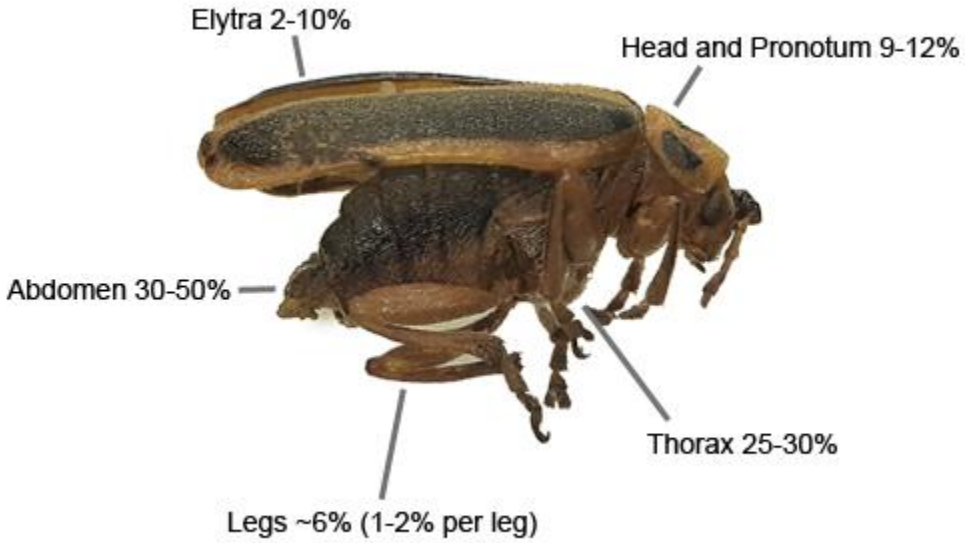

Figure S1. Typical mass breakdown for typical specimens of Coleoptera (n = 10).

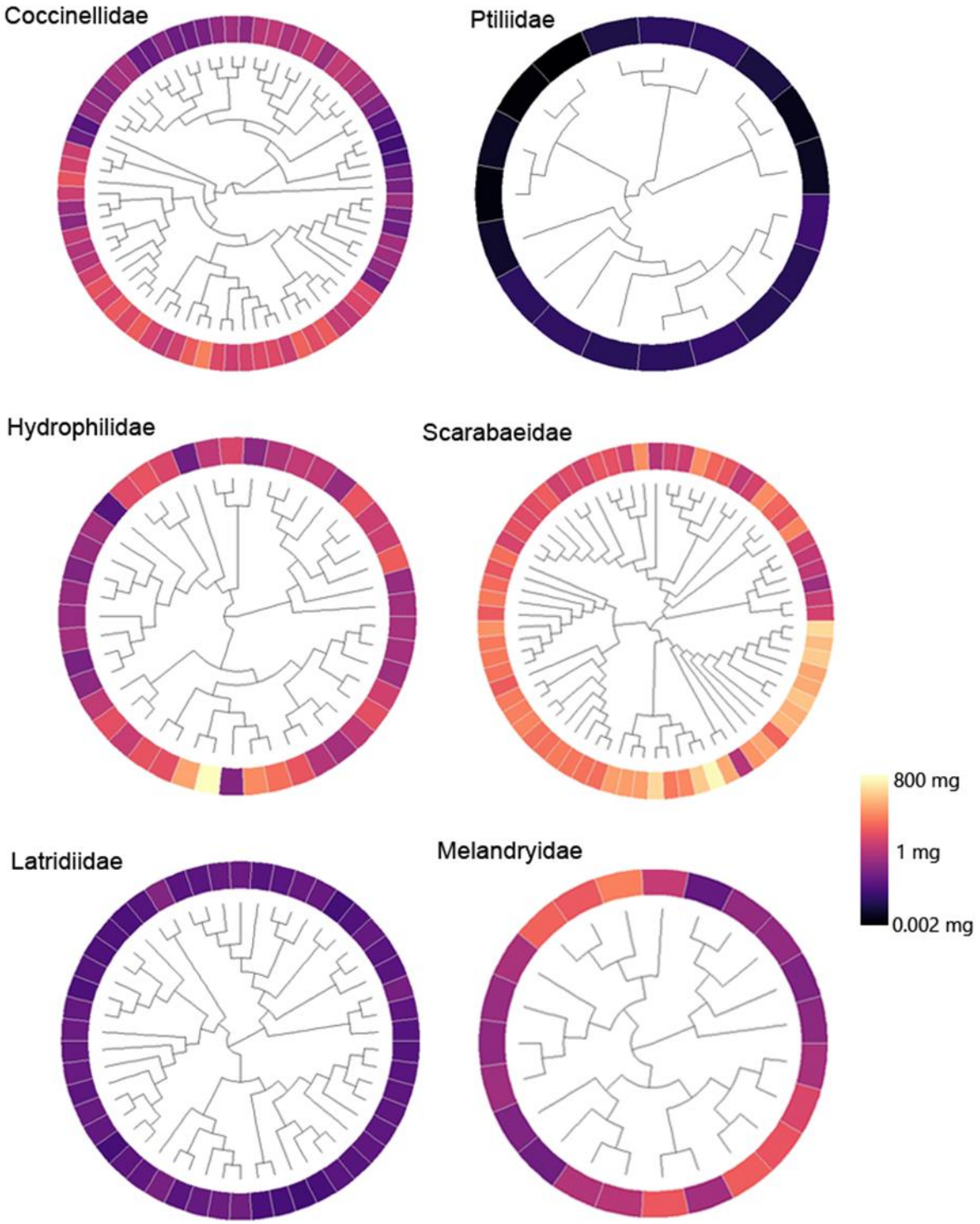

Figure S2. COI trees for six Coleoptera families, chosen to illustrate diversity in patterns of mass variation, with heat maps representing species mass.

B: Mass data by BIN

BIN	Family	Subfamily	Genus/species	Net mass (mg)
BOLD:AAO0480	Aderidae		*Aderus populneus*	1.58E-01
BOLD:ACY8427	Aderidae		*Elonus basalis*	3.96E-01
BOLD:ADF7265	Aderidae		*Elonus gruberi*	4.55E-01
BOLD:ACC3231	Aderidae		*Elonus nebulosus*	2.63E-01
BOLD:ACY7628	Aderidae		*Vanonus calvescens*	1.12E-01
BOLD:ACL9634	Aderidae		*Vanonus huronicus*	7.39E-02
BOLD:AAM7646	Aderidae		*Vanonus vigilans*	6.13E-02
BOLD:ACM5881	Aderidae		*Vanonus wickhami*	1.22E-01
BOLD:ACY8313	Aderidae		*Zonantes fasciatus*	1.87E-01
BOLD:AAN5907	Aderidae		*Zonantes pallidus*	1.49E-01
BOLD:ACU8018	Agyrtidae	Agyrtinae	*Ipelates latus*	6.51E-01
BOLD:ACL2746	Agyrtidae	Necrophilinae	*Necrophilus hydrophiloides*	1.37E+01
BOLD:AAH2753	Anthicidae	Anthicinae	*Anthicus cervinus*	2.55E-01
BOLD:AAP7097	Anthicidae	Anthicinae	*Anthicus coracinus*	4.98E-01
BOLD:ABX0569	Anthicidae	Anthicinae	*Anthicus hastatus*	3.88E-01
BOLD:ABX2506	Anthicidae	Anthicinae	*Anthicus nanus*	1.82E-01
BOLD:ACL9877	Anthicidae	Anthicinae	*Ischyropalpus nitidulus*	2.43E-01
BOLD:ACF8552	Anthicidae	Anthicinae	*Malporus formicarius*	3.54E-01
BOLD:AAN6206	Anthicidae	Anthicinae	*Omonadus floralis*	5.58E-01
BOLD:ABY0699	Anthicidae	Anthicinae	*Omonadus formicarius*	3.78E-01
BOLD:ABX1668	Anthicidae	Anthicinae	*Sapintus fulvipes*	2.61E-01
BOLD:ACJ7221	Anthicidae	Anthicinae	*Sapintus pubescens*	2.76E-01
BOLD:ABA9086	Anthicidae	Anthicinae	*Sapintus pusillus*	2.27E-01
BOLD:AAQ1028	Anthicidae	Anthicinae	*Stricticollis tobias*	1.91E-01
BOLD:AAQ0043	Anthicidae	Eurygeniinae	*Pergetus campanulatus*	6.05E+00
BOLD:ABW9925	Anthicidae	Eurygeniinae	*Stereopalpus vestitus*	3.05E+00
BOLD:ABY1165	Anthicidae	Notoxinae	*Notoxus anchora*	8.08E-01
BOLD:ABX0657	Anthicidae	Notoxinae	*Notoxus desertus*	4.08E-01
BOLD:AAP7869	Anthicidae	Notoxinae	*Notoxus pictus*	3.92E-01
BOLD:AAP7006	Anthicidae	Notoxinae	*Notoxus subtilis*	4.68E-01
BOLD:AAO1339	Anthribidae	Anthribinae	*Anthribus nebulosus*	1.42E+00
BOLD:AAG5219	Anthribidae	Anthribinae	*Euparius marmoreus*	7.68E+00
BOLD:ACC7975	Anthribidae	Anthribinae	*Euparius paganus*	2.22E+00
BOLD:ACA9173	Anthribidae	Anthribinae	*Eurymycter tricarinatus*	1.81E+01
BOLD:ACI3616	Anthribidae	Anthribinae	*Eusphyrus walshii*	6.59E-01
BOLD:ACG9499	Anthribidae	Anthribinae	*Ormiscus saltator*	2.26E-01
BOLD:AAU7341	Anthribidae	Anthribinae	*Ormiscus walshii*	5.79E-01
BOLD:ACK1937	Anthribidae	Anthribinae	*Trigonorhinus alternatus*	1.10E+00
BOLD:AAH0210	Anthribidae	Choraginae	*Araecerus fasciculatus*	1.30E+00
BOLD:ACR2675	Anthribidae	Choraginae	*Choragus*	1.08E-01
BOLD:ACB1036	Anthribidae	Choraginae	*Choragus sayi*	9.66E-02
BOLD:ACL7771	Anthribidae	Choraginae	*Choragus sayi*	4.41E-01
BOLD:ACB0792	Anthribidae	Choraginae	*Euxenus punctatus*	2.74E-01
BOLD:ADI7621	Anthribidae			6.15E-02
BOLD:ADJ2370	Anthribidae			5.49E-02

BOLD:ADJ4567	Anthribidae			3.22E-01
BOLD:ADL8690	Anthribidae			2.19E-01
BOLD:ABX7626	Artematopodidae	Artematopodinae	*Eurypogon harrisii*	8.11E-01
BOLD:AAH0191	Artematopodidae	Artematopodinae	*Macropogon piceus*	2.95E+00
BOLD:AAQ0033	Artematopodidae	Artematopodinae	*Macropogon piceus*	2.98E+00
BOLD:AAY3200	Attelabidae	Rhynchitinae	*Eugnamptus angustatus*	2.30E+00
BOLD:AAI1400	Attelabidae	Rhynchitinae	*Merhynchites bicolor*	8.73E+00
BOLD:AAP7859	Attelabidae	Rhynchitinae	*Merhynchites wickhami*	6.41E+00
BOLD:AAP7860	Attelabidae	Rhynchitinae	*Merhynchites wickhami*	7.97E+00
BOLD:AAQ0035	Attelabidae	Rhynchitinae	*Merhynchites wickhami*	8.62E+00
BOLD:ACG4592	Attelabidae	Rhynchitinae	*Pselaphorhynchites cyanellus*	6.22E-01
BOLD:AAH0433	Bostrichidae	Bostrichinae	*Amphicerus bicaudatus*	1.35E+01
BOLD:ABW9910	Bostrichidae	Bostrichinae	*Lichenophanes bicornis*	1.76E+01
BOLD:AAU7129	Bostrichidae	Bostrichinae	*Xylobiops basilaris*	1.87E+00
BOLD:ACB4329	Bostrichidae	Dinoderinae	*Rhyzopertha dominica*	3.03E-01
BOLD:ADJ0581	Bostrichidae	Lyctinae	*Lyctus opaculus*	7.54E-01
BOLD:AAH0161	Bostrichidae	Polycaoninae	*Polycaon stoutii*	7.98E+01
BOLD:AAG5182	Brachyceridae	Brachycerinae	*Grypus*	6.79E+00
BOLD:AAZ5070	Brachyceridae	Brachycerinae	*Onychylis nigrirostris*	8.12E-01
BOLD:AAM9958	Brachyceridae	Brachycerinae	*Tanysphyrus lemnae*	1.28E-01
BOLD:AAP7059	Brachyceridae	Brachycerinae	*Tournotaris bimaculata*	1.31E+01
BOLD:ABV5339	Brentidae	Apioninae	*Alocentron attenuatum*	2.98E-01
BOLD:ABV4007	Brentidae	Apioninae	*Apion extensum*	3.35E-01
BOLD:AAU7326	Brentidae	Apioninae	*Betulapion simile*	2.74E-01
BOLD:AAP7015	Brentidae	Apioninae	*Eutrichapion cavifrons*	4.15E-01
BOLD:ABX0646	Brentidae	Apioninae	*Fallapion*	3.19E-01
BOLD:AAN6210	Brentidae	Apioninae	*Ischnopterapion virens*	3.54E-01
BOLD:ABW2856	Brentidae	Apioninae	*Ischnopterapion virens*	4.81E-01
BOLD:AAG5247	Brentidae	Apioninae	*Perapion curtirostre*	2.79E-01
BOLD:AAZ3710	Brentidae	Apioninae	*Perapion punctinasum*	2.98E-01
BOLD:AAN9253	Brentidae	Apioninae	*Stenopterapion meliloti*	5.34E-01
BOLD:ACC2680	Brentidae	Apioninae	*Stenopterapion meliloti*	6.03E-01
BOLD:ABX1672	Brentidae	Apioninae	*Trichapion*	5.25E-01
BOLD:AAP7009	Brentidae	Apioninae	*Trichapion centrale*	6.02E-01
BOLD:ABV4427	Brentidae	Apioninae	*Trichapion commodum*	1.11E+00
BOLD:AAZ3525	Brentidae	Apioninae	*Trichapion nigrum*	6.93E-01
BOLD:ABA0247	Brentidae	Apioninae	*Trichapion porcatum*	3.31E-01
BOLD:AAF8687	Brentidae	Brentinae	*Arrhenodes minutus*	1.57E+01
BOLD:ABV5744	Brentidae	Nanophyinae	*Microon canadensis*	1.43E-01
BOLD:AAO4782	Brentidae	Nanophyinae	*Nanophyes marmoratus*	2.56E-01
BOLD:ADI6792	Brentidae			3.12E-01
BOLD:AAD6459	Buprestidae	Agrilinae	*Agrilus bilineatus*	8.91E+00
BOLD:AAM7748	Buprestidae	Agrilinae	*Agrilus celti*	1.07E+00
BOLD:AAM7611	Buprestidae	Agrilinae	*Agrilus cephalicus*	1.73E+00
BOLD:ACK2288	Buprestidae	Agrilinae	*Agrilus criddlei*	2.45E+00
BOLD:AAF7292	Buprestidae	Agrilinae	*Agrilus cuprescens*	2.21E+00
BOLD:AAF7300	Buprestidae	Agrilinae	*Agrilus cyanescens*	2.66E+00
BOLD:ACA2976	Buprestidae	Agrilinae	*Agrilus fallax*	2.15E+00
BOLD:AAC7478	Buprestidae	Agrilinae	*Agrilus granulatus*	1.05E+01

BOLD:AAJ1540	Buprestidae	Agrilinae	*Agrilus lecontei*	2.05E+00
BOLD:AAU7325	Buprestidae	Agrilinae	*Agrilus masculinus*	2.24E+00
BOLD:ACA4489	Buprestidae	Agrilinae	*Agrilus pensus*	4.95E+00
BOLD:ACK2378	Buprestidae	Agrilinae	*Agrilus pensus*	3.67E+00
BOLD:AAE6821	Buprestidae	Agrilinae	*Agrilus planipennis*	1.56E+01
BOLD:AAE6828	Buprestidae	Agrilinae	*Agrilus politus*	1.83E+00
BOLD:ACA2912	Buprestidae	Agrilinae	*Agrilus putillus*	6.71E-01
BOLD:ACA2920	Buprestidae	Agrilinae	*Agrilus subcinctus*	7.53E-01
BOLD:AAD4506	Buprestidae	Agrilinae	*Agrilus vittaticollis*	1.30E+01
BOLD:AAG3483	Buprestidae	Agrilinae	*Brachys ovatus*	5.68E+00
BOLD:AAM7621	Buprestidae	Agrilinae	*Taphrocerus gracilis*	7.08E-01
BOLD:AAG3480	Buprestidae	Buprestinae	*Anthaxia inornata*	3.78E+00
BOLD:ACA2064	Buprestidae	Buprestinae	*Buprestis aurulenta*	7.05E+01
BOLD:ACL4321	Buprestidae	Buprestinae	*Buprestis laeviventris*	8.47E+01
BOLD:AAE8565	Buprestidae	Buprestinae	*Buprestis maculativentris*	5.31E+01
BOLD:AAG3504	Buprestidae	Buprestinae	*Buprestis nutalli*	1.15E+02
BOLD:AAG3482	Buprestidae	Buprestinae	*Buprestis striata*	6.70E+01
BOLD:ACA2253	Buprestidae	Buprestinae	*Chrysobothris adelpha*	3.08E+01
BOLD:ABX0918	Buprestidae	Buprestinae	*Chrysobothris cribraria*	2.73E+01
BOLD:AAE2094	Buprestidae	Buprestinae	*Chrysobothris femorata*	2.56E+01
BOLD:ACA6042	Buprestidae	Buprestinae	*Chrysobothris rugosiceps*	1.89E+01
BOLD:AAF2731	Buprestidae	Buprestinae	*Chrysobothris sexsignata*	9.34E+00
BOLD:AAG3475	Buprestidae	Buprestinae	*Phaenops drummondi*	7.00E+00
BOLD:AAE9027	Buprestidae	Buprestinae	*Phaenops fulvoguttata*	9.33E+00
BOLD:AAE9033	Buprestidae	Buprestinae	*Phaenops fulvoguttata*	1.16E+01
BOLD:AAG3481	Buprestidae	Buprestinae	*Spectralia gracilipes*	1.96E+01
BOLD:AAC3543	Buprestidae	Chrysochroinae	*Dicerca*	9.45E+01
BOLD:AAF5689	Buprestidae	Chrysochroinae	*Dicerca lurida*	7.21E+01
BOLD:AAE7502	Buprestidae	Chrysochroinae	*Dicerca tuberculata*	6.78E+01
BOLD:AAE7372	Buprestidae	Chrysochroinae	*Poecilonota cyanipes*	4.73E+01
BOLD:AAG3479	Buprestidae	Polycestinae	*Acmaeodera*	1.19E+01
BOLD:AAG3478	Buprestidae	Polycestinae	*Acmaeodera pulchella*	5.50E+00
BOLD:ACG6546	Byrrhidae	Byrrhinae	*Arctobyrrhus subcanus*	2.48E+00
BOLD:AAQ0066	Byrrhidae	Byrrhinae	*Byrrhus eximius*	9.45E+00
BOLD:AAG1804	Byrrhidae	Byrrhinae	*Byrrhus kirbyi*	1.51E+01
BOLD:ACG4339	Byrrhidae	Byrrhinae	*Cytilus auricomus*	7.40E+00
BOLD:AAN5899	Byrrhidae	Byrrhinae	*Porcinolus undatus*	1.58E+00
BOLD:AAG1805	Byrrhidae	Byrrhinae	*Simplocaria*	8.06E-01
BOLD:ABW1696	Byrrhidae	Byrrhinae	*Simplocaria semistriata*	8.15E-01
BOLD:ACJ7719	Byrrhidae	Syncalyptinae	*Curimopsis echinata*	6.94E-01
BOLD:ACW4567	Byrrhidae			3.62E+00
BOLD:AAP7064	Byturidae	Byturinae	*Byturus unicolor*	4.60E-01
BOLD:AAH0915	Cantharidae	Cantharinae	*Atalantycha bilineata*	2.98E+00
BOLD:ACX7753	Cantharidae	Cantharinae	*Atalantycha dentigera*	5.62E+00
BOLD:AAH7311	Cantharidae	Cantharinae	*Atalantycha neglecta*	1.06E+01
BOLD:AAH7310	Cantharidae	Cantharinae	*Atalantycha neglecta*	6.92E+00
BOLD:AAH0152	Cantharidae	Cantharinae	*Cantharis rufa*	1.34E+01
BOLD:AAH0921	Cantharidae	Cantharinae	*Cantharis tuberculata*	1.50E+00
BOLD:AAH7080	Cantharidae	Cantharinae	*Dichelotarsus*	2.58E+00

BOLD:AAP7785	Cantharidae	Cantharinae	*Dichelotarsus cavicollis*	1.25E+00
BOLD:AAP7791	Cantharidae	Cantharinae	*Dichelotarsus cavicollis*	1.47E+00
BOLD:AAH0914	Cantharidae	Cantharinae	*Dichelotarsus deceptus*	1.42E+00
BOLD:AAH0929	Cantharidae	Cantharinae	*Dichelotarsus excursus*	6.78E+00
BOLD:ACB2222	Cantharidae	Cantharinae	*Dichelotarsus extremus*	1.76E+00
BOLD:AAH0913	Cantharidae	Cantharinae	*Dichelotarsus heteronychus*	1.24E+00
BOLD:AAH0248	Cantharidae	Cantharinae	*Dichelotarsus laevicollis*	2.10E+00
BOLD:AAH7079	Cantharidae	Cantharinae	*Dichelotarsus laevicollis*	1.04E+00
BOLD:ABX5103	Cantharidae	Cantharinae	*Dichelotarsus laevicollis*	2.43E+00
BOLD:ACM2123	Cantharidae	Cantharinae	*Dichelotarsus limbellus*	3.42E+00
BOLD:ACD1281	Cantharidae	Cantharinae	*Dichelotarsus lygarius*	2.20E+00
BOLD:AAH0918	Cantharidae	Cantharinae	*Dichelotarsus nr. fumiganus*	6.30E+00
BOLD:AAH0927	Cantharidae	Cantharinae	*Dichelotarsus obscurevittatus*	2.06E+00
BOLD:AAH0933	Cantharidae	Cantharinae	*Dichelotarsus piniphilus*	1.28E+00
BOLD:AAP7080	Cantharidae	Cantharinae	*Dichelotarsus piniphilus*	1.71E+00
BOLD:AAH0465	Cantharidae	Cantharinae	*Dichelotarsus puberulus*	2.73E+00
BOLD:AAH0925	Cantharidae	Cantharinae	*Dichelotarsus puncticollis*	4.50E+00
BOLD:AAQ0045	Cantharidae	Cantharinae	*Dichelotarsus tetragonoderus*	9.23E+00
BOLD:ACB2253	Cantharidae	Cantharinae	*Pacificanthia curtisi*	1.02E+01
BOLD:AAH0934	Cantharidae	Cantharinae	*Pacificanthia rotundicollis*	1.20E+01
BOLD:AAH0919	Cantharidae	Cantharinae	*Podabrus*	5.79E+00
BOLD:ACB3691	Cantharidae	Cantharinae	*Podabrus brevicollis*	8.96E+00
BOLD:AAH0922	Cantharidae	Cantharinae	*Podabrus diadema*	5.98E+00
BOLD:AAH0930	Cantharidae	Cantharinae	*Podabrus falli*	8.85E+00
BOLD:AAH0138	Cantharidae	Cantharinae	*Podabrus flavicollis*	8.00E+00
BOLD:AAH0318	Cantharidae	Cantharinae	*Podabrus intrusus*	7.75E+00
BOLD:ACD1483	Cantharidae	Cantharinae	*Podabrus lapponicus*	3.50E+00
BOLD:AAH0148	Cantharidae	Cantharinae	*Podabrus modestus*	1.22E+01
BOLD:AAH0928	Cantharidae	Cantharinae	*Podabrus pruinosus*	1.48E+01
BOLD:AAQ0044	Cantharidae	Cantharinae	*Podabrus pruinosus*	1.23E+01
BOLD:ABX5183	Cantharidae	Cantharinae	*Podabrus rugosulus*	4.43E+00
BOLD:AAH0304	Cantharidae	Cantharinae	*Podabrus tomentosus*	8.32E+00
BOLD:ACI5613	Cantharidae	Cantharinae	*Podabrus tricostatus*	1.84E+01
BOLD:AAH0321	Cantharidae	Cantharinae	*Rhagonycha excavata*	9.15E-01
BOLD:AAH0926	Cantharidae	Cantharinae	*Rhagonycha fraxini*	1.59E+00
BOLD:AAL1297	Cantharidae	Cantharinae	*Rhagonycha fulva*	5.80E+00
BOLD:AAH0187	Cantharidae	Cantharinae	*Rhagonycha hirticula*	1.21E+00
BOLD:AAU7319	Cantharidae	Cantharinae	*Rhagonycha imbecillis*	8.54E-01
BOLD:AAH0320	Cantharidae	Cantharinae	*Rhagonycha lineola*	1.89E+00
BOLD:AAH0912	Cantharidae	Cantharinae	*Rhagonycha mandibularis*	1.28E+00
BOLD:AAD5623	Cantharidae	Cantharinae	*Rhagonycha mollis*	8.08E-01
BOLD:AAH0935	Cantharidae	Cantharinae	*Rhagonycha nanula*	3.93E-01
BOLD:AAN6106	Cantharidae	Cantharinae	*Rhagonycha oriflava*	1.53E+00
BOLD:ABY1306	Cantharidae	Cantharinae	*Rhagonycha parvicollis*	4.68E-01
BOLD:AAH0920	Cantharidae	Cantharinae	*Rhagonycha recta*	9.79E-01
BOLD:ADG4808	Cantharidae	Cantharinae	*Rhagonycha septentrionis*	1.27E+00
BOLD:ACB2194	Cantharidae	Cantharinae	*Rhagonycha sylvatica*	6.30E-01
BOLD:AAH0917	Cantharidae	Cantharinae	*Rhaxonycha bilobata*	1.08E+01
BOLD:ACU3483	Cantharidae	Cantharinae	*Rhaxonycha carolina*	9.40E+00

BOLD:AAH0916	Cantharidae	Chauliognathinae	*Chauliognathus pensylvanicus*	8.88E+00
BOLD:ACA6651	Cantharidae	Malthininae	*Malthodes*	1.37E-01
BOLD:ACF9615	Cantharidae	Malthininae	*Malthodes*	6.04E-02
BOLD:AAP7784	Cantharidae	Malthininae	*Malthodes acuticauda*	2.62E-01
BOLD:AAL8070	Cantharidae	Malthininae	*Malthodes canadensis*	3.08E-01
BOLD:AAP7858	Cantharidae	Malthininae	*Malthodes canadensis*	1.99E-01
BOLD:ACA6654	Cantharidae	Malthininae	*Malthodes columbiensis*	2.22E-01
BOLD:ACC7426	Cantharidae	Malthininae	*Malthodes fragilis*	1.24E-01
BOLD:ABX8613	Cantharidae	Malthininae	*Malthodes fuliginosus*	2.83E-01
BOLD:ACL8343	Cantharidae	Malthininae	*Malthodes fuliginosus*	2.83E-01
BOLD:ACC6577	Cantharidae	Malthininae	*Malthodes intricatus*	2.27E-01
BOLD:ACA6655	Cantharidae	Malthininae	*Malthodes niger*	2.08E-01
BOLD:ACC2945	Cantharidae	Malthininae	*Malthodes oregonus*	7.62E-02
BOLD:ACM1969	Cantharidae	Malthininae	*Malthodes parvulus*	4.05E-02
BOLD:AAP7843	Cantharidae	Malthininae	*Malthodes pumilus*	1.41E-02
BOLD:AAH0472	Cantharidae	Malthininae	*Malthodes similis*	3.07E-01
BOLD:AAP7094	Cantharidae	Malthininae	*Malthodes stacesmithi*	1.60E-01
BOLD:ACT6113	Cantharidae	Malthininae	*Malthodes stacesmithi*	2.03E-01
BOLD:ACU5505	Cantharidae	Silinae	*Polemius canadensis*	1.63E+00
BOLD:AAM7749	Cantharidae	Silinae	*Polemius laticornis*	3.47E+00
BOLD:AAH0924	Cantharidae	Silinae	*Silis difficilis*	1.51E+00
BOLD:AAP7800	Cantharidae	Silinae	*Silis lutea*	1.17E+00
BOLD:AAY6535	Cantharidae	Silinae	*Silis percomis*	1.81E+00
BOLD:ACA6492	Cantharidae	Silinae	*Silis percomis*	9.10E-01
BOLD:ADH2754	Cantharidae	Silinae	*Silis percomis*	1.29E+00
BOLD:ADI6476	Cantharidae			2.62E+00
BOLD:ADI7150	Cantharidae			1.02E-01
BOLD:AAZ0126	Carabidae	Brachininae	*Brachinus cyanipennis*	1.26E+01
BOLD:AAZ0127	Carabidae	Brachininae	*Brachinus cyanochroaticus*	1.32E+01
BOLD:AAY9343	Carabidae	Broscinae	*Zacotus matthewsii*	6.86E+01
BOLD:AAK1720	Carabidae	Carabinae	*Calosoma frigidum*	1.31E+02
BOLD:AAH2759	Carabidae	Carabinae	*Calosoma scrutator*	3.15E+02
BOLD:AAW7990	Carabidae	Carabinae	*Calosoma wilcoxi*	9.13E+01
BOLD:AAC0942	Carabidae	Carabinae	*Carabus chamissonis*	5.37E+01
BOLD:AAH2755	Carabidae	Carabinae	*Carabus granulatus*	1.20E+02
BOLD:AAC6348	Carabidae	Carabinae	*Carabus maeander maeander*	6.49E+01
BOLD:AAH2826	Carabidae	Carabinae	*Carabus nemoralis*	1.94E+02
BOLD:AAY8099	Carabidae	Carabinae	*Carabus sylvosus*	1.44E+02
BOLD:AAA1254	Carabidae	Carabinae	*Carabus taedatus*	1.44E+02
BOLD:AAI9511	Carabidae	Carabinae	*Cychrus tuberculatus*	1.84E+02
BOLD:AAY5623	Carabidae	Carabinae	*Scaphinotus*	1.07E+02
BOLD:AAY7541	Carabidae	Carabinae	*Scaphinotus angulatus*	5.43E+01
BOLD:AAI0665	Carabidae	Carabinae	*Scaphinotus angusticollis*	6.97E+01
BOLD:AAP7848	Carabidae	Carabinae	*Scaphinotus marginatus*	3.22E+01
BOLD:AAO3882	Carabidae	Carabinae	*Sphaeroderus canadensis*	2.49E+01
BOLD:AAH2828	Carabidae	Carabinae	*Sphaeroderus nitidicollis*	3.00E+01
BOLD:AAI0146	Carabidae	Carabinae	*Sphaeroderus stenostomus*	4.23E+01
BOLD:AAQ0092	Carabidae	Cicindelinae	*Cicindela*	3.53E+01
BOLD:AAC2412	Carabidae	Cicindelinae	*Cicindela duodecimguttata*	2.84E+01

BOLD:AAC0156	Carabidae	Cicindelinae	*Cicindela hirticollis*	3.01E+01
BOLD:AAQ0091	Carabidae	Cicindelinae	*Cicindela limbalis*	4.65E+01
BOLD:AAC0162	Carabidae	Cicindelinae	*Cicindela nebraskana*	4.93E+01
BOLD:AAD4676	Carabidae	Cicindelinae	*Cicindela punctulata*	1.74E+01
BOLD:ACZ1748	Carabidae	Cicindelinae	*Cicindela punctulata*	1.50E+01
BOLD:AAE2697	Carabidae	Cicindelinae	*Cicindela purpurea*	4.21E+01
BOLD:AAD4677	Carabidae	Cicindelinae	*Cicindela repanda*	2.68E+01
BOLD:AAB3401	Carabidae	Cicindelinae	*Cicindela sexguttata*	2.62E+01
BOLD:ACY9749	Carabidae	Cicindelinae	*Cylindera terricola*	1.74E+01
BOLD:ACL4794	Carabidae	Cicindelinae	*Omus dejeanii*	1.40E+02
BOLD:AAZ0964	Carabidae	Elaphrinae	*Blethisa quadricollis*	5.17E+01
BOLD:AAM6032	Carabidae	Elaphrinae	*Diacheila arctica*	3.82E+00
BOLD:AAN5414	Carabidae	Elaphrinae	*Diacheila polita*	6.27E+00
BOLD:AAB8479	Carabidae	Elaphrinae	*Elaphrus*	7.41E+00
BOLD:AAI6148	Carabidae	Elaphrinae	*Elaphrus clairvillei*	8.10E+00
BOLD:AAD0385	Carabidae	Elaphrinae	*Elaphrus lapponicus*	9.79E+00
BOLD:AAQ0093	Carabidae	Elaphrinae	*Elaphrus lecontei*	1.14E+01
BOLD:AAZ1247	Carabidae	Elaphrinae	*Elaphrus olivaceus*	4.98E+00
BOLD:ACJ1709	Carabidae	Harpalinae	*Acupalpus carus*	3.07E-01
BOLD:AAV9904	Carabidae	Harpalinae	*Acupalpus indistinctus*	6.99E-01
BOLD:ACN5724	Carabidae	Harpalinae	*Acupalpus nanellus*	2.08E-01
BOLD:AAM7659	Carabidae	Harpalinae	*Acupalpus pauperculus*	4.20E-01
BOLD:AAU7165	Carabidae	Harpalinae	*Acupalpus pumilus*	1.56E-01
BOLD:AAE9008	Carabidae	Harpalinae	*Agonoleptus conjunctus*	8.51E-01
BOLD:AAC7304	Carabidae	Harpalinae	*Agonum*	7.91E+00
BOLD:AAH2803	Carabidae	Harpalinae	*Agonum*	2.29E+00
BOLD:AAP8587	Carabidae	Harpalinae	*Agonum*	2.08E+00
BOLD:AAH2768	Carabidae	Harpalinae	*Agonum aeruginosum*	2.51E+00
BOLD:AAJ6739	Carabidae	Harpalinae	*Agonum affine*	8.30E+00
BOLD:AAQ0063	Carabidae	Harpalinae	*Agonum consimile*	2.41E+00
BOLD:AAZ2477	Carabidae	Harpalinae	*Agonum crenistriatum*	5.83E+00
BOLD:AAC7290	Carabidae	Harpalinae	*Agonum cupreum*	1.31E+01
BOLD:AAH2758	Carabidae	Harpalinae	*Agonum decorum*	7.49E+00
BOLD:AAY5528	Carabidae	Harpalinae	*Agonum extensicolle*	7.14E+00
BOLD:AAP7861	Carabidae	Harpalinae	*Agonum ferruginosum*	1.38E+00
BOLD:AAF9269	Carabidae	Harpalinae	*Agonum gratiosum*	4.60E+00
BOLD:AAH0143	Carabidae	Harpalinae	*Agonum moerens*	8.96E+00
BOLD:AAH2774	Carabidae	Harpalinae	*Agonum muelleri*	1.18E+01
BOLD:AAT9880	Carabidae	Harpalinae	*Agonum mutatum*	1.08E+01
BOLD:AAY6641	Carabidae	Harpalinae	*Agonum nigriceps*	1.86E+00
BOLD:AAZ1942	Carabidae	Harpalinae	*Agonum palustre*	3.29E+00
BOLD:AAZ2480	Carabidae	Harpalinae	*Agonum piceolum*	3.54E+00
BOLD:AAH8527	Carabidae	Harpalinae	*Agonum propinquum*	2.99E+00
BOLD:AAH2831	Carabidae	Harpalinae	*Agonum retractum*	4.36E+00
BOLD:AAH2765	Carabidae	Harpalinae	*Agonum thoreyi*	4.84E+00
BOLD:AAH0099	Carabidae	Harpalinae	*Agonum trigeminum*	1.20E+01
BOLD:AAO3880	Carabidae	Harpalinae	*Amara*	9.53E+00
BOLD:AAC4902	Carabidae	Harpalinae	*Amara aenea*	9.17E+00
BOLD:AAH2780	Carabidae	Harpalinae	*Amara apricaria*	1.10E+01

BOLD:AAP8857	Carabidae	Harpalinae	*Amara aulica*	3.78E+01
BOLD:AAB7975	Carabidae	Harpalinae	*Amara carinata*	1.82E+01
BOLD:AAY7578	Carabidae	Harpalinae	*Amara conflata*	1.37E+01
BOLD:AAI4535	Carabidae	Harpalinae	*Amara confusa*	1.03E+01
BOLD:AAR3700	Carabidae	Harpalinae	*Amara glacialis*	9.31E+00
BOLD:AAF3610	Carabidae	Harpalinae	*Amara hyperborea*	1.89E+01
BOLD:AAQ0060	Carabidae	Harpalinae	*Amara lacustris*	2.32E+01
BOLD:AAH0443	Carabidae	Harpalinae	*Amara latior*	1.84E+01
BOLD:ACT4273	Carabidae	Harpalinae	*Amara lindrothi*	6.80E+00
BOLD:AAC6859	Carabidae	Harpalinae	*Amara littoralis*	1.74E+01
BOLD:AAC6413	Carabidae	Harpalinae	*Amara obesa*	2.26E+01
BOLD:AAJ5377	Carabidae	Harpalinae	*Amara ovata*	1.42E+01
BOLD:AAB2273	Carabidae	Harpalinae	*Amara quenseli quenseli*	7.76E+00
BOLD:AAY7566	Carabidae	Harpalinae	*Amara rubrica*	6.01E+00
BOLD:AAC4903	Carabidae	Harpalinae	*Amara sinuosa*	8.59E+00
BOLD:AAC6361	Carabidae	Harpalinae	*Amara tenax*	7.95E+00
BOLD:AAH2757	Carabidae	Harpalinae	*Amphasia sericea*	1.57E+01
BOLD:AAH0145	Carabidae	Harpalinae	*Anisodactylus*	2.45E+01
BOLD:AAR3472	Carabidae	Harpalinae	*Anisodactylus agricola*	5.60E+01
BOLD:AAJ2627	Carabidae	Harpalinae	*Anisodactylus binotatus*	2.84E+01
BOLD:AAQ0059	Carabidae	Harpalinae	*Anisodactylus nigrita*	1.33E+01
BOLD:AAH0087	Carabidae	Harpalinae	*Anisodactylus rusticus*	1.14E+01
BOLD:AAM7615	Carabidae	Harpalinae	*Axinopalpus biplagiatus*	2.65E-01
BOLD:AAE3092	Carabidae	Harpalinae	*Bradycellus*	6.63E-01
BOLD:ADJ2804	Carabidae	Harpalinae	*Bradycellus kirbyi*	2.99E+00
BOLD:ACA9920	Carabidae	Harpalinae	*Bradycellus lecontei*	1.31E+00
BOLD:AAZ1528	Carabidae	Harpalinae	*Bradycellus nigrinus*	1.96E+00
BOLD:AAW8321	Carabidae	Harpalinae	*Calathus advena*	9.28E+00
BOLD:AAO4635	Carabidae	Harpalinae	*Calathus fuscipes*	1.94E+01
BOLD:ADI5357	Carabidae	Harpalinae	*Calathus gregarius*	7.57E+00
BOLD:AAC4547	Carabidae	Harpalinae	*Calathus ingratus*	8.61E+00
BOLD:AAD5465	Carabidae	Harpalinae	*Calleida viridis*	8.37E+00
BOLD:AAJ0149	Carabidae	Harpalinae	*Chlaenius emarginatus*	5.11E+01
BOLD:AAY9984	Carabidae	Harpalinae	*Chlaenius impunctifrons*	3.75E+01
BOLD:AAQ2465	Carabidae	Harpalinae	*Chlaenius nebraskensis*	2.96E+01
BOLD:AAH0213	Carabidae	Harpalinae	*Chlaenius niger*	2.64E+01
BOLD:AAI4267	Carabidae	Harpalinae	*Chlaenius pennsylvanicus pennsylvanicus*	2.83E+01
BOLD:AAH2764	Carabidae	Harpalinae	*Chlaenius sericeus sericeus*	6.36E+01
BOLD:AAH0357	Carabidae	Harpalinae	*Chlaenius tricolor*	2.28E+01
BOLD:ADJ2522	Carabidae	Harpalinae	*Cymindis*	8.34E+00
BOLD:ACM6793	Carabidae	Harpalinae	*Cymindis americana*	1.17E+01
BOLD:AAF7755	Carabidae	Harpalinae	*Cymindis cribricollis*	1.52E+01
BOLD:AAH0342	Carabidae	Harpalinae	*Cymindis limbata*	5.88E+00
BOLD:AAO3881	Carabidae	Harpalinae	*Cymindis neglecta*	3.48E+00
BOLD:ACF5707	Carabidae	Harpalinae	*Cymindis planipennis*	1.85E+01
BOLD:AAZ1504	Carabidae	Harpalinae	*Cymindis platicollis*	1.32E+01
BOLD:ADH3834	Carabidae	Harpalinae	*Cymindis platicollis*	7.14E+00
BOLD:AAE7896	Carabidae	Harpalinae	*Cymindis unicolor*	8.13E+00

BOLD:AAV5222	Carabidae	Harpalinae	*Dicheirotrichus cognatus*	9.42E-01
BOLD:AAH2807	Carabidae	Harpalinae	*Dromius piceus*	2.48E+00
BOLD:AAH2760	Carabidae	Harpalinae	*Galerita janus*	5.75E+01
BOLD:AAM7674	Carabidae	Harpalinae	*Gastrellarius honestus*	9.93E+00
BOLD:AAK5199	Carabidae	Harpalinae	*Harpalus*	1.46E+01
BOLD:AAH2775	Carabidae	Harpalinae	*Harpalus affinis*	1.74E+01
BOLD:ACF1198	Carabidae	Harpalinae	*Harpalus caliginosus*	1.19E+01
BOLD:AAV6870	Carabidae	Harpalinae	*Harpalus compar*	3.06E+01
BOLD:AAC1928	Carabidae	Harpalinae	*Harpalus herbivagus*	1.12E+01
BOLD:AAQ0058	Carabidae	Harpalinae	*Harpalus laevipes*	2.21E+01
BOLD:AAF1757	Carabidae	Harpalinae	*Harpalus nigritarsis*	1.08E+01
BOLD:AAC3054	Carabidae	Harpalinae	*Harpalus pensylvanicus*	4.60E+01
BOLD:AAI2023	Carabidae	Harpalinae	*Harpalus reversus*	3.91E+01
BOLD:AAI2024	Carabidae	Harpalinae	*Harpalus rubripes*	1.57E+01
BOLD:AAE5160	Carabidae	Harpalinae	*Harpalus rufipes*	5.05E+01
BOLD:ACF0418	Carabidae	Harpalinae	*Harpalus somnulentus*	1.17E+01
BOLD:AAH2811	Carabidae	Harpalinae	*Harpalus ventralis*	9.84E+00
BOLD:AAY9896	Carabidae	Harpalinae	*Lachnocrepis parallela*	1.24E+01
BOLD:AAY7736	Carabidae	Harpalinae	*Laemostenus complanatus*	1.32E+00
BOLD:AAH0212	Carabidae	Harpalinae	*Lebia*	5.52E+00
BOLD:AAX0112	Carabidae	Harpalinae	*Lebia analis*	2.61E+00
BOLD:AAH2796	Carabidae	Harpalinae	*Lebia atriceps*	3.99E+00
BOLD:AAE5031	Carabidae	Harpalinae	*Lebia grandis*	1.04E+01
BOLD:ABA6349	Carabidae	Harpalinae	*Lebia ornata*	7.33E-01
BOLD:AAH2832	Carabidae	Harpalinae	*Lebia pumila*	2.04E-01
BOLD:AAH2769	Carabidae	Harpalinae	*Lebia solea*	2.52E+00
BOLD:ABA6369	Carabidae	Harpalinae	*Lebia tricolor*	7.29E+00
BOLD:AAX0100	Carabidae	Harpalinae	*Lebia viridipennis*	2.03E+00
BOLD:AAH0141	Carabidae	Harpalinae	*Lebia viridis*	2.47E+00
BOLD:AAP7012	Carabidae	Harpalinae	*Lebia vittata*	2.01E+00
BOLD:AAH0385	Carabidae	Harpalinae	*Leptotrachelus dorsalis*	2.95E+00
BOLD:AAY5099	Carabidae	Harpalinae	*Myas cyanescens*	4.98E+01
BOLD:AAH2766	Carabidae	Harpalinae	*Notiobia terminata*	9.34E+00
BOLD:AAH2752	Carabidae	Harpalinae	*Notiobia terminata*	1.16E+01
BOLD:ACM3766	Carabidae	Harpalinae	*Olisthopus parmatus*	3.80E+00
BOLD:AAX0467	Carabidae	Harpalinae	*Oodes fluvialis*	3.32E+01
BOLD:AAP8666	Carabidae	Harpalinae	*Ophonus puncticeps*	3.33E+00
BOLD:AAO0719	Carabidae	Harpalinae	*Perigona nigriceps*	1.45E-01
BOLD:AAZ0909	Carabidae	Harpalinae	*Philodes rectangulus*	2.63E-01
BOLD:AAO4818	Carabidae	Harpalinae	*Philorhizus melanocephalus*	2.17E-01
BOLD:AAY5403	Carabidae	Harpalinae	*Piosoma setosum*	1.33E+01
BOLD:AAI2719	Carabidae	Harpalinae	*Platynus cincticollis*	1.11E+01
BOLD:AAH2778	Carabidae	Harpalinae	*Platynus decentis*	3.12E+01
BOLD:AAY4533	Carabidae	Harpalinae	*Platynus hypolithos*	2.29E+01
BOLD:AAF0989	Carabidae	Harpalinae	*Platynus mannerheimii*	2.06E+01
BOLD:ADG9848	Carabidae	Harpalinae	*Platynus opaculus*	1.35E+01
BOLD:AAC6682	Carabidae	Harpalinae	*Poecilus*	2.59E+01
BOLD:AAC3361	Carabidae	Harpalinae	*Poecilus lucublandus*	2.86E+01
BOLD:AAH2785	Carabidae	Harpalinae	*Pterostichus adoxus*	1.50E+01

BOLD:AAH1018	Carabidae	Harpalinae	*Pterostichus adstrictus*	1.99E+01
BOLD:AAQ0070	Carabidae	Harpalinae	*Pterostichus algidus*	2.48E+01
BOLD:AAQ0056	Carabidae	Harpalinae	*Pterostichus amethystinus*	2.64E+01
BOLD:AAN5416	Carabidae	Harpalinae	*Pterostichus barryorum*	4.17E+00
BOLD:AAY5605	Carabidae	Harpalinae	*Pterostichus commutabilis*	1.05E+01
BOLD:AAG3640	Carabidae	Harpalinae	*Pterostichus coracinus*	5.76E+01
BOLD:AAY5601	Carabidae	Harpalinae	*Pterostichus corvinus*	3.92E+01
BOLD:AAQ0055	Carabidae	Harpalinae	*Pterostichus crenicollis*	1.06E+02
BOLD:AAY8415	Carabidae	Harpalinae	*Pterostichus ecarinatus*	2.11E+01
BOLD:AAC0671	Carabidae	Harpalinae	*Pterostichus empetricola*	3.14E+00
BOLD:AAY8414	Carabidae	Harpalinae	*Pterostichus herculaneus*	4.66E+01
BOLD:AAY7527	Carabidae	Harpalinae	*Pterostichus lama*	1.53E+02
BOLD:ACE5143	Carabidae	Harpalinae	*Pterostichus luctuosus*	1.07E+01
BOLD:AAC0661	Carabidae	Harpalinae	*Pterostichus melanarius*	5.33E+01
BOLD:AAD9157	Carabidae	Harpalinae	*Pterostichus mutus*	2.17E+01
BOLD:ABZ0193	Carabidae	Harpalinae	*Pterostichus neobrunneus*	3.00E+01
BOLD:ABY1969	Carabidae	Harpalinae	*Pterostichus patruelis*	2.91E+00
BOLD:AAD9158	Carabidae	Harpalinae	*Pterostichus pensylvanicus*	2.77E+01
BOLD:ACF1103	Carabidae	Harpalinae	*Pterostichus protractus*	3.93E+01
BOLD:AAY7519	Carabidae	Harpalinae	*Pterostichus pumilus pumilus*	1.31E+01
BOLD:AAB2547	Carabidae	Harpalinae	*Pterostichus punctatissimus*	6.13E+01
BOLD:AAP7087	Carabidae	Harpalinae	*Pterostichus riparius*	8.78E+00
BOLD:AAY8422	Carabidae	Harpalinae	*Pterostichus sphodrinus*	1.48E+01
BOLD:AAX7608	Carabidae	Harpalinae	*Pterostichus stygicus*	4.45E+01
BOLD:AAH2771	Carabidae	Harpalinae	*Pterostichus tenuis*	1.17E+01
BOLD:AAN6180	Carabidae	Harpalinae	*Pterostichus tristis*	3.73E+01
BOLD:AAH2761	Carabidae	Harpalinae	*Selenophorus opalinus*	1.26E+01
BOLD:AAH2827	Carabidae	Harpalinae	*Sericoda obsoleta*	3.09E+00
BOLD:AAH2829	Carabidae	Harpalinae	*Sericoda quadripunctata*	1.15E+00
BOLD:AAE9009	Carabidae	Harpalinae	*Stenolophus*	3.77E+00
BOLD:AAV8867	Carabidae	Harpalinae	*Stenolophus fuliginosus*	3.03E+00
BOLD:ABZ1162	Carabidae	Harpalinae	*Stenolophus lecontei*	3.59E+00
BOLD:AAH0149	Carabidae	Harpalinae	*Stenolophus lineola*	1.24E+01
BOLD:AAH0147	Carabidae	Harpalinae	*Stenolophus ochropezus*	4.56E+00
BOLD:AAB2541	Carabidae	Harpalinae	*Stereocerus haematopus*	1.60E+01
BOLD:AAD7624	Carabidae	Harpalinae	*Syntomus americanus*	2.36E-01
BOLD:AAC1927	Carabidae	Harpalinae	*Synuchus impunctatus*	7.60E+00
BOLD:AAH2806	Carabidae	Harpalinae	*Trichotichnus autumnalis*	6.68E+00
BOLD:AAW8151	Carabidae	Harpalinae	*Trichotichnus vulpeculus*	1.15E+01
BOLD:AAG4434	Carabidae	Licininae	*Badister*	3.42E+00
BOLD:ADI1150	Carabidae	Licininae	*Badister notatus*	7.75E-01
BOLD:ACL6252	Carabidae	Licininae	*Dicaelus politus*	2.98E+01
BOLD:AAX9545	Carabidae	Licininae	*Diplocheila major*	9.80E+01
BOLD:AAX9544	Carabidae	Licininae	*Diplocheila obtusa*	1.78E+01
BOLD:AAX9540	Carabidae	Licininae	*Diplocheila striatopunctata*	4.87E+01
BOLD:AAG3657	Carabidae	Loricerinae	*Loricera pilicornis*	2.48E+00
BOLD:ACJ6746	Carabidae	Loricerinae	*Loricera pilicornis*	4.72E+00
BOLD:AAQ0069	Carabidae	Nebriinae	*Nebria arkansana*	1.08E+01
BOLD:AAQ0061	Carabidae	Nebriinae	*Nebria crassicornis*	1.97E+01

BOLD:AAQ0064	Carabidae	Nebriinae	*Nebria diversa*	2.40E+01
BOLD:AAY9988	Carabidae	Nebriinae	*Nebria gebleri*	1.52E+01
BOLD:ACG1726	Carabidae	Nebriinae	*Nebria gyllenhali*	1.45E+01
BOLD:AAQ0057	Carabidae	Nebriinae	*Nebria mannerheimii*	1.76E+01
BOLD:ACE7564	Carabidae	Nebriinae	*Nebria obliqua*	1.76E+01
BOLD:AAQ0052	Carabidae	Nebriinae	*Nebria schwarzi*	2.76E+01
BOLD:AAX5555	Carabidae	Nebriinae	*Notiophilus aeneus*	2.03E+00
BOLD:AAC8539	Carabidae	Nebriinae	*Notiophilus aquaticus*	1.44E+00
BOLD:AAF2717	Carabidae	Nebriinae	*Notiophilus borealis*	3.74E+00
BOLD:AAP4110	Carabidae	Nebriinae	*Notiophilus directus*	1.94E+00
BOLD:ACY7945	Carabidae	Nebriinae	*Notiophilus directus*	2.15E+00
BOLD:ABY7676	Carabidae	Nebriinae	*Notiophilus sylvaticus*	2.17E+00
BOLD:AAY9497	Carabidae	Patrobinae	*Patrobus cinctus*	7.39E+00
BOLD:ACL2975	Carabidae	Patrobinae	*Patrobus fossifrons*	4.82E+00
BOLD:AAY8834	Carabidae	Patrobinae	*Patrobus longicornis*	3.44E+01
BOLD:AAI4217	Carabidae	Patrobinae	*Patrobus stygicus*	1.19E+01
BOLD:AAH2779	Carabidae	Patrobinae	*Platypatrobus lacustris*	1.38E+01
BOLD:AAM6031	Carabidae	Patrobinae		5.81E+00
BOLD:AAP7803	Carabidae	Scaritinae	*Akephorus obesus*	3.03E+00
BOLD:AAH0274	Carabidae	Scaritinae	*Clivina fossor*	2.54E+00
BOLD:AAB7921	Carabidae	Scaritinae	*Clivina impressefrons*	4.19E+00
BOLD:AAN5415	Carabidae	Scaritinae	*Dyschirius*	2.29E-01
BOLD:AAH0155	Carabidae	Scaritinae	*Dyschirius dejeanii*	1.25E+00
BOLD:AAO0845	Carabidae	Scaritinae	*Dyschirius globosus*	2.29E-01
BOLD:AAM7672	Carabidae	Scaritinae	*Dyschirius globulosus*	3.22E-01
BOLD:AAP7799	Carabidae	Scaritinae	*Dyschirius pacificus*	1.24E+00
BOLD:AAI4099	Carabidae	Scaritinae	*Paraclivina bipustulata*	7.43E+00
BOLD:AAH2777	Carabidae	Scaritinae	*Pasimachus elongatus*	1.35E+02
BOLD:AAH0177	Carabidae	Scaritinae	*Scarites subterraneus*	9.00E+01
BOLD:ACA2516	Carabidae	Scaritinae	*Scarites vicinus*	1.76E+02
BOLD:ACS2508	Carabidae	Trechinae	*Amerizus wingatei*	1.61E+00
BOLD:AAU7127	Carabidae	Trechinae	*Bembidion affine*	1.33E-01
BOLD:AAU7137	Carabidae	Trechinae	*Bembidion americanum*	2.17E+00
BOLD:AAP7779	Carabidae	Trechinae	*Bembidion bimaculatum*	3.56E+00
BOLD:AAP7077	Carabidae	Trechinae	*Bembidion breve*	1.13E+00
BOLD:AAH2751	Carabidae	Trechinae	*Bembidion carinula*	5.26E+00
BOLD:AAM7671	Carabidae	Trechinae	*Bembidion chalceum*	5.55E+00
BOLD:AAY7983	Carabidae	Trechinae	*Bembidion complanulum*	9.67E-01
BOLD:AAP7783	Carabidae	Trechinae	*Bembidion farrarae*	9.61E-01
BOLD:AAZ2758	Carabidae	Trechinae	*Bembidion fortestriatum*	2.11E-01
BOLD:AAU7150	Carabidae	Trechinae	*Bembidion frontale*	3.11E-01
BOLD:AAP7868	Carabidae	Trechinae	*Bembidion grapii*	1.03E+00
BOLD:AAN6197	Carabidae	Trechinae	*Bembidion impotens*	2.11E-01
BOLD:AAP7856	Carabidae	Trechinae	*Bembidion iridescens*	5.48E-01
BOLD:AAP6948	Carabidae	Trechinae	*Bembidion mimus*	2.86E-01
BOLD:AAH0225	Carabidae	Trechinae	*Bembidion morulum*	8.54E-01
BOLD:AAE3093	Carabidae	Trechinae	*Bembidion nigripes*	8.53E-01
BOLD:AAD2752	Carabidae	Trechinae	*Bembidion nitidum*	1.22E+00

BOLD:AAW3443	Carabidae	Trechinae	*Bembidion nr. transversale DRMaddison DNA2162*	4.87E+00
BOLD:AAP9490	Carabidae	Trechinae	*Bembidion obtusum*	4.35E-01
BOLD:AAU7290	Carabidae	Trechinae	*Bembidion patruele*	7.91E-01
BOLD:AAY7986	Carabidae	Trechinae	*Bembidion petrosum*	1.46E+00
BOLD:AAF0277	Carabidae	Trechinae	*Bembidion quadrimaculatum*	7.60E-01
BOLD:AAH0268	Carabidae	Trechinae	*Bembidion rosslandicum*	1.02E+00
BOLD:AAM7664	Carabidae	Trechinae	*Bembidion salebratum*	9.86E-01
BOLD:AAP6817	Carabidae	Trechinae	*Bembidion sordidum*	2.09E+00
BOLD:AAZ2578	Carabidae	Trechinae	*Bembidion transparens transparens*	5.18E-01
BOLD:ACD5430	Carabidae	Trechinae	*Bembidion versicolor*	3.87E-01
BOLD:AAV7909	Carabidae	Trechinae	*Blemus discus*	1.91E+00
BOLD:AAV6571	Carabidae	Trechinae	*Elaphropus*	1.62E-01
BOLD:AAN5951	Carabidae	Trechinae	*Mioptachys flavicauda*	8.02E-02
BOLD:AAH0153	Carabidae	Trechinae	*Paratachys*	1.49E-01
BOLD:AAY8540	Carabidae	Trechinae	*Polyderis laeva*	2.69E-02
BOLD:AAH0156	Carabidae	Trechinae	*Tachys scitulus*	1.62E-01
BOLD:AAY7903	Carabidae	Trechinae	*Tachyta kirbyi*	1.99E-01
BOLD:AAJ8568	Carabidae	Trechinae	*Trechus apicalis*	7.47E-01
BOLD:ACB1694	Carabidae	Trechinae	*Trechus chalybeus*	1.63E+00
BOLD:ACC4145	Carabidae	Trechinae	*Trechus obtusus*	8.29E-01
BOLD:AAL6870	Carabidae	Trechinae	*Trechus quadristriatus*	7.00E-01
BOLD:ADJ5115	Carabidae			6.49E+00
BOLD:AAG5555	Cerambycidae	Cerambycinae	*Anelaphus parallelus*	1.13E+01
BOLD:AAZ1211	Cerambycidae	Cerambycinae	*Anelaphus villosus*	2.75E+01
BOLD:AAN6130	Cerambycidae	Cerambycinae	*Batyle suturalis*	1.02E+01
BOLD:AAK1928	Cerambycidae	Cerambycinae	*Callidium cicatricosum*	1.35E+01
BOLD:AAW8715	Cerambycidae	Cerambycinae	*Callimoxys sanguinicollis*	1.37E+01
BOLD:AAF4412	Cerambycidae	Cerambycinae	*Clytus canadensis*	3.50E+00
BOLD:AAF4406	Cerambycidae	Cerambycinae	*Clytus planifrons*	2.03E+01
BOLD:AAB6702	Cerambycidae	Cerambycinae	*Clytus ruricola*	1.64E+01
BOLD:AAD4513	Cerambycidae	Cerambycinae	*Cyrtophorus verrucosus*	1.25E+01
BOLD:AAD5015	Cerambycidae	Cerambycinae	*Enaphalodes rufulus*	3.16E+02
BOLD:AAY7858	Cerambycidae	Cerambycinae	*Euderces picipes*	5.39E+00
BOLD:AAG5565	Cerambycidae	Cerambycinae	*Meriellum proteus*	2.17E+01
BOLD:AAH0019	Cerambycidae	Cerambycinae	*Molorchus bimaculatus*	1.96E+00
BOLD:AAE1629	Cerambycidae	Cerambycinae	*Neoclytus acuminatus*	8.98E+00
BOLD:AAE1630	Cerambycidae	Cerambycinae	*Neoclytus leucozonus*	1.97E+00
BOLD:AAI3406	Cerambycidae	Cerambycinae	*Obrium rufulum*	2.39E+00
BOLD:AAS3192	Cerambycidae	Cerambycinae	*Phoracantha recurva*	4.11E+01
BOLD:AAH8461	Cerambycidae	Cerambycinae	*Phymatodes aeneus*	4.81E+00
BOLD:ABA6341	Cerambycidae	Cerambycinae	*Phymatodes amoenus*	1.48E+00
BOLD:AAD1115	Cerambycidae	Cerambycinae	*Phymatodes dimidiatus*	2.14E+00
BOLD:AAD8900	Cerambycidae	Cerambycinae	*Phymatodes testaceus*	1.43E+01
BOLD:AAD5014	Cerambycidae	Cerambycinae	*Pronocera collaris*	1.43E+01
BOLD:AAD5016	Cerambycidae	Cerambycinae	*Pronocera collaris*	1.85E+01
BOLD:AAE9403	Cerambycidae	Cerambycinae	*Sarosesthes fulminans*	6.63E+01
BOLD:AAF6341	Cerambycidae	Cerambycinae	*Tylonotus bimaculatus*	2.16E+01

BOLD:AAE3423	Cerambycidae	Cerambycinae	*Xylotrechus annosus*	3.14E+01
BOLD:AAC6184	Cerambycidae	Cerambycinae	*Xylotrechus colonus*	1.28E+01
BOLD:ACO8902	Cerambycidae	Cerambycinae	*Xylotrechus magnicollis*	1.20E+01
BOLD:AAJ9695	Cerambycidae	Cerambycinae	*Xylotrechus nauticus*	4.59E+01
BOLD:AAF7394	Cerambycidae	Cerambycinae	*Xylotrechus sagittatus*	2.67E+01
BOLD:AAB8141	Cerambycidae	Cerambycinae	*Xylotrechus undulatus*	3.70E+01
BOLD:AAB6764	Cerambycidae	Lamiinae	*Acanthocinus*	1.59E+01
BOLD:AAE6659	Cerambycidae	Lamiinae	*Aegomorphus modestus*	3.89E+01
BOLD:ACL0653	Cerambycidae	Lamiinae	*Astylopsis*	9.09E+00
BOLD:AAD2158	Cerambycidae	Lamiinae	*Astylopsis macula*	1.07E+01
BOLD:AAD2157	Cerambycidae	Lamiinae	*Astylopsis macula*	6.25E+00
BOLD:ADI3400	Cerambycidae	Lamiinae	*Astylopsis macula*	8.95E+00
BOLD:AAJ9523	Cerambycidae	Lamiinae	*Astylopsis sexguttata*	1.87E+01
BOLD:AAF6725	Cerambycidae	Lamiinae	*Dorcaschema nigrum*	5.80E+00
BOLD:AAF6389	Cerambycidae	Lamiinae	*Ecyrus dasycerus*	7.48E+00
BOLD:AAJ0473	Cerambycidae	Lamiinae	*Eupogonius pauper*	4.09E+00
BOLD:AAD6547	Cerambycidae	Lamiinae	*Graphisurus fasciatus*	1.77E+01
BOLD:ABW6174	Cerambycidae	Lamiinae	*Hippopsis lemniscata*	1.51E+01
BOLD:AAE6803	Cerambycidae	Lamiinae	*Hyperplatys*	4.20E+00
BOLD:AAG5564	Cerambycidae	Lamiinae	*Leptostylus transversus*	7.24E+01
BOLD:AAF7649	Cerambycidae	Lamiinae	*Lepturges confluens*	6.72E+00
BOLD:AAD2926	Cerambycidae	Lamiinae	*Microgoes oculatus*	1.05E+01
BOLD:AAA9568	Cerambycidae	Lamiinae	*Monochamus scutellatus*	1.12E+02
BOLD:ADI3956	Cerambycidae	Lamiinae	*Oberea*	1.10E+01
BOLD:ABZ5218	Cerambycidae	Lamiinae	*Oberea perspicillata*	1.16E+01
BOLD:AAK4234	Cerambycidae	Lamiinae	*Oberea quadricallosa*	2.05E+01
BOLD:AAI3402	Cerambycidae	Lamiinae	*Oberea tripunctata*	8.16E+00
BOLD:ACL6588	Cerambycidae	Lamiinae	*Oberea tripunctata*	6.27E+00
BOLD:ACA8608	Cerambycidae	Lamiinae	*Plectrura spinicauda*	1.88E+01
BOLD:AAC6764	Cerambycidae	Lamiinae	*Pogonocherus penicillatus*	4.89E+00
BOLD:AAF6440	Cerambycidae	Lamiinae	*Psenocerus supernotatus*	9.74E-01
BOLD:AAD7174	Cerambycidae	Lamiinae	*Saperda calcarata*	1.45E+02
BOLD:AAE9449	Cerambycidae	Lamiinae	*Saperda lateralis*	8.28E+00
BOLD:AAX9182	Cerambycidae	Lamiinae	*Saperda puncticollis*	1.22E+01
BOLD:AAD2696	Cerambycidae	Lamiinae	*Saperda tridentata*	6.29E+01
BOLD:AAD6865	Cerambycidae	Lamiinae	*Saperda vestita*	4.01E+01
BOLD:AAF5163	Cerambycidae	Lamiinae	*Sternidius alpha*	2.22E+00
BOLD:ACE4064	Cerambycidae	Lamiinae	*Sternidius alpha*	3.91E+00
BOLD:ADJ0917	Cerambycidae	Lamiinae	*Sternidius alpha*	6.14E+00
BOLD:AAC9226	Cerambycidae	Lamiinae	*Tetraopes tetrophthalmus*	3.07E+01
BOLD:AAE9431	Cerambycidae	Lamiinae	*Tetrops praeusta*	9.51E-01
BOLD:AAH7597	Cerambycidae	Lamiinae	*Urgleptes facetus*	1.19E+00
BOLD:AAP7004	Cerambycidae	Lamiinae	*Urgleptes querci*	2.51E+00
BOLD:AAW7235	Cerambycidae	Lamiinae	*Urgleptes querci*	3.32E+00
BOLD:ABA6368	Cerambycidae	Lamiinae	*Urgleptes querci*	1.56E+00
BOLD:AAF5630	Cerambycidae	Lamiinae	*Urgleptes signatus*	3.85E+00
BOLD:AAB2742	Cerambycidae	Lepturinae	*Acmaeops proteus*	1.03E+01
BOLD:AAI4512	Cerambycidae	Lepturinae	*Analeptura lineola*	7.51E+00
BOLD:AAG5594	Cerambycidae	Lepturinae	*Analeptura lineola*	9.83E+00

BOLD:AAJ2319	Cerambycidae	Lepturinae	*Analeptura lineola*	9.25E+00
BOLD:ACG6998	Cerambycidae	Lepturinae	*Analeptura lineola*	6.81E+00
BOLD:AAF3982	Cerambycidae	Lepturinae	*Anastrangalia laetifica*	1.52E+01
BOLD:AAD7569	Cerambycidae	Lepturinae	*Anastrangalia sanguinea*	1.09E+01
BOLD:AAD8168	Cerambycidae	Lepturinae	*Anoplodera pubera*	1.42E+01
BOLD:AAB6421	Cerambycidae	Lepturinae	*Anthophylax attenuatus*	3.98E+01
BOLD:AAD6708	Cerambycidae	Lepturinae	*Anthophylax cyaneus*	5.11E+01
BOLD:AAD2060	Cerambycidae	Lepturinae	*Bellamira scalaris*	2.70E+01
BOLD:AAD2061	Cerambycidae	Lepturinae	*Bellamira scalaris*	1.97E+02
BOLD:AAI8365	Cerambycidae	Lepturinae	*Brachyleptura champlaini*	1.80E+01
BOLD:AAI8367	Cerambycidae	Lepturinae	*Brachyleptura rubrica*	3.51E+01
BOLD:AAE8242	Cerambycidae	Lepturinae	*Brachysomida bivittata*	1.42E+01
BOLD:AAI5878	Cerambycidae	Lepturinae	*Cortodera coniferae*	6.79E+00
BOLD:AAD0549	Cerambycidae	Lepturinae	*Desmocerus aureipennis*	6.40E+01
BOLD:AAB9228	Cerambycidae	Lepturinae	*Evodinus monticola*	1.34E+01
BOLD:AAB9226	Cerambycidae	Lepturinae	*Evodinus monticola*	1.98E+01
BOLD:AAI7042	Cerambycidae	Lepturinae	*Gaurotes cyanipennis*	2.46E+01
BOLD:AAB1766	Cerambycidae	Lepturinae	*Gnathacmaeops pratensis*	1.02E+01
BOLD:ABZ7729	Cerambycidae	Lepturinae	*Gnathacmaeops pratensis*	9.76E+00
BOLD:AAY9135	Cerambycidae	Lepturinae	*Grammoptera exigua*	5.04E+00
BOLD:AAC4215	Cerambycidae	Lepturinae	*Grammoptera haematites*	3.14E+00
BOLD:AAC4214	Cerambycidae	Lepturinae	*Grammoptera subargentata*	2.24E+00
BOLD:AAC4218	Cerambycidae	Lepturinae	*Grammoptera subargentata*	5.14E+00
BOLD:AAI5441	Cerambycidae	Lepturinae	*Grammoptera subargentata*	5.52E+00
BOLD:ACP4799	Cerambycidae	Lepturinae	*Grammoptera subargentata*	3.91E+00
BOLD:AAI7676	Cerambycidae	Lepturinae	*Idiopidonia pedalis*	7.39E+00
BOLD:AAB6709	Cerambycidae	Lepturinae	*Judolia montivagans*	1.78E+01
BOLD:ACD0755	Cerambycidae	Lepturinae	*Judolia quadrata*	9.10E+00
BOLD:AAF2342	Cerambycidae	Lepturinae	*Leptalia macilenta*	3.91E+00
BOLD:ACC6928	Cerambycidae	Lepturinae	*Leptalia macilenta*	3.78E+00
BOLD:AAB3304	Cerambycidae	Lepturinae	*Lepturobosca chrysocoma*	3.75E+01
BOLD:AAJ1369	Cerambycidae	Lepturinae	*Lepturopsis biforis*	4.98E+01
BOLD:AAH2364	Cerambycidae	Lepturinae	*Metacmaeops vittata*	5.55E+00
BOLD:AAE5359	Cerambycidae	Lepturinae	*Neoalosterna capitata*	1.06E+01
BOLD:AAE4356	Cerambycidae	Lepturinae	*Pachyta lamed*	4.52E+01
BOLD:AAG5563	Cerambycidae	Lepturinae	*Pedostrangalia obliterata*	6.83E+01
BOLD:AAE6801	Cerambycidae	Lepturinae	*Pedostrangalia plebeja*	1.34E+01
BOLD:AAC8075	Cerambycidae	Lepturinae	*Pedostrangalia subhamata*	2.21E+01
BOLD:AAD4910	Cerambycidae	Lepturinae	*Pidonia quadrata*	2.49E+00
BOLD:AAC9780	Cerambycidae	Lepturinae	*Pidonia ruficollis*	5.65E+00
BOLD:AAD6095	Cerambycidae	Lepturinae	*Pidonia scripta*	5.53E+00
BOLD:AAD6096	Cerambycidae	Lepturinae	*Pidonia scripta*	4.70E+00
BOLD:AAI5629	Cerambycidae	Lepturinae	*Pseudogaurotina cressoni*	4.01E+01
BOLD:AAC2267	Cerambycidae	Lepturinae	*Pygoleptura nigrella*	2.60E+01
BOLD:ACI5359	Cerambycidae	Lepturinae	*Rhagium*	3.90E+01
BOLD:AAB4854	Cerambycidae	Lepturinae	*Rhagium inquisitor*	4.71E+01
BOLD:AAB4855	Cerambycidae	Lepturinae	*Rhagium inquisitor*	2.69E+01
BOLD:ACE7813	Cerambycidae	Lepturinae	*Rhagium inquisitor*	4.42E+01
BOLD:AAC9071	Cerambycidae	Lepturinae	*Sachalinobia rugipennis*	3.16E+01

BOLD:AAF3452	Cerambycidae	Lepturinae	*Stenocorus nubifer*	3.84E+01
BOLD:AAE8995	Cerambycidae	Lepturinae	*Stenocorus obtusus*	3.15E+01
BOLD:AAC2238	Cerambycidae	Lepturinae	*Stictoleptura canadensis*	5.07E+01
BOLD:AAG9444	Cerambycidae	Lepturinae	*Stictoleptura canadensis*	4.26E+01
BOLD:AAB8978	Cerambycidae	Lepturinae	*Strangalepta abbreviata*	1.92E+01
BOLD:AAB8977	Cerambycidae	Lepturinae	*Strangalepta abbreviata*	1.66E+01
BOLD:AAF3276	Cerambycidae	Lepturinae	*Strangalia luteicornis*	1.17E+01
BOLD:AAE2193	Cerambycidae	Lepturinae	*Strophiona nitens*	4.61E+01
BOLD:AAE2194	Cerambycidae	Lepturinae	*Strophiona nitens*	2.46E+01
BOLD:ADC1148	Cerambycidae	Lepturinae	*Toxoleptura vexatrix*	2.48E+01
BOLD:ACD0944	Cerambycidae	Lepturinae	*Trachysida*	1.63E+01
BOLD:AAG0943	Cerambycidae	Lepturinae	*Trachysida aspera*	1.46E+01
BOLD:AAG0944	Cerambycidae	Lepturinae	*Trachysida aspera*	1.68E+01
BOLD:AAB7401	Cerambycidae	Lepturinae	*Trachysida mutabilis*	1.89E+01
BOLD:AAE0815	Cerambycidae	Lepturinae	*Trigonarthris minnesotana*	3.79E+01
BOLD:AAE0816	Cerambycidae	Lepturinae	*Trigonarthris proxima*	6.09E+01
BOLD:AAF0196	Cerambycidae	Lepturinae	*Typocerus fulvocinctus*	1.20E+01
BOLD:AAC7923	Cerambycidae	Lepturinae	*Typocerus velutinus*	3.87E+01
BOLD:AAF2123	Cerambycidae	Lepturinae	*Xestoleptura crassicornis*	2.46E+01
BOLD:ACY1650	Cerambycidae	Lepturinae	*Xestoleptura crassicornis*	1.77E+01
BOLD:AAD0073	Cerambycidae	Lepturinae	*Xestoleptura crassipes*	2.05E+01
BOLD:AAB9227	Cerambycidae	Lepturinae	*Xestoleptura tibialis*	2.13E+01
BOLD:ABW6156	Cerambycidae	Necydalinae	*Necydalis cavipennis*	1.04E+01
BOLD:ACT4277	Cerambycidae	Necydalinae	*Necydalis laevicollis*	1.93E+01
BOLD:ADJ3368	Cerambycidae	Parandrinae	*Neandra brunnea*	6.93E+01
BOLD:AAH0166	Cerambycidae	Prioninae	*Prionus californicus*	5.95E+02
BOLD:AAD6583	Cerambycidae	Prioninae	*Tragosoma harrisii*	3.17E+02
BOLD:AAG5551	Cerambycidae	Spondylidinae	*Arhopalus foveicollis*	7.22E+01
BOLD:AAB4568	Cerambycidae	Spondylidinae	*Asemum striatum*	2.41E+01
BOLD:AAC6388	Cerambycidae	Spondylidinae	*Megasemum asperum*	4.12E+01
BOLD:AAE9136	Cerambycidae	Spondylidinae	*Neospondylis upiformis*	7.88E+01
BOLD:AAB9039	Cerambycidae	Spondylidinae	*Tetropium cinnamopterum*	1.97E+01
BOLD:ACC7082	Cerylonidae	Ceryloninae	*Cerylon castaneum*	1.70E-01
BOLD:ACA9867	Cerylonidae	Ceryloninae	*Cerylon unicolor*	2.40E-01
BOLD:ABX9329	Cerylonidae	Ceryloninae	*Philothermus glabriculus*	2.32E-01
BOLD:ADI5069	Cerylonidae			1.35E-01
BOLD:AAN6212	Chrysomelidae	Bruchinae	*Bruchidius villosus*	6.36E-01
BOLD:AAJ8933	Chrysomelidae	Bruchinae	*Bruchus brachialis*	1.19E+00
BOLD:AAP7851	Chrysomelidae	Bruchinae	*Kytorhinus prolixus*	6.30E-01
BOLD:AAP7852	Chrysomelidae	Bruchinae	*Kytorhinus prolixus*	3.90E-01
BOLD:AAH0474	Chrysomelidae	Cassidinae	*Anisostena nigrita*	2.01E+00
BOLD:AAH0179	Chrysomelidae	Cassidinae	*Baliosus nervosus*	3.33E+00
BOLD:AAO0522	Chrysomelidae	Cassidinae	*Cassida rubiginosa*	6.94E+00
BOLD:AAH0349	Chrysomelidae	Cassidinae	*Charidotella*	8.65E+00
BOLD:ABA6363	Chrysomelidae	Cassidinae	*Charidotella purpurata*	4.74E+00
BOLD:AAG6588	Chrysomelidae	Cassidinae	*Deloyala guttata*	4.73E+00
BOLD:AAN6127	Chrysomelidae	Cassidinae	*Jonthonota nigripes*	1.20E+01
BOLD:ABA6340	Chrysomelidae	Cassidinae	*Microrhopala excavata*	4.96E+00
BOLD:AAH0112	Chrysomelidae	Cassidinae	*Microrhopala vittata*	6.75E+00

BOLD:AAM7665	Chrysomelidae	Cassidinae	*Microrhopala xerene*	3.00E+00
BOLD:AAG4461	Chrysomelidae	Cassidinae	*Odontota dorsalis*	4.53E+00
BOLD:AAG4430	Chrysomelidae	Cassidinae	*Plagiometriona clavata*	8.88E+00
BOLD:AAM7753	Chrysomelidae	Cassidinae	*Sumitrosis inaequalis*	1.20E+00
BOLD:AAY6537	Chrysomelidae	Cassidinae	*Sumitrosis inaequalis*	2.28E+00
BOLD:ABA5311	Chrysomelidae	Cassidinae	*Sumitrosis inaequalis*	1.05E+00
BOLD:ACL1518	Chrysomelidae	Cassidinae	*Sumitrosis rosea*	2.01E+00
BOLD:ACF6273	Chrysomelidae	Chrysomelinae	*Calligrapha californica*	6.26E+00
BOLD:AAG4429	Chrysomelidae	Chrysomelinae	*Calligrapha multipunctata*	2.62E+01
BOLD:AAG4427	Chrysomelidae	Chrysomelinae	*Calligrapha philadelphica*	1.94E+01
BOLD:AAZ0026	Chrysomelidae	Chrysomelinae	*Calligrapha rowena*	2.21E+01
BOLD:AAG4439	Chrysomelidae	Chrysomelinae	*Chrysolina hyperici*	8.14E+00
BOLD:AAP9442	Chrysomelidae	Chrysomelinae	*Chrysolina quadrigemina*	1.54E+01
BOLD:AAU6890	Chrysomelidae	Chrysomelinae	*Chrysomela*	7.18E+00
BOLD:AAG4451	Chrysomelidae	Chrysomelinae	*Chrysomela crotchi*	1.79E+01
BOLD:AAJ5070	Chrysomelidae	Chrysomelinae	*Chrysomela knabi*	6.96E+00
BOLD:AAE9204	Chrysomelidae	Chrysomelinae	*Chrysomela mainensis*	1.03E+01
BOLD:AAG4441	Chrysomelidae	Chrysomelinae	*Chrysomela scripta*	1.08E+01
BOLD:AAZ0095	Chrysomelidae	Chrysomelinae	*Entomoscelis americana*	1.29E+01
BOLD:AAM7731	Chrysomelidae	Chrysomelinae	*Gastrophysa cyanea*	3.43E+00
BOLD:AAG4432	Chrysomelidae	Chrysomelinae	*Gastrophysa polygoni*	3.05E+00
BOLD:AAH0086	Chrysomelidae	Chrysomelinae	*Gonioctena americana*	6.15E+00
BOLD:AAN5654	Chrysomelidae	Chrysomelinae	*Gonioctena nivosa*	1.06E+01
BOLD:AAG4419	Chrysomelidae	Chrysomelinae	*Gonioctena notmani*	4.59E+00
BOLD:AAG4436	Chrysomelidae	Chrysomelinae	*Labidomera clivicollis*	4.11E+01
BOLD:AAC0432	Chrysomelidae	Chrysomelinae	*Leptinotarsa decemlineata*	4.10E+01
BOLD:ACO1857	Chrysomelidae	Chrysomelinae	*Phaedon armoraciae*	1.79E+00
BOLD:ACF2843	Chrysomelidae	Chrysomelinae	*Phaedon laevigatus*	1.25E+00
BOLD:AAG4464	Chrysomelidae	Chrysomelinae	*Phratora frosti*	2.23E+00
BOLD:AAP7013	Chrysomelidae	Chrysomelinae	*Phratora purpurea*	3.15E+00
BOLD:AAP8573	Chrysomelidae	Chrysomelinae	*Phratora vulgatissima*	1.82E+00
BOLD:AAG4477	Chrysomelidae	Chrysomelinae	*Plagiodera versicolora*	3.25E+00
BOLD:AAH0071	Chrysomelidae	Chrysomelinae	*Prasocuris boreella*	1.85E+00
BOLD:AAJ9815	Chrysomelidae	Chrysomelinae	*Zygogramma suturalis*	4.63E+00
BOLD:ABA8907	Chrysomelidae	Criocerinae	*Crioceris asparagi*	3.80E+00
BOLD:AAF1527	Chrysomelidae	Criocerinae	*Crioceris duodecimpunctata*	6.74E+00
BOLD:AAG4425	Chrysomelidae	Criocerinae	*Lema daturaphila*	6.14E+00
BOLD:AAO1465	Chrysomelidae	Criocerinae	*Lilioceris lilii*	7.96E+00
BOLD:AAK5928	Chrysomelidae	Criocerinae	*Oulema melanopus*	3.12E+00
BOLD:ADH8687	Chrysomelidae	Criocerinae	*Oulema melanopus*	2.27E+00
BOLD:ACA3697	Chrysomelidae	Cryptocephalinae	*Anomoea laticlavia*	7.79E+00
BOLD:AAM7577	Chrysomelidae	Cryptocephalinae	*Babia quadriguttata*	3.22E+00
BOLD:AAM7661	Chrysomelidae	Cryptocephalinae	*Bassareus mammifer*	5.23E+00
BOLD:AAH0328	Chrysomelidae	Cryptocephalinae	*Cryptocephalus*	5.65E+00
BOLD:ABZ0295	Chrysomelidae	Cryptocephalinae	*Cryptocephalus notatus*	6.29E+00
BOLD:AAG4447	Chrysomelidae	Cryptocephalinae	*Cryptocephalus venustus*	6.65E+00
BOLD:ABX3292	Chrysomelidae	Cryptocephalinae	*Cryptocephalus venustus*	8.06E+00
BOLD:AAM7683	Chrysomelidae	Cryptocephalinae	*Diachus auratus*	2.30E-01
BOLD:ABA9098	Chrysomelidae	Cryptocephalinae	*Exema canadensis*	1.29E+00

BOLD:ACV6970	Chrysomelidae	Cryptocephalinae	*Exema canadensis*	1.47E+00
BOLD:AAH0139	Chrysomelidae	Cryptocephalinae	*Neochlamisus bebbianae*	1.95E+00
BOLD:AAM7594	Chrysomelidae	Cryptocephalinae	*Neochlamisus eubati*	8.43E+00
BOLD:AAL8066	Chrysomelidae	Cryptocephalinae	*Pachybrachis*	7.23E-01
BOLD:ACM6200	Chrysomelidae	Cryptocephalinae	*Pachybrachis peccans*	3.40E-01
BOLD:AAG4453	Chrysomelidae	Cryptocephalinae	*Saxinis saucia*	5.20E+00
BOLD:AAG4431	Chrysomelidae	Donaciinae	*Donacia cincticornis*	1.21E+01
BOLD:ACA2984	Chrysomelidae	Donaciinae	*Donacia fulgens*	9.68E+00
BOLD:AAP6998	Chrysomelidae	Donaciinae	*Donacia hypoleuca*	2.11E+01
BOLD:AAH0214	Chrysomelidae	Donaciinae	*Donacia piscatrix*	1.33E+01
BOLD:ABA6347	Chrysomelidae	Donaciinae	*Donacia subtilis*	1.15E+01
BOLD:ACA3927	Chrysomelidae	Donaciinae	*Donacia subtilis*	4.73E+00
BOLD:AAG4455	Chrysomelidae	Donaciinae	*Plateumaris*	5.01E+00
BOLD:AAG4443	Chrysomelidae	Donaciinae	*Plateumaris fulvipes*	5.95E+00
BOLD:AAG4438	Chrysomelidae	Donaciinae	*Plateumaris germari*	5.85E+00
BOLD:AAP7798	Chrysomelidae	Donaciinae	*Plateumaris neomexicana*	5.01E+00
BOLD:AAG4474	Chrysomelidae	Donaciinae	*Plateumaris nitida*	8.80E+00
BOLD:AAG4440	Chrysomelidae	Donaciinae	*Plateumaris pusilla*	6.75E+00
BOLD:AAG4435	Chrysomelidae	Donaciinae	*Plateumaris rufa*	8.45E+00
BOLD:AAG4437	Chrysomelidae	Donaciinae	*Plateumaris rufa*	7.60E+00
BOLD:ACU2784	Chrysomelidae	Donaciinae	*Plateumaris rufa*	7.68E+00
BOLD:ACK3469	Chrysomelidae	Eumolpinae	*Brachypnoea puncticollis*	1.44E+00
BOLD:AAG2530	Chrysomelidae	Eumolpinae	*Bromius obscurus*	7.11E+00
BOLD:AAG2531	Chrysomelidae	Eumolpinae	*Bromius obscurus*	6.05E+00
BOLD:AAJ0222	Chrysomelidae	Eumolpinae	*Chrysochus auratus*	3.15E+01
BOLD:ABX3229	Chrysomelidae	Eumolpinae	*Colaspis brunnea*	3.51E+00
BOLD:AAH0404	Chrysomelidae	Eumolpinae	*Fidia viticida*	3.55E+00
BOLD:AAU7144	Chrysomelidae	Eumolpinae	*Metachroma angustulum*	5.25E+00
BOLD:ABX3608	Chrysomelidae	Eumolpinae	*Metachroma longulum*	4.65E+00
BOLD:AAH0128	Chrysomelidae	Eumolpinae	*Paria fragariae*	2.34E+00
BOLD:AAJ7786	Chrysomelidae	Eumolpinae	*Paria fragariae*	2.66E+00
BOLD:ABA3960	Chrysomelidae	Eumolpinae	*Paria fragariae*	1.69E+00
BOLD:ABA6334	Chrysomelidae	Eumolpinae	*Paria fragariae*	2.91E+00
BOLD:ACF6671	Chrysomelidae	Eumolpinae	*Paria fragariae*	2.17E+00
BOLD:ADA1097	Chrysomelidae	Eumolpinae	*Paria fragariae*	2.84E+00
BOLD:AAH0390	Chrysomelidae	Eumolpinae	*Paria thoracica*	3.04E+00
BOLD:ADI1699	Chrysomelidae	Eumolpinae	*Paria thoracica*	2.04E+00
BOLD:ADI2042	Chrysomelidae	Eumolpinae	*Paria thoracica*	2.12E+00
BOLD:ADI5278	Chrysomelidae	Eumolpinae	*Paria thoracica*	3.19E+00
BOLD:AAH0410	Chrysomelidae	Eumolpinae	*Rhabdopterus praetextus*	3.20E+00
BOLD:ABA6335	Chrysomelidae	Eumolpinae	*Xanthonia decemnotata*	1.48E+00
BOLD:ACJ0239	Chrysomelidae	Eumolpinae	*Xanthonia decemnotata*	1.35E+00
BOLD:ADI2800	Chrysomelidae	Eumolpinae	*Xanthonia decemnotata*	4.95E-01
BOLD:ABX4772	Chrysomelidae	Galerucinae	*Acalymma gouldi*	1.75E+00
BOLD:AAF4335	Chrysomelidae	Galerucinae	*Acalymma vittatum*	4.34E+00
BOLD:AAM7800	Chrysomelidae	Galerucinae	*Altica*	1.37E+00
BOLD:ACI7386	Chrysomelidae	Galerucinae	*Altica*	5.58E-01
BOLD:ACO1929	Chrysomelidae	Galerucinae	*Altica*	1.44E+00
BOLD:AAQ0042	Chrysomelidae	Galerucinae	*Altica bimarginata*	4.53E+00

BOLD:AAH0273	Chrysomelidae	Galerucinae	*Altica chalybea*	1.22E+00
BOLD:AAG4445	Chrysomelidae	Galerucinae	*Altica corni*	1.43E+00
BOLD:AAG4475	Chrysomelidae	Galerucinae	*Altica kalmiae*	1.37E+00
BOLD:ACZ3135	Chrysomelidae	Galerucinae	*Altica prasina*	5.43E+00
BOLD:AAH0216	Chrysomelidae	Galerucinae	*Altica subplicata*	5.02E+00
BOLD:AAG3656	Chrysomelidae	Galerucinae	*Altica tombacina*	1.54E+00
BOLD:AAO3078	Chrysomelidae	Galerucinae	*Aphthona cyparissiae*	8.60E-01
BOLD:ADH8671	Chrysomelidae	Galerucinae	*Capraita*	2.54E+00
BOLD:ABX3314	Chrysomelidae	Galerucinae	*Capraita subvittata*	3.15E+00
BOLD:ADG8727	Chrysomelidae	Galerucinae	*Capraita subvittata*	2.49E+00
BOLD:ACA3990	Chrysomelidae	Galerucinae	*Capraita thyamoides*	4.03E+00
BOLD:AAD4097	Chrysomelidae	Galerucinae	*Cerotoma trifurcata*	3.38E+00
BOLD:ABA9949	Chrysomelidae	Galerucinae	*Chaetocnema concinna*	3.69E-01
BOLD:ACW9475	Chrysomelidae	Galerucinae	*Chaetocnema confinis*	1.61E-01
BOLD:AAM7650	Chrysomelidae	Galerucinae	*Chaetocnema hortensis*	5.14E-01
BOLD:AAP7061	Chrysomelidae	Galerucinae	*Chaetocnema protensa*	1.59E+00
BOLD:AAW6736	Chrysomelidae	Galerucinae	*Chaetocnema pulicaria*	1.40E-01
BOLD:AAG4462	Chrysomelidae	Galerucinae	*Crepidodera*	5.67E-01
BOLD:AAP7062	Chrysomelidae	Galerucinae	*Crepidodera*	6.94E-01
BOLD:AAG4463	Chrysomelidae	Galerucinae	*Crepidodera digna*	4.60E-01
BOLD:ABA9095	Chrysomelidae	Galerucinae	*Crepidodera heikertingeri*	7.59E-01
BOLD:AAH0126	Chrysomelidae	Galerucinae	*Crepidodera nana*	7.20E-01
BOLD:ACA4421	Chrysomelidae	Galerucinae	*Crepidodera sculpturata*	6.19E-01
BOLD:ACP9505	Chrysomelidae	Galerucinae	*Crepidodera sculpturata*	4.99E-01
BOLD:AAB5012	Chrysomelidae	Galerucinae	*Diabrotica barberi*	3.38E+00
BOLD:AAL1349	Chrysomelidae	Galerucinae	*Diabrotica cristata*	2.15E+00
BOLD:AAF8473	Chrysomelidae	Galerucinae	*Diabrotica undecimpunctata*	5.89E+00
BOLD:AAD4999	Chrysomelidae	Galerucinae	*Diabrotica virgifera*	2.71E+00
BOLD:AAL0908	Chrysomelidae	Galerucinae	*Dibolia borealis*	1.07E+00
BOLD:ABA9947	Chrysomelidae	Galerucinae	*Dibolia borealis*	7.81E-01
BOLD:ACU5687	Chrysomelidae	Galerucinae	*Dibolia chelones*	6.06E-01
BOLD:AAG4428	Chrysomelidae	Galerucinae	*Disonycha alternata*	1.51E+01
BOLD:AAQ0041	Chrysomelidae	Galerucinae	*Disonycha latifrons*	2.58E+01
BOLD:ABZ4320	Chrysomelidae	Galerucinae	*Disonycha pensylvanica*	3.29E+00
BOLD:AAG4454	Chrysomelidae	Galerucinae	*Disonycha procera*	6.95E+00
BOLD:ACC7862	Chrysomelidae	Galerucinae	*Disonycha uniguttata*	1.14E+01
BOLD:AAG4418	Chrysomelidae	Galerucinae	*Disonycha xanthomelas*	4.64E+00
BOLD:AAM7647	Chrysomelidae	Galerucinae	*Distigmoptera borealis*	4.69E-01
BOLD:ABA9101	Chrysomelidae	Galerucinae	*Epitrix cucumeris*	2.10E-01
BOLD:ACY3141	Chrysomelidae	Galerucinae	*Epitrix humeralis*	2.35E-01
BOLD:AAU7332	Chrysomelidae	Galerucinae	*Epitrix tuberis*	1.59E-01
BOLD:AAG4421	Chrysomelidae	Galerucinae	*Galerucella nymphaeae*	2.55E+00
BOLD:AAN5904	Chrysomelidae	Galerucinae	*Glyptina*	1.35E-01
BOLD:ACJ6865	Chrysomelidae	Galerucinae	*Glyptina abbreviata*	1.83E-01
BOLD:ACU6892	Chrysomelidae	Galerucinae	*Glyptina brunnea*	2.37E-01
BOLD:ACA3877	Chrysomelidae	Galerucinae	*Kuschelina vians*	6.93E+00
BOLD:AAN6151	Chrysomelidae	Galerucinae	*Longitarsus*	1.13E-01
BOLD:AAP8332	Chrysomelidae	Galerucinae	*Longitarsus*	2.89E-01
BOLD:ACL6160	Chrysomelidae	Galerucinae	*Longitarsus*	3.53E-01

BOLD:AAP7031	Chrysomelidae	Galerucinae	*Longitarsus erro*	2.42E-01
BOLD:AAY6553	Chrysomelidae	Galerucinae	*Longitarsus erro*	3.51E-01
BOLD:ACL9494	Chrysomelidae	Galerucinae	*Longitarsus jacobaeae*	1.41E+00
BOLD:ACI5614	Chrysomelidae	Galerucinae	*Longitarsus lewisii*	1.25E-01
BOLD:ABA1661	Chrysomelidae	Galerucinae	*Longitarsus pellucidus*	5.41E-01
BOLD:ABA1660	Chrysomelidae	Galerucinae	*Longitarsus rubiginosus*	3.65E-01
BOLD:ACI9958	Chrysomelidae	Galerucinae	*Longitarsus suspectus*	1.57E-01
BOLD:ACK1281	Chrysomelidae	Galerucinae	*Margaridisa atriventris*	1.43E-01
BOLD:AAH0258	Chrysomelidae	Galerucinae	*Monoxia*	1.23E+00
BOLD:AAP7098	Chrysomelidae	Galerucinae	*Monoxia*	2.25E+00
BOLD:AAO3132	Chrysomelidae	Galerucinae	*Neocrepidodera ferruginea*	1.36E+00
BOLD:AAL2945	Chrysomelidae	Galerucinae	*Neogalerucella*	1.91E+00
BOLD:ABX0183	Chrysomelidae	Galerucinae	*Ophraella*	3.42E+00
BOLD:ACF8270	Chrysomelidae	Galerucinae	*Ophraella conferta*	2.10E+00
BOLD:AAG4459	Chrysomelidae	Galerucinae	*Phyllobrotica decorata*	5.15E+00
BOLD:AAN5911	Chrysomelidae	Galerucinae	*Phyllotreta*	3.96E-01
BOLD:ACI3400	Chrysomelidae	Galerucinae	*Phyllotreta*	1.76E-01
BOLD:ABY2888	Chrysomelidae	Galerucinae	*Phyllotreta aerea*	1.26E-01
BOLD:ADH8320	Chrysomelidae	Galerucinae	*Phyllotreta bipustulata*	5.69E-01
BOLD:ADF6388	Chrysomelidae	Galerucinae	*Phyllotreta conjuncta*	2.98E-01
BOLD:AAH0255	Chrysomelidae	Galerucinae	*Phyllotreta cruciferae*	1.12E-01
BOLD:AAN5901	Chrysomelidae	Galerucinae	*Phyllotreta pusilla*	1.59E-01
BOLD:AAH0261	Chrysomelidae	Galerucinae	*Phyllotreta robusta*	2.69E-01
BOLD:AAL5267	Chrysomelidae	Galerucinae	*Phyllotreta striolata*	1.79E-01
BOLD:AAP7016	Chrysomelidae	Galerucinae	*Phyllotreta striolata*	2.49E-01
BOLD:AAN5989	Chrysomelidae	Galerucinae	*Psylliodes*	1.43E-01
BOLD:ABX2490	Chrysomelidae	Galerucinae	*Psylliodes*	4.47E-01
BOLD:AAU6967	Chrysomelidae	Galerucinae	*Psylliodes affinis*	5.72E-01
BOLD:ABX3225	Chrysomelidae	Galerucinae	*Psylliodes cucullatus*	5.40E-01
BOLD:ABA4532	Chrysomelidae	Galerucinae	*Psylliodes napi*	9.51E-01
BOLD:AAP8162	Chrysomelidae	Galerucinae	*Psylliodes picinus*	4.57E-01
BOLD:AAL1083	Chrysomelidae	Galerucinae	*Pyrrhalta viburni*	6.65E+00
BOLD:ABW1434	Chrysomelidae	Galerucinae	*Scelolyperus liriophilus*	1.31E+00
BOLD:AAG4478	Chrysomelidae	Galerucinae	*Scelolyperus meracus*	1.71E+00
BOLD:AAH0269	Chrysomelidae	Galerucinae	*Scelolyperus nigrocyaneus*	6.22E-01
BOLD:AAH0253	Chrysomelidae	Galerucinae	*Systena blanda*	1.01E+00
BOLD:AAH6468	Chrysomelidae	Galerucinae	*Systena frontalis*	1.70E+00
BOLD:AAM7614	Chrysomelidae	Galerucinae	*Systena hudsonias*	1.79E+00
BOLD:ACX8812	Chrysomelidae	Galerucinae	*Systena marginalis*	3.46E-01
BOLD:AAG4465	Chrysomelidae	Galerucinae	*Tricholochmaea*	4.52E+00
BOLD:ACW0747	Chrysomelidae	Galerucinae	*Tricholochmaea*	2.81E+00
BOLD:ACW1276	Chrysomelidae	Galerucinae	*Tricholochmaea*	3.48E+00
BOLD:AAG4444	Chrysomelidae	Galerucinae	*Tricholochmaea alni*	1.15E+00
BOLD:AAG4420	Chrysomelidae	Galerucinae	*Tricholochmaea cavicollis*	3.44E+00
BOLD:AAG4442	Chrysomelidae	Galerucinae	*Tricholochmaea cavicollis*	3.15E+00
BOLD:AAP7089	Chrysomelidae	Galerucinae	*Tricholochmaea punctipennis*	1.18E+01
BOLD:AAG4458	Chrysomelidae	Galerucinae	*Trirhabda*	6.88E+00
BOLD:AAG4472	Chrysomelidae	Galerucinae	*Trirhabda canadensis*	2.78E+01
BOLD:AAG4448	Chrysomelidae	Galerucinae	*Trirhabda pilosa*	3.85E+00

BOLD:ACL9601	Chrysomelidae	Galerucinae	*Trirhabda pilosa*	3.96E+00
BOLD:AAH0388	Chrysomelidae	Galerucinae	*Xanthogaleruca luteola*	6.95E+00
BOLD:ABA9953	Chrysomelidae	Galerucinae		2.98E-01
BOLD:AAG4450	Chrysomelidae	Synetinae	*Syneta*	5.89E+00
BOLD:ACI5965	Chrysomelidae	Synetinae	*Syneta*	8.14E+00
BOLD:AAG4456	Chrysomelidae	Synetinae	*Syneta carinata*	8.18E+00
BOLD:AAG4449	Chrysomelidae	Synetinae	*Syneta ferruginea*	6.85E+00
BOLD:AAG4457	Chrysomelidae	Synetinae	*Syneta hamata*	7.34E+00
BOLD:ACN5601	Chrysomelidae	Synetinae	*Syneta pilosa*	2.02E+00
BOLD:AAP7847	Chrysomelidae	Synetinae	*Syneta simplex*	3.72E+00
BOLD:ACB0847	Chrysomelidae			3.11E-01
BOLD:ADJ2453	Chrysomelidae			2.06E-01
BOLD:ADL2821	Chrysomelidae			1.29E-01
BOLD:ACZ0951	Ciidae	Ciinae	*Ceracis singularis*	1.07E-01
BOLD:AAK0893	Ciidae	Ciinae	*Ceracis thoracicornis*	1.73E-01
BOLD:AAJ3268	Ciidae	Ciinae	*Cis boleti*	8.59E-01
BOLD:AAU8194	Ciidae	Ciinae	*Cis fuscipes*	3.81E-01
BOLD:ACA7530	Ciidae	Ciinae	*Cis levettei*	1.83E-01
BOLD:AAX8636	Ciidae	Ciinae	*Dolichocis manitoba*	4.51E-02
BOLD:ADG9315	Ciidae	Ciinae	*Malacocis brevicollis*	1.80E-01
BOLD:AAX0040	Ciidae	Ciinae	*Octotemnus laevis*	8.15E-02
BOLD:AAJ4705	Ciidae	Ciinae	*Strigocis opacicollis*	1.28E-01
BOLD:ADI2563	Ciidae			5.52E-01
BOLD:ADK1748	Ciidae			1.46E-01
BOLD:ACG7966	Clambidae	Clambinae	*Clambus*	5.47E-02
BOLD:AAO0037	Clambidae	Clambinae	*Clambus simsoni*	5.66E-02
BOLD:ABY0030	Cleridae	Clerinae	*Enoclerus nigrifrons*	2.55E+00
BOLD:AAU6970	Cleridae	Clerinae	*Enoclerus nigripes*	3.77E+00
BOLD:ADH8052	Cleridae	Clerinae	*Enoclerus nigripes*	2.42E+00
BOLD:AAH0237	Cleridae	Clerinae	*Enoclerus rosmarus*	1.96E+00
BOLD:ACI9790	Cleridae	Clerinae	*Enoclerus rosmarus*	4.14E+00
BOLD:AAP8584	Cleridae	Clerinae	*Placopterus thoracicus*	1.80E+00
BOLD:AAG5724	Cleridae	Clerinae	*Thanasimus undatulus*	3.63E+00
BOLD:AAP7854	Cleridae	Clerinae	*Thanasimus undatulus*	4.69E+00
BOLD:AAG5717	Cleridae	Clerinae	*Trichodes nutalli*	9.05E+00
BOLD:AAG5718	Cleridae	Clerinae	*Trichodes ornatus*	1.08E+01
BOLD:AAM7609	Cleridae	Hydnocerinae	*Isohydnocera curtipennis*	9.30E-01
BOLD:AAU7126	Cleridae	Hydnocerinae	*Isohydnocera curtipennis*	6.95E-01
BOLD:ACZ0196	Cleridae	Hydnocerinae	*Isohydnocera tabida*	9.62E-01
BOLD:ACB3721	Cleridae	Hydnocerinae	*Phyllobaenus subfasciatus*	7.05E-01
BOLD:AAU7142	Cleridae	Korynetinae	*Chariessa pilosa*	1.08E+01
BOLD:ACC7747	Cleridae	Korynetinae	*Cregya oculata*	1.38E+00
BOLD:ACF6496	Cleridae	Korynetinae	*Madoniella dislocata*	1.51E+00
BOLD:ABA6311	Cleridae	Thaneroclerinae	*Zenodosus sanguineus*	5.00E+00
BOLD:ABA6328	Cleridae	Tillinae	*Cymatodera*	1.05E+01
BOLD:AAM7663	Cleridae	Tillinae	*Cymatodera bicolor*	5.69E+00
BOLD:AAU6910	Cleridae	Tillinae	*Cymatodera bicolor*	8.86E+00
BOLD:ACA7844	Cleridae	Tillinae	*Cymatodera bicolor*	9.09E+00
BOLD:ACE2806	Cleridae	Tillinae	*Cymatodera undulata*	6.30E+00

BOLD:ADI8766	Cleridae			2.10E+00
BOLD:AAO1521	Coccinellidae	Chilocorinae	*Chilocorus renipustulatus*	4.28E+00
BOLD:AAH3301	Coccinellidae	Chilocorinae	*Chilocorus stigma*	2.78E+00
BOLD:ACA6340	Coccinellidae	Chilocorinae	*Chilocorus stigma*	3.48E+00
BOLD:AAH3288	Coccinellidae	Coccinellinae	*Adalia bipunctata*	2.64E+00
BOLD:AAH3304	Coccinellidae	Coccinellinae	*Adalia bipunctata*	3.75E+00
BOLD:AAH3316	Coccinellidae	Coccinellinae	*Adalia bipunctata*	5.15E+00
BOLD:ACE3479	Coccinellidae	Coccinellinae	*Adalia bipunctata*	4.94E+00
BOLD:AAF3857	Coccinellidae	Coccinellinae	*Anatis labiculata*	2.83E+01
BOLD:ACS2580	Coccinellidae	Coccinellinae	*Anatis lecontei*	2.31E+01
BOLD:AAH3318	Coccinellidae	Coccinellinae	*Anatis mali*	1.03E+01
BOLD:AAH3287	Coccinellidae	Coccinellinae	*Anisosticta bitriangularis*	6.71E-01
BOLD:AAK2029	Coccinellidae	Coccinellinae	*Aphidecta obliterata*	1.20E+00
BOLD:AAH3298	Coccinellidae	Coccinellinae	*Brachiacantha albifrons*	1.65E+00
BOLD:AAH3319	Coccinellidae	Coccinellinae	*Brachiacantha rotunda*	1.14E+00
BOLD:ACK1868	Coccinellidae	Coccinellinae	*Brachiacantha rotunda*	6.83E-01
BOLD:ABA6356	Coccinellidae	Coccinellinae	*Brachiacantha ursina*	2.09E+00
BOLD:AAH3295	Coccinellidae	Coccinellinae	*Calvia quatuordecimguttata*	5.10E+00
BOLD:AAH3289	Coccinellidae	Coccinellinae	*Ceratomegilla ulkei*	1.29E+00
BOLD:AAH3291	Coccinellidae	Coccinellinae	*Ceratomegilla ulkei*	1.44E+00
BOLD:ACA6131	Coccinellidae	Coccinellinae	*Coccinella hieroglyphica*	1.84E+00
BOLD:ACA6285	Coccinellidae	Coccinellinae	*Coccinella novemnotata*	5.79E+00
BOLD:AAA8933	Coccinellidae	Coccinellinae	*Coccinella septempunctata*	1.19E+01
BOLD:AAH3315	Coccinellidae	Coccinellinae	*Coccinella transversoguttata*	9.72E+00
BOLD:AAE2547	Coccinellidae	Coccinellinae	*Coccinella trifasciata*	4.38E+00
BOLD:AAP7476	Coccinellidae	Coccinellinae	*Coccinella undecimpunctata*	2.55E+00
BOLD:AAD7604	Coccinellidae	Coccinellinae	*Coleomegilla maculata*	2.92E+00
BOLD:ACA6292	Coccinellidae	Coccinellinae	*Cycloneda*	1.86E+00
BOLD:AAH3300	Coccinellidae	Coccinellinae	*Cycloneda munda*	4.12E+00
BOLD:AAG4502	Coccinellidae	Coccinellinae	*Didion longulum*	1.30E-01
BOLD:AAP7049	Coccinellidae	Coccinellinae	*Didion longulum*	1.26E-01
BOLD:AAN5903	Coccinellidae	Coccinellinae	*Didion punctatum*	1.57E-01
BOLD:AAP7040	Coccinellidae	Coccinellinae	*Didion punctatum*	1.50E-01
BOLD:ADF8448	Coccinellidae	Coccinellinae	*Diomus debilis*	9.77E-02
BOLD:AAN5910	Coccinellidae	Coccinellinae	*Diomus terminatus*	2.86E-01
BOLD:AAB5640	Coccinellidae	Coccinellinae	*Harmonia axyridis*	7.97E+00
BOLD:AAH3293	Coccinellidae	Coccinellinae	*Hippodamia convergens*	5.22E+00
BOLD:AAH3305	Coccinellidae	Coccinellinae	*Hippodamia glacialis*	9.50E+00
BOLD:AAQ0071	Coccinellidae	Coccinellinae	*Hippodamia oregonensis*	4.15E+00
BOLD:AAB8013	Coccinellidae	Coccinellinae	*Hippodamia parenthesis*	3.31E+00
BOLD:AAX1229	Coccinellidae	Coccinellinae	*Hippodamia tredecimpunctata*	7.24E+00
BOLD:AAH3299	Coccinellidae	Coccinellinae	*Hippodamia variegata*	2.20E+00
BOLD:ADH8958	Coccinellidae	Coccinellinae	*Hyperaspis bigeminata*	1.26E+00
BOLD:AAN6147	Coccinellidae	Coccinellinae	*Hyperaspis binotata*	1.37E+00
BOLD:ACF9356	Coccinellidae	Coccinellinae	*Hyperaspis binotata*	2.43E+00
BOLD:ACA7487	Coccinellidae	Coccinellinae	*Hyperaspis lateralis*	1.11E+00
BOLD:ACU7795	Coccinellidae	Coccinellinae	*Hyperaspis lateralis*	1.45E+00
BOLD:ACU7899	Coccinellidae	Coccinellinae	*Hyperaspis lateralis*	1.43E+00
BOLD:ACW2336	Coccinellidae	Coccinellinae	*Hyperaspis lateralis*	1.84E+00

BOLD:ACA7425	Coccinellidae	Coccinellinae	*Hyperaspis proba*	6.62E-01
BOLD:AAP7833	Coccinellidae	Coccinellinae	*Macronaemia episcopalis*	3.95E-01
BOLD:AAI3237	Coccinellidae	Coccinellinae	*Mulsantina hudsonica*	3.05E+00
BOLD:AAM7729	Coccinellidae	Coccinellinae	*Mulsantina picta*	4.95E+00
BOLD:AAH3314	Coccinellidae	Coccinellinae	*Myzia*	1.02E+01
BOLD:ABX0180	Coccinellidae	Coccinellinae	*Neoharmonia venusta*	8.72E+00
BOLD:ACK1214	Coccinellidae	Coccinellinae	*Nephaspis*	1.38E-01
BOLD:ACZ0794	Coccinellidae	Coccinellinae	*Nephus flavifrons*	2.30E-01
BOLD:AAF6935	Coccinellidae	Coccinellinae	*Propylaea quatuordecimpunctata*	3.25E+00
BOLD:ACA7954	Coccinellidae	Coccinellinae	*Psyllobora borealis*	1.92E-01
BOLD:AAH3320	Coccinellidae	Coccinellinae	*Psyllobora vigintimaculata*	7.74E-01
BOLD:AAM7657	Coccinellidae	Coccinellinae	*Psyllobora vigintimaculata*	6.92E-01
BOLD:AAN6045	Coccinellidae	Coccinellinae	*Psyllobora vigintimaculata*	6.52E-01
BOLD:AAU2688	Coccinellidae	Coccinellinae	*Psyllobora vigintimaculata*	2.06E-01
BOLD:ACC9145	Coccinellidae	Coccinellinae	*Psyllobora vigintimaculata*	4.54E-01
BOLD:ACN4256	Coccinellidae	Coccinellinae	*Psyllobora vigintimaculata*	1.55E-01
BOLD:ADJ3401	Coccinellidae	Coccinellinae	*Psyllobora vigintimaculata*	1.81E-01
BOLD:AAN6213	Coccinellidae	Coccinellinae	*Rhyzobius*	1.01E+00
BOLD:ACC8156	Coccinellidae	Coccinellinae	*Scymnus*	3.58E-01
BOLD:ADI4527	Coccinellidae	Coccinellinae	*Scymnus*	3.46E-01
BOLD:ACA5907	Coccinellidae	Coccinellinae	*Scymnus brullei*	8.51E-01
BOLD:ACL3086	Coccinellidae	Coccinellinae	*Scymnus caurinus*	7.44E-01
BOLD:AAM7684	Coccinellidae	Coccinellinae	*Scymnus fraternus*	4.69E-01
BOLD:AAN5943	Coccinellidae	Coccinellinae	*Scymnus lacustris*	4.16E-01
BOLD:ACL3105	Coccinellidae	Coccinellinae	*Scymnus marginicollis*	4.17E-01
BOLD:ABX2482	Coccinellidae	Coccinellinae	*Scymnus nebulosus*	4.32E-01
BOLD:AAN9250	Coccinellidae	Coccinellinae	*Scymnus rubromaculatus*	4.56E-01
BOLD:AAN5942	Coccinellidae	Coccinellinae	*Scymnus securus*	3.60E-01
BOLD:AAP8242	Coccinellidae	Coccinellinae	*Scymnus suturalis*	2.23E-01
BOLD:ACA7106	Coccinellidae	Coccinellinae	*Scymnus tenebrosus*	8.03E-01
BOLD:AAN6149	Coccinellidae	Coccinellinae	*Stethorus punctillum*	7.53E-02
BOLD:AAM7639	Coccinellidae	Coccinellinae	*Stethorus punctum*	1.01E-01
BOLD:ACC9999	Coccinellidae	Microweiseinae	*Coccidophilus marginatus*	4.93E-02
BOLD:AAE7462	Coccinellidae	Microweiseinae	*Delphastus catalinae*	1.65E-01
BOLD:AAP7830	Coccinellidae	Microweiseinae	*Microweisea misella*	3.81E-02
BOLD:ACU8237	Coccinellidae	Microweiseinae	*Microweisea misella*	4.91E-02
BOLD:ADJ3402	Coccinellidae			4.10E-01
BOLD:AAN5900	Corylophidae	Corylophinae	*Arthrolips decolor*	3.42E-02
BOLD:AAN6155	Corylophidae	Corylophinae	*Clypastraea*	1.03E-01
BOLD:ACI5754	Corylophidae	Corylophinae	*Clypastraea*	5.74E-02
BOLD:AAP7838	Corylophidae	Corylophinae	*Clypastraea lugubris*	6.62E-02
BOLD:ACJ0061	Corylophidae	Corylophinae	*Gloeosoma fuscicornis*	6.86E-02
BOLD:ACO8584	Corylophidae	Corylophinae	*Gloeosoma hesperum*	3.98E-02
BOLD:ACC1652	Corylophidae	Corylophinae	*Holopsis marginicollis*	4.09E-02
BOLD:ACG3646	Corylophidae	Corylophinae	*Orthoperus*	2.37E-02
BOLD:ACI5790	Corylophidae	Corylophinae	*Orthoperus*	3.60E-02
BOLD:AAU7040	Corylophidae	Corylophinae	*Orthoperus scutellaris*	1.74E-02
BOLD:ABA9097	Corylophidae	Corylophinae	*Orthoperus suturalis*	2.76E-02

BOLD:ABA2914	Corylophidae	Corylophinae	*Sericoderus lateralis*	5.29E-02
BOLD:ADB1856	Corylophidae	Corylophinae	*Sericoderus lateralis*	4.88E-02
BOLD:ADF6584	Corylophidae			4.60E-02
BOLD:ADJ1188	Corylophidae			4.16E-02
BOLD:AAG5060	Cryptophagidae	Atomariinae	*Atomaria*	8.49E-02
BOLD:AAU7168	Cryptophagidae	Atomariinae	*Atomaria*	5.24E-02
BOLD:AAU7170	Cryptophagidae	Atomariinae	*Atomaria*	6.56E-02
BOLD:ACE2416	Cryptophagidae	Atomariinae	*Atomaria*	9.32E-02
BOLD:ACG2996	Cryptophagidae	Atomariinae	*Atomaria*	1.26E-01
BOLD:ACG3394	Cryptophagidae	Atomariinae	*Atomaria*	1.07E-01
BOLD:ACI5424	Cryptophagidae	Atomariinae	*Atomaria*	1.60E-01
BOLD:ABX9407	Cryptophagidae	Atomariinae	*Atomaria apicalis*	7.62E-02
BOLD:AAG9569	Cryptophagidae	Atomariinae	*Atomaria CHU1*	9.26E-02
BOLD:AAP7030	Cryptophagidae	Atomariinae	*Atomaria ephippiata*	8.66E-02
BOLD:ACI4909	Cryptophagidae	Atomariinae	*Atomaria ephippiata*	7.62E-02
BOLD:ABA9946	Cryptophagidae	Atomariinae	*Atomaria fuscata*	1.19E-01
BOLD:ACL6930	Cryptophagidae	Atomariinae	*Atomaria lederi*	6.78E-02
BOLD:AAM7626	Cryptophagidae	Atomariinae	*Atomaria lewisi*	1.83E-01
BOLD:AAO1019	Cryptophagidae	Atomariinae	*Atomaria nigrirostris*	1.05E-01
BOLD:ACR3723	Cryptophagidae	Atomariinae	*Atomaria stricticollis*	2.03E-01
BOLD:AAH0292	Cryptophagidae	Atomariinae	*Atomaria testacea*	7.00E-02
BOLD:AAP7043	Cryptophagidae	Atomariinae	*Atomaria vespertina*	8.12E-02
BOLD:AAL0643	Cryptophagidae	Atomariinae	*Ephistemus globulus*	6.16E-02
BOLD:AAP7084	Cryptophagidae	Cryptophaginae	*Antherophagus ochraceus*	1.98E+00
BOLD:ACK3946	Cryptophagidae	Cryptophaginae	*Caenoscelis*	1.27E-01
BOLD:ACP9373	Cryptophagidae	Cryptophaginae	*Caenoscelis basalis*	1.44E-01
BOLD:AAP7042	Cryptophagidae	Cryptophaginae	*Caenoscelis subdeplanata*	1.17E-01
BOLD:AAO0110	Cryptophagidae	Cryptophaginae	*Cryptophagus acutangulus*	3.11E-01
BOLD:AAG5059	Cryptophagidae	Cryptophaginae	*Cryptophagus bidentatus*	2.14E-01
BOLD:ABA9954	Cryptophagidae	Cryptophaginae	*Cryptophagus dentatus*	2.29E-01
BOLD:ACI5415	Cryptophagidae	Cryptophaginae	*Cryptophagus difficilis*	2.76E-01
BOLD:ACI6800	Cryptophagidae	Cryptophaginae	*Cryptophagus difficilis*	2.45E-01
BOLD:ACI6972	Cryptophagidae	Cryptophaginae	*Cryptophagus difficilis*	2.14E-01
BOLD:ABX4786	Cryptophagidae	Cryptophaginae	*Cryptophagus histricus*	3.81E-01
BOLD:ACD9453	Cryptophagidae	Cryptophaginae	*Cryptophagus quadrihamatus*	1.72E-01
BOLD:AAN5981	Cryptophagidae	Cryptophaginae	*Cryptophagus tuberculosus*	4.40E-01
BOLD:ABY0110	Cryptophagidae	Cryptophaginae	*Cryptophagus valens*	3.69E-01
BOLD:ACM2551	Cryptophagidae	Cryptophaginae	*Henotiderus centromaculatus*	2.24E-01
BOLD:ACB0023	Cryptophagidae	Cryptophaginae	*Henotiderus lorna*	2.63E-01
BOLD:AAK0930	Cryptophagidae	Cryptophaginae	*Telmatophilus typhae*	1.43E-01
BOLD:ADJ6202	Cryptophagidae			2.71E-01
BOLD:ABA6312	Cucujidae		*Cucujus clavipes*	9.53E+00
BOLD:AAQ0047	Cucujidae		*Cucujus clavipes*	2.16E+01
BOLD:AAU6888	Cucujidae		*Cucujus clavipes*	1.60E+01
BOLD:AAH0076	Cucujidae		*Pediacus fuscus*	6.03E-01
BOLD:ACV1724	Cupedidae	Cupedinae	*Tenomerga cinerea*	1.11E+01
BOLD:AAJ9289	Cupedidae	Priacminae	*Priacma serrata*	2.07E+01
BOLD:AAU6928	Curculionidae	Baridinae	*Ampeloglypter ampelopsis*	1.25E+00
BOLD:ABW8729	Curculionidae	Baridinae	*Catapastus conspersus*	4.16E-01

BOLD:ACM7620	Curculionidae	Baridinae	*Cosmobaris scolopacea*	7.60E-01
BOLD:AAY6533	Curculionidae	Baridinae	*Madarellus undulatus*	2.10E+00
BOLD:ACO4433	Curculionidae	Baridinae	*Nedyus apicalis*	2.01E+00
BOLD:ADI3951	Curculionidae	Baridinae	*Odontocorynus umbellae*	2.00E+00
BOLD:AAY6557	Curculionidae	Baridinae	*Stethobaris ovata*	1.47E+00
BOLD:AAR3684	Curculionidae	Ceutorhynchinae	*Amalus scortillum*	4.28E-01
BOLD:AAN5699	Curculionidae	Ceutorhynchinae	*Auleutes epilobii*	4.47E-01
BOLD:AAP7075	Curculionidae	Ceutorhynchinae	*Auleutes nebulosus*	7.70E-01
BOLD:AAN5992	Curculionidae	Ceutorhynchinae	*Ceutorhynchus*	2.14E-01
BOLD:ADH8524	Curculionidae	Ceutorhynchinae	*Ceutorhynchus americanus*	7.03E-01
BOLD:AAN9823	Curculionidae	Ceutorhynchinae	*Ceutorhynchus erysimi*	6.17E-01
BOLD:AAK0575	Curculionidae	Ceutorhynchinae	*Ceutorhynchus obstrictus*	9.00E-01
BOLD:ABA9084	Curculionidae	Ceutorhynchinae	*Ceutorhynchus omissus*	5.81E-01
BOLD:AAW6761	Curculionidae	Ceutorhynchinae	*Ceutorhynchus pallidactylus*	7.48E-01
BOLD:AAN9807	Curculionidae	Ceutorhynchinae	*Ceutorhynchus typhae*	4.10E-01
BOLD:ACD0024	Curculionidae	Ceutorhynchinae	*Craponius inaequalis*	1.89E+00
BOLD:ABA6338	Curculionidae	Ceutorhynchinae	*Dietzella zimmermannii*	1.84E+00
BOLD:AAH3461	Curculionidae	Ceutorhynchinae	*Glocianus punctiger*	6.24E-01
BOLD:ACU4920	Curculionidae	Ceutorhynchinae	*Microplontus campestris*	1.05E+00
BOLD:AAH3458	Curculionidae	Ceutorhynchinae	*Mononychus vulpeculus*	6.68E+00
BOLD:AAP6194	Curculionidae	Ceutorhynchinae	*Pelenomus waltoni*	6.51E-01
BOLD:AAQ1024	Curculionidae	Ceutorhynchinae	*Rhinoncus bruchoides*	1.01E+00
BOLD:AAO1278	Curculionidae	Ceutorhynchinae	*Rhinoncus castor*	1.10E+00
BOLD:AAO1279	Curculionidae	Ceutorhynchinae	*Rhinoncus perpendicularis*	7.49E-01
BOLD:ACL3306	Curculionidae	Conoderinae	*Acoptus*	7.71E-01
BOLD:AAU6930	Curculionidae	Conoderinae	*Acoptus suturalis*	8.48E-01
BOLD:AAM7790	Curculionidae	Conoderinae	*Lechriops oculatus*	1.26E+00
BOLD:ABA9079	Curculionidae	Conoderinae	*Psomus armatus*	2.64E-01
BOLD:ABA4566	Curculionidae	Cossoninae	*Caulophilus dubius*	1.88E-01
BOLD:ACA2315	Curculionidae	Cossoninae	*Cossonus impressifrons*	1.26E+00
BOLD:ACC6990	Curculionidae	Cossoninae	*Cossonus pacificus*	1.25E+00
BOLD:ACI5894	Curculionidae	Cossoninae	*Phloeophagus apionides*	5.52E-01
BOLD:AAP7853	Curculionidae	Cossoninae	*Rhyncolus brunneus*	1.02E+00
BOLD:ACA5840	Curculionidae	Cossoninae	*Stenoscelis brevis*	9.13E-01
BOLD:ABA4567	Curculionidae	Cryptorhynchinae	*Acalles carinatus*	4.87E+00
BOLD:AAD1735	Curculionidae	Cryptorhynchinae	*Cryptorhynchus lapathi*	2.19E+01
BOLD:ACU2925	Curculionidae	Cryptorhynchinae	*Cryptorhynchus tristis*	7.16E+00
BOLD:ACY2911	Curculionidae	Cryptorhynchinae	*Peracalles pectoralis*	2.98E+00
BOLD:ABX2456	Curculionidae	Cryptorhynchinae	*Tyloderma foveolatum*	3.40E+00
BOLD:AAG5180	Curculionidae	Curculioninae	*Acalyptus carpini*	5.15E-01
BOLD:ABW1290	Curculionidae	Curculioninae	*Anthonomus nebulosus*	2.93E+00
BOLD:AAG5245	Curculionidae	Curculioninae	*Anthonomus profundus*	8.94E-01
BOLD:AAG5179	Curculionidae	Curculioninae	*Anthonomus quadrigibbus*	2.38E+00
BOLD:AAH3460	Curculionidae	Curculioninae	*Anthonomus quesnelensis*	3.65E-01
BOLD:AAP7831	Curculionidae	Curculioninae	*Anthonomus robustulus*	2.70E-01
BOLD:ADE3613	Curculionidae	Curculioninae	*Anthonomus rubidus*	6.83E-01
BOLD:AAZ2616	Curculionidae	Curculioninae	*Anthonomus rufipes*	1.08E+00
BOLD:AAG5209	Curculionidae	Curculioninae	*Anthonomus signatus*	7.11E-01
BOLD:ABW1289	Curculionidae	Curculioninae	*Anthonomus signatus*	5.01E-01

BOLD:ACK9843	Curculionidae	Curculioninae	*Anthonomus signatus*	6.62E-01
BOLD:ACD8700	Curculionidae	Curculioninae	*Archarius salicivorus*	3.94E-01
BOLD:ACL1883	Curculionidae	Curculioninae	*Curculio rubidus*	1.04E+00
BOLD:ABV5168	Curculionidae	Curculioninae	*Curculio sulcatulus*	6.49E+00
BOLD:ACF6362	Curculionidae	Curculioninae	*Dorytomus hirtus*	1.12E+00
BOLD:ACF6605	Curculionidae	Curculioninae	*Dorytomus hirtus*	1.36E+00
BOLD:ACA3993	Curculionidae	Curculioninae	*Dorytomus inaequalis*	2.08E+00
BOLD:ABA0187	Curculionidae	Curculioninae	*Dorytomus laticollis*	8.87E-01
BOLD:ACA6290	Curculionidae	Curculioninae	*Dorytomus leucophyllus*	1.38E+00
BOLD:AAG5217	Curculionidae	Curculioninae	*Dorytomus mucidus*	1.03E+01
BOLD:ACA6103	Curculionidae	Curculioninae	*Dorytomus rufulus*	1.56E+00
BOLD:ACA4125	Curculionidae	Curculioninae	*Dorytomus squamosus*	7.69E-01
BOLD:ACE2095	Curculionidae	Curculioninae	*Dorytomus vagenotatus*	1.03E+00
BOLD:ACL4042	Curculionidae	Curculioninae	*Dorytomus vagenotatus*	5.04E-01
BOLD:ACL3929	Curculionidae	Curculioninae	*Isochnus rufipes*	1.74E-01
BOLD:ACA3052	Curculionidae	Curculioninae	*Isochnus sequensi*	4.02E-01
BOLD:ACJ7409	Curculionidae	Curculioninae	*Lignyodes helvolus*	1.57E+00
BOLD:ACF6291	Curculionidae	Curculioninae	*Lignyodes horridulus*	1.95E+00
BOLD:AAO0328	Curculionidae	Curculioninae	*Mecinus pascuorum*	1.55E-01
BOLD:ABA6330	Curculionidae	Curculioninae	*Myrmex chevrolatii*	1.97E+00
BOLD:AAM7726	Curculionidae	Curculioninae	*Orchestes alni*	5.71E-01
BOLD:AAK5387	Curculionidae	Curculioninae	*Orchestes fagi*	4.26E-01
BOLD:AAM7599	Curculionidae	Curculioninae	*Orchestes mixtus*	7.42E-01
BOLD:ACB3202	Curculionidae	Curculioninae	*Orchestes pallicornis*	6.91E-01
BOLD:ACY5625	Curculionidae	Curculioninae	*Orchestes testaceus*	2.37E-01
BOLD:ACF7317	Curculionidae	Curculioninae	*Phyllotrox nubifer*	2.99E-01
BOLD:ACM0799	Curculionidae	Curculioninae	*Piazorhinus scutellaris*	6.03E-01
BOLD:ACC9442	Curculionidae	Curculioninae	*Pseudanthonomus validus*	4.18E-01
BOLD:ACE2245	Curculionidae	Curculioninae	*Rhinusa antirrhini*	5.68E-01
BOLD:ABX3610	Curculionidae	Curculioninae	*Smicronyx*	2.87E-01
BOLD:ACA4101	Curculionidae	Curculioninae	*Tachyerges ephippiatus*	9.75E-01
BOLD:AAN6179	Curculionidae	Curculioninae	*Tachyerges niger*	6.19E-01
BOLD:AAM7740	Curculionidae	Curculioninae	*Tychius meliloti*	3.30E-01
BOLD:AAP7027	Curculionidae	Curculioninae	*Tychius picirostris*	3.25E-01
BOLD:ACV3774	Curculionidae	Curculioninae	*Tychius stephensi*	3.46E-01
BOLD:ADI1513	Curculionidae	Cyclominae	*Listronotus*	2.13E+00
BOLD:ABW8698	Curculionidae	Cyclominae	*Listronotus humilis*	2.34E+00
BOLD:ACI9863	Curculionidae	Cyclominae	*Listronotus sparsus*	1.95E+00
BOLD:ACJ0010	Curculionidae	Cyclominae	*Listronotus sparsus*	2.22E+00
BOLD:ADH8481	Curculionidae	Cyclominae	*Listronotus sparsus*	2.38E+00
BOLD:ADI8154	Curculionidae	Entiminae	*Agronus carri*	1.77E+00
BOLD:ACA4292	Curculionidae	Entiminae	*Anametis granulata*	2.47E+01
BOLD:AAG5192	Curculionidae	Entiminae	*Barypeithes pellucidus*	1.25E+00
BOLD:AAG5242	Curculionidae	Entiminae	*Barypeithes pellucidus*	1.29E+00
BOLD:AAN4018	Curculionidae	Entiminae	*Barypeithes pellucidus*	1.16E+00
BOLD:ACD1445	Curculionidae	Entiminae	*Barypeithes pellucidus*	1.43E+00
BOLD:ADI8909	Curculionidae	Entiminae	*Barypeithes pellucidus*	9.81E-01
BOLD:AAU7125	Curculionidae	Entiminae	*Calomycterus setarius*	1.98E+00
BOLD:AAN6182	Curculionidae	Entiminae	*Cyrtepistomus castaneus*	3.82E+00

BOLD:ACU3025	Curculionidae	Entiminae	*Dyslobus alternatus*	1.26E+01
BOLD:ACX9621	Curculionidae	Entiminae	*Dyslobus decoratus*	6.92E+00
BOLD:ACI7537	Curculionidae	Entiminae	*Hormorus undulatus*	1.16E+01
BOLD:ABY0134	Curculionidae	Entiminae	*Lepidophorus lineaticollis*	2.92E+00
BOLD:AAX2923	Curculionidae	Entiminae	*Myosides seriehispidus*	2.26E+00
BOLD:AAG5198	Curculionidae	Entiminae	*Otiorhynchus ovatus*	5.88E+00
BOLD:AAW9302	Curculionidae	Entiminae	*Otiorhynchus raucus*	1.68E+01
BOLD:ACZ0575	Curculionidae	Entiminae	*Otiorhynchus raucus*	1.20E+01
BOLD:AAG5191	Curculionidae	Entiminae	*Otiorhynchus rugosostriatus*	1.33E+01
BOLD:AAG5193	Curculionidae	Entiminae	*Otiorhynchus singularis*	1.34E+01
BOLD:AAW9297	Curculionidae	Entiminae	*Otiorhynchus sulcatus*	2.55E+01
BOLD:AAQ0036	Curculionidae	Entiminae	*Pachyrhinus californicus*	5.45E+00
BOLD:ACJ8655	Curculionidae	Entiminae	*Pachyrhinus elegans*	3.27E+00
BOLD:AAU7322	Curculionidae	Entiminae	*Pandeleteius hilaris*	7.68E-01
BOLD:AAF9187	Curculionidae	Entiminae	*Phyllobius oblongus*	6.80E-01
BOLD:AAG5244	Curculionidae	Entiminae	*Polydrusus cervinus*	2.10E+00
BOLD:AAB8911	Curculionidae	Entiminae	*Polydrusus formosus*	4.75E+00
BOLD:ACO8630	Curculionidae	Entiminae	*Polydrusus formosus*	3.52E+00
BOLD:AAO4332	Curculionidae	Entiminae	*Polydrusus impressifrons*	1.81E+00
BOLD:AAD5565	Curculionidae	Entiminae	*Sciaphilus asperatus*	6.42E+00
BOLD:AAP7794	Curculionidae	Entiminae	*Sciopithes obscurus*	4.60E+00
BOLD:ACA7795	Curculionidae	Entiminae	*Sitona aquilonius*	8.29E+00
BOLD:AAH0408	Curculionidae	Entiminae	*Sitona cylindricollis*	2.75E+00
BOLD:AAH0130	Curculionidae	Entiminae	*Sitona hispidulus*	2.55E+00
BOLD:ABV3850	Curculionidae	Entiminae	*Sitona lepidus*	2.82E+00
BOLD:AAN0064	Curculionidae	Entiminae	*Sitona lineatus*	1.65E+00
BOLD:AAH0257	Curculionidae	Entiminae	*Sitona lineellus*	4.51E-01
BOLD:AAG5222	Curculionidae	Entiminae	*Strophosoma melanogrammum*	4.08E+00
BOLD:AAO0555	Curculionidae	Entiminae	*Trachyphloeus aristatus*	1.60E+00
BOLD:AAL8052	Curculionidae	Entiminae	*Trachyphloeus asperatus*	1.13E+00
BOLD:AAH0270	Curculionidae	Entiminae	*Trachyphloeus bifoveolatus*	2.85E+00
BOLD:AAG5195	Curculionidae	Entiminae	*Trichalophus alternatus*	4.04E+01
BOLD:AAG5196	Curculionidae	Entiminae	*Trichalophus alternatus*	4.49E+01
BOLD:AAO4906	Curculionidae	Hyperinae	*Hypera meles*	2.94E+00
BOLD:AAP7014	Curculionidae	Hyperinae	*Hypera nigrirostris*	1.49E+00
BOLD:AAN6027	Curculionidae	Hyperinae	*Hypera postica*	3.52E+00
BOLD:AAN9744	Curculionidae	Hyperinae	*Hypera postica*	6.12E+00
BOLD:ACX9502	Curculionidae	Hyperinae	*Hypera trivittata*	8.45E+00
BOLD:ACN3501	Curculionidae	Lixinae	*Cyphocleonus achates*	2.65E+01
BOLD:AAB6956	Curculionidae	Lixinae	*Larinus minutus*	6.35E+00
BOLD:AAB7600	Curculionidae	Lixinae	*Larinus obtusus*	7.46E+00
BOLD:AAO1182	Curculionidae	Lixinae	*Larinus planus*	1.03E+01
BOLD:ACW5105	Curculionidae	Lixinae	*Lixus rubellus*	1.48E+01
BOLD:ACG0491	Curculionidae	Lixinae	*Rhinocyllus conicus*	8.45E+00
BOLD:ACA3844	Curculionidae	Mesoptiliinae	*Magdalis armicollis*	1.19E+00
BOLD:AAH3459	Curculionidae	Mesoptiliinae	*Magdalis gentilis*	3.15E+00
BOLD:AAM7743	Curculionidae	Mesoptiliinae	*Magdalis gentilis*	2.05E+00
BOLD:ACA7469	Curculionidae	Mesoptiliinae	*Magdalis gentilis*	1.74E+00

BOLD:ACR6001	Curculionidae	Mesoptiliinae	*Magdalis gentilis*	1.70E+00
BOLD:ACA6067	Curculionidae	Molytinae	*Conotrachelus anaglypticus*	2.46E+00
BOLD:ACP8780	Curculionidae	Molytinae	*Conotrachelus anaglypticus*	5.36E+00
BOLD:ACB1098	Curculionidae	Molytinae	*Conotrachelus aratus*	3.54E+00
BOLD:ADJ2423	Curculionidae	Molytinae	*Conotrachelus crataegi*	1.44E+01
BOLD:ACY2140	Curculionidae	Molytinae	*Conotrachelus elegans*	2.38E+00
BOLD:ACA6003	Curculionidae	Molytinae	*Conotrachelus juglandis*	5.34E+00
BOLD:ABA6367	Curculionidae	Molytinae	*Conotrachelus nenuphar*	3.05E+00
BOLD:AAG5221	Curculionidae	Molytinae	*Conotrachelus nenuphar*	3.95E+00
BOLD:ACB1097	Curculionidae	Molytinae	*Conotrachelus schoofi*	5.34E+00
BOLD:AAG5243	Curculionidae	Molytinae	*Hylobius pales*	3.41E+01
BOLD:AAG5241	Curculionidae	Molytinae	*Hylobius warreni*	6.99E+01
BOLD:AAG5206	Curculionidae	Molytinae	*Lepyrus*	5.38E+01
BOLD:ACQ9042	Curculionidae	Molytinae	*Microhyus setiger*	8.50E-01
BOLD:ACL4426	Curculionidae	Molytinae	*Pissodes*	1.57E+01
BOLD:ACL8324	Curculionidae	Molytinae	*Pissodes fiskei*	1.15E+01
BOLD:ADL0336	Curculionidae	Molytinae	*Pissodes fiskei*	7.15E+00
BOLD:AAQ0034	Curculionidae	Molytinae	*Steremnius carinatus*	2.27E+01
BOLD:ACD0255	Curculionidae	Molytinae	*Steremnius tuberosus*	3.55E+01
BOLD:ACA7603	Curculionidae	Molytinae	*Sthereus horridus*	4.90E+00
BOLD:ACC3413	Curculionidae	Molytinae	*Sthereus quadrituberculatus*	9.18E-01
BOLD:AAE2005	Curculionidae	Scolytinae	*Alniphagus aspericollis*	1.64E+00
BOLD:AAD0158	Curculionidae	Scolytinae	*Anisandrus dispar*	7.81E-01
BOLD:ABW4612	Curculionidae	Scolytinae	*Anisandrus maiche*	1.55E-01
BOLD:AAU7342	Curculionidae	Scolytinae	*Anisandrus sayi*	4.01E-01
BOLD:ACM1751	Curculionidae	Scolytinae	*Corthylus columbianus*	2.12E+00
BOLD:ABW6304	Curculionidae	Scolytinae	*Dendroctonus*	1.86E+01
BOLD:AAA7915	Curculionidae	Scolytinae	*Dendroctonus ponderosae*	2.99E+00
BOLD:AAD6254	Curculionidae	Scolytinae	*Dendroctonus rufipennis*	4.13E+00
BOLD:AAE3430	Curculionidae	Scolytinae	*Dendroctonus valens*	1.44E+01
BOLD:AAJ9256	Curculionidae	Scolytinae	*Dryocoetes autographus*	1.47E+00
BOLD:ACA4013	Curculionidae	Scolytinae	*Dryocoetes granicollis*	3.52E-01
BOLD:ACI8902	Curculionidae	Scolytinae	*Gnathotrichus sulcatus*	6.02E-01
BOLD:ABW1979	Curculionidae	Scolytinae	*Hylastes opacus*	7.26E-01
BOLD:AAU7331	Curculionidae	Scolytinae	*Hylesinus aculeatus*	4.80E-01
BOLD:ABA9073	Curculionidae	Scolytinae	*Hylesinus criddlei*	6.81E-01
BOLD:ACE7600	Curculionidae	Scolytinae	*Hylurgops*	4.00E+00
BOLD:AAI2226	Curculionidae	Scolytinae	*Hylurgops porosus*	1.76E+00
BOLD:ACD0202	Curculionidae	Scolytinae	*Monarthrum mali*	1.18E+00
BOLD:ABY0293	Curculionidae	Scolytinae	*Monarthrum scutellare*	8.69E-01
BOLD:ACF7932	Curculionidae	Scolytinae	*Phloeosinus canadensis*	7.71E-01
BOLD:AAI2850	Curculionidae	Scolytinae	*Phloeosinus punctatus*	6.05E-01
BOLD:AAP7795	Curculionidae	Scolytinae	*Phloeosinus sequoiae*	1.72E+00
BOLD:ABW4275	Curculionidae	Scolytinae	*Phloeotribus piceae*	2.95E-01
BOLD:ABW5076	Curculionidae	Scolytinae	*Pityogenes hopkinsi*	1.37E-01
BOLD:ADI0015	Curculionidae	Scolytinae	*Pityokteines sparsus*	1.82E-01
BOLD:ADH8137	Curculionidae	Scolytinae	*Pityophthorus*	1.54E-01
BOLD:ABW5072	Curculionidae	Scolytinae	*Pityophthorus cariniceps*	3.59E-01
BOLD:ABW5073	Curculionidae	Scolytinae	*Pityophthorus consimilis*	6.68E-02

BOLD:ABX8929	Curculionidae	Scolytinae	*Pityophthorus lautus*	9.25E-02
BOLD:AAG1980	Curculionidae	Scolytinae	*Polygraphus rufipennis*	4.30E-01
BOLD:ACA6060	Curculionidae	Scolytinae	*Polygraphus rufipennis*	4.04E-01
BOLD:ACD8445	Curculionidae	Scolytinae	*Procryphalus mucronatus*	1.06E-01
BOLD:ACA5990	Curculionidae	Scolytinae	*Pseudopityophthorus minutissimus*	9.37E-02
BOLD:AAD1195	Curculionidae	Scolytinae	*Scolytus multistriatus*	7.62E-01
BOLD:AAU7292	Curculionidae	Scolytinae	*Scolytus muticus*	6.40E-01
BOLD:AAP7870	Curculionidae	Scolytinae	*Scolytus piceae*	4.79E-01
BOLD:ACT7094	Curculionidae	Scolytinae	*Scolytus tsugae*	1.42E+00
BOLD:AAB7844	Curculionidae	Scolytinae	*Trypodendron domesticum*	7.80E-01
BOLD:AAB3221	Curculionidae	Scolytinae	*Trypodendron lineatum*	1.16E+00
BOLD:AAB3222	Curculionidae	Scolytinae	*Trypodendron lineatum*	1.24E+00
BOLD:AAB3223	Curculionidae	Scolytinae	*Trypodendron lineatum*	9.23E-01
BOLD:ACT5022	Curculionidae	Scolytinae	*Trypodendron retusum*	2.45E-01
BOLD:AAB2754	Curculionidae	Scolytinae	*Xyleborinus attenuatus*	4.24E-01
BOLD:AAB9577	Curculionidae	Scolytinae	*Xyleborinus saxeseni*	1.56E-01
BOLD:AAB9578	Curculionidae	Scolytinae	*Xyleborinus saxeseni*	1.41E-01
BOLD:AAM7754	Curculionidae	Scolytinae	*Xylosandrus crassiusculus*	4.54E-01
BOLD:AAF7523	Curculionidae	Scolytinae	*Xylosandrus germanus*	3.50E-01
BOLD:ACG3487	Curculionidae	Scolytinae		1.19E-01
BOLD:ACK1847	Curculionidae	Scolytinae		6.32E-01
BOLD:AAG5210	Curculionidae			6.24E-01
BOLD:ACN6570	Curculionidae			2.46E-01
BOLD:ADJ4557	Curculionidae			8.39E-01
BOLD:ADL6654	Curculionidae			8.52E-01
BOLD:ADF5508	Curculionidae			2.17E+01
BOLD:ACA6365	Dermestidae	Attageninae	*Attagenus brunneus*	1.50E+00
BOLD:AAI7918	Dermestidae	Attageninae	*Attagenus unicolor*	1.84E+00
BOLD:AAH0173	Dermestidae	Dermestinae	*Dermestes*	1.24E+01
BOLD:AAG2032	Dermestidae	Dermestinae	*Dermestes lardarius*	9.11E+00
BOLD:ACL6789	Dermestidae	Megatominae	*Anthrenus castaneae*	3.79E-01
BOLD:AAG2033	Dermestidae	Megatominae	*Anthrenus fuscus*	1.55E-01
BOLD:AAO1475	Dermestidae	Megatominae	*Anthrenus museorum*	2.81E-01
BOLD:AAW5868	Dermestidae	Megatominae	*Anthrenus verbasci*	2.58E-01
BOLD:AAM7612	Dermestidae	Megatominae	*Cryptorhopalum triste*	3.42E-01
BOLD:AAW5869	Dermestidae	Megatominae	*Trogoderma*	4.06E-01
BOLD:AAP7857	Dermestidae	Orphilinae	*Orphilus subnitidus*	1.26E+00
BOLD:AAU7329	Derotontidae	Laricobiinae	*Laricobius rubidus*	2.46E-01
BOLD:AAH0110	Dryophthoridae	Dryophthorinae	*Dryophthorus americanus*	6.37E-01
BOLD:ADI8736	Dryophthoridae	Dryophthorinae	*Sphenophorus zeae*	1.63E+01
BOLD:AAD3545	Dytiscidae	Agabinae	*Agabus*	7.55E+00
BOLD:AAC9201	Dytiscidae	Agabinae	*Agabus ajax*	1.55E+01
BOLD:ABA4846	Dytiscidae	Agabinae	*Agabus ambiguus*	1.25E+01
BOLD:AAB9957	Dytiscidae	Agabinae	*Agabus antennatus*	9.06E+00
BOLD:AAB3815	Dytiscidae	Agabinae	*Agabus arcticus*	4.57E+00
BOLD:AAD3546	Dytiscidae	Agabinae	*Agabus audeni*	2.33E+01
BOLD:AAE6444	Dytiscidae	Agabinae	*Agabus clavicornis*	6.77E+00
BOLD:AAB9955	Dytiscidae	Agabinae	*Agabus colymbus*	4.09E+00

BOLD:AAE9447	Dytiscidae	Agabinae	*Agabus crassipes*	3.02E+01
BOLD:AAB4638	Dytiscidae	Agabinae	*Agabus infuscatus*	7.20E+00
BOLD:ACA6276	Dytiscidae	Agabinae	*Agabus leptapsis*	1.66E+01
BOLD:AAD3547	Dytiscidae	Agabinae	*Agabus thomsoni*	9.47E+00
BOLD:ABV4643	Dytiscidae	Agabinae	*Agabus tristis*	4.84E+01
BOLD:AAH3845	Dytiscidae	Agabinae	*Ilybiosoma seriatum*	1.17E+01
BOLD:AAY6634	Dytiscidae	Agabinae	*Ilybius*	6.37E+00
BOLD:AAH0146	Dytiscidae	Agabinae	*Ilybius biguttulus*	2.70E+01
BOLD:AAA9163	Dytiscidae	Agabinae	*Ilybius churchillensis*	1.88E+01
BOLD:AAD4344	Dytiscidae	Agabinae	*Ilybius discedens*	3.56E+00
BOLD:AAD6399	Dytiscidae	Agabinae	*Ilybius erichsoni*	3.47E+01
BOLD:AAH2912	Dytiscidae	Agabinae	*Ilybius fraterculus*	3.05E+01
BOLD:ACA6260	Dytiscidae	Agabinae	*Ilybius hypomelas*	6.62E+00
BOLD:AAH3846	Dytiscidae	Agabinae	*Ilybius larsoni*	4.85E+00
BOLD:AAP6240	Dytiscidae	Agabinae	*Ilybius oblitus*	2.86E+01
BOLD:AAB8834	Dytiscidae	Agabinae	*Ilybius subaeneus*	1.50E+01
BOLD:ACA6310	Dytiscidae	Agabinae	*Ilybius vancouverensis*	1.17E+01
BOLD:AAA6661	Dytiscidae	Colymbetinae	*Colymbetes dolabratus*	6.42E+01
BOLD:ACA6498	Dytiscidae	Colymbetinae	*Neoscutopterus angustus*	5.77E+01
BOLD:AAF3756	Dytiscidae	Colymbetinae	*Neoscutopterus hornii*	8.09E+01
BOLD:AAH3812	Dytiscidae	Colymbetinae	*Rhantus binotatus*	2.66E+01
BOLD:AAH3816	Dytiscidae	Colymbetinae	*Rhantus sinuatus*	4.43E+00
BOLD:AAC1783	Dytiscidae	Colymbetinae	*Rhantus wallisi*	2.34E+01
BOLD:AAN6114	Dytiscidae	Copelatinae	*Copelatus glyphicus*	1.31E+00
BOLD:ABW8719	Dytiscidae	Coptotominae	*Coptotomus*	1.44E+01
BOLD:AAH3847	Dytiscidae	Coptotominae	*Coptotomus longulus*	2.23E+00
BOLD:ACA6659	Dytiscidae	Dytiscinae	*Acilius mediatus*	3.35E+01
BOLD:AAB6147	Dytiscidae	Dytiscinae	*Dytiscus dauricus*	7.49E+02
BOLD:AAH0231	Dytiscidae	Dytiscinae	*Dytiscus fasciventris*	2.02E+02
BOLD:AAL3231	Dytiscidae	Dytiscinae	*Graphoderus fascicollis*	8.03E+01
BOLD:AAL3232	Dytiscidae	Dytiscinae	*Graphoderus liberus*	3.65E+01
BOLD:AAH3817	Dytiscidae	Dytiscinae	*Graphoderus occidentalis*	5.08E+01
BOLD:AAI6674	Dytiscidae	Dytiscinae	*Graphoderus perplexus*	6.15E+01
BOLD:AAU6902	Dytiscidae	Hydroporinae	*Boreonectes striatellus*	1.45E+00
BOLD:ADI3882	Dytiscidae	Hydroporinae	*Coelambus*	3.46E-01
BOLD:AAN6194	Dytiscidae	Hydroporinae	*Coelambus falli*	2.29E+00
BOLD:AAH3828	Dytiscidae	Hydroporinae	*Coelambus impressopunctatus*	3.82E+00
BOLD:AAH0075	Dytiscidae	Hydroporinae	*Coelambus marklini*	5.48E-01
BOLD:AAD1015	Dytiscidae	Hydroporinae	*Coelambus novemlineatus*	1.73E+00
BOLD:AAM7741	Dytiscidae	Hydroporinae	*Coelambus nubilus*	2.64E+00
BOLD:AAD0154	Dytiscidae	Hydroporinae	*Coelambus patruelis*	1.45E+00
BOLD:AAY6639	Dytiscidae	Hydroporinae	*Coelambus picatus*	8.17E-01
BOLD:AAD0153	Dytiscidae	Hydroporinae	*Coelambus unguicularis*	4.18E+00
BOLD:ACO4071	Dytiscidae	Hydroporinae	*Desmopachria convexa*	2.53E-01
BOLD:AAC3601	Dytiscidae	Hydroporinae	*Hydroporus*	8.90E-01
BOLD:AAF1062	Dytiscidae	Hydroporinae	*Hydroporus dentellus*	2.08E+00
BOLD:AAC3600	Dytiscidae	Hydroporinae	*Hydroporus fuscipennis*	8.86E-01
BOLD:AAC3602	Dytiscidae	Hydroporinae	*Hydroporus lapponum*	1.10E+00
BOLD:AAK5636	Dytiscidae	Hydroporinae	*Hydroporus larsoni*	7.95E-01

BOLD:AAH0267	Dytiscidae	Hydroporinae	*Hydroporus mannerheimi*	2.13E+00
BOLD:ADJ0092	Dytiscidae	Hydroporinae	*Hydroporus melsheimeri*	1.17E+00
BOLD:AAH0451	Dytiscidae	Hydroporinae	*Hydroporus morio*	1.09E+00
BOLD:AAD3633	Dytiscidae	Hydroporinae	*Hydroporus notabilis*	9.72E-01
BOLD:AAH3827	Dytiscidae	Hydroporinae	*Hydroporus occidentalis*	6.92E-01
BOLD:AAD3632	Dytiscidae	Hydroporinae	*Hydroporus sinuatipes*	1.86E+00
BOLD:ACE6560	Dytiscidae	Hydroporinae	*Hydroporus striola*	2.93E-01
BOLD:ABU9932	Dytiscidae	Hydroporinae	*Hydrovatus pustulatus*	5.28E-01
BOLD:AAN3354	Dytiscidae	Hydroporinae	*Hygrotus*	1.62E+00
BOLD:AAM7655	Dytiscidae	Hydroporinae	*Liodessus*	2.08E-01
BOLD:ABX2491	Dytiscidae	Hydroporinae	*Liodessus obscurellus*	2.45E-01
BOLD:AAH3810	Dytiscidae	Hydroporinae	*Nebrioporus rotundatus*	3.86E+00
BOLD:AAM7673	Dytiscidae	Hydroporinae	*Neoporus undulatus*	1.11E+00
BOLD:ADI9308	Dytiscidae	Hydroporinae	*Neoporus vitiosus*	1.21E+00
BOLD:AAH3813	Dytiscidae	Hydroporinae	*Oreodytes laevis*	2.11E+00
BOLD:AAM7675	Dytiscidae	Hydroporinae	*Oreodytes scitulus*	1.34E+00
BOLD:AAC0473	Dytiscidae	Hydroporinae	*Stictotarsus griseostriatus*	3.03E+00
BOLD:ACY7703	Dytiscidae	Hydroporinae	*Stictotarsus griseostriatus*	1.65E+00
BOLD:AAU7152	Dytiscidae	Hydroporinae	*Uvarus lacustris*	1.58E-01
BOLD:AAO3879	Dytiscidae	Laccophilinae	*Agabetes acuductus*	5.11E+00
BOLD:AAF2732	Dytiscidae	Laccophilinae	*Laccophilus biguttatus*	2.29E+00
BOLD:AAH0221	Dytiscidae	Laccophilinae	*Laccophilus maculosus*	3.85E+00
BOLD:AAP6241	Dytiscidae	Matinae	*Matus bicarinatus*	1.38E+01
BOLD:AAH3815	Dytiscidae	Matinae	*Matus ovatus*	4.93E+00
BOLD:ADI6994	Dytiscidae			1.16E-01
BOLD:AAP6369	Elateridae	Agrypninae	*Aeolus mellillus*	2.02E+00
BOLD:ABA4842	Elateridae	Agrypninae	*Aeolus mellillus*	4.93E+00
BOLD:ACP9027	Elateridae	Agrypninae	*Aeolus mellillus*	2.09E+00
BOLD:AAH0252	Elateridae	Agrypninae	*Alaus oculatus*	3.08E+02
BOLD:AAM7590	Elateridae	Agrypninae	*Conoderus bellus*	3.92E-01
BOLD:ACA4121	Elateridae	Agrypninae	*Danosoma brevicorne*	2.64E+01
BOLD:ACA3714	Elateridae	Agrypninae	*Lacon auroratus*	2.62E+01
BOLD:ACA4074	Elateridae	Agrypninae	*Lacon discoideus*	1.87E+01
BOLD:AAH2380	Elateridae	Cardiophorinae	*Cardiophorus convexus*	9.10E+00
BOLD:AAP6368	Elateridae	Cardiophorinae	*Cardiophorus convexus*	5.40E+00
BOLD:ACC7779	Elateridae	Cardiophorinae	*Cardiophorus convexus*	8.35E+00
BOLD:ACS7918	Elateridae	Cardiophorinae	*Cardiophorus gagates*	7.42E+00
BOLD:AAU7124	Elateridae	Cardiophorinae	*Horistonotus curiatus*	1.04E+00
BOLD:AAH2365	Elateridae	Dendrometrinae	*Ascoliocerus sanborni*	6.17E+00
BOLD:ACB0820	Elateridae	Dendrometrinae	*Athous*	4.15E+00
BOLD:AAH2433	Elateridae	Dendrometrinae	*Athous acanthus*	3.84E+00
BOLD:AAH2428	Elateridae	Dendrometrinae	*Athous brightwelli*	2.52E+01
BOLD:ACA3913	Elateridae	Dendrometrinae	*Athous brightwelli*	9.94E+00
BOLD:AAU7149	Elateridae	Dendrometrinae	*Athous cucullatus*	9.13E+00
BOLD:ACL0167	Elateridae	Dendrometrinae	*Athous fossularis*	1.23E+01
BOLD:AAO0995	Elateridae	Dendrometrinae	*Athous haemorrhoidalis*	1.09E+01
BOLD:ABX0929	Elateridae	Dendrometrinae	*Athous nigropilis*	1.71E+01
BOLD:AAY6546	Elateridae	Dendrometrinae	*Athous orvus*	9.20E+00
BOLD:AAH2381	Elateridae	Dendrometrinae	*Athous productus*	1.56E+01

BOLD:ACA3928	Elateridae	Dendrometrinae	*Athous rufifrons*	8.43E+00
BOLD:ACA3890	Elateridae	Dendrometrinae	*Athous scapularis*	1.26E+01
BOLD:AAP7790	Elateridae	Dendrometrinae	*Athous sierrae*	6.18E+00
BOLD:ACH1358	Elateridae	Dendrometrinae	*Berninelsonius hyperboreus*	2.89E+00
BOLD:AAH2414	Elateridae	Dendrometrinae	*Corymbitodes pygmaeus*	4.30E+00
BOLD:ACV5201	Elateridae	Dendrometrinae	*Corymbitodes tarsalis*	1.13E+01
BOLD:AAQ0082	Elateridae	Dendrometrinae	*Ctenicera angularis*	5.23E+00
BOLD:AAQ0086	Elateridae	Dendrometrinae	*Ctenicera angusticollis*	1.57E+01
BOLD:AAV9084	Elateridae	Dendrometrinae	*Ctenicera angusticollis*	1.24E+01
BOLD:ACX2352	Elateridae	Dendrometrinae	*Ctenicera comes*	1.74E+01
BOLD:ACV1072	Elateridae	Dendrometrinae	*Ctenicera pyrrhos*	4.07E+01
BOLD:AAH0466	Elateridae	Dendrometrinae	*Denticollis denticornis*	5.83E+00
BOLD:ACM1124	Elateridae	Dendrometrinae	*Denticollis denticornis*	8.85E+00
BOLD:ACM1366	Elateridae	Dendrometrinae	*Denticollis denticornis*	6.84E+00
BOLD:AAN5519	Elateridae	Dendrometrinae	*Denticollis varians*	2.71E+00
BOLD:ABZ4555	Elateridae	Dendrometrinae	*Eanus albertanus*	2.13E+00
BOLD:AAH2366	Elateridae	Dendrometrinae	*Eanus decoratus*	5.28E+00
BOLD:AAQ0090	Elateridae	Dendrometrinae	*Eanus estriatus*	4.85E+00
BOLD:ACN9356	Elateridae	Dendrometrinae	*Eanus maculipennis*	1.57E+00
BOLD:ACA4105	Elateridae	Dendrometrinae	*Elathous nebulosus*	7.66E+00
BOLD:ACA3452	Elateridae	Dendrometrinae	*Hadromorphus glaucus*	1.05E+01
BOLD:AAU7314	Elateridae	Dendrometrinae	*Hadromorphus inflatus*	1.37E+01
BOLD:ACJ3091	Elateridae	Dendrometrinae	*Hemicrepidius*	5.00E+00
BOLD:ACR2773	Elateridae	Dendrometrinae	*Hemicrepidius*	3.13E+00
BOLD:ACG6167	Elateridae	Dendrometrinae	*Hemicrepidius bilobatus*	2.10E+01
BOLD:AAP6367	Elateridae	Dendrometrinae	*Hemicrepidius brevicollis*	2.60E+01
BOLD:ACA2538	Elateridae	Dendrometrinae	*Hemicrepidius hemipodus*	1.45E+01
BOLD:AAH2373	Elateridae	Dendrometrinae	*Hemicrepidius memnonius*	3.27E+01
BOLD:AAH2413	Elateridae	Dendrometrinae	*Hypnoidus*	2.01E+00
BOLD:AAH2367	Elateridae	Dendrometrinae	*Hypnoidus bicolor*	1.56E+00
BOLD:AAX2226	Elateridae	Dendrometrinae	*Hypnoidus leei*	3.46E+00
BOLD:ACA4062	Elateridae	Dendrometrinae	*Hypoganus sulcicollis*	3.57E+01
BOLD:AAH2385	Elateridae	Dendrometrinae	*Liotrichus*	2.08E+01
BOLD:ACA3938	Elateridae	Dendrometrinae	*Liotrichus falsificus*	4.35E+00
BOLD:ACA4130	Elateridae	Dendrometrinae	*Liotrichus sagitticollis*	1.46E+01
BOLD:AAH2396	Elateridae	Dendrometrinae	*Liotrichus umbricola*	1.47E+01
BOLD:ACI5065	Elateridae	Dendrometrinae	*Liotrichus umbripennis*	2.73E+00
BOLD:AAH2374	Elateridae	Dendrometrinae	*Liotrichus volitans*	2.24E+01
BOLD:ACM6748	Elateridae	Dendrometrinae	*Liotrichus vulneratus*	1.22E+01
BOLD:AAQ0081	Elateridae	Dendrometrinae	*Metanomus insidiosus*	5.35E+00
BOLD:AAH2387	Elateridae	Dendrometrinae	*Nitidolimonius resplendens*	3.01E+01
BOLD:AAQ0073	Elateridae	Dendrometrinae	*Nitidolimonius resplendens*	1.93E+01
BOLD:ABX5492	Elateridae	Dendrometrinae	*Nitidolimonius resplendens*	2.67E+01
BOLD:ACA2470	Elateridae	Dendrometrinae	*Oxygonus montanus*	6.41E+00
BOLD:AAU7335	Elateridae	Dendrometrinae	*Oxygonus obesus*	7.85E+00
BOLD:AAH2398	Elateridae	Dendrometrinae	*Prosternon bombycinum*	1.59E+01
BOLD:AAJ5833	Elateridae	Dendrometrinae	*Prosternon medianum*	1.43E+01
BOLD:AAH2430	Elateridae	Dendrometrinae	*Pseudanostirus hamatus*	8.73E+00
BOLD:AAH2434	Elateridae	Dendrometrinae	*Pseudanostirus hieroglyphicus*	1.76E+01

BOLD:AAQ0079	Elateridae	Dendrometrinae	*Pseudanostirus hoppingi*	4.45E+00
BOLD:ACU3540	Elateridae	Dendrometrinae	*Pseudanostirus nebraskensis*	9.23E+00
BOLD:AAQ0076	Elateridae	Dendrometrinae	*Pseudanostirus nigricollis*	1.58E+01
BOLD:AAM6643	Elateridae	Dendrometrinae	*Pseudanostirus ochreipennis*	5.28E+00
BOLD:AAH2386	Elateridae	Dendrometrinae	*Pseudanostirus propolus*	6.48E+00
BOLD:AAH2429	Elateridae	Dendrometrinae	*Pseudanostirus propolus*	5.95E+00
BOLD:ACG1380	Elateridae	Dendrometrinae	*Pseudanostirus propolus*	4.40E+00
BOLD:AAX8328	Elateridae	Dendrometrinae	*Pseudanostirus pudicus*	1.28E+01
BOLD:ACU2924	Elateridae	Dendrometrinae	*Pseudanostirus tigrinus*	1.33E+01
BOLD:AAH2384	Elateridae	Dendrometrinae	*Pseudanostirus triundulatus*	3.75E+00
BOLD:ACG1315	Elateridae	Dendrometrinae	*Selatosomus aeripennis*	2.43E+01
BOLD:AAH2391	Elateridae	Dendrometrinae	*Selatosomus appropinquans*	4.30E+01
BOLD:ACA3234	Elateridae	Dendrometrinae	*Selatosomus festivus*	1.88E+01
BOLD:ACD0395	Elateridae	Dendrometrinae	*Selatosomus morulus*	4.84E+00
BOLD:ACA2594	Elateridae	Dendrometrinae	*Selatosomus pulcher*	1.04E+01
BOLD:ACC6977	Elateridae	Dendrometrinae	*Selatosomus pulcher*	1.57E+01
BOLD:ACC6978	Elateridae	Dendrometrinae	*Selatosomus pulcher*	1.42E+01
BOLD:ACS7360	Elateridae	Dendrometrinae	*Selatosomus pulcher*	1.08E+01
BOLD:ACA3235	Elateridae	Dendrometrinae	*Selatosomus suckleyi*	2.61E+01
BOLD:AAH2431	Elateridae	Dendrometrinae	*Setasomus aratus*	1.47E+01
BOLD:AAH2393	Elateridae	Dendrometrinae	*Setasomus nitidulus*	1.05E+01
BOLD:AAH2370	Elateridae	Dendrometrinae	*Sylvanelater cylindriformis*	1.85E+01
BOLD:ABX5949	Elateridae	Dendrometrinae	*Sylvanelater cylindriformis*	3.88E+01
BOLD:AAH2394	Elateridae	Dendrometrinae	*Sylvanelater mendax*	7.05E+00
BOLD:AAH2377	Elateridae	Elaterinae	*Agriotes avulsus*	3.95E+00
BOLD:ACG6792	Elateridae	Elaterinae	*Agriotes ferrugineipennis*	1.28E+01
BOLD:AAH2369	Elateridae	Elaterinae	*Agriotes fucosus*	1.93E+01
BOLD:AAH2432	Elateridae	Elaterinae	*Agriotes limosus*	4.14E+00
BOLD:AAL6108	Elateridae	Elaterinae	*Agriotes lineatus*	1.14E+01
BOLD:ABA4841	Elateridae	Elaterinae	*Agriotes mancus*	7.55E+00
BOLD:ACR4426	Elateridae	Elaterinae	*Agriotes oblongicollis*	4.68E+00
BOLD:AAW1955	Elateridae	Elaterinae	*Agriotes pubescens*	7.35E+00
BOLD:ADD1782	Elateridae	Elaterinae	*Agriotes sparsus*	2.46E+00
BOLD:AAL5975	Elateridae	Elaterinae	*Agriotes sputator*	3.94E+00
BOLD:AAW1968	Elateridae	Elaterinae	*Agriotes stabilis*	1.47E+01
BOLD:AAQ0075	Elateridae	Elaterinae	*Ampedus*	1.15E+01
BOLD:ACF2222	Elateridae	Elaterinae	*Ampedus*	1.39E+01
BOLD:ACU9860	Elateridae	Elaterinae	*Ampedus*	3.31E+00
BOLD:ABA6316	Elateridae	Elaterinae	*Ampedus areolatus*	1.12E+00
BOLD:ACM2015	Elateridae	Elaterinae	*Ampedus areolatus*	1.28E+00
BOLD:AAN6198	Elateridae	Elaterinae	*Ampedus deletus*	2.15E+00
BOLD:ACI7343	Elateridae	Elaterinae	*Ampedus deletus*	3.17E+00
BOLD:ACC3560	Elateridae	Elaterinae	*Ampedus dimidiatus*	1.01E+01
BOLD:ACI5717	Elateridae	Elaterinae	*Ampedus evansi*	1.22E+01
BOLD:ACA6173	Elateridae	Elaterinae	*Ampedus fuscatus*	7.25E+00
BOLD:ACA6098	Elateridae	Elaterinae	*Ampedus fusculus*	2.67E+00
BOLD:AAU7141	Elateridae	Elaterinae	*Ampedus linteus*	4.34E+00
BOLD:AAH2390	Elateridae	Elaterinae	*Ampedus luctuosus*	8.30E+00
BOLD:AAQ0087	Elateridae	Elaterinae	*Ampedus luctuosus*	1.54E+01

BOLD:ACA6171	Elateridae	Elaterinae	*Ampedus melsheimeri*	1.54E+01
BOLD:ACF8200	Elateridae	Elaterinae	*Ampedus miniipennis*	1.95E+00
BOLD:AAU6971	Elateridae	Elaterinae	*Ampedus mixtus*	5.70E+00
BOLD:ACE3330	Elateridae	Elaterinae	*Ampedus moerens*	1.40E+01
BOLD:ACU9753	Elateridae	Elaterinae	*Ampedus nigricans*	1.43E+01
BOLD:AAH2376	Elateridae	Elaterinae	*Ampedus nigricollis*	2.06E+01
BOLD:AAM6642	Elateridae	Elaterinae	*Ampedus nigrinus*	3.11E+00
BOLD:ACG6373	Elateridae	Elaterinae	*Ampedus nigrinus*	1.88E+00
BOLD:ACU3542	Elateridae	Elaterinae	*Ampedus nigrinus*	3.72E+00
BOLD:ACA3849	Elateridae	Elaterinae	*Ampedus oblessus*	1.11E+01
BOLD:AAY6525	Elateridae	Elaterinae	*Ampedus pedalis*	6.55E+00
BOLD:ACA3174	Elateridae	Elaterinae	*Ampedus phoenicopterus*	1.45E+01
BOLD:ACR3975	Elateridae	Elaterinae	*Ampedus protervus*	1.18E+01
BOLD:AAP7863	Elateridae	Elaterinae	*Ampedus pullus*	2.43E+00
BOLD:ACC8889	Elateridae	Elaterinae	*Ampedus rhodopus*	1.76E+01
BOLD:ACC8890	Elateridae	Elaterinae	*Ampedus rhodopus*	9.90E+00
BOLD:ACG6433	Elateridae	Elaterinae	*Ampedus semicinctus*	1.36E+01
BOLD:ABX7717	Elateridae	Elaterinae	*Ampedus sp. C*	8.35E+00
BOLD:ACT5541	Elateridae	Elaterinae	*Ampedus varipilis*	5.93E+00
BOLD:ACA2840	Elateridae	Elaterinae	*Ampedus verticinus*	3.07E+01
BOLD:ACA3153	Elateridae	Elaterinae	*Ampedus vitiosus*	1.99E+01
BOLD:AAP7063	Elateridae	Elaterinae	*Dalopius asellus*	1.98E+00
BOLD:ACL1459	Elateridae	Elaterinae	*Dalopius fuscipes*	1.85E+00
BOLD:ACG2607	Elateridae	Elaterinae	*Dalopius gartrelli*	1.57E+00
BOLD:AAU7316	Elateridae	Elaterinae	*Dalopius gentilis*	3.13E+00
BOLD:ADH8761	Elateridae	Elaterinae	*Dalopius gentilis*	2.34E+00
BOLD:AAQ0089	Elateridae	Elaterinae	*Dalopius insulanus*	3.10E+00
BOLD:AAH2372	Elateridae	Elaterinae	*Dalopius pallidus*	2.65E+00
BOLD:AAP7081	Elateridae	Elaterinae	*Dalopius suspectus*	2.35E+00
BOLD:AAL8068	Elateridae	Elaterinae	*Dalopius tristis*	3.32E+00
BOLD:AAH2388	Elateridae	Elaterinae	*Dalopius vagus*	3.95E+00
BOLD:AAH2416	Elateridae	Elaterinae	*Dalopius vagus*	2.29E+00
BOLD:AAH0434	Elateridae	Elaterinae	*Dolerosomus silaceus*	2.45E+00
BOLD:AAX7307	Elateridae	Elaterinae	*Elater abruptus*	6.29E+01
BOLD:ACA3788	Elateridae	Elaterinae	*Idolus bigeminatus*	1.44E+00
BOLD:ACL4967	Elateridae	Elaterinae	*Idolus columbiana*	5.41E+00
BOLD:ACF8199	Elateridae	Elaterinae	*Idolus debilis*	1.03E+00
BOLD:ACJ0724	Elateridae	Elaterinae	*Idolus debilis*	1.06E+00
BOLD:ACM7372	Elateridae	Elaterinae	*Megapenthes caprella*	4.02E+00
BOLD:ACF8587	Elateridae	Elaterinae	*Megapenthes stigmosus*	2.47E+00
BOLD:AAH2378	Elateridae	Elaterinae	*Melanotus castanipes*	2.32E+01
BOLD:AAH2392	Elateridae	Elaterinae	*Melanotus castanipes*	2.64E+01
BOLD:AAH0144	Elateridae	Elaterinae	*Melanotus communis*	2.16E+01
BOLD:AAZ2240	Elateridae	Elaterinae	*Melanotus decumanus*	1.87E+01
BOLD:ACB0856	Elateridae	Elaterinae	*Melanotus hyslopi*	1.38E+01
BOLD:AAH2375	Elateridae	Elaterinae	*Melanotus prasinus*	6.22E+00
BOLD:ACF3126	Elateridae	Elaterinae	*Melanotus prasinus*	6.86E+00
BOLD:AAF3428	Elateridae	Elaterinae	*Melanotus similis*	2.16E+01
BOLD:AAH0376	Elateridae	Elaterinae	*Melanotus similis*	3.04E+01

BOLD:AAH2382	Elateridae	Elaterinae	*Melanotus similis*	2.53E+01
BOLD:AAM7567	Elateridae	Elaterinae	*Melanotus similis*	4.05E+01
BOLD:AAH0377	Elateridae	Elaterinae	*Melanotus sp. OPC-2015*	1.13E+01
BOLD:ACA3090	Elateridae	Elaterinae	*Melanotus spadix*	3.60E+01
BOLD:AAM7566	Elateridae	Elaterinae	*Melanotus testaceus*	9.24E+00
BOLD:ADG1495	Elateridae	Elaterinae	*Melanotus trapezoideus*	5.18E+00
BOLD:AAH2400	Elateridae	Elaterinae	*Parallelostethus attenuatus*	7.02E+01
BOLD:ACA3854	Elateridae	Elaterinae	*Sericus honestus*	3.66E+01
BOLD:AAH2395	Elateridae	Elaterinae	*Sericus incongruus*	4.45E+00
BOLD:ACF1756	Elateridae	Elaterinae	*Sericus incongruus*	2.85E+00
BOLD:AAZ1201	Elateridae	Elaterinae	*Sericus viridanus*	9.44E+00
BOLD:ACV4495	Elateridae	Negastriinae	*Negastrius*	1.30E-01
BOLD:ACA4072	Elateridae	Negastriinae	*Neohypdonus restrictulus*	3.47E-01
BOLD:AAH2417	Elateridae	Negastriinae	*Neohypdonus tumescens*	6.68E-01
BOLD:AAH2383	Elateridae	Prosterninae	*Limonius aeger*	3.20E+00
BOLD:AAH2415	Elateridae	Prosterninae	*Limonius aeger*	2.45E+00
BOLD:AAH2419	Elateridae	Prosterninae	*Limonius aeger*	1.22E+00
BOLD:AAU7320	Elateridae	Prosterninae	*Limonius aurifer*	2.70E+00
BOLD:AAX5083	Elateridae	Prosterninae	*Limonius confusus*	6.14E+00
BOLD:ACG6861	Elateridae	Prosterninae	*Limonius ectypus*	1.24E+01
BOLD:ACG6637	Elateridae	Prosterninae	*Limonius ectypus*	9.85E+00
BOLD:ACA2944	Elateridae	Prosterninae	*Limonius plebejus*	7.80E+00
BOLD:ADH4381	Elateridae	Prosterninae	*Limonius rudis*	1.88E+01
BOLD:AAM7669	Elateridae			2.48E-01
BOLD:ADC9898	Elateridae			9.24E+00
BOLD:ADI5805	Elateridae			8.91E+00
BOLD:ADI7199	Elateridae			5.63E+00
BOLD:ADL7087	Elateridae			6.11E+00
BOLD:ADM1269	Elateridae			9.77E+00
BOLD:ADI6893	Elateridae			1.01E+01
BOLD:ADI8850	Elateridae			6.40E+01
BOLD:ADJ1669	Elateridae			1.04E+01
BOLD:ADJ2061	Elateridae			4.42E+01
BOLD:ADJ5626	Elateridae			1.42E+01
BOLD:AAF6867	Elmidae	Elminae	*Dubiraphia vittata*	4.01E-01
BOLD:AAE7495	Elmidae	Elminae	*Macronychus glabratus*	1.09E+00
BOLD:AAA9073	Elmidae	Elminae	*Optioservus*	5.27E-01
BOLD:AAN4596	Elmidae	Elminae	*Optioservus*	1.11E+00
BOLD:AAC5827	Elmidae	Elminae	*Promoresia tardella*	3.33E-01
BOLD:ADI7983	Elmidae	Elminae	*Stenelmis crenata*	1.18E+00
BOLD:ABZ5521	Elmidae	Elminae	*Stenelmis quadrimaculata*	4.75E-01
BOLD:AAN5764	Elmidae	Elminae	*Zaitzevia*	2.74E-01
BOLD:ADH7835	Endomychidae	Anamorphinae	*Symbiotes*	1.85E-01
BOLD:ACL2587	Endomychidae	Anamorphinae	*Symbiotes duryi*	2.04E-01
BOLD:ACA8446	Endomychidae	Anamorphinae	*Symbiotes gibberosus*	1.26E-01
BOLD:AAX7549	Endomychidae	Endomychinae	*Endomychus biguttatus*	2.10E+00
BOLD:ACF6542	Endomychidae	Leiestinae	*Phymaphora pulchella*	8.82E-01
BOLD:ACA9754	Endomychidae	Lycoperdininae	*Aphorista vittata*	4.93E+00
BOLD:AAH3321	Endomychidae	Lycoperdininae	*Mycetina perpulchra*	1.52E+00

BOLD:AAU7317	Endomychidae	Stenotarsinae	*Danae testacea*	1.82E+00
BOLD:AAP6170	Erotylidae	Cryptophilinae	*Cryptophilus obliteratus*	2.21E-01
BOLD:ABW2833	Erotylidae	Cryptophilinae	*Cryptophilus obliteratus*	3.57E-01
BOLD:AAY6550	Erotylidae	Cryptophilinae	*Cryptophilus propinquus*	1.01E-01
BOLD:ABA6320	Erotylidae	Cryptophilinae	*Toramus pulchellus*	1.47E-01
BOLD:AAU7330	Erotylidae	Erotylinae	*Dacne quadrimaculata*	4.96E-01
BOLD:AAJ2876	Erotylidae	Erotylinae	*Megalodacne fasciata*	4.99E+01
BOLD:AAP7066	Erotylidae	Erotylinae	*Triplax dissimulator*	1.59E+00
BOLD:ACZ0553	Erotylidae	Erotylinae	*Triplax flavicollis*	1.50E+00
BOLD:AAH0182	Erotylidae	Erotylinae	*Triplax frosti*	4.44E+00
BOLD:ACI9012	Erotylidae	Erotylinae	*Triplax thoracica*	6.81E+00
BOLD:ADI1942	Erotylidae	Erotylinae	*Tritoma humeralis*	6.52E-01
BOLD:ABA6327	Erotylidae	Erotylinae	*Tritoma mimetica*	1.87E+00
BOLD:AAG3209	Erotylidae	Erotylinae	*Tritoma pulchra*	1.65E+00
BOLD:AAU7318	Erotylidae	Erotylinae	*Tritoma pulchra*	4.47E-01
BOLD:ABW2816	Erotylidae	Erotylinae	*Tritoma pulchra*	2.47E+00
BOLD:AAY6536	Erotylidae	Erotylinae	*Tritoma sanguinipennis*	2.38E+00
BOLD:ACA9847	Erotylidae	Languriinae	*Acropteroxys gracilis*	1.87E+00
BOLD:AAH0178	Erotylidae	Languriinae	*Languria mozardi*	2.35E+00
BOLD:ABW2821	Erotylidae	Loberinae	*Loberus impressus*	1.77E-01
BOLD:ADI0877	Erotylidae			1.13E-01
BOLD:ADK5172	Erotylidae			3.44E+00
BOLD:ABW2834	Eucinetidae		*Eucinetus morio*	5.47E-01
BOLD:AAN6196	Eucinetidae		*Eucinetus terminalis*	9.41E-01
BOLD:ACL4517	Eucinetidae		*Nycteus infumatus*	1.63E+00
BOLD:ACE2236	Eucinetidae		*Nycteus punctulatus*	6.83E-01
BOLD:AAN6192	Eucinetidae		*Nycteus testaceus*	1.14E+00
BOLD:AAU7160	Eucnemidae	Macraulacinae	*Deltometopus amoenicornis*	5.49E-01
BOLD:ABA6358	Eucnemidae	Macraulacinae	*Dromaeolus cylindricollis*	5.35E+00
BOLD:ACA5514	Eucnemidae	Macraulacinae	*Isarthrus rufipes*	1.38E+00
BOLD:ACC7122	Eucnemidae	Macraulacinae	*Nematodes penetrans*	1.39E+00
BOLD:ACH4140	Eucnemidae	Macraulacinae	*Nematodes penetrans*	3.11E+00
BOLD:ACZ0703	Eucnemidae	Macraulacinae	*Onichodon canadensis*	1.85E+01
BOLD:ABY1343	Eucnemidae	Melasinae	*Dirrhagofarsus ernae*	3.25E+00
BOLD:ACL1726	Eucnemidae	Melasinae	*Dirrhagofarsus ernae*	2.99E+00
BOLD:AAP7844	Eucnemidae	Melasinae	*Epiphanis cornutus*	2.96E+00
BOLD:ABX8218	Eucnemidae	Melasinae	*Hylis terminalis*	8.79E-01
BOLD:AAY6528	Eucnemidae	Melasinae	*Isorhipis obliqua*	1.11E+00
BOLD:AAY6532	Eucnemidae	Melasinae	*Isorhipis obliqua*	3.32E+00
BOLD:ACG5742	Eucnemidae	Melasinae	*Isorhipis occidentalis*	1.17E+00
BOLD:ABA6339	Eucnemidae	Melasinae	*Microrhagus pectinatus*	1.44E+00
BOLD:ACA7831	Eucnemidae	Melasinae	*Microrhagus subsinuatus*	9.65E-01
BOLD:ADI9851	Eucnemidae			1.28E+00
BOLD:ADI6405	Eucnemidae			1.29E+01
BOLD:ADJ5029	Eucnemidae			1.99E+01
BOLD:AAX0212	Geotrupidae	Bolboceratinae	*Odonteus liebecki*	3.17E+01
BOLD:ACM7148	Geotrupidae	Bolboceratinae	*Odonteus obesus*	2.28E+01
BOLD:AAF9892	Geotrupidae	Geotrupinae	*Geotrupes balyi*	8.22E+01
BOLD:AAZ0097	Geotrupidae	Geotrupinae	*Geotrupes hornii*	2.00E+02

BOLD:ABX0920	Gyrinidae	Enhydrinae	*Dineutus assimilis*	2.31E+01
BOLD:AAG0715	Gyrinidae	Enhydrinae	*Dineutus discolor*	2.46E+01
BOLD:AAG0713	Gyrinidae	Enhydrinae	*Dineutus hornii*	2.69E+01
BOLD:AAG0708	Gyrinidae	Enhydrinae	*Dineutus nigrior*	2.70E+01
BOLD:AAL3435	Gyrinidae	Gyrininae	*Gyrinus aeratus*	2.62E+00
BOLD:AAG0712	Gyrinidae	Gyrininae	*Gyrinus affinis*	9.03E+00
BOLD:AAG0710	Gyrinidae	Gyrininae	*Gyrinus bifarius*	1.23E+01
BOLD:AAF7950	Gyrinidae	Gyrininae	*Gyrinus cavatus*	1.85E+00
BOLD:AAG0707	Gyrinidae	Gyrininae	*Gyrinus confinis*	4.35E+00
BOLD:AAG0711	Gyrinidae	Gyrininae	*Gyrinus consobrinus*	4.25E+00
BOLD:AAF7948	Gyrinidae	Gyrininae	*Gyrinus dubius*	4.45E+00
BOLD:ACL2881	Gyrinidae	Gyrininae	*Gyrinus latilimbus*	5.97E-01
BOLD:AAI1993	Gyrinidae	Gyrininae	*Gyrinus maculiventris*	8.45E+00
BOLD:ACA1981	Gyrinidae	Gyrininae	*Gyrinus marginellus*	9.91E-01
BOLD:AAE6890	Gyrinidae	Gyrininae	*Gyrinus opacus*	4.65E+00
BOLD:ACL2428	Gyrinidae	Gyrininae	*Gyrinus picipes*	5.59E+00
BOLD:AAG0709	Gyrinidae	Gyrininae	*Gyrinus pleuralis*	7.65E+00
BOLD:AAF7936	Gyrinidae	Gyrininae	*Gyrinus wallisi*	6.14E+00
BOLD:ACE4953	Haliplidae		*Haliplus apicalis*	8.44E-01
BOLD:AAY6637	Haliplidae		*Haliplus cribrarius*	3.13E+00
BOLD:AAD5421	Haliplidae		*Haliplus falli*	7.58E-01
BOLD:AAI6895	Haliplidae		*Haliplus immaculicollis*	9.12E-01
BOLD:ACD6441	Haliplidae		*Haliplus immaculicollis*	4.55E-01
BOLD:ACL2224	Haliplidae		*Haliplus leechi*	2.80E+00
BOLD:ADI7329	Haliplidae		*Haliplus lucigelinae*	1.02E+00
BOLD:AAD5422	Haliplidae		*Haliplus stagninus*	6.81E-01
BOLD:ACU6480	Haliplidae		*Peltodytes muticus*	1.21E+00
BOLD:ADK9929	Haliplidae			8.62E-01
BOLD:AAH0403	Heteroceridae	Heterocerinae	*Heterocerus sp.*	1.00E+00
BOLD:AAP7099	Heteroceridae	Heterocerinae	*Lapsus tristis*	7.42E-01
BOLD:AAP7003	Heteroceridae	Heterocerinae	*Neoheterocerus fatuus*	2.06E+00
BOLD:AAH0078	Heteroceridae	Heterocerinae	*Neoheterocerus gnatho*	1.83E+00
BOLD:AAM7592	Heteroceridae	Heterocerinae	*Tropicus pusillus*	2.28E-01
BOLD:ADH5216	Histeridae	Abraeinae	*Acritus depressus*	6.24E-02
BOLD:ADH5215	Histeridae	Abraeinae	*Acritus exiguus*	5.47E-02
BOLD:ADH6444	Histeridae	Abraeinae	*Teretrius*	4.68E-01
BOLD:ADI1929	Histeridae	Dendrophilinae	*Bacanius punctiformis*	4.69E-02
BOLD:ACB1040	Histeridae	Dendrophilinae	*Paromalus mancus*	3.67E-01
BOLD:AAQ0096	Histeridae	Histerinae	*Hister furtivus*	2.63E+01
BOLD:AAP6761	Histeridae	Histerinae	*Margarinotus brunneus*	1.67E+01
BOLD:ADB1881	Histeridae	Histerinae	*Platysoma gracile*	1.61E+00
BOLD:ACW5195	Histeridae	Saprininae	*Euspilotus assimilis*	3.70E+00
BOLD:ADL5446	Histeridae	Saprininae	*Geomysaprinus copei*	2.15E+00
BOLD:ACB0943	Histeridae	Saprininae	*Saprinus oregonensis*	5.82E+00
BOLD:ADJ7887	Histeridae			8.24E+00
BOLD:ADM0883	Histeridae			1.16E+01
BOLD:ABZ3044	Hybosoridae	Ceratocanthinae	*Germarostes aphodioides*	6.85E+00
BOLD:ACX3770	Hydraenidae	Hydraeninae	*Hydraena pacifica*	4.39E-02
BOLD:ACF6529	Hydraenidae	Hydraeninae	*Hydraena pensylvanica*	3.11E-02

BOLD:AAG0475	Hydrophilidae	Helophorinae	*Helophorus arcticus*	1.83E+00
BOLD:ACR8815	Hydrophilidae	Helophorinae	*Helophorus lacustris*	1.24E+00
BOLD:AAY6640	Hydrophilidae	Helophorinae	*Helophorus oblongus*	2.09E+00
BOLD:ABA9957	Hydrophilidae	Helophorinae	*Helophorus sempervarians*	5.41E-01
BOLD:AAH0154	Hydrophilidae	Hydrochinae	*Hydrochus*	8.04E-01
BOLD:ABX0589	Hydrophilidae	Hydrochinae	*Hydrochus neosquamifer*	4.92E-01
BOLD:ADI0175	Hydrophilidae	Hydrophilinae	*Anacaena*	4.41E-01
BOLD:AAF4596	Hydrophilidae	Hydrophilinae	*Anacaena lutescens*	4.00E-01
BOLD:AAH0308	Hydrophilidae	Hydrophilinae	*Berosus fraternus*	6.50E+00
BOLD:AAP7002	Hydrophilidae	Hydrophilinae	*Berosus peregrinus*	1.98E+00
BOLD:AAH0180	Hydrophilidae	Hydrophilinae	*Berosus sayi*	2.45E+00
BOLD:AAU7173	Hydrophilidae	Hydrophilinae	*Chaetarthria pallida*	1.61E-01
BOLD:ACM5968	Hydrophilidae	Hydrophilinae	*Cymbiodyta vindicata*	1.80E+00
BOLD:ACO5348	Hydrophilidae	Hydrophilinae	*Cymbiodyta vindicata*	4.31E+00
BOLD:ACW4992	Hydrophilidae	Hydrophilinae	*Enochrus cinctus*	6.37E+00
BOLD:AAH0211	Hydrophilidae	Hydrophilinae	*Enochrus consortus*	3.15E+00
BOLD:AAH2913	Hydrophilidae	Hydrophilinae	*Enochrus diffusus*	7.95E+00
BOLD:AAH2907	Hydrophilidae	Hydrophilinae	*Enochrus hamiltoni*	1.37E+00
BOLD:AAH2911	Hydrophilidae	Hydrophilinae	*Enochrus hamiltoni*	8.50E-01
BOLD:AAH2917	Hydrophilidae	Hydrophilinae	*Enochrus hamiltoni*	2.03E+00
BOLD:AAH2910	Hydrophilidae	Hydrophilinae	*Enochrus ochraceus*	7.56E-01
BOLD:AAH2918	Hydrophilidae	Hydrophilinae	*Enochrus ochraceus*	9.33E-01
BOLD:AAM7778	Hydrophilidae	Hydrophilinae	*Enochrus ochraceus*	8.84E-01
BOLD:ADI3256	Hydrophilidae	Hydrophilinae	*Enochrus pygmaeus*	9.76E-01
BOLD:AAH2909	Hydrophilidae	Hydrophilinae	*Helocombus bifidus*	7.25E+00
BOLD:AAM7687	Hydrophilidae	Hydrophilinae	*Helocombus bifidus*	6.75E+00
BOLD:AAH0085	Hydrophilidae	Hydrophilinae	*Hydrobius*	1.02E+01
BOLD:AAH2906	Hydrophilidae	Hydrophilinae	*Hydrobius*	2.75E+00
BOLD:AAH2914	Hydrophilidae	Hydrophilinae	*Hydrobius*	2.93E+00
BOLD:AAC5900	Hydrophilidae	Hydrophilinae	*Hydrobius fuscipes*	8.02E+00
BOLD:AAH2908	Hydrophilidae	Hydrophilinae	*Hydrochara obtusata*	7.31E+01
BOLD:AAQ2470	Hydrophilidae	Hydrophilinae	*Hydrophilus triangularis*	7.97E+02
BOLD:AAE5514	Hydrophilidae	Hydrophilinae	*Laccobius cinereus*	5.76E-01
BOLD:ADB0966	Hydrophilidae	Hydrophilinae	*Paracymus*	2.83E-01
BOLD:ADB2675	Hydrophilidae	Hydrophilinae	*Paracymus subcupreus*	2.78E-01
BOLD:AAH0176	Hydrophilidae	Hydrophilinae	*Tropisternus lateralis*	1.80E+01
BOLD:ACA3026	Hydrophilidae	Hydrophilinae	*Tropisternus natator*	3.66E+01
BOLD:ABA6866	Hydrophilidae	Sphaeridiinae	*Cercyon assecla*	7.70E-01
BOLD:ADI0658	Hydrophilidae	Sphaeridiinae	*Cercyon cinctus*	8.30E-01
BOLD:ACX6956	Hydrophilidae	Sphaeridiinae	*Cercyon connivens*	2.23E-01
BOLD:ABV1545	Hydrophilidae	Sphaeridiinae	*Cercyon haemorrhoidalis*	5.32E-01
BOLD:AAH0275	Hydrophilidae	Sphaeridiinae	*Cercyon herceus*	4.21E-01
BOLD:AAU7178	Hydrophilidae	Sphaeridiinae	*Cercyon herceus*	2.77E-01
BOLD:ABW4468	Hydrophilidae	Sphaeridiinae	*Cercyon lateralis*	6.22E-01
BOLD:AAH0272	Hydrophilidae	Sphaeridiinae	*Cercyon marinus*	5.69E-01
BOLD:ADI8676	Hydrophilidae	Sphaeridiinae	*Cercyon minusculus*	3.56E-01
BOLD:AAL8071	Hydrophilidae	Sphaeridiinae	*Cercyon praetextatus*	8.12E-01
BOLD:ABY0162	Hydrophilidae	Sphaeridiinae	*Cercyon pygmaeus*	7.65E-02
BOLD:AAH0271	Hydrophilidae	Sphaeridiinae	*Cercyon quisquilius*	5.62E-01

BOLD:ADI9877	Hydrophilidae	Sphaeridiinae	*Cryptopleurum*	3.10E-01
BOLD:ABW4289	Hydrophilidae	Sphaeridiinae	*Cryptopleurum subtile*	2.61E-01
BOLD:AAO2914	Hydrophilidae	Sphaeridiinae	*Sphaeridium*	4.40E+00
BOLD:AAJ3982	Hydrophilidae	Sphaeridiinae	*Sphaeridium bipustulatum*	7.60E+00
BOLD:AAO3909	Hydrophilidae	Sphaeridiinae	*Sphaeridium scarabaeoides*	5.13E+00
BOLD:ADH7806	Hydrophilidae			2.02E+00
BOLD:ABA9077	Kateretidae		*Brachypterolus pulicarius*	5.73E-01
BOLD:AAH0249	Kateretidae		*Brachypterus urticae*	4.32E-01
BOLD:ACU8085	Kateretidae		*Heterhelus sericans*	3.51E-01
BOLD:ADE3840	Laemophloeidae		*Charaphloeus adustus*	8.65E-02
BOLD:ABY2268	Laemophloeidae		*Cryptolestes*	6.14E-02
BOLD:ACM6835	Laemophloeidae		*Cryptolestes*	7.26E-02
BOLD:ABW8699	Laemophloeidae		*Laemophloeus biguttatus*	2.39E-01
BOLD:ACA9001	Laemophloeidae		*Laemophloeus fasciatus*	1.10E-01
BOLD:ADI1331	Laemophloeidae		*Laemophloeus fervidus*	6.57E-01
BOLD:ACM9752	Lampyridae	Lampyrinae	*Ellychnia*	1.01E+01
BOLD:ABA6302	Lampyridae	Lampyrinae	*Ellychnia*	6.36E+00
BOLD:ACL8662	Lampyridae	Lampyrinae	*Ellychnia*	2.37E+00
BOLD:ADI8004	Lampyridae	Lampyrinae	*Ellychnia*	8.47E+00
BOLD:ADI8005	Lampyridae	Lampyrinae	*Ellychnia*	4.62E+00
BOLD:AAF4976	Lampyridae	Lampyrinae	*Ellychnia corrusca*	6.57E+00
BOLD:AAE9936	Lampyridae	Lampyrinae	*Lucidota atra*	4.74E+00
BOLD:ACG5895	Lampyridae	Lampyrinae	*Phausis rhombica*	3.41E-01
BOLD:ACX1644	Lampyridae	Lampyrinae	*Phausis rhombica*	9.32E-01
BOLD:ACB1067	Lampyridae	Lampyrinae	*Photinus curtatus*	3.25E+00
BOLD:AAH0109	Lampyridae	Lampyrinae	*Photinus ignitus*	4.16E+00
BOLD:ACS6453	Lampyridae	Lampyrinae	*Photinus indictus*	4.11E+00
BOLD:AAH7309	Lampyridae	Lampyrinae	*Photinus macdermotti*	2.18E+00
BOLD:AAP6952	Lampyridae	Lampyrinae	*Photinus marginellus*	2.13E+00
BOLD:ACA9182	Lampyridae	Lampyrinae	*Photinus obscurellus*	4.89E+00
BOLD:AAH6660	Lampyridae	Lampyrinae	*Pyractomena angulata*	3.92E+00
BOLD:AAH6661	Lampyridae	Lampyrinae	*Pyractomena borealis*	1.29E+01
BOLD:AAU7285	Lampyridae	Lampyrinae	*Pyractomena lucifera*	7.88E+00
BOLD:ADI7606	Lampyridae	Lampyrinae	*Pyropyga*	1.54E+00
BOLD:AAT9407	Lampyridae	Lampyrinae	*Pyropyga decipiens*	1.56E+00
BOLD:ADI2460	Lampyridae	Lampyrinae	*Pyropyga decipiens*	1.89E+00
BOLD:AAH7307	Lampyridae	Lampyrinae	*Pyropyga nigricans*	3.45E+00
BOLD:ACA7830	Lampyridae	Lampyrinae		1.55E+00
BOLD:AAF6064	Lampyridae	Photurinae	*Photuris*	2.94E+01
BOLD:AAY0890	Lampyridae	Photurinae	*Photuris pensylvanica*	1.67E+01
BOLD:AAY2723	Lampyridae	Psilocladinae	*Pollaclasis bifaria*	4.43E+00
BOLD:ADI8006	Lampyridae			1.40E+01
BOLD:AAP7808	Latridiidae	Corticariinae	*Corticaria*	1.98E-01
BOLD:ACK2360	Latridiidae	Corticariinae	*Corticaria*	1.62E-01
BOLD:ADH7974	Latridiidae	Corticariinae	*Corticaria*	1.48E-01
BOLD:ACW9468	Latridiidae	Corticariinae	*Corticaria dentiventris*	2.81E-01
BOLD:AAN6041	Latridiidae	Corticariinae	*Corticaria elongata*	5.20E-02
BOLD:AAM7682	Latridiidae	Corticariinae	*Corticaria ferruginea*	6.77E-02
BOLD:AAP7050	Latridiidae	Corticariinae	*Corticaria rubripes*	9.58E-02

BOLD:ACK6024	Latridiidae	Corticariinae	*Corticaria rubripes*	8.04E-02
BOLD:AAO0421	Latridiidae	Corticariinae	*Corticaria serrata*	1.15E-01
BOLD:AAH0256	Latridiidae	Corticariinae	*Corticarina*	4.81E-02
BOLD:AAP7839	Latridiidae	Corticariinae	*Corticarina*	7.16E-02
BOLD:ACC2745	Latridiidae	Corticariinae	*Corticarina*	6.77E-02
BOLD:ACF8198	Latridiidae	Corticariinae	*Corticarina*	4.89E-02
BOLD:ACP0853	Latridiidae	Corticariinae	*Corticarina*	7.79E-02
BOLD:ACC2109	Latridiidae	Corticariinae	*Corticarina herbivagan*	3.76E-02
BOLD:ABA6931	Latridiidae	Corticariinae	*Corticarina longipennis*	9.38E-02
BOLD:AAH3551	Latridiidae	Corticariinae	*Corticarina minuta*	8.50E-02
BOLD:ACD4236	Latridiidae	Corticariinae	*Corticarina minuta*	9.18E-02
BOLD:ACT3637	Latridiidae	Corticariinae	*Corticarina minuta*	9.24E-02
BOLD:AAI8935	Latridiidae	Corticariinae	*Cortinicara gibbosa*	4.46E-02
BOLD:AAM7680	Latridiidae	Corticariinae	*Melanophthalma*	5.62E-02
BOLD:AAP7026	Latridiidae	Corticariinae	*Melanophthalma*	1.25E-01
BOLD:AAU6965	Latridiidae	Corticariinae	*Melanophthalma*	8.52E-02
BOLD:AAU7340	Latridiidae	Corticariinae	*Melanophthalma*	6.70E-02
BOLD:ABA6324	Latridiidae	Corticariinae	*Melanophthalma*	1.07E-01
BOLD:ABX1677	Latridiidae	Corticariinae	*Melanophthalma*	5.44E-02
BOLD:ACC1461	Latridiidae	Corticariinae	*Melanophthalma*	5.39E-02
BOLD:ACP8533	Latridiidae	Corticariinae	*Melanophthalma americana*	1.13E-01
BOLD:ABA9093	Latridiidae	Corticariinae	*Melanophthalma helvola*	1.03E-01
BOLD:AAU7175	Latridiidae	Corticariinae	*Melanophthalma helvola*	8.61E-02
BOLD:AAN6154	Latridiidae	Corticariinae	*Melanophthalma inermis*	1.29E-01
BOLD:ACF8197	Latridiidae	Corticariinae	*Melanophthalma picta*	5.88E-02
BOLD:ACC1802	Latridiidae	Corticariinae		8.62E-02
BOLD:ACU6895	Latridiidae	Corticariinae		1.25E-01
BOLD:AAW4095	Latridiidae	Latridiinae	*Cartodere bifasciata*	9.05E-02
BOLD:ABA9076	Latridiidae	Latridiinae	*Cartodere constricta*	6.23E-02
BOLD:ACM8802	Latridiidae	Latridiinae	*Cartodere constricta*	4.14E-02
BOLD:AAO0516	Latridiidae	Latridiinae	*Cartodere nodifer*	1.28E-01
BOLD:ACW9862	Latridiidae	Latridiinae	*Enicmus cordatus*	7.64E-02
BOLD:AAN5905	Latridiidae	Latridiinae	*Enicmus fictus*	7.94E-02
BOLD:ACN5209	Latridiidae	Latridiinae	*Enicmus fictus*	1.06E-01
BOLD:AAN6153	Latridiidae	Latridiinae	*Enicmus nitens*	7.94E-02
BOLD:ABX9520	Latridiidae	Latridiinae	*Enicmus rugosus*	7.68E-02
BOLD:ACC4298	Latridiidae	Latridiinae	*Enicmus rugosus*	1.17E-01
BOLD:ACG5965	Latridiidae	Latridiinae	*Enicmus rugosus*	8.09E-02
BOLD:ACG8955	Latridiidae	Latridiinae	*Enicmus tenuicornis*	1.30E-01
BOLD:AAO3898	Latridiidae	Latridiinae	*Latridius*	1.19E-01
BOLD:ACD9541	Latridiidae	Latridiinae	*Latridius*	8.06E-02
BOLD:ACL3107	Latridiidae	Latridiinae	*Latridius*	1.18E-01
BOLD:ACB3183	Latridiidae	Latridiinae	*Stephostethus breviclavis*	7.15E-02
BOLD:ABA9100	Latridiidae	Latridiinae	*Stephostethus liratus*	9.35E-02
BOLD:ACC1761	Latridiidae	Latridiinae	*Stephostethus liratus*	1.92E-01
BOLD:ACH1126	Latridiidae			8.59E-02
BOLD:ADH8692	Latridiidae			8.44E-02
BOLD:ADH9071	Latridiidae			4.32E-02
BOLD:ADJ0331	Latridiidae			7.80E-02

BOLD:ADJ4407	Latridiidae			1.65E-01
BOLD:ADL2621	Latridiidae			4.00E-02
BOLD:AAP7801	Leiodidae	Cholevinae	*Catops basilaris*	5.96E-01
BOLD:ACC1188	Leiodidae	Cholevinae	*Catops basilaris*	9.94E-01
BOLD:ACL4989	Leiodidae	Cholevinae	*Catops basilaris*	4.24E-01
BOLD:ACV9339	Leiodidae	Cholevinae	*Catops egenus*	7.03E-01
BOLD:ACC2646	Leiodidae	Cholevinae	*Catops mathersi*	3.70E-01
BOLD:AAB2310	Leiodidae	Cholevinae	*Catops morio*	1.40E+00
BOLD:AAH3504	Leiodidae	Cholevinae	*Catops paramericanus*	3.65E-01
BOLD:AAP6951	Leiodidae	Cholevinae	*Catops simplex*	3.09E-01
BOLD:ACZ0640	Leiodidae	Cholevinae	*Dissochaetus oblitus*	2.31E-01
BOLD:ADI4024	Leiodidae	Cholevinae	*Nemadus*	3.26E-01
BOLD:ACI6050	Leiodidae	Cholevinae	*Nemadus brachyderus*	1.51E-01
BOLD:AAP6949	Leiodidae	Cholevinae	*Prionochaeta opaca*	1.87E+00
BOLD:AAU6931	Leiodidae	Cholevinae	*Ptomaphagus*	3.88E-01
BOLD:AAX7199	Leiodidae	Cholevinae	*Ptomaphagus brevior*	3.89E-01
BOLD:ACN3630	Leiodidae	Cholevinae	*Sciodrepoides*	5.46E-01
BOLD:ABW5498	Leiodidae	Cholevinae	*Sciodrepoides terminans*	4.18E-01
BOLD:ABW6289	Leiodidae	Cholevinae	*Sciodrepoides watsoni*	4.17E-01
BOLD:ACC1171	Leiodidae	Cholevinae	*Sciodrepoides watsoni*	6.61E-01
BOLD:ACL7379	Leiodidae	Cholevinae	*Sciodrepoides watsoni*	3.10E-01
BOLD:ACC5809	Leiodidae	Coloninae	*Colon hubbardi*	2.62E-01
BOLD:ACS2011	Leiodidae	Coloninae	*Colon incisum*	2.63E-01
BOLD:ACV8702	Leiodidae	Coloninae	*Colon oblongum*	1.11E-01
BOLD:AAO4725	Leiodidae	Coloninae	*Colon serripes*	2.17E-01
BOLD:ADI2333	Leiodidae	Leiodinae	*Agathidium*	2.66E-01
BOLD:ACF9482	Leiodidae	Leiodinae	*Agathidium angulare*	6.01E-01
BOLD:ACV6912	Leiodidae	Leiodinae	*Agathidium angulare*	4.32E-01
BOLD:AAH3498	Leiodidae	Leiodinae	*Agathidium athabascanum*	4.58E-01
BOLD:ACJ7558	Leiodidae	Leiodinae	*Agathidium depressum*	1.04E+00
BOLD:AAU7338	Leiodidae	Leiodinae	*Agathidium exiguum*	3.16E-01
BOLD:ABX8886	Leiodidae	Leiodinae	*Agathidium fawcettae*	4.20E-01
BOLD:ACC5808	Leiodidae	Leiodinae	*Agathidium pulchrum*	4.12E-01
BOLD:ACM6645	Leiodidae	Leiodinae	*Agathidium pulchrum*	3.04E-01
BOLD:ADH8544	Leiodidae	Leiodinae	*Aglyptinus laevis*	1.05E-01
BOLD:ACO5335	Leiodidae	Leiodinae	*Anisotoma basalis*	5.13E-01
BOLD:ACI7721	Leiodidae	Leiodinae	*Anisotoma discolor*	8.00E-01
BOLD:ACC5896	Leiodidae	Leiodinae	*Anisotoma errans*	8.92E-01
BOLD:ACC7194	Leiodidae	Leiodinae	*Anisotoma geminata*	9.52E-01
BOLD:AAZ2176	Leiodidae	Leiodinae	*Anisotoma globososa*	1.19E+00
BOLD:AAR3435	Leiodidae	Leiodinae	*Anisotoma obsoleta*	6.47E-01
BOLD:ABA6310	Leiodidae	Leiodinae	*Anogdus obsoletus*	3.91E-01
BOLD:ABW2818	Leiodidae	Leiodinae	*Colenis impunctata*	1.73E-01
BOLD:ACJ0168	Leiodidae	Leiodinae	*Hydnobius*	1.77E-01
BOLD:ABX2477	Leiodidae	Leiodinae	*Hydnobius laticeps*	1.71E-01
BOLD:ACI4769	Leiodidae	Leiodinae	*Hydnobius substriatus*	3.71E-01
BOLD:ABA9102	Leiodidae	Leiodinae	*Isoplastus fossor*	1.68E-01
BOLD:ACI9554	Leiodidae	Leiodinae	*Leiodes curvata*	5.99E-01
BOLD:AAH3502	Leiodidae	Leiodinae	*Leiodes puncticollis*	3.22E-01

BOLD:AAP7018	Leiodidae	Leiodinae	*Leiodes punctostriata*	7.65E-01
BOLD:ABW5499	Leiodidae	Leiodinae	*Leiodes pygmaea*	1.08E-01
BOLD:ACK9968	Leiodidae	Leiodinae	*Lionothus forticornis*	5.92E-01
BOLD:ACE2029	Leiodidae	Leiodinae	*Platyhydnobius arizonensis*	4.18E-01
BOLD:ACD0362	Leiodidae	Leiodinae	*Triarthron lecontei*	1.22E+00
BOLD:ACW3549	Leiodidae	Leiodinae	*Zeadolopus egenus*	1.19E-01
BOLD:ADF7015	Leiodidae			2.60E-01
BOLD:AAX6466	Lucanidae	Aesalinae	*Nicagus obscurus*	7.93E+00
BOLD:AAH0513	Lucanidae	Lucaninae	*Lucanus placidus*	4.18E+02
BOLD:ACI9205	Lucanidae	Lucaninae	*Platycerus marginalis*	1.10E+01
BOLD:AAY4363	Lucanidae	Lucaninae	*Platycerus oregonensis*	1.69E+01
BOLD:ADF8162	Lucanidae	Lucaninae	*Platycerus quercus*	1.42E+01
BOLD:AAL4632	Lucanidae	Lucaninae	*Platycerus virescens*	1.20E+01
BOLD:AAI3970	Lucanidae	Syndesinae	*Ceruchus piceus*	4.99E+01
BOLD:ACM0666	Lycidae	Dictyopterinae	*Dictyoptera*	3.98E+00
BOLD:AAG9110	Lycidae	Dictyopterinae	*Dictyoptera aurora*	3.40E+00
BOLD:AAN6191	Lycidae	Dictyopterinae	*Dictyoptera aurora*	2.83E+00
BOLD:AAQ0048	Lycidae	Dictyopterinae	*Dictyoptera aurora*	5.25E+00
BOLD:ACR2113	Lycidae	Dictyopterinae	*Dictyoptera aurora*	9.33E+00
BOLD:AAG9111	Lycidae	Dictyopterinae	*Dictyoptera simplicipes*	4.90E+00
BOLD:ACI6664	Lycidae	Dictyopterinae	*Greenarus thoracicus*	5.32E+00
BOLD:AAI3956	Lycidae	Lycinae	*Caenia dimidiata*	4.04E+00
BOLD:AAN6062	Lycidae	Lycinae	*Calopteron discrepans*	1.09E+01
BOLD:AAU7333	Lycidae	Lycinae	*Calopteron reticulatum*	1.81E+01
BOLD:AAY6542	Lycidae	Lycinae	*Eropterus arculus*	1.32E+00
BOLD:AAG9120	Lycidae	Lycinae	*Eropterus trilineatus*	1.64E+00
BOLD:AAY6545	Lycidae	Lycinae	*Eros humeralis*	2.66E+00
BOLD:AAQ0049	Lycidae	Lycinae	*Leptoceletes basalis*	5.97E-01
BOLD:ACB0911	Lycidae	Lycinae	*Plateros bispiculatus*	1.80E+00
BOLD:AAU7148	Lycidae	Lycinae	*Plateros flavoscutellatus*	1.60E+00
BOLD:ADI7157	Lycidae	Lycinae	*Plateros flavoscutellatus*	2.24E+00
BOLD:ADI7159	Lycidae	Lycinae	*Plateros flavoscutellatus*	2.20E+00
BOLD:AAG9119	Lycidae	Lycinae	*Plateros lictor*	1.84E+00
BOLD:AAH7308	Lycidae	Lycinae	*Plateros peregrinus*	4.64E+00
BOLD:ADI2753	Lycidae	Lycinae	*Plateros subfurcatus*	8.73E-01
BOLD:ACA8560	Lymexylidae	Hylecoetinae	*Elateroides lugubris*	4.99E+00
BOLD:AAH0363	Melandryidae	Melandryinae	*Dircaea liturata*	8.73E+00
BOLD:AAU6911	Melandryidae	Melandryinae	*Emmesa connectens*	4.40E+00
BOLD:ACA7524	Melandryidae	Melandryinae	*Enchodes sericea*	1.24E+01
BOLD:ACI6005	Melandryidae	Melandryinae	*Enchodes sericea*	9.21E+00
BOLD:AAY6539	Melandryidae	Melandryinae	*Hypulus simulator*	9.88E-01
BOLD:AAK7242	Melandryidae	Melandryinae	*Melandrya striata*	2.75E+01
BOLD:ABY1344	Melandryidae	Melandryinae	*Microscapha clavicornis*	1.65E-01
BOLD:ACN3115	Melandryidae	Melandryinae	*Microtonus sericans*	4.79E-01
BOLD:AAM7670	Melandryidae	Melandryinae	*Orchesia castanea*	1.31E+00
BOLD:AAP7011	Melandryidae	Melandryinae	*Orchesia cultriformis*	1.51E+00
BOLD:AAU7337	Melandryidae	Melandryinae	*Orchesia ovata*	2.65E-01
BOLD:ACC7193	Melandryidae	Melandryinae	*Phloiotrya fusca*	7.67E-01
BOLD:ACU5913	Melandryidae	Melandryinae	*Prothalpia*	4.52E-01

BOLD:AAP7789	Melandryidae	Melandryinae	*Prothalpia holmbergi*	6.97E-01
BOLD:ACU5912	Melandryidae	Melandryinae	*Prothalpia holmbergi*	5.75E-01
BOLD:ACM0998	Melandryidae	Melandryinae	*Prothalpia undata*	9.25E-01
BOLD:ACC1394	Melandryidae	Melandryinae	*Scotochroides antennatus*	4.19E-01
BOLD:ACB9232	Melandryidae	Melandryinae	*Serropalpus coxalis*	1.05E+01
BOLD:AAH9565	Melandryidae	Melandryinae	*Serropalpus substriatus*	7.62E+00
BOLD:ABA9080	Melandryidae	Melandryinae	*Symphora flavicollis*	1.13E-01
BOLD:AAM7619	Melandryidae	Melandryinae	*Symphora rugosa*	2.63E-01
BOLD:ACA7430	Melandryidae	Melandryinae	*Zilora hispida*	2.24E+00
BOLD:ACL5425	Melandryidae	Melandryinae		4.64E-01
BOLD:AAI5347	Meloidae	Meloinae	*Epicauta*	5.13E+01
BOLD:AAF9393	Meloidae	Meloinae	*Epicauta fabricii*	2.74E+01
BOLD:AAF9395	Meloidae	Meloinae	*Epicauta ferruginea*	5.70E+00
BOLD:AAF9414	Meloidae	Meloinae	*Epicauta murina*	2.66E+01
BOLD:AAF9398	Meloidae	Meloinae	*Epicauta oregona*	2.11E+01
BOLD:ACU3641	Meloidae	Meloinae	*Epicauta pensylvanica*	4.48E+00
BOLD:AAF9400	Meloidae	Meloinae	*Epicauta pruinosa*	2.36E+01
BOLD:AAF9396	Meloidae	Meloinae	*Epicauta sericans*	5.95E+00
BOLD:AAF9397	Meloidae	Meloinae	*Epicauta sericans*	9.55E+00
BOLD:AAF9399	Meloidae	Meloinae	*Linsleya sphaericollis*	1.20E+01
BOLD:AAF9394	Meloidae	Meloinae	*Lytta*	8.03E+01
BOLD:AAF9392	Meloidae	Meloinae	*Lytta sayi*	4.62E+01
BOLD:AAF9408	Meloidae	Meloinae	*Meloe impressus*	2.16E+02
BOLD:AAN6092	Meloidae	Meloinae	*Meloe niger*	4.63E+01
BOLD:ACB1457	Meloidae	Nemognathinae	*Nemognatha nemorensis*	2.80E+00
BOLD:AAH0324	Meloidae	Nemognathinae		1.97E+01
BOLD:AAH0190	Melyridae	Dasytinae	*Hoppingiana hudsonica*	1.31E+00
BOLD:AAH0286	Melyridae	Dasytinae	*Hoppingiana hudsonica*	3.72E-01
BOLD:ACD0759	Melyridae	Dasytinae	*Hoppingiana hudsonica*	6.66E-01
BOLD:ACE2248	Melyridae	Dasytinae	*Hoppingiana hudsonica*	8.21E-01
BOLD:ACG4122	Melyridae	Dasytinae	*Hoppingiana hudsonica*	4.24E-01
BOLD:ACS3437	Melyridae	Dasytinae	*Hoppingiana hudsonica*	1.04E+00
BOLD:ADC2427	Melyridae	Dasytinae	*Listrus*	1.90E-01
BOLD:ACU3172	Melyridae	Dasytinae	*Listrus plenus*	4.44E-01
BOLD:ACI2749	Melyridae	Dasytinae	*Listrus quadricollis*	8.93E-01
BOLD:AAH0251	Melyridae	Dasytinae	*Listrus senilis*	3.12E-01
BOLD:ACI3232	Melyridae	Dasytinae		2.48E-01
BOLD:ABA6355	Melyridae	Malachiinae	*Anthocomus equestris*	6.79E-01
BOLD:ACF9386	Melyridae	Malachiinae	*Anthocomus equestris*	3.94E-01
BOLD:ACI2758	Melyridae	Malachiinae	*Attalus morulus*	1.96E-01
BOLD:ACJ0383	Melyridae	Malachiinae	*Attalus morulus*	1.38E-01
BOLD:ACW5255	Melyridae	Malachiinae	*Attalus morulus*	2.75E-01
BOLD:AAP7782	Melyridae	Malachiinae	*Attalus nigrellus*	4.83E-01
BOLD:ACA7195	Melyridae	Malachiinae	*Attalus pallifrons*	1.41E-01
BOLD:ACU7960	Melyridae	Malachiinae	*Attalus pallifrons*	1.50E-01
BOLD:ACC7625	Melyridae	Malachiinae	*Attalus terminalis*	2.10E-01
BOLD:AAP7314	Melyridae	Malachiinae	*Axinotarsus pulicarius*	6.58E-01
BOLD:AAH0263	Melyridae	Malachiinae	*Collops hirtellus*	2.32E+00
BOLD:AAJ7435	Melyridae	Malachiinae	*Collops tricolor*	1.21E+00

BOLD:AAI5977	Melyridae	Malachiinae	*Collops vittatus*	4.04E+00
BOLD:AAN5932	Melyridae	Malachiinae	*Hypebaeus apicalis*	1.05E-01
BOLD:ACA9180	Melyridae	Malachiinae	*Hypebaeus bicolor*	7.54E-02
BOLD:ACA9255	Melyridae	Malachiinae	*Malachius aeneus*	5.83E+00
BOLD:ADJ1901	Monotimidae	Monotominae	*Monotoma americana*	1.53E-01
BOLD:ADJ2189	Monotimidae	Monotominae	*Monotoma americana*	3.08E-01
BOLD:ACG2756	Monotimidae	Monotominae	*Monotoma longicollis*	7.56E-02
BOLD:AAO0819	Monotimidae	Monotominae	*Monotoma picipes*	1.50E-01
BOLD:ACA5543	Monotimidae	Monotominae	*Pycnotomina cavicollis*	1.36E-01
BOLD:ACA9587	Monotimidae	Rhizophaginae	*Rhizophagus dimidiatus*	2.49E-01
BOLD:ACA9026	Monotimidae	Rhizophaginae	*Rhizophagus sculpturatus*	3.92E-01
BOLD:ADF7428	Monotimidae			1.33E-01
BOLD:ACD1025	Mordellidae	Mordellinae	*Falsomordellistena*	1.08E+00
BOLD:ACC1583	Mordellidae	Mordellinae	*Falsomordellistena discolor*	8.42E-01
BOLD:ACB1076	Mordellidae	Mordellinae	*Falsomordellistena liturata*	9.82E-01
BOLD:AAU7140	Mordellidae	Mordellinae	*Hoshihananomia octopunctata*	7.15E+00
BOLD:AAL8067	Mordellidae	Mordellinae	*Mordella atrata*	3.95E+00
BOLD:ACA7554	Mordellidae	Mordellinae	*Mordella atrata*	2.54E+00
BOLD:ADC5819	Mordellidae	Mordellinae	*Mordella atrata*	3.28E+00
BOLD:AAG4494	Mordellidae	Mordellinae	*Mordella marginata*	1.16E+00
BOLD:AAU7134	Mordellidae	Mordellinae	*Mordella marginata*	2.03E+00
BOLD:ACC7853	Mordellidae	Mordellinae	*Mordella marginata*	1.08E+00
BOLD:ADI3682	Mordellidae	Mordellinae	*Mordella marginata*	1.08E+00
BOLD:AAQ0053	Mordellidae	Mordellinae	*Mordella quadripunctata*	6.90E+00
BOLD:AAU7283	Mordellidae	Mordellinae	*Mordellaria*	1.28E+00
BOLD:ABX3317	Mordellidae	Mordellinae	*Mordellaria*	1.99E+00
BOLD:ABX8545	Mordellidae	Mordellinae	*Mordellaria serval*	2.11E+00
BOLD:ABW2815	Mordellidae	Mordellinae	*Mordellaria undulata*	8.97E-01
BOLD:AAP6953	Mordellidae	Mordellinae	*Mordellina ancilla*	1.96E-01
BOLD:AAY6534	Mordellidae	Mordellinae	*Mordellina ancilla*	1.48E-01
BOLD:ACD4134	Mordellidae	Mordellinae	*Mordellina ancilla*	1.74E-01
BOLD:ACX6731	Mordellidae	Mordellinae	*Mordellina guttulata*	2.25E-01
BOLD:ACB1321	Mordellidae	Mordellinae	*Mordellina infima*	1.39E-01
BOLD:ABA9082	Mordellidae	Mordellinae	*Mordellina nigricans*	3.68E-01
BOLD:ACB1349	Mordellidae	Mordellinae	*Mordellina nigricans*	2.50E-01
BOLD:AAU7291	Mordellidae	Mordellinae	*Mordellina pustulata*	7.19E-01
BOLD:ABA9087	Mordellidae	Mordellinae	*Mordellina pustulata*	4.37E-01
BOLD:ACC7947	Mordellidae	Mordellinae	*Mordellina quadrinotata*	1.78E-01
BOLD:AAH0125	Mordellidae	Mordellinae	*Mordellistena*	2.94E-01
BOLD:AAN5924	Mordellidae	Mordellinae	*Mordellistena*	1.91E-01
BOLD:AAP7072	Mordellidae	Mordellinae	*Mordellistena*	1.60E+00
BOLD:AAU7161	Mordellidae	Mordellinae	*Mordellistena*	2.06E-01
BOLD:AAU7171	Mordellidae	Mordellinae	*Mordellistena*	2.82E-01
BOLD:ACA5534	Mordellidae	Mordellinae	*Mordellistena*	1.10E+00
BOLD:ACC7510	Mordellidae	Mordellinae	*Mordellistena*	6.40E-01
BOLD:ACC9523	Mordellidae	Mordellinae	*Mordellistena*	5.66E-01
BOLD:ACI3547	Mordellidae	Mordellinae	*Mordellistena*	2.43E-01
BOLD:ACK3402	Mordellidae	Mordellinae	*Mordellistena*	2.97E-01
BOLD:ACK6134	Mordellidae	Mordellinae	*Mordellistena*	5.03E-01

BOLD:ACK7135	Mordellidae	Mordellinae	*Mordellistena*	3.88E-01
BOLD:ACR2063	Mordellidae	Mordellinae	*Mordellistena*	1.58E-01
BOLD:ACU9444	Mordellidae	Mordellinae	*Mordellistena*	6.41E-01
BOLD:ACX7646	Mordellidae	Mordellinae	*Mordellistena*	4.15E-01
BOLD:ABA9078	Mordellidae	Mordellinae	*Mordellistena aspersa*	1.63E-01
BOLD:ABX3620	Mordellidae	Mordellinae	*Mordellistena bicinctella*	1.53E-01
BOLD:ACP7703	Mordellidae	Mordellinae	*Mordellistena bicinctella*	1.75E-01
BOLD:AAH0475	Mordellidae	Mordellinae	*Mordellistena errans*	9.91E-01
BOLD:ADJ3860	Mordellidae	Mordellinae	*Mordellistena errans*	9.66E-01
BOLD:ADJ3861	Mordellidae	Mordellinae	*Mordellistena errans*	4.59E-01
BOLD:ADJ3862	Mordellidae	Mordellinae	*Mordellistena errans*	1.15E+00
BOLD:AAF9413	Mordellidae	Mordellinae	*Mordellistena fuscipennis*	3.65E+00
BOLD:AAM7666	Mordellidae	Mordellinae	*Mordellistena limbalis*	6.11E-01
BOLD:ACE3572	Mordellidae	Mordellinae	*Mordellistena militaris*	2.55E-01
BOLD:AAU7159	Mordellidae	Mordellinae	*Mordellistena ornata*	8.15E-01
BOLD:ACK1250	Mordellidae	Mordellinae	*Mordellistena ornata*	1.24E+00
BOLD:ACZ2383	Mordellidae	Mordellinae	*Mordellistena picilabris*	2.47E-01
BOLD:ACO6512	Mordellidae	Mordellinae	*Mordellistena spACO6512*	2.58E-01
BOLD:ACB1322	Mordellidae	Mordellinae	*Mordellistena trifasciata*	4.88E-01
BOLD:AAU6912	Mordellidae	Mordellinae	*Mordellochroa scapularis*	1.56E+00
BOLD:AAU7139	Mordellidae	Mordellinae	*Paramordellaria triloba*	9.17E-01
BOLD:ACB1348	Mordellidae	Mordellinae	*Pseudotolida*	1.10E+00
BOLD:ACC7073	Mordellidae	Mordellinae	*Pseudotolida arida*	6.62E-01
BOLD:ACK2635	Mordellidae	Mordellinae	*Pseudotolida arida*	1.18E+00
BOLD:ACZ1867	Mordellidae	Mordellinae	*Pseudotolida arida*	4.86E-01
BOLD:ACB0985	Mordellidae	Mordellinae	*Tolidomordella discoidea*	4.73E-01
BOLD:AAU7277	Mordellidae	Mordellinae	*Tomoxia lineella*	6.22E+00
BOLD:ACB0612	Mordellidae	Mordellinae		1.08E+00
BOLD:ACB1061	Mordellidae	Mordellinae		8.65E-01
BOLD:ACI2750	Mordellidae	Mordellinae		4.89E-01
BOLD:ACI3018	Mordellidae	Mordellinae		5.86E-01
BOLD:ACU6111	Mordellidae	Mordellinae		4.64E-01
BOLD:ADG3816	Mordellidae			1.71E-01
BOLD:ADI5619	Mordellidae			2.49E-01
BOLD:ADM0356	Mordellidae			4.67E-01
BOLD:ADM2850	Mordellidae			4.52E-01
BOLD:ADM5532	Mordellidae			4.02E-01
BOLD:AAO1515	Mycetophagidae	Mycetophaginae	*Litargus*	1.90E-01
BOLD:ACM0624	Mycetophagidae	Mycetophaginae	*Litargus balteatus*	1.97E-01
BOLD:AAU7327	Mycetophagidae	Mycetophaginae	*Litargus tetraspilotus*	2.72E-01
BOLD:ACB0587	Mycetophagidae	Mycetophaginae	*Mycetophagus distinctus*	1.15E+00
BOLD:ACS0745	Mycetophagidae	Mycetophaginae	*Mycetophagus flexuosus*	1.09E+00
BOLD:ADH6200	Mycetophagidae	Mycetophaginae	*Mycetophagus pluripunctatus*	5.53E-01
BOLD:AAX3298	Mycetophagidae	Mycetophaginae	*Mycetophagus punctatus*	3.23E+00
BOLD:ADI4525	Mycetophagidae	Mycetophaginae	*Mycetophagus serrulatus*	1.11E+00
BOLD:ACB0589	Mycetophagidae	Mycetophaginae	*Mycetophagus tenuifasciatus*	1.98E+00
BOLD:ABA6352	Mycetophagidae	Mycetophaginae	*Typhaea stercorea*	2.54E-01
BOLD:ABX3602	Mycetophagidae	Mycetophaginae	*Typhaea stercorea*	4.09E-01
BOLD:AAR9228	Nemonychidae	Cimberidinae	*Cimberis*	4.60E-01

BOLD:ABV9508	Nemonychidae	Cimberidinae	*Cimberis pallipennis*	6.80E-01
BOLD:AAG4433	Nitidulidae	Amphicrossinae	*Amphicrossus ciliatus*	3.55E+00
BOLD:ACB6149	Nitidulidae	Carpophilinae	*Carpophilus*	7.92E-01
BOLD:AAH0072	Nitidulidae	Carpophilinae	*Carpophilus brachypterus*	2.30E-01
BOLD:AAN6006	Nitidulidae	Carpophilinae	*Carpophilus hemipterus*	1.07E+00
BOLD:ACA6322	Nitidulidae	Carpophilinae	*Carpophilus sp.*	1.21E+00
BOLD:AAG4319	Nitidulidae	Carpophilinae	*Nitops pallipennis*	6.26E-01
BOLD:ACA6288	Nitidulidae	Cillaeinae	*Colopterus truncatus*	2.18E-01
BOLD:ACC7604	Nitidulidae	Cillaeinae	*Colopterus truncatus*	9.73E-02
BOLD:AAH0131	Nitidulidae	Cryptarchinae	*Cryptarcha ampla*	8.50E+00
BOLD:AAU6932	Nitidulidae	Cryptarchinae	*Glischrochilus fasciatus*	4.64E+00
BOLD:ABW5500	Nitidulidae	Cryptarchinae	*Glischrochilus moratus*	2.25E+00
BOLD:AAG5778	Nitidulidae	Cryptarchinae	*Glischrochilus quadrisignatus*	5.88E+00
BOLD:AAP8585	Nitidulidae	Cryptarchinae	*Glischrochilus sanguinolentus*	3.34E+00
BOLD:AAU6964	Nitidulidae	Cryptarchinae	*Glischrochilus siepmanni*	3.64E+00
BOLD:ACU4791	Nitidulidae	Cybocephalinae	*Cybocephalus*	6.61E-02
BOLD:AAP7069	Nitidulidae	Epuraeinae	*Epuraea*	4.42E-01
BOLD:AAU7157	Nitidulidae	Epuraeinae	*Epuraea*	2.93E-01
BOLD:ACL7887	Nitidulidae	Epuraeinae	*Epuraea*	3.50E-01
BOLD:AAZ0061	Nitidulidae	Epuraeinae	*Epuraea aestiva*	8.76E-01
BOLD:ACA6332	Nitidulidae	Epuraeinae	*Epuraea aestiva*	9.06E-01
BOLD:ACM3484	Nitidulidae	Epuraeinae	*Epuraea aestiva*	7.31E-01
BOLD:ACA6216	Nitidulidae	Epuraeinae	*Epuraea avara*	3.67E-01
BOLD:AAN6187	Nitidulidae	Epuraeinae	*Epuraea flavomaculata*	6.65E-01
BOLD:ACM2423	Nitidulidae	Epuraeinae	*Epuraea labilis*	4.03E-01
BOLD:ACC5895	Nitidulidae	Epuraeinae	*Epuraea linearis*	3.29E-01
BOLD:ACN4977	Nitidulidae	Epuraeinae	*Epuraea linearis*	3.75E-01
BOLD:ABA6306	Nitidulidae	Epuraeinae	*Epuraea obliqua*	5.48E-01
BOLD:AAP7832	Nitidulidae	Epuraeinae	*Epuraea pallescens*	2.85E-01
BOLD:AAH0102	Nitidulidae	Epuraeinae	*Epuraea rufa*	8.34E-01
BOLD:ACI8663	Nitidulidae	Epuraeinae	*Epuraea rufomarginata*	2.72E-01
BOLD:AAM7649	Nitidulidae	Epuraeinae	*Epuraea terminalis*	4.31E-01
BOLD:AAP7828	Nitidulidae	Epuraeinae	*Epuraea truncatella*	3.60E-01
BOLD:AAX8537	Nitidulidae	Epuraeinae	*Epuraea unicolor*	3.66E-01
BOLD:AAP7037	Nitidulidae	Meligethinae	*Afrogethes canadensis*	4.10E-01
BOLD:AAM7739	Nitidulidae	Meligethinae	*Brassicogethes simplipes*	2.05E-01
BOLD:AAH0069	Nitidulidae	Meligethinae	*Fabogethes nigrescens*	2.65E-01
BOLD:ACE3100	Nitidulidae	Meligethinae	*Genistogethes carinulatus*	1.53E-01
BOLD:ACM1119	Nitidulidae	Nitidulinae	*Cychramus adustus*	2.08E+00
BOLD:ADH9736	Nitidulidae	Nitidulinae	*Cyllodes biplagiatus*	9.16E-01
BOLD:ACF6421	Nitidulidae	Nitidulinae	*Nitidula rufipes*	1.59E+00
BOLD:ABA6342	Nitidulidae	Nitidulinae	*Pallodes pallidus*	1.77E+00
BOLD:AAH0467	Nitidulidae	Nitidulinae	*Phenolia grossa*	1.13E+01
BOLD:AAH0151	Nitidulidae	Nitidulinae	*Prometopia sexmaculata*	3.56E+00
BOLD:AAO2301	Nitidulidae	Nitidulinae	*Stelidota geminata*	6.85E-01
BOLD:AAH0115	Nitidulidae	Nitidulinae	*Stelidota octomaculata*	1.13E+00
BOLD:ADI5228	Nitidulidae			7.00E-01
BOLD:AAP6242	Noteridae	Noterinae	*Hydrocanthus iricolor*	9.19E-01
BOLD:ACY6873	Ochodaeidae	Ochodaeinae	*Xenochodaeus musculus*	1.20E+01

BOLD:AAH6802	Ochodaeidae	Ochodaeinae	*Xenochodaeus simplex*	1.20E+01
BOLD:AAI3866	Oedemeridae	Calopodinae	*Calopus angustus*	2.27E+01
BOLD:ABY3977	Oedemeridae	Oedemerinae	*Asclera puncticollis*	7.49E+00
BOLD:ACL5199	Oedemeridae	Oedemerinae	*Asclera ruficollis*	3.73E+00
BOLD:AAG3211	Oedemeridae	Oedemerinae	*Ditylus quadricollis*	3.62E+01
BOLD:ACA8932	Oedemeridae	Oedemerinae	*Nacerdes melanura*	1.02E+01
BOLD:ACN6921	Oedemeridae	Oedemerinae	*Xanthochroina bicolor*	2.57E+00
BOLD:AAG4452	Orsodacnidae	Orsodacninae	*Orsodacne atra*	2.82E+00
BOLD:ACL2308	Passandridae	Passandrinae	*Catogenus rufus*	2.67E+00
BOLD:ACM7465	Phalacridae	Phalacrinae	*Acylomus*	2.80E-01
BOLD:ADF9260	Phalacridae	Phalacrinae	*Acylomus*	1.66E-01
BOLD:AAH0135	Phalacridae	Phalacrinae	*Acylomus ergoti*	2.11E-01
BOLD:ADH7928	Phalacridae	Phalacrinae	*Litochropus*	3.07E-01
BOLD:ACF7672	Phalacridae	Phalacrinae	*Litochropus scalptus*	1.67E-01
BOLD:AAG4848	Phalacridae	Phalacrinae	*Olibrus*	3.65E-01
BOLD:ACV0003	Phalacridae	Phalacrinae	*Olibrus*	1.60E-01
BOLD:ACV1303	Phalacridae	Phalacrinae	*Olibrus*	1.38E-01
BOLD:AAX0584	Phalacridae	Phalacrinae	*Olibrus liquidus*	4.89E-01
BOLD:AAK9463	Phalacridae	Phalacrinae	*Olibrus semistriatus*	1.76E-01
BOLD:AAP7025	Phalacridae	Phalacrinae	*Olibrus semistriatus*	1.82E-01
BOLD:AAH0262	Phalacridae	Phalacrinae	*Phalacrus penicillatus*	7.03E-01
BOLD:AAP7834	Phalacridae	Phalacrinae	*Stilbus*	1.71E-01
BOLD:AAH0134	Phalacridae	Phalacrinae	*Stilbus apicialis*	3.19E-01
BOLD:AAG2932	Phengodidae	Phengodinae	*Phengodes plumosa*	1.06E+01
BOLD:AAE8162	Psephenidae	Eubriinae	*Ectopria thoracica*	7.64E-01
BOLD:AAP7822	Ptiliidae	Acrotrichinae	*Acrotrichis*	1.78E-02
BOLD:ACE2618	Ptiliidae	Acrotrichinae	*Acrotrichis*	6.90E-03
BOLD:ACI6486	Ptiliidae	Acrotrichinae	*Acrotrichis*	3.33E-02
BOLD:ACI7304	Ptiliidae	Acrotrichinae	*Acrotrichis*	1.71E-02
BOLD:ACO9452	Ptiliidae	Acrotrichinae	*Acrotrichis*	2.23E-02
BOLD:ADJ0888	Ptiliidae	Acrotrichinae	*Acrotrichis*	2.04E-02
BOLD:AAM7679	Ptiliidae	Acrotrichinae	*Acrotrichis cognata*	1.71E-02
BOLD:ACG5485	Ptiliidae	Acrotrichinae	*Acrotrichis insularis*	2.02E-02
BOLD:ACV6975	Ptiliidae	Acrotrichinae	*Acrotrichis insularis*	2.68E-02
BOLD:AAU7167	Ptiliidae	Ptiliinae	*Ptenidium*	1.18E-02
BOLD:ACN8757	Ptiliidae	Ptiliinae	*Ptenidium*	1.98E-02
BOLD:ACX8592	Ptiliidae	Ptiliinae	*Ptenidium*	1.24E-02
BOLD:ABA7547	Ptiliidae	Ptiliinae	*Ptenidium intermedium*	2.76E-02
BOLD:AAH7911	Ptiliidae	Ptiliinae	*Ptenidium longicorne*	2.14E-02
BOLD:AAN5972	Ptiliidae	Ptiliinae	*Ptiliola*	3.30E-03
BOLD:ACI8875	Ptiliidae	Ptiliinae	*Ptiliola kunzei*	5.60E-03
BOLD:ACE2597	Ptiliidae	Ptiliinae	*Ptiliolum*	1.06E-02
BOLD:ACG6182	Ptiliidae	Ptiliinae	*Ptiliolum*	4.40E-03
BOLD:AAM7677	Ptiliidae	Ptiliinae	*Ptiliolum fuscum*	5.60E-03
BOLD:ADH5266	Ptiliidae	Ptiliinae		2.40E-03
BOLD:ADK1220	Ptiliidae	Ptiliinae		2.60E-03
BOLD:ACZ1699	Ptiliidae			2.02E-02
BOLD:ADD1985	Ptiliidae			2.04E-02
BOLD:ADF8341	Ptiliidae			1.10E-02

BOLD:ADH8485	Ptiliidae			2.70E-03
BOLD:ADK2552	Ptiliidae			2.60E-03
BOLD:ADK8648	Ptiliidae			1.10E-02
BOLD:ADJ4653	Ptilodactylidae	Ptilodactylinae	*Ptilodactyla*	1.53E+00
BOLD:AAU7287	Ptilodactylidae	Ptilodactylinae	*Ptilodactyla serricollis*	1.94E+00
BOLD:ACR3763	Ptilodactylidae	Ptilodactylinae	*Ptilodactyla serricollis*	2.23E+00
BOLD:AAP8586	Ptinidae	Anobiinae	*Hadrobregmus notatus*	7.55E-01
BOLD:AAP7001	Ptinidae	Anobiinae	*Hemicoelus carinatus*	1.43E+00
BOLD:ACK1231	Ptinidae	Anobiinae	*Hemicoelus pusillus*	3.52E-01
BOLD:AAY6526	Ptinidae	Anobiinae	*Hemicoelus umbrosus*	1.50E+00
BOLD:ACH2408	Ptinidae	Anobiinae	*Oligomerus*	1.19E+00
BOLD:ADI1721	Ptinidae	Anobiinae	*Oligomerus sericans*	1.04E+00
BOLD:AAU7324	Ptinidae	Anobiinae	*Priobium sericeum*	2.15E+00
BOLD:AAH9980	Ptinidae	Anobiinae	*Stegobium paniceum*	1.28E-01
BOLD:AAN6156	Ptinidae	Dorcatominae	*Caenocara*	5.18E-01
BOLD:ACF6515	Ptinidae	Dorcatominae	*Caenocara*	8.81E-01
BOLD:ACD1010	Ptinidae	Dorcatominae	*Caenocara blanchardi*	2.97E-01
BOLD:AAH0077	Ptinidae	Dorcatominae	*Caenocara scymnoides*	5.81E-01
BOLD:ACU9950	Ptinidae	Dorcatominae	*Caenocara scymnoides*	6.42E-01
BOLD:ACG8826	Ptinidae	Dorcatominae	*Dorcatoma pallicornis*	9.00E-01
BOLD:ACV1604	Ptinidae	Dorcatominae	*Dorcatoma setulosa*	1.75E-01
BOLD:AAU7151	Ptinidae	Dorcatominae	*Sculptotheca puberula*	2.13E-01
BOLD:ACC1620	Ptinidae	Dorcatominae	*Sculptotheca puberula*	2.07E-01
BOLD:ACC1644	Ptinidae	Dorcatominae	*Sculptotheca puberula*	2.65E-01
BOLD:ACL4479	Ptinidae	Ernobiinae	*Xestobium affine*	3.05E+00
BOLD:ACI7732	Ptinidae	Ernobiinae	*Xestobium marginicolle*	4.74E-01
BOLD:ACI7730	Ptinidae	Ptilininae	*Ptilinus basalis*	2.00E+00
BOLD:AAP7068	Ptinidae	Ptilininae	*Ptilinus lobatus*	5.06E-01
BOLD:ACJ3145	Ptinidae	Ptilininae	*Ptilinus ruficornis*	1.66E+00
BOLD:ACN7946	Ptinidae	Ptininae	*Ptinus fallax*	1.66E-01
BOLD:ACU6867	Ptinidae	Ptininae	*Ptinus raptor*	9.94E-01
BOLD:ACL6280	Ptinidae	Xyletininae	*Euvrilletta harrisii*	2.36E+00
BOLD:AAH0188	Pyrochroidae	Pedilinae	*Pedilus*	3.65E+00
BOLD:AAU7315	Pyrochroidae	Pedilinae	*Pedilus*	1.20E+00
BOLD:ACJ0590	Pyrochroidae	Pedilinae	*Pedilus*	1.39E+00
BOLD:AAH0183	Pyrochroidae	Pedilinae	*Pedilus elegans*	3.14E+00
BOLD:AAH0127	Pyrochroidae	Pedilinae	*Pedilus lugubris*	4.28E+00
BOLD:ABA6332	Pyrochroidae	Pedilinae	*Pedilus terminalis*	1.73E+00
BOLD:AAG0758	Pyrochroidae	Pyrochroinae	*Dendroides canadensis*	1.46E+01
BOLD:AAD5963	Pyrochroidae	Pyrochroinae	*Dendroides concolor*	1.26E+01
BOLD:ACI6375	Pyrochroidae	Pyrochroinae	*Dendroides concolor*	9.90E+00
BOLD:ACB1653	Pyrochroidae	Pyrochroinae	*Dendroides ephemeroides*	6.09E+00
BOLD:ACJ2687	Pyrochroidae	Pyrochroinae	*Dendroides testaceus*	1.24E+01
BOLD:ACB1646	Pyrochroidae	Pyrochroinae	*Neopyrochroa femoralis*	2.92E+01
BOLD:ACU8336	Pyrochroidae	Pyrochroinae	*Neopyrochroa flabellata*	1.41E+01
BOLD:AAG0759	Pyrochroidae	Pyrochroinae	*Schizotus cervicalis*	2.82E+00
BOLD:AAU6900	Pythidae	Pythinae	*Pytho seidlitzi*	1.69E+01
BOLD:ABA6365	Ripiphoridae	Pelecotominae	*Pelecotoma flavipes*	5.03E-01
BOLD:ABA6346	Ripiphoridae	Ripiphorinae	*Ripiphorus fasciatus*	4.33E+00

BOLD:ADH7426	Salpingidae	Salpinginae	*Rhinosimus*	3.55E-01
BOLD:ACC3234	Salpingidae	Salpinginae	*Rhinosimus viridiaeneus*	2.15E-01
BOLD:ACI6024	Salpingidae	Salpinginae	*Rhinosimus viridiaeneus*	4.68E-01
BOLD:ACL7864	Salpingidae	Salpinginae	*Rhinosimus viridiaeneus*	4.76E-01
BOLD:ACL8164	Salpingidae	Salpinginae	*Rhinosimus viridiaeneus*	3.17E-01
BOLD:AAP7051	Salpingidae	Salpinginae	*Sphaeriestes virescens*	1.90E-01
BOLD:AAH6818	Scarabaeidae	Aegialiinae	*Aegialia lacustris*	3.49E+00
BOLD:AAY9690	Scarabaeidae	Aegialiinae	*Aegialia lacustris*	3.02E+00
BOLD:AAZ0072	Scarabaeidae	Aegialiinae	*Aegialia terminalis*	2.41E+00
BOLD:AAP7793	Scarabaeidae	Aegialiinae	*Caelius montanus*	1.43E+00
BOLD:AAY9426	Scarabaeidae	Aphodiinae	*Agoliinus albertanus*	3.49E+00
BOLD:ACZ2345	Scarabaeidae	Aphodiinae	*Agoliinus aleutus*	3.96E+00
BOLD:AAH6808	Scarabaeidae	Aphodiinae	*Agoliinus anthracus*	1.05E+01
BOLD:ACL4313	Scarabaeidae	Aphodiinae	*Agoliinus anthracus*	7.01E+00
BOLD:AAP7086	Scarabaeidae	Aphodiinae	*Agoliinus congregatus*	5.46E+00
BOLD:AAP7092	Scarabaeidae	Aphodiinae	*Agoliinus congregatus*	3.32E+00
BOLD:AAH6806	Scarabaeidae	Aphodiinae	*Agoliinus leopardus*	5.40E+00
BOLD:AAQ0098	Scarabaeidae	Aphodiinae	*Agoliinus piceatus*	6.09E+00
BOLD:ABA9069	Scarabaeidae	Aphodiinae	*Aphodius pedellus*	1.25E+01
BOLD:ACK1561	Scarabaeidae	Aphodiinae	*Ataenius*	2.01E+00
BOLD:AAH0150	Scarabaeidae	Aphodiinae	*Ataenius spretulus*	1.88E+00
BOLD:AAU7293	Scarabaeidae	Aphodiinae	*Ataenius spretulus*	3.65E+00
BOLD:AAM7733	Scarabaeidae	Aphodiinae	*Calamosternus granarius*	2.91E+00
BOLD:AAY9011	Scarabaeidae	Aphodiinae	*Caligodorus opacus*	4.14E+01
BOLD:AAZ1479	Scarabaeidae	Aphodiinae	*Cryptoscatomaseter punctissimus*	1.58E+00
BOLD:ADH4918	Scarabaeidae	Aphodiinae	*Dialytellus dialytoides*	1.49E+00
BOLD:AAM7660	Scarabaeidae	Aphodiinae	*Dialytes striatulus*	3.42E+00
BOLD:AAP6551	Scarabaeidae	Aphodiinae	*Dialytes truncatus*	8.09E+00
BOLD:AAP6549	Scarabaeidae	Aphodiinae	*Dialytes ulkei*	6.78E+00
BOLD:AAY9002	Scarabaeidae	Aphodiinae	*Diapterna omissa*	3.76E+01
BOLD:ACI3677	Scarabaeidae	Aphodiinae	*Liothorax alternatus*	2.98E+00
BOLD:AAZ1061	Scarabaeidae	Aphodiinae	*Melinopterus prodromus*	8.53E+00
BOLD:AAH0159	Scarabaeidae	Aphodiinae	*Oscarinus rusicola*	2.14E+00
BOLD:ACW5518	Scarabaeidae	Aphodiinae	*Oscarinus rusicola*	3.61E+00
BOLD:AAO4744	Scarabaeidae	Aphodiinae	*Otophorus haemorrhoidalis*	3.46E+00
BOLD:AAP7007	Scarabaeidae	Aphodiinae	*Psammodius laevipennis*	6.79E-01
BOLD:AAP5945	Scarabaeidae	Aphodiinae	*Teuchestes fossor*	3.92E+01
BOLD:ACX5730	Scarabaeidae	Cetoniidae	*Osmoderma eremicola*	7.15E+02
BOLD:AAY8904	Scarabaeidae	Cetoniidae	*Osmoderma scabra*	1.98E+02
BOLD:AAQ0095	Scarabaeidae	Cetoniinae	*Trichiotinus assimilis*	3.42E+01
BOLD:AAO0249	Scarabaeidae	Cetoniinae	*Valgus hemipterus*	3.60E+01
BOLD:AAH6800	Scarabaeidae	Dynastinae	*Tomarus gibbosus*	8.27E+01
BOLD:AAR3859	Scarabaeidae	Melolonthinae	*Amphimallon majale*	7.65E+01
BOLD:ADB1892	Scarabaeidae	Melolonthinae	*Dichelonyx*	1.58E+01
BOLD:AAH0140	Scarabaeidae	Melolonthinae	*Dichelonyx albicollis*	1.76E+01
BOLD:ACC1981	Scarabaeidae	Melolonthinae	*Dichelonyx backii*	5.06E+01
BOLD:AAQ0097	Scarabaeidae	Melolonthinae	*Dichelonyx backii*	8.38E+00
BOLD:AAH6803	Scarabaeidae	Melolonthinae	*Dichelonyx kirbyi*	9.30E+00

BOLD:AAH6801	Scarabaeidae	Melolonthinae	*Dichelonyx linearis*	1.54E+01
BOLD:AAG4446	Scarabaeidae	Melolonthinae	*Dichelonyx subvittata*	2.33E+01
BOLD:AAH6863	Scarabaeidae	Melolonthinae	*Dichelonyx subvittata*	2.41E+01
BOLD:ACE4462	Scarabaeidae	Melolonthinae	*Dichelonyx subvittata*	4.42E+01
BOLD:ACF4941	Scarabaeidae	Melolonthinae	*Dichelonyx subvittata*	1.95E+01
BOLD:ACF4942	Scarabaeidae	Melolonthinae	*Dichelonyx subvittata*	2.30E+01
BOLD:AAH6807	Scarabaeidae	Melolonthinae	*Diplotaxis brevicollis*	6.16E+01
BOLD:AAY9403	Scarabaeidae	Melolonthinae	*Diplotaxis haydenii*	6.24E+01
BOLD:ABY7987	Scarabaeidae	Melolonthinae	*Diplotaxis obscura*	6.49E+01
BOLD:AAH6793	Scarabaeidae	Melolonthinae	*Diplotaxis tristis*	5.90E+01
BOLD:AAH0136	Scarabaeidae	Melolonthinae	*Phyllophaga anxia*	9.81E+01
BOLD:AAH6791	Scarabaeidae	Melolonthinae	*Phyllophaga anxia*	1.68E+02
BOLD:ACE7537	Scarabaeidae	Melolonthinae	*Phyllophaga anxia*	1.31E+02
BOLD:AAC4287	Scarabaeidae	Melolonthinae	*Phyllophaga crenulata*	1.40E+01
BOLD:ACE8584	Scarabaeidae	Melolonthinae	*Phyllophaga drakii*	2.93E+02
BOLD:ACE8583	Scarabaeidae	Melolonthinae	*Phyllophaga fusca*	1.65E+02
BOLD:AAD1098	Scarabaeidae	Melolonthinae	*Phyllophaga futilis*	1.16E+02
BOLD:AAC5184	Scarabaeidae	Melolonthinae	*Phyllophaga implicita*	7.35E+01
BOLD:ADI5554	Scarabaeidae	Melolonthinae	*Phyllophaga longispina*	8.45E+01
BOLD:AAY1121	Scarabaeidae	Melolonthinae	*Phyllophaga marginalis*	2.99E+02
BOLD:AAH6804	Scarabaeidae	Melolonthinae	*Phyllophaga nitida*	1.40E+02
BOLD:AAJ2312	Scarabaeidae	Melolonthinae	*Phyllophaga rugosa*	2.02E+02
BOLD:ADF9894	Scarabaeidae	Melolonthinae	*Phyllophaga rugosa*	2.44E+02
BOLD:AAY1152	Scarabaeidae	Melolonthinae	*Phyllophaga tristis*	4.54E+01
BOLD:AAH6805	Scarabaeidae	Melolonthinae	*Serica atracapilla*	2.39E+01
BOLD:ABX5587	Scarabaeidae	Melolonthinae	*Serica atracapilla*	3.13E+01
BOLD:AAQ0094	Scarabaeidae	Melolonthinae	*Serica curvata*	1.02E+01
BOLD:AAP6211	Scarabaeidae	Melolonthinae	*Serica georgiana*	2.52E+01
BOLD:ACM8090	Scarabaeidae	Melolonthinae	*Serica georgiana*	2.78E+01
BOLD:AAH6792	Scarabaeidae	Melolonthinae	*Serica intermixta*	1.88E+01
BOLD:AAH6797	Scarabaeidae	Melolonthinae	*Serica parallela*	2.35E+01
BOLD:AAH6798	Scarabaeidae	Melolonthinae	*Serica sericea*	2.09E+01
BOLD:ADF8955	Scarabaeidae	Melolonthinae	*Serica sericea*	1.90E+01
BOLD:ADF8956	Scarabaeidae	Melolonthinae	*Serica sericea*	1.75E+01
BOLD:AAH6862	Scarabaeidae	Melolonthinae	*Serica tristis*	1.88E+01
BOLD:AAH6809	Scarabaeidae	Rutelinae	*Pelidnota punctata*	2.95E+02
BOLD:AAF0418	Scarabaeidae	Rutelinae	*Popillia japonica*	2.37E+01
BOLD:AAH6796	Scarabaeidae	Scarabaeinae	*Onthophagus hecate*	1.40E+01
BOLD:AAK3393	Scarabaeidae	Scarabaeinae	*Onthophagus hecate*	2.29E+01
BOLD:ACY6649	Scarabaeidae	Scarabaeinae	*Onthophagus hecate*	1.79E+01
BOLD:AAH6817	Scarabaeidae	Scarabaeinae	*Onthophagus nuchicornis*	3.13E+01
BOLD:AAH6827	Scarabaeidae	Scarabaeinae	*Onthophagus orpheus*	7.43E+00
BOLD:AAM7653	Scirtidae	Scirtinae	*Contacyphon*	3.44E-01
BOLD:AAM7685	Scirtidae	Scirtinae	*Contacyphon*	2.48E-01
BOLD:AAN5931	Scirtidae	Scirtinae	*Contacyphon*	4.25E-01
BOLD:AAU7169	Scirtidae	Scirtinae	*Contacyphon*	1.34E-01
BOLD:ABA6308	Scirtidae	Scirtinae	*Contacyphon*	1.64E-01
BOLD:ACC3281	Scirtidae	Scirtinae	*Contacyphon*	3.98E-01
BOLD:ACI5580	Scirtidae	Scirtinae	*Contacyphon*	2.43E-01

BOLD:ACL5432	Scirtidae	Scirtinae	*Contacyphon*	7.95E-01
BOLD:ACL8899	Scirtidae	Scirtinae	*Contacyphon*	7.63E-01
BOLD:ACS5814	Scirtidae	Scirtinae	*Contacyphon*	1.56E-01
BOLD:ACU4421	Scirtidae	Scirtinae	*Contacyphon*	2.67E-01
BOLD:ACU4653	Scirtidae	Scirtinae	*Contacyphon*	1.74E-01
BOLD:ACV0994	Scirtidae	Scirtinae	*Contacyphon*	4.71E-01
BOLD:ACX4619	Scirtidae	Scirtinae	*Contacyphon*	4.14E-01
BOLD:ACZ2399	Scirtidae	Scirtinae	*Contacyphon*	3.61E-01
BOLD:ACX3673	Scirtidae	Scirtinae	*Contacyphon fuscescens*	7.22E-01
BOLD:AAJ3307	Scirtidae	Scirtinae	*Contacyphon kongsbergensis*	2.18E-01
BOLD:AAG7260	Scirtidae	Scirtinae	*Contacyphon obscurellus*	2.03E-01
BOLD:ACP0631	Scirtidae	Scirtinae	*Contacyphon obscurellus*	2.69E-01
BOLD:ACP0632	Scirtidae	Scirtinae	*Contacyphon obscurellus*	4.04E-01
BOLD:AAG7259	Scirtidae	Scirtinae	*Contacyphon obscurus*	2.80E-01
BOLD:AAN6202	Scirtidae	Scirtinae	*Contacyphon obscurus*	5.06E-01
BOLD:ACF7856	Scirtidae	Scirtinae	*Contacyphon obscurus*	5.13E-01
BOLD:AAG7261	Scirtidae	Scirtinae	*Contacyphon ochreatus*	1.99E-01
BOLD:AAP7021	Scirtidae	Scirtinae	*Contacyphon pusillus*	2.85E-01
BOLD:AAG7258	Scirtidae	Scirtinae	*Contacyphon variabilis*	6.10E-01
BOLD:AAH0074	Scirtidae	Scirtinae	*Contacyphon variabilis*	1.15E+00
BOLD:ABX0672	Scirtidae	Scirtinae	*Contacyphon variabilis*	3.62E-01
BOLD:ACN3059	Scirtidae	Scirtinae	*Contacyphon variabilis*	3.06E-01
BOLD:ACA6831	Scirtidae	Scirtinae	*Elodes maculicollis*	3.48E-01
BOLD:ACK5690	Scirtidae	Scirtinae	*Exneria ruficollis*	4.56E-01
BOLD:AAP7091	Scirtidae	Scirtinae	*Herthania concinna*	4.97E-01
BOLD:AAP7786	Scirtidae	Scirtinae	*Hiekecyphon brevicollis*	1.29E+00
BOLD:ACL4535	Scirtidae	Scirtinae	*Nyholmia collaris*	5.90E-01
BOLD:ACL4545	Scirtidae	Scirtinae	*Nyholmia confusa*	9.45E-01
BOLD:ABA6354	Scirtidae	Scirtinae	*Prionocyphon discoideus*	1.64E+00
BOLD:ABW8701	Scirtidae	Scirtinae	*Prionocyphon limbatus*	1.16E+00
BOLD:AAU7321	Scirtidae	Scirtinae	*Sacodes pulchella*	6.15E-01
BOLD:ABX3604	Scirtidae	Scirtinae	*Sacodes thoracica*	1.32E+00
BOLD:ADH8691	Scirtidae	Scirtinae	*Sacodes thoracica*	6.96E-01
BOLD:AAH0215	Scirtidae	Scirtinae	*Scirtes tibialis*	8.25E-01
BOLD:ADI5474	Scirtidae			4.14E-01
BOLD:ADJ2595	Scirtidae			2.33E-01
BOLD:AAH0302	Scraptiidae	Anaspidinae	*Anaspis atrata*	2.93E-01
BOLD:ADG2608	Scraptiidae	Anaspidinae	*Anaspis atrata*	2.69E-01
BOLD:AAP7056	Scraptiidae	Anaspidinae	*Anaspis duryi*	2.14E-01
BOLD:AAP7841	Scraptiidae	Anaspidinae	*Anaspis flavipennis*	2.57E-01
BOLD:ACC3109	Scraptiidae	Anaspidinae	*Anaspis olympiae*	2.79E-01
BOLD:ACI3342	Scraptiidae	Anaspidinae	*Anaspis rayi*	1.60E-01
BOLD:AAH0265	Scraptiidae	Anaspidinae	*Anaspis rufa*	4.38E-01
BOLD:AAH0469	Scraptiidae	Anaspidinae	*Anaspis rufa*	4.52E-01
BOLD:AAP7041	Scraptiidae	Anaspidinae	*Anaspis rufa*	2.00E-01
BOLD:ACI7482	Scraptiidae	Anaspidinae	*Anaspis rufa*	2.43E-01
BOLD:AAP7820	Scraptiidae	Anaspidinae	*Pentaria fuscula*	1.45E-01
BOLD:AAU7135	Scraptiidae	Anaspidinae	*Pentaria trifasciata*	3.12E-01
BOLD:ABX0620	Scraptiidae	Anaspidinae	*Pentaria trifasciata*	1.34E-01

BOLD:ACJ0532	Scraptiidae	Anaspidinae	*Pentaria trifasciata*	3.53E-01
BOLD:ABY1051	Scraptiidae	Ischaliinae	*Ischalia costata*	7.94E-01
BOLD:ACA7147	Scraptiidae	Scraptiinae	*Canifa*	1.35E-01
BOLD:ACN0297	Scraptiidae	Scraptiinae	*Canifa*	1.90E-01
BOLD:ADI8647	Scraptiidae	Scraptiinae	*Canifa*	2.45E-01
BOLD:ADJ1651	Scraptiidae	Scraptiinae	*Canifa*	2.86E-01
BOLD:ADJ3604	Scraptiidae	Scraptiinae	*Canifa*	1.05E-01
BOLD:AAH0470	Scraptiidae	Scraptiinae	*Canifa pallipes*	2.42E-01
BOLD:AAP7039	Scraptiidae	Scraptiinae	*Canifa pallipes*	2.58E-01
BOLD:AAY6551	Scraptiidae	Scraptiinae	*Canifa pallipes*	3.58E-01
BOLD:ABA9081	Scraptiidae	Scraptiinae	*Canifa pallipes*	1.04E-01
BOLD:ABY0745	Scraptiidae	Scraptiinae	*Canifa pallipes*	1.53E-01
BOLD:ACN6724	Scraptiidae	Scraptiinae	*Canifa pallipes*	1.10E-01
BOLD:ACB0833	Scraptiidae	Scraptiinae	*Canifa pusilla*	2.37E-01
BOLD:ACU2996	Scraptiidae	Scraptiinae	*Pectotoma hoppingi*	5.26E-01
BOLD:AAE2146	Silphidae	Nicrophorinae	*Nicrophorus defodiens*	8.02E+01
BOLD:AAI3110	Silphidae	Nicrophorinae	*Nicrophorus hebes*	8.01E+01
BOLD:AAF2735	Silphidae	Nicrophorinae	*Nicrophorus hybridus*	2.31E+02
BOLD:AAB4891	Silphidae	Nicrophorinae	*Nicrophorus investigator*	1.05E+02
BOLD:AAE1939	Silphidae	Nicrophorinae	*Nicrophorus orbicollis*	1.22E+02
BOLD:AAC2598	Silphidae	Nicrophorinae	*Nicrophorus pustulatus*	1.78E+02
BOLD:AAD8009	Silphidae	Nicrophorinae	*Nicrophorus sayi*	1.11E+02
BOLD:AAG3729	Silphidae	Nicrophorinae	*Nicrophorus tomentosus*	1.01E+02
BOLD:ACL3054	Silphidae	Silphinae	*Heterosilpha ramosa*	5.98E+01
BOLD:AAC2599	Silphidae	Silphinae	*Necrodes surinamensis*	9.38E+01
BOLD:AAG2066	Silphidae	Silphinae	*Necrophila americana*	8.74E+01
BOLD:AAM7717	Silphidae	Silphinae	*Oiceoptoma inaequale*	2.87E+01
BOLD:ACQ2131	Silphidae	Silphinae	*Oiceoptoma noveboracense*	1.95E+01
BOLD:AAH0184	Silphidae	Silphinae	*Thanatophilus sagax*	1.09E+01
BOLD:AAG4608	Silphidae	Silphinae	*Thanatophilus trituberculatus*	8.52E+00
BOLD:ACA9015	Silvanidae	Brontinae	*Dendrophagus cygnaei*	1.97E+00
BOLD:AAW6380	Silvanidae	Brontinae	*Telephanus velox*	5.84E-01
BOLD:AAJ7829	Silvanidae	Brontinae	*Uleiota*	3.65E-01
BOLD:AAJ2005	Silvanidae	Silvaninae	*Ahasverus advena*	9.96E-02
BOLD:ACK1636	Silvanidae	Silvaninae	*Oryzaephilus mercator*	2.23E-01
BOLD:AAO0157	Silvanidae	Silvaninae	*Silvanus bidentatus*	1.88E-01
BOLD:ACE2008	Sphindidae	Odontosphindinae	*Odontosphindus denticollis*	4.95E-01
BOLD:ACC4459	Sphindidae	Sphindinae	*Eurysphindus hirtus*	2.39E-01
BOLD:ABA9085	Sphindidae	Sphindinae	*Sphindus*	1.97E-01
BOLD:ABX0586	Sphindidae	Sphindinae	*Sphindus*	2.38E-01
BOLD:ADI2900	Sphindidae	Sphindinae	*Sphindus*	1.83E-01
BOLD:ACI0585	Staphylinidae	Aleocharinae	*Acrotona*	3.47E-02
BOLD:ABW2813	Staphylinidae	Aleocharinae	*Acrotona fungi*	6.27E-02
BOLD:ABA6307	Staphylinidae	Aleocharinae	*Aleochara*	1.71E+00
BOLD:AAC3518	Staphylinidae	Aleocharinae	*Aleochara bilineata*	8.98E-01
BOLD:AAJ3997	Staphylinidae	Aleocharinae	*Aleochara castaneipennis*	4.06E-01
BOLD:AAN6189	Staphylinidae	Aleocharinae	*Aleochara castaneipennis*	5.81E-01
BOLD:AAJ2741	Staphylinidae	Aleocharinae	*Aleochara curtula*	3.06E+00
BOLD:ACI6667	Staphylinidae	Aleocharinae	*Aleochara fumata*	2.98E-01

BOLD:ACL1460	Staphylinidae	Aleocharinae	*Aleochara inexpectata*	2.01E-01
BOLD:AAJ3943	Staphylinidae	Aleocharinae	*Aleochara lanuginosa*	8.31E-01
BOLD:AAJ2760	Staphylinidae	Aleocharinae	*Aleochara lata*	1.77E+00
BOLD:AAW1617	Staphylinidae	Aleocharinae	*Aleochara rubricalis*	2.48E-01
BOLD:AAY6529	Staphylinidae	Aleocharinae	*Aleochara rubripennis*	7.58E-01
BOLD:ABW2817	Staphylinidae	Aleocharinae	*Aleochara sculptiventris*	5.97E-01
BOLD:AAG4268	Staphylinidae	Aleocharinae	*Aleochara sekanai*	1.52E+00
BOLD:AAJ3320	Staphylinidae	Aleocharinae	*Aleochara sulcicollis*	3.96E-01
BOLD:ACL8833	Staphylinidae	Aleocharinae	*Aleochara thoracica*	5.52E-01
BOLD:AAJ2720	Staphylinidae	Aleocharinae	*Aleochara verna*	3.10E-01
BOLD:ACL9252	Staphylinidae	Aleocharinae	*Aleodorus bilobatus*	2.25E-01
BOLD:ABX2447	Staphylinidae	Aleocharinae	*Amarochara brevios*	7.30E-02
BOLD:ABA5313	Staphylinidae	Aleocharinae	*Amischa*	4.68E-02
BOLD:ACP6255	Staphylinidae	Aleocharinae	*Amischa*	3.00E-02
BOLD:ABA6362	Staphylinidae	Aleocharinae	*Amischa decipiens*	7.73E-02
BOLD:AAG4273	Staphylinidae	Aleocharinae	*Atheta*	6.72E-01
BOLD:AAG4308	Staphylinidae	Aleocharinae	*Atheta*	1.99E-01
BOLD:ACE1400	Staphylinidae	Aleocharinae	*Atheta*	1.12E-01
BOLD:ACG4426	Staphylinidae	Aleocharinae	*Atheta*	1.80E-01
BOLD:ACI4768	Staphylinidae	Aleocharinae	*Atheta*	1.56E-01
BOLD:ABW2109	Staphylinidae	Aleocharinae	*Atheta aeneipennis*	1.73E-01
BOLD:AAU6963	Staphylinidae	Aleocharinae	*Atheta alesi*	1.00E-01
BOLD:ABX2453	Staphylinidae	Aleocharinae	*Atheta altaica*	1.13E-01
BOLD:ABA9094	Staphylinidae	Aleocharinae	*Atheta brunneipennis*	2.03E-01
BOLD:ACO0041	Staphylinidae	Aleocharinae	*Atheta brunswickensis*	8.10E-02
BOLD:AAP7809	Staphylinidae	Aleocharinae	*Atheta capsularis*	7.74E-02
BOLD:AAP7810	Staphylinidae	Aleocharinae	*Atheta capsularis*	1.71E-01
BOLD:ACN6611	Staphylinidae	Aleocharinae	*Atheta crenuliventris*	1.76E-01
BOLD:AAM7648	Staphylinidae	Aleocharinae	*Atheta dadopora*	1.33E-02
BOLD:AAP7816	Staphylinidae	Aleocharinae	*Atheta dadopora*	2.21E-02
BOLD:ACL9881	Staphylinidae	Aleocharinae	*Atheta fanatica*	8.13E-02
BOLD:AAO0986	Staphylinidae	Aleocharinae	*Atheta graminicola*	2.37E-01
BOLD:AAM7651	Staphylinidae	Aleocharinae	*Atheta hampshirensis*	5.53E-02
BOLD:AAP7813	Staphylinidae	Aleocharinae	*Atheta irrupta*	2.68E-01
BOLD:ACC7178	Staphylinidae	Aleocharinae	*Atheta klagesi*	1.13E-01
BOLD:AAK0550	Staphylinidae	Aleocharinae	*Atheta longicornis*	1.55E-01
BOLD:AAG4334	Staphylinidae	Aleocharinae	*Atheta modesta*	1.20E-01
BOLD:ACC7214	Staphylinidae	Aleocharinae	*Atheta modesta*	1.46E-01
BOLD:AAP7826	Staphylinidae	Aleocharinae	*Atheta nescia*	3.23E-02
BOLD:ACO4408	Staphylinidae	Aleocharinae	*Atheta nigra*	3.85E-02
BOLD:ACU1496	Staphylinidae	Aleocharinae	*Atheta pseudocrenuliventris*	6.01E-02
BOLD:AAP7047	Staphylinidae	Aleocharinae	*Atheta pseudometlakatlana*	2.08E-01
BOLD:AAG4329	Staphylinidae	Aleocharinae	*Atheta strigosula*	2.09E-01
BOLD:AAP7045	Staphylinidae	Aleocharinae	*Atheta strigosula*	2.13E-01
BOLD:ACM1497	Staphylinidae	Aleocharinae	*Atheta ventricosa*	1.26E-01
BOLD:ACM1510	Staphylinidae	Aleocharinae	*Atheta ventricosa*	1.15E-01
BOLD:ACD0258	Staphylinidae	Aleocharinae	*Autalia truncatula*	1.15E-01
BOLD:AAG4311	Staphylinidae	Aleocharinae	*Boreophilia fusca*	4.14E-01
BOLD:AAN6493	Staphylinidae	Aleocharinae	*Boreostiba parvipennis*	5.01E-02

BOLD:AAP7811	Staphylinidae	Aleocharinae	*Boreostiba websteri*	9.55E-02
BOLD:ACX6587	Staphylinidae	Aleocharinae	*Brachyusa helenae*	4.63E-02
BOLD:ACC2301	Staphylinidae	Aleocharinae	*Callicerus rigidicornis*	2.92E-01
BOLD:AAO0582	Staphylinidae	Aleocharinae	*Cordalia obscura*	1.37E-01
BOLD:ADE9599	Staphylinidae	Aleocharinae	*Cypha inexpectata*	2.55E-02
BOLD:AAF9270	Staphylinidae	Aleocharinae	*Devia prospera*	4.74E-01
BOLD:ADH0425	Staphylinidae	Aleocharinae	*Dexiogyia angustiventris*	6.05E-02
BOLD:ABW9176	Staphylinidae	Aleocharinae	*Dexiogyia forticornis*	1.15E-01
BOLD:AAM0420	Staphylinidae	Aleocharinae	*Dinaraea aequata*	2.42E-01
BOLD:ACM9585	Staphylinidae	Aleocharinae	*Dinaraea borealis*	1.08E-01
BOLD:ACL3596	Staphylinidae	Aleocharinae	*Dinaraea pacei*	9.48E-02
BOLD:AAY0146	Staphylinidae	Aleocharinae	*Drusilla canaliculata*	5.90E-01
BOLD:ACC6491	Staphylinidae	Aleocharinae	*Earota dentata*	2.46E-01
BOLD:ACN3294	Staphylinidae	Aleocharinae	*Euvira micmac*	5.06E-02
BOLD:ACE3137	Staphylinidae	Aleocharinae	*Falagria caesa*	8.45E-02
BOLD:ACR9612	Staphylinidae	Aleocharinae	*Gennadota canadensis*	6.49E-01
BOLD:AAY1422	Staphylinidae	Aleocharinae	*Geostiba circellaris*	6.20E-02
BOLD:AAV0967	Staphylinidae	Aleocharinae	*Gnathusa tenuicornis*	2.57E-01
BOLD:ACO5219	Staphylinidae	Aleocharinae	*Gymnusa grandiceps*	1.60E+00
BOLD:AAU7103	Staphylinidae	Aleocharinae	*Gymnusa pseudovariegata*	1.50E+00
BOLD:ABX1702	Staphylinidae	Aleocharinae	*Gyrophaena*	2.67E-01
BOLD:ACK6363	Staphylinidae	Aleocharinae	*Gyrophaena*	3.46E-02
BOLD:ACN0985	Staphylinidae	Aleocharinae	*Gyrophaena*	1.02E-01
BOLD:ACW9453	Staphylinidae	Aleocharinae	*Gyrophaena*	3.49E-02
BOLD:ADI2735	Staphylinidae	Aleocharinae	*Gyrophaena*	4.25E-02
BOLD:ACF7981	Staphylinidae	Aleocharinae	*Gyrophaena affinis*	3.88E-02
BOLD:ACY8004	Staphylinidae	Aleocharinae	*Gyrophaena criddlei*	4.15E-02
BOLD:ACV6600	Staphylinidae	Aleocharinae	*Gyrophaena fuscicollis*	7.33E-02
BOLD:ACY7790	Staphylinidae	Aleocharinae	*Gyrophaena gilvicollis*	1.06E-01
BOLD:ACY8387	Staphylinidae	Aleocharinae	*Gyrophaena involuta*	4.63E-02
BOLD:ACF7316	Staphylinidae	Aleocharinae	*Gyrophaena keeni*	4.47E-02
BOLD:ACG8262	Staphylinidae	Aleocharinae	*Gyrophaena laetula*	3.76E-02
BOLD:ACG6295	Staphylinidae	Aleocharinae	*Gyrophaena lobata*	1.09E-01
BOLD:ACY7730	Staphylinidae	Aleocharinae	*Gyrophaena modesta*	7.28E-02
BOLD:ACS0708	Staphylinidae	Aleocharinae	*Gyrophaena socia*	3.16E-02
BOLD:ACY5436	Staphylinidae	Aleocharinae	*Gyrophaena subnitens*	8.07E-02
BOLD:ACN2725	Staphylinidae	Aleocharinae	*Hylota cryptica*	3.26E-01
BOLD:ACD9884	Staphylinidae	Aleocharinae	*Leptusa*	7.83E-02
BOLD:ACM2432	Staphylinidae	Aleocharinae	*Leptusa carolinensis*	1.58E-01
BOLD:ADH4156	Staphylinidae	Aleocharinae	*Leptusa carolinensis*	4.37E-02
BOLD:ACN6826	Staphylinidae	Aleocharinae	*Liogluta intermedia*	2.69E-01
BOLD:ACI0993	Staphylinidae	Aleocharinae	*Liogluta nigropolita*	2.00E-01
BOLD:ACF6643	Staphylinidae	Aleocharinae	*Liogluta nitens*	1.19E-01
BOLD:ACL9669	Staphylinidae	Aleocharinae	*Lypoglossa angularis*	3.51E-01
BOLD:ACI4493	Staphylinidae	Aleocharinae	*Lypoglossa franclemonti*	6.38E-01
BOLD:AAX4592	Staphylinidae	Aleocharinae	*Meotica exilis*	1.25E-02
BOLD:ABW2870	Staphylinidae	Aleocharinae	*Meronera venustula*	7.62E-02
BOLD:ACF6642	Staphylinidae	Aleocharinae	*Mocyta breviuscula*	9.30E-02
BOLD:ACJ6804	Staphylinidae	Aleocharinae	*Myllaena arcana*	4.71E-02

BOLD:ACO2096	Staphylinidae	Aleocharinae	*Myllaena ludificans*	5.68E-02
BOLD:ACC7395	Staphylinidae	Aleocharinae	*Myrmecocephalus gatineauensis*	3.22E-01
BOLD:ACE1406	Staphylinidae	Aleocharinae	*Neothetalia canadiana*	9.35E-01
BOLD:ACG5226	Staphylinidae	Aleocharinae	*Neothetalia columbiana*	5.14E-01
BOLD:ACH7285	Staphylinidae	Aleocharinae	*Neothetalia nimia*	3.10E-01
BOLD:AAP9955	Staphylinidae	Aleocharinae	*Oligota parva*	1.24E-02
BOLD:ACC3375	Staphylinidae	Aleocharinae	*Oxypoda*	9.48E-02
BOLD:ACU3320	Staphylinidae	Aleocharinae	*Oxypoda*	6.77E-02
BOLD:ACC7328	Staphylinidae	Aleocharinae	*Oxypoda amica*	5.79E-02
BOLD:AAG4315	Staphylinidae	Aleocharinae	*Oxypoda demissa*	8.95E-02
BOLD:ACG5046	Staphylinidae	Aleocharinae	*Oxypoda frigida*	9.02E-02
BOLD:ACJ1791	Staphylinidae	Aleocharinae	*Oxypoda frigida*	8.51E-02
BOLD:AAP7840	Staphylinidae	Aleocharinae	*Oxypoda hiemalis*	6.65E-02
BOLD:AAP7048	Staphylinidae	Aleocharinae	*Oxypoda irrasa*	1.16E-01
BOLD:ACE1420	Staphylinidae	Aleocharinae	*Oxypoda irrasa*	1.72E-01
BOLD:ACE2633	Staphylinidae	Aleocharinae	*Oxypoda lacustris*	9.32E-02
BOLD:ACC2263	Staphylinidae	Aleocharinae	*Oxypoda longicarinata*	1.93E-01
BOLD:ACM1326	Staphylinidae	Aleocharinae	*Oxypoda lucidula*	5.34E-02
BOLD:AAN1581	Staphylinidae	Aleocharinae	*Oxypoda opaca*	6.98E-01
BOLD:ACI5073	Staphylinidae	Aleocharinae	*Oxypoda pseudoconvergens*	1.90E-01
BOLD:ABX9416	Staphylinidae	Aleocharinae	*Oxypoda pseudolacustris*	1.39E-01
BOLD:ACI5854	Staphylinidae	Aleocharinae	*Oxypoda sylvia*	1.83E-01
BOLD:ACL9506	Staphylinidae	Aleocharinae	*Pella gesneri*	6.00E-01
BOLD:ACY5387	Staphylinidae	Aleocharinae	*Pella loricata*	5.02E-01
BOLD:ABW2820	Staphylinidae	Aleocharinae	*Philhygra*	7.14E-02
BOLD:ACG6461	Staphylinidae	Aleocharinae	*Philhygra botanicarum*	4.18E-01
BOLD:ABA9956	Staphylinidae	Aleocharinae	*Philhygra jarmilae*	1.10E-01
BOLD:ACU6301	Staphylinidae	Aleocharinae	*Philhygra laevicollis*	2.95E-01
BOLD:AAG4282	Staphylinidae	Aleocharinae	*Philhygra malleoides*	7.71E-02
BOLD:AAN6150	Staphylinidae	Aleocharinae	*Philhygra palustris*	1.03E-01
BOLD:AAG4313	Staphylinidae	Aleocharinae	*Philhygra pseudopolaris*	2.98E-01
BOLD:ABW5504	Staphylinidae	Aleocharinae	*Philhygra pseudoterminalis*	1.01E-01
BOLD:ACS3907	Staphylinidae	Aleocharinae	*Phloeopora canadensis*	6.27E-02
BOLD:ABY1664	Staphylinidae	Aleocharinae	*Placusa*	3.69E-02
BOLD:ABW5497	Staphylinidae	Aleocharinae	*Placusa tachyporoides*	7.07E-02
BOLD:AAP7806	Staphylinidae	Aleocharinae	*Placusa tacomae*	8.16E-02
BOLD:ACU9155	Staphylinidae	Aleocharinae	*Placusa vaga*	4.84E-02
BOLD:AAP7804	Staphylinidae	Aleocharinae	*Pontomalota opaca*	1.31E-01
BOLD:ACG4547	Staphylinidae	Aleocharinae	*Seeversiella globicollis*	9.05E-02
BOLD:ACL9254	Staphylinidae	Aleocharinae	*Silusa alternans*	2.78E-01
BOLD:ACC1636	Staphylinidae	Aleocharinae	*Silusa californica*	2.43E-01
BOLD:ACD0108	Staphylinidae	Aleocharinae	*Silusa densa*	8.06E-02
BOLD:ACH8111	Staphylinidae	Aleocharinae	*Silusa opaca*	2.57E-01
BOLD:AAG4335	Staphylinidae	Aleocharinae	*Silusida marginella*	8.99E-02
BOLD:ACH6420	Staphylinidae	Aleocharinae	*Stethusa spuriella*	1.14E-01
BOLD:AAP7058	Staphylinidae	Aleocharinae	*Stictalia brevicornis*	8.35E-02
BOLD:AAN6203	Staphylinidae	Aleocharinae	*Strigota ambigua*	4.34E-02
BOLD:AAU6968	Staphylinidae	Aleocharinae	*Strigota obscurata*	3.13E-02

BOLD:ACH6819	Staphylinidae	Aleocharinae	*Thamiaraea brittoni*	2.70E-01
BOLD:ACU6005	Staphylinidae	Aleocharinae	*Trichiusa*	3.94E-02
BOLD:AAY6555	Staphylinidae	Aleocharinae	*Trichiusa immigrata*	5.17E-02
BOLD:ADI1088	Staphylinidae	Aleocharinae	*Zyras*	5.25E-01
BOLD:ACF6082	Staphylinidae	Aleocharinae	*Zyras obliquus*	1.05E+00
BOLD:AAH0119	Staphylinidae	Aleocharinae		8.50E-02
BOLD:AAJ3271	Staphylinidae	Aleocharinae		1.11E-01
BOLD:AAP7020	Staphylinidae	Aleocharinae		5.89E-02
BOLD:AAP7823	Staphylinidae	Aleocharinae		1.06E-01
BOLD:AAP7849	Staphylinidae	Aleocharinae		6.93E-01
BOLD:AAY6554	Staphylinidae	Aleocharinae		5.87E-02
BOLD:ABW2844	Staphylinidae	Aleocharinae		4.85E-02
BOLD:ABX2478	Staphylinidae	Aleocharinae		2.93E-02
BOLD:ACA5597	Staphylinidae	Aleocharinae		1.34E-01
BOLD:ACC2939	Staphylinidae	Aleocharinae		6.15E-02
BOLD:ACC5897	Staphylinidae	Aleocharinae		1.16E-01
BOLD:ACC6492	Staphylinidae	Aleocharinae		4.76E-02
BOLD:ACE1365	Staphylinidae	Aleocharinae		6.94E-02
BOLD:ACE2096	Staphylinidae	Aleocharinae		7.68E-02
BOLD:ACF4289	Staphylinidae	Aleocharinae		5.64E-02
BOLD:ACF6186	Staphylinidae	Aleocharinae		3.27E-01
BOLD:ACF6293	Staphylinidae	Aleocharinae		9.44E-02
BOLD:ACF6294	Staphylinidae	Aleocharinae		3.14E-01
BOLD:ACG2775	Staphylinidae	Aleocharinae		2.64E-02
BOLD:ACG4366	Staphylinidae	Aleocharinae		4.27E-01
BOLD:ACI4329	Staphylinidae	Aleocharinae		2.29E-01
BOLD:ACI4809	Staphylinidae	Aleocharinae		1.74E-01
BOLD:ACI4884	Staphylinidae	Aleocharinae		8.83E-01
BOLD:ACI5072	Staphylinidae	Aleocharinae		5.76E-01
BOLD:ACI5302	Staphylinidae	Aleocharinae		1.20E-01
BOLD:ACL4508	Staphylinidae	Aleocharinae		9.78E-02
BOLD:ACN3724	Staphylinidae	Aleocharinae		3.66E-02
BOLD:ACN8501	Staphylinidae	Aleocharinae		4.36E-01
BOLD:ACO1650	Staphylinidae	Aleocharinae		1.64E-01
BOLD:ACO1826	Staphylinidae	Aleocharinae		1.16E-01
BOLD:ACU1188	Staphylinidae	Aleocharinae		1.21E-01
BOLD:ACV4138	Staphylinidae	Aleocharinae		8.18E-02
BOLD:ACW1689	Staphylinidae	Aleocharinae		1.61E-02
BOLD:ACW1885	Staphylinidae	Aleocharinae		1.60E-01
BOLD:ACZ0542	Staphylinidae	Aleocharinae		4.48E-02
BOLD:ACZ1067	Staphylinidae	Aleocharinae		2.17E-02
BOLD:ACZ1976	Staphylinidae	Aleocharinae		1.39E-02
BOLD:ADI7652	Staphylinidae	Aleocharinae		1.47E-02
BOLD:ADK7574	Staphylinidae	Aleocharinae		3.13E-02
BOLD:ADN2409	Staphylinidae	Aleocharinae		4.65E-02
BOLD:ACM6628	Staphylinidae	Empelinae	*Empelus brunnipennis*	1.32E-01
BOLD:AAH0117	Staphylinidae	Habrocerinae	*Habrocerus capillaricornis*	3.13E-01
BOLD:ACN8008	Staphylinidae	Omaliinae	*Acidota*	1.18E+00
BOLD:ACL8092	Staphylinidae	Omaliinae	*Acidota crenata*	1.38E+00

BOLD:AAV0966	Staphylinidae	Omaliinae	*Acidota quadrata*	6.33E-01
BOLD:ABW2836	Staphylinidae	Omaliinae	*Acidota subcarinata*	8.08E-01
BOLD:ACK0112	Staphylinidae	Omaliinae	*Acrolocha diffusa*	1.58E-01
BOLD:ACC2262	Staphylinidae	Omaliinae	*Amphichroum maculatum*	1.32E+00
BOLD:ACT9161	Staphylinidae	Omaliinae	*Anthobium fimetarium*	3.41E-01
BOLD:ACK8550	Staphylinidae	Omaliinae	*Brathinus nitidus*	6.62E-01
BOLD:ACG2797	Staphylinidae	Omaliinae	*Deinopteroloma subcostatum*	8.58E-01
BOLD:AAG4269	Staphylinidae	Omaliinae	*Eucnecosum brunnescens*	2.73E-01
BOLD:AAG4310	Staphylinidae	Omaliinae	*Eucnecosum brunnescens*	2.03E-01
BOLD:ACK0049	Staphylinidae	Omaliinae	*Eusphalerum convexum*	1.58E-01
BOLD:ACJ9525	Staphylinidae	Omaliinae	*Eusphalerum farrarae*	1.59E-01
BOLD:AAP7824	Staphylinidae	Omaliinae	*Eusphalerum fenyesi*	8.33E-02
BOLD:AAH0247	Staphylinidae	Omaliinae	*Eusphalerum pothos*	1.25E-01
BOLD:AAH0250	Staphylinidae	Omaliinae	*Eusphalerum sp.*	1.03E-01
BOLD:AAP7821	Staphylinidae	Omaliinae	*Eusphalerum sp.*	6.45E-02
BOLD:ACK8448	Staphylinidae	Omaliinae	*Geodromicus plagiatus*	8.46E-01
BOLD:ACJ9367	Staphylinidae	Omaliinae	*Hapalaraea hamata*	1.03E-01
BOLD:ACI5074	Staphylinidae	Omaliinae	*Hapalaraea megarthroides*	1.13E-01
BOLD:ACI6270	Staphylinidae	Omaliinae	*Lesteva pallipes*	3.06E-01
BOLD:AAG4280	Staphylinidae	Omaliinae	*Olophrum*	7.89E-01
BOLD:AAG4279	Staphylinidae	Omaliinae	*Olophrum boreale*	6.76E-01
BOLD:ABA6317	Staphylinidae	Omaliinae	*Olophrum obtectum*	1.64E+00
BOLD:AAG4272	Staphylinidae	Omaliinae	*Olophrum rotundicolle*	1.80E+00
BOLD:ACZ1623	Staphylinidae	Omaliinae	*Omalium*	1.64E-01
BOLD:ABX9417	Staphylinidae	Omaliinae	*Omalium foraminosum*	9.37E-02
BOLD:AAN1494	Staphylinidae	Omaliinae	*Omalium rivulare*	1.98E-01
BOLD:ACX2087	Staphylinidae	Omaliinae	*Pelecomalium*	2.05E-01
BOLD:AAP7096	Staphylinidae	Omaliinae	*Pelecomalium puberulum*	6.28E-01
BOLD:AAP7085	Staphylinidae	Omaliinae	*Pelecomalium testaceum*	5.39E-01
BOLD:AAP7088	Staphylinidae	Omaliinae	*Phlaeopterus*	4.31E+00
BOLD:ACE7299	Staphylinidae	Omaliinae	*Phlaeopterus lagrandeuri*	5.13E-01
BOLD:AAM7652	Staphylinidae	Omaliinae	*Phloeonomus*	3.28E-02
BOLD:ACC3017	Staphylinidae	Omaliinae	*Phloeonomus laesicollis*	1.93E-02
BOLD:AAG4317	Staphylinidae	Omaliinae	*Phloeostiba lapponica*	4.70E-02
BOLD:AAP7044	Staphylinidae	Omaliinae	*Phloeostiba lapponica*	5.98E-02
BOLD:ACG1894	Staphylinidae	Omaliinae	*Phloeostiba lapponica*	6.01E-02
BOLD:ABW5502	Staphylinidae	Omaliinae	*Phyllodrepa*	8.79E-02
BOLD:AAO1314	Staphylinidae	Omaliinae	*Phyllodrepa floralis*	3.32E-01
BOLD:ACK3100	Staphylinidae	Omaliinae	*Pseudohaida rothi*	1.54E-01
BOLD:ACI7100	Staphylinidae	Omaliinae	*Pycnoglypta campbelli*	6.07E-02
BOLD:ACZ1626	Staphylinidae	Omaliinae	*Pycnoglypta campbelli*	6.79E-02
BOLD:AAP7807	Staphylinidae	Omaliinae		3.63E-02
BOLD:AAP7862	Staphylinidae	Omaliinae		3.00E-01
BOLD:ACD0197	Staphylinidae	Omaliinae		1.94E-01
BOLD:ACE1433	Staphylinidae	Omaliinae		1.02E-01
BOLD:ACL5932	Staphylinidae	Omaliinae		4.42E-01
BOLD:ACM8777	Staphylinidae	Omaliinae		1.56E-01
BOLD:ACN1262	Staphylinidae	Omaliinae		2.49E-01
BOLD:ACT9387	Staphylinidae	Omaliinae		2.21E-01

BOLD:ACW3474	Staphylinidae	Omaliinae		2.42E-01
BOLD:ACX5588	Staphylinidae	Omaliinae		4.06E-01
BOLD:ACX7572	Staphylinidae	Omaliinae		1.39E-01
BOLD:ACZ2481	Staphylinidae	Omaliinae		3.50E-01
BOLD:ADD3887	Staphylinidae	Omaliinae		1.21E-01
BOLD:ACM1267	Staphylinidae	Osoriinae	*Renardia nigrella*	7.20E-02
BOLD:ACL0045	Staphylinidae	Osoriinae	*Thoracophorus costalis*	1.13E-01
BOLD:ACM0139	Staphylinidae	Oxyporinae	*Oxyporus*	1.56E+01
BOLD:AAP7008	Staphylinidae	Oxyporinae	*Oxyporus occipitalis*	4.63E+00
BOLD:ACM0326	Staphylinidae	Oxyporinae	*Oxyporus quinquemaculatus*	2.79E+00
BOLD:AAH0104	Staphylinidae	Oxytelinae	*Anotylus*	2.83E-01
BOLD:AAR3352	Staphylinidae	Oxytelinae	*Anotylus insecatus*	6.86E-01
BOLD:AAN4152	Staphylinidae	Oxytelinae	*Anotylus rugosus*	1.24E+00
BOLD:AAN1738	Staphylinidae	Oxytelinae	*Anotylus tetracarinatus*	6.72E-02
BOLD:ABX0554	Staphylinidae	Oxytelinae	*Apocellus*	2.59E-01
BOLD:ACM0437	Staphylinidae	Oxytelinae	*Apocellus sphaericollis*	1.34E-01
BOLD:AAG4300	Staphylinidae	Oxytelinae	*Bledius*	2.58E-01
BOLD:AAU7174	Staphylinidae	Oxytelinae	*Bledius*	3.31E-01
BOLD:ACV4933	Staphylinidae	Oxytelinae	*Bledius*	2.34E-01
BOLD:ADE2155	Staphylinidae	Oxytelinae	*Bledius*	4.25E-01
BOLD:ACM1150	Staphylinidae	Oxytelinae	*Bledius annularis*	5.36E-01
BOLD:ACI4714	Staphylinidae	Oxytelinae	*Bledius confusus*	1.88E+00
BOLD:AAL8063	Staphylinidae	Oxytelinae	*Bledius gravidus*	1.51E+00
BOLD:AAH0142	Staphylinidae	Oxytelinae	*Bledius philadelphicus*	6.07E-01
BOLD:AAM7593	Staphylinidae	Oxytelinae	*Bledius semiferrugineus*	1.19E+00
BOLD:AAM7620	Staphylinidae	Oxytelinae	*Carpelimus*	2.59E-01
BOLD:AAM7681	Staphylinidae	Oxytelinae	*Carpelimus*	8.52E-02
BOLD:AAN6491	Staphylinidae	Oxytelinae	*Carpelimus*	5.41E-02
BOLD:AAP7835	Staphylinidae	Oxytelinae	*Carpelimus*	6.55E-02
BOLD:AAU7154	Staphylinidae	Oxytelinae	*Carpelimus*	1.19E-01
BOLD:AAU7158	Staphylinidae	Oxytelinae	*Carpelimus*	1.14E-01
BOLD:AAU7164	Staphylinidae	Oxytelinae	*Carpelimus*	1.70E-01
BOLD:AAU7177	Staphylinidae	Oxytelinae	*Carpelimus*	4.22E-02
BOLD:AAU7180	Staphylinidae	Oxytelinae	*Carpelimus*	1.42E-01
BOLD:ABX0564	Staphylinidae	Oxytelinae	*Carpelimus*	3.18E-02
BOLD:ABX4033	Staphylinidae	Oxytelinae	*Carpelimus*	1.74E-01
BOLD:ADF6623	Staphylinidae	Oxytelinae	*Carpelimus*	6.34E-02
BOLD:ADI2808	Staphylinidae	Oxytelinae	*Carpelimus*	8.25E-02
BOLD:ADO0564	Staphylinidae	Oxytelinae	*Carpelimus*	7.05E-02
BOLD:AAW4293	Staphylinidae	Oxytelinae	*Carpelimus elongatulus*	9.71E-02
BOLD:AAO0549	Staphylinidae	Oxytelinae	*Carpelimus gracilis*	1.86E-02
BOLD:ABW4437	Staphylinidae	Oxytelinae	*Carpelimus pusillus*	1.76E-02
BOLD:AAN1045	Staphylinidae	Oxytelinae	*Coprophilus striatulus*	1.58E+00
BOLD:AAM7686	Staphylinidae	Oxytelinae	*Deleaster dichrous*	1.90E+00
BOLD:ACG2798	Staphylinidae	Oxytelinae	*Ochthephilus*	6.42E-01
BOLD:ACO7559	Staphylinidae	Oxytelinae	*Oxytelus*	2.66E-01
BOLD:AAK4726	Staphylinidae	Oxytelinae	*Oxytelus laqueatus*	4.89E-01
BOLD:AAP7845	Staphylinidae	Oxytelinae	*Oxytelus montanus*	8.88E-01
BOLD:ABA4847	Staphylinidae	Oxytelinae		9.94E-02

BOLD:ACB3318	Staphylinidae	Oxytelinae		4.31E-01
BOLD:ACI5964	Staphylinidae	Oxytelinae		5.90E-03
BOLD:ACK2634	Staphylinidae	Oxytelinae		5.99E-01
BOLD:ACV4901	Staphylinidae	Oxytelinae		7.80E-03
BOLD:ACX6912	Staphylinidae	Oxytelinae		1.93E-01
BOLD:ADA0712	Staphylinidae	Oxytelinae		3.95E-02
BOLD:ACC7608	Staphylinidae	Paederinae	*Astenus discopunctatus*	1.04E-01
BOLD:AAU7281	Staphylinidae	Paederinae	*Homaeotarsus*	4.40E+00
BOLD:ABW8777	Staphylinidae	Paederinae	*Homaeotarsus bicolor*	3.33E+00
BOLD:ADG8394	Staphylinidae	Paederinae	*Homaeotarsus cinctus*	2.99E+00
BOLD:ABA6350	Staphylinidae	Paederinae	*Homaeotarsus cribratus*	3.71E+00
BOLD:ADH2714	Staphylinidae	Paederinae	*Homaeotarsus pallipes*	3.84E+00
BOLD:AAG4288	Staphylinidae	Paederinae	*Homaeotarsus pimerianus*	5.68E+00
BOLD:ACM2955	Staphylinidae	Paederinae	*Lathrobium armatum*	1.66E+00
BOLD:AAG4327	Staphylinidae	Paederinae	*Lathrobium fauveli*	1.83E+00
BOLD:ACL8158	Staphylinidae	Paederinae	*Lathrobium othioides*	6.97E-01
BOLD:ACC7213	Staphylinidae	Paederinae	*Lathrobium scolopaceum*	7.15E-01
BOLD:ABX8887	Staphylinidae	Paederinae	*Lathrobium simile*	2.19E+00
BOLD:AAN6200	Staphylinidae	Paederinae	*Lithocharis nigriceps*	2.03E-01
BOLD:ABX3618	Staphylinidae	Paederinae	*Lobrathium*	4.90E-01
BOLD:ABA8115	Staphylinidae	Paederinae	*Lobrathium collare*	4.91E-01
BOLD:AAG4299	Staphylinidae	Paederinae	*Lobrathium coloradense*	1.39E+00
BOLD:ACX7551	Staphylinidae	Paederinae	*Lobrathium grande*	7.71E+00
BOLD:AAY6538	Staphylinidae	Paederinae	*Medon americanus*	5.41E-01
BOLD:ABA3745	Staphylinidae	Paederinae	*Ochthephilum fracticorne*	5.03E-01
BOLD:ABX0945	Staphylinidae	Paederinae	*Paederus littorarius*	9.56E-01
BOLD:AAG1179	Staphylinidae	Paederinae	*Pinophilus latipes*	1.62E+01
BOLD:AAO1222	Staphylinidae	Paederinae	*Rugilus orbiculatus*	4.16E-01
BOLD:AAL8073	Staphylinidae	Paederinae	*Rugilus rufipes*	1.03E+00
BOLD:ABX9691	Staphylinidae	Paederinae	*Sunius confluentus*	3.13E-01
BOLD:ACA8226	Staphylinidae	Paederinae	*Sunius melanocephalus*	1.19E-01
BOLD:ABA6337	Staphylinidae	Paederinae	*Tetartopeus*	1.11E+00
BOLD:AAH0132	Staphylinidae	Paederinae	*Tetartopeus furvulus*	1.78E+00
BOLD:AAM7644	Staphylinidae	Paederinae		1.35E-01
BOLD:AAU7179	Staphylinidae	Paederinae		2.36E-01
BOLD:ABW8692	Staphylinidae	Paederinae		1.67E+00
BOLD:ABX0588	Staphylinidae	Paederinae		2.91E-01
BOLD:ACL3142	Staphylinidae	Paederinae		1.36E-01
BOLD:ACP2369	Staphylinidae	Phloeocharinae	*Charhyphus picipennis*	1.01E-01
BOLD:AAO3216	Staphylinidae	Phloeocharinae	*Phloeocharis subtilissima*	4.09E-02
BOLD:ACC5898	Staphylinidae	Proteininae	*Megarthrus*	1.53E-01
BOLD:ACC5807	Staphylinidae	Proteininae	*Megarthrus angulicollis*	1.82E-01
BOLD:ACI5063	Staphylinidae	Proteininae	*Megarthrus excisus*	1.50E-01
BOLD:AAM7678	Staphylinidae	Proteininae	*Proteinus*	5.15E-02
BOLD:AAN6492	Staphylinidae	Proteininae	*Proteinus*	3.72E-02
BOLD:ACE2094	Staphylinidae	Proteininae	*Proteinus*	4.53E-02
BOLD:ACI7099	Staphylinidae	Proteininae	*Proteinus*	6.49E-02
BOLD:ACM3693	Staphylinidae	Proteininae	*Proteinus*	7.74E-02
BOLD:ADI7551	Staphylinidae	Proteininae	*Proteinus*	3.64E-02

BOLD:ADJ1022	Staphylinidae	Proteininae	*Proteinus*	5.26E-02
BOLD:AAU6972	Staphylinidae	Proteininae	*Proteinus collaris*	8.73E-02
BOLD:ACV6421	Staphylinidae	Proteininae	*Proteinus limbatus*	4.08E-02
BOLD:ACN4004	Staphylinidae	Proteininae		9.81E-02
BOLD:ACV8173	Staphylinidae	Proteininae		9.48E-02
BOLD:ACV8570	Staphylinidae	Proteininae		3.66E-02
BOLD:ACV9784	Staphylinidae	Proteininae		4.39E-02
BOLD:ADJ5032	Staphylinidae	Pselaphinae	*Batrisodes*	1.46E-01
BOLD:ACK2578	Staphylinidae	Pselaphinae	*Batrisodes frontalis*	2.97E-01
BOLD:ACF9617	Staphylinidae	Pselaphinae	*Batrisodes lineaticollis*	2.61E-01
BOLD:ADI0454	Staphylinidae	Pselaphinae	*Batrisodes scabriceps*	1.50E-01
BOLD:ABA9074	Staphylinidae	Pselaphinae	*Ctenisodes piceus*	1.24E-01
BOLD:ACK1947	Staphylinidae	Pselaphinae	*Decarthron*	1.19E-01
BOLD:ACK2509	Staphylinidae	Pselaphinae	*Euplectus duryi*	2.99E-02
BOLD:AAO0164	Staphylinidae	Pselaphinae	*Euplectus karstenii*	2.78E-02
BOLD:AAX8173	Staphylinidae	Pselaphinae	*Pselaphus heisei*	7.84E-02
BOLD:ACK1622	Staphylinidae	Pselaphinae	*Reichenbachia borealis*	8.12E-02
BOLD:ACK1878	Staphylinidae	Pselaphinae	*Reichenbachia spatulifer*	8.80E-02
BOLD:ACK1282	Staphylinidae	Pselaphinae	*Rybaxis*	1.08E-01
BOLD:AAP7055	Staphylinidae	Pselaphinae		1.80E-01
BOLD:ABA9072	Staphylinidae	Pselaphinae		7.78E-02
BOLD:ABA9075	Staphylinidae	Pselaphinae		8.56E-02
BOLD:ACE1434	Staphylinidae	Pselaphinae		1.02E-01
BOLD:ACI5172	Staphylinidae	Pselaphinae		5.56E-02
BOLD:ACM6607	Staphylinidae	Pselaphinae		1.02E-01
BOLD:ACO1919	Staphylinidae	Pselaphinae		5.18E-02
BOLD:ACO2053	Staphylinidae	Pselaphinae		1.09E-01
BOLD:ACO2170	Staphylinidae	Pselaphinae		1.89E-02
BOLD:ACZ1288	Staphylinidae	Pselaphinae		4.98E-02
BOLD:ACZ7268	Staphylinidae	Pselaphinae		3.40E-02
BOLD:AAP7032	Staphylinidae	Pseudopsinae	*Pseudopsis sagitta*	2.05E-01
BOLD:ACC9974	Staphylinidae	Scaphidiinae	*Baeocera picea*	6.09E-02
BOLD:ACP0011	Staphylinidae	Scaphidiinae	*Scaphidium*	3.22E+00
BOLD:ACJ9716	Staphylinidae	Scaphidiinae	*Scaphisoma commune*	4.11E-01
BOLD:ABA9089	Staphylinidae	Scaphidiinae	*Scaphisoma convexum*	4.90E-01
BOLD:ACC9590	Staphylinidae	Scaphidiinae	*Scaphisoma repandum*	2.22E-01
BOLD:ABA9099	Staphylinidae	Scaphidiinae	*Scaphisoma rubens*	2.01E-01
BOLD:ACB0729	Staphylinidae	Scaphidiinae	*Scaphisoma rubens*	2.31E-01
BOLD:AAP7073	Staphylinidae	Scaphidiinae	*Scaphium castanipes*	6.17E+00
BOLD:ACK1731	Staphylinidae	Scaphidiinae	*Toxidium gammaroides*	2.63E-01
BOLD:ABX7820	Staphylinidae	Scaphidiinae		5.20E-01
BOLD:ACF5461	Staphylinidae	Scaphidiinae		3.74E-01
BOLD:ACI6929	Staphylinidae	Scaphidiinae		4.75E-01
BOLD:ACL8877	Staphylinidae	Scaphidiinae		3.74E-01
BOLD:ACM6029	Staphylinidae	Scaphidiinae		1.09E-01
BOLD:ACQ9186	Staphylinidae	Scaphidiinae		6.42E-01
BOLD:ACR5631	Staphylinidae	Scaphidiinae		8.07E-01
BOLD:ACR6156	Staphylinidae	Scaphidiinae		1.26E-01
BOLD:ACV3130	Staphylinidae	Scaphidiinae		6.03E-02

BOLD:AAO4392	Staphylinidae	Scydmaeninae	*Scydmaenus rufus*	3.84E-02
BOLD:ACG7904	Staphylinidae	Scydmaeninae	*Stenichnus*	4.22E-02
BOLD:AAN9916	Staphylinidae	Scydmaeninae	*Stenichnus scutellaris*	1.34E-01
BOLD:AAN6455	Staphylinidae	Scydmaeninae		3.41E-02
BOLD:AAP7812	Staphylinidae	Scydmaeninae		7.25E-02
BOLD:AAP7814	Staphylinidae	Scydmaeninae		5.69E-02
BOLD:ACD0854	Staphylinidae	Scydmaeninae		1.75E-01
BOLD:ACI2755	Staphylinidae	Scydmaeninae		3.99E-02
BOLD:ACJ3235	Staphylinidae	Scydmaeninae		3.45E-02
BOLD:ACL2909	Staphylinidae	Scydmaeninae		4.17E-02
BOLD:ACL3047	Staphylinidae	Scydmaeninae		2.06E-02
BOLD:ACL9757	Staphylinidae	Scydmaeninae		5.27E-02
BOLD:ACM1120	Staphylinidae	Scydmaeninae		2.20E-02
BOLD:ACM2014	Staphylinidae	Scydmaeninae		6.10E-02
BOLD:ACM2398	Staphylinidae	Scydmaeninae		3.79E-02
BOLD:ACM6986	Staphylinidae	Scydmaeninae		3.77E-02
BOLD:ACM8071	Staphylinidae	Scydmaeninae		1.09E-01
BOLD:ACN4565	Staphylinidae	Scydmaeninae		2.21E-02
BOLD:ACP0060	Staphylinidae	Scydmaeninae		4.81E-02
BOLD:ACR4349	Staphylinidae	Scydmaeninae		2.52E-02
BOLD:ACT4410	Staphylinidae	Scydmaeninae		3.95E-02
BOLD:ACT9662	Staphylinidae	Scydmaeninae		4.67E-02
BOLD:ACV0643	Staphylinidae	Scydmaeninae		2.70E-02
BOLD:ACV4569	Staphylinidae	Scydmaeninae		3.68E-02
BOLD:ACV4799	Staphylinidae	Scydmaeninae		6.77E-02
BOLD:ACV4974	Staphylinidae	Scydmaeninae		3.89E-02
BOLD:ACV5887	Staphylinidae	Scydmaeninae		2.77E-02
BOLD:ACV6557	Staphylinidae	Scydmaeninae		3.83E-02
BOLD:ACX7602	Staphylinidae	Scydmaeninae		1.06E-01
BOLD:ACZ0303	Staphylinidae	Scydmaeninae		5.79E-02
BOLD:ADB2451	Staphylinidae	Scydmaeninae		6.38E-02
BOLD:AAR3749	Staphylinidae	Staphylininae	*Anaquedius vernix*	9.48E+00
BOLD:ACM1452	Staphylinidae	Staphylininae	*Atrecus macrocephalus*	1.09E+00
BOLD:AAH0121	Staphylinidae	Staphylininae	*Bisnius blandus*	1.07E+00
BOLD:AAG4278	Staphylinidae	Staphylininae	*Bisnius hyperboreus*	7.48E-01
BOLD:AAP7787	Staphylinidae	Staphylininae	*Cafius canescens*	8.35E+00
BOLD:AAQ0040	Staphylinidae	Staphylininae	*Cafius canescens*	4.32E+00
BOLD:AAQ0039	Staphylinidae	Staphylininae	*Cafius seminitens*	9.81E+00
BOLD:AAG4323	Staphylinidae	Staphylininae	*Dinothenarus capitatus*	1.61E+01
BOLD:ACL9981	Staphylinidae	Staphylininae	*Erichsonius nanus*	3.37E-01
BOLD:ACM0683	Staphylinidae	Staphylininae	*Erichsonius patella*	5.29E-01
BOLD:ACU7206	Staphylinidae	Staphylininae	*Gabrius*	3.91E-01
BOLD:ABW7167	Staphylinidae	Staphylininae	*Gabrius appendiculatus*	1.72E-01
BOLD:AAP7070	Staphylinidae	Staphylininae	*Gabrius brevipennis*	4.36E-01
BOLD:AAG4276	Staphylinidae	Staphylininae	*Gabrius CHU1*	3.84E-01
BOLD:ACG8831	Staphylinidae	Staphylininae	*Gabrius fallaciosus*	5.91E-01
BOLD:ACG6163	Staphylinidae	Staphylininae	*Gabrius forcipatus*	7.60E-01
BOLD:ABW2822	Staphylinidae	Staphylininae	*Gabrius microphthalmus*	2.89E-01
BOLD:ACF9724	Staphylinidae	Staphylininae	*Gabrius picipennis*	5.09E-01

BOLD:ACC7216	Staphylinidae	Staphylininae	*Gabrius punctatellus*	7.79E-01
BOLD:ABY0286	Staphylinidae	Staphylininae	*Gabronthus thermarum*	1.15E-01
BOLD:ADI4436	Staphylinidae	Staphylininae	*Hesperus apicialis*	8.01E+00
BOLD:ACT2650	Staphylinidae	Staphylininae	*Heterothops conformis*	1.62E-01
BOLD:ACU5449	Staphylinidae	Staphylininae	*Heterothops fusculus*	2.49E-01
BOLD:AAX0829	Staphylinidae	Staphylininae	*Heterothops praevius*	2.61E-01
BOLD:AAM7643	Staphylinidae	Staphylininae	*Heterothops pusio*	1.36E-01
BOLD:ACP5119	Staphylinidae	Staphylininae	*Hypnogyra gularis*	1.16E+00
BOLD:AAO1025	Staphylinidae	Staphylininae	*Leptacinus intermedius*	2.12E-01
BOLD:AAH0116	Staphylinidae	Staphylininae	*Lithocharodes longicollis*	2.33E-01
BOLD:AAO0892	Staphylinidae	Staphylininae	*Neobisnius villosulus*	2.66E-01
BOLD:ACL9891	Staphylinidae	Staphylininae	*Neohypnus beckeri*	1.12E+00
BOLD:AAY6531	Staphylinidae	Staphylininae	*Nudobius*	8.14E-01
BOLD:AAC6989	Staphylinidae	Staphylininae	*Ontholestes cingulatus*	3.73E+01
BOLD:AAQ0038	Staphylinidae	Staphylininae	*Philonthus*	2.47E+00
BOLD:AAU6969	Staphylinidae	Staphylininae	*Philonthus*	5.34E-01
BOLD:AAU7131	Staphylinidae	Staphylininae	*Philonthus*	1.12E+00
BOLD:ABA5310	Staphylinidae	Staphylininae	*Philonthus*	3.92E+00
BOLD:ABA6344	Staphylinidae	Staphylininae	*Philonthus*	5.22E+00
BOLD:AAM7585	Staphylinidae	Staphylininae	*Philonthus*	1.40E+01
BOLD:ACS6065	Staphylinidae	Staphylininae	*Philonthus*	1.02E+00
BOLD:ACU4940	Staphylinidae	Staphylininae	*Philonthus*	5.79E-01
BOLD:AAF6824	Staphylinidae	Staphylininae	*Philonthus caeruleipennis*	1.34E+01
BOLD:ACO1987	Staphylinidae	Staphylininae	*Philonthus caeruleipennis*	1.08E+01
BOLD:AAR1764	Staphylinidae	Staphylininae	*Philonthus carbonarius*	2.23E+00
BOLD:AAL5087	Staphylinidae	Staphylininae	*Philonthus cognatus*	7.98E+00
BOLD:AAN6185	Staphylinidae	Staphylininae	*Philonthus concinnus*	2.13E+00
BOLD:AAO1400	Staphylinidae	Staphylininae	*Philonthus cruentatus*	2.07E+00
BOLD:ABV1529	Staphylinidae	Staphylininae	*Philonthus debilis*	5.67E-01
BOLD:AAH0105	Staphylinidae	Staphylininae	*Philonthus flavibasis*	1.51E+00
BOLD:AAH0106	Staphylinidae	Staphylininae	*Philonthus flavibasis*	2.15E+00
BOLD:AAH0113	Staphylinidae	Staphylininae	*Philonthus flavibasis*	1.25E+00
BOLD:AAU7311	Staphylinidae	Staphylininae	*Philonthus jurgans*	2.02E+00
BOLD:ACY7389	Staphylinidae	Staphylininae	*Philonthus lomatus*	1.12E+00
BOLD:ABA6303	Staphylinidae	Staphylininae	*Philonthus monaeses*	8.10E-01
BOLD:AAN6146	Staphylinidae	Staphylininae	*Philonthus sericans*	7.73E-01
BOLD:ACC7249	Staphylinidae	Staphylininae	*Philonthus thoracicus*	1.80E+00
BOLD:AAN6145	Staphylinidae	Staphylininae	*Philonthus varians*	2.28E+00
BOLD:AAG4283	Staphylinidae	Staphylininae	*Philonthus vulgatus*	5.35E+00
BOLD:ACE6153	Staphylinidae	Staphylininae	*Platydracus*	1.50E+01
BOLD:AAG4287	Staphylinidae	Staphylininae	*Platydracus cinnamopterus*	1.19E+01
BOLD:ACJ0017	Staphylinidae	Staphylininae	*Platydracus cinnamopterus*	7.64E+00
BOLD:AAG4322	Staphylinidae	Staphylininae	*Platydracus fossator*	3.55E+01
BOLD:AAM7583	Staphylinidae	Staphylininae	*Platydracus mysticus*	3.10E+01
BOLD:ACB0875	Staphylinidae	Staphylininae	*Platydracus violaceus*	1.56E+01
BOLD:AAY4535	Staphylinidae	Staphylininae	*Platydracus viridanus*	2.11E+01
BOLD:ACC7393	Staphylinidae	Staphylininae	*Quedionuchus plagiatus*	2.67E+00
BOLD:AAP7078	Staphylinidae	Staphylininae	*Quedius*	1.76E+00
BOLD:AAP7079	Staphylinidae	Staphylininae	*Quedius*	3.47E-01

BOLD:ACA6924	Staphylinidae	Staphylininae	*Quedius*	3.23E+00
BOLD:ACU4504	Staphylinidae	Staphylininae	*Quedius*	7.03E+00
BOLD:AAF9202	Staphylinidae	Staphylininae	*Quedius brunnipennis*	1.43E+00
BOLD:ACA7231	Staphylinidae	Staphylininae	*Quedius canadensis*	1.87E+00
BOLD:ACL9920	Staphylinidae	Staphylininae	*Quedius capucinus*	2.31E+00
BOLD:ACA7311	Staphylinidae	Staphylininae	*Quedius criddlei*	2.13E+00
BOLD:AAO1236	Staphylinidae	Staphylininae	*Quedius cruentus*	2.95E+00
BOLD:AAZ0388	Staphylinidae	Staphylininae	*Quedius curtipennis*	8.76E+00
BOLD:AAG4295	Staphylinidae	Staphylininae	*Quedius fellmani*	8.52E-01
BOLD:ACG6204	Staphylinidae	Staphylininae	*Quedius fulgidus*	3.93E+00
BOLD:ACB0188	Staphylinidae	Staphylininae	*Quedius fuliginosus*	1.65E+00
BOLD:AAV0970	Staphylinidae	Staphylininae	*Quedius fulvicollis*	8.13E-01
BOLD:ACA7261	Staphylinidae	Staphylininae	*Quedius labradorensis*	7.56E+00
BOLD:AAN6181	Staphylinidae	Staphylininae	*Quedius laticollis*	4.41E+00
BOLD:AAO1235	Staphylinidae	Staphylininae	*Quedius mesomelinus*	3.45E+00
BOLD:AAQ0037	Staphylinidae	Staphylininae	*Quedius molochinoides*	5.69E+00
BOLD:ABX8416	Staphylinidae	Staphylininae	*Quedius mordax*	1.59E+00
BOLD:ACP4377	Staphylinidae	Staphylininae	*Quedius nitipennis*	9.60E-01
BOLD:AAG4325	Staphylinidae	Staphylininae	*Quedius peregrinus*	2.90E+00
BOLD:ACC9988	Staphylinidae	Staphylininae	*Quedius rusticus*	1.40E+00
BOLD:ACA9204	Staphylinidae	Staphylininae	*Quedius simulator*	1.23E+00
BOLD:ACA7359	Staphylinidae	Staphylininae	*Quedius tetricus*	2.14E+00
BOLD:AAP7082	Staphylinidae	Staphylininae	*Quedius velox*	2.31E+00
BOLD:ACA9223	Staphylinidae	Staphylininae	*Quedius vilis*	6.02E-01
BOLD:ACF9292	Staphylinidae	Staphylininae	*Stenistoderus rubripennis*	6.30E-01
BOLD:ACI5752	Staphylinidae	Staphylininae	*Stictolinus flavipes*	1.94E-01
BOLD:AAG4285	Staphylinidae	Staphylininae	*Tasgius melanarius*	2.18E+01
BOLD:AAG4321	Staphylinidae	Staphylininae	*Tasgius melanarius*	1.86E+01
BOLD:AAQ0068	Staphylinidae	Staphylininae	*Thinopinus pictus*	7.65E+01
BOLD:ABX9288	Staphylinidae	Staphylininae	*Tympanophorus puncticollis*	3.08E+00
BOLD:AAP7179	Staphylinidae	Staphylininae	*Xantholinus elegans*	2.33E+00
BOLD:AAG4333	Staphylinidae	Staphylininae	*Xantholinus linearis*	8.73E-01
BOLD:ABX7618	Staphylinidae	Staphylininae	*Xantholinus longiventris*	1.21E+00
BOLD:AAU7313	Staphylinidae	Staphylininae		6.57E-01
BOLD:ABA9958	Staphylinidae	Staphylininae		4.61E-01
BOLD:ABW6323	Staphylinidae	Staphylininae		6.35E+00
BOLD:ACF9279	Staphylinidae	Staphylininae		1.32E+00
BOLD:ACG5513	Staphylinidae	Staphylininae		4.10E-01
BOLD:ACJ0741	Staphylinidae	Staphylininae		6.21E-01
BOLD:ACK0018	Staphylinidae	Staphylininae		3.96E-01
BOLD:ACO1611	Staphylinidae	Staphylininae		8.23E+00
BOLD:ACU5289	Staphylinidae	Staphylininae		3.40E-01
BOLD:ACU7125	Staphylinidae	Staphylininae		3.10E-01
BOLD:ACW0850	Staphylinidae	Staphylininae		7.17E-01
BOLD:ACX6397	Staphylinidae	Staphylininae		3.03E-01
BOLD:ACX8851	Staphylinidae	Staphylininae		4.32E-01
BOLD:ACY6103	Staphylinidae	Staphylininae		1.98E-01
BOLD:ACZ1138	Staphylinidae	Staphylininae		2.99E-01
BOLD:ADE4411	Staphylinidae	Staphylininae		1.42E+00

BOLD:ADI7769	Staphylinidae	Staphylininae		5.77E-01
BOLD:AAG4298	Staphylinidae	Steninae	*Stenus*	5.35E-01
BOLD:ACA6645	Staphylinidae	Steninae	*Stenus*	8.04E-01
BOLD:ACU4109	Staphylinidae	Steninae	*Stenus*	3.00E-01
BOLD:ACP3323	Staphylinidae	Steninae	*Stenus alexanderi*	3.24E-01
BOLD:ACA6572	Staphylinidae	Steninae	*Stenus annularis*	1.15E+00
BOLD:AAN6490	Staphylinidae	Steninae	*Stenus CHU2*	2.10E-01
BOLD:ABA5312	Staphylinidae	Steninae	*Stenus clavicornis*	1.17E+00
BOLD:ACI5232	Staphylinidae	Steninae	*Stenus dolosus*	3.54E-01
BOLD:AAU7102	Staphylinidae	Steninae	*Stenus hyperboreus*	2.46E-01
BOLD:AAG4330	Staphylinidae	Steninae	*Stenus juno*	1.06E+00
BOLD:ACA7534	Staphylinidae	Steninae	*Stenus mammops*	2.19E-01
BOLD:ADG9701	Staphylinidae	Steninae	*Stenus mammops*	2.43E-01
BOLD:AAG4275	Staphylinidae	Steninae	*Stenus niveus*	4.03E-01
BOLD:ACP5027	Staphylinidae	Steninae	*Stenus occidentalis*	3.51E-01
BOLD:ACM0737	Staphylinidae	Steninae	*Stenus pudicus*	1.61E-01
BOLD:ACL9463	Staphylinidae	Steninae	*Stenus pumilio*	3.18E-02
BOLD:AAP7781	Staphylinidae	Steninae	*Stenus stygicus*	3.44E-01
BOLD:AAU7101	Staphylinidae	Steninae	*Stenus umbratilis*	7.14E-01
BOLD:AAN6190	Staphylinidae	Tachyporinae	*Bolitobius cingulatus*	3.09E+00
BOLD:ABA6329	Staphylinidae	Tachyporinae	*Bolitobius cingulatus*	2.15E+00
BOLD:AAP6946	Staphylinidae	Tachyporinae	*Bryoporus*	3.89E-01
BOLD:AAU7000	Staphylinidae	Tachyporinae	*Bryoporus rufescens*	1.01E+00
BOLD:ABW5503	Staphylinidae	Tachyporinae	*Carphacis effrenatus*	8.24E-01
BOLD:ADH9731	Staphylinidae	Tachyporinae	*Carphacis effrenatus*	1.76E+00
BOLD:AAO1048	Staphylinidae	Tachyporinae	*Cilea silphoides*	2.96E-01
BOLD:AAP7842	Staphylinidae	Tachyporinae	*Coproporus ventriculus*	2.05E-01
BOLD:ACG7849	Staphylinidae	Tachyporinae	*Ischnosoma*	3.51E-01
BOLD:AAG4332	Staphylinidae	Tachyporinae	*Ischnosoma fimbriatum*	7.03E-01
BOLD:ACC7078	Staphylinidae	Tachyporinae	*Ischnosoma pictum*	1.75E-01
BOLD:AAG4296	Staphylinidae	Tachyporinae	*Ischnosoma splendidum*	4.89E-01
BOLD:ACC7215	Staphylinidae	Tachyporinae	*Ischnosoma virginicum*	3.59E-01
BOLD:ABA9749	Staphylinidae	Tachyporinae	*Lordithon*	4.47E-01
BOLD:ABA6309	Staphylinidae	Tachyporinae	*Lordithon anticus*	3.81E-01
BOLD:ABA6331	Staphylinidae	Tachyporinae	*Lordithon appalachianus*	5.43E-01
BOLD:ABA6370	Staphylinidae	Tachyporinae	*Lordithon cinctus*	1.67E+00
BOLD:ACP3288	Staphylinidae	Tachyporinae	*Lordithon conabilis*	8.02E-01
BOLD:ACB0762	Staphylinidae	Tachyporinae	*Lordithon facilis*	3.96E-01
BOLD:AAG4307	Staphylinidae	Tachyporinae	*Lordithon fungicola*	2.75E+00
BOLD:ABA6305	Staphylinidae	Tachyporinae	*Lordithon kelleyi*	1.12E+00
BOLD:ACF8586	Staphylinidae	Tachyporinae	*Lordithon longiceps*	3.84E+00
BOLD:ACI6395	Staphylinidae	Tachyporinae	*Lordithon poecilus*	3.03E-01
BOLD:ACL7992	Staphylinidae	Tachyporinae	*Lordithon thoracicus*	3.75E-01
BOLD:ADH4104	Staphylinidae	Tachyporinae	*Lordithon thoracicus*	2.80E-01
BOLD:ACF9654	Staphylinidae	Tachyporinae	*Mycetoporus*	3.67E-01
BOLD:ACL9554	Staphylinidae	Tachyporinae	*Mycetoporus lucidulus*	2.80E-01
BOLD:ACC3440	Staphylinidae	Tachyporinae	*Mycetoporus rufohumeralis*	1.05E+00
BOLD:ACD1476	Staphylinidae	Tachyporinae	*Mycetoporus rugosus*	8.95E-01
BOLD:ACL9456	Staphylinidae	Tachyporinae	*Nitidotachinus scrutator*	9.45E-01

BOLD:ACG6291	Staphylinidae	Tachyporinae	*Nitidotachinus tachyporoides*	9.32E-01
BOLD:ACP3181	Staphylinidae	Tachyporinae	*Nitidotachinus tachyporoides*	7.55E-01
BOLD:AAN6204	Staphylinidae	Tachyporinae	*Sepedophilus*	3.34E-01
BOLD:AAP6950	Staphylinidae	Tachyporinae	*Sepedophilus*	1.58E+00
BOLD:ACD9452	Staphylinidae	Tachyporinae	*Sepedophilus*	5.14E-01
BOLD:ADF4437	Staphylinidae	Tachyporinae	*Sepedophilus*	1.28E+00
BOLD:ACL8349	Staphylinidae	Tachyporinae	*Sepedophilus basalis*	3.53E-01
BOLD:ACC1294	Staphylinidae	Tachyporinae	*Sepedophilus cinctulus*	3.44E-01
BOLD:AAJ7617	Staphylinidae	Tachyporinae	*Sepedophilus littoreus*	9.09E-01
BOLD:ACC7394	Staphylinidae	Tachyporinae	*Sepedophilus littoreus*	5.71E-01
BOLD:AAN9241	Staphylinidae	Tachyporinae	*Sepedophilus marshami*	9.71E-01
BOLD:ACL8104	Staphylinidae	Tachyporinae	*Sepedophilus occultus*	4.99E-01
BOLD:ADB0917	Staphylinidae	Tachyporinae	*Sepedophilus opicus*	1.99E-01
BOLD:ACK9817	Staphylinidae	Tachyporinae	*Sepedophilus scriptus*	1.84E-01
BOLD:AAH0108	Staphylinidae	Tachyporinae	*Sepedophilus testaceus*	8.86E-01
BOLD:ACJ3516	Staphylinidae	Tachyporinae	*Sepedophilus versicolor*	5.60E-01
BOLD:AAM9922	Staphylinidae	Tachyporinae	*Tachinus*	2.16E+00
BOLD:AAN6186	Staphylinidae	Tachyporinae	*Tachinus*	1.74E+00
BOLD:AAP7017	Staphylinidae	Tachyporinae	*Tachinus*	1.26E+00
BOLD:ACK2240	Staphylinidae	Tachyporinae	*Tachinus*	2.76E+00
BOLD:ACM3588	Staphylinidae	Tachyporinae	*Tachinus*	2.95E+00
BOLD:ACI4498	Staphylinidae	Tachyporinae	*Tachinus addendus*	8.66E-01
BOLD:ACB3690	Staphylinidae	Tachyporinae	*Tachinus angustatus*	4.91E-01
BOLD:ACN7465	Staphylinidae	Tachyporinae	*Tachinus basalis*	6.01E-01
BOLD:AAH0107	Staphylinidae	Tachyporinae	*Tachinus corticinus*	5.38E-01
BOLD:AAP7095	Staphylinidae	Tachyporinae	*Tachinus elongatus*	2.99E+00
BOLD:AAG4324	Staphylinidae	Tachyporinae	*Tachinus fimbriatus*	2.65E+00
BOLD:AAG4328	Staphylinidae	Tachyporinae	*Tachinus fumipennis*	1.40E+00
BOLD:AAG4286	Staphylinidae	Tachyporinae	*Tachinus limbatus*	3.09E+00
BOLD:AAG4290	Staphylinidae	Tachyporinae	*Tachinus luridus*	1.52E+00
BOLD:ACF9169	Staphylinidae	Tachyporinae	*Tachinus luridus*	1.00E+00
BOLD:ACI8901	Staphylinidae	Tachyporinae	*Tachinus maculicollis*	2.52E+00
BOLD:ACK3194	Staphylinidae	Tachyporinae	*Tachinus minimus*	4.91E-01
BOLD:AAM7668	Staphylinidae	Tachyporinae	*Tachinus picipes*	4.20E+00
BOLD:AAG4326	Staphylinidae	Tachyporinae	*Tachinus quebecensis*	2.35E+00
BOLD:ACK3122	Staphylinidae	Tachyporinae	*Tachinus semirufus*	4.43E+00
BOLD:AAG4274	Staphylinidae	Tachyporinae	*Tachyporus*	3.21E-01
BOLD:AAP7028	Staphylinidae	Tachyporinae	*Tachyporus*	2.52E-01
BOLD:AAP7029	Staphylinidae	Tachyporinae	*Tachyporus*	1.37E-01
BOLD:ABX3740	Staphylinidae	Tachyporinae	*Tachyporus*	3.09E-01
BOLD:ACG4536	Staphylinidae	Tachyporinae	*Tachyporus*	3.62E-01
BOLD:ACL3531	Staphylinidae	Tachyporinae	*Tachyporus*	3.74E-01
BOLD:ABX2484	Staphylinidae	Tachyporinae	*Tachyporus atriceps*	1.83E-01
BOLD:ACL8080	Staphylinidae	Tachyporinae	*Tachyporus atriceps*	2.07E-01
BOLD:AAP7071	Staphylinidae	Tachyporinae	*Tachyporus borealis*	2.94E-01
BOLD:ACL9260	Staphylinidae	Tachyporinae	*Tachyporus canadensis*	1.66E-01
BOLD:AAN9511	Staphylinidae	Tachyporinae	*Tachyporus chrysomelinus*	3.13E-01
BOLD:AAU6934	Staphylinidae	Tachyporinae	*Tachyporus elegans*	3.90E-01
BOLD:ACC9422	Staphylinidae	Tachyporinae	*Tachyporus jocosus*	2.52E-01

BOLD:ACT0260	Staphylinidae	Tachyporinae	*Tachyporus mexicanus*	3.23E-01
BOLD:AAM9619	Staphylinidae	Tachyporinae	*Tachyporus nitidulus*	1.14E-01
BOLD:AAV0965	Staphylinidae	Tachyporinae	*Tachyporus nitidulus*	1.24E-01
BOLD:ABA9096	Staphylinidae	Tachyporinae	*Tachyporus nitidulus*	1.60E-01
BOLD:ABW2269	Staphylinidae	Tachyporinae	*Tachyporus nitidulus*	1.89E-01
BOLD:ACL9153	Staphylinidae	Tachyporinae	*Tachyporus nitidulus*	4.36E-01
BOLD:ACA5596	Staphylinidae	Tachyporinae		6.27E-01
BOLD:ACC3346	Staphylinidae	Tachyporinae		1.18E+00
BOLD:ACG3717	Staphylinidae	Tachyporinae		2.11E-01
BOLD:ACG5305	Staphylinidae	Tachyporinae		1.23E+00
BOLD:ACG5359	Staphylinidae	Tachyporinae		4.51E-01
BOLD:ABW9580	Staphylinidae	Trichophyinae	*Trichophya pilicornis*	7.96E-02
BOLD:ACK7779	Staphylinidae			1.07E-01
BOLD:ACO1797	Staphylinidae			1.04E-01
BOLD:ACX8313	Staphylinidae			2.25E-01
BOLD:ACZ2365	Staphylinidae			4.79E-01
BOLD:ADD0681	Staphylinidae			9.40E-03
BOLD:ADE6836	Staphylinidae			3.56E-01
BOLD:ADF5845	Staphylinidae			1.50E-01
BOLD:ADF7103	Staphylinidae			1.76E-02
BOLD:ADH7619	Staphylinidae			1.07E-01
BOLD:ADH8262	Staphylinidae			1.05E-01
BOLD:ADH9880	Staphylinidae			5.35E-02
BOLD:ADI1151	Staphylinidae			1.05E-01
BOLD:ADI1317	Staphylinidae			6.47E+00
BOLD:ADI2583	Staphylinidae			2.94E-02
BOLD:ADI4039	Staphylinidae			3.59E-01
BOLD:ADI4428	Staphylinidae			1.45E+00
BOLD:ADI5868	Staphylinidae			4.16E-02
BOLD:ADI7246	Staphylinidae			3.78E-02
BOLD:ADI8556	Staphylinidae			1.94E-01
BOLD:ADJ0239	Staphylinidae			9.24E-02
BOLD:ADK3311	Staphylinidae			1.24E-01
BOLD:ADL3464	Staphylinidae			4.95E-01
BOLD:AAQ0032	Stenotrachelidae	Cephaloinae	*Cephaloon bicolor*	2.62E+01
BOLD:AAI3796	Stenotrachelidae	Cephaloinae	*Cephaloon lepturoides*	5.65E+00
BOLD:AAQ0031	Stenotrachelidae	Cephaloinae	*Cephaloon tenuicorne*	1.72E+01
BOLD:AAD8165	Stenotrachelidae	Cephaloinae	*Cephaloon ungulare*	4.79E+00
BOLD:AAH0375	Synchroidae		*Synchroa punctata*	1.63E+01
BOLD:AAZ0351	Tenebrionidae	Alleculinae	*Capnochroa fuliginosa*	1.58E+01
BOLD:AAP7866	Tenebrionidae	Alleculinae	*Hymenorus*	3.07E+00
BOLD:AAZ4032	Tenebrionidae	Alleculinae	*Hymenorus dubius*	4.31E+00
BOLD:ACR9707	Tenebrionidae	Alleculinae	*Hymenorus obesus*	5.54E+00
BOLD:AAH0473	Tenebrionidae	Alleculinae	*Hymenorus picipennis*	6.45E+00
BOLD:AAZ1879	Tenebrionidae	Alleculinae	*Hymenorus pilosus*	5.23E+00
BOLD:ABY3787	Tenebrionidae	Alleculinae	*Hymenorus sobrinus*	2.99E+00
BOLD:AAV0892	Tenebrionidae	Alleculinae	*Isomira*	2.25E+00
BOLD:AAH0400	Tenebrionidae	Alleculinae	*Isomira angusta*	2.83E+00
BOLD:AAZ1163	Tenebrionidae	Alleculinae	*Isomira comstocki*	2.38E+00

BOLD:AAP7000	Tenebrionidae	Alleculinae	*Isomira oblongula*	3.84E+00
BOLD:AAH0186	Tenebrionidae	Alleculinae	*Isomira quadristriata*	2.99E+00
BOLD:AAY6527	Tenebrionidae	Alleculinae	*Mycetochara analis*	2.60E+00
BOLD:AAZ1128	Tenebrionidae	Alleculinae	*Mycetochara bicolor*	7.67E+00
BOLD:AAU7138	Tenebrionidae	Alleculinae	*Mycetochara fraterna*	1.37E+00
BOLD:ACI2933	Tenebrionidae	Alleculinae	*Mycetochara procera*	1.29E+00
BOLD:AAZ0014	Tenebrionidae	Alleculinae	*Pseudocistela brevis*	1.42E+01
BOLD:ACI9140	Tenebrionidae	Alleculinae	*Pseudocistela pinguis*	1.03E+01
BOLD:AAY6541	Tenebrionidae	Alleculinae		8.70E-01
BOLD:ACB0526	Tenebrionidae	Alleculinae		5.35E+00
BOLD:ADM3801	Tenebrionidae	Diaperinae	*Cynaeus angustus*	2.71E+00
BOLD:AAY9945	Tenebrionidae	Diaperinae	*Diaperis maculata*	1.88E+01
BOLD:AAH0426	Tenebrionidae	Diaperinae	*Neomida bicornis*	3.71E+00
BOLD:ABW1299	Tenebrionidae	Diaperinae	*Platydema subcostatum*	7.02E+00
BOLD:AAZ1531	Tenebrionidae	Diaperinae	*Platydema teleops*	7.64E-01
BOLD:AAY9895	Tenebrionidae	Diaperinae	*Scaphidema aeneolum*	1.11E+00
BOLD:AAH0468	Tenebrionidae	Lagriinae	*Arthromacra aenea*	1.07E+01
BOLD:ACI6956	Tenebrionidae	Lagriinae	*Paratenetus exutus*	3.56E-01
BOLD:AAZ1351	Tenebrionidae	Lagriinae	*Paratenetus fuscus*	4.44E-01
BOLD:AAZ0340	Tenebrionidae	Lagriinae	*Paratenetus punctatus*	9.59E-01
BOLD:AAZ1109	Tenebrionidae	Pimeliinae	*Coniontis ovalis*	3.51E+01
BOLD:AAG3221	Tenebrionidae	Stenochiinae	*Alobates pensylvanicus*	1.03E+02
BOLD:ACE2713	Tenebrionidae	Stenochiinae	*Haplandrus fulvipes*	1.78E+01
BOLD:ABW6185	Tenebrionidae	Stenochiinae	*Merinus laevis*	2.21E+02
BOLD:AAJ8296	Tenebrionidae	Stenochiinae	*Upis ceramboides*	7.22E+01
BOLD:AAH2782	Tenebrionidae	Stenochiinae	*Xylopinus saperdoides*	1.89E+01
BOLD:ACZ1026	Tenebrionidae	Tenebrioninae	*Alphitobius diaperinus*	6.77E+00
BOLD:AAZ1567	Tenebrionidae	Tenebrioninae	*Blapstinus metallicus*	5.32E+00
BOLD:AAG0755	Tenebrionidae	Tenebrioninae	*Bolitophagus corticola*	1.04E+01
BOLD:AAF0405	Tenebrionidae	Tenebrioninae	*Bolitotherus cornutus*	4.59E+01
BOLD:ACY9994	Tenebrionidae	Tenebrioninae	*Eleodes novoverruculus*	4.69E+01
BOLD:AAG3217	Tenebrionidae	Tenebrioninae	*Eleodes obscura*	5.74E+02
BOLD:AAG3223	Tenebrionidae	Tenebrioninae	*Eleodes obsoletus*	7.32E+01
BOLD:AAQ0050	Tenebrionidae	Tenebrioninae	*Eleodes tricostatus*	1.00E+02
BOLD:ACY9729	Tenebrionidae	Tenebrioninae	*Eleodes vandykei*	7.56E+01
BOLD:ACO0492	Tenebrionidae	Tenebrioninae	*Helops laetus*	5.73E+00
BOLD:AAY9985	Tenebrionidae	Tenebrioninae	*Neatus tenebrioides*	2.20E+01
BOLD:AAF4851	Tenebrionidae	Tenebrioninae	*Tribolium confusum*	3.64E-01
BOLD:ACE0626	Tetratomidae	Eustrophinae	*Eustrophopsis bicolor*	4.77E+00
BOLD:ACI7017	Tetratomidae	Eustrophinae	*Eustrophus tomentosus*	2.70E+00
BOLD:AAK7440	Tetratomidae	Eustrophinae	*Synstrophus repandus*	5.17E+00
BOLD:ACD0027	Tetratomidae	Hallomeninae	*Hallomenus*	7.72E-01
BOLD:ACF9265	Tetratomidae	Hallomeninae	*Hallomenus*	8.30E-01
BOLD:ABA6348	Tetratomidae	Hallomeninae	*Hallomenus binotatus*	4.18E-01
BOLD:ACB3261	Tetratomidae	Hallomeninae	*Hallomenus scapularis*	6.13E-01
BOLD:ACG3777	Tetratomidae	Hallomeninae	*Hallomenus scapularis*	1.88E-01
BOLD:ACA7648	Tetratomidae	Penthinae	*Penthe obliquata*	5.11E+01
BOLD:ACI5460	Tetratomidae	Piseninae	*Pisenus humeralis*	1.73E+00
BOLD:ACC3034	Throscidae	Poterginae	*Pactopus hornii*	9.52E-01

BOLD:AAU7339	Throscidae	Throscinae	*Aulonothroscus constrictor*	4.17E-01
BOLD:ABA9083	Throscidae	Throscinae	*Aulonothroscus distans*	4.30E-01
BOLD:AAU7336	Throscidae	Throscinae	*Aulonothroscus punctatus*	6.75E-01
BOLD:ACI9871	Throscidae	Throscinae	*Aulonothroscus validus*	1.11E+00
BOLD:AAU6966	Throscidae		*Trixagus*	2.85E-01
BOLD:ABW2869	Throscidae		*Trixagus*	1.76E-01
BOLD:AAN6148	Throscidae		*Trixagus carinicollis*	3.25E-01
BOLD:ACB1448	Throscidae		*Trixagus carinicollis*	7.12E-01
BOLD:ABW4548	Throscidae		*Trixagus carinifrons*	4.64E-01
BOLD:ACF8582	Throscidae		*Trixagus chevrolati*	3.10E-01
BOLD:ACF8583	Throscidae		*Trixagus chevrolati*	2.63E-01
BOLD:ACF8584	Throscidae		*Trixagus chevrolati*	3.34E-01
BOLD:ACC5051	Throscidae		*Trixagus meybohmi*	5.41E-01
BOLD:ACC2430	Throscidae		*Trixagus sericeus*	3.48E-01
BOLD:ACM1293	Throscidae		*Trixagus sericeus*	3.83E-01
BOLD:AAH0306	Trogidae	Troginae	*Trox aequalis*	8.95E+00
BOLD:AAD2211	Trogidae	Troginae	*Trox unistriatus*	5.31E+01
BOLD:ACL9997	Trogossitidae	Peltinae	*Grynocharis quadrilineata*	4.62E+00
BOLD:AAK1751	Trogossitidae	Peltinae	*Thymalus marginicollis*	9.63E+00
BOLD:AAH9754	Trogossitidae	Trogossitinae	*Tenebroides corticalis*	6.55E+00
BOLD:ACC1428	Zopheridae	Colydiinae	*Synchita fuliginosa*	2.57E-01
BOLD:AAH8544	Zopheridae	Zopherinae	*Phellopsis obcordata*	4.21E+01
BOLD:ADG0079	Zopheridae			8.52E-01