

# Examining phylogenetic relatedness as a driver of plant-pollinator interactions in montane meadows.

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## Abstract

Pollinators are currently experiencing widespread population decline, thus plant-pollinator networks are of particular interest and concern in the ecological community. This study investigates whether phylogenetic relatedness of plant families is correlated with the families of pollinators they share. Phylogenetic trees of plant and pollinator families present at the H.J. Andrews Experimental Forest were produced using software associated with the National Center for Biotechnology Information (NCBI). These phylogenies and plant-pollinator interaction data were analyzed in a pairwise family comparison using the Jaccard index. The study found that there is a weak negative correlation between phylogenetic distance of plant families and the percent of pollinator families they share, although many closely related plant families share few pollinator families, likely due to evolutionary differentiation of flower morphology.

## Introduction

Plants and their insect pollinators are currently undergoing a global decline and are of particular relevance to ecological, biological, and conservation studies (Pornon et al. 2016). The study of plant-pollinator networks is conducive to understanding dynamic ecological processes and creating biological models that have the potential to inform conservation decisions regarding the preservation of biodiversity and ecosystem health (Pornon et al. 2016). Additionally, nearly 90 percent of flowering plants rely on animal pollinators to reproduce, including agricultural crops (Burkle et al. 2013). Hence, plant-pollinator networks are of particular relevance in the current ecological discussion.

Despite the abundance of literature regarding plant-pollinator networks and the behaviors of common pollinators such as the European honeybee (*Apis mellifera*) and the bumblebee (*Bombus sp.*), there is little published literature regarding how phylogeny of plants and pollinators influences the way in which these networks are structured and how their components interact. Johnson and Steiner (2000) examine the driving factors behind generalization versus

specialization in plant-pollinator networks. One such driver they discuss is phylogenetic relatedness, stating that “Unrelated plants that share similar pollinators often show convergent suites of floral traits known as pollination syndromes” (Johnson and Steiner, 2000). The study also asserts that these pollination syndromes are greatly limited by the phylogenetics of the flowering plants, thus plant morphology is dictated by evolutionary processes as well as phylogenetic parameters (Johnson and Steiner, 2000).

However, a study conducted by Schemske and Bradshaw investigates the “pollinator discrimination in two closely related species of monkeyflowers that differ in their major pollinators” (Schemske and Bradshaw, 1999). Their findings call into question the widespread belief that pollinators tend to be generalists and thus do not strongly influence the evolution of flower morphology (Schemske and Bradshaw, 1999). These findings are supported by the claim that “many bee species show narrow host-plant preferences, reflected both in behavior and morphological adaptations to particular attributes of host-plant pollen or floral morphology” (Patiny et al. 2007).

Despite these studies, it is difficult to encounter literature that focuses on implications of phylogeny within plant-pollinator networks rather than implications of convergent evolution and phylogeny on the insect and plant species themselves. This study investigates the phylogeny of plant families as a potential explanation for the interactions in plant-pollinator networks in the montane meadows of the Western Cascades Range.

The goal of this study is to examine the relationship between phylogenetic relatedness of plant families and the degree to which they share interactions with the same pollinator families. In other words, how does phylogenetic relatedness of plant families correlate with frequency of interactions by members of the same pollinator families? I hypothesize that increasing phylogenetic distance between plant families will correlate with decreasing percent of shared pollinator families.

Additionally, this study aims to add to the ongoing plant-pollinator study at the H.J. Andrews Experimental Forest by publishing phylogenies of Andrews-specific plant and pollinator families which have never before been constructed.

## Methods

### Field Methods

H.J. Andrews Experimental Forest is located in Blue River, Oregon in the Western Cascade Mountain Range. The Forest is 15,800 acres, is encompassed by temperate coniferous forest (Jones 2016), and “is a center for forest and stream ecosystem research in the Pacific Northwest” (AND LTER). H.J. Andrews is an NSF-funded long term ecological research site (LTER) and is thus conducive to conducting ongoing studies. Within the Forest exist montane meadows that were selected for plant-pollinator network research based on a “stratified-random

design” (Pfeiffer 2012). Fifteen meadows were originally “stratified by size (large, small) and meadow complexes were stratified by isolation; one large meadow and two small meadows were randomly chosen from each complex”, though only twelve of these meadows are a part of this study (Pfeiffer 2012). Each meadow complex (Carpenter, Frissell, Lookout) contains four meadows, each with ten three-by-three meter plots. Thus 120 plots are included in this study.

All 120 plots were sampled on five different occurrences from June to August 2011-2017. Each plot watch involved a survey of all flower species in anthesis and a 15 minute period in which all plant-pollinator interactions were recorded. See Jones, J.; Pfeiffer, V. 2017 for complete documentation of the field sampling process.

## Analytical Methods

This analysis uses interaction data from 2011 to 2016 that have been edited and refined by data management processes. The 2017 data have been excluded from this study, as they have not yet been reviewed. Additionally, some legacy data from 2011 and 2012 that included sampling meadows in Bunchgrass and Cone complexes were discarded as these complexes were excluded from the study after 2012.

In order to examine how phylogenetic relatedness of plant families correlates with the percent of interactions by the same pollinator families, these phylogenies must first be created. No such phylogenies have yet been compiled and published by the H.J. Andrews LTER. Two lists, one of all observed plant species, the other of all observed pollinator species, were obtained from the compiled 2011-2016 data using R Studio software by Joshua B. Griffin (see Appendix II.1).

The pollinator phylogeny was created using taxonomy published on bugguide.net, an online database of “insects, spiders, & their kin for the United States & Canada”, hosted by the Iowa State University Department of Entomology, as well as the second edition of *American Insects* by Ross H. Arnett, Jr.. Each pollinator entry in the existing data was assigned to its appropriate family using these two resources. The plant phylogeny was created using the taxonomy provided by online databases from the National Center for Biotechnology Information (NCBI) and the United States Department of Agriculture Natural Resources Conservation Service. Each plant species was thus assigned to its appropriate family. This procedure produced two lists: all plant families and all pollinator families observed in plant-pollinator interactions from 2011-2016.

Phylogenies of both plant and pollinator families were constructed using the NCBI supported software phyloT and iTOL. The list of families was entered into phyloT, which “generates phylogenetic trees based on the NCBI taxonomy” (Letunic 2017). The trees were then visualized using the online Interactive Tree of Life software (iTOL). See Figures 1a and 2 in Results. This study examines shared pollinators as a function of phylogenetic distance between

plant families, which necessitates the implementation of metrics to quantify this distance. Table 1 shows the relevant Linnaean hierarchy used to classify and relate the plant families.

**Table 1. Outline of the methodology used to assign distance values to phylogenetic nodes on the plant family phylogeny.** Whereas animal phylogeny is clearly defined into Linnaean groups such as Class, Order, Family, Subfamily, Tribe, etc., botanical phylogenies are often not as clearly defined, as shown below.

<b>Linnaean hierarchical rank</b>	<b>Assigned value</b>	<b>Example (Plants)</b>
Family	0	Apiaceae
Suborder/tribe	1	Apiinea
Order	2	Apiales
Clade/Subclass	3	Campanulids
Clade	4	Asterids
Subclass	5	Petrosaviidae
Clade	6	Pentapetalae
Clade	7	Gunneridae
Monophyletic clade/Class	8	Eudicotyledons
One of two principal clades within the flowering plants	9	Mesangiospermae

#### Obtaining phylogenetic distance between plant families

The plant family produced by phyloT and iTOL did not include data for branch length or distance between terminal taxa; thus shorthand distance metrics were implemented. Using the phylogeny produced by iTOL, values were assigned to each node on the tree. The terminal taxa received a “distance score” of zero and each node at a subsequently higher resolution received a subsequently larger distance score. These distance scores range from zero to nine based on the relative coarseness of each node. See Figure 1b for the plant phylogeny annotated with distance scores.

Distance between each pair of plant families was calculated by traversing the phylogeny from one terminal taxa to another, summing each node on the pathway. The data were compiled into a matrix, referred to as the “phylogenetic distance matrix”.

## Obtaining percent of pollinator families shared between plant families

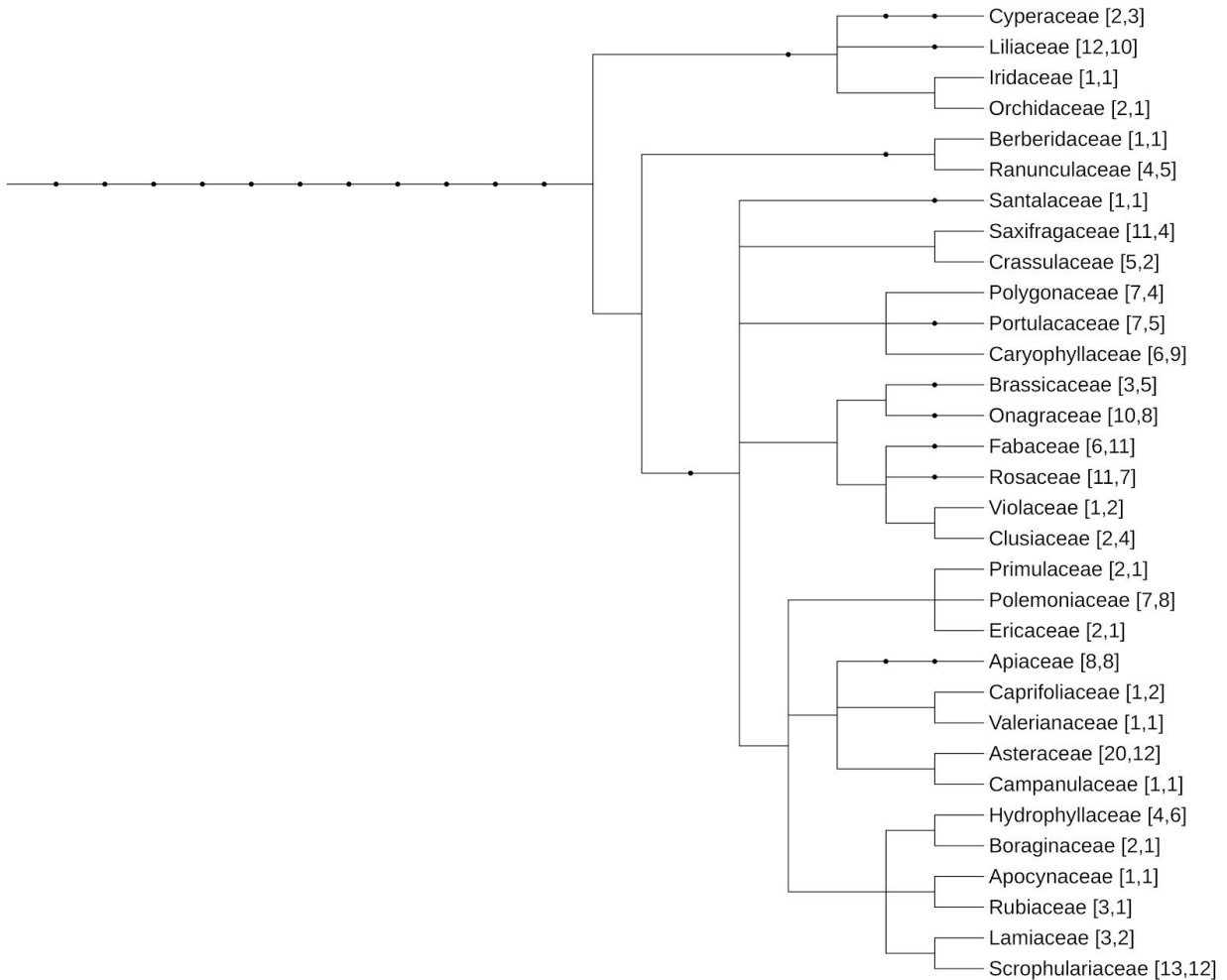
The compiled 2011-2016 interaction data was pared down to the relevant data entries: number of interactions, plant species name, and pollinator species name. Using the previously created lists (plant species & respective families, pollinator species & respective families), the plant species and pollinator species names were replaced with corresponding family names in the pared interactions data.

Using RStudio and code created by Joshua B. Griffin (see Appendix II.2), the percentage of shared pollinator families was calculated for each pair of plant families using the Jaccard index. This code conducts a pairwise analysis of two pollinator families and their interactions, determining how many pollinator families are observed interacting with both plant family 1 and plant family 2 (the intersection of the two family sets). This intersection value is then divided by the total number of pollinators that interact with these families (the union of the two family sets), producing the percent of pollinators that interact with both families in question. This algorithm was run on every combination of plant families and the results were transformed into a matrix whose entries are percentages of shared pollinator families, referred to as the “shared pollinator matrix”.

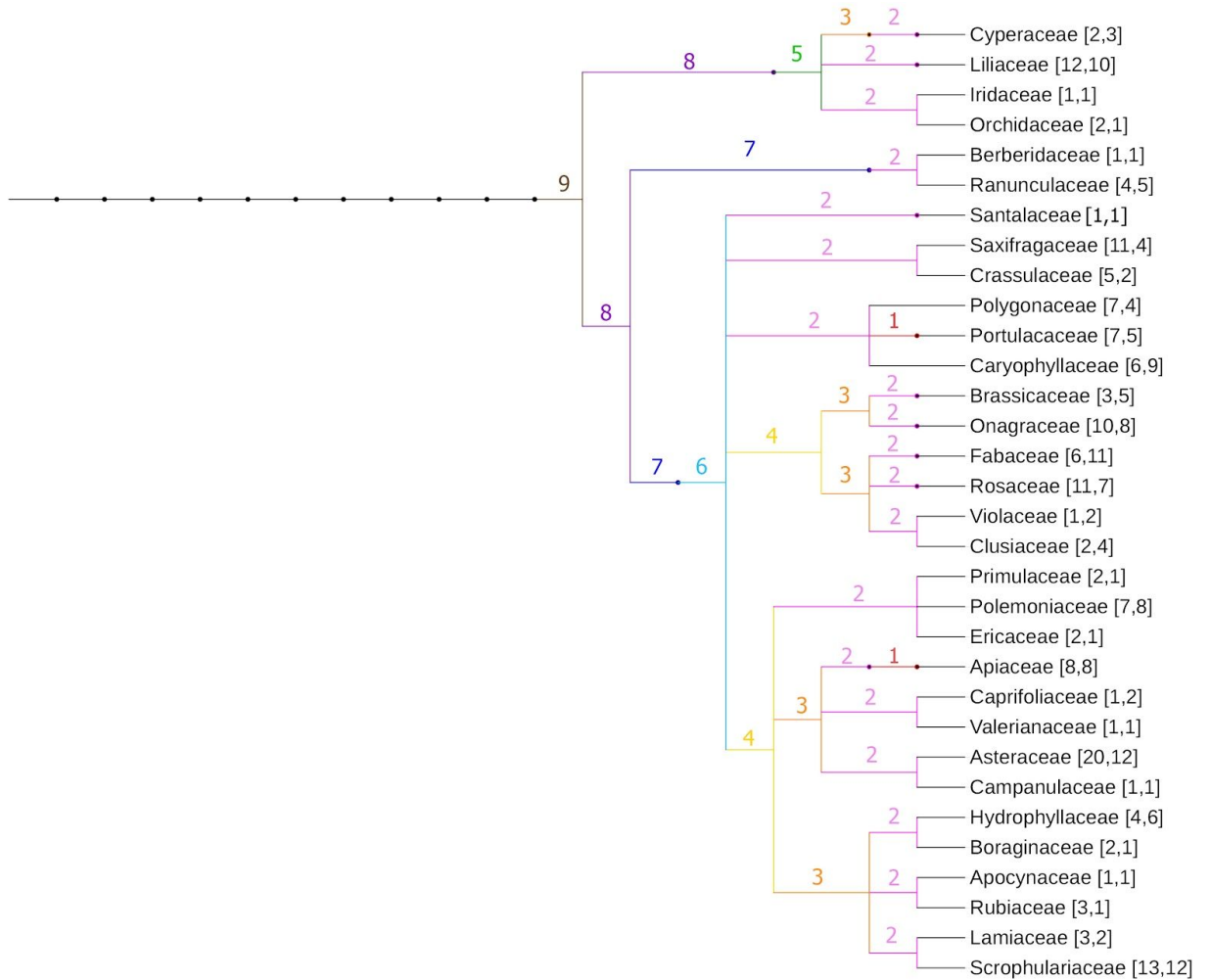
## Plotting the relationship between phylogenetic distance and percent shared pollinators

Using code written in part by Lydia S. Miller and Dr. Rebecca A. Hutchinson (see Appendix II.3), the phylogenetic distance and shared pollinator matrices were plotted as a scatterplot, with the matrices as the x and y axes, respectively (see Figure 3). The resulting scatterplot was then analyzed with a linear regression using RStudio software. Multiple points in the scatterplot were selected for further examination due to exceptionally high or low percent of shared pollinators. These were isolated using code developed in part by Dr. Rebecca A. Hutchinson (see Appendix II.4) and are presented in Table 2.

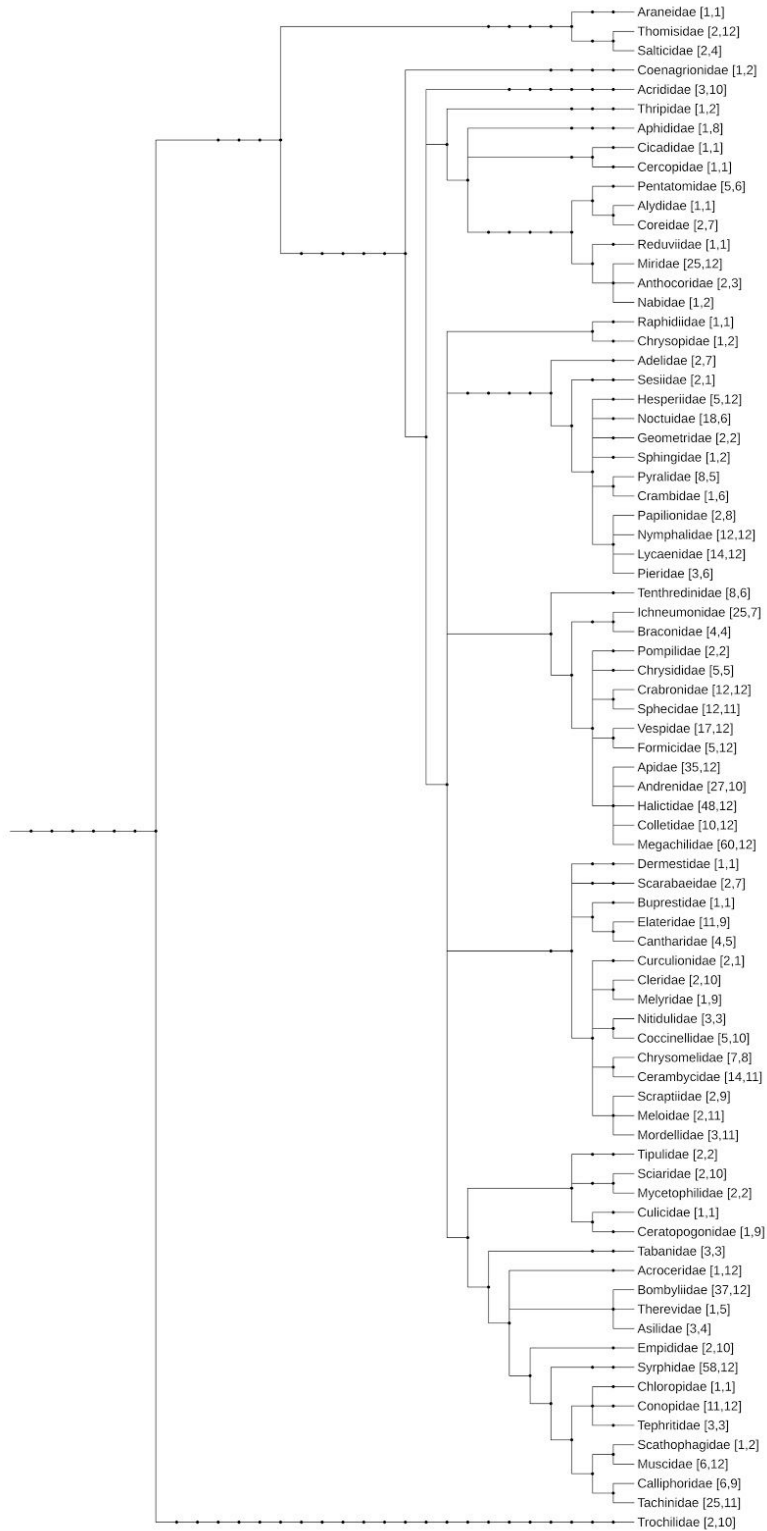
## Results



**Figure 1a. Annotated phylogeny of plant families.** The plant family phylogeny was constructed via phyloT and iTOL using NCBI taxonomy for all observed plant families (2011-2016). Each terminal taxa is annotated with the number of observed species within the family and the number of meadows in which the plant family is present.



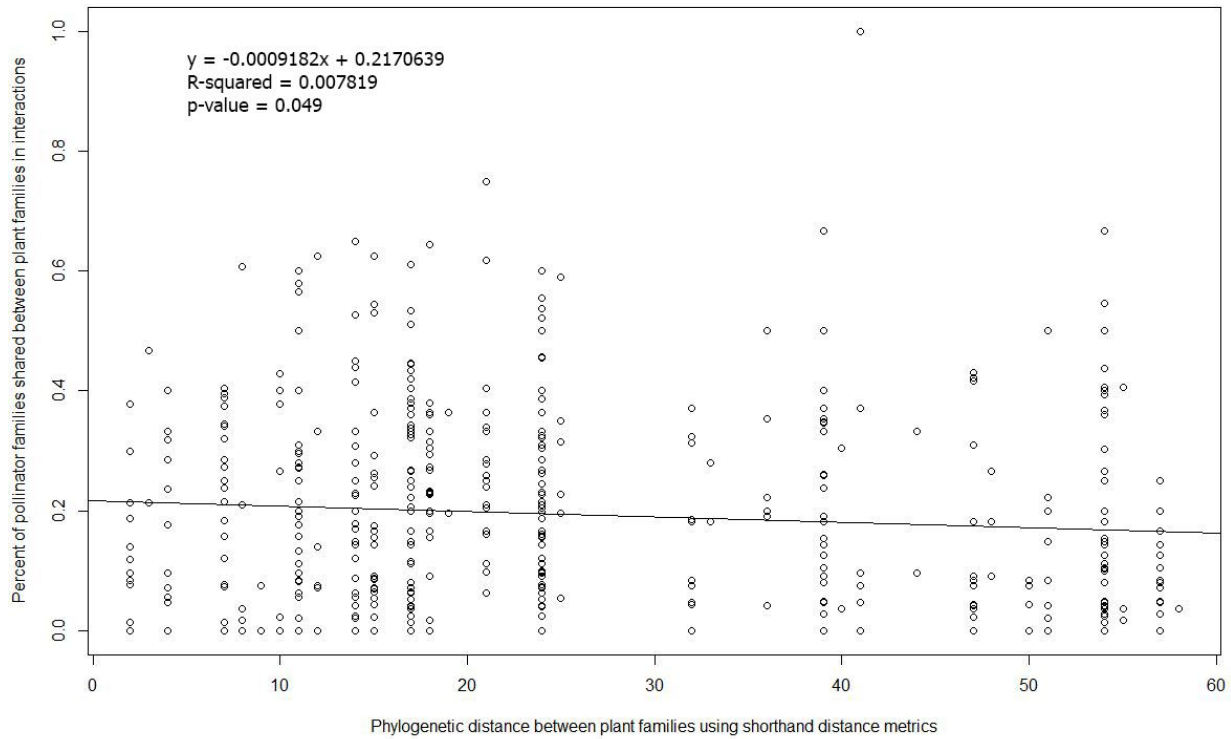
**Figure 1b. Phylogeny of plant families annotated with distance scores.** The phylogeny of plant families was produced by phyloT and iTOL using NCBI taxonomy for all observed plant families (2011-2016). Each terminal taxa is given a distance score of zero. Each subsequent node possesses a distance score greater by one integer, corresponding to relatively lower or coarser taxonomic resolution. Using Figure 1b, each node “traversed” on the path from one terminal taxa to another was summed and the resulting sum was used as the distance between two terminal taxa.



**Figure 2. Annotated phylogeny of pollinator families.** The pollinator family phylogeny was produced by phyloT and iTOL using NCBI taxonomy for all observed pollinator families



(2011-2016). Each terminal taxa is annotated with the number of observed species within the family and the number of meadows in which the pollinator family is present.



**Figure 3. Relationship of shared pollinator family interactions as a function of phylogenetic distances between pairwise comparisons of plant families.** Figure 3 depicts a slightly negative relationship (slope equal to -0.0009182) between phylogenetic distance between plant families and percent of pollinator families that interact with both plants. Each point on the plot represents a pair of plant families. The R-squared value of this regression is very low, at 0.007819. The p-value given by this regression is just barely significant at the ecological threshold with a value of 0.049.

**Table 2. Points of interest due to their high percentage of pollinator families shared.** Table 2 shows the seven points with the highest percent of pollinator families shared. The phylogenetic distance between the families is listed in the rightmost column; this value may range from two to 58.

<b>Plant families compared</b>	<b>Percent of pollinator families shared</b>	<b>Phylogenetic distance</b>
Berberidaceae x Orchidaceae	75	41
Violaceae x Orchidaceae	66.7	54
Boraginaceae x Orchidaceae	66.7	54
Berberidaceae x Violaceae	66.7	39
Boraginaceae x Berberidaceae	66.7	39
Polemoniaceae x Polygonaceae	64.9	14
Apiaceae x Polygonaceae	64.5	18

**Table 3. Percent of pollinators shared between plant families with low phylogenetic distance.** Table 3 shows the percent of pollinators shared between plant families in which the phylogenetic distance between the families is the lowest possible distance score (2).

<b>Plant families compared</b>	<b>Phylogenetic distance</b>	<b>Percent of pollinators shared</b>
Iridaceae x Orchidaceae	2	0
Berberidaceae x Ranunculaceae	2	9.5
Caryophyllaceae x Polygonaceae	2	21
Crassulaceae x Saxifragaceae	2	38
Polemoniaceae x Ericaceae	2	8.3
Polemoniaceae x Primulaceae	2	14
Ericaceae x Primulaceae	2	30
Campanulaceae x Asteraceae	2	1.4
Valerianaceae x Caprifoliaceae	2	7.7
Apocynaceae x Rubiaceae	2	0
Scrophulariaceae x Lamiaceae	2	12
Hydrophyllaceae x Boraginaceae	2	19

**Table 4. Percent of pollinator families shared and phylogenetic distance values for plant families compared with *Orchidaceae*.** Table 4 shows the phylogenetic distances between *Orchidaceae* and other plant families which share pollinators at a high percent or at zero percent.

<b>Family compared with <i>Orchidaceae</i></b>	<b>Percent of pollinators shared with <i>Orchidaceae</i></b>	<b>Phylogenetic distance between listed family and <i>Orchidaceae</i></b>
Berberidaceae	75	41
Violaceae	66.7	54
Boraginaceae	66.7	54
Iridaceae	0	2
Santalaceae	0	47
Valerianaceae	0	54
Apocynaceae	0	54

## Discussion

Figure 3 suggests that there is a small negative correlation between phylogenetic distance between plant families and the percent of pollinators shared between these families. This provides very minimal support for the alternative hypothesis that increasing phylogenetic distance between plant families correlates with decreasing percent of shared pollinators. This suggests a weak relationship and the low R-squared value of 0.007819 obtained by the linear regression implies that phylogenetic distance poorly explains the way plant families interact with pollinator families. However, the statistical analysis of the scatterplot returned a p-value of 0.049, which is just barely significant under the ecological significance threshold of 0.05. Hence, the relationship between phylogeny of plant families and the pollinator families that they share is weakly statistically significant, but bears more investigation, as phylogenetic distance and shared pollinators are somehow related.

Tables 2 and 3 emphasize a lack of strong correlation between phylogenetic distance of plant families and percent of shared pollinator families. For example, Table 2 shows that the two plant families with the largest shared percent of pollinators (75%) are separated by 41 distance units, while another two families share 64.9% of pollinator families and have only 14 distance units separating them. Table 3 shows that the plant families separated by the lowest distance unit (2) vary greatly in the percent of pollinator families that they share (0% to 38%). Additionally, none of the plant families separated by only two distance units are present in the list of families that share the highest percent of pollinator families.

Table 4 illuminates some interesting points regarding the plant family *Orchidaceae*. *Orchidaceae* is involved in many of the comparisons that yield some of the highest and lowest percentage of shared pollinator families. For example, *Orchidaceae* is one of the families in the pairwise comparison that shares the highest percent of pollinator families (75%). Two other families compared with *Orchidaceae* share greater than 66% of their pollinator families. Interestingly, *Orchidaceae* is also involved in four comparisons in which the two families share 0% of their pollinators. The distance between *Orchidaceae* and the other families of interest ranges from 2 units to 54 units, which further emphasizes that the relationship between phylogenetic distance of plant families and the percent of shared pollinator families is weak. However, the distance variability of the plant families with which *Orchidaceae* overlaps is interesting in light of a host of other explanations for the reasoning behind plant-pollinator interactions.

The effects of coevolution on both plants and pollinators as well as convergent evolution of plant family morphology may play a role in which pollinator families are shared. Lunau states that “Diffuse coevolution between angiosperm species and pollinating insects may cause frequent convergent evolution of floral traits such as nectar reward” (Lunau 2004). Phylogenetically distant plant families may share a large percent of their pollinator families due to similar flower morphology produced by convergent evolution. Likewise, while plant families that are phylogenetically close may be similar in some ways, their morphology may differ in others that have a higher degree of influence on pollinator interactions. For example, one theory suggests that flowers that coexist evolve distinct morphologies so as to avoid resource overlap (Kodric-Brown and Brown, 1979). See Figure 4 for a visual representation of this theory.



**Figure 4. Flower morphology comparison between species of the families *Liliaceae* and *Apiaceae*.** Species representatives of the family *Liliaceae* are shown in the top two photos (species one and two), while species representatives of the family *Apiaceae* are shown in the bottom two photos (species three and four).

*Liliaceae* and *Apiaceae* differ by 55 distance units; only three units away from the maximum phylogenetic distance. Within *Liliaceae*, species one and two are morphologically very different, even though they are closely related. Within *Apiaceae*, species three and four look quite similar, likely due to their high degree of phylogenetic relatedness. Although *Liliaceae* and

*Apiaceae* differ greatly in their placement on the phylogeny of plant families, species one shares some morphological characteristics with species three and four. For example, the stamens of species one extend above its petals, as is the case with species three and four. Additionally, the inflorescences of species three and four are structured as umbels. While species one does not possess the same structure, its inflorescence is more similar to the *Apiaceae* species than it is to the other species in its family (species two). Figure 4 thus illustrates the concept that factors such as flower morphology and accessibility to pollinators vary between and within plant families, an alternative explanation for the ways in which plants and pollinators interact.

## Conclusions

This study set out to investigate the question “How does phylogenetic relatedness of plant families correlate with frequency of interactions by members of the same pollinator families?”. It was found that phylogenetic relatedness of plant families and shared pollinator families are related, though only weakly in the way in which this study chose to investigate.

Kodric-Brown and Brown (1979) discuss the theory that coexisting plants evolve different morphology and phenology in order to avoid competition for pollinator species (Kodric-Brown and Brown, 1979). A design for a further study may include determining which plant families are most often found to coexist and determining the extent to which these families share pollinator families. In this study, rather than construct a phylogenetic distance matrix for all combinations of plant families, one could construct a “coexistence matrix” based on a developed “coexistence score” between each combination of plant families. This matrix could then be plotted against the “shared pollinators matrix” from the current study and analyzed using the same statistical methods.

Additionally, there are a handful of factors in question that may be points of improvement in this study. There are implications to conducting this study at the taxonomic level of family as opposed to higher or lower resolutions. An interesting complement to this study would be an investigation that runs the same analyses on a variety of taxonomic levels with regard to the plants. Another factor that this study does not address is the fact that not all plants and pollinators are equally involved in the observed interactions. Some plant and pollinator families are involved in the majority of recorded interactions, whereas others may appear in the data only a handful of times. This can be partially visualized by observing Figures 1a and 2, as not all plant or pollinator families are observed in every meadow, nor do all families, plant or pollinator, possess equal numbers of species. One last interesting addition to the current study involves conducting the analysis the opposite direction. This reversal would investigate whether phylogenetic relatedness of pollinator families corresponds to the percent of plant families shared between pollinator families.

In conclusion, the current study illuminates some of the challenges of phylogenetic analyses, as phylogenetic relatedness does not always fully explain biological processes. Perhaps

morphology and character development resulting from evolutionary processes such as natural selection, in concert with phylogeny, allow scientists to better understand complex ecological phenomena, including plant-pollinator networks.

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# Appendix I. Datasets

## 1. Plant Phylogeny

NAME IN DATABASE	DOMAIN	KINGDOM	PHYLUM	CLASS	FAMILY	GENUS	SPECIES
Achillea millefolium	Eukaryota	Plantae	Tracheophyta	Angiospermae	Asteraceae	Achillea	millefolium
Acmispon nevadensis	Eukaryota	Plantae	Tracheophyta	Angiospermae	Fabaceae	Acmispon	nevadensis
Agoseris aurantiaca	Eukaryota	Plantae	Tracheophyta	Angiospermae	Asteraceae	Agoseris	aurantiaca
Agoseris heterophylla	Eukaryota	Plantae	Tracheophyta	Angiospermae	Asteraceae	Agoseris	heterophylla
Allium amplexens	Eukaryota	Plantae	Tracheophyta	Angiospermae	Liliaceae	Allium	amplexens
Amelanchier alnifolia	Eukaryota	Plantae	Tracheophyta	Angiospermae	Rosaceae	Amelanchier	alnifolia
Anaphalis margaritacea	Eukaryota	Plantae	Tracheophyta	Angiospermae	Asteraceae	Anaphalis	margaritacea
Angelica arguta	Eukaryota	Plantae	Tracheophyta	Angiospermae	Apiaceae	Angelica	arguta
Anthriscus caucalis	Eukaryota	Plantae	Tracheophyta	Angiospermae	Apiaceae	Anthriscus	scandicina
Apocynum androsaemifolium	Eukaryota	Plantae	Tracheophyta	Angiospermae	Apocynaceae	Apocynum	androsaemifolium
Aquilegia formosa	Eukaryota	Plantae	Tracheophyta	Angiospermae	Ranunculaceae	Aquilegia	formosa
Arabis holboellii	Eukaryota	Plantae	Tracheophyta	Angiospermae	Brassicaceae	Arabis	holboellii
Arctostaphylos nevadensis	Eukaryota	Plantae	Tracheophyta	Angiospermae	Ericaceae	Arctostaphylos	nevadensis
Arenaria capillaris	Eukaryota	Plantae	Tracheophyta	Angiospermae	Caryophyllaceae	Arenaria	capillaris
Arenaria macrophylla	Eukaryota	Plantae	Tracheophyta	Angiospermae	Caryophyllaceae	Arenaria	macrophylla
Barbarea orthoceras	Eukaryota	Plantae	Tracheophyta	Angiospermae	Brassicaceae	Barbarea	orthoceras
Boykinia major	Eukaryota	Plantae	Tracheophyta	Angiospermae	Saxifragaceae	Boykinia	major
Brodiaea congesta	Eukaryota	Plantae	Tracheophyta	Angiospermae	Liliaceae	Brodiaea	congesta
Brodiaea congestum	Eukaryota	Plantae	Tracheophyta	Angiospermae	Liliaceae	Brodiaea	congestum
Calochortus subalpinus	Eukaryota	Plantae	Tracheophyta	Angiospermae	Liliaceae	Calochortus	subalpinus
Campanula scouleri	Eukaryota	Plantae	Tracheophyta	Angiospermae	Campanulaceae	Campanula	scouleri
Carex sp.	Eukaryota	Plantae	Tracheophyta	Angiospermae	Cyperaceae	Carex	sp
Castilleja hispida	Eukaryota	Plantae	Tracheophyta	Angiospermae	Scrophulariaceae	Castilleja	hispida
Castilleja miniata	Eukaryota	Plantae	Tracheophyta	Angiospermae	Scrophulariaceae	Castilleja	miniata
Cerastium arvense	Eukaryota	Plantae	Tracheophyta	Angiospermae	Caryophyllaceae	Cerastium	arvense
Chamerion angustifolium (= Epilobium a.)	Eukaryota	Plantae	Tracheophyta	Angiospermae	Onagraceae	Chamerion	angustifolium
Circaea alpina	Eukaryota	Plantae	Tracheophyta	Angiospermae	Onagraceae	Circaea	alpina
Cirsium callilepis	Eukaryota	Plantae	Tracheophyta	Angiospermae	Asteraceae	Cirsium	callilepis
Clarkia amoena	Eukaryota	Plantae	Tracheophyta	Angiospermae	Onagraceae	Clarkia	amoena
Claytonia lanceolata	Eukaryota	Plantae	Tracheophyta	Angiospermae	Portulacaceae	Claytonia	lanceolata
Claytonia perfoliata	Eukaryota	Plantae	Tracheophyta	Angiospermae	Portulacaceae	Claytonia	perfoliata
Claytonia sibirica	Eukaryota	Plantae	Tracheophyta	Angiospermae	Portulacaceae	Claytonia	sibirica
Claytonia sp	Eukaryota	Plantae	Tracheophyta	Angiospermae	Portulacaceae	Claytonia	sp
Clintonia uniflora	Eukaryota	Plantae	Tracheophyta	Angiospermae	Liliaceae	Clintonia	uniflora
Collinsia grandiflora	Eukaryota	Plantae	Tracheophyta	Angiospermae	Scrophulariaceae	Collinsia	grandiflora
Collinsia parviflora	Eukaryota	Plantae	Tracheophyta	Angiospermae	Scrophulariaceae	Collinsia	parviflora
Comandra umbellata	Eukaryota	Plantae	Tracheophyta	Angiospermae	Santalaceae	Comandra	umbellata
Convolvulus nyctagineus	Eukaryota	Plantae	Tracheophyta	Angiospermae	Convolvulaceae	Convolvulus	nyctagineus
Delphinium menziesii	Eukaryota	Plantae	Tracheophyta	Angiospermae	Ranunculaceae	Delphinium	menziesii
Delphinium nuttallianum	Eukaryota	Plantae	Tracheophyta	Angiospermae	Ranunculaceae	Delphinium	nuttallianum
Dicentra uniflora	Eukaryota	Plantae	Tracheophyta	Angiospermae	Fumariaceae	Dicentra	uniflora
Dichelostemma congestum (=Brodiaea c.)	Eukaryota	Plantae	Tracheophyta	Angiospermae	Liliaceae	Dichelostemma	congestum
Dodecatheon alpinum	Eukaryota	Plantae	Tracheophyta	Angiospermae	Primulaceae	Dodecatheon	alpinum
Dodecatheon jeffreyi	Eukaryota	Plantae	Tracheophyta	Angiospermae	Primulaceae	Dodecatheon	jeffreyi
Drymocallis glandulosa (= Potentilla g.)	Eukaryota	Plantae	Tracheophyta	Angiospermae	Rosaceae	Drymocallis	glandulosa
Epilobium alpinum	Eukaryota	Plantae	Tracheophyta	Angiospermae	Onagraceae	Epilobium	alpinum
Epilobium angustifolium	Eukaryota	Plantae	Tracheophyta	Angiospermae	Onagraceae	Epilobium	angustifolium
Epilobium ciliatum	Eukaryota	Plantae	Tracheophyta	Angiospermae	Onagraceae	Epilobium	ciliatum
Epilobium oregonense (=E. alpinum gracillimum)	Eukaryota	Plantae	Tracheophyta	Angiospermae	Onagraceae	Epilobium	oregonense
Epilobium paniculatum	Eukaryota	Plantae	Tracheophyta	Angiospermae	Onagraceae	Epilobium	paniculatum
Erigeron alicae	Eukaryota	Plantae	Tracheophyta	Angiospermae	Asteraceae	Erigeron	aliceae
Erigeron foliosus	Eukaryota	Plantae	Tracheophyta	Angiospermae	Asteraceae	Erigeron	foliosus
Eriogonum compositum	Eukaryota	Plantae	Tracheophyta	Angiospermae	Polygonaceae	Eriogonum	compositum
Eriogonum nudum	Eukaryota	Plantae	Tracheophyta	Angiospermae	Polygonaceae	Eriogonum	nudum
Eriogonum umbellatum	Eukaryota	Plantae	Tracheophyta	Angiospermae	Polygonaceae	Eriogonum	umbellatum
Eriophyllum lanatum	Eukaryota	Plantae	Tracheophyta	Angiospermae	Asteraceae	Eriophyllum	lanatum
Erysimum asperum	Eukaryota	Plantae	Tracheophyta	Angiospermae	Brassicaceae	Erysimum	asperum
Erythronium grandiflorum	Eukaryota	Plantae	Tracheophyta	Angiospermae	Liliaceae	Erythronium	grandiflorum
Eucephalus ledophyllus	Eukaryota	Plantae	Tracheophyta	Angiospermae	Asteraceae	Aster	ledophyllus
Fragaria virginiana	Eukaryota	Plantae	Tracheophyta	Angiospermae	Rosaceae	Fragaria	virginiana
Galium aparine	Eukaryota	Plantae	Tracheophyta	Angiospermae	Rubiaceae	Galium	aparine
Galium oreganum	Eukaryota	Plantae	Tracheophyta	Angiospermae	Rubiaceae	Galium	oreganum
Galium trifidum	Eukaryota	Plantae	Tracheophyta	Angiospermae	Rubiaceae	Galium	trifidum
Gayophytum diffusum	Eukaryota	Plantae	Tracheophyta	Angiospermae	Onagraceae	Gayophytum	diffusum
Gayophytum humile	Eukaryota	Plantae	Tracheophyta	Angiospermae	Onagraceae	Gayophytum	humile
Gilia capitata	Eukaryota	Plantae	Tracheophyta	Angiospermae	Polemoniaceae	Gilia	capitata
Haplopappus hallii	Eukaryota	Plantae	Tracheophyta	Angiospermae	Asteraceae	Haplopappus	hallii
Heracleum maximum (= H. lanatum)	Eukaryota	Plantae	Tracheophyta	Angiospermae	Apiaceae	Heracleum	maximum
Hieracium cynoglossoides	Eukaryota	Plantae	Tracheophyta	Angiospermae	Asteraceae	Hieracium	cynoglossoides
Holodiscus discolor	Eukaryota	Plantae	Tracheophyta	Angiospermae	Rosaceae	Holodiscus	discolor
Holodiscus dumosus	Eukaryota	Plantae	Tracheophyta	Angiospermae	Rosaceae	Holodiscus	dumosus
Hydrophyllum occidentale	Eukaryota	Plantae	Tracheophyta	Angiospermae	Hydrophyllaceae	Hydrophyllum	occidentale
Hypericum anagaloides	Eukaryota	Plantae	Tracheophyta	Angiospermae	Clusiaceae	Hypericum	anagaloides
Hypericum perforatum	Eukaryota	Plantae	Tracheophyta	Angiospermae	Clusiaceae	Hypericum	perforatum
Ipomopsis aggregata	Eukaryota	Plantae	Tracheophyta	Angiospermae	Polemoniaceae	Ipomopsis	aggregata

<i>Iris chrysophylla</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Iridaceae	<i>Iris</i>	<i>chrysophylla</i>
<i>Lathyrus nevadensis</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Fabaceae	<i>Lathyrus</i>	<i>nevadensis</i>
<i>Lewisia triphylla</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Portulacaceae	<i>Lewisia</i>	<i>triphylla</i>
<i>Ligusticum grayi</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Apiaceae	<i>Ligusticum</i>	<i>grayi</i>
<i>Lilium pardalinum</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Liliaceae	<i>Lilium</i>	<i>pardalinum</i>
<i>Linanthus capillaris</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Polemoniaceae	<i>Linanthus</i>	<i>capillaris</i>
<i>Lithophragma parviflora</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Saxifragaceae	<i>Lithophragma</i>	<i>parviflora</i>
<i>Lithophragma tenellum</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Saxifragaceae	<i>Lithophragma</i>	<i>tenellum</i>
<i>Lomatium martindalei</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Apiaceae	<i>Lomatium</i>	<i>martindalei</i>
<i>Lomatium triternatum</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Apiaceae	<i>Lomatium</i>	<i>triternatum</i>
<i>Lotus micranthus</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Fabaceae	<i>Lotus</i>	<i>micranthus</i>
<i>Lotus nevadensis</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Fabaceae	<i>Lotus</i>	<i>nevadensis</i>
<i>Luina stricta</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Asteraceae	<i>Luina</i>	<i>stricta</i>
<i>Lupinus laxiflorus</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Fabaceae	<i>Lupinus</i>	<i>laxiflorus</i>
<i>Madia minima</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Asteraceae	<i>Madia</i>	<i>minima</i>
<i>Mertensia bella</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Boraginaceae	<i>Mertensia</i>	<i>bella</i>
<i>Mertensia paniculata</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Boraginaceae	<i>Mertensia</i>	<i>paniculata</i>
<i>Mimulus breweri</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Scrophulariaceae	<i>Mimulus</i>	<i>breweri</i>
<i>Mimulus guttatus</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Scrophulariaceae	<i>Mimulus</i>	<i>guttatus</i>
<i>Mimulus moschatus</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Scrophulariaceae	<i>Mimulus</i>	<i>moschatus</i>
<i>Mimulus rubellus</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Scrophulariaceae	<i>Mimulus</i>	<i>rubellus</i>
<i>Mimulus tilingii</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Scrophulariaceae	<i>Mimulus</i>	<i>tilingii</i>
<i>Mitella pentandra</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Saxifragaceae	<i>Mitella</i>	<i>pentandra</i>
<i>Montia parvifolia</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Portulacaceae	<i>Montia</i>	<i>parvifolia</i>
<i>Montia siberica</i> (misid. As <i>Claytonia</i> s.)	Eukaryota	Plantae	Tracheophyta	Angiospermae	Portulacaceae	<i>Montia</i>	<i>siberica</i>
<i>Mycelis muralis</i> (= <i>Lactuca</i> m.)	Eukaryota	Plantae	Tracheophyta	Angiospermae	Asteraceae	<i>Mycelis</i>	<i>muralis</i>
<i>Navarretia divaricata</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Polemoniaceae	<i>Navarretia</i>	<i>divaricata</i>
<i>Orthocarpus imbricatus</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Scrophulariaceae	<i>Orthocarpus</i>	<i>imbricatus</i>
<i>Osmorhiza</i> sp X	Eukaryota	Plantae	Tracheophyta	Angiospermae	Apiaceae	<i>Osmorhiza</i>	<i>sp</i>
<i>Paxistima myrsinites</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Celastraceae	<i>Paxistima</i>	<i>myrsinites</i>
<i>Penstemon cardwellii</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Scrophulariaceae	<i>Penstemon</i>	<i>cardwellii</i>
<i>Penstemon procerus</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Scrophulariaceae	<i>Penstemon</i>	<i>procerus</i>
<i>Perideridia gairdneri</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Apiaceae	<i>Perideridia</i>	<i>gairdneri</i>
<i>Phacelia hastata</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Hydrophyllaceae	<i>Phacelia</i>	<i>hastata</i>
<i>Phacelia heterophylla</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Hydrophyllaceae	<i>Phacelia</i>	<i>heterophylla</i>
<i>Phlox diffusa</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Polemoniaceae	<i>Phlox</i>	<i>diffusa</i>
<i>Phlox gracilis</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Polemoniaceae	<i>Phlox</i>	<i>gracilis</i>
<i>Platanthera dilatata</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Orchidaceae	<i>Platanthera</i>	<i>dilatata</i>
<i>Platanthera sparsiflora</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Orchidaceae	<i>Platanthera</i>	<i>sparsiflora</i>
<i>Polemonium carneum</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Polemoniaceae	<i>Polemonium</i>	<i>carneum</i>
<i>Polygonum douglasii</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Polygonaceae	<i>Polygonum</i>	<i>douglasii</i>
<i>Polygonum minimum</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Polygonaceae	<i>Polygonum</i>	<i>minimum</i>
<i>Polygonum phytolaccaefolium</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Polygonaceae	<i>Polygonum</i>	<i>phytolaccaefolium</i>
<i>Potentilla glandulosa</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Rosaceae	<i>Potentilla</i>	<i>glandulosa</i>
<i>Potentilla gracilis</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Rosaceae	<i>Potentilla</i>	<i>gracilis</i>
<i>Prunella vulgaris</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Lamiaceae	<i>Prunella</i>	<i>vulgaris</i>
<i>Rainiera stricta</i> (= <i>Luina</i> s.)	Eukaryota	Plantae	Tracheophyta	Angiospermae	Asteraceae	<i>Rainiera</i>	<i>stricta</i>
<i>Ranunculus uncinatus</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Ranunculaceae	<i>Ranunculus</i>	<i>uncinatus</i>
<i>Ribes viscosissimum</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Grossulariaceae	<i>Ribes</i>	<i>viscosissimum</i>
<i>Romanzoffia thompsonii</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Hydrophyllaceae	<i>Romanzoffia</i>	<i>thompsonii</i>
<i>Rosa gymnocarpa</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Rosaceae	<i>Rosa</i>	<i>gymnocarpa</i>
<i>Rubus parviflorus</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Rosaceae	<i>Rubus</i>	<i>parviflorus</i>
<i>Rudbeckia occidentalis</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Asteraceae	<i>Rudbeckia</i>	<i>occidentalis</i>
<i>Rumex acetosella</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Polygonaceae	<i>Rumex</i>	<i>acetosella</i>
<i>Sagina saginoides</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Caryophyllaceae	<i>Sagina</i>	<i>saginoides</i>
<i>Saxifraga ferruginea</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Saxifragaceae	<i>Saxifraga</i>	<i>ferruginea</i>
<i>Saxifraga integerrimus</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Saxifragaceae	<i>Saxifraga</i>	<i>integerrimus</i>
<i>Saxifraga occidentalis</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Saxifragaceae	<i>Saxifraga</i>	<i>occidentalis</i>
<i>Saxifraga oregana</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Saxifragaceae	<i>Saxifraga</i>	<i>oregana</i>
<i>Scirpus</i> sp.	Eukaryota	Plantae	Tracheophyta	Angiospermae	Cyperaceae	<i>Scirpus</i>	<i>sp</i>
<i>Sedum oregonum</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Crassulaceae	<i>Sedum</i>	<i>oregonum</i>
<i>Sedum oregonense</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Crassulaceae	<i>Sedum</i>	<i>oregonense</i>
<i>Sedum spathulifolium</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Crassulaceae	<i>Sedum</i>	<i>spathulifolium</i>
<i>Sedum stenopetalum</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Crassulaceae	<i>Sedum</i>	<i>stenopetalum</i>
<i>Senecio integerrimus</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Asteraceae	<i>Senecio</i>	<i>integerrimus</i>
<i>Senecio triangularis</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Asteraceae	<i>Senecio</i>	<i>triangularis</i>
<i>Sibbaldia procumbens</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Rosaceae	<i>Sibbaldia</i>	<i>procumbens</i>
<i>Silene douglasii</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Caryophyllaceae	<i>Silene</i>	<i>douglasii</i>
<i>Smilacina racemosa</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Liliaceae	<i>Smilacina</i>	<i>racemosa</i>
<i>Smilacina stellata</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Liliaceae	<i>Smilacina</i>	<i>stellata</i>
<i>Solidago canadensis</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Asteraceae	<i>Solidago</i>	<i>canadensis</i>
<i>Sorbus sitchensis</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Rosaceae	<i>Sorbus</i>	<i>sitchensis</i>
<i>Stachys chamissonis</i> var. <i>cooleyae</i> (= <i>S. cooleyae</i> )	Eukaryota	Plantae	Tracheophyta	Angiospermae	Lamiaceae	<i>Stachys</i>	<i>chamissonis</i>
<i>Stachys cooleyae</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Lamiaceae	<i>Stachys</i>	<i>cooleyae</i>
<i>Stellaria crispa</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Caryophyllaceae	<i>Stellaria</i>	<i>crispa</i>
<i>Symphoricarpos mollis</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Caprifoliaceae	<i>Symphoricarpos</i>	<i>mollis</i>
<i>Taraxacum officinale</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Asteraceae	<i>Taraxacum</i>	<i>officinale</i>
<i>Tellima grandiflora</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Saxifragaceae	<i>Tellima</i>	<i>grandiflora</i>
<i>Tiarella trifoliata</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Saxifragaceae	<i>Tiarella</i>	<i>trifoliata</i>
<i>Tillaea erecta</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Crassulaceae	<i>Tillaea</i>	<i>erecta</i>
<i>Tolmiea menziesii</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Saxifragaceae	<i>Tolmiea</i>	<i>menziesii</i>
<i>Vaccinium alaskaense</i>	Eukaryota	Plantae	Tracheophyta	Angiospermae	Ericaceae	<i>Vaccinium</i>	<i>alaskaense</i>

Valeriana scouleri	Eukaryota	Plantae	Tracheophyta	Angiospermae	Valerianaceae	Valeriana	scouleri
Vancouveria hexandra	Eukaryota	Plantae	Tracheophyta	Angiospermae	Berberidaceae	Vancouveria	hexandra
Veronica serpyllifolia	Eukaryota	Plantae	Tracheophyta	Angiospermae	Scrophulariaceae	Veronica	serpyllifolia
Vicia americana	Eukaryota	Plantae	Tracheophyta	Angiospermae	Fabaceae	Vicia	americana
Viola orbiculata	Eukaryota	Plantae	Tracheophyta	Angiospermae	Violaceae	Viola	orbiculata
Xerophyllum tenax	Eukaryota	Plantae	Tracheophyta	Angiospermae	Liliaceae	Xerophyllum	tenax
Zigadenus venenosus	Eukaryota	Plantae	Tracheophyta	Angiospermae	Liliaceae	Zigadenus	venenosus

## 2. Pollinator Phylogeny

NAME IN DATABASE	DOMAIN	KINGDOM	PHYLUM	CLASS	ORDER	FAMILY	GENUS	SPECIES
Acridid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Orthoptera	Acrididae		
Acridid sp 16-3	Eukaryota	Animalia	Arthropoda	Insecta	Orthoptera	Acrididae		
Acridid sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Orthoptera	Acrididae		
Adela sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Adelidae	Adela	sp
Adela trisignata	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Adelidae	Adela	trisignata
Agapostemon virescens	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Agapostemon	virescens
Agulla sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Neuroptera	Raphidiidae	Agulla	sp
Alticine sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Chrysomelidae		
Alydidae sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Alydidae		
Alypia langtoni	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Alypia	langtoni
Alypia sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Alypia	sp
Ammophila sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Sphecidae	Ammophila	sp
Ammophila sp 15-1 prostrate hair	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Sphecidae	Ammophila	sp
Ammophila sp 15-2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Sphecidae	Ammophila	sp
Ammophila sp 3	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Sphecidae	Ammophila	sp
Anaspis rufa	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Scraptidae	Anaspis	rufa
Anastrangalia laetifica	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Anastrangalia	laetifica
Ancistrocerus sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Ancistrocerus	sp
Ancistrocerus sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Ancistrocerus	sp
Andrena (Micrandrena) sp 3	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	sp
Andrena birtwelli	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	birtwelli
Andrena buckelli	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	buckelli
Andrena columbiana	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	columbiana
Andrena melanothroa	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	melanothroa
Andrena nigroaerulea	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	nigroaerulea
Andrena pertristis carliniformis	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	pertristis carliniformis
Andrena prunorum	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	prunorum
Andrena scutellinitens	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	scutellinitens
Andrena sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	sp
Andrena sp 14-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	sp
Andrena sp 15-1 black tessellate	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	sp
Andrena sp 19	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	sp
Andrena sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	sp
Andrena sp 3	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	sp
Andrena sp 4A	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	sp
Andrena sp 4C	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	sp
Andrena sp 5A	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	sp
Andrena sp 5B	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	sp
Andrena sp 5C	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	sp
Andrena sp 7	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	sp
Andrena sp 8	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	sp
Andrena vicina	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	vicina
Andrena vicinoides	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Andrena	vicinoides
Anthaxia sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Buprestidae	Anthaxia	sp
Anthidium sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Anthidium	sp
Anthidium sp 14-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Anthidium	sp
Anthidium sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Anthidium	sp
Anthidium sp 4	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Anthidium	sp
Anthidium sp 5	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Anthidium	sp
Anthocaris sara	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Pieridae	Anthocaris	sara
Anthocopa abjecta abjecta	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Anthophoridae	Anthocopa	sp
Anthocopa abjecta alta	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Anthophoridae	Anthocopa	sp
Anthocopa copelandica	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Anthophoridae	Anthocopa	copelandica
Anthocopa oregona	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Anthophoridae	Anthocopa	oregona
Anthocopa sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Anthophoridae	Anthocopa	sp
Anthocopa sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Anthophoridae	Anthocopa	sp
Anthocorid sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Anthocoridae		
Anthophora urbana	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Anthophora	urbana
Anthrax sp X1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Anthrax	sp
Aphid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Homoptera	Aphididae		
Apis mellifera	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Apis	mellifera
Araniella displicata	Eukaryota	Animalia	Arthropoda	Arachnida	Araneae	Araneidae	Araniella	displicata
Arctophila flagrans	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Arctophila	flagrans
Asemosyrphus polygrammus	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Asemosyrphus	polygrammus
Ashmeadiella sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Ashmeadiella	sp
Asilid genus 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Asilidae		
Asilid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Asilidae		
Asilid sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Asilidae		
Bembicene sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Crabronidae	Bembicene	sp

Bembix amoena	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Crabronidae	Bembix	amoena
Blera scitula	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Blera	scitula
Boloria epithore	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Boloria	epithore
Bombus appositus	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Bombus	appositus
Bombus bifarius	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Bombus	bifarius
Bombus californicus	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Bombus	californicus
Bombus fernaldae	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Bombus	fernaldae
Bombus flavifrons	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Bombus	flavifrons
Bombus griseocollis	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Bombus	griseocollis
Bombus insularis	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Bombus	insularis
Bombus melanopygus	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Bombus	melanopygus
Bombus mixtus	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Bombus	mixtus
Bombus nevadensis	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Bombus	nevadensis
Bombus occidentalis	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Bombus	occidentalis
Bombus sp M1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Bombus	sp
Bombus sp M2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Bombus	sp
Bombus sp M3	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Bombus	sp
Bombus sp M4	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Bombus	sp
Bombus suckleyi	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Bombus	suckleyi
Bombus unknown male	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Bombus	sp
Bombus vosnesenskii	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Bombus	vosnesenskii
Bombyliid genus 2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae		
Bombyliid genus 5	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae		
Bombyliid genus 7	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae		
Bombyliid genus X	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae		
Bombyliidae genus 16-2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae		
Bombylius major	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Bombylius	major
Bombylius sp 15-6	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Bombylius	sp
Bombylius sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Bombylius	sp
Bombylius sp 3	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Bombylius	sp
Bombylius sp 4	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Bombylius	sp
Brachyleptura vexabilis	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Brachyleptura	vexabilis
Brachyleptura vexatrix	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Brachyleptura	vexatrix
Braconid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Braconidae		
Braconid sp 14-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Braconidae		
Braconid sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Braconidae		
Braconid sp 15-2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Braconidae		
Bradysia sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Sciaridae	Bradysia	sp
Bradysia sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Sciaridae	Bradysia	sp
Bruchid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Chrysomelidae		sp
Bruchid sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Chrysomelidae		sp
Calliphorid genus 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Calliphoridae		
Calliphorid genus 2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Calliphoridae		
Calliphorid genus 3	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Calliphoridae		
Calliphorid genus 4	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Calliphoridae		
Calliphorid genus 5	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Calliphoridae		
Calliphorid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Calliphoridae		
Calliprobola pulchra	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Calliprobola	pulchra
Callophrys sheridoni	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Lycenidae	Callophrys	sheridoni
Calypte anna	Eukaryota	Animalia	Chordata	Aves	Apodiformes	Trochilidae	Calypte	anna
Cantharid genus 1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Cantharidae		
Cantharid sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Cantharidae		
Cantharid sp 16-2	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Cantharidae		
Cantharis sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Cantharidae	Cantharis	sp
Carterocephalus palaemon	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Hesperiidae	Carterocephalus	palaemon
Cartosyrphus sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Cartosyrphus	sp
Celastrina argiolus	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Lycenidae	Celastrina	argiolus
Ceratina acantha	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Ceratina	acantha
Ceratina nanula	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Ceratina	nanula
Ceratopogonid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Ceratopogonidae		sp
Cerceris sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Crabronidae	Cerceris	sp
Cerceris sp 6	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Crabronidae	Cerceris	sp
Cerceris sp 8	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Crabronidae	Cerceris	sp
Cercopid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Homoptera	Cercopidae		
Cercyonis oetus	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Cercyonis	oetus
Chalybion californica	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Sphecidae	Chalybion	californica
Cheilosia ferruginea	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Cheilosia	ferruginea
Cheilosia sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Cheilosia	sp
Cheilosia sp X	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Cheilosia	sp
Chelostoma phaceliae	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Chelostoma	phaceliae
Chlorops sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Chloropidae	Chlorops	sp
Chlosyne hoffmanni	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Chlosyne	hoffmanni
Chrysidid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictinae	Chrysidid	sp
Chrysidid sp 14-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Chrysididae		
Chrysidid sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Chrysididae		
Chrysidid sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Chrysididae		
Chrysidid sp 3	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Chrysididae		
Chrysidid sp 9	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Chrysididae		
Chrysolina quadrigeminata	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Chrysomelidae	Chrysolina	quadrigeminata
Chrysopa sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Neuroptera	Chrysopidae	Chrysopa	sp
Chrysotoxum derivatum	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Chrysotoxum	derivatum
Chrysotoxum fasciatum	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Chrysotoxum	fasciatum

Coccinella septempunctata	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Coccinellidae	Coccinella	septempunctata
Coccinella sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Coccinellidae	Coccinella	sp
Coccinella trifasciata	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Coccinellidae	Coccinella	trifasciata
Coelioxys sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Coelioxys	sp
Coenonympha tullia	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Coenonympha	tullia
Colletes simulans nevadensis	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Colletes	sp
Conophorus sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Conophorus	sp
Conophorus sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Conophorus	sp
Conophorus sp 3	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Conophorus	sp
Conopid genus 4	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Conopidae		
Conopid genus 5 =9106	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Conopidae		
Conopid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Conopidae		
Conopid sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Conopidae		
Conopid sp 3	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Conopidae		
Coreid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Coreidae		
Coreid sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Coreidae		
Corimelaena sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Thyrecoridae	Corimelaena	sp
Cortodera falsa	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Cortodera	falsa
Cosmosalia chrysostoma	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Cosmosalia	chrysotoma
Culicid sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Culicidae		
Curculionid sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Curculionidae		
Curculionid sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Curculionidae		
Dasysyrphus sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Dasysyrphus	sp
Dermestid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Dermestidae		
Diabrotica undecimpunctata	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Chrysomelidae	Diabrotica	undecimpunctata
Dialictus sp	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dialictus sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dialictus sp 10	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dialictus sp 11	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dialictus sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dialictus sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dialictus sp 16-10	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dialictus sp 16-2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dialictus sp 16-3	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dialictus sp 16-4	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dialictus sp 16-5	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dialictus sp 16-6	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dialictus sp 16-7	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dialictus sp 16-8	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dialictus sp 16-9	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dialictus sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dialictus sp 3	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dialictus sp 3M	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dialictus sp 4	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dialictus sp 5	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dialictus sp 6	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dialictus sp 9	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dialictus	sp
Dianthidium ulkei	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Dianthidium	ulkei
Dichelonyx sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Dichelonyx	sp
Didea laxa	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Didea	laxa
Dolichovespula arenaria	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Dolichovespula	arenaria
Dolichovespula maculata	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Dolichovespula	maculata
Dufourea bernardina	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dufourea	bernardina
Dufourea calochorti	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dufourea	calochorti
Dufourea campanulae	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dufourea	campanulae
Dufourea scabricornis	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dufourea	scabricornis
Dufourea trochantera	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dufourea	trochantera
Dufourea versatilis rubriventris	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Dufourea	sp
Eclimus sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Eclimus	sp
Eclimus sp 16-2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Eclimus	sp
Eclimus sp 16-3	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Eclimus	sp
Eclimus sp 16-4	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Eclimus	sp
Elater sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Elateridae		
Elater sp 5	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Elateridae		
Elaterid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Elateridae		
Elaterid sp 10	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Elateridae		
Elaterid sp 12	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Elateridae		
Elaterid sp 13	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Elateridae		
Elaterid sp 14	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Elateridae		
Elaterid sp 15	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Elateridae		
Elaterid sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Elateridae		
Elaterid sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Elateridae		
Elaterid sp 8	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Elateridae		
Empidid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Empididae		
Empidid sp X	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Empididae		
Epicauta puncticollis	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Meloidae	Epicauta	puncticollis
Epuraea sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Nitidulidae	Epuraea	sp
Eris marginata	Eukaryota	Animalia	Arthropoda	Arachnida	Araneae	Salticidae	Eris	marginata
Eristalis arbustorum	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Eristalis	arbustorum
Eristalis hirtus	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Eristalis	hirtus
Eristalis obscurus	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Eristalis	obscurus
Eristalis tenax	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Eristalis	tenax

Erynnis perseus	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Hesperiidae	Erynnis	perseus
Erynnis propertius	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Hesperiidae	Erynnis	propertius
Eschatocrepis constrictus	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Melyridae	Eschatocrepis	constrictus
Eulonchus tristis	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Acroceridae	Eulonchus	tristis
Eumenes nearcticus	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Eumenes	nearcticus
Eumenes oregonensis	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Eumenes	oregonensis
Eumerus tuberculatus	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Eumerus	tuberculatus
Euodynerus oregonus	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Euodynerus	oregonus
Euodynerus sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Euodynerus	sp
Eupeodes americanus	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Eupeodes	americanus
Eupeodes lapponicus	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Eupeodes	lapponicus
Eupeodes luniger	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Eupeodes	luniger
Eupeodes sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Eupeodes	sp
Eupeodes volucris	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Eupeodes	volucris
Euphilotes battoides	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Lycaenidae	Euphilotes	battoides
Euphilotes enoptes	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Lycaenidae	Euphilotes	enoptes
Euphilotes glaucon	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Lycaenidae	Euphilotes	glaucon
Euphydryas colon	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Euphydryas	colon
Evodinus monticola	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Evodinus	monticola
Evylaeus sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Evylaeus	sp
Evylaeus sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Evylaeus	sp
Evylaeus sp 2M	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Evylaeus	sp
Evylaeus sp 3	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Evylaeus	sp
Evylaeus sp 4	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Evylaeus	sp
Evylaeus sp 5M	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Evylaeus	sp
Fly coccinelloid	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae		
Formica fusca	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Formica	fusca
Formica neorufibarbis	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Formica	neorufibarbis
Formica sanguinipes	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Formica	sanguinipes
Frankliniella occidentalis	Animalia	Arthropoda	Insecta	Insecta	Thysanoptera	Thripidae	Frankliniella	occidentalis
Geometrid sp L1	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae		
Glaucopsyche lygdamus	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Lycaenidae	Glaucopsyche	lygdamus
Goniochaeta sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae	Goniochaeta	sp
Hadromyia grandis	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Hadromyia	grandis
Halictus farinosus	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Halictus	farinosus
Halictus ligatus	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Halictus	ligatus
Halictus rubicundus	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Halictus	rubicundus
Halictus tripartitus	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Halictus	tripartitus
Hemaris diffinis	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Sphingidae	Hemaris	diffinis
Heringia sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Heringia	sp
Heringia sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Heringia	sp
Hesperia colorado	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Hesperiidae	Hesperia	colorado
Hippodamia convergens	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Coccinellidae	Hippodamia	convergens
Hoplitis albifrons	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Hoplitis	albifrons
Hoplitis fulgida	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Hoplitis	fulgida
Hylaeus affinis	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hylaeus	affinis
Hylaeus nevadensis	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hylaeus	nevadensis
Hylaeus nunnenmacheri	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hylaeus	nunnenmacheri
Hylaeus personatellus	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hylaeus	personatellus
Hylaeus sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hylaeus	sp
Hylaeus sp 16-2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hylaeus	sp
Hylaeus sp 16-3	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hylaeus	sp
Hylaeus verticalis	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hylaeus	verticalis
Hylaeus wootoni	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Colletidae	Hylaeus	wootoni
Ichneumonid sp 14-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Ichneumonid sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Ichneumonid sp 15-2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Ichneumonid sp 15-3	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Ichneumonid sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Ichneumonid sp 3	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Ichneumonid sp A	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Ichneumonid sp D	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Ichneumonid sp E	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Ichneumonid sp F	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Ichneumonid sp J	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Ichneumonid sp K	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Ichneumonid sp L	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Ichneumonid sp M	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Ichneumonid sp N	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Ichneumonid sp P	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Ichneumonid sp R	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Ichneumonid sp S	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Ischnura sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Odonata	Coenagrionidae	Ischnura	sp
Judiola instabilis	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Judiola	instabilis
Judiola monticola	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Judiola	monticola
Lasioglossum sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum	sp
Lasioglossum sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum	sp
Lasioglossum titusi	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Lasioglossum	titusi
Leptura obliterata	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Leptura	obliterata
Leptura sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Leptura	sp
Leptura sp 12-1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Leptura	sp
Leptura sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Leptura	sp



Lepturoopsis dolorosa	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Lepturoopsis	dolorosa
Lycæna heteronea	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Lycænidae	Lycæna	heteronea
Lycæna mariposa	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Lycænidae	Lycæna	mariposa
Lycæna nivalis	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Lycænidae	Lycæna	nivalis
Lygaeidae sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Lygaeidae		sp
Lygus sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Lytta moerens	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Meloidae	Lytta	moerens
Mallota sackeni	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Mallota	sackeni
Megachile brevis	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile	brevis
Megachile melanophaea	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile	melanophaea
Megachile perihirta	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile	perihirta
Megachile pugnata	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile	pugnata
Megachile sp 15-1M	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile	sp
Megachile sp 15-2M	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile	sp
Megachile sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile	sp
Megachile sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile	sp
Megachile sp 4	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile	sp
Megachile sp 5	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Megachile	sp
Melanostoma mellinum	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Melanostoma	mellinum
Melissodes rivalis	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Melissodes	rivalis
Melissodes sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Melissodes	sp
Metaphidippus aeneolus	Eukaryota	Animalia	Arthropoda	Arachnida	Araneae	Salticidae	Metaphidippus	aeneolus
Mirid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Mirid sp 10	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Mirid sp 11	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
mirid sp 12	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Mirid sp 12	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Mirid sp 14	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Mirid sp 15	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Mirid sp 15-2	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Mirid sp 15-3	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Mirid sp 15-4	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Mirid sp 15-5	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Mirid sp 16	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Mirid sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Mirid sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Mirid sp 3	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Mirid sp 4	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Mirid sp 5	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Mirid sp 6	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Mirid sp 7	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Mirid sp 8	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Mirid sp 9	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Mirid sp immature red	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Mirid sp sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae		
Misumena vatia	Eukaryota	Animalia	Arthropoda	Arachnida	Araneae	Thomisidae	Misumena	vatia
Mordella atrata albosuturalis	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Mordellidae	Mordella	atrata
Mordellistena sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Mordellidae	Mordellistena	sp
Mordellistena sp 3	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Mordellidae	Mordellistena	sp
Moth sp 10	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae		
Moth sp 11	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae		
Moth sp 12	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae		
Moth sp 14	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae		
Moth sp 15	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae		
Moth sp 22	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae		
Moth sp 23	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae		
Moth sp 8	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae		
Moth sp 9	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae		
Musca domestica	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Muscidae	Musca	domestica
Muscoid genus 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Muscidae		
Muscoid genus 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Muscidae		
Muscoid genus 2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Muscidae		
Muscoid genus 3	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Muscidae		
Muscoid sp 14-4	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Muscidae		
Mycetophilid sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Mycetophilidae		
Mycetophilid sp 16-2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Mycetophilidae		
Myrmecinae sp 16-1T	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae		
Nabis sp 14-1	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Nabidae	Nabis	sp
Neophasia menape	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Pieridae	Neophasia	menape
Nitidulid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Nitidulidae		
Nitidulid sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Nitidulidae		
Noctuid sp A	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae		
Noctuid sp B	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae		
Noctuid sp D	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae		
Noctuid sp E	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae		
Noctuid sp G	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae		
Nomada sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Nomada	sp
Nomada sp 14-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Nomada	sp
Nomada sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Nomada	sp
Nomada sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Nomada	sp
Nomada sp 3	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Nomada	sp
Nomada sp 4	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Nomada	sp

Nomada sp 5	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Nomada	sp
Nomada sp 6	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Nomada	sp
Nowickia sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae	Nowickia	sp
Ochlodes sylvanodes	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Hesperiidae	Ochlodes	sylvanodes
Oeneis chryxus	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Oeneis	chryxus
Omalinae genus 1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Staphylinidae		
Orius tricolor	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Anthoridae	Orius	tricolor
Orthotylus sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Miridae	Orthotylus	sp
Osmia (Acanthosmoides) male	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia (Chenosmia) male	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia (Chenosmia) sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia coloradensis	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	coloradensis
Osmia sp 11	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 12	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 13	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 14	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 14-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 14-2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 14-M1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 14-M2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 14-M3	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 15	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 16	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 18	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 19	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 20	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 21	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 23	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 23A	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 23B	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 24	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 25	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 27	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 27A	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 29	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 2M	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 30	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 31	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 32	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 3M	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 4M	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 6M	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 7M	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia sp 8M	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	sp
Osmia subaustralis	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Megachilidae	Osmia	subaustralis
Oxybelus sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Crabronidae	Oxybelus	sp
Pachyta armata	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae	Pachyta	armata
Panurginus sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Panurginus	sp
Papilio rutulus	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Papilionidae	Papilio	rutulus
Paragus sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Paragus	sp
Parasitic wasp 16-3	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Parasitic wasp 16-4	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Parasitic wasp 16-5	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
parasitic wasp sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
parasitic wasp sp 15-2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
parasitic wasp sp 15-3	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Parasitid wasp 16-2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Ichneumonidae		
Parnassius clodius	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Papilionidae	Parnassius	clodius
Peleteria 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae	Peleteria	sp
Peleteria 16-2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae	Peleteria	sp
Pentaria sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Scraptiidae	Pentaria	sp
Pentatomid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae		
Pentatomid sp 14-1	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae		
Pentatomid sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae		
Pentatomid sp 15-2	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae		
Pentatomid sp 6	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Pentatomidae		
Perdita rivalis	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Perdita	rivalis
Perdita sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Andrenidae	Perdita	sp
Philanthus sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Crabronidae	Philanthus	sp
Phyciodes mylitta	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Phyciodes	mylitta
Physocephala sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Conopinae	Physocephala	sp
Pieris occidentalis	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Pieridae	Pieris	occidentalis
Platycheirus luteipennis	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Platycheirus	luteipennis
Platycheirus pallidus	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Platycheirus	pallidus
Platycheirus rufomaculatus	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Platycheirus	rufomaculatus
Platycheirus sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Platycheirus	sp
Platycheirus stegnoides	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Platycheirus	stegnoides
Platycheirus stegnus	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Platycheirus	stegnus
Plebejus acmon	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Lycenidae	Plebejus	acmon
Plebejus anna	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Lycenidae	Plebejus	anna

Plebejus icarioides	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Lycanidae	Plebejus	icarioides
Plebejus saepeolus	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Lycanidae	Plebejus	saepeolus
Poecilanthrax sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Poecilanthrax	sp
Polistes aurifer	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Polistes	aurifer
Polygonia sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae		
Pompilid sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Pompilidae		
Pompilid tiny	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Pompilidae		
Psen sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Crabronidae	Psen	sp
Psenulus sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Crabronidae	Psenulus	sp
Pseudoluperodes sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Chrysomelidae		
Pseudomasaris zonalis	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Pseudomasaris	zonalis
Psithyrus insularis	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Psithyrus	insularis
Pyralid metallic	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae		
Pyralid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae		
Pyralid sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae		
Pyralid sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae		
Pyralid sp A	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae		
Pyralid sp B	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae		
Pyralid sp C	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae		
Pyralid sp D	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Pyralidae		
Pyrausta unifasciata	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Crambidae	Pyrausta	unifasciata
Saxinis saucia	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Chrysomelidae	Saxinis	saucia
Scaeva pyrastris	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Scaeva	pyrastris
Scatophaga sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Scatophagidae	Scatophaga	sp
Schinia honesta	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Schinia	honesta
Schinia vaccinia	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Noctuidae	Schinia	vaccinia
Scopula sideraria	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Geometridae	Scopula	sideraria
Scymnus sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Coccinellidae	Scymnus	sp
Selasphorus rufus	Eukaryota	Animalia	Chordata	Aves	Apodiformes	Trochilidae	Selasphorus	rufus
Serica sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Scarabaeidae	Serica	sp
Sericomyia chalcopyga	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Sericomyia	chalcopyga
Solierella sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Crabronidae	Solierella	sp
Speyeria cybele	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Speyeria	cybele
Speyeria zerene	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Speyeria	zerene
Sphaerophoria continua	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Sphaerophoria	continua
Sphaerophoria philanthus	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Sphaerophoria	philanthus
Sphaerophoria sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Sphaerophoria	sp
Sphaerophoria sulphuripes	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Sphaerophoria	sulphuripes
Sphecid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Sphecidae		
Sphecid sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Sphecidae		
Sphecid sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Sphecidae		
Sphecid sp 3	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Sphecidae		
Sphecodes sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Sphecodes	sp
Sphecodes sp 16tiny	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Sphecodes	sp
Sphecodes sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Sphecodes	sp
Sphecodes sp 3	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Sphecodes	sp
Sphecodes sp 6	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Sphecodes	sp
Sphecodes sp 7	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Halictidae	Sphecodes	sp
Sphecomyia pattoni	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Sphecomyia	pattoni
Sphex ichneumoneus	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Sphecidae	Sphex	ichneumoneus
Steniola albicanthia	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Crabronidae	Steniola	albicanthia
Steniola albicanthia	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Crabronidae	Steniola	albicanthia
Stenodynerus sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Stenodynerus	sp
Stenodynerus sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Stenodynerus	sp
Strymon mellinus	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Lycanidae	Strymon	mellinus
Symphoromyia sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Therevidae	Symphoromyia	sp
Synanthedon sp Large	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Sesiidae	Synanthedon	
Synanthedon sp Small	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Sesiidae	Synanthedon	
Syrphid 15-1 (bombyd)	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae		
Syrphid sp 16-1Q	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae		
Syrphid sp 16-2T	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae		
Syrphus currani	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Syrphus	currani
Syrphus opinator	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Syrphus	opinator
Syrphus ribesii	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Syrphus	ribesii
Syrphus vitripennis	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Syrphus	vitripennis
Tabanid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tabanidae		
Tabanid sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tabanidae		
Tabanid sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tabanidae		
Tachinid genus A	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae		
Tachinid genus B	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae		
Tachinid genus C	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae		
Tachinid genus D	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae		
Tachinid genus E	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae		
Tachinid genus F	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae		
Tachinid genus G	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae		
Tachinid genus H	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae		
Tachinid genus K	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae		
Tachinid genus L	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae		
Tachinid genus M	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae		
Tachinid genus X	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae		
Tachinid misc genera	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae		
Tachinid sp 14-1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae		

Tachinid sp 14-2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae		
Tachinid sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae		
Tachinid sp 15-2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae		
Tachinid sp E	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae		
Tachinidae genus C	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tachinidae		
Tapinoma sessile	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Formicidae	Tapinoma	sessile
Tenthredinid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Tenthredinidae		
Tenthredinid sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Tenthredinidae		
Tenthredinid sp 3	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Tenthredinidae		
Tenthredinid sp 4	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Tenthredinidae		
Tenthredinid sp 5	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Tenthredinidae		
Tenthredinid sp 6	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Tenthredinidae		
Tenthredinid sp 7	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Tenthredinidae		
Tenthredinid sp 8	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Tenthredinidae		
Tephritid sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tephritidae		
Tephritid sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tephritidae		
Tephritid sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tephritidae		
Thecophora sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Conopidae	Thecophora	sp
Thecophora sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Conopidae	Thecophora	sp
Thevenemyia sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Thevenemyia	sp
Tibicen sp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Homoptera	Cicadidae	Tibicen	sp
Tipulidae sp. A	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tipulidae		
Tipulidae sp. B	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Tipulidae		
Toxomerus marginatus	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Toxomerus	marginatus
Toxomerus occidentalis	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Toxomerus	occidentalis
Toxophora sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Toxophora	sp
Toxophora sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Toxophora	sp
Toxophora sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Toxophora	sp
Toxophora sp 15-2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Toxophora	sp
Toxophora sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Toxophora	sp
Toxophora sp 3	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Toxophora	sp
Toxophora sp 4	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Toxophora	sp
Toxophora sp 5	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Toxophora	sp
Toxophora sp 7	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Toxophora	sp
Toxophora sp 8	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Toxophora	sp
Toxophora sp 9	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Toxophora	sp
Trichodes ornatus	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Cleridae	Trichodes	ornatus
Trichodes sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Coleoptera	Cleridae	Trichodes	sp
Vanessa annabella	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Vanessa	annabella
Vanessa cardui	Eukaryota	Animalia	Arthropoda	Insecta	Lepidoptera	Nymphalidae	Vanessa	cardui
Vespa vulgaris	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Vespa	vulgaris
Vespidae sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae		
Vespula pensylvanica	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Vespula	pensylvanica
Vespula vulgaris	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Vespidae	Vespula	vulgaris
Villa eumenes	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Villa	eumenes
Villa lateralis	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Villa	lateralis
Villa sp 1 small	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Villa	sp
Villa sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Villa	sp
Villa sp 6	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Villa	sp
Villa sp tiny	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Bombyliidae	Villa	sp
wasp 16-1	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Sphecidae		
wasp 16-2	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Sphecidae		
Xanthomelanodes						Tachinidae		
Xeromelecta californica	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Xeromelecta	californica
Xylocopa californica	Eukaryota	Animalia	Arthropoda	Insecta	Hymenoptera	Apidae	Xylocopa	californica
Xylota sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Xylota	sp
Xylota sp 15-1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Xylota	sp
Xylota sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Xylota	sp
Xylota sp 3	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Xylota	sp
Xylota sp 4	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Xylota	sp
Xylota sp 5	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Xylota	sp
Xylota sp 6	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Xylota	sp
Xylota sp 7	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Xylota	sp
Xylota sp x	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Syrphidae	Xylota	sp
Xysticus sp	Eukaryota	Animalia	Arthropoda	Arachnida	Araneae	Thomisidae	Xysticus	sp
Zelus sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Hemiptera	Reduviidae	Zelus	sp
Zodion sp 1	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Conopidae	Zodion	sp
Zodion sp 2	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Conopidae	Zodion	sp
Zodion sp 3	Eukaryota	Animalia	Arthropoda	Insecta	Diptera	Conopidae	Zodion	sp

## Appendix II. Code

### 1. Code used to produce plant & pollinator species lists

Used by Joshua B. Griffin

```
int_data = read.csv("2011-16 interactions.csv")
  plant_spec_names <- levels(as.factor(int_data$PLTSP_NAME))
  poll_spec_names <- levels(as.factor(int_data$VECT_NAME))
```

### 2. Code used to calculate the Jaccard index for shared pollinator families in pairwise comparisons of plant families

Developed by Joshua B. Griffin

```
calculate_percent_shared <- function(){
  family <- read.csv("familyfix.csv")

  plantfam <- levels(family[,2])
  pnfam <- levels(family[,3])

  myArray <- array(0, dim = c(length(plantfam),length(pnfam)), dimnames =
list(plantfam, pnfam))

  for(i in 1:dim(family)[1]){
    myArray[family[i,2],family[i,3]] = 1
  }

  num_sets <- choose(dim(myArray)[1],2)

  idx_sets <- generate_idx_sets(myArray[,1])

  myDimnames <- generate_dimnames(idx_sets,plantfam)

  perc_arr <- array(NA, dim = c(1,num_sets),dimnames = list("Intersection/Union
%",myDimnames[]))

  for(i in 1:dim(idx_sets)[2]){
    perc_arr[i] = compare(myArray[idx_sets[1,i],],myArray[idx_sets[2,i],])
  }

  return(perc_arr)
}

compare <- function(set1,set2){
```

```

same <- 0
different <- 0
for(i in 1:length(set1)){
  if(set1[i] == set2[i]){
    if(set1[i] == 1){
      same = same + 1
    }
  }
  else{
    different = different + 1
  }
}

union = different + same

percent <- same/union
return(percent)
}

generate_idx_sets <- function(set1){

  num_sets <- choose(length(set1),2)

  indices_to_compare <- array(NA,dim = c(2,num_sets))

  counter <- 1

  for(i in 1:length(set1)){
    for(j in 1:length(set1)){
      if(j>i){
        indices_to_compare[1,counter] = i
        indices_to_compare[2,counter] = j
        counter = counter + 1
      }
    }
  }
  return(indices_to_compare)
}

generate_dimnames <- function(idx_sets,plantfam){

  dimnames <- list()

  for(i in 1:dim(idx_sets)[2]){
    dimnames[i] = paste(plantfam[idx_sets[1,i]],plantfam[idx_sets[2,i]],sep = " X ")
  }

  return(dimnames)
}

perc_arr <- calculate_percent_shared()

```

### 3. Code used to format the phylogenetic distance matrix and the Jaccard index

Developed in part by Dr. Rebecca A. Hutchinson and Lydia S. Miller

```
plantnames=read.csv("plantnames.csv")$NAME
pfmatrix=matrix(0,nrow=length(plantnames),ncol=length(plantnames),dimnames=list(plantnames,plantnames))

for(i in 1:length(perc_arr)){
  name=dimnames(perc_arr)[[2]][i]
  x=strsplit(name," ")[[1]][1]
  y=strsplit(name," ")[[1]][3]
  pfmatrix[which(plantnames==x),which(plantnames==y)]=perc_arr[i]
  pfmatrix[which(plantnames==y),which(plantnames==x)]=perc_arr[i]
}

diag(pfmatrix) = 1
View(pfmatrix)
percshared=pfmatrix
```

### 4. Code used to plot the phylogenetic distance and percent shared pollinator matrices and to isolate points of interest

Developed in part by Dr. Rebecca A. Hutchinson

```
phyloDists = read.csv("dist.csv",row.names=1)
plot(phyloDists[lower.tri(phyloDists)],percshared[lower.tri(percshared)],xlab="Phylogenetic distance between plant families using shorthand distance metrics",ylab="Percent of pollinator families shared between plant families in interactions")
title("Percent of shared pollinator family interactions as a function of phylogenetic distance between plant families")

model =
lm(pollShare~plantDist,data=data.frame(pollShare=percshared[lower.tri(percshared)],plantDist=phyloDists[lower.tri(phyloDists)]))
summary(model)
coef(model)
summary(model)$r.squared
abline(a=coef(model)[1],b=coef(model)[2])

which(percshared==max(percshared),arr.ind = TRUE)
table(percshared)
which(percshared==0.75,arr.ind = TRUE)
which(percshared>0.666 & percshared<0.6666666666666667,arr.ind=TRUE)
which(percshared>0.649 & percshared<0.65,arr.ind=TRUE)
which(percshared>0.645 & percshared<0.646,arr.ind=TRUE)
which(phyloDists==0,arr.ind=TRUE)
which(phyloDists>0 & phyloDists<3,arr.ind=TRUE)
```