



# An updated checklist of the bees (Hymenoptera, Apoidea, Anthophila) of Pennsylvania, United States of America

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## Abstract

Checklists provide information about the species found in a defined region and serve as baselines for detecting species range expansions, contractions, or introductions. Bees are a diverse and important group of insect pollinators. Although some bee populations are declining, these patterns are difficult to document and generalize due to a lack of long-term studies for most localities. Documenting the diversity of wild bee communities is critical for assessing pollination services, community ecology, and geographical and temporal changes in distribution and density. Here, an updated checklist of the bees of the Commonwealth of Pennsylvania, USA, is presented. Since the first checklist was published (2010; 372 species), thousands of additional specimens from the state have been collected and databased, new species have been described in the region, and the taxonomic status of some species have changed. Specimen data from insect collections, databases, scientific literature, and unpublished records were compared to the original checklist. Seventy-nine new state species records – including 49 first-time reports – representing five of the six bee families in North America, were documented resulting in a total of at least 437 bee

species reported from Pennsylvania. We highlight new county records and species persistence details. Our list includes a total of 23 exotic species and at least five species of conservation concern. Lists of species excluded from the state checklist and species anticipated to occur in Pennsylvania are also included. This checklist provides baseline data for researchers and the public. The benefits of insect collections, specimen databases, determination and voucher labels, and georeferencing to biodiversity studies and other aspects of biological research are also discussed.

### Keywords

Aculeata, adventive species, Andrenidae, Apidae, biodiversity, check list, Colletidae, conservation, distribution, faunal records, Halictidae, new records, Megachilidae, Melittidae, persistence, phenology, pollinators

## Introduction

Bees (Hymenoptera: Apoidea: Anthophila) represent a fascinating and diverse group of insects. World-wide, there are at least 20,473 species of bees and, of these, 5,227 species are recorded from North America (Ascher and Pickering 2020). The majority of these bee species are native, but at least 45 species have been introduced to the continent since 1620 (Russo 2016; Gibbs and Dathe 2017; Martins et al. 2017; Normandin et al. 2017; USGS Native Bee Laboratory 2019). Because of their ecologically important role as pollinators of flowering plants in natural ecosystems and agricultural areas, maintaining wild bee species diversity is critical for crop pollination and ecosystem function (Genung et al. 2017; Winfree et al. 2008; Winfree et al. 2018; Grab et al. 2019).

Overwhelming evidence of declines in managed and wild bee populations has emphasized the need for a better understanding of bee diversity across different geographic areas (e.g., Potts et al. 2010b; Colla et al. 2012; Bartomeus et al. 2013). Despite extensive research efforts, our understanding of the status of most native bee species remains deficient (Cane and Tepedino 2001; Potts et al. 2010a; Koh et al. 2016; Meiners et al. 2019). It is challenging to assess the status of many species due to a lack of comparable historical and long-term datasets. In the past 140 years, non-*Apis* and non-*Bombus* bee species richness declines measured 15% in the northeastern United States (Bartomeus et al. 2013). Recent surveys revealed that ~5% of the eastern North American species had not been documented between 1990 and 2009, though the exact reason(s) for their absence in collections remains unconfirmed (Colla et al. 2012). These findings in bees reflect the larger issue of global insect decline, most recently reviewed by Montgomery et al. (2019).

Checklists serve as baselines, helping fill the lack of knowledge of species' distributions, taxonomic classifications, and biodiversity of a region. They may also contribute details on the phenology, persistence, and other biological aspects of species. Checklists can be used to detect range shifts in both native and non-native species over time, and to identify under-surveyed localities and seasonalities (e.g., Dibble et al. 2017; Gibbs et al. 2017a). This information can contribute to establishing long-term monitoring programs (Berenbaum et al. 2007; LeBuhn et al. 2013). Repeated surveys, coupled with long-term monitoring of bee biodiversity, community composition, and population

dynamics over time, can provide data to establish conservation strategies and priorities (Berenbaum et al. 2007; LeBuhn et al. 2013; Koh et al. 2016).

Taxonomic studies of bees in the eastern United States have documented some of the biodiversity in the Commonwealth of Pennsylvania (PA), USA (Cockerell 1908; Stephen 1954; Mitchell 1960, 1962; Ordway 1966; Shinn 1967; Roberts 1972; Daly 1973; LaBerge 1969, 1971, 1973, 1977, 1980, 1985, 1987, 1989; LaBerge and Bouseman 1970; LaBerge and Ribble 1972, 1975; Milliron 1973a; Baker 1975; Timberlake 1975; Svensson et al. 1977; Bouseman and LaBerge 1978; McGinley 1986, 2003; Broemeling 1988). Donovall and vanEngelsdorp (2010) published the first checklist of bees in Pennsylvania, reporting 372 species from 13,076 specimens located in 20 collections. Since then, a number of crop pollination studies and citizen science projects have been done in the state (e.g., DeBarros 2010; Sidhu 2013; studies cited in Table 1). In addition, the Pennsylvania Department of Agriculture (PDA) has surveyed bees nearly annually since 2005 (Donovall and vanEngelsdorp 2010; Karen Rocca-secca, pers. comm.) and bycatch from PDA invasive pest insect monitoring traps also commonly includes bees (Mikulas and Barringer 2018). As a result, thousands of bee specimens from across the state have been collected, identified, and documented in collection databases and research publications.

This study updates the taxonomy of species listed in Donovall and vanEngelsdorp (2010), resolves dubious records reported in Donovall and vanEngelsdorp (2010), and reports additional Pennsylvanian bee species data. We present new records at state and county levels, distribution data at the county level, collection date ranges, and the most recent year of collection or observation for each species. Additionally, we discuss the natural history of Pennsylvania's bee biodiversity, the value of checklists, and the importance of repeatable taxonomy, collections, and voucher material to faunistic studies and knowledge.

## Methods

### Baseline Pennsylvania bee checklist data

We transcribed the list of Pennsylvanian bee species and their county, dates of collection, most recent year of collection records, and all other information from Donovall and vanEngelsdorp (2010) (Suppl. material 1). In addition, species' taxonomy was updated as necessary following recent revisions. This document provided a baseline to which new data could be compared to information reported in the previous checklist.

The individual specimens examined for the previous checklist were not traceable due to a lack of voucher/acquisition numbers or another way to reliably identify the physical material that was deposited/returned to the collections after their study. A spreadsheet that Donovall and vanEngelsdorp had used to record some of the data for their checklist was obtained via personal communications with both authors and Emily Agar (University of Guelph, Ontario, Canada). A subset of the bee species records within the spreadsheet, using their specimen data in place of voucher identifiers,

were targeted for verification based on the proximity and accessibility of collections they were housed at. This included material in the following collections: Department of Entomology, Academy of Natural Sciences, Philadelphia, PA (ANSP), Section of Insects and Spiders, Carnegie Museum of Natural History, Pittsburgh, PA (CMNH = ICCM), and the Pennsylvania Department of Agriculture Arthropod Collection, Bureau of Plant Industry, Pennsylvania Department of Agriculture, Harrisburg, PA (PADA). Specimens at the PADA collection were also examined for new records. As not all of the PADA specimens listed in the spreadsheet were present in the PADA collection and material at the other collections was difficult to trace, we used new data to verify previously reported species records. Furthermore, the full details for two records were not available in the spreadsheet: “USNM 1” for *Colletes americanus* Cresson, 1868 and “PADA 15” for *Osmia cornifrons* (Radoszkowski, 1887). Specifically, Pennsylvanian *C. americanus* specimens from the collection suggested by the codon and number was not present and, in the case of *O. cornifrons*, the species was absent from the spreadsheet. Thus, the full specimen records indicated by these codes could not be verified and the data was removed from the checklist. All other data published in Donovall and vanEngelsdorp (2010) was unable to be fully verified and is reprinted here with this caveat.

### Specimen database review

Databases of bee specimens collected in Pennsylvania and identified by experts were primarily obtained via personal communications from eight sources between Summer 2017 and Fall 2019 (Table 1). Only species identified to a single species-level name were used; specimen records with no names and no data, identified to more than one species name (e.g., *Ceratina dupla* sensu lato, *Hylaeus affinis/modestus*), or with taxonomic uncertainty (containing terms such as “maybe”, “like”, “close to”, “cf” in their name or a notes section), were excluded. We also excluded 17 specimen records that were identified to species-level. These records warrented verification of the specimens’ identities, but we were unable to examine them of as part of this study. County-record data for specimens with no county given in the database were confirmed via personal communications with the database manager(s) or georeferenced using Google Earth Pro (version 7.3.2.5776 (64-bit); Table 1). Julian dates in Bartomeus et al. (2013) were converted to calendar dates using the DATE function in Microsoft Excel (version 16.16.15; Table 1). Individual specimen records in each database were compared to the previously published data for bee species recorded in Pennsylvania (Donovall and vanEngelsdorp 2010). For specimens without a determiner listed in the database, we treated them as if they were identified by at least one of the other experts associated with the collection’s material, but that these specimens did not have determination labels applied as is sometimes common when specimens are identified; not all specimens may bear determination labels by the end of the process and are thus databased without a determiner listed.

**Table 1.** Information about the bee specimen databases examined for this study. Database names, locations of the specimen material, the total numbers of records used, the names of people who identified material, and the names of people who provided database files/access are presented.

Database Name	Location(s) of Specimen Material	Total # of specimen records used	Primary Identifiers	Obtained from	Supplemental material #
Bartomeus et al. 2013	American Museum of Natural History, University of Connecticut, Cornell University, Rutgers University, Connecticut Agricultural Station, University of New Hampshire, University of Massachusetts, Vermont State Bee Database, New York State Museum, Bohart Museum of Entomology (University of California, Davis)	537	J.S. Ascher, R.W. Brooks, E.L. Bzdyk, B. Coelho, Daly, L. Day, N.B. DeBarros, S. Droege, G.C. Eickwort, J. Gibbs, R.S. Jacobson, Bouseman & LaBerge, W.E. LaBerge, R.B. Miller, T.B. Mitchell, D.W. Ribble, L. Richardson, M.G. Rightmyer, R.B. Roberts, G. Sandhouse, R.R. Snelling, R.W. Thorp, Viereck	Bartomeus et al. (2013)	2
Biddinger Laboratory Database [includes data from Shugrue (2016) and Gibbs et al. (2017b)]	Penn State University Fruit Research and Extension Center, Biglerville, PA (PSUB); Frost Entomological Museum, Department of Entomology, Pennsylvania State University, University Park, PA (PSUC)	96,382	D. Biddinger, J. Gibbs, R. Jean, K. Wright	Kathryn Wholaver, pers. comm.	3
Droege Database	United States Geological Survey (USGS) Patuxent Wildlife Research Center, Laurel, MD	1,139	J. Ascher, S. Droege, S. Rehan	Sam Droege, pers. comm.	4
Integrated Crop Pollination (ICP) Project: Fleischer Laboratory Database [includes data from McGrady et al. (2019)]	Frost Entomological Museum, Department of Entomology, Pennsylvania State University, University Park, PA (PSUC)	1,176	S. Droege, J. Gibbs, R. Jean, D. Roberts, K. Watrous	N/A	5
López-Uribe Laboratory Database [includes 2008 Pennsylvania Department of Agriculture survey material]	López-Uribe Laboratory, Department of Entomology, Pennsylvania State University, University Park, PA	3,417	N.D. Amon, J. Baker, S. Burrows, L.R. Donovall, S. Droege, K.E. Ellis, S.K. Kilpatrick, M.M. Mikulas, R. Snyder	N/A	6

Database Name	Location(s) of Specimen Material	Total # of specimen records used	Primary Identifiers	Obtained from	Supplemental material #
Winfree Laboratory Database [includes data from Winfree et al. 2008]	Winfree Laboratory, Department of Ecology, Evolution and Natural Resources, Rutgers University, New Brunswick, NJ	17,804	J. Ascher, S. Droege, J. Gibbs, T. Griswold, T. Harrison, M. Rightmyer	Rachel Winfree, pers. comm.	7
Mahan et al., in prep [Utility Rights-of-way at State Game Lands 33 and Green Lane Research & Demonstration Areas; <a href="https://sites.psu.edu/transmissiononlinecology/">https://sites.psu.edu/transmissiononlinecology/</a> ]	Frost Entomological Museum, Department of Entomology, Pennsylvania State University, University Park, PA (PSUC)	2,614	S. Droege, D. Roberts, L. Russo, H. Stout	Carolyn Mahan and Hannah Stout, pers. comm.	8
Choate et al. 2018 [includes full data from Choate et al. (2018)]	Choate Laboratory, Department of Environmental Science & Sustainability, Allegheny College, Meadville, PA	1,520	S. Droege, P.L. Hickman, E.A. Moretti	Beth Choate, pers. comm.	9

It is noted that Donovall and vanEngelsdorp (2010) used material deposited at the Penn State University Fruit Research and Extension Center, Biglerville, PA (PSUB) in their manuscript. However, as it was impossible to determine specifically what specimen records they reviewed/reported, we used all of the specimen records available. Additionally, some of the specimen records in PSUB were also part of the Integrated Crop Pollination (ICP) Project database (Table 1). To avoid duplication of records, only non-PSUB data from the ICP database was reported while the PSUB database was used in full. A total of 124,589 specimen records from databases were used (Table 1).

## Literature review

We examined several literature sources that contributed to the first list of species in Pennsylvania: Mitchell (1960, 1962), LaBerge (1985), Timberlake (1975), and McGinley (2003). Other literature cited by Donovall and vanEngelsdorp (2010) as treating Pennsylvanian bee fauna was also examined to verify record information (Ordway 1966; Shinn 1967; LaBerge and Bouseman 1970; LaBerge and Ribble 1972; Roberts 1972; Daly 1973; Milliron 1973a; Baker 1975; LaBerge 1973, 1977, 1980, 1987; Bouseman and LaBerge 1978; McGinley 1986; Broemeling 1988). We also reviewed other scientific literature, with a focus on bee studies performed in Pennsylvania, the northeastern United States, or on Pennsylvanian taxa since 2010, for new species and details for inclusion in our updated checklist (Cockerell 1908; Swenk 1915; Stephen 1954; LaBerge 1969, 1971, 1989; LaBerge and Ribble 1975; Svensson et al. 1977;

Schwarz and Gusenleitner 2004; Matteson et al. 2008; Rightmyer 2008; Gibbs 2009, 2010, 2011, 2012; DeBarros 2010; Droege et al. 2010; Rehan and Sheffield 2011; Gibbs et al. 2013; Sidhu 2013; Gibbs and Dathe 2017; Onuferko 2017, 2018; Mikulas and Barringer 2018). We compiled 1,283 specimen records from these sources (Suppl. material 10). County geography was verified for records as feasible using Google Earth Pro (version 7.3.2.5776 (64-bit)). There were only six cases in which a specific locality name was available, but county-level geography was impossible to assign with certainty (see comments in Suppl. material 10). Dates ranges were inferred from methods sections as feasible, though these are not included in the checklist if they did not represent a single collecting event (as in DeBarros 2010; Suppl. material 10). Furthermore, year of collection ranges from Sidhu (2013) are only reported in our checklist if they represented either the most recent year(s) of collection ( $n = 1$ ) or the only known year(s) of collection for a species ( $n = 2$ ) (Suppl. material 1, 10). Specimen data from Winfree et al. (2008), Shrude (2016), Gibbs et al. (2017b), Choate et al. (2018), and McGrady et al. (2019) were not included in the literature review as their data were reviewed in databases (Table 1). Reports of species or specimens inferred from range maps without data points, generalized distribution statements, tentative identifications, and observation-based records in the reviewed literature were not compiled and are thus not presented; they are considered unverifiable until either a specimen from Pennsylvania is confirmed to exist or specimens' identities are fully confirmed.

Several of the papers reviewed did not provide full data for the specimens examined or collected. The full data for some of these (Daly 1973; McGinley 1986; DeBarros 2010; Sidhu 2013) was either stated or seemed likely to be available based on the text. The appropriate personnel at the institutions as assumed or indicated by each author were contacted in an attempt to verify complete collecting events. The availability of Daly's (1973) and DeBarro's (2010) data remains unknown. McGinley's (1986) specimen data was not available from the Smithsonian Institution Archives (Ellen Alers, pers. comm.) or U.S. National Entomological Collection (USNM) / Department of Entomology (Floyd Shockley, pers. comm.). McGinley is in the process of locating these records to resolve the discrepancy (Ron McGinley, pers. comm.). In the case of Sidhu (2010), the records that were expected to be in the Frost Entomological Museum's holdings were not available, but an additional data sheet was (Andy Deans, pers. comm.).

## Additional records

State and county records were haphazardly added to the checklist as we became aware of them and they were verified. A total of four specimens, from PSUB, Rosemary Malfi Insect Collection, and Emily Erickson [now deposited in the Bee Inventory and Monitoring Lab (BIML)], were examined and their identities confirmed for inclusion in the checklist (Suppl. material 11). Other specimen records came from the Department of Entomology Collection, American Museum of Natural History, New York, New York (AMNH) available on Discover Life (<http://discoverlife.org>) and reliable

records on BugGuide, typically identified by J.S. Ascher (<http://bugguide.net>) – based either on a specimen deposited in a collection or with clear archived images accompanying the occurrence record. We also systematically retrieved records from both BugGuide and iNaturalist (<https://www.inaturalist.org/>) on 10 November 2019 to ensure no species were missing from our checklist, and present these as supplemental records (Suppl. materials 12–17). Specimen data available on GBIF.org were retrieved on 07 January 2020 (GBIF Occurrence Download <https://doi.org/10.15468/dl.wghcks>) and reviewed for records identified by known bee experts. The BugGuide, iNaturalist, and GBIF records that are not presented within the checklist are not included in the species data for the state, and are not represented in the tables and figures.

## Taxonomy

We updated species names applied in earlier records to match modern taxonomic understanding, agree with the gender of their genus name (e.g., some *Melissodes* Latreille), and reflect their status as nouns (e.g., some *Lasioglossum* Curtis). We follow Michener (2007) with exceptions based on more recent studies. For *Lasioglossum* subgenera we followed Gibbs et al. (2013), and we used an inclusive *Eucera* Scopoli based on Dorchin et al. (2018) that treats *Cemolobus* Robertson and *Peponapis* Robertson as subgenera. For clarity, we also present a list of species names included in the previous checklist, which are not included in our results due to recent taxonomic changes or verification of Donovall and vanEngelsdorp's (2010) original intent:

***Anthophora plumipes* (Pallas, 1772):** Černá et al. (2017) provide evidence that *A. plumipes* and *A. villosula* Smith, 1854 are distinct species, and that *A. villosula* was the species introduced to North America.

***Epeolus lanhami* Mitchell, 1962:** Onuferko (2017) synonymized this name with *Epeolus americanus* (Cresson, 1878).

***Nomada 077ensis* Cockerell:** This entry was intended to be *Nomada lehighensis* Cockerell, 1903 based on Donovall and vanEngelsdorp's (2010) original notes.

***Nomada bishippi* (Cockerell, 1911):** Schwarz and Gusenleitner (2004) synonymized this name with *Nomada imbricata* Smith, 1854.

***Nomada inepta* Mitchell, 1962:** This name is a synonym of *Nomada gracilis* Cresson, 1863 based on Sheffield et al. (2009).

***Andrena irana* Cockerell, 1929:** LaBerge and Bouseman (1977) synonymized this name with *Andrena (Scaphandrena) nigerrima* Casad, 1896. Note that this record is well outside the known range of the species, but could not be verified and has been removed from the state checklist.

***Lasioglossum (Dialictus) rohweli* (Ellis, 1915):** Gibbs (2010) synonymized this name with *Lasioglossum (Dialictus) versatum* (Robertson, 1902).

***Lasioglossum (Evylaeus) divergens* (Lovell, 1905):** Gibbs et al. (2013) synonymized this name with *Lasioglossum (Hemihalictus) macoupinense* (Robertson, 1895).

***Lasioglossum (Dialictus) apertum* (Sandhouse, 1924):** Gibbs (2010) synonymized this name with *Lasioglossum (Dialictus) versatum* (Robertson, 1902).

***Lasioglossum (Dialictus) atlanticum* (Mitchell, 1960):** Gibbs (2012) replaced this name with *Lasioglossum (Dialictus) hitchensi* Gibbs, 2012 to resolve a case of secondary homonymy.

***Lasioglossum (Dialictus) nympaeaearum* (Robertson, 1895):** This name is a junior synonym of *L. albipenne* (see Gibbs et al. 2017a). *Lasioglossum (Dialictus) oceanicum* (Cockerell, 1916) is the valid name for the species typically referred to as *L. nympaeaearum*.

***Lasioglossum (Evylaeus) macoupinense* (Robertson, 1895):** Although *L. macoupinense* is retained on the list, it is used for a different species. The earlier use of this name and most applications of it prior to Gibbs et al (2013) refer to *Lasioglossum (Hemihalictus) birkmanni* (Crawford, 1906).

***Lasioglossum (Dialictus) perspicuum* (Knerer & Atwood, 1966):** Gibbs (2010) synonymized this name with *Lasioglossum (Dialictus) admirandum* (Sandhouse, 1924).

***Lasioglossum (Paralictus) asteris* (Mitchell, 1960):** Gibbs (2011) synonymized this name with *Lasioglossum (Dialictus) lionotus* (Sandhouse, 1923).

***Megachile (Eutricharaea) concinna* Smith, 1879:** considered a synonym of *Megachile (Eutricharaea) pusilla* by Soltani et al. (2017).

***Stelis (Microstelis) vernalis* Mitchell, 1962:** synonymized with *Stelis (Stelis) coarctatus* Crawford, 1916 by Parker and Griswold, in Gibbs et al. (2017).

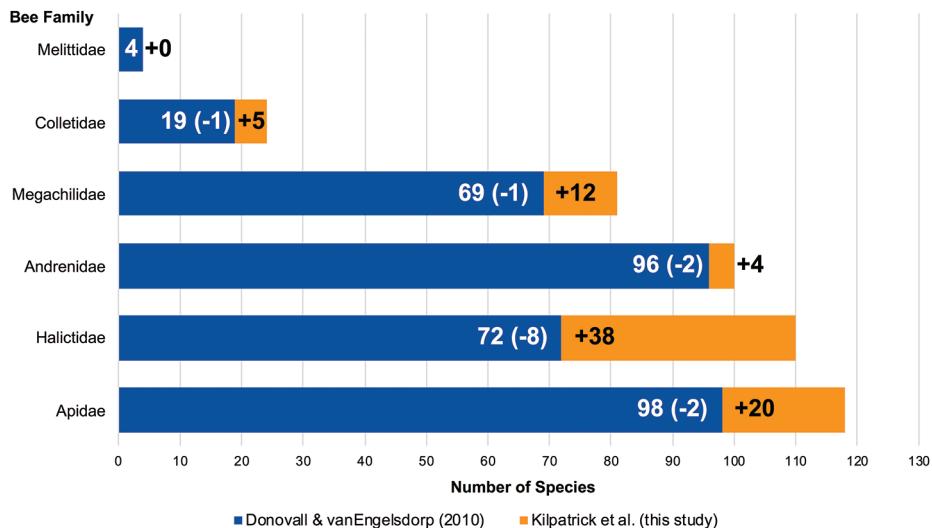
When available, the year of determination was used to update the taxonomy of specimen records in the databases we reviewed. Otherwise, specimen data was presented for the species it was recorded as. Notes are included within the checklist for species of *Andrena* F., *Ceratina* Latreille, and *Lasioglossum* that may have records attributable to different species reported under their name. For the purpose of species counts at the state and county levels, and figure data, occurrence records for *Augochloropsis metallica* sensu lato F., 1793 and *A. metallica fulgida* Smith, 1853 were combined.

## Figures

Figures were created in Microsoft Excel (version 16.16.17), Adobe Illustrator (version 23.1.1), and R 3.4.1 in RStudio (R Core Team 2017; RStudio Team 2015), using the following packages: *dunn.test* (Dinno 2017), *ggmap* (Kahle and Wickham 2013) *ggplot2* (Wickham 2016), *grid* (R Core Team 2017), *mapdata* (Becker et al. 2016), *mapproj* (McIlroy 2017), *maps* (Becker et al. 2017), *plyr* (Wickham 2011), and *raster* (Hijmans 2017).

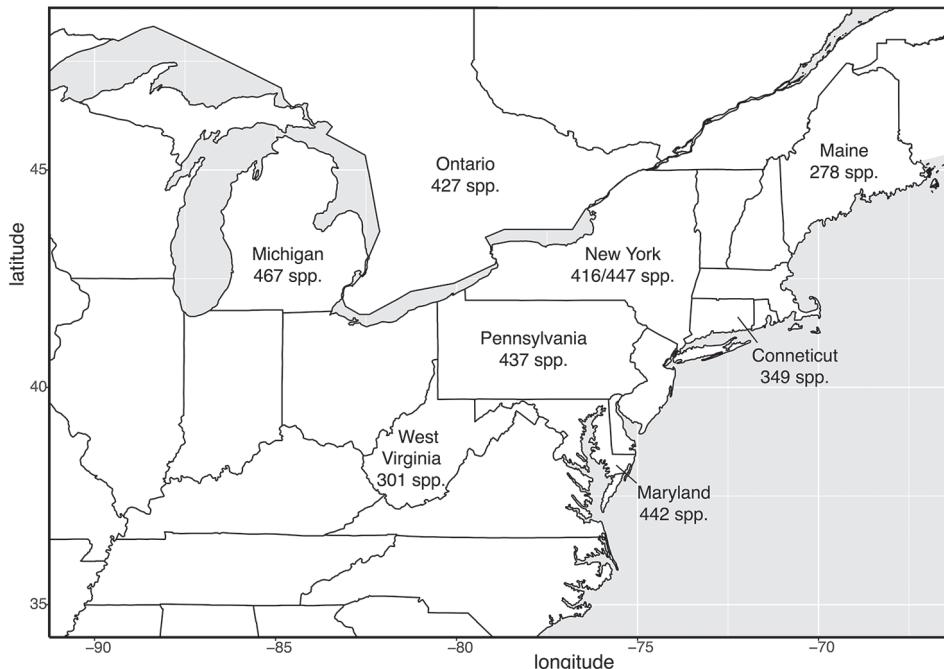
## Results and discussion

We record 437 species of bees in Pennsylvania by adding 79 new species from our review, removing eight species based on unverifiable records, and accounting for six



**Figure 1.** The numbers of bee species by family and per checklist study in Pennsylvania. Blue portions of bars represent the number of species reported in the previous checklist (Donovall and vanEngelsdorp 2010); orange portions of bars denote data from our study. The number inside the blue portion of each bar represents the number of species retained from the previous checklist. Numbers with “-” and enclosed in parentheses indicate taxa removed from the state checklist due either to unverifiable records or synonymy. The numbers with “+”, either inside the orange portion or adjacent to the end of each bar, signify new state species records. The families rank from least to greatest number of species as follows: Melittidae (4 spp.), Colletidae (24 spp.), Megachilidae (81 spp.), Andrenidae (100 spp.), Halictidae (110 spp.), and Apidae (118 spp.).

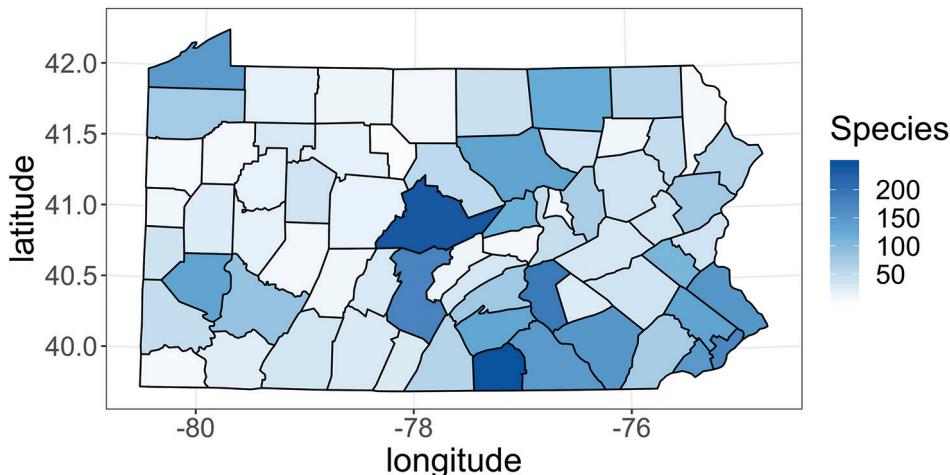
species removed from the total due to synonymies, compared to those included in the previous state checklist (Donovall and vanEngelsdorp 2010; Fig. 1). We present the first literature reports that we are aware of for 49 species in the state. There are new species records for five of the six North American bee families. Apidae has the most species recorded (118 spp.), followed by Halictidae (110 spp.), Andrenidae (100 spp.), Megachilidae (81 spp.), Colletidae (24 spp.), and Melittidae (4 spp.) (Fig. 1). We newly report the occurrence of three genera in the state (*Melecta* Latreille, *Melitoma* Lepeletier and Serville, and *Pseudoanthidium* Friese), for a total of 46 genera. These measures of biodiversity are comparable to that of neighboring jurisdictions including Connecticut (349 spp.; Zarrillo et al. 2016), Maine (278 spp.; Dibble et al. 2017), Maryland (442 spp.; North American Native Bee Collaborative 2017; Sam Droege, pers. comm.), Michigan (467 spp.; Gibbs et al. 2017a; Jamieson et al. 2019), New York (416 spp.; Danforth and van Dyke 2015 / 447 spp.; Ascher et al. 2014), Ontario (427 spp.; Sheffield et al. 2017; Bees of Canada 2020), and West Virginia (301 spp.; McKinney 2016) (Fig. 2). In addition, we provide a list of nine dubious species records and a list of 11 species that potentially occur in Pennsylvania, with notes about their current known distributions. Our checklist contributes to ongoing projects that docu-



**Figure 2.** Map of northeastern North America with relative bee species richness. The number of bee species reported for Pennsylvania (this study), and neighboring provinces and states, is shown: Connecticut (Zarrillo et al. 2016), Maine (Dibble et al. 2017), Maryland (North American Native Bee Collaborative 2017; Sam Droege, pers. comm.), Michigan (Gibbs et al. 2017a; Jamieson et al. 2019), New York (Danforth and van Dyke 2015; Ascher et al. 2014), Ontario (Sheffield et al. 2017; Bees of Canada 2020), and West Virginia (McKinney 2016).

ment bee biodiversity in North America. In addition to the checklists summarized above, additional checklists now available or in progress include Colorado (Scott et al. 2011), Illinois (Decker et al., in review), Indiana (Jean 2010), Louisiana (Owens et al. 2018), Massachusetts (Goldstein and Ascher 2016), northern Arizona (McCabe et al. 2020), and Wisconsin (Wolf and Ascher 2009; Scott et al. 2011). The bees of the following states are also being surveyed: Montana (Casey Delphia, pers. comm.), New York (New York Natural Heritage Program 2019), Oregon (Andony Melathopoulos, pers. comm.), and Virginia (Ellison Orcutt, pers. comm.).

Sixty-five of 67 counties (all except for Forest and Mifflin) have new species records (Fig. 3; Suppl. material 1). The number of species reports for counties ranges from one (Cameron Co.) to 246 (Adams Co.) (Fig. 3). Even counties that had high species richness reported in the previous checklist had new records. For example, Allegheny, Centre, Cumberland, Dauphin, Delaware, and Philadelphia counties, each had over 100 species listed previously, but all had new records (Donovall and vanEngelsdorp 2010; Fig. 3). Notably, these six counties also have large institutional insect collec-



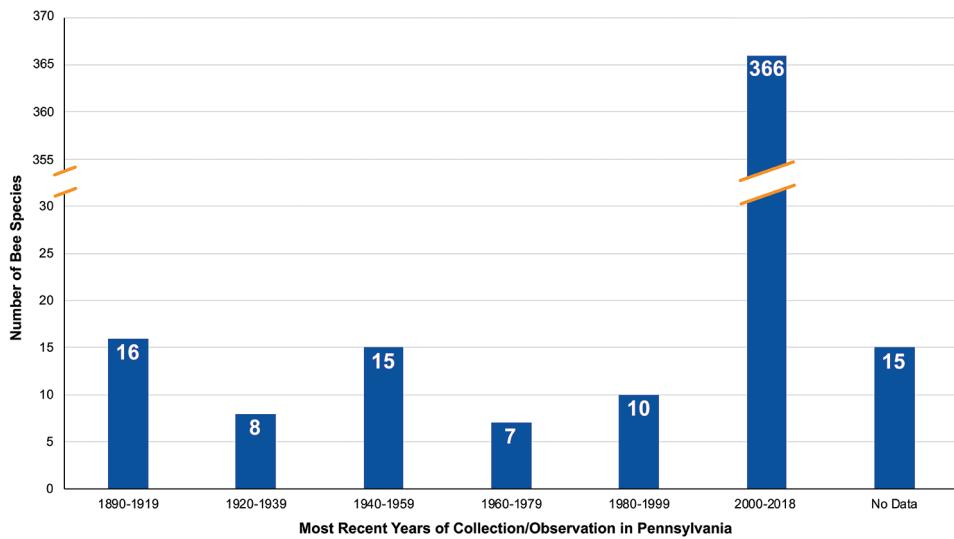
**Figure 3.** Choropleth map of Pennsylvania specifying bee species richness by county. The greater number of species recorded for a county, the darker blue the county is on the map; lighter-colored counties have fewer species reported from them. The number of species reports for counties ranges from one (Cameron Co.) to 246 (Adams Co.).

tions located in or near them. Furthermore, Adams and Centre counties have been intensively sampled in the past decade, primarily due to high agroecological and habitat management research activity within their borders, and currently have the highest documented species richness in the state (Fig. 3). However, species expected to be widespread remain undocumented for these seven counties and many parts of the state (Suppl. material 1). Additionally, there are still regions within the state that appear under-surveyed, particularly in the western part of the state (Fig. 3; Suppl. material 1). Sampling of such areas would likely yield additional species records and they should be targeted for future studies to increase information about bee species' distributions across the state (Jamieson et al. 2019). Counties adjacent to neighboring states also have the potential to record new state records as changes in species' distributions occur (i.e., Mikulas and Barringer 2018). By updating the first checklist within a decade of its publication, our work has shown that checklists are not static. Regularly compiling species and specimen data, and adding additional analyses, could allow species' relative abundances to be tracked overtime. Undoubtedly, additional specimen material and records will contribute new data for bee species in Pennsylvania in the future.

Our records also include the presence of at least 23 exotic species. This includes three species not previously reported in Pennsylvania to our knowledge: *Coelioxys coturnix* Pérez, 1884, *Hoplitis anthocopoides* (Schenck, 1853), and *Pseudoanthidium nanum* (Mocsáry, 1881). These species were generally expected to reach the state, based on where they were first confirmed in North America, and in some cases, where they have spread since detection (Sheffield et al. 2011a; Russo 2016; Portman et al. 2019; USGS Native Bee Laboratory 2019). We also add distribution data for *Anthophora*

*villosula* Smith, 1854, which was reported in Donovall and vanEngelsdorp (2010), but not included on the main checklist. *Lasioglossum zonulum* (Smith, 1848) is listed as an exotic species, based on recent evidence (Giles and Ascher 2006; USGS Native Bee Laboratory 2019). Additionally, the earliest verified year of collection for *Osmia cornifrons* (Radoszkowski, 1887) in Pennsylvania is updated to 2002, six years earlier than previously published (Donovall and vanEngelsdorp 2010). Non-native species can potentially out-compete native bees for resources, transmit diseases and parasites, change pollination effectiveness and network structures, and hybridize with local species/populations (Russo 2016; Portman et al. 2019). On the other hand, exotic species may also have positive effects, serving as pollinators of native and agricultural plants, bioindicators and biological control agents, and as study systems for biology and natural history (Russo 2016; Portman et al. 2019). Checklists and monitoring programs that include regular faunistic surveys can be used to readily detect exotic species and identify their effects on local taxa over time.

Our list includes five species of conservation concern. We include one endangered species, *Bombus affinis* Cresson, 1863, which has been federally listed since 2017 (U.S. Fish and Wildlife Service 2019; Xerces Society for Invertebrate Conservation 2019b). Other currently threatened or declining bumble bee species that occur in Pennsylvania are *B. fervidus* (F., 1798), *B. pensylvanicus* (DeGeer, 1773), and *B. terricola* Kirby, 1837 (Xerces Society for Invertebrate Conservation 2019b). *Epeoloides pilosulus* (Cresson, 1878) is also considered a species of conservation concern due to extreme rarity within its range since the 1960s (Bartomeus et al. 2013; Wood et al. 2019; Xerces Society for Invertebrate Conservation 2019a); it has not been recovered in Pennsylvania since 1911 according to our data. The population status for many bee species remains unassessed; other taxa may be experiencing declines or other changes, and require further study. In the absence of these data, we present a breakdown of the number of years since collection for all Pennsylvanian taxa (Fig. 4; Suppl. material 1). The majority of bee species in the state have been collected between 2000–2018, but at least 56 species (12.8% of all species in the state) have not been detected within that time frame (Fig. 4; Suppl. material 1). An additional 15 species with no year of collection available are the result of specimens reported in the literature with either no or limited collecting event information. These species' collection years, based on the years of publication which they are referenced in, range from pre-1908 to pre-2011. Of the species that Colla et al. (2012) listed as unrecorded in the eastern North America between 1990–2009, one was also undocumented in Pennsylvania between 1990–2018: *Andrena mendica* Mitchell, 1960, most recently collected in Pennsylvania in 1937 (Suppl. material 1). Contrastingly, two of the unrecorded species listed by Colla et al. (2012) were collected in Pennsylvania within the same time period: *A. daeckeii* Viereck, 1907 and *Sphecodes smilacinae* Robertson, 1897, last collected in 2007 and 2011, respectively (Suppl. material 1). It is possible that species which have not been recently collected are still present in Pennsylvania but are not represented in the datasets we analyzed. Expeditions specifically focused on collecting these species based on their historical reports would reveal more information about their present status. However, it is also difficult to assess



**Figure 4.** The number of bee species by their most recent years of collection/observation in Pennsylvania. The number within each bar represents the total number of species in the specified time period. Of the species in the state, 366 (83.8%) have been detected between 2000–2018, while at least 56 species (12.8%) have not. No date of collection/observation was available for 15 species (3.4%).

the status of species that have just recently been reported in the state and their populations could also be surveyed to provide these data. We update the most recent year of collection/observation in Pennsylvania for 276 species, compared to data presented in Donovall and vanEngelsdorp (2010). For 105 species, the difference between the most recent year of collection, between the previous checklist and our data, was greater than 20 years (ranging from 23–139 years), further showing the importance of regular and widely-ranging surveys (Donovall and vanEngelsdorp 2010; Suppl. material 1).

We contribute floral visitation records with specimen collection data for many species (Suppl. materials 3–6, 11), and increase phenology information. We note that female bees collected on plants may not have been foraging for pollen or nectar, or at all. Furthermore, some records are attributable to male individuals as well; specimens' sexes were not always indicated in databases or the literature. Thus, "host plant" status for plant taxa listed must be interpreted with caution. Biological and ecological information for Pennsylvania bee taxa can be found in Hurd (1979), Michener (2007), Fowler (2016), Gibbs et al. (2017), Danforth et al. (2019), as well as the previously-cited reviews and revisions. As approximately 15% of northeastern United States native bee species are specialists (Fowler 2016), focused collections on plant taxa known to attract oligoleptic species may contribute additional bee taxa to the Pennsylvanian checklist. Additionally, of the data used in this study, few specimen records were from early- and late-season collections. These gaps can be filled by additional surveying during these time periods throughout the state.

We included information from eight databases, 39 literature sources, three collections, and three additional datasets, and focused on specimens in Pennsylvania which were identified by experts and deposited in collections, without overlapping material addressed in Donovall and vanEngelsdorp (2010). We acknowledge that the datasets compiled for our study were not exhaustive; additional specimen records exist, which are not reflected in our data. Furthermore, our inclusion of AMNH, BugGuide, iNaturalist, and GBIF records in the checklist was limited to a few specimens with reliable determinations. We include all of the BugGuide and iNaturalist reports we retrieved as supplementary data and the GBIF records are accessible online (Suppl. material 12–17; GBIF Occurrence Download <https://doi.org/10.15468/dl.wghcks>). Records from other sources were either not retrieved in our process or not included due to difficulties accessing the data contained, validating identifications, and/or the lack of voucher specimens/images that could be examined in the future (Wheeler et al. 2004; Turney et al. 2015; Funk et al. 2018; Packer et al. 2018). Additional data, along with specimens in other collections, could be incorporated into future checklist updates.

Tracking the fate of specimens used for studies, within collections, loans, or deaccessioned material, using barcodes or a similar system, is critical for retrieving or evaluating vouchers' statuses. We follow recommendations for generating reproducible and verifiable specimen-based entomological research (Packer et al. 2018) as closely as possible. Our limitations include not knowing what materials were used to identify specimens and the ability to place accession numbers on individual specimens. The specimens in the datasets we used represent vouchers (Yoshimoto 1978). Lists of specimen records used, associated with species name (used in the respective database; not necessarily the most taxonomically-updated name), and specimen code, identifier, and determination date when available, is included to assist with tracking individual materials within their respective collections (Suppl. material 2–9, 11). Providing this data allows others to more easily locate specimens used as records and verify them, or use them in future studies.

One of the challenges of biodiversity work, which was apparent in our project, was the wide range of formats used to capture specimen data. There was little standardization between the datasets we reviewed as each of them had been created for different purposes. Based on the variety we encountered, we recommend that database columns be clearly labeled and metadata describing the contents of each column should accompany it. This will avoid assumptions about what one header or another means as these may differ between databases. One example of standardized terms for biological data is Darwin Core (<https://dwc.tdwg.org/>). Additionally, in some cases, readily-available and detailed information about the data contained in the database itself would have been helpful. Examples include knowing if the text in the database was copied verbatim or from the label or if it had been transformed in any way, and if and how specimen localities had been georeferenced. Providing this information will make the data set easier to navigate for use in biodiversity research and other projects. Additionally, it was often unclear who was responsible for identifying individual specimens or when the specimen was identified. This was problematic as there was no credibility directly

associated with the specimen record. We were often able to confirm who would have examined the material, though that data had not been entered into the database. A possibility for why the name would have been excluded from the database is that the individual specimen did not have a determination label attached. Therefore, we suggest that determination labels be printed for individual specimens when they are identified, not just the first specimen in a series, so that there is no confusion on who identified the specimen and the credibility of the identification in the future, when it is examined or entered into a database. Determination date should be considered just as important as the determiner field in a database due to changes in taxonomy or nomenclatural usage that can be traced to specific years [e.g., *L. birkmanni* and *L. macoupinense*; Gibbs et al. 2013)].

Updating the checklist of bee species known in Pennsylvania provides baseline data for future research on bee biodiversity, ecology, and conservation in the state. By identifying less-surveyed areas, seasons, and species, targeted collecting can be planned to fill gaps in our knowledge. Our results will inform future updates to the Pennsylvania Pollinator Protection Plan (P4), which provides recommendations for supporting pollinator populations (P4 Task Force 2019). Through open access publishing, we also allow these current data to become more readily accessible to all who are interested in understanding bee biodiversity. This also opens the door to future research projects where connections can be made between academia and interested parties; anyone can contribute data on bee biodiversity and potentially discover something entirely new (e.g., Best et al. 2019). Our checklist provides baseline data for more “boots on the ground” by encouraging people to document the species and their natural histories that may be in their own backyards (Wilson 2017).

## Checklist

All records for the bee species reported from Pennsylvania that we examined (new and previously reported) are presented here. Within each bee family, taxa are arranged alphabetically first by subfamily, then tribe, genus, subgenus (when applicable), and finally by species name. Each species record consists of the counties for which a voucher specimen or verifiable record has been confirmed. The earliest and latest dates, or only date(s) of collection in Pennsylvania are presented. The most recent year of collection in Pennsylvania is also shown in parentheses. Exotic species are indicated by an asterisk (\*) followed by the earliest verified Pennsylvania collection year in parentheses. Bold text indicates a new Pennsylvanian record, previously unpublished to our knowledge and of any type (state, county, date, or most recent year of collection). The source(s) for each record are indicated with superscript numbers defined in the Legend. The source for statewide distribution records with no further data are presented directly after the species name or the earliest verified Pennsylvania collection year, if the species is exotic. AMNH records included in the checklist are presented with their specimen code; full specimen records can be obtained on Discover Life using the ‘Retrieve ID’ function

(available at [https://www.discoverlife.org/mp/20l?act=enter\\_id](https://www.discoverlife.org/mp/20l?act=enter_id)). BugGuide records included in the checklist are shown with their Image IDs; full data is available via links in Suppl. material 12–16. Additional BugGuide and all iNaturalist occurrence records for bees in Pennsylvania that are not included below can be found in the Suppl. material 12–17. GBIF data is available online at <https://doi.org/10.15468/dl.wghcks>. Notes are also presented for certain species, particularly those whose older records may apply to other species as a result of recent taxonomic treatments. Lists of species excluded and species expected to occur in Pennsylvania are presented following the checklist.

**Legend:** <sup>1</sup> = Donovall and vanEngelsdorp (2010); <sup>2</sup> = Bartomeus et al. (2013); <sup>3</sup> = Biddinger Laboratory Database; <sup>4</sup> = Droege Database; <sup>5</sup> = Integrated Crop Pollination (ICP) Project: Fleischer Laboratory Database; <sup>6</sup> = López-Uribe Laboratory Database; <sup>7</sup> = Mahan et al., in prep; <sup>8</sup> = Winfree Laboratory Database; <sup>9</sup> = Choate et al. (2018); <sup>10</sup> = Baker, J.R. (1975); <sup>11</sup> = Bouseman, J.K. and LaBerge, W.E. (1978); <sup>12</sup> = Broemeling, D.K. (1998); <sup>13</sup> = Cockerell, T.D.A. (1908); <sup>14</sup> = Daly, H.V. (1973); <sup>15</sup> = DeBarros, N.B. (2010); <sup>16</sup> = Droege et al. (2010); <sup>17</sup> = Gibbs (2010); <sup>18</sup> = Gibbs (2011); <sup>19</sup> = Gibbs and Dathe (2017); <sup>20</sup> = Gibbs et al. (2013); <sup>21</sup> = LaBerge (1969); <sup>22</sup> = LaBerge (1971); <sup>23</sup> = LaBerge (1973); <sup>24</sup> = LaBerge (1977); <sup>25</sup> = LaBerge (1980); <sup>26</sup> = LaBerge (1985); <sup>27</sup> = LaBerge (1987); <sup>28</sup> = LaBerge (1989); <sup>29</sup> = LaBerge and Bouseman (1970); <sup>30</sup> = LaBerge and Ribble (1972); <sup>31</sup> = Matteson et al. (2008); <sup>32</sup> = McGinley (1986); <sup>33</sup> = McGinley (2003); <sup>34</sup> = Mikulas and Barringer (2018); <sup>35</sup> = Milliron (1973a); <sup>36</sup> = Mitchell (1960); <sup>37</sup> = Mitchell (1962); <sup>38</sup> = Onuferko (2017); <sup>39</sup> = Onuferko (2018); <sup>40</sup> = Ordway (1966); <sup>41</sup> = Rehan and Sheffield (2011); <sup>42</sup> = Roberts (1972); <sup>43</sup> = Shinn (1967); <sup>44</sup> = Sidhu (2013); <sup>45</sup> = Stephen (1954); <sup>46</sup> = Svensson et al. (1977); <sup>47</sup> = Timberlake (1975); <sup>48</sup> = AMNH; <sup>49</sup> = BugGuide; <sup>50</sup> = Swenk (1915); <sup>51</sup> = PSUB; <sup>52</sup> = Rosemary Malfi Insect Collection; <sup>53</sup> = Emily Erickson/BIML.

## Melittidae

### Melittinae

#### Macropidini

##### Genus *Macropis* Panzer

**Taxonomy:** Michez and Patiny (2005); Mitchell (1960).

##### Subgenus *Macropis* Panzer s. s.

*Macropis* (*Macropis*) *ciliata* Patton, 1880 – Bucks<sup>1</sup>, Centre<sup>7</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1</sup>, Lancaster<sup>1</sup>, Lehigh<sup>1</sup>, Philadelphia<sup>2</sup>; 12 Jun<sup>1</sup> – 9 Jul<sup>1</sup> (**2017**<sup>7</sup>).

*Macropis* (*Macropis*) *nuda* (Provancher, 1882) – Lehigh<sup>1</sup>, Pike<sup>1,2</sup>; 21 Apr<sup>1</sup> – 9 Jul<sup>1</sup> (1983<sup>1</sup>).

*Macropis* (*Macropis*) *patellata* Patton, 1880 – Bucks<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Huntingdon<sup>1</sup>, Lehigh<sup>1</sup>, Philadelphia<sup>1,2</sup>; 3 Jun<sup>2</sup> – 14 Jul<sup>1</sup> (1922<sup>1</sup>).

## Melittini

### Genus *Melitta* Kirby

**Taxonomy:** Michez and Eardley (2007); Mitchell (1960).

### Subgenus *Cilissa* Leach

*Melitta (Cilissa) melittoides* (Viereck, 1909)<sup>36</sup> – Centre<sup>1</sup>; 16 Jun<sup>1</sup> (1958<sup>1</sup>).

### Apidae

#### Apinae

##### Anthophorini

### Genus *Anthophora* Latreille

**Taxonomy:** Mitchell (1962); Brooks (1983); Černá et al. (2017).

### Subgenus *Anthophora* Latreille s. s.

*Anthophora (Anthophora) villosula* Smith, 1854\* (2013<sup>3,8</sup>)<sup>1</sup> – Adams<sup>3</sup>, Union<sup>8</sup>; 10 Apr<sup>3</sup> – 28 Apr<sup>8</sup> (2013<sup>3,8</sup>).

### Subgenus *Clisodon* Patton

*Anthophora (Clisodon) terminalis* Cresson, 1869<sup>37</sup> – Adams<sup>3,8</sup>, Allegheny<sup>1</sup>, Blair<sup>1,2</sup>, Bradford<sup>8</sup>, Centre<sup>1</sup>, Chester<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Erie<sup>9</sup>, Fayette<sup>1</sup>, Franklin<sup>1</sup>, Huntingdon<sup>1,8</sup>, Lycoming<sup>8</sup>, Montgomery<sup>1</sup>, Northumberland<sup>1</sup>, Perry<sup>1</sup>, Philadelphia<sup>1</sup>, Susquehanna<sup>8</sup>, Union<sup>8</sup>, York<sup>1</sup>; 14 May<sup>3</sup> – 23 Oct<sup>3</sup> (2018<sup>3</sup>).

### Subgenus *Lophanthophora* Brooks

*Anthophora (Lophanthophora) ursina* Cresson, 1869 – Schuylkill<sup>1,2</sup>; 28 May<sup>2</sup> – 29 May<sup>1</sup> (1988<sup>1,2</sup>).

### Subgenus *Melea* Sandhouse

**Revision:** Brooks (1983).

*Anthophora (Melea) abrupta* Say, 1837 (*bombooides* group)<sup>37</sup> – Adams<sup>3</sup>, Allegheny<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Lackawanna<sup>2</sup>, Lehigh<sup>1</sup>, Montgomery<sup>1,7</sup>, Tioga<sup>1</sup>; 10 Apr<sup>3</sup> – 17 Aug<sup>3</sup> (2018<sup>3</sup>).

*Anthophora (Melea) bombooides* Kirby, 1837 (*bombooides* group)<sup>37</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, Carbon<sup>1</sup>, Centre<sup>1,15</sup>, **Dauphin**<sup>6</sup>, **Huntingdon**<sup>6</sup>, Lehigh<sup>1</sup>, **Montgomery**<sup>7</sup>, Northumberland<sup>1</sup>, **Union**<sup>8</sup>, **Washington**<sup>6</sup>; 23 Apr<sup>6</sup> – 16 Aug<sup>3</sup> (2018<sup>3</sup>).

### Genus *Habropoda* Smith

*Habropoda laboriosa* (Fabricius, 1804) – **Adams**<sup>3</sup>, **Bucks**<sup>8</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, **Huntingdon**<sup>8</sup>, **Lycoming**<sup>8</sup>, Philadelphia<sup>1</sup>, York<sup>8</sup>; 21 Mar<sup>3</sup> – 4 Jun<sup>1</sup> (2015<sup>3,8</sup>).

### Apini

#### Genus *Apis* Linnaeus

*Apis (Apis) mellifera mellifera* Linnaeus, 1758\* (1887<sup>1</sup>)<sup>37</sup> – **Adams**<sup>3,6</sup>, **Allegheny**<sup>6</sup>, Beaver<sup>44</sup>, **Bedford**<sup>6</sup>, **Berks**<sup>6</sup>, **Bradford**<sup>4,6</sup>, **Bucks**<sup>4</sup>, **Cambria**<sup>4,6</sup>, **Carbon**<sup>6</sup>, Centre<sup>5,6,7,15,44</sup>, **Clearfield**<sup>4,6</sup>, **Clinton**<sup>6</sup>, **Columbia**<sup>5</sup>, **Crawford**<sup>4,6</sup>, **Cumberland**<sup>6</sup>, **Dauphin**<sup>4,6</sup>, **Delaware**<sup>4</sup>, **Elk**<sup>6</sup>, Erie<sup>6,9</sup>, **Franklin**<sup>6</sup>, Fulton<sup>44</sup>, **Huntingdon**<sup>3</sup>, **Jefferson**<sup>6</sup>, Juniata<sup>6,44</sup>, **Lackawanna**<sup>4</sup>, Lancaster<sup>3,5,6,15,44</sup>, **Lebanon**<sup>4</sup>, Lycoming<sup>6,44</sup>, **McKean**<sup>4</sup>, **Monroe**<sup>6</sup>, Montgomery<sup>6,7,44</sup>, **Montour**<sup>6</sup>, Northampton<sup>5,6</sup>, **Perry**<sup>6</sup>, **Pike**<sup>4</sup>, Schuylkill<sup>4</sup>, **Snyder**<sup>4</sup>, **Somerset**<sup>6</sup>, **Tioga**<sup>4</sup>, **Warren**<sup>6</sup>, **Washington**<sup>6</sup>, **Westmoreland**<sup>4,6</sup>, York<sup>4,6</sup>; 14 Mar<sup>1</sup> – 17 Nov<sup>1</sup> (2017<sup>3,7</sup>). **Notes.** This non-native species, previously reported has having a ubiquitous distribution in Pennsylvania (Donovall and vanEngelsdorp 2010), undoubtedly occurs in all counties due to its status as a managed pollinator.

### Bombini

#### Genus *Bombus* Latreille

**Taxonomy:** Milliron (1971, 1973a, b); Mitchell (1962); Laverty and Harder (1988); Williams et al. (2008, 2014).

#### Subgenus *Bombias* Robertson

*Bombus (Bombias) auricomus* (Robertson, 1903) – **Adams**<sup>3,8</sup>, Allegheny<sup>1</sup>, Bradford<sup>1</sup>, Bucks<sup>1,2</sup>, Centre<sup>1,44</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1,4</sup>, Erie<sup>1</sup>, Fayette<sup>1</sup>, **Huntingdon**<sup>3</sup>, Juniata<sup>1</sup>, **Lancaster**<sup>3</sup>, Lawrence<sup>1</sup>, Lebanon<sup>1</sup>, Lehigh<sup>1</sup>, Montgomery<sup>1,8</sup>, Northumberland<sup>1</sup>, Philadelphia<sup>1</sup>, Somerset<sup>1</sup>, Tioga<sup>1</sup>, Washington<sup>1</sup>, Westmoreland<sup>1</sup>; 27 Apr<sup>1</sup> – 13 Sep<sup>1</sup> (2017<sup>3</sup>).

#### Subgenus *Bombus* Latreille s. s.

*Bombus (Bombus) affinis* Cresson, 1863 – Allegheny<sup>1</sup>, Bucks<sup>2</sup>, Centre<sup>1</sup>, Clinton<sup>1</sup>, Columbia<sup>2</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>2,52</sup>, Erie<sup>1</sup>, Fayette<sup>1</sup>, Forest<sup>1</sup>, Fulton<sup>1</sup>, Huntingdon<sup>1</sup>, Juniata<sup>1</sup>, Lackawanna<sup>2</sup>, Lancaster<sup>1</sup>, Lawrence<sup>1</sup>, Lehigh<sup>1</sup>, Luzerne<sup>1,2</sup>,

*Lycoming*<sup>1</sup>, *McKean*<sup>1</sup>, *Monroe*<sup>1,2</sup>, *Northumberland*<sup>1</sup>, *Perry*<sup>1</sup>, *Philadelphia*<sup>1,2</sup>, *Tioga*<sup>1</sup>, *Venango*<sup>1</sup>, *Warren*<sup>1</sup>, *Washington*<sup>1</sup>, *Westmoreland*<sup>1,2</sup>, *York*<sup>1</sup>; 22 Apr<sup>1</sup> – 4 Oct<sup>1</sup> (2006<sup>52</sup>).

*Bombus (Bombus) terricola* Kirby, 1837 – *Blair*<sup>1</sup>, *Centre*<sup>1,2,6,15</sup>, *Clearfield*<sup>1</sup>, *Clinton*<sup>1</sup>, *Columbia*<sup>1</sup>, *Erie*<sup>1</sup>, *Huntingdon*<sup>1</sup>, *Lackawanna*<sup>2</sup>, *Luzerne*<sup>1,2</sup>, *Lycoming*<sup>1</sup>, *McKean*<sup>1</sup>, *Monroe*<sup>1,2</sup>, *Pike*<sup>1</sup>, *Sullivan*<sup>1</sup>, *Tioga*<sup>1</sup>, *Warren*<sup>1</sup>; 29 Apr<sup>2</sup> – 2 Nov<sup>1</sup> (2009<sup>15</sup>).

### Subgenus *Cullumanobombus* Vogt

*Bombus (Cullumanobombus) griseocollis* (DeGeer, 1773) (*griseocollis* group) – **Adams**<sup>3,6,8</sup>, **Allegheny**<sup>1,35</sup>, **Berks**<sup>2</sup>, **Bradford**<sup>1</sup>, **Bucks**<sup>1,2,6,8</sup>, **Centre**<sup>1,6,7,15</sup>, **Chester**<sup>1,8,44</sup>, **Columbia**<sup>5</sup>, **Cumberland**<sup>1</sup>, **Dauphin**<sup>1,4,6</sup>, **Delaware**<sup>1,2,4</sup>, **Erie**<sup>1</sup>, **Fayette**<sup>1,35</sup>, **Huntingdon**<sup>1,8</sup>, **Lancaster**<sup>1,3,4,5,6,15,44</sup>, **Lebanon**<sup>4</sup>, **Lehigh**<sup>1</sup>, **Luzerne**<sup>2</sup>, **Lycoming**<sup>6</sup>, **Monroe**<sup>1,2</sup>, **Montgomery**<sup>7,8</sup>, **Perry**<sup>1,4</sup>, **Philadelphia**<sup>1,4</sup>, **Pike**<sup>1</sup>, **Snyder**<sup>4</sup>, **Tioga**<sup>1</sup>, **Union**<sup>8</sup>, **Washington**<sup>1</sup>, **Westmoreland**<sup>1,35</sup>, **York**<sup>4,6,8</sup>; **10 Apr**<sup>3</sup> – **12 Oct**<sup>3</sup> (2018<sup>3</sup>).

*Bombus (Cullumanobombus) rufocinctus* Cresson, 1863 (*rufocinctus* group) – **Erie**<sup>34</sup>; 30 Jul<sup>34</sup> (2017<sup>34</sup>).

### Subgenus *Psithyrus* Lepetier

*Bombus (Psithyrus) ashtoni* (Cresson, 1864) (*bohemicus* group) – **Allegheny**<sup>1</sup>, **Berks**<sup>2</sup>, **Centre**<sup>1,2,15</sup>, **Columbia**<sup>2</sup>, **Cumberland**<sup>1</sup>, **Dauphin**<sup>1</sup>, **Erie**<sup>1</sup>, **Lackawanna**<sup>1</sup>, **Perry**<sup>1</sup>, **Westmoreland**<sup>1</sup>; 12 May<sup>1</sup> – 26 Sep<sup>2</sup> (2009<sup>15</sup>).

*Bombus (Psithyrus) citrinus* (Smith, 1854) (*citrinus* group) – **Allegheny**<sup>1</sup>, **Berks**<sup>1</sup>, **Bucks**<sup>8</sup>, **Centre**<sup>1,15</sup>, **Columbia**<sup>1</sup>, **Cumberland**<sup>1</sup>, **Dauphin**<sup>1</sup>, **Erie**<sup>1</sup>, **Fulton**<sup>1</sup>, **Huntingdon**<sup>1</sup>, **Lancaster**<sup>1,3</sup>, **Lehigh**<sup>1</sup>, **Lycoming**<sup>1</sup>, **Monroe**<sup>2</sup>, **Northumberland**<sup>1</sup>, **Perry**<sup>1</sup>, **Philadelphia**<sup>4</sup>, **Pike**<sup>1</sup>, **Westmoreland**<sup>1</sup>, **York**<sup>1</sup>; 2 Apr<sup>1</sup> – 14 Nov<sup>1</sup> (2012<sup>3</sup>).

*Bombus (Psithyrus) fernaldae* (Franklin, 1911) (*sylvestris* group) – **Adams**<sup>1,3</sup>, **Centre**<sup>1,6,7,15</sup>, **Erie**<sup>9</sup>; **6 May**<sup>6</sup> – **15–16 Aug**<sup>7</sup> (2016<sup>7</sup>).

*Bombus (Psithyrus) insularis* (Smith, 1861) (*citrinus* group) – **Centre**<sup>1,15</sup>, **Cumberland**<sup>1</sup>, **Perry**<sup>1</sup>; 23 Jun<sup>1</sup> (2009<sup>15</sup>).

### Subgenus *Pyrobombus* Dalla Torre

*Bombus (Pyrobombus) bimaculatus* Cresson, 1863 (*lapponicus* group) – **Adams**<sup>1,3,8</sup>, **Allegheny**<sup>1</sup>, **Beaver**<sup>44</sup>, **Bedford**<sup>1,6</sup>, **Blair**<sup>6</sup>, **Bradford**<sup>6,8</sup>, **Bucks**<sup>6,8</sup>, **Centre**<sup>1,3,5,6,7,15,44</sup>, **Chester**<sup>8</sup>, **Columbia**<sup>5</sup>, **Crawford**<sup>1</sup>, **Cumberland**<sup>1</sup>, **Dauphin**<sup>1,6</sup>, **Delaware**<sup>1,2,4</sup>, **Erie**<sup>9</sup>, **Fulton**<sup>1</sup>, **Huntingdon**<sup>1,2,3,8</sup>, **Jefferson**<sup>6</sup>, **Juniata**<sup>1</sup>, **Lackawanna**<sup>1,2</sup>, **Lancaster**<sup>1,3,5,8</sup>, **Lebanon**<sup>1</sup>, **Lehigh**<sup>1,6</sup>, **Lycoming**<sup>6,8</sup>, **Mifflin**<sup>1</sup>, **Monroe**<sup>1</sup>, **Montgomery**<sup>7,8</sup>, **Northampton**<sup>5,6</sup>, **Northumberland**<sup>1</sup>, **Perry**<sup>1</sup>, **Philadelphia**<sup>1,2</sup>, **Pike**<sup>1,4</sup>, **Schuylkill**<sup>2,4</sup>, **Somerset**<sup>1,6</sup>, **Susquehanna**<sup>8</sup>, **Union**<sup>1,8</sup>, **Washington**<sup>1</sup>, **Westmoreland**<sup>1</sup>, **York**<sup>1,8</sup>; 14 Mar<sup>1</sup> – 12 Nov<sup>1</sup> (2018<sup>3</sup>).

*Bombus (Pyrobombus) impatiens* Cresson, 1863 (*lapponicus* group)<sup>37</sup> – **Adams**<sup>3,8,44</sup>, **Allegheny**<sup>1</sup>, **Beaver**<sup>44</sup>, **Bedford**<sup>6</sup>, **Berks**<sup>6</sup>, **Blair**<sup>6</sup>, **Bradford**<sup>1,4,6,8</sup>, **Bucks**<sup>1,4,6,8</sup>, **Butler**<sup>1,44</sup>,

**Cambria**<sup>6</sup>, Carbon<sup>1,6</sup>, Centre<sup>1,5,6,7,8,15,44</sup>, Chester<sup>1,6,8,44</sup>, Clearfield<sup>1,4</sup>, Clinton<sup>1,6</sup>, Columbia<sup>2,5</sup>, Crawford<sup>1,6</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,4,6</sup>, Delaware<sup>1,2,4,6,44</sup>, Erie<sup>1,6,9</sup>, Fayette<sup>1</sup>, Franklin<sup>1</sup>, Fulton<sup>1,3,44</sup>, Huntingdon<sup>1,3,8</sup>, Indiana<sup>1</sup>, Jefferson<sup>1,6</sup>, Juniata<sup>1,3,6,44</sup>, Lackawanna<sup>1,2,4,6</sup>, Lancaster<sup>1,2,3,4,5,6,8,15,44</sup>, Lebanon<sup>1,4,6</sup>, Lehigh<sup>1,6</sup>, Luzerne<sup>1,2</sup>, Lycoming<sup>1,6,8,44</sup>, McKean<sup>1,4</sup>, Mifflin<sup>1</sup>, Monroe<sup>1,2,6</sup>, Montgomery<sup>1,2,6,7,8,44</sup>, **Northampton**<sup>5,6</sup>, Northumberland<sup>1,6</sup>, Perry<sup>1,4</sup>, Philadelphia<sup>1,2,4,6</sup>, **Schuylkill**<sup>4,6</sup>, **Snyder**<sup>4</sup>, **Somerset**<sup>6</sup>, Sullivan<sup>1</sup>, **Susquehanna**<sup>8</sup>, Union<sup>1,8</sup>, Washington<sup>1</sup>, Wayne<sup>1</sup>, Westmoreland<sup>1,6</sup>, **Wyoming**<sup>4</sup>, York<sup>1,4,6,8,44</sup>; **31 Mar**<sup>3</sup> – 12 Nov<sup>1</sup> (**2018**<sup>3</sup>).

*Bombus (Pyrobombus) perplexus* Cresson, 1863 (*hypnorum* group) – Adams<sup>1,3,8</sup>, Beaver<sup>44</sup>, **Bradford**<sup>4,6,8</sup>, Bucks<sup>2,8</sup>, Centre<sup>1,3,6,7,15,44</sup>, Columbia<sup>2,5</sup>, **Dauphin**<sup>6</sup>, Delaware<sup>2</sup>, Erie<sup>9</sup>, Huntingdon<sup>3,8</sup>, Juniata<sup>3</sup>, Lackawanna<sup>2,4</sup>, Lancaster<sup>1,3,4,6</sup>, **Lebanon**<sup>6</sup>, **Lycoming**<sup>8</sup>, McKean<sup>4</sup>, Monroe<sup>4</sup>, Montgomery<sup>7</sup>, Northampton<sup>4</sup>, Philadelphia<sup>2</sup>, Schuylkill<sup>2</sup>, Union<sup>8</sup>, York<sup>6,8</sup>; **12 Apr**<sup>3</sup> – 27 Dec<sup>1</sup> (**2018**<sup>3</sup>).

*Bombus (Pyrobombus) sandersoni* Franklin, 1913 (*pratorum* group)<sup>37</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, Bucks<sup>1</sup>, Carbon<sup>1</sup>, Centre<sup>1,3,6,7</sup>, Chester<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1</sup>, Franklin<sup>1</sup>, Huntingdon<sup>1</sup>, Lackawanna<sup>2</sup>, **Lebanon**<sup>6</sup>, Lehigh<sup>1</sup>, McKean<sup>1</sup>, Monroe<sup>1</sup>, Northumberland<sup>1</sup>, Perry<sup>1</sup>, Philadelphia<sup>1</sup>, Schuylkill<sup>2</sup>, Sullivan<sup>1</sup>, Tioga<sup>1</sup>, **Union**<sup>8</sup>, Westmoreland<sup>1</sup>; 29 Apr<sup>2</sup> – **15–16 Aug**<sup>7</sup> (**2017**<sup>7</sup>).

*Bombus (Pyrobombus) ternarius* Say, 1837 (*lapponicus* group)<sup>37</sup> – Bradford<sup>1,4,6,8</sup>, Carbon<sup>1,6</sup>, Centre<sup>1,44</sup>, Clinton<sup>1</sup>, Columbia<sup>1,5</sup>, Crawford<sup>1</sup>, Huntingdon<sup>1</sup>, Lackawanna<sup>1,2</sup>, Lancaster<sup>3,44</sup>, Luzerne<sup>1,2</sup>, Lycoming<sup>1</sup>, McKean<sup>1</sup>, Monroe<sup>1,2</sup>, Perry<sup>1</sup>, **Schuylkill**<sup>6</sup>, Sullivan<sup>1</sup>, Wayne<sup>2</sup>; 25 Apr<sup>1</sup> – 16 Oct<sup>1</sup> (**2015**<sup>5</sup>).

*Bombus (Pyrobombus) vagans* vagans Smith, 1854 (*vagans* group)<sup>37</sup> – Adams<sup>1,3,8</sup>, Allegheny<sup>1</sup>, Beaver<sup>1,44</sup>, Bedford<sup>1</sup>, Berks<sup>2</sup>, Blair<sup>2</sup>, **Bradford**<sup>4,8</sup>, Bucks<sup>1,8</sup>, Butler<sup>1</sup>, Cambria<sup>1</sup>, Centre<sup>1,3,7,15,44</sup>, Chester<sup>1,8</sup>, **Clearfield**<sup>4</sup>, Clinton<sup>1</sup>, Columbia<sup>1,2,5</sup>, Crawford<sup>1,4,6</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1,2</sup>, Erie<sup>1,9</sup>, Fayette<sup>1</sup>, Forest<sup>1</sup>, Franklin<sup>1</sup>, Fulton<sup>1</sup>, Huntingdon<sup>1,2,8</sup>, Juniata<sup>1,44</sup>, Lackawanna<sup>2,4</sup>, Lancaster<sup>1,3</sup>, Lebanon<sup>1</sup>, Lehigh<sup>1</sup>, Luzerne<sup>1</sup>, Lycoming<sup>1,8,44</sup>, McKean<sup>1,4</sup>, Monroe<sup>2</sup>, Montgomery<sup>1,8</sup>, Northumberland<sup>1</sup>, Perry<sup>1</sup>, Philadelphia<sup>1</sup>, Pike<sup>1,2,4</sup>, Schuylkill<sup>1,2,4</sup>, **Somerset**<sup>6</sup>, Sullivan<sup>1</sup>, **Susquehanna**<sup>8</sup>, Tioga<sup>1,6</sup>, Union<sup>1,8</sup>, Warren<sup>1,6</sup>, Washington<sup>1</sup>, Westmoreland<sup>1</sup>, Wyoming<sup>1</sup>, York<sup>1,4,8</sup>; **31 Mar**<sup>3</sup> – 3 Nov<sup>1</sup> (**2018**<sup>3</sup>).

### Subgenus *Subterraneobombus* Vogt

*Bombus (Subterraneobombus) borealis* Kirby, 1837 – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, Beaver<sup>1</sup>, Tioga<sup>1</sup>; 11 Aug<sup>1</sup> – **24 Sep**<sup>3</sup> (**2015**<sup>3</sup>).

### Subgenus *Thoracobombus* Dalla Torre

*Bombus (Thoracobombus) fervidus* (Fabricius, 1798) (*pensylvanicus* group)<sup>37</sup> – Adams<sup>1,3,8</sup>, Allegheny<sup>1</sup>, Berks<sup>1,2</sup>, **Bradford**<sup>8</sup>, Bucks<sup>1,8</sup>, Centre<sup>1,7,44</sup>, Chester<sup>1,8</sup>, Clinton<sup>1</sup>, Columbia<sup>1,2,5</sup>, **Crawford**<sup>4</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1,4,6</sup>, Erie<sup>1</sup>, Forest<sup>1</sup>, Franklin<sup>1</sup>, Greene<sup>1</sup>, Huntingdon<sup>1,2</sup>, Lackawanna<sup>2</sup>, Lancaster<sup>1,3,5,8,15</sup>, Lawrence<sup>1</sup>, Lehigh<sup>1</sup>,

Luzerne<sup>1</sup>, **Lycoming<sup>8</sup>**, Mifflin<sup>1</sup>, Montgomery<sup>1,2,8</sup>, **Northampton<sup>5</sup>**, Northumberland<sup>1</sup>, Philadelphia<sup>1,2,4</sup>, Tioga<sup>1</sup>, Washington<sup>1</sup>, Westmoreland<sup>1</sup>, York<sup>1,8</sup>; **31 Mar<sup>3</sup> – 4 Nov<sup>1</sup> (2018<sup>3</sup>)**.  
*Bombus (Thoracobombus) pensylvanicus* (DeGeer, 1773) (*pensylvanicus* group)<sup>37</sup> – **Adams<sup>3</sup>**, Allegheny<sup>1</sup>, Beaver<sup>1</sup>, Berks<sup>2</sup>, Centre<sup>1,44</sup>, Chester<sup>1</sup>, Clarion<sup>1</sup>, Columbia<sup>1,2,5</sup>, Crawford<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1,4</sup>, Erie<sup>1</sup>, Fayette<sup>1</sup>, Jefferson<sup>1</sup>, Juniata<sup>1</sup>, Lancaster<sup>1</sup>, Lebanon<sup>1</sup>, Mifflin<sup>1</sup>, Monroe<sup>2</sup>, Montgomery<sup>1</sup>, Philadelphia<sup>1,2</sup>, Tioga<sup>1</sup>, Union<sup>1</sup>, Washington<sup>1</sup>, Westmoreland<sup>1</sup>, York<sup>1</sup>; 23 Apr<sup>1</sup> – 15 Oct<sup>1</sup> (2018<sup>3</sup>).

## Emphorini

### Genus *Melitoma* Lepeletier and Serville

**Taxonomy:** Mitchell (1962).

*Melitoma taurea* (Say, 1837) – Adams<sup>3</sup>, Lancaster<sup>3,8</sup>; 12 Jun<sup>3</sup> – 2 Oct<sup>3</sup> (2018<sup>3</sup>).

### Genus *Ptilothrix* Smith

**Taxonomy:** Mitchell (1962).

*Ptilothrix bombiformis* (Cresson, 1878) – Adams<sup>3,8</sup>, Delaware<sup>1,4</sup>, Montgomery<sup>8</sup>, York<sup>8</sup>; 26 Apr<sup>3</sup> – 2 Oct<sup>3</sup> (2018<sup>3</sup>).

## Eucerinae

### Eucerini

#### Genus *Eucera* Scopoli

**Taxonomy:** Dorchin et al. (2018).

#### Subgenus *Cemolobus* Robertson

**Taxonomy:** Mitchell (1962). Monotypic.

*Eucera (Cemolobus) ipomoeae* (Robertson, 1891) – Adams<sup>3</sup>; 5 Jul<sup>3</sup> – 30 Jul<sup>3</sup> (2017<sup>3</sup>).

#### Subgenus *Peponapis* Robertson

**Revision:** Hurd and Linsley (1964).

**Key:** Ayala and Griswold (2012).

*Eucera (Peponapis) pruinosa* (Say, 1837)<sup>37</sup> – **Adams**<sup>3,8</sup>, Allegheny<sup>1</sup>, **Armstrong**<sup>6</sup>, Beaver<sup>44</sup>, **Berks**<sup>6</sup>, **Bradford**<sup>6,8</sup>, **Bucks**<sup>8</sup>, Centre<sup>1,5,6,7,15,44</sup>, **Chester**<sup>8</sup>, **Columbia**<sup>5</sup>, **Crawford**<sup>4</sup>, **Cumberland**<sup>6</sup>, Dauphin<sup>1,6</sup>, **Delaware**<sup>4</sup>, Erie<sup>1,9</sup>, **Franklin**<sup>6</sup>, Fulton<sup>44</sup>, **Huntingdon**<sup>3,8</sup>, **Jefferson**<sup>6</sup>, Juniata<sup>44</sup>, Lancaster<sup>3,5,6,8,15,44</sup>, **Lebanon**<sup>6</sup>, Lycoming<sup>8,44</sup>, **Monroe**<sup>6</sup>, Montgomery<sup>6,8,44</sup>, **Perry**<sup>6</sup>, Philadelphia<sup>1</sup>, **Union**<sup>8</sup>, Wayne<sup>1</sup>, Westmoreland<sup>1</sup>, York<sup>1,6,8</sup>; 5 May<sup>1</sup> – 12 Oct<sup>3</sup> (2018<sup>3</sup>).

### Subgenus *Synhalonia* Patton

**Revision:** Timberlake (1969).

*Eucera (Synhalonia) atriventris* (Smith, 1854)<sup>37</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, Centre<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1</sup>, Franklin<sup>1</sup>, **Huntingdon**<sup>3,8</sup>, Montgomery<sup>1</sup>, Philadelphia<sup>1</sup>, York<sup>1</sup>; 12 Apr<sup>1</sup> – 29 Jul<sup>3</sup> (2017<sup>3</sup>).

*Eucera (Synhalonia) dubitata* (Cresson, 1878)<sup>37</sup> – **Adams**<sup>3</sup>, **Lycoming**<sup>8</sup>; 27 Apr<sup>3</sup> – 24 Sep<sup>3</sup> (2017<sup>3</sup>).

*Eucera (Synhalonia) hamata* (Bradley, 1942) – Adams<sup>3,8</sup>, **Delaware**<sup>4</sup>, **Huntingdon**<sup>8</sup>, Lancaster<sup>3,5,8</sup>, York<sup>8</sup>; 31 Mar<sup>3</sup> – 17 Aug<sup>3</sup> (2018<sup>3</sup>).

*Eucera (Synhalonia) rosae* (Robertson, 1900) – Adams<sup>3</sup>; 17 Apr<sup>3</sup> – 5 Jul<sup>3</sup> (2017<sup>3</sup>).

### Genus *Melissodes* Latreille

**Taxonomy:** LaBerge (1955, 1956a, b, 1961); Mitchell (1962).

#### Subgenus *Apomelissodes* LaBerge

**Revision:** LaBerge (1956b).

*Melissodes (Apomelissodes) apicatus* Lovell & Cockerell, 1906 – Montgomery<sup>7</sup>; 26 – 27 Jun<sup>7</sup> (2017<sup>7</sup>).

*Melissodes (Apomelissodes) fimbriatus* Cresson, 1878 – Adams<sup>3,51</sup>; 21 Jun<sup>3</sup> – 28 Jun–5 Jul<sup>51</sup> (2012<sup>3,51</sup>).

#### Subgenus *Eumelissodes* LaBerge

**Revision:** LaBerge (1961).

*Melissodes (Eumelissodes) agilis* Cresson, 1878<sup>37</sup> – Allegheny<sup>1</sup>, Centre<sup>15,44</sup>, Dauphin<sup>1</sup>, Lancaster<sup>1,8</sup>, Lebanon<sup>1</sup>, Philadelphia<sup>1</sup>; 14 Jul<sup>1</sup> – 12 Aug<sup>1</sup> (2015<sup>8</sup>).

*Melissodes (Eumelissodes) boltoniae* Robertson, 1905<sup>37</sup> – Centre<sup>1</sup>, Forest<sup>1</sup>; 25 Jun<sup>1</sup> – 27 Aug<sup>1</sup> (1956<sup>1</sup>).

*Melissodes (Eumelissodes) denticulatus* Smith, 1854<sup>37</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, Armstrong<sup>1</sup>, Beaver<sup>1</sup>, Centre<sup>1,5,44</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Elk<sup>6</sup>, Erie<sup>9</sup>, **Lancaster**<sup>3</sup>, Perry<sup>1,4</sup>, Philadelphia<sup>1</sup>, Washington<sup>1</sup>, York<sup>1</sup>; **26 May**<sup>3</sup> – 8 Oct<sup>1</sup> (**2018**<sup>3</sup>).

*Melissodes (Eumelissodes) dentiventris* Smith, 1854<sup>37</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, **Carbon**<sup>6</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Philadelphia<sup>1</sup>, York<sup>1</sup>; **3 Jul**<sup>3</sup> – 17 Oct<sup>1</sup> (**2015**<sup>3</sup>).

*Melissodes (Eumelissodes) druriellus* (Kirby, 1802)<sup>37</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, **Bradford**<sup>8</sup>, Centre<sup>1,7,15,44</sup>, Columbia<sup>2</sup>, **Crawford**<sup>4</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1</sup>, **Huntingdon**<sup>6</sup>, Lackawanna<sup>1</sup>, **Lycoming**<sup>8</sup>, Monroe<sup>1,2</sup>, Montgomery<sup>1</sup>, Philadelphia<sup>1</sup>, Tioga<sup>1</sup>, **Union**<sup>8</sup>, Westmoreland<sup>1</sup>; **11 Jun**<sup>6</sup> – 29 Sep<sup>2</sup> (**2017**<sup>7</sup>).

*Melissodes (Eumelissodes) fumosus* LaBerge, 1961 – Centre<sup>44</sup>; dates not reported<sup>44</sup> (2010 – 2012<sup>44</sup>).

*Melissodes (Eumelissodes) illatus* Lovell & Cockerell, 1906<sup>37</sup> – **Adams**<sup>3</sup>, Centre<sup>15</sup>, Erie<sup>9</sup>; **11 Jun**<sup>3</sup> – **17 Aug**<sup>3</sup> (**2016**<sup>9</sup>).

*Melissodes (Eumelissodes) niveus* Robertson, 1895 – Center<sup>44</sup>, Delaware<sup>1</sup>; 3 Sep<sup>1</sup> (2010 – 2012<sup>44</sup>).

*Melissodes (Eumelissodes) subillatus* LaBerge, 1961<sup>37</sup> – **Adams**<sup>3</sup>, Huntingdon<sup>2</sup>, **Lancaster**<sup>3</sup>; **14 Jun**<sup>3</sup> – **6 Sep**<sup>3</sup> (**2014**<sup>3</sup>).

*Melissodes (Eumelissodes) trinodis* Robertson, 1901<sup>37</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, **Bucks**<sup>8</sup>, Centre<sup>7</sup>, **Chester**<sup>8</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1,4</sup>, **Lancaster**<sup>3,5</sup>, **Lycoming**<sup>8</sup>, **Montgomery**<sup>8</sup>, Philadelphia<sup>1</sup>, **York**<sup>8</sup>; **4 Jun**<sup>3</sup> – **13 Oct**<sup>3</sup> (**2018**<sup>3</sup>).

### Subgenus *Heliomelissodes* LaBerge

**Revision:** LaBerge (1956b).

*Melissodes (Heliomelissodes) desponsus* Smith, 1854<sup>37</sup> – Adams<sup>1,3</sup>, **Bradford**<sup>4,8</sup>, Centre<sup>1,2,15,44</sup>, **Columbia**<sup>5</sup>, Cumberland<sup>1</sup>, **Dauphin**<sup>6</sup>, **Delaware**<sup>4</sup>, Erie<sup>9</sup>, Forest<sup>1</sup>, **Franklin**<sup>6</sup>, **Huntingdon**<sup>3,8</sup>, **Lancaster**<sup>3,8</sup>, Lebanon<sup>1,4</sup>, **Lycoming**<sup>8</sup>, Philadelphia<sup>1</sup>, **Snyder**<sup>4</sup>, **Somerset**<sup>6</sup>, **Washington**<sup>6</sup>, York<sup>6,8</sup>; 23 Apr<sup>2</sup> – **1 Oct**<sup>3</sup> (**2018**<sup>3</sup>).

### Subgenus *Melissodes* Latreille s. s.

**Revision:** LaBerge (1956a).

*Melissodes (Melissodes) bimaculatus bimaculatus* (Lepeletier, 1825)<sup>37</sup> – Adams<sup>1,3,8</sup>, Allegheny<sup>1</sup>, **Bedford**<sup>6</sup>, **Bradford**<sup>8</sup>, Bucks<sup>1,8</sup>, **Carbon**<sup>6</sup>, Centre<sup>1,15,44</sup>, Chester<sup>1,8</sup>, Columbia<sup>2,5</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1,4</sup>, Erie<sup>9</sup>, Franklin<sup>1</sup>, Fulton<sup>44</sup>, Huntingdon<sup>1,3,8</sup>, Juniata<sup>1,3</sup>, Lancaster<sup>1,3,4,5,6,8,15</sup>, Lebanon<sup>1</sup>, Lycoming<sup>8,44</sup>, Mifflin<sup>1</sup>, Montgomery<sup>1,8,44</sup>, Montour<sup>1</sup>, Perry<sup>1,4</sup>, Philadelphia<sup>1,4</sup>, **Union**<sup>8</sup>, Washington<sup>1</sup>, York<sup>1,6,8</sup>; **26 Apr**<sup>3</sup> – 31 Oct<sup>1</sup> (**2018**<sup>3</sup>).

*Melissodes (Melissodes) communis communis* Cresson, 1878 – Allegheny<sup>1</sup>; dates and year not reported<sup>1</sup>.

*Melissodes (Melissodes) tepaneca* Cresson, 1878 – Adams<sup>3</sup>; **13 Aug**<sup>3</sup> (**2015**<sup>3</sup>).

## Genus *Svastra* Holmberg

### Subgenus *Anthedonia* Michener

**Revision:** LaBerge (1955).

*Svastra (Anthedonia) compta* (Cresson, 1878) – Philadelphia<sup>1</sup>; dates and year not reported<sup>1</sup>.

### Subgenus *Epimelissodes* Ashmead

**Revision:** LaBerge (1956a).

*Svastra (Epimelissodes) obliqua* (Say, 1837) *caliginosa* (Cresson, 1878) – Adams<sup>3</sup>, Delaware<sup>4</sup>, Lancaster<sup>3</sup>; 30 Jun<sup>3</sup> – 9 Sep<sup>4</sup> (2018<sup>3</sup>).

## Nomadinae

### Ammobatoidini

## Genus *Holcopasites* Ashmead

**Taxonomy:** Mitchell (1962); Hurd and Linsley (1972).

*Holcopasites calliopsisidis calliopsisidis* (Linsley, 1943) – Adams<sup>3,8</sup>, Centre<sup>1,6,7</sup>, Dauphin<sup>1</sup>, Delaware<sup>2</sup>, Indiana<sup>1</sup>, Lackawanna<sup>1</sup>, Lancaster<sup>3,15</sup>, Lehigh<sup>6</sup>, Philadelphia<sup>1</sup>, Westmoreland<sup>6</sup>, York<sup>1,6</sup>; 24–25 May<sup>7</sup> – 18 Aug<sup>3</sup> (2017<sup>3</sup>).

*Holcopasites illinoiensis* (Robertson, 1891) – Bucks<sup>1</sup>; 28 Jun<sup>1</sup> (1936<sup>1</sup>).

## Epeolini

### Genus *Epeorus* Latreille

**Taxonomy:** Mitchell (1962); Brumley (1965); Onuferko (2017, 2018).

*Epeorus americanus* (Cresson, 1878)<sup>37</sup> – Dauphin<sup>1,37</sup>; 6 Jun<sup>1</sup> – 27 Jun<sup>37</sup> (1923<sup>37</sup>).

*Epeorus autumnalis* Robertson, 1902 – Centre<sup>1</sup>, Huntingdon<sup>1</sup>, Philadelphia<sup>2</sup>; 27 Apr<sup>2</sup> – 20 Sep<sup>1</sup> (2003<sup>1</sup>).

*Epeorus bifasciatus* Cresson, 1864<sup>37,39</sup> – Adams<sup>3</sup>, Berks<sup>2</sup>, Centre<sup>1,15,38,44</sup>, Dauphin<sup>1</sup>, Huntingdon<sup>1</sup>, Lancaster<sup>3,15</sup>, Lehigh<sup>1</sup>, Luzerne<sup>2</sup>, Philadelphia<sup>1</sup>; 2 Jul<sup>3</sup> – 5 Sep<sup>1</sup> (2016<sup>38</sup>).

*Epeorus lectoides* Robertson, 1901 – Adams<sup>6</sup>, Philadelphia<sup>1</sup>; 14 Aug<sup>6</sup> – 17 Sep<sup>1</sup> (2008<sup>6</sup>).

*Epeorus pusillus* Cresson, 1864 – Columbia<sup>1,2</sup>, Lycoming<sup>8</sup>, Union<sup>8</sup>; 25 Sep<sup>2</sup> – 28 Sep<sup>8</sup> (2014<sup>8</sup>).

*Epeorus scutellaris* Say, 1824<sup>37</sup> – Bradford<sup>39</sup>, Centre<sup>1,7</sup>, Erie<sup>1</sup>, Huntingdon<sup>1</sup>, Monroe<sup>1,2</sup>, Philadelphia<sup>2</sup>; 9 Aug<sup>2</sup> – 25 Sep<sup>1</sup>/Aug–Oct<sup>39</sup> (2017<sup>7</sup>).

## Genus *Tripeolus* Robertson

**Revision:** Rightmyer (2008).

*Tripeolus atripes* Mitchell, 1962 – Lancaster<sup>37</sup>; 5 Sep<sup>37</sup> (1954<sup>37</sup>).

***Tripeolus concavus* (Cresson, 1878) – Adams<sup>3</sup>, Lancaster<sup>3</sup>; 12 Jul<sup>3</sup> - 26 Jul<sup>3</sup> (2012<sup>3</sup>).**

*Tripeolus donatus* (Smith, 1854)<sup>37</sup> – Centre<sup>7</sup>, Forest<sup>1</sup>, Westmoreland<sup>6</sup>; 25 May<sup>1</sup> – 24–25 Jul<sup>7</sup> (2017<sup>7</sup>).

*Tripeolus helianthi* (Robertson, 1897) – Beaver<sup>1</sup>, Centre<sup>1,15</sup>, Franklin<sup>1</sup>; 9 Jul<sup>1</sup> – 19 Aug<sup>1</sup> (2009<sup>15</sup>).

*Tripeolus lunatus* (Say, 1824)<sup>37</sup> – Adams<sup>1,3</sup>, Allegheny<sup>1</sup>, Bucks<sup>8</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1</sup>, Lancaster<sup>1,3,6</sup>, Montgomery<sup>1,8</sup>, Perry<sup>4</sup>, Somerset<sup>1</sup>, York<sup>1</sup>; 25 Jun<sup>3</sup> – 11 Sep<sup>1</sup> (2018<sup>3</sup>).

***Tripeolus nevadensis* (Cresson, 1878) – Adams<sup>3</sup>; 4 Aug<sup>3</sup> (2016<sup>3</sup>).**

*Tripeolus pectoralis* (Robertson, 1897) – Columbia<sup>2</sup>, Delaware<sup>1,2</sup>, York<sup>1</sup>; 4 Sep<sup>1,2</sup> – 29 Sep<sup>2</sup> (1992<sup>2</sup>).

*Tripeolus quadrifasciatus* (Say, 1823) *atlanticus* Mitchell, 1962 – Huntingdon<sup>1</sup>; 10 Sep<sup>1</sup> (1996<sup>1</sup>).

*Tripeolus remigatus* (Fabricius, 1804)<sup>37</sup> – Adams<sup>3</sup>, Bucks<sup>8</sup>, Centre<sup>1,6,44</sup>, Chester<sup>8</sup>, Columbia<sup>5</sup>, Dauphin<sup>1</sup>, Delaware<sup>1,2,4</sup>, Huntingdon<sup>1</sup>, Juniata<sup>44</sup>, Lancaster<sup>1,3,4,5,15</sup>, Lycoming<sup>44</sup>, Montgomery<sup>8,44</sup>, Philadelphia<sup>1</sup>, York<sup>8</sup>; 9 Jul<sup>8</sup> – 7 Sep<sup>1</sup> (2014<sup>5</sup>).

*Tripeolus rhododontus* Cockerell, 1921 – Huntingdon<sup>1</sup>; 26 Aug<sup>1</sup> (1996<sup>1</sup>).

*Tripeolus rugosus* Mitchell, 1962 – Huntingdon<sup>1</sup>; 26 Aug<sup>1</sup> (1996<sup>1</sup>).

*Tripeolus simplex* Robertson, 1903 – Union<sup>8</sup>, York<sup>1</sup>; 6 Aug<sup>1</sup> – 24 Aug<sup>8</sup> (2015<sup>8</sup>).

## Melectini

### Genus *Melecta* Latreille

Subgenus *Melecta* Latreille s. s.

**Revisions:** Linsley (1939); Hurd and Linsley (1951).

*Melecta (Melecta) pacifica* Cresson, 1878 – Adams<sup>3</sup>; 13 Apr<sup>3</sup> (2017<sup>3</sup>).

## Nomadini

### Genus *Nomada* Scopoli

**Taxonomy:** Alexander and Schwarz (1994); Broemeling and Moalif (1988); Droege et al. (2010); Evans (1972); Mitchell (1962); Schwarz and Gusenleitner (2004). *Nomada* is in serious need of revision (Gibbs et al. 2017a). This list of species is likely to change considerably following the publication of updated taxonomy for the genus.

*Nomada affabilis* Cresson, 1878 (*edwardsii* group) – Adams<sup>3</sup>; 7 Jun<sup>3</sup> – 12 Jun<sup>3</sup> (2013<sup>3</sup>).

*Nomada armatella* Cockerell, 1903 (*ruficornis* group) – Cumberland<sup>6</sup>, Elk<sup>1</sup>; 9 Apr<sup>1</sup> – 16 Apr<sup>6</sup> (2008<sup>6</sup>).

*Nomada articulata* Smith, 1854 (*erigeronis* group)<sup>37</sup> – Adams<sup>3</sup>, Bucks<sup>8</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1</sup>, Erie<sup>1,9</sup>, Huntingdon<sup>1,2,8</sup>, Luzerne<sup>1</sup>, Lycoming<sup>8</sup>, Montgomery<sup>1</sup>, Philadelphia<sup>1</sup>, Union<sup>1</sup>; 25 Apr<sup>1</sup> – 8 Jul<sup>1</sup> (2018<sup>3</sup>).

*Nomada australis* Mitchell, 1962 (*erigeronis* group) – Adams<sup>3</sup>; 24 May<sup>3</sup> – 3 Jun<sup>3</sup> (2016<sup>3</sup>).

*Nomada bella* Cresson, 1863 (*ruficornis* group: bidentate mandible) – Centre<sup>1,2</sup>, Cumberland<sup>1</sup>, Elk<sup>1</sup>, Huntingdon<sup>1</sup>, Philadelphia<sup>1,2</sup>; 27 Mar<sup>1</sup> – 12 Jun<sup>1</sup> (2009<sup>2</sup>).

*Nomada bethunei* Cockerell, 1903 (*ruficornis* group) – Centre<sup>1</sup>, Cumberland<sup>1,6</sup>, Huntingdon<sup>3</sup>, Jefferson<sup>6</sup>, Northumberland<sup>16</sup>, Perry<sup>1,16</sup>, Washington<sup>6</sup>; 16 Apr<sup>6</sup> – 29 Aug<sup>1</sup> (2008<sup>6</sup>).

*Nomada ceanothi* Cockerell, 1907 (*ruficornis* group) – Columbia<sup>5</sup>, Cumberland<sup>1</sup>, Delaware<sup>1</sup>, Huntingdon<sup>3</sup>, Montgomery<sup>1</sup>, York<sup>1</sup>; 19 Apr<sup>1</sup> – 25 Jun<sup>1</sup> (2013<sup>5</sup>).

*Nomada composita* Mitchell, 1962 (*ruficornis* group) – Adams<sup>3</sup>, Centre<sup>1</sup>, Huntingdon<sup>8</sup>, Lycoming<sup>8</sup>, Perry<sup>6</sup>, Susquehanna<sup>8</sup>, Union<sup>8</sup>, York<sup>8</sup>; 2 Apr<sup>1</sup> – 30 May<sup>3</sup> (2015<sup>8</sup>).

*Nomada cressonii* Robertson, 1893 (*ruficornis* group)<sup>37</sup> – Adams<sup>1,3</sup>, Blair<sup>1,2</sup>, Bradford<sup>6,8</sup>, Bucks<sup>8</sup>, Centre<sup>1,7</sup>, Crawford<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1</sup>, Elk<sup>1</sup>, Erie<sup>1,9</sup>, Huntingdon<sup>1,8</sup>, Lancaster<sup>8</sup>, Lehigh<sup>1</sup>, Lycoming<sup>8</sup>, Montgomery<sup>1</sup>, Perry<sup>1,6</sup>, Philadelphia<sup>1</sup>, Somerset<sup>1</sup>, Susquehanna<sup>8</sup>, Tioga<sup>1</sup>, Union<sup>8</sup>, York<sup>1,8</sup>; 4 Apr<sup>6</sup> – 20 Aug<sup>1</sup> (2016<sup>3,7,9</sup>).

*Nomada cuneata* (Robertson, 1903) (*ruficornis* group: bidentate mandible)<sup>37</sup> – Adams<sup>2</sup>, Blair<sup>1,2</sup>, Centre<sup>1</sup>, Dauphin<sup>1</sup>, Erie<sup>1</sup>, Franklin<sup>1</sup>, Huntingdon<sup>1</sup>, Perry<sup>1</sup>, Pike<sup>1,4</sup>, Sullivan<sup>1</sup>, York<sup>1</sup>; 3 Apr<sup>1</sup> – 26 Jun<sup>1</sup> (2006<sup>1,2</sup>).

*Nomada denticulata* Robertson, 1902 (*ruficornis* group)<sup>37</sup> – Bradford<sup>8</sup>, Bucks<sup>8</sup>, Centre<sup>7,8</sup>, Columbia<sup>5</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1</sup>, Elk<sup>1</sup>, Erie<sup>9</sup>, Franklin<sup>1</sup>, Huntingdon<sup>3,8</sup>, Pike<sup>1</sup>, York<sup>1,8</sup>; 15 Apr<sup>8</sup> – 15 Jun<sup>8</sup> (2017<sup>7</sup>).

*Nomada depressa* Cresson, 1863 (*ruficornis* group) – Adams<sup>3</sup>, Bradford<sup>8</sup>, Bucks<sup>8</sup>, Centre<sup>1</sup>, Crawford<sup>6</sup>, Cumberland<sup>6</sup>, Dauphin<sup>1,6</sup>, Huntingdon<sup>1,8</sup>, Lancaster<sup>8</sup>, Luzerne<sup>1</sup>, Lycoming<sup>8</sup>, Perry<sup>6</sup>, Susquehanna<sup>8</sup>, Union<sup>8</sup>, Warren<sup>6</sup>; 4 Apr<sup>6</sup> – 19 Sep<sup>1</sup> (2016<sup>3</sup>).

*Nomada fervida* Smith, 1854 (*vegana* group) – Adams<sup>3</sup>, Erie<sup>1</sup>; 3 Jun<sup>3</sup> – 30 Jul<sup>1</sup> (2008<sup>3</sup>).

*Nomada fragariae* Mitchell, 1962 (*ruficornis* group) – Centre<sup>1</sup>, Mercer<sup>6</sup>; 5 May<sup>1</sup> (2009<sup>6</sup>).

*Nomada gracilis* Cresson, 1863 (*ruficornis* group) – Dauphin<sup>6</sup>, Huntingdon<sup>1</sup>, Susquehanna<sup>8</sup>, Union<sup>8</sup>; 11 Apr<sup>6</sup> – 28 May<sup>1</sup> (2014<sup>8</sup>).

*Nomada illinoensis* Robertson, 1900 (*ruficornis* group) – Adams<sup>3</sup>, Dauphin<sup>1</sup>; 26 Apr<sup>3</sup> – 1 Jul<sup>3</sup> (2018<sup>3</sup>).

*Nomada imbricata* Smith, 1854 (*ruficornis* group)<sup>37</sup> – Adams<sup>3</sup>, Bradford<sup>8</sup>, Centre<sup>1,7,8</sup>, Crawford<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1,2</sup>, Erie<sup>9</sup>, Huntingdon<sup>1,2,8</sup>, Lancaster<sup>8</sup>, Mercer<sup>6</sup>, Montour<sup>6</sup>, Philadelphia<sup>1,2,4</sup>, Susquehanna<sup>8</sup>, Union<sup>8</sup>, York<sup>1,8</sup>; 14 Apr<sup>3</sup> – 15 Jun<sup>8</sup> (2018<sup>3</sup>).

*Nomada integerrima* Dalla Torre, 1896 (*ruficornis* group)<sup>37</sup> – **Somerset<sup>6</sup>, Washington<sup>6</sup>; 28 May<sup>6</sup> – 13 Jun<sup>6</sup> (2009<sup>6</sup>)**.

*Nomada lehighensis* Cockerell, 1903 (*ruficornis* group)<sup>37</sup> – Adams<sup>16</sup>, Carbon<sup>16</sup>, Dauphin<sup>16</sup>, Erie<sup>1,16</sup>, **Huntingdon<sup>8</sup>**, Lehigh<sup>1,16</sup>, **Lycoming<sup>8</sup>**, Northampton<sup>16</sup>, Schuylkill<sup>2</sup>; **1 Apr<sup>16</sup> – 21 Jul<sup>1</sup> (2015<sup>8</sup>)**.

*Nomada lepida* Cresson, 1863 (*ruficornis* group: bidentate mandible)<sup>37</sup> – **Adams<sup>3</sup>, Columbia<sup>5</sup>**, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1</sup>, Erie<sup>1</sup>, **Huntingdon<sup>3</sup>**, Philadelphia<sup>1</sup>; **10 Apr<sup>3</sup> – 30 Jun<sup>1</sup> (2016<sup>3</sup>)**.

*Nomada luteola* Olivier, 1812 (*ruficornis* group) – **Adams<sup>3</sup>**, Dauphin<sup>1</sup>, Delaware<sup>1</sup>, Huntingdon<sup>1</sup>, Montgomery<sup>1</sup>, Philadelphia<sup>1,2</sup>, **York<sup>8</sup>**; **23 Apr<sup>3</sup> – 21 Jun<sup>1</sup> (2016<sup>3</sup>)**.

*Nomada luteoloides* Robertson, 1895 (*ruficornis* group) – **Adams<sup>3,8</sup>, Bradford<sup>8</sup>, Bucks<sup>8</sup>**, Centre<sup>1,7,8</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1</sup>, Erie<sup>1</sup>, Franklin<sup>1</sup>, Huntingdon<sup>1,3,8</sup>, **Lancaster<sup>8</sup>**, Luzerne<sup>1</sup>, **Lycoming<sup>8</sup>**, **Perry<sup>6</sup>**, Philadelphia<sup>1</sup>, Schuylkill<sup>1,2</sup>, **Susquehanna<sup>8</sup>**, **Union<sup>8</sup>**, York<sup>1,8</sup>; **31 Mar<sup>3</sup> – 11 Jun<sup>1,8</sup> (2017<sup>7</sup>)**.

*Nomada maculata* Cresson, 1863 (*ruficornis* group: bidentate mandible) – **Adams<sup>3</sup>, Bradford<sup>8</sup>, Bucks<sup>8</sup>**, Centre<sup>1,7</sup>, Chester<sup>1</sup>, **Columbia<sup>5</sup>**, Dauphin<sup>1</sup>, Delaware<sup>1</sup>, Erie<sup>1,9</sup>, Huntingdon<sup>1,2,8</sup>, **Lancaster<sup>8</sup>**, **Lycoming<sup>8</sup>**, Montgomery<sup>1</sup>, Perry<sup>1</sup>, Philadelphia<sup>1,2</sup>, Pike<sup>1,4</sup>, Schuylkill<sup>1,2</sup>, **Susquehanna<sup>8</sup>**, Tioga<sup>1</sup>, **Union<sup>8</sup>**, York<sup>1,8</sup>; **13 Apr<sup>1</sup> – 17 Jun<sup>1</sup> (2017<sup>7</sup>)**.

*Nomada oblitterata* Cresson, 1863 (*ruficornis* group) – Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, York<sup>1</sup>; **30 Apr<sup>1</sup> – 27 Jun<sup>1</sup> (1970<sup>1</sup>)**.

*Nomada ovata* (Robertson, 1903) (*ruficornis* group: bidentate mandible)<sup>37</sup> – **Adams<sup>3</sup>**, Centre<sup>1</sup>, Cumberland<sup>1</sup>, Huntingdon<sup>1</sup>; **16 Apr<sup>3</sup> – 11 Jul<sup>1</sup> (2013<sup>3</sup>)**.

*Nomada parva* Robertson, 1900 (*ruficornis* group)<sup>37</sup> – **Chester<sup>6</sup>**, Dauphin<sup>1</sup>; **6 May<sup>1</sup> – 13 Jul<sup>6</sup> (2008<sup>6</sup>)**.

*Nomada perplexa* Cresson, 1863 (*ruficornis* group: bidentate mandible)<sup>37</sup> – Centre<sup>1</sup>, Crawford<sup>1</sup>, Dauphin<sup>1</sup>, Erie<sup>1</sup>, Huntingdon<sup>1</sup>, **Lancaster<sup>3</sup>**, Lehigh<sup>1</sup>, Monroe<sup>2</sup>, Philadelphia<sup>2</sup>; **5 Mar<sup>1</sup> – 14 Jul<sup>1</sup> (2013<sup>3</sup>)**.

*Nomada placida* Cresson, 1863 (*roberjeotiana* group) – Cumberland<sup>1,12</sup>, Delaware<sup>1,2</sup>; **28 Aug<sup>1,12</sup> – 25 Sep<sup>2</sup> (1947<sup>1</sup>)**.

*Nomada pygmaea* Cresson, 1863 (*ruficornis* group)<sup>37</sup> – **Adams<sup>3</sup>, Bradford<sup>8</sup>, Bucks<sup>2,8</sup>**, Centre<sup>7</sup>, **Columbia<sup>5</sup>**, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1</sup>, Erie<sup>9</sup>, Huntingdon<sup>2,8</sup>, **Lancaster<sup>8</sup>**, Lehigh<sup>1</sup>, **Lycoming<sup>8</sup>**, **Mercer<sup>6</sup>**, Montgomery<sup>1</sup>, Philadelphia<sup>1</sup>, Pike<sup>1,4</sup>, **Susquehanna<sup>8</sup>**, **Union<sup>8</sup>**, York<sup>1,8</sup>; **15 Apr<sup>8</sup> – 29–30 Jun<sup>7</sup> (2017<sup>7</sup>)**.

*Nomada rubicunda* Olivier, 1812 (*erigeronis* group) – Philadelphia<sup>1</sup>; dates and year not reported<sup>1</sup>.

*Nomada sayi* Robertson, 1893 (*ruficornis* group)<sup>37</sup> – **Adams<sup>3</sup>, Chester<sup>6</sup>**, Crawford<sup>1</sup>, Dauphin<sup>1,6</sup>, Franklin<sup>1</sup>, Huntingdon<sup>1</sup>, Montgomery<sup>1</sup>, Philadelphia<sup>1</sup>; **17 Apr<sup>6</sup> – 11 Jul<sup>1</sup> (2016<sup>3</sup>)**.

*Nomada skinneri* Cockerell, 1908 (*ruficornis* group)<sup>37</sup> – Carbon<sup>13</sup>, Lehigh<sup>13</sup>, Northampton<sup>13</sup>; **30 Jun<sup>13</sup> (year not reported<sup>13</sup>)**.

*Nomada sulphurata* Smith, 1854 (*ruficornis* group) – **Adams<sup>3</sup>**, Dauphin<sup>1</sup>, Montgomery<sup>1</sup>; **28 Apr<sup>1</sup> – 26 May<sup>3</sup> (2016<sup>3</sup>)**.

*Nomada superba* Cresson, 1863 (*superba* group) – Adams<sup>3</sup>; 5 May<sup>3</sup> – 12 May<sup>3</sup> (2016<sup>3</sup>).

*Nomada tiftonensis* Cockerell, 1903 (*vegana* group) – Philadelphia<sup>2</sup>; 5 May<sup>2</sup> (1905<sup>2</sup>).

*Nomada ulsterensis* Mitchell, 1962 (*ruficornis* group)<sup>37</sup> – Philadelphia<sup>50</sup>; 18 Jun<sup>50</sup> (1905<sup>50</sup>).

*Nomada valida* Smith, 1854 (*ruficornis* group) – Adams<sup>3</sup>, Clinton<sup>1</sup>, Crawford<sup>1</sup>; 3 Apr<sup>1</sup> – 28 May<sup>1</sup> (2015<sup>3</sup>).

*Nomada vicina* Cresson, 1863 (*ruficornis* group) – Centre<sup>1,7</sup>, Erie<sup>1</sup>, Huntingdon<sup>1</sup>; 12 Aug<sup>1</sup> – 20 Sep<sup>1</sup> (2017<sup>7</sup>).

*Nomada xanthura* Cockerell, 1908 (*ruficornis* group) – Centre<sup>1,7</sup>, Pike<sup>1</sup>; 1 May<sup>1</sup> – 31 May–1 Jun<sup>7</sup> (2017<sup>7</sup>).

## Osirini

### Genus *Epeoloides* Giraud

**Taxonomy:** Mitchell (1962).

*Epeoloides pilosulus* (Cresson, 1878) – Dauphin<sup>1</sup>, Lehigh<sup>1</sup>; 9 Jun<sup>1</sup> – 30 Jun<sup>1</sup> (1911<sup>1</sup>).

## Xylocopinae

### Ceratinini

#### Genus *Ceratina* Latreille

##### Subgenus *Zadontomerus* Ashmead

**Taxonomy:** Mitchell (1962); Daly (1973); Rehan and Richards (2008); Rehan and Sheffield (2011).

*Ceratina (Zadontomerus) calcarata* Robertson, 1900<sup>14,37</sup> – Adams<sup>1,3,6,8</sup>, Allegheny<sup>1,6</sup>, **Armstrong**<sup>6</sup>, Berks<sup>1,6</sup>, Bradford<sup>1,4,6,8</sup>, Bucks<sup>1,6,8</sup>, **Carbon**<sup>6</sup>, Centre<sup>1,6,7,8,15,44</sup>, Chester<sup>1,6</sup>, **Clarion**<sup>6</sup>, Clearfield<sup>1,4</sup>, Clinton<sup>1</sup>, **Columbia**<sup>5</sup>, Crawford<sup>1</sup>, Cumberland<sup>1,6</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1,4</sup>, Erie<sup>1,6,9</sup>, Forest<sup>1</sup>, **Franklin**<sup>6</sup>, **Greene**<sup>6</sup>, Huntingdon<sup>2,3,8</sup>, **Indiana**<sup>6</sup>, **Jefferson**<sup>6</sup>, Juniata<sup>1,6</sup>, **Lackawanna**<sup>4</sup>, Lancaster<sup>3,5,6,8,15,44</sup>, Lehigh<sup>1,6</sup>, **Lycoming**<sup>8</sup>, Monroe<sup>1</sup>, **Montgomery**<sup>4,6</sup>, Northampton<sup>1,6</sup>, Northumberland<sup>1</sup>, Perry<sup>1,4,6</sup>, Philadelphia<sup>1,4</sup>, **Schuylkill**<sup>6</sup>, Somerset<sup>1</sup>, **Susquehanna**<sup>8</sup>, **Union**<sup>8</sup>, Washington<sup>1</sup>, Westmoreland<sup>1</sup>, York<sup>1,6,8</sup>; 23 Mar<sup>3</sup> – 6 Nov<sup>3</sup> (2018<sup>3</sup>). **Notes.** Older records for *C. calcarata*, especially pre-2011 determinations, may be attributable to *C. mikmaqi* (see Rehan and Sheffield 2011).

*Ceratina (Zadontomerus) dupla* Say, 1837<sup>14,37</sup> – Adams<sup>1,3,6,8</sup>, Allegheny<sup>1</sup>, Berks<sup>1,6</sup>, Bradford<sup>1,6,8</sup>, Bucks<sup>1,6,8</sup>, Carbon<sup>1</sup>, Centre<sup>1,6,7,8,15,44</sup>, Chester<sup>1,6</sup>, **Clearfield**<sup>6</sup>, **Clinton**<sup>6</sup>, **Columbia**<sup>5</sup>, Crawford<sup>1,6</sup>, Cumberland<sup>1,6</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1,4</sup>, Erie<sup>1,6,9</sup>, Franklin<sup>1,6</sup>, Huntingdon<sup>1,3,8</sup>, **Jefferson**<sup>6</sup>, **Juniata**<sup>3,6</sup>, Lackawanna<sup>1,4</sup>, Lancaster<sup>3,5,6,15</sup>, Lawrence<sup>1</sup>,

Lehigh<sup>1,6</sup>, **Lycoming**<sup>6,8</sup>, Montgomery<sup>1,4,6,7,44</sup>, Northumberland<sup>1</sup>, Perry<sup>1,6</sup>, Philadelphia<sup>1,6</sup>, Pike<sup>1</sup>, Schuylkill<sup>6</sup>, Tioga<sup>1</sup>, **Union**<sup>8</sup>, **Warren**<sup>6</sup>, **Washington**<sup>6</sup>, York<sup>1,6,8</sup>; 20 Feb<sup>1</sup> – 22 Dec<sup>1</sup> (**2018**<sup>3</sup>).

**Ceratina (Zadontomerus) floridana** Mitchell, 1962 – **Delaware**<sup>4</sup>; 21 May<sup>4</sup> (**2007**<sup>4</sup>).

**Ceratina (Zadontomerus) mikmaqi** Rehan & Sheffield, 2011<sup>41</sup> – **Adams**<sup>3,8</sup>, **Bradford**<sup>8</sup>, **Bucks**<sup>8</sup>, **Centre**<sup>7,8</sup>, **Dauphin**<sup>48</sup> (AMNH\_BEE00172273), Erie<sup>9</sup>, **Huntingdon**<sup>8</sup>, **Lancaster**<sup>3,5,8</sup>, **Lycoming**<sup>8</sup>, **Montgomery**<sup>7</sup>, **Union**<sup>8</sup>, **York**<sup>8</sup>; 29 Mar<sup>3</sup> – 6 Nov<sup>3</sup> (**2018**<sup>3</sup>).

**Notes.** Older records for female *C. calcarata* and male *C. dupla*, especially pre-2011 determinations, may be attributable to *C. mikmaqi* (see Rehan and Sheffield 2011).

**Ceratina (Zadontomerus) strenua** Smith, 1879 – Adams<sup>1,3,6,8</sup>, Allegheny<sup>1</sup>, **Armstrong**<sup>6</sup>, Berks<sup>2,6</sup>, **Bradford**<sup>6,8</sup>, Bucks<sup>1,2,8</sup>, Centre<sup>6,7,8,15</sup>, Chester<sup>1,6,8</sup>, **Clarion**<sup>6</sup>, Crawford<sup>1</sup>, Cumberland<sup>1,6</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1,4</sup>, Erie<sup>6,9</sup>, Franklin<sup>1,6</sup>, Huntingdon<sup>1,2,3,8</sup>, Juniata<sup>1,6</sup>, Lancaster<sup>1,3,6,8,15</sup>, **Lehigh**<sup>6</sup>, **Lycoming**<sup>8</sup>, **Monroe**<sup>4</sup>, **Montgomery**<sup>4,6,7,8</sup>, **Northampton**<sup>6</sup>, Northumberland<sup>1,14</sup>, Perry<sup>1,4,6</sup>, Philadelphia<sup>1,4</sup>, Pike<sup>1,4</sup>, **Union**<sup>8</sup>, **Washington**<sup>6</sup>, Westmoreland<sup>1</sup>, York<sup>1,6,8</sup>; 31 Mar<sup>3</sup> – 4 Dec<sup>6</sup> (**2018**<sup>3</sup>).

## Xylocopini

**Genus Xylocopa Latreille**

**Subgenus Xylocopoides** Michener

**Taxonomy:** Hurd (1961); Mitchell (1962).

**Xylocopa (Xylocopoides) virginica virginica** (Linnaeus, 1771) – Adams<sup>1,3,8</sup>, Allegheny<sup>1,2</sup>, Blair<sup>1</sup>, **Bradford**<sup>6</sup>, Bucks<sup>1,6,8</sup>, Butler<sup>1</sup>, Centre<sup>1,3,5,6,7,15,44</sup>, Chester<sup>1,8</sup>, Clearfield<sup>1</sup>, Columbia<sup>1,2,5</sup>, Crawford<sup>1</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1</sup>, Erie<sup>1,9</sup>, Fayette<sup>1</sup>, Forest<sup>1</sup>, Greene<sup>1</sup>, Huntingdon<sup>1,3,8</sup>, Indiana<sup>1</sup>, Jefferson<sup>1</sup>, Juniata<sup>1</sup>, Lackawanna<sup>2</sup>, Lancaster<sup>1,2,3,5,15</sup>, **Lebanon**<sup>4</sup>, Lehigh<sup>1</sup>, Luzerne<sup>1</sup>, **Lycoming**<sup>8</sup>, Montgomery<sup>1,7,8</sup>, Perry<sup>1,4</sup>, Philadelphia<sup>1,2,4</sup>, Schuylkill<sup>1,2</sup>, **Snyder**<sup>4</sup>, Union<sup>1,8</sup>, Washington<sup>1</sup>, Westmoreland<sup>1,2</sup>, York<sup>1,8</sup>; 5 Mar<sup>1</sup> – **30 Oct**<sup>3</sup> (**2018**<sup>3</sup>).

## Megachilidae

**Megachilinae**

**Anthidiini**

**Genus Anthidiellum Cockerell**

**Subgenus Loyolanthidium** Urban

**Taxonomy:** Mitchell (1962); Urban (2001).

**Anthidiellum (Loyolanthidium) notatum notatum** (Latreille, 1809) – Centre<sup>1</sup>, Huntingdon<sup>1,2</sup>, **Lancaster**<sup>3</sup>, Mifflin<sup>1</sup>, Monroe<sup>1</sup>, **Northampton**<sup>6</sup>, Philadelphia<sup>1</sup>; 12 Jul<sup>1,2</sup> – **22 Aug**<sup>3</sup> (**2012**<sup>3</sup>).

## Genus *Anthidium* Fabricius

**Revision:** Gonzalez and Griswold (2013).

### Subgenus *Anthidium* Fabricius s. s.

*Anthidium* (*Anthidium*) *manicatum* *manicatum* (Linnaeus, 1758)\* (1990<sup>1,6</sup>) – **Adams**<sup>3,8</sup>, **Bradford**<sup>8</sup>, Centre<sup>1,2,6,15,44</sup>, Cumberland<sup>1,6</sup>, Dauphin<sup>1,6</sup>, **Delaware**<sup>4</sup>, Erie<sup>6,9</sup>, Huntingdon<sup>1,3</sup>, **Lancaster**<sup>8</sup>, **Lehigh**<sup>3,6</sup>, **Lycoming**<sup>8</sup>, Montgomery<sup>44</sup>, Philadelphia<sup>1</sup>, **Schuylkill**<sup>6</sup>, Sullivan<sup>1</sup>, **Union**<sup>8</sup>, **Washington**<sup>6</sup>, York<sup>1,8</sup>; **25 Mar**<sup>6</sup> – **19 Oct**<sup>3</sup> (2018<sup>3</sup>).

### Subgenus *Proanthidium* Friese

*Anthidium* (*Proanthidium*) *oblongatum* *oblongatum* (Illiger, 1806)\* (1994<sup>1</sup>) – **Adams**<sup>3,6</sup>, **Bradford**<sup>8</sup>, **Bucks**<sup>4,8</sup>, Centre<sup>1</sup>, Columbia<sup>1</sup>, Crawford<sup>1</sup>, **Cumberland**<sup>6</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1,4</sup>, Erie<sup>9</sup>, **Lackawanna**<sup>4</sup>, Lancaster<sup>1,8</sup>, Lehigh<sup>1,6</sup>, **Lycoming**<sup>8</sup>, **Northampton**<sup>6</sup>, Philadelphia<sup>1,4</sup>, **Union**<sup>8</sup>, **Westmoreland**<sup>4</sup>, **York**<sup>8</sup>; **14 May**<sup>3</sup> – **17 Oct**<sup>1</sup> (2018<sup>3</sup>).

## Genus *Paranthidium* Cockerell and Cockerell

**Taxonomy:** Schwarz (1926).

### Subgenus *Paranthidium* Cockerell and Cockerell s. s.

*Paranthidium* (*Paranthidium*) *jugatorium* *jugatorium* (Say, 1824) – Bedford<sup>1</sup>, Centre<sup>1</sup>; 28 Jul<sup>1</sup> – 29 Aug<sup>1</sup> (2006<sup>1</sup>).

## Genus *Pseudoanthidium* Friese

**Taxonomy:** Michener and Griswold (1994); Portman et al. (2019).

### Subgenus *Pseudoanthidium* Friese s. s.

*Pseudoanthidium* (*Pseudoanthidium*) *nanum* (Mocsáry, 1881)\* (2008<sup>6</sup>) – Allegheny<sup>49</sup> (BugGuide Image IDs: 1538244/1538247/1538248/1538249), Dauphin<sup>6</sup>, Lycoming<sup>8</sup>; 3 Jun<sup>6</sup> – 28 Aug<sup>8</sup> (2018<sup>49</sup>).

## Genus *Stelis* Panzer

**Taxonomy:** Parker and Bohart (1979); Mitchell (1962).

## Subgenus *Dolichostelis* Parker and Bohart

*Stelis (Dolichostelis) louisae* Cockerell, 1911 – Bucks<sup>49</sup> (BugGuide Image IDs: 1417130/1417131/1417132/1416293), Lehigh<sup>49</sup> (BugGuide Image IDs: 747710/747711/747712); 28 Jul<sup>49</sup> – 1 Aug<sup>49</sup> (2017<sup>49</sup>).

## Subgenus *Stelis* Panzer s. s.

*Stelis (Stelis) coarctatus* Crawford, 1916<sup>37</sup> – Adams<sup>1,3</sup>, Sullivan<sup>37</sup>; 22 May<sup>1</sup> – 23 Jul<sup>37</sup> (**2009**<sup>3</sup>).

*Stelis (Stelis) foederalis* Smith, 1854 – Huntingdon<sup>1</sup>; 17 May<sup>1</sup> – 27 May<sup>1</sup> (1999<sup>1</sup>).

*Stelis (Stelis) labiata* (Provancher, 1888) – locations, dates, and year not reported<sup>37</sup>.

*Stelis (Stelis) lateralis* Cresson, 1864<sup>37</sup> – Adams<sup>3</sup>, Allegheny<sup>1</sup>, **Columbia**<sup>5</sup>, Erie<sup>9</sup>; 7 May<sup>3</sup> – 5–7 Jul<sup>9</sup> (**2015**<sup>3,9</sup>).

## Megachilini

### Genus *Coelioxys* Latreille

**Taxonomy:** Mitchell (1962, 1980); Baker (1975); Rocha Filho and Packer (2016).

## Subgenus *Allococelioxys* Tkalcú

*Coelioxys (Allococelioxys) coturnix* Pérez, 1884\* (**2014**<sup>8</sup>) – Lancaster<sup>8</sup>, York<sup>8</sup>; 1 Jun<sup>8</sup> – 21 Jul<sup>8</sup> (**2015**<sup>8</sup>).

## Subgenus *Boreocoelioxys* Mitchell

**Revision:** Baker (1975).

*Coelioxys (Boreocoelioxys) banksi* Crawford, 1914 – Allegheny<sup>1</sup>, Centre<sup>1</sup>; 24 Aug<sup>1</sup> (1996<sup>1</sup>).

*Coelioxys (Boreocoelioxys) moestus* Cresson, 1864<sup>10</sup> – Adams<sup>3</sup>, Allegheny<sup>1</sup>, Blair<sup>1,2</sup>, Centre<sup>7</sup>, Lawrence<sup>1</sup>, Philadelphia<sup>1</sup>; 24 May<sup>3</sup> – 15 Sep<sup>3</sup> (**2017**<sup>7</sup>).

*Coelioxys (Boreocoelioxys) octodentatus* Say, 1824<sup>10</sup> – Adams<sup>3</sup>, Allegheny<sup>1</sup>, Centre<sup>7</sup>, Dauphin<sup>1</sup>, Forest<sup>1</sup>, Lancaster<sup>3</sup>, Lehigh<sup>1</sup>, Philadelphia<sup>1,4</sup>; 26 May<sup>3</sup> – 24 Aug<sup>1,4</sup> (**2016**<sup>3,7</sup>).

*Coelioxys (Boreocoelioxys) porterae* Cockerell, 1900<sup>10</sup> – Allegheny<sup>1</sup>, Centre<sup>1</sup>, Lehigh<sup>1</sup>; 25 Jun<sup>1</sup> – 23 Jul<sup>1</sup> (1954<sup>1</sup>).

*Coelioxys (Boreocoelioxys) rufitarsis* Smith, 1854<sup>10,37</sup> – Adams<sup>3</sup>, Allegheny<sup>1</sup>, Beaver<sup>1</sup>, Berks<sup>1</sup>, Bradford<sup>8</sup>, Bucks<sup>1</sup>, Centre<sup>7</sup>, Erie<sup>1,2</sup>, Lehigh<sup>1</sup>, Monroe<sup>2</sup>, Philadelphia<sup>1</sup>, York<sup>1</sup>; 11 Jun<sup>3</sup> – 25 Sep<sup>1</sup> (**2017**<sup>7</sup>).

*Coelioxys (Boreocoelioxys) sayi* Robertson, 1897<sup>10,37</sup> – Adams<sup>3</sup>, Allegheny<sup>1</sup>, Berks<sup>1</sup>, Bucks<sup>1,8</sup>, Centre<sup>1,7</sup>, Chester<sup>1</sup>, Columbia<sup>1</sup>, Crawford<sup>4</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1,2</sup>, Erie<sup>1</sup>, Fayette<sup>1</sup>, Franklin<sup>6</sup>, Huntingdon<sup>1,2</sup>, Lancaster<sup>2</sup>, Lawrence<sup>1</sup>, Lehigh<sup>1</sup>, Monroe<sup>1</sup>, Montgomery<sup>1</sup>, Northampton<sup>6</sup>, Philadelphia<sup>1,2,4</sup>, Union<sup>8</sup>, York<sup>8</sup>; 29 May<sup>2</sup> – 28 Sep<sup>8</sup> (**2017**<sup>7</sup>).

### Subgenus *Cyrtocoelioxys* Mitchell

**Key:** Baker (1975).

*Coelioxys (Cyrtocoelioxys) modestus* Smith, 1854<sup>37</sup> – Allegheny<sup>1</sup>, **Centre**<sup>7</sup>, Lehigh<sup>1</sup>; Jun<sup>1</sup> – 16–17 Aug<sup>7</sup> (2017<sup>7</sup>).

### Subgenus *Paracoelioxys* Gribodo

**Revision:** Baker (1975 as subgenus *Schizocoelioxys* Mitchell).

*Coelioxys (Paracoelioxys) funerarius* Smith, 1854<sup>10,37</sup> – **Northampton**<sup>6</sup>; 25 Jul<sup>6</sup> (2010<sup>6</sup>).

### Subgenus *Synocoelioxys* Mitchell

**Revision:** Baker (1975).

*Coelioxys (Synocoelioxys) alternatus* Say, 1837<sup>10,37</sup> – **Adams**<sup>3</sup>, Huntingdon<sup>1,2</sup>, **Lehigh**<sup>6</sup>; 7 May<sup>6</sup> – 2 Sep<sup>3</sup> (2009<sup>3</sup>).

*Coelioxys (Synocoelioxys) hunteri* Crawford, 1914 – Washington<sup>1</sup>; 13 Jul<sup>1</sup> (1910<sup>1</sup>).

### Subgenus *Xerocoelioxys* Latreille s. s.

**Revision:** Baker (1975); Rocha-Filho and Packer (2016).

*Coelioxys (Xerocoelioxys) immaculatus* Cockerell, 1912 – Allegheny<sup>1</sup>, Philadelphia<sup>2</sup>; 8 Jul<sup>2</sup> (2005<sup>2</sup>).

## Genus *Megachile* Latreille

**Taxonomy:** Mitchell (1934, 1935a; b, 1936a; b, 1937a; b; c, 1962); Parker (1978); Ivanochko (1979); Sheffield et al. (2011b).

### Subgenus *Callomegachile* Michener

*Megachile (Callomegachile) sculpturalis* Smith, 1853\* (1996<sup>1</sup>) – **Adams**<sup>3</sup>, Bradford<sup>1</sup>, **Bucks**<sup>8</sup>, Centre<sup>1,6,7,44</sup>, Clinton<sup>1</sup>, Dauphin<sup>1,3,6</sup>, Erie<sup>1</sup>, Huntingdon<sup>1</sup>, Jefferson<sup>1,2,6</sup>, Lycoming<sup>44</sup>, **Northampton**<sup>6</sup>, **Schuylkill**<sup>6</sup>, Tioga<sup>1</sup>; 28 Jun<sup>3</sup> – 15 Aug<sup>3</sup> (2018<sup>3</sup>).

### Subgenus *Chelostomoides* Robertson

**Revision:** Mitchell (1937c).

*Megachile (Chelostomoides) campanulae* (Robertson, 1903)<sup>37</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, Beaver<sup>1</sup>, **Bucks**<sup>8</sup>, Centre<sup>1,7</sup>, Dauphin<sup>1</sup>, Erie<sup>9</sup>, Huntingdon<sup>1,2</sup>, **Jefferson**<sup>6</sup>, **Lancaster**<sup>3</sup>, Monroe<sup>1</sup>, Philadelphia<sup>1,4</sup>; 15 May<sup>1</sup> – 24 Aug<sup>1,4</sup> (2018<sup>3</sup>).

*Megachile (Chelostomoides) exilis* Cresson, 1872 – **Adams**<sup>3</sup>, **Bucks**<sup>8</sup>, Philadelphia<sup>1,4</sup>; **29 Jun**<sup>3</sup> – 23 Aug<sup>1,4</sup> (2017<sup>3</sup>).

### Subgenus *Eutricharaea* Thomson

**Taxonomy:** Parker (1978); Mitchell (1980); Soltani et al. (2017).

*Megachile (Eutricharaea) apicalis* Spinola, 1808\* (1996<sup>1</sup>) – **Bucks**<sup>4</sup>, **Carbon**<sup>6</sup>, Dauphin<sup>1,6</sup>, **Lancaster**<sup>8</sup>, **Lehigh**<sup>6</sup>, **Lycoming**<sup>8</sup>, **Northampton**<sup>6</sup>, **Schuylkill**<sup>6</sup>, **Union**<sup>8</sup>, **York**<sup>8</sup>; 7 May<sup>6</sup> – 28 Sep<sup>8</sup> (2015<sup>8</sup>).

*Megachile (Eutricharaea) pusilla* Pérez, 1884\* (1946<sup>1</sup>)<sup>37</sup> – Centre<sup>1</sup>; 20 Jul<sup>1</sup> (1946<sup>1</sup>).

*Megachile (Eutricharaea) rotundata* (Fabricius, 1787)\* (1946<sup>1</sup>) – **Adams**<sup>3,6,8</sup>, Bradford<sup>1,6,8</sup>, **Bucks**<sup>4,8</sup>, **Carbon**<sup>6</sup>, Centre<sup>1,6,8,15,44</sup>, Clinton<sup>1,6</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1,4</sup>, Erie<sup>6,9</sup>, **Franklin**<sup>6</sup>, **Lancaster**<sup>3,6,8</sup>, **Lehigh**<sup>6</sup>, **Lycoming**<sup>8</sup>, **Montgomery**<sup>8</sup>, **Northampton**<sup>6</sup>, Philadelphia<sup>1,4</sup>, **Schuylkill**<sup>6</sup>, **Union**<sup>8</sup>, **Westmoreland**<sup>6</sup>, **York**<sup>8</sup>; 7 May<sup>6</sup> – 9 Oct<sup>3</sup> (2016<sup>9</sup>).

### Subgenus *Leptorachis* Mitchell

**Taxonomy:** Mitchell (1934).

*Megachile (Leptorachis) petulans* Cresson, 1878<sup>37</sup> – **Berks**<sup>6</sup>, Delaware<sup>1</sup>, Warren<sup>1</sup>; 30 Jul<sup>1</sup> – 12 Aug<sup>6</sup> (2008<sup>6</sup>).

### Subgenus *Litomegachile* Mitchell

**Taxonomy:** Mitchell (1935a); Bzdyk (2012).

*Megachile (Litomegachile) brevis* Say, 1837<sup>37</sup> – Adams<sup>1,3,8</sup>, Allegheny<sup>1</sup>, **Bradford**<sup>8</sup>, **Bucks**<sup>8</sup>, Centre<sup>1,15,44</sup>, **Columbia**<sup>5</sup>, **Crawford**<sup>4</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1,4</sup>, Erie<sup>9</sup>, Franklin<sup>1</sup>, **Huntingdon**<sup>6</sup>, Juniata<sup>1</sup>, Lancaster<sup>5,15</sup>, **Lycoming**<sup>8</sup>, Montgomery<sup>1,7,8</sup>, Perry<sup>1</sup>, Philadelphia<sup>1,4</sup>, **York**<sup>8</sup>; 1 Jun<sup>8</sup> – 15 Oct<sup>3</sup> (2018<sup>3</sup>).

*Megachile (Litomegachile) mendica* Cresson, 1878<sup>37</sup> – **Adams**<sup>3,8</sup>, Allegheny<sup>1</sup>, Berks<sup>2,6</sup>, **Bradford**<sup>8</sup>, Bucks<sup>1,4,8</sup>, **Carbon**<sup>6</sup>, Centre<sup>1,7,8,15,44</sup>, Chester<sup>1,8</sup>, Columbia<sup>2</sup>, **Crawford**<sup>6</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,2,6</sup>, Delaware<sup>1</sup>, Erie<sup>1,6,9</sup>, Fulton<sup>44</sup>, Huntingdon<sup>1,2,3,8</sup>, **Jefferson**<sup>6</sup>, **Juniata**<sup>3</sup>, Lancaster<sup>1,2,3,15</sup>, Lehigh<sup>1</sup>, Luzerne<sup>1</sup>, **Lycoming**<sup>8</sup>, Mifflin<sup>1</sup>, Monroe<sup>1</sup>, Montgomery<sup>1,2,7,8,44</sup>, **Northampton**<sup>4,6</sup>, Northumberland<sup>1</sup>, **Perry**<sup>4</sup>, Philadelphia<sup>1,2,4</sup>, **Schuylkill**<sup>6</sup>, Sullivan<sup>1</sup>, **Union**<sup>8</sup>, Westmoreland<sup>1</sup>, **York**<sup>8</sup>; 6 Mar<sup>1</sup> – 16 Oct<sup>3</sup> (2018<sup>3</sup>).

*Megachile (Litomegachile) texana* Cresson, 1878<sup>37</sup> – Erie<sup>9</sup>, Lehigh<sup>1</sup>, Philadelphia<sup>1,2,4</sup>; 7 Jul<sup>1</sup> – 25 Aug<sup>1,4</sup> (2016<sup>9</sup>).

### Subgenus *Megachile* Latreille s. s.

**Revision:** Mitchell (1935b as *Delomegachile*).

*Megachile (Megachile) centuncularis* (Linnaeus, 1758)<sup>37</sup> – Adams<sup>1</sup>, Allegheny<sup>1,2</sup>, **Bradford**<sup>8</sup>, **Bucks**<sup>4</sup>, Centre<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1</sup>, Erie<sup>1,9</sup>, Franklin<sup>1</sup>, Huntingdon<sup>2</sup>, **Montgomery**<sup>8</sup>, Philadelphia<sup>1,4</sup>, York<sup>1,6</sup>; 15 May<sup>1</sup> – 24 Sep<sup>1</sup> (**2016**<sup>9</sup>).

*Megachile (Megachile) inermis* Provancher, 1888<sup>37</sup> – **Adams**<sup>3</sup>, Centre<sup>1,7</sup>, Fayette<sup>1</sup>, Forest<sup>1</sup>, Huntingdon<sup>1</sup>; 24 Jun<sup>1</sup> – 9 Sep<sup>1</sup> (**2017**<sup>7</sup>).

*Megachile (Megachile) montivaga* Cresson, 1878<sup>37</sup> – **Adams**<sup>3,8</sup>, Bradford<sup>1</sup>, **Bucks**<sup>4</sup>, Centre<sup>1,7</sup>, **Chester**<sup>8</sup>, Crawford<sup>1</sup>, Dauphin<sup>1,6</sup>, Erie<sup>9</sup>, **Lancaster**<sup>3</sup>, **Lycoming**<sup>8</sup>, **Montgomery**<sup>7</sup>, Pike<sup>1,4</sup>, Sullivan<sup>1</sup>, **Washington**<sup>6</sup>; **15 May**<sup>6</sup> – **28 Sep**<sup>8</sup> (**2018**<sup>3</sup>).

*Megachile (Megachile) relativa* Cresson, 1878<sup>37</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, Blair<sup>1,2</sup>, **Bradford**<sup>8</sup>, Centre<sup>1,7,15</sup>, Clearfield<sup>1</sup>, Dauphin<sup>1,2,6</sup>, Erie<sup>9</sup>, Huntingdon<sup>1,2,3</sup>, Lancaster<sup>1,4</sup>, **Lycoming**<sup>8</sup>, Monroe<sup>1</sup>, Perry<sup>1</sup>, Somerset<sup>1,2</sup>, Sullivan<sup>1</sup>, **Susquehanna**<sup>8</sup>, **Union**<sup>8</sup>, Washington<sup>1</sup>, **Wyoming**<sup>4</sup>; **1 Jun**<sup>3</sup> – **3 Oct**<sup>1</sup> (**2017**<sup>7</sup>).

### Subgenus *Megachiloides* Mitchell

**Revision:** Mitchell (1936b).

*Megachile (Megachilodes) integra* Cresson, 1878 – **Adams**<sup>3</sup>, Bucks<sup>1</sup>, Dauphin<sup>1</sup>, Huntingdon<sup>1</sup>, **Northampton**<sup>6</sup>, Perry<sup>1</sup>, Philadelphia<sup>1</sup>; 5 May<sup>1</sup> – 18 Sep<sup>1</sup> (**2012**<sup>3</sup>).

### Subgenus *Sayapis* Titus

**Revision:** Mitchell (1937b).

*Megachile (Sayapis) frugalis frugalis* Cresson, 1872<sup>37</sup> – **Adams**<sup>3</sup>, **Carbon**<sup>6</sup>, Centre<sup>1</sup>, Dauphin<sup>1,6</sup>, **Delaware**<sup>4</sup>, Lehigh<sup>1</sup>, **Northampton**<sup>6</sup>; 26 May<sup>1</sup> – **6 Aug**<sup>6</sup> (**2017**<sup>3</sup>).

*Megachile (Sayapis) inimica* Cresson, 1872 *sayi* Cresson, 1878<sup>37</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, **Bucks**<sup>4,8</sup>, Centre<sup>1,7,8</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,6</sup>, Erie<sup>1</sup>, Huntingdon<sup>1</sup>, **Lancaster**<sup>3</sup>; **10 Jun**<sup>6</sup> – **28 Sep**<sup>8</sup> (**2017**<sup>3,7</sup>).

*Megachile (Sayapis) pugnata pugnata* Say, 1837<sup>37</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, Beaver<sup>1</sup>, Centre<sup>1,7,15,44</sup>, Dauphin<sup>1</sup>, Huntingdon<sup>1,2,3</sup>, **Lancaster**<sup>3</sup>, Union<sup>1</sup>, Washington<sup>1</sup>; **29 May**<sup>3</sup> – **16–17 Aug**<sup>7</sup> (**2018**<sup>3</sup>).

### Subgenus *Xanthosarus* Robertson

**Revision:** Mitchell (1936a).

*Megachile (Xanthosarus) addenda* Cresson, 1878<sup>37</sup> – Adams<sup>1,3</sup>, Allegheny<sup>1</sup>, Centre<sup>15</sup>, Dauphin<sup>1,6</sup>, Erie<sup>9</sup>, Lehigh<sup>1</sup>; **16 May**<sup>3</sup> – 15 Jul<sup>1</sup> (**2015**<sup>9</sup>).

*Megachile (Xanthosarus) frigida frigida* Smith, 1853<sup>37</sup> – Centre<sup>1</sup>, Dauphin<sup>1</sup>, Erie<sup>1</sup>, Forest<sup>1</sup>, Lebanon<sup>1</sup>, **Lycoming**<sup>8</sup>, Monroe<sup>2</sup>, **Montgomery**<sup>8</sup>; 30 May<sup>1</sup> – 20 Aug<sup>1</sup> (**2015**<sup>8</sup>).

*Megachile (Xanthosarus) gemula gemula* Cresson, 1878<sup>37</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, **Bucks**<sup>8</sup>, Centre<sup>1,7</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Elk<sup>1</sup>, **Huntingdon**<sup>3</sup>, Lehigh<sup>1</sup>, Monroe<sup>1,2</sup>, Philadelphia<sup>1</sup>, Sullivan<sup>1,2</sup>; 30 Apr<sup>1</sup> – **6 Sep**<sup>3</sup> (**2018**<sup>3</sup>).

*Megachile (Xanthosarus) ingenua* Cresson, 1878<sup>37</sup> – locations, dates, and year not reported<sup>37</sup>.

*Megachile (Xanthosarus) latimanus* Say, 1823<sup>37</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, **Bradford**<sup>8</sup>, Bucks<sup>1</sup>, **Carbon**<sup>6</sup>, Centre<sup>1,7</sup>, Columbia<sup>2</sup>, Cumberland<sup>1,2</sup>, Dauphin<sup>1,2</sup>, Delaware<sup>1</sup>, Erie<sup>1,9</sup>, Franklin<sup>1</sup>, Huntingdon<sup>1</sup>, **Lackawanna**<sup>6</sup>, Lancaster<sup>2</sup>, Lehigh<sup>1</sup>, Monroe<sup>1</sup>, Philadelphia<sup>1</sup>, Schuylkill<sup>1</sup>, Sullivan<sup>1,2</sup>, Washington<sup>1</sup>, Westmoreland<sup>1</sup>, Wyoming<sup>1</sup>; **2–4 Jun**<sup>9</sup> – 1 Oct<sup>1</sup> (**2017**<sup>7</sup>).

*Megachile (Xanthosarus) melanophaea melanophaea* Smith, 1853<sup>37</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, Dauphin<sup>1</sup>, Sullivan<sup>1</sup>, **Westmoreland**<sup>6</sup>; 4 Jun<sup>1</sup> – **14 Jul**<sup>6</sup> (**2016**<sup>3</sup>).

*Megachile (Xanthosarus) mucida* Cresson, 1878 – **Crawford**<sup>6</sup>, Forest<sup>1</sup>; 19 Jul<sup>1</sup> – **13 Aug**<sup>6</sup> (**2008**<sup>6</sup>).

## Osmiini

### Genus *Chelostoma* Latreille

#### Subgenus *Gyrodromella* Michener

**Taxonomy:** Eickwort (1980); Buck et al. (2005); Müller (2015).

*Chelostoma (Gyrodromella) rapunculi* (Lepeletier, 1841)\* (**2015**<sup>9</sup>) – Erie<sup>9</sup>; **2–4 Jun**<sup>9</sup> – **9–11 Jun**<sup>9</sup> (**2016**<sup>9</sup>).

#### Subgenus *Prochelostoma* Robertson

**Taxonomy:** Eickwort (1980); Buck et al. (2005).

*Chelostoma (Prochelostoma) philadelphi* (Robertson, 1891)<sup>37</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, **Bucks**<sup>8</sup>, **Centre**<sup>6</sup>, Dauphin<sup>1</sup>, Delaware<sup>1</sup>, Erie<sup>9</sup>, Fayette<sup>1</sup>, Fulton<sup>1</sup>, Lycoming<sup>1</sup>, Montgomery<sup>1</sup>, Northumberland<sup>1</sup>, Perry<sup>1</sup>, Philadelphia<sup>1</sup>, Pike<sup>1</sup>, Westmoreland<sup>1</sup>; **18 Apr**<sup>6</sup> – 27 Jul<sup>1</sup> (**2018**<sup>3</sup>).

### Genus *Heriades* Spinola

#### Subgenus *Neotrypetes* Robertson

**Taxonomy:** Michener (1938); Mitchell (1962).

*Heriades (Neotrypetes) carinata* Cresson, 1864 – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, **Bucks**<sup>8</sup>, Centre<sup>7,15</sup>, **Chester**<sup>8</sup>, Cumberland<sup>1</sup>, Erie<sup>1</sup>, **Lancaster**<sup>3</sup>, Lehigh<sup>1</sup>, Philadelphia<sup>1</sup>; 2 Jun<sup>1</sup> – **14 Aug**<sup>3</sup> (**2018**<sup>3</sup>).

*Heriades (Neotrypetes) leavitti* Crawford, 1913 – Adams<sup>3</sup>, Centre<sup>7</sup>; 4 Jun<sup>3</sup> – 24–25 Jul<sup>7</sup> (2017<sup>7</sup>).

*Heriades (Neotrypetes) variolosa* (Cresson, 1872) – Adams<sup>3</sup>, Centre<sup>15</sup>, Montgomery<sup>8</sup>; 11 Jul<sup>8</sup> – 15 Sep<sup>3</sup> (2011<sup>8</sup>).

### Genus *Hoplitis* Klug

**Taxonomy:** Michener (1947); Mitchell (1962); Sedivy et al. (2013).

#### Subgenus *Alcidamea* Cresson

*Hoplitis (Alcidamea) albifrons albifrons* (Kirby, 1837) (*tuberculata* group) – Adams<sup>3</sup>, Somerset<sup>2</sup>; 24 Jun<sup>2</sup> – 10 Jul<sup>3</sup> (2015<sup>3</sup>).

*Hoplitis (Alcidamea) pilosifrons* (Cresson, 1864) (*producta* group) – Adams<sup>3</sup>, Blair<sup>1,2</sup>, Bradford<sup>6</sup>, Centre<sup>7</sup>, Dauphin<sup>6</sup>, Delaware<sup>2</sup>, Huntingdon<sup>1,2</sup>, Lancaster<sup>3</sup>, Monroe<sup>4</sup>, Montgomery<sup>7</sup>, Northumberland<sup>1</sup>, Perry<sup>1</sup>, Philadelphia<sup>1,2</sup>, York<sup>8</sup>; 30 Apr<sup>3</sup> – 18 Oct<sup>3</sup> (2018<sup>3</sup>).

*Hoplitis (Alcidamea) producta producta* (Cresson, 1864) (*producta* group)<sup>37</sup> – Adams<sup>3</sup>, Allegheny<sup>1</sup>, Blair<sup>6</sup>, Bradford<sup>6,8</sup>, Butler, Centre<sup>6,7,8,15</sup>, Chester<sup>1</sup>, Clinton<sup>6</sup>, Crawford<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>4</sup>, Erie<sup>6</sup>, Jefferson<sup>6</sup>, Lehigh<sup>1</sup>, Monroe<sup>4</sup>, Montgomery<sup>7</sup>, Philadelphia<sup>2</sup>, Union<sup>8</sup>, Washington<sup>6</sup>, York<sup>8</sup>; 4 May<sup>3</sup> – 16–17 Aug<sup>7</sup> (2018<sup>3</sup>).

*Hoplitis (Alcidamea) spoliata* (Provancher, 1888) (*tuberculata* group) – Centre<sup>1,7</sup>, Crawford<sup>4</sup>, Dauphin<sup>1,6</sup>, Huntingdon<sup>1,2,8</sup>, Lehigh<sup>1</sup>, Lycoming<sup>8</sup>, Monroe<sup>2</sup>, Perry<sup>1</sup>; 27 May<sup>1</sup> – 19–20 Aug<sup>4</sup> (2017<sup>7</sup>).

*Hoplitis (Alcidamea) truncata truncata* (Cresson, 1878) (*truncata* group) – Adams<sup>3</sup>, Bradford<sup>6</sup>, Clarion<sup>1</sup>, Cumberland<sup>1</sup>, Franklin<sup>1</sup>, Lehigh<sup>1</sup>, Northumberland<sup>6</sup>, York<sup>8</sup>; 1 Jun<sup>1</sup> – 9 Aug<sup>1</sup> (2015<sup>8</sup>).

#### Subgenus *Hoplitis* Klug s. s.

*Hoplitis (Hoplitis) anthocopoides* (Schenck, 1853) (*Annosmia-Hoplitis* group)\* (2012<sup>3</sup>) – Adams<sup>3</sup>; 31 May<sup>3</sup> – 14 Jun<sup>3</sup> (2012<sup>3</sup>).

#### Subgenus *Robertsonella* Titus

*Hoplitis (Robertsonella) simplex* (Cresson, 1864) – Bradford<sup>6</sup>, Bucks<sup>8</sup>, Dauphin<sup>6</sup>, Lancaster<sup>8</sup>, York<sup>8</sup>; 8 May<sup>6</sup> – 16 Jun<sup>6</sup> (2014<sup>8</sup>).

### Genus *Osmia* Panzer

**Taxonomy:** Sandhouse (1939); Mitchell (1962); Rust (1974).

#### Subgenus *Diceratosmia* Robertson

**Revision:** Michener (1949).

*Osmia (Diceratosmia) conjuncta* Cresson, 1864 – Adams<sup>3</sup>, Huntingdon<sup>8</sup>; 27 Apr<sup>8</sup> – 15 Jun<sup>8</sup> (2015<sup>8</sup>).

### Subgenus *Helicosmia* Thomson

**Revision:** Rust (1974 as *Chalcosmia*).

*Osmia (Helicosmia) caerulescens* (Linnaeus, 1758)\* (1905<sup>1</sup>)<sup>37</sup> – Adams<sup>3</sup>, Allegheny<sup>1</sup>, Bradford<sup>1</sup>, Butler<sup>1</sup>, Centre<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Franklin<sup>1</sup>, Perry<sup>1</sup>, Philadelphia<sup>1</sup>, Pike<sup>1</sup>, Washington<sup>1,2</sup>; 10 Apr<sup>2</sup> – 29 Aug<sup>1</sup> (2017<sup>3</sup>).

*Osmia (Helicosmia) chalybea* Smith, 1853 – Delaware<sup>1</sup>, Philadelphia<sup>2</sup>; 16 May<sup>2</sup> – 22 Jun<sup>1</sup> (1907<sup>1</sup>).

*Osmia (Helicosmia) coloradensis* Cresson, 1878 – Bradford<sup>1</sup>; 13 Jun<sup>1</sup> – 2 Jul<sup>1</sup> (1939<sup>1</sup>).

*Osmia (Helicosmia) georgica* Cresson, 1878<sup>37</sup> – Adams<sup>3</sup>, Allegheny<sup>1</sup>, Bradford<sup>8</sup>, Bucks<sup>8</sup>, Centre<sup>7</sup>, Dauphin<sup>1</sup>, Delaware<sup>1</sup>, Erie<sup>9</sup>, Huntingdon<sup>8</sup>, Lancaster<sup>3,8</sup>, Lycoming<sup>8</sup>, Montgomery<sup>4</sup>, Perry<sup>6</sup>, Susquehanna<sup>8</sup>, Union<sup>8</sup>, York<sup>1,8</sup>; 15 Apr<sup>8</sup> – 21 Jul<sup>3</sup> (2018<sup>3</sup>).

*Osmia (Helicosmia) texana* Cresson, 1872 – Adams<sup>3</sup>, Allegheny<sup>1</sup>, Bradford<sup>8</sup>, Centre<sup>8</sup>, Cumberland<sup>6</sup>, Greene<sup>1</sup>, Huntingdon<sup>1</sup>, Lancaster<sup>8</sup>, Washington<sup>6</sup>; 25 May<sup>1</sup> – 15 Sep<sup>8</sup> (2018<sup>3</sup>).

### Subgenus *Melanosmia* Schmiedeknecht

**Taxonomy:** Rightmyer et al. (2010).

*Osmia (Melanosmia) albiventris* Cresson, 1864<sup>37</sup> – Centre<sup>1</sup>, Clarion<sup>6</sup>, Dauphin<sup>6</sup>, Huntingdon<sup>8</sup>, Lehigh<sup>1</sup>, Montgomery<sup>1</sup>, Philadelphia<sup>1</sup>, Tioga<sup>1</sup>, Union<sup>8</sup>, York<sup>8</sup>; 23 Apr<sup>1</sup> – 3 Jul<sup>6</sup> (2015<sup>8</sup>).

*Osmia (Melanosmia) atriventris* Cresson, 1864<sup>37</sup> – Adams<sup>3</sup>, Allegheny<sup>1</sup>, Blair<sup>2</sup>, Bradford<sup>1,8</sup>, Bucks<sup>8</sup>, Centre<sup>7,8,15</sup>, Dauphin<sup>1</sup>, Delaware<sup>1,2</sup>, Huntingdon<sup>8</sup>, Lancaster<sup>8</sup>, Lycoming<sup>8</sup>, Monroe<sup>1</sup>, Montgomery<sup>7</sup>, Perry<sup>6</sup>, Philadelphia<sup>1,2</sup>, Pike<sup>1,4</sup>, Susquehanna<sup>8</sup>, Tioga<sup>1</sup>, Union<sup>8</sup>, York<sup>8</sup>; 29 Mar<sup>3</sup> – 26–27 Jul<sup>7</sup> (2018<sup>3</sup>).

*Osmia (Melanosmia) bucephala* Cresson, 1864<sup>37</sup> – Adams<sup>1,3,8</sup>, Berks<sup>1</sup>, Bradford<sup>8</sup>, Bucks<sup>8</sup>, Centre<sup>2,6,7,15</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1</sup>, Erie<sup>9</sup>, Huntingdon<sup>1,3,6,8</sup>, Northumberland<sup>6</sup>, Pike<sup>1,4</sup>, Schuylkill<sup>1,2</sup>, Susquehanna<sup>8</sup>, Union<sup>8</sup>, Washington<sup>1</sup>, York<sup>8</sup>; 10 Apr<sup>1,3</sup> – 4 Jul<sup>1</sup> (2018<sup>3</sup>).

*Osmia (Melanosmia) collinsiae* Robertson, 1905<sup>37</sup> – Adams<sup>3</sup>, Allegheny<sup>1</sup>, Bucks<sup>8</sup>, Centre<sup>7</sup>, Cumberland<sup>6</sup>, Perry<sup>6</sup>, York<sup>8</sup>; 12 Apr<sup>6</sup> – 1 Jul<sup>1</sup> (2017<sup>7</sup>).

*Osmia (Melanosmia) distincta* Cresson, 1864<sup>37</sup> – Adams<sup>3</sup>, Cumberland<sup>6</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1</sup>, Huntingdon<sup>1,2</sup>, Luzerne<sup>1</sup>, Monroe<sup>4</sup>, Montgomery<sup>7</sup>, Perry<sup>6</sup>, Pike<sup>1,4</sup>, York<sup>8</sup>; 9 Apr<sup>2</sup> – 1–30 Jun<sup>4</sup> (2017<sup>7</sup>).

*Osmia (Melanosmia) felti* Cockerell, 1911<sup>37</sup> – Adams<sup>3</sup>, Perry<sup>6</sup>; 12 Apr<sup>6</sup> – 20 May<sup>3</sup> (2009<sup>3</sup>).

*Osmia (Melanosmia) inspergens* Lovell & Cockerell, 1907<sup>37</sup> – **Centre**<sup>7</sup>, **Huntingdon**<sup>8</sup>, **Susquehanna**<sup>8</sup>; **28 Apr**<sup>8</sup> – **24–25 May**<sup>7</sup> (**2015**<sup>8</sup>).

*Osmia (Melanosmia) proxima* Cresson, 1864 – Sullivan<sup>1</sup>, York<sup>1</sup>; 27 Apr<sup>1</sup> – 15 Aug<sup>1</sup> (1941<sup>1</sup>).

*Osmia (Melanosmia) pumila* Cresson, 1864<sup>37</sup> – Adams<sup>1,3</sup>, **Bedford**<sup>6</sup>, Blair<sup>1,2</sup>, Bradford<sup>1,6,8</sup>, Bucks<sup>2,8</sup>, Centre<sup>1,2,7,8,15</sup>, Chester<sup>1</sup>, **Columbia**<sup>5</sup>, Crawford<sup>1</sup>, Cumberland<sup>1,6</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1,2,4</sup>, Erie<sup>6,9</sup>, Franklin<sup>1,6</sup>, **Greene**<sup>6</sup>, Huntingdon<sup>1,8</sup>, **Jefferson**<sup>6</sup>, **Lackawanna**<sup>6</sup>, Lancaster<sup>1,3,8</sup>, Lehigh<sup>1</sup>, **Lycoming**<sup>6,8</sup>, Montgomery<sup>1,4</sup>, **Montour**<sup>6</sup>, **Perry**<sup>6</sup>, Philadelphia<sup>1,2</sup>, Pike<sup>1,4</sup>, Somerset<sup>1,2</sup>, **Susquehanna**<sup>8</sup>, **Union**<sup>8</sup>, **Warren**<sup>6</sup>, Washington<sup>1,6</sup>, **York**<sup>8</sup>; **13 Mar**<sup>6</sup> – **29 Jul**<sup>6</sup> (**2018**<sup>3</sup>).

*Osmia (Melanosmia) sandhouseae* Mitchell, 1927 – Adams<sup>3</sup>, Huntingdon<sup>8</sup>; **23 Apr**<sup>3</sup> – **28 Apr**<sup>8</sup> (**2015**<sup>3,8</sup>).

*Osmia (Melanosmia) simillima* Smith, 1853<sup>37</sup> – Adams<sup>1</sup>, Centre<sup>1</sup>, Cumberland<sup>1</sup>, Montgomery<sup>1</sup>, Philadelphia<sup>1</sup>, Tioga<sup>1</sup>; 8 May<sup>1</sup> – 12 Jul<sup>1</sup> (1909<sup>1</sup>).

*Osmia (Melanosmia) virga* Sandhouse, 1939<sup>37</sup> – Adams<sup>3</sup>, Bucks<sup>8</sup>, Lancaster<sup>8</sup>, Lycoming<sup>8</sup>, Union<sup>8</sup>, York<sup>8</sup>; **15 Apr**<sup>8</sup> – **15 Jun**<sup>8</sup> (**2015**<sup>8</sup>).

### Subgenus *Osmia* Panzer s. s.

**Revision:** Rust (1974).

*Osmia (Osmia) cornifrons* (Radoszkowski, 1887)\* (**2002**<sup>3</sup>) – Adams<sup>3</sup>, Bradford<sup>8</sup>, Bucks<sup>8</sup>, Centre<sup>2,5,6,7,8,15</sup>, Cumberland<sup>6</sup>, Dauphin<sup>6</sup>, Erie<sup>9</sup>, Huntingdon<sup>8</sup>, Lancaster<sup>8</sup>, Lycoming<sup>6,8</sup>, Montgomery<sup>7</sup>, Susquehanna<sup>8</sup>, Union<sup>8</sup>, York<sup>8</sup>; **29 Mar**<sup>3</sup> – **29 Jul**<sup>6</sup> (**2018**<sup>3</sup>).

*Osmia (Osmia) lignaria lignaria* Say, 1837<sup>37</sup> – Adams<sup>1,3</sup>, Allegheny<sup>1</sup>, Butler<sup>1</sup>, Cambria<sup>1</sup>, Centre<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,4</sup>, Delaware<sup>1,2</sup>, Franklin<sup>1</sup>, Fulton<sup>1</sup>, Huntingdon<sup>1,3,8</sup>, Jefferson<sup>6</sup>, Juniata<sup>6</sup>, Lancaster<sup>8</sup>, Lehigh<sup>1</sup>, Montgomery<sup>1,2,7</sup>, Perry<sup>1</sup>, Philadelphia<sup>2</sup>, Somerset<sup>1</sup>, Washington<sup>1</sup>, Westmoreland<sup>1</sup>, **York**<sup>8</sup>; **31 Mar**<sup>3</sup> – **1 Sep**<sup>1</sup> (**2017**<sup>3,7</sup>).

*Osmia (Osmia) taurus* Smith, 1873\* (**2008**<sup>3,6</sup>) – Adams<sup>3</sup>, Bradford<sup>8</sup>, Centre<sup>6,7,8</sup>, Clinton<sup>6</sup>, Cumberland<sup>6</sup>, Dauphin<sup>6</sup>, Erie<sup>9</sup>, Huntingdon<sup>8</sup>, Lancaster<sup>8</sup>, Lycoming<sup>8</sup>, Perry<sup>6</sup>, Susquehanna<sup>8</sup>, Union<sup>8</sup>, York<sup>8</sup>; **31 Mar**<sup>3</sup> – **29 Jul**<sup>6</sup> (**2018**<sup>3</sup>).

### Lithurginae

#### Lithurgini

##### Genus *Lithurgus* Berthold

**Taxonomy:** Snelling (1986).

*Lithurgus chrysurus* Fonscolombe, 1834\* (2007<sup>1</sup>) – Carbon<sup>6</sup>, Lehigh<sup>1,6</sup>, Northampton<sup>6</sup>; **7 Jul**<sup>1</sup> – **9 Aug**<sup>6</sup> (**2009**<sup>6</sup>).

**Andrenidae****Andreninae****Andrenini****Genus *Andrena* Fabricius**

**Taxonomy:** Mitchell (1960); LaBerge (1967, 1969, 1971, 1973, 1977, 1980, 1985, 1987, 1989); Ribble (1967, 1968, 1974); LaBerge and Bouseman (1970, 1977); LaBerge and Ribble (1972, 1975); Bouseman and LaBerge (1978).

**Subgenus *Andrena* Fabricius s. s.**

**Revision:** LaBerge (1980).

*Andrena (Andrena) carolina* Viereck, 1909<sup>25,36</sup> – Centre<sup>1,6,7</sup>, Elk<sup>1</sup>, Luzerne<sup>1</sup>, **Lycoming**<sup>8</sup>, Philadelphia<sup>1,2</sup>, Pike<sup>1,4</sup>; 9 Apr<sup>1</sup> – **15–16 Aug**<sup>7</sup> (**2017**<sup>7</sup>).

*Andrena (Andrena) clarkella* (Kirby, 1802) – Forest<sup>1,25</sup>, Sullivan<sup>1,2</sup>; 30 Mar<sup>2</sup> – 6 May<sup>1</sup> (1983<sup>1,2</sup>).

*Andrena (Andrena) cornelli* Viereck, 1907 – **Adams**<sup>3</sup>, **Bucks**<sup>8</sup>, Cumberland<sup>1</sup>, Erie<sup>9</sup>, Perry<sup>25</sup>, Philadelphia<sup>1,2,25</sup>, Schuylkill<sup>2</sup>; **4 May**<sup>8</sup> – **9–11 Jun**<sup>9</sup> (**2016**<sup>3,9</sup>).

*Andrena (Andrena) frigida* Smith, 1853<sup>36</sup> – **Union**<sup>8</sup>, **York**<sup>8</sup>; **24 Apr**<sup>8</sup> – **28 Apr**<sup>8</sup> (**2015**<sup>8</sup>).

*Andrena (Andrena) macoupinensis* Robertson, 1900<sup>36</sup> – **Lancaster**<sup>3</sup>, Philadelphia<sup>1</sup>, Pike<sup>1,4</sup>; 2 May<sup>1</sup> – 30 May<sup>1,4</sup> (**2012**<sup>3</sup>).

*Andrena (Andrena) mandibularis* Robertson, 1892<sup>36</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1,25</sup>, **Bucks**<sup>8</sup>, Centre<sup>1,7</sup>, Crawford<sup>1</sup>, Cumberland<sup>25</sup>, Dauphin<sup>1,25</sup>, Delaware<sup>2</sup>, Franklin<sup>1</sup>, **Huntingdon**<sup>3</sup>, **Lycoming**<sup>8</sup>, Montgomery<sup>1,25</sup>, Philadelphia<sup>1</sup>, **Susquehanna**<sup>8</sup>, Westmoreland<sup>1,25</sup>; 5 Mar<sup>1</sup> – **13 Jun**<sup>3</sup> (**2016**<sup>3,7</sup>).

*Andrena (Andrena) milwaukeensis* Graenicher, 1903<sup>36</sup> – Allegheny<sup>1,25</sup>, Centre<sup>1,3,5,7</sup>, Cumberland<sup>1,25</sup>, Dauphin<sup>1</sup>, **Huntingdon**<sup>8</sup>, **Lycoming**<sup>8</sup>, Monroe<sup>1,2</sup>, Somerset<sup>1,25</sup>, **Susquehanna**<sup>8</sup>, Westmoreland<sup>1</sup>, Wyoming<sup>1</sup>; 18 Apr<sup>1</sup> – 22 Jun<sup>1</sup> (**2018**<sup>3</sup>).

*Andrena (Andrena) rufosignata* Cockerell, 1902<sup>25</sup> – Centre<sup>1</sup>, Clinton<sup>1</sup>, Forest<sup>1,25</sup>, **Huntingdon**<sup>8</sup>, **Lycoming**<sup>8</sup>, Sullivan<sup>1</sup>, **Susquehanna**<sup>8</sup>, **Union**<sup>8</sup>, Westmoreland<sup>1</sup>, **York**<sup>8</sup>; **15 Apr**<sup>8</sup> – 16 Jul<sup>1</sup> (**2015**<sup>8</sup>).

*Andrena (Andrena) thaspii* Graenicher, 1903 – **Adams**<sup>3</sup>, Allegheny<sup>1,25</sup>, Centre<sup>1,25</sup>, **Huntingdon**<sup>3</sup>, Westmoreland<sup>25</sup>; **1 May**<sup>3</sup> – 4 Jul<sup>1</sup> (**2012**<sup>3</sup>).

*Andrena (Andrena) tridens* Robertson, 1902<sup>36</sup> – **Adams**<sup>3</sup>, **Bradford**<sup>8</sup>, Centre<sup>1,7</sup>, Erie<sup>6,9</sup>, Franklin<sup>1</sup>, **Huntingdon**<sup>8</sup>, **Jefferson**<sup>6</sup>, **Lancaster**<sup>8</sup>, Lebanon<sup>1,25</sup>, **Lycoming**<sup>8</sup>, Perry<sup>1</sup>, Philadelphia<sup>1</sup>, **Susquehanna**<sup>8</sup>, **Union**<sup>8</sup>, Westmoreland<sup>1</sup>, **York**<sup>8</sup>; **13 Mar**<sup>3</sup> – **24 Jul**<sup>6</sup> (**2017**<sup>3</sup>).

**Subgenus *Archiaendrena* LaBerge**

**Revision:** LaBerge (1985).

*Andrena (Archiandrena) banksi* Malloch, 1917 – Bucks<sup>8</sup>, Susquehanna<sup>8</sup>; 28 Apr<sup>8</sup> – 22 May<sup>8</sup> (2015<sup>8</sup>).

*Andrena (Archiandrena) dimorpha* Mitchell, 1960 – Philadelphia<sup>26</sup>; dates and year not reported<sup>26</sup>.

### Subgenus *Callandrena* Cockerell s. l.

**Revision:** LaBerge (1967).

*Andrena (Callandrena s. l.) aliciae* Robertson, 1891 (*aliciae* group) – Allegheny<sup>1</sup>, Dauphin<sup>1</sup>, Fayette<sup>1</sup>; 6 Aug<sup>1</sup> – 1 Sep<sup>1</sup> (1940<sup>1</sup>).

*Andrena (Callandrena s. l.) asteris* Robertson, 1891 (*simplex* group)<sup>36</sup> – Allegheny<sup>1</sup>, Beaver<sup>1</sup>, Bucks<sup>8</sup>, Chester<sup>1</sup>, Columbia<sup>2</sup>, Dauphin<sup>1</sup>, Delaware<sup>1,2</sup>, Erie<sup>9</sup>, Lycoming<sup>1</sup>, Philadelphia<sup>1</sup>; 7 Sep<sup>1</sup> – 29 Sep<sup>2</sup> (2016<sup>9</sup>).

*Andrena (Callandrena s. l.) asteroides* Mitchell, 1960 (*simplex* group) – Centre<sup>1</sup>; 5 Mar<sup>1</sup> (1930<sup>1</sup>).

*Andrena (Callandrena s. l.) gardineri* Cockerell, 1906 (*gardineri* group) – Adams<sup>3</sup>, Westmoreland<sup>1</sup>; 18 May<sup>1</sup> – 21 May<sup>3</sup> (2013<sup>3</sup>).

*Andrena (Callandrena s. l.) helianthi* Robertson, 1891 (*helianthi* group) – Allegheny<sup>1</sup>, Chester<sup>1</sup>, Lackawanna<sup>6</sup>, Potter<sup>1</sup>, Westmoreland<sup>1</sup>; 21 Apr<sup>1</sup> – 16 Sep<sup>1</sup> (2008<sup>6</sup>).

*Andrena (Callandrena s. l.) krigiana* Robertson, 1901 (*krigiana* group) – Dauphin<sup>1</sup>, Montgomery<sup>1,7</sup>, Perry<sup>1</sup>, Philadelphia<sup>1,2</sup>, Susquehanna<sup>8</sup>; 24 May<sup>1</sup> – 3 Oct<sup>1</sup> (2017<sup>7</sup>).

*Andrena (Callandrena s. l.) placata* Mitchell, 1960 (*simplex* group) – Centre<sup>15</sup>, Erie<sup>9</sup>, Philadelphia<sup>1</sup>; 11–13 Sep<sup>9</sup> – 19 Sep<sup>1</sup> (2016<sup>9</sup>).

*Andrena (Callandrena s. l.) rudbeckiae* Robertson, 1891 (*melliventris* group) – Huntingdon<sup>1,2</sup>; 12 Jul<sup>2</sup> – 13 Jul<sup>1</sup> (2005<sup>1,2</sup>).

*Andrena (Callandrena s. l.) simplex* Smith, 1853 (*simplex* group)<sup>36</sup> – Allegheny<sup>1</sup>, Bradford<sup>8</sup>, Bucks<sup>6</sup>, Chester<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>6</sup>, Delaware<sup>1,2</sup>, Lycoming<sup>6,8</sup>, Philadelphia<sup>1</sup>, Wyoming<sup>1</sup>, York<sup>8</sup>; 8 Jun<sup>6</sup> – 23 Sep<sup>2,8</sup> (2015<sup>8</sup>).

### Subgenus *Cnemidandrena* Hedicke

**Revision:** Donovan (1977).

*Andrena (Cnemidandrena) chromotricha* Cockerell, 1899<sup>36</sup> – Allegheny<sup>1</sup>, Cambria<sup>36</sup>; 25 Aug<sup>36</sup> (1925<sup>36</sup>).

*Andrena (Cnemidandrena) hirticincta* Provancher, 1888<sup>36</sup> – Allegheny<sup>1</sup>, Beaver<sup>1</sup>, Centre<sup>7</sup>, Chester<sup>1</sup>, Cumberland<sup>1</sup>, Delaware<sup>1</sup>, Forest<sup>1</sup>, Mercer<sup>1</sup>, Monroe<sup>2</sup>, Philadelphia<sup>1</sup>, Tioga<sup>1</sup>; 20 Jun<sup>1</sup> – 2 Oct<sup>1</sup> (2017<sup>7</sup>).

*Andrena (Cnemidandrena) nubecula* Smith, 1853 – Adams<sup>3</sup>, Allegheny<sup>1,2</sup>, Centre<sup>1,7,15</sup>, Clarion<sup>1</sup>, Cumberland<sup>1</sup>, Delaware<sup>1</sup>, Forest<sup>1</sup>, Luzerne<sup>1</sup>, Monroe<sup>1,2</sup>, Montgomery<sup>1</sup>, Union<sup>8</sup>, Wyoming<sup>1</sup>; 21 Jul<sup>1</sup> – 28 Sep<sup>8</sup> (2018<sup>3</sup>).

### **Subgenus *Conandrena* Viereck**

**Revision:** LaBerge (1986).

*Andrena (Conandrena) bradleyi* Viereck, 1907<sup>26</sup> – Bucks<sup>1</sup>, Centre<sup>6,7</sup>, Clinton<sup>1,26</sup>, Crawford<sup>2</sup>, Dauphin<sup>1,26</sup>, Delaware<sup>26</sup>, Huntingdon<sup>6</sup>, Lycoming<sup>8</sup>, Philadelphia<sup>2</sup>; 16 Apr<sup>1</sup> – 31 May–1 Jun<sup>7</sup> (2017<sup>7</sup>).

### **Subgenus *Derandrena* Ribble**

**Revision:** Ribble (1968).

*Andrena (Derandrena) uvulariae* Mitchell, 1960 – Westmoreland<sup>1</sup>; 18 May<sup>1</sup> (1982<sup>1</sup>).  
*Andrena (Derandrena) ziziaeformis* Cockerell, 1908<sup>36</sup> – Bradford<sup>8</sup>, Centre<sup>7</sup>, Dauphin<sup>1</sup>, Delaware<sup>1</sup>, Huntingdon<sup>8</sup>, Lycoming<sup>8</sup>, Monroe<sup>1,2</sup>, Philadelphia<sup>1</sup>, Pike<sup>1,4</sup>, Union<sup>8</sup>, York<sup>1</sup>; 30 Apr<sup>1</sup> – 15 Jun<sup>8</sup> (2017<sup>7</sup>).

### **Subgenus *Euandrena* Hedicke**

**Revisions:** LaBerge and Ribble (1975); LaBerge (1977).

*Andrena (Euandrena) algida* Smith, 1853<sup>36</sup> – Centre<sup>1</sup>, Forest<sup>1</sup>, Montour<sup>6</sup>; 8 May<sup>1</sup> – 23 Jun<sup>1</sup> (2008<sup>6</sup>).

*Andrena (Euandrena) geranii* Robertson, 1891<sup>36</sup> – Allegheny<sup>1,24</sup>, Bucks<sup>2,8</sup>, Centre<sup>1</sup>, Delaware<sup>1</sup>, Fayette<sup>1</sup>, Huntingdon<sup>3</sup>, Montgomery<sup>1</sup>, Philadelphia<sup>2</sup>, Union<sup>1,24</sup>, Westmoreland<sup>1,24</sup>; 22 Apr<sup>1</sup> – 30 Jun<sup>1</sup> (2006<sup>8</sup>).

*Andrena (Euandrena) nigrihirta* (Ashmead, 1890)<sup>36</sup> – Bucks<sup>1</sup>, Centre<sup>1</sup>, Huntingdon<sup>8</sup>, Monroe<sup>1</sup>, Susquehanna<sup>8</sup>; 28 Apr<sup>8</sup> – 16 Jul<sup>1</sup> (2015<sup>8</sup>).

*Andrena (Euandrena) phaceliae* Mitchell, 1960<sup>36</sup> – Centre<sup>1</sup>; 22 May<sup>1</sup> (1947<sup>1</sup>).

### **Subgenus *Gonandrena* Viereck**

**Revision:** LaBerge and Ribble (1972).

*Andrena (Gonandrena) fragilis* Smith, 1853 – Adams<sup>3</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Huntingdon<sup>2</sup>, Lackawanna<sup>4</sup>, Lancaster<sup>1,30</sup>, Lehigh<sup>1</sup>, Montgomery<sup>1</sup>, Philadelphia<sup>1</sup>, Westmoreland<sup>1</sup>, York<sup>1</sup>; 28 May<sup>1</sup> – 15 Jul<sup>4</sup> (2013<sup>4</sup>).

*Andrena (Gonandrena) integra* Smith, 1853 – Allegheny<sup>1,30</sup>, Bucks<sup>8</sup>, Delaware<sup>2</sup>, Huntingdon<sup>1</sup>, Philadelphia<sup>2</sup>, Westmoreland<sup>1,30</sup>; 7 Apr<sup>2</sup> – 20 Jun<sup>1</sup> (2007<sup>8</sup>).

*Andrena (Gonandrena) platyparia* Robertson, 1895<sup>36</sup> – Adams<sup>3</sup>, Allegheny<sup>30</sup>, Bradford<sup>30</sup>, Centre<sup>1</sup>, Columbia<sup>1,5</sup>, Crawford<sup>1</sup>, Dauphin<sup>1</sup>, Lancaster<sup>30</sup>, Montgomery<sup>1</sup>; 19 May<sup>3</sup> – 12 Jul<sup>1</sup> (2017<sup>3</sup>).

### Subgenus *Holandrena* Pérez

**Revision:** LaBerge (1985).

*Andrena (Holandrena) cressonii cressonii* Robertson, 1891<sup>36</sup> – Adams<sup>1,3,8</sup>, Allegheny<sup>1,26</sup>, Blair<sup>2</sup>, Bradford<sup>8</sup>, Bucks<sup>8</sup>, Centre<sup>1,3,7</sup>, Chester<sup>1,2</sup>, Clinton<sup>6</sup>, Columbia<sup>5</sup>, Cumberland<sup>1,26</sup>, Dauphin<sup>1,6,26</sup>, Delaware<sup>1,2,4,26</sup>, Elk<sup>1</sup>, Erie<sup>9</sup>, Franklin<sup>1</sup>, Huntingdon<sup>2,8</sup>, Lancaster<sup>3,8</sup>, Lehigh<sup>1</sup>, Lycoming<sup>8</sup>, Monroe<sup>4</sup>, Montgomery<sup>1,2,7,26</sup>, Montour<sup>6</sup>, Northumberland<sup>26</sup>, Perry<sup>1,26</sup>, Philadelphia<sup>1,2,4,26</sup>, Union<sup>8</sup>, Warren<sup>2</sup>, Washington<sup>6</sup>, Westmoreland<sup>1,26</sup>, York<sup>1,8,26</sup>; **2 Apr<sup>3</sup> – 1 Oct<sup>3</sup> (2018<sup>3</sup>)**.

### Subgenus *Iomelissa* Robertson

**Revision:** LaBerge (1985). Monotypic.

*Andrena (Iomelissa) violae* Robertson, 1891<sup>36</sup> – Adams<sup>3</sup>, Allegheny<sup>1</sup>, Clinton<sup>1</sup>, Crawford<sup>1</sup>, Cumberland<sup>1,6</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1,26</sup>, Huntingdon<sup>8</sup>, Jefferson<sup>6</sup>, Lancaster<sup>8</sup>, Lycoming<sup>8</sup>, Monroe<sup>4</sup>, Northumberland<sup>26</sup>, Philadelphia<sup>1</sup>, Susquehanna<sup>8</sup>, Union<sup>8</sup>, Westmoreland<sup>1</sup>, York<sup>1,8</sup>; **31 Mar<sup>3</sup> – 1–30 Jun<sup>4</sup> (2018<sup>3</sup>)**.

### Subgenus *Larandrena* LaBerge

**Revision:** Ribble (1967).

*Andrena (Larandrena) miserabilis* Cresson, 1872<sup>36</sup> – Adams<sup>1,3</sup>, Allegheny<sup>1</sup>, Bucks<sup>1,8</sup>, Centre<sup>1,5,7,8</sup>, Chester<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1,2</sup>, Erie<sup>9</sup>, Forest<sup>1</sup>, Huntingdon<sup>8</sup>, Lancaster<sup>3,8</sup>, Lycoming<sup>8</sup>, Monroe<sup>1</sup>, Montgomery<sup>1,2</sup>, Philadelphia<sup>1,2</sup>, Pike<sup>1,2,4</sup>, Potter<sup>1</sup>, Tioga<sup>1</sup>, Union<sup>1,8</sup>, Westmoreland<sup>1</sup>, York<sup>1,8</sup>; 14 Feb<sup>1</sup> – **9 Jul<sup>3</sup> (2018<sup>3</sup>)**.

### Subgenus *Leucandrena* Hedicke

**Revision:** LaBerge (1987).

*Andrena (Leucandrena) barbilabris* (Kirby, 1802)<sup>36</sup> – Bucks<sup>2</sup>, Butler<sup>27</sup>, Centre<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,27</sup>, Delaware<sup>1,27</sup>, Fayette<sup>1</sup>, Lawrence<sup>1,27</sup>, Montgomery<sup>1,27</sup>, Northumberland<sup>27</sup>, Philadelphia<sup>1,27</sup>, Washington<sup>6</sup>; **30 Mar<sup>1</sup> – 28 May<sup>6</sup> (2008<sup>6</sup>)**.

*Andrena (Leucandrena) erythronii* Robertson, 1891<sup>36</sup> – Allegheny<sup>1,27</sup>, Bucks<sup>8</sup>, Centre<sup>1</sup>, Crawford<sup>1</sup>, Huntingdon<sup>8</sup>, Jefferson<sup>6</sup>, Lycoming<sup>8</sup>, Northumberland<sup>1,27</sup>, Philadelphia<sup>2</sup>, Union<sup>1,27</sup>, Westmoreland<sup>1</sup>; 4 Apr<sup>1</sup> – 6 Jun<sup>1</sup> **(2015<sup>8</sup>)**.

### Subgenus *Melandrena* Pérez

**Revision:** Bouseman and LaBerge (1979).

- Andrena (Melandrena) barbara* Bouseman and LaBerge, 1979 – Adams<sup>1,3</sup>, **Bucks<sup>8</sup>**, Centre<sup>1</sup>, **Lancaster<sup>8</sup>**, Westmoreland<sup>1</sup>, **York<sup>8</sup>**; **20 Mar<sup>3</sup> – 17 May<sup>3</sup> (2018<sup>3</sup>)**.
- Andrena (Melandrena) carlini* Cockerell, 1901<sup>36</sup> – Adams<sup>1,3,8</sup>, Allegheny<sup>1,11</sup>, Beaver<sup>1,11</sup>, Berks<sup>1</sup>, Bradford<sup>8,11</sup>, **Bucks<sup>8</sup>**, Centre<sup>1,2,3,5,6,7,8,11,36</sup>, Chester<sup>1</sup>, Clinton<sup>1</sup>, Crawford<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1,2,11</sup>, Erie<sup>9</sup>, Franklin<sup>1</sup>, **Huntingdon<sup>3,8</sup>**, **Jefferson<sup>6</sup>**, **Lancaster<sup>8</sup>**, Lehigh<sup>1</sup>, Luzerne<sup>1,2,11</sup>, **Lycoming<sup>8</sup>**, Montgomery<sup>1,4,7</sup>, Northumberland<sup>1</sup>, Perry<sup>1,6</sup>, Philadelphia<sup>1,2,4,11</sup>, Pike<sup>1,4,11</sup>, Sullivan<sup>1</sup>, **Susquehanna<sup>8</sup>**, Union<sup>1,8</sup>, Wayne<sup>1</sup>, Westmoreland<sup>1,11</sup>, York<sup>1,8</sup>; **20 Mar<sup>3</sup> – 1 Aug<sup>1</sup> (2018<sup>3</sup>)**.
- Andrena (Melandrena) commoda* Smith, 1879<sup>36</sup> – **Adams<sup>3</sup>**, Allegheny<sup>1,11</sup>, Berks<sup>1</sup>, Butler<sup>1</sup>, Carbon<sup>11</sup>, Centre<sup>1,11</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,11</sup>, Delaware<sup>2</sup>, Erie<sup>1</sup>, **Lancaster<sup>5</sup>**, Lehigh<sup>11</sup>, Monroe<sup>1</sup>, Montgomery<sup>1,7</sup>, Northumberland<sup>1</sup>, Philadelphia<sup>1,11</sup>, Pike<sup>1,2,11</sup>, Tioga<sup>1,11</sup>, York<sup>11</sup>; **3 Apr<sup>3</sup> – 25 Jul<sup>1</sup> (2018<sup>3</sup>)**.
- Andrena (Melandrena) confederata* Viereck, 1917 – **Adams<sup>3</sup>**, **Bucks<sup>8</sup>**, Crawford<sup>1</sup>, Delaware<sup>1,2,11</sup>; **8 May<sup>8</sup> – 6 Jun<sup>1</sup> (2018<sup>3</sup>)**.
- Andrena (Melandrena) dunningi* Cockerell, 1898 – **Adams<sup>3</sup>**, Allegheny<sup>1,11</sup>, **Bradford<sup>8</sup>**, Centre<sup>1,8</sup>, Chester<sup>1,11</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, **Huntingdon<sup>8</sup>**, **Lancaster<sup>5,8</sup>**, **Lycoming<sup>8</sup>**, Philadelphia<sup>1,2</sup>, **Susquehanna<sup>8</sup>**, **Union<sup>8</sup>**, **York<sup>8</sup>**; **20 Mar<sup>3</sup> – 21 Jun<sup>3</sup> (2018<sup>3</sup>)**.
- Andrena (Melandrena) hilaris* Smith, 1853 – **Adams<sup>3</sup>**, Centre<sup>3</sup>, Chester<sup>1,11</sup>, Dauphin<sup>11</sup>, Delaware<sup>1,2,11</sup>, Philadelphia<sup>1,11</sup>; **21 Apr<sup>1</sup> – 10 Aug<sup>1</sup> (2018<sup>3</sup>)**.
- Andrena (Melandrena) illini* Bouseman and La Berge, 1979 – Erie<sup>9</sup>, Westmoreland<sup>1</sup>; **18–20 May<sup>9</sup> – 2 Jun<sup>1</sup> (2016<sup>9</sup>)**.
- Andrena (Melandrena) nivalis* Smith, 1853<sup>36</sup> – **Adams<sup>3</sup>**, Blair<sup>2</sup>, Bradford<sup>1,11</sup>, Carbon<sup>11</sup>, Centre<sup>1,7</sup>, Clinton<sup>1,6</sup>, Crawford<sup>1</sup>, Cumberland<sup>1,11</sup>, Dauphin<sup>1,2</sup>, Elk<sup>1</sup>, **Huntingdon<sup>3</sup>**, Lehigh<sup>1,11</sup>, Luzerne<sup>1</sup>, McKean<sup>2</sup>, Montgomery<sup>1,2,11</sup>, **Northampton<sup>6</sup>**, Perry<sup>1,6</sup>, Pike<sup>1,2,11</sup>, Sullivan<sup>1</sup>, Westmoreland<sup>1,11</sup>; **16 Apr<sup>6</sup> – 26 Jul<sup>1</sup> (2017<sup>7</sup>)**.
- Andrena (Melandrena) pruni* Robertson, 1891<sup>36</sup> – **Adams<sup>3</sup>**, Allegheny<sup>1,11</sup>, Bedford<sup>2</sup>, Blair<sup>2</sup>, Bucks<sup>2,8</sup>, Centre<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1,2</sup>, Huntingdon<sup>2</sup>, Montgomery<sup>1,4,7</sup>, Philadelphia<sup>1</sup>, York<sup>1</sup>; **23 Mar<sup>3</sup> – 20 Jun<sup>3</sup> (2018<sup>3</sup>)**.
- Andrena (Melandrena) regularis* Malloch, 1917<sup>36</sup> – Centre<sup>1</sup>, Clinton<sup>1,2,11</sup>; **25 Apr<sup>2</sup> – 12 May<sup>1</sup> (1966<sup>1,2</sup>)**.
- Andrena (Melandrena) sayi* Robertson, 1891 – **Lycoming<sup>8</sup>**, **Montgomery<sup>7</sup>**, Philadelphia<sup>1</sup>; **28 Apr<sup>8</sup> – 26–27 Jun<sup>7</sup> (2017<sup>7</sup>)**.
- Andrena (Melandrena) vicina* Smith, 1853<sup>36</sup> – **Adams<sup>3</sup>**, Allegheny<sup>11</sup>, Bradford<sup>11</sup>, **Bucks<sup>8</sup>**, Butler<sup>1</sup>, Centre<sup>1,7,11</sup>, **Columbia<sup>5</sup>**, **Cumberland<sup>6</sup>**, Dauphin<sup>1,6,11</sup>, Delaware<sup>1,2</sup>, Elk<sup>6</sup>, Erie<sup>9</sup>, Forest<sup>1</sup>, Huntingdon<sup>1,2,8</sup>, **Jefferson<sup>6</sup>**, **Lancaster<sup>8</sup>**, Lehigh<sup>1</sup>, Luzerne<sup>1</sup>, **Lycoming<sup>8</sup>**, Monroe<sup>1</sup>, Montgomery<sup>1,11</sup>, Northumberland<sup>1</sup>, Philadelphia<sup>1,4,11</sup>, Pike<sup>1,4</sup>, Westmoreland<sup>1</sup>; **5 Apr<sup>3</sup> – 15–16 Aug<sup>7</sup> (2018<sup>3</sup>)**.

## Subgenus *Micrandrena* Ashmead

**Revision:** Ribble (1968).

- Andrena (Micrandrena) lamelliterga* Ribble, 1968 (*piperi* group) – Beaver<sup>1</sup>; **5 Jun<sup>1</sup>** (1931<sup>1</sup>).

*Andrena (Micrandrena) melanochroa* Cockerell, 1898 (*piperi* group) – **Adams<sup>3</sup>**, Allegheny<sup>1</sup>, York<sup>1</sup>; 8 May<sup>1</sup> – **3 Jun<sup>3</sup> (2009<sup>3</sup>)**.

*Andrena (Micrandrena) nigrae* Robertson, 1905 (*illinoiensis* group) – **Adams<sup>3</sup>**, Allegheny<sup>1</sup>, Northumberland<sup>1</sup>, Philadelphia<sup>1</sup>, **Washington<sup>6</sup>**, York<sup>1</sup>; 24 Apr<sup>1</sup> – **31 May<sup>3</sup> (2018<sup>3</sup>)**.

*Andrena (Micrandrena) personata* Robertson, 1897 (*piperi* group) – **Bradford<sup>8</sup>, Bucks<sup>8</sup>, Centre<sup>7</sup>**, Delaware<sup>2</sup>, Franklin<sup>1</sup>, Philadelphia<sup>1,4</sup>, York<sup>1</sup>; 6 Apr<sup>1</sup> – 7 Jun<sup>1,8</sup> (**2016<sup>7</sup>**).

*Andrena (Micrandrena) salictaria* Robertson, 1905 (*illinoiensis* group)<sup>36</sup> – Allegheny<sup>1</sup>, Franklin<sup>1</sup>, Huntingdon<sup>1</sup>, Westmoreland<sup>1</sup>; 9 Apr<sup>1</sup> – 4 May<sup>1</sup> (1966<sup>1</sup>).

*Andrena (Micrandrena) ziziae* Robertson, 1891 (*piperi* group) – Allegheny<sup>1</sup>, **Bucks<sup>8</sup>, Dauphin<sup>6</sup>**, Tioga<sup>1</sup>, **Washington<sup>6</sup>**; **9 Apr<sup>6</sup> – 28 May<sup>6</sup> (2008<sup>6</sup>)**. **Notes.** All specimens identified as *A. ziziae* should be reexamined as some may be attributable to *A. vernalis*, which has recently been resurrected from synonymy (see Portman et al., in press).

### Subgenus *Parandrena* Robertson

**Revision:** LaBerge and Ribble (1972).

*Andrena (Parandrena) nida* Mitchell, 1960 – Butler<sup>30</sup>, Lawrence<sup>1,30</sup>; 27 Apr<sup>1</sup> (1940<sup>1</sup>).

### Subgenus *Plastandrena* Hedicke

**Revision:** LaBerge (1969).

*Andrena (Plastandrena) crataegi* Robertson, 1893 (*crataegi* group)<sup>21,36</sup> – **Adams<sup>3</sup>**, Allegheny<sup>1</sup>, Armstrong<sup>1</sup>, Bedford<sup>2</sup>, Butler<sup>1</sup>, Centre<sup>1,3,7</sup>, Crawford<sup>1</sup>, Cumberland<sup>1,2</sup>, Dauphin<sup>1,2</sup>, Delaware<sup>2</sup>, Erie<sup>1,9</sup>, Forest<sup>1</sup>, Fulton<sup>1</sup>, Huntingdon<sup>1,3</sup>, Indiana<sup>1</sup>, Lehigh<sup>1</sup>, Luzerne<sup>1</sup>, Monroe<sup>1</sup>, Montgomery<sup>1,7</sup>, Northumberland<sup>1</sup>, Pike<sup>1,2</sup>, Potter<sup>1</sup>, Snyder<sup>1</sup>, Somerset<sup>1</sup>, **Susquehanna<sup>8</sup>**, Tioga<sup>1</sup>, Westmoreland<sup>1</sup>; **22 Apr<sup>3</sup> – 8 Aug<sup>1</sup> (2017<sup>3,7</sup>)**.

### Subgenus *Ptilandrena* Robertson

**Revision:** LaBerge (1987).

*Andrena (Ptilandrena) distans* Provancher, 1888<sup>36</sup> – **Adams<sup>3</sup>**, Allegheny<sup>1,27</sup>, Centre<sup>1</sup>, Delaware<sup>1,2</sup>, **Jefferson<sup>6</sup>**, Philadelphia<sup>2</sup>, Union<sup>1,27</sup>; 17 Apr<sup>1</sup> – 21 Jul<sup>1</sup> (**2017<sup>3</sup>**).

*Andrena (Ptilandrena) erigeniae* Robertson, 1891 – **Adams<sup>3,8</sup>**, Allegheny<sup>1,27</sup>, **Bradford<sup>8</sup>, Bucks<sup>8</sup>**, Butler<sup>1,27</sup>, Centre<sup>2,8</sup>, Crawford<sup>1</sup>, **Cumberland<sup>6</sup>**, Dauphin<sup>1,27</sup>, Delaware<sup>1,2,4,27</sup>, Franklin<sup>1,27</sup>, **Huntingdon<sup>8</sup>**, **Lycoming<sup>8</sup>**, **Perry<sup>6</sup>**, Philadelphia<sup>1</sup>, Pike<sup>1,4</sup>, **Susquehanna<sup>8</sup>**, **Union<sup>8</sup>**, Westmoreland<sup>1,27</sup>, York<sup>1,8,27</sup>; **15 Apr<sup>8</sup> – 9 Jun<sup>2</sup> (2015<sup>8</sup>)**.

### Subgenus *Rhacandrena* LaBerge

**Revision:** LaBerge (1977).

*Andrena (Rhacandrena) brevipalpis* Cockerell, 1930 – **Adams**<sup>3</sup>, Allegheny<sup>1,24</sup>, Berks<sup>24</sup>, Butler<sup>1</sup>, **Centre**<sup>7</sup>, **Chester**<sup>6</sup>, Cumberland<sup>1,2,24</sup>, Dauphin<sup>1,2,24</sup>, **Fayette**<sup>6</sup>, Northampton<sup>24</sup>, Northumberland<sup>24</sup>, Pike<sup>1,24</sup>, Somerset<sup>1,24</sup>, Westmoreland<sup>1,24</sup>; 14 May<sup>1</sup> – **10 Oct**<sup>6</sup> (**2016**<sup>3,7</sup>).

*Andrena (Rhacandrena) robertsonii* Dalla Torre, 1896<sup>36</sup> – **Adams**<sup>3</sup>, **Bradford**<sup>4,8</sup>, **Bucks**<sup>8</sup>, Cumberland<sup>1,24</sup>, Dauphin<sup>1</sup>, Delaware<sup>2</sup>, Franklin<sup>1</sup>, **Huntingdon**<sup>8</sup>, **Lancaster**<sup>8</sup>, **Lycoming**<sup>6</sup>, **Montgomery**<sup>7</sup>, Philadelphia<sup>1,24</sup>, Pike<sup>1,2</sup>, Potter<sup>1,24</sup>, Westmoreland<sup>1</sup>, York<sup>1</sup>; **26 Apr**<sup>3</sup> – **3 Aug**<sup>4</sup> (**2017**<sup>7</sup>).

### Subgenus *Scaphandrena* Lanham

**Revision:** Ribble (1974).

*Andrena (Scaphandrena) arabis* Robertson, 1897 (*scurra* group)<sup>36</sup> – **Adams**<sup>3,8</sup>, Allegheny<sup>1</sup>, **Bradford**<sup>8</sup>, **Bucks**<sup>8</sup>, Carbon<sup>1</sup>, **Centre**<sup>8</sup>, Dauphin<sup>1</sup>, Delaware<sup>1</sup>, **Huntingdon**<sup>3,8</sup>, **Lancaster**<sup>8</sup>, Luzerne<sup>1,2</sup>, **Lycoming**<sup>8</sup>, Montgomery<sup>1,2</sup>, Philadelphia<sup>1,2</sup>, **Union**<sup>8</sup>, Washington<sup>1</sup>, Westmoreland<sup>1</sup>; 29 Mar<sup>1</sup> – 21 Jun<sup>1</sup> (**2017**<sup>3</sup>).

### Subgenus *Scrapteropsis* Viereck

**Revision:** LaBerge (1971).

*Andrena (Scrapteropsis) alleghaniensis* Viereck, 1907 (*alleghaniensis* group) – **Bucks**<sup>8</sup>, Dauphin<sup>1,22</sup>, Delaware<sup>2</sup>, Erie<sup>9</sup>, Monroe<sup>22</sup>, Philadelphia<sup>1,22</sup>; 10 May<sup>2</sup> – **9–11 Jun**<sup>9</sup> (**2016**<sup>9</sup>).

*Andrena (Scrapteropsis) daeckei* Viereck, 1907 (*daeckei* group) – Centre<sup>1</sup>, Luzerne<sup>22</sup>, Mifflin<sup>1</sup>; dates not reported<sup>1,22</sup> (2007<sup>1</sup>).

*Andrena (Scrapteropsis) fenningeri* Viereck, 1922 (*imitatrix* group) – **Adams**<sup>3</sup>, Philadelphia<sup>1,2</sup>, **Venango**<sup>6</sup>; **20 Apr**<sup>3</sup> – 9 May<sup>1</sup> (**2015**<sup>3</sup>).

*Andrena (Scrapteropsis) ilicis* Mitchell, 1960 (*imitatrix* group) – Philadelphia<sup>1,22</sup>, Westmoreland<sup>1</sup>; 16 May<sup>1</sup> – 8 Jun<sup>1</sup> (1950<sup>1</sup>).

*Andrena (Scrapteropsis) imitatrix* Cresson, 1872 (*imitatrix* group)<sup>22,36</sup> – **Adams**<sup>3,8</sup>, Allegheny<sup>1</sup>, Armstrong<sup>1</sup>, Beaver<sup>1</sup>, Bedford<sup>1</sup>, Blair<sup>2</sup>, **Bradford**<sup>8</sup>, Bucks<sup>2,8</sup>, Butler<sup>1</sup>, Centre<sup>1,5,7</sup>, Crawford<sup>1,6</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1,2</sup>, Franklin<sup>1</sup>, Huntingdon<sup>1,8</sup>, **Lancaster**<sup>3,5,8</sup>, Luzerne<sup>1</sup>, **Lycoming**<sup>8</sup>, Montgomery<sup>1</sup>, Philadelphia<sup>1</sup>, Pike<sup>1,2</sup>, **Susquehanna**<sup>8</sup>, **Union**<sup>8</sup>, Westmoreland<sup>1</sup>, York<sup>1,8</sup>; **3 Mar**<sup>3</sup> – 30 Jun<sup>1</sup> (**2018**<sup>3</sup>).

*Andrena (Scrapteropsis) morrisonella* Viereck, 1917 (*imitatrix* group) – Allegheny<sup>1,22</sup>, **Lancaster**<sup>8</sup>, **Lycoming**<sup>8</sup>, Philadelphia<sup>1</sup>, **Susquehanna**<sup>8</sup>, York<sup>1,8</sup>; **24 Apr**<sup>8</sup> – Jul<sup>1</sup> (**2014**<sup>8</sup>).

### Subgenus *Simandrena* Pérez

**Revision:** LaBerge (1989).

*Andrena (Simandrena) nasonii* Robertson, 1895<sup>28,36</sup> – **Adams**<sup>3,8</sup>, Allegheny<sup>1,28</sup>, **Armstrong**<sup>6</sup>, Bedford<sup>2</sup>, Blair<sup>2</sup>, Bradford<sup>1,6,8</sup>, **Bucks**<sup>8</sup>, Butler<sup>1</sup>, Centre<sup>1,2,5,7,8</sup>, Chester<sup>1,2,28</sup>, Clinton<sup>1</sup>, **Columbia**<sup>5</sup>, Crawford<sup>1</sup>, Cumberland<sup>1,6,28</sup>, Dauphin<sup>1,6,28</sup>, Delaware<sup>1,2,4,28</sup>, Erie<sup>9</sup>, Franklin<sup>1</sup>, Huntingdon<sup>2,3,8</sup>, **Jefferson**<sup>6</sup>, **Lancaster**<sup>3,8</sup>, **Lycoming**<sup>6,8</sup>, **Mercer**<sup>6</sup>, Monroe<sup>1,4</sup>, Montgomery<sup>1,2,7,28</sup>, **Perry**<sup>6</sup>, Philadelphia<sup>1,2,28</sup>, Pike<sup>1,4</sup>, Potter<sup>28</sup>, **Susquehanna**<sup>8</sup>, **Union**<sup>8</sup>, **Warren**<sup>6</sup>, Washington<sup>6,28</sup>, Westmoreland<sup>1</sup>, York<sup>8,28</sup>; **5 Mar**<sup>3</sup> – **1 Aug**<sup>6</sup> (**2018**<sup>3</sup>).

*Andrena (Simandrena) wheeleri* Graenicher, 1904<sup>28,36</sup> – **Adams**<sup>3</sup>, Centre<sup>1</sup>; **16 Apr**<sup>3</sup> – **10 May**<sup>1</sup> (**2008**<sup>3</sup>).

### Subgenus *Taeniandrena* Hedicke

**Revision:** LaBerge (1989).

*Andrena (Taeniandrena) wilkella* (Kirby, 1802)\* (1912<sup>1</sup>)<sup>36</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1,28</sup>, **Bedford**<sup>6</sup>, Berks<sup>2,28</sup>, **Bradford**<sup>8</sup>, Bucks<sup>1,8,28</sup>, Butler<sup>1</sup>, Centre<sup>1,7,44</sup>, **Chester**<sup>8</sup>, Clarion<sup>28</sup>, Clinton<sup>1</sup>, **Columbia**<sup>5</sup>, Dauphin<sup>1</sup>, Delaware<sup>2</sup>, Erie<sup>1,28</sup>, Franklin<sup>1,28</sup>, Huntingdon<sup>1,2,8</sup>, **Jefferson**<sup>6</sup>, Lackawanna<sup>4</sup>, **Lancaster**<sup>3,5,8</sup>, Mifflin<sup>1</sup>, **Montgomery**<sup>8</sup>, Northampton<sup>6,28</sup>, Perry<sup>1</sup>, Philadelphia<sup>1,28</sup>, Schuylkill<sup>1,2</sup>, **Union**<sup>8</sup>, **Westmoreland**<sup>6</sup>, York<sup>1,8,28</sup>; **21 Apr**<sup>1</sup> – **24–25 Jul**<sup>7</sup> (**2018**<sup>3</sup>).

### Subgenus *Thysandrena* Lanham

**Revision:** LaBerge (1977).

*Andrena (Thysandrena) bisalicis* Viereck, 1908<sup>36</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1,24</sup>, **Armstrong**<sup>6</sup>, Carbon<sup>24</sup>, Centre<sup>1</sup>, Clinton<sup>1,24</sup>, Crawford<sup>2</sup>, Cumberland<sup>1,24</sup>, Dauphin<sup>1,24</sup>, Delaware<sup>1,24</sup>, Eric<sup>9</sup>, Forest<sup>1,24</sup>, Lehigh<sup>1,24</sup>, Montgomery<sup>1,24</sup>, Northampton<sup>24</sup>, Washington<sup>1</sup>, Westmoreland<sup>1,24</sup>; **21 Mar**<sup>3</sup> – **10 Jun**<sup>6</sup> (**2018**<sup>3</sup>).

*Andrena (Thysandrena) w-scripta* Viereck, 1904 – Allegheny<sup>1</sup>, Armstrong<sup>1,24</sup>, **Bedford**<sup>6</sup>, Carbon<sup>24</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,24</sup>, Huntingdon<sup>1</sup>, Lawrence<sup>24</sup>, Lehigh<sup>1,24</sup>, Luzerne<sup>1</sup>, Northampton<sup>24</sup>, Philadelphia<sup>1,2</sup>, Potter, Somerset<sup>1,24</sup>, **York**<sup>8</sup>; **15 Apr**<sup>8</sup> – **28 Aug**<sup>6</sup> (**2015**<sup>8</sup>).

### Subgenus *Trachandrena* Robertson

**Revision:** LaBerge (1973).

*Andrena (Trachandrena) ceanothi* Viereck, 1917 – Adams<sup>1,3</sup>, Allegheny<sup>1,23</sup>, Bedford<sup>2,23</sup>, Carbon<sup>23</sup>, Centre<sup>1,7</sup>, Cumberland<sup>1,23</sup>, Dauphin<sup>1,2</sup>, Franklin<sup>1</sup>, Lehigh<sup>1,23</sup>, Northampton<sup>23</sup>; **23 May**<sup>3</sup> – **28 Jun–1 Jul**<sup>7</sup> (**2017**<sup>7</sup>).

*Andrena (Trachandrena) forbesii* Robertson, 1891<sup>23,36</sup> – **Adams**<sup>3,8</sup>, Allegheny<sup>1</sup>, Armstrong<sup>1</sup>, **Bucks**<sup>8</sup>, Centre<sup>1,5,7,8</sup>, Chester<sup>1</sup>, Crawford<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,6</sup>, Dela-

- ware<sup>1,2</sup>, Franklin<sup>1</sup>, **Huntingdon**<sup>8</sup>, **Lancaster**<sup>3,8</sup>, **Lycoming**<sup>8</sup>, Mifflin<sup>1</sup>, Montgomery<sup>1</sup>, Philadelphia<sup>1</sup>, Pike<sup>1,2</sup>, Union<sup>1,8</sup>, Westmoreland<sup>1</sup>, **York**<sup>8</sup>; **20 Mar**<sup>3</sup> – 14 Jul<sup>1</sup> (**2018**<sup>3</sup>). *Andrena (Trachandrena) heraclei* Robertson, 1897 – **Adams**<sup>3</sup>, **Lancaster**<sup>8</sup>, Philadelphia<sup>1,23</sup>, **York**<sup>8</sup>; **29 Mar**<sup>3</sup> – **21 Jun**<sup>3</sup> (**2018**<sup>3</sup>). *Andrena (Trachandrena) hippotes* Robertson, 1897<sup>23</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, Armstrong<sup>1</sup>, Bedford<sup>2</sup>, Centre<sup>2,3</sup>, Chester<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,2</sup>, Delaware<sup>1,2</sup>, Franklin<sup>1</sup>, **Huntingdon**<sup>8</sup>, **Lancaster**<sup>8</sup>, **Lycoming**<sup>8</sup>, Monroe<sup>1</sup>, Northumberland<sup>1</sup>, Philadelphia<sup>1</sup>, **Union**<sup>8</sup>, Westmoreland<sup>1</sup>, **York**<sup>8</sup>; **5 Mar**<sup>3</sup> – 21 Sep<sup>1</sup> (**2018**<sup>3</sup>). *Andrena (Trachandrena) mariae* Robertson, 1891 – Beaver<sup>1</sup>, Northumberland<sup>1</sup>, Philadelphia<sup>1</sup>; 10 May<sup>1</sup> – 8 Jun<sup>1</sup> (1951<sup>1</sup>). *Andrena (Trachandrena) miranda* Smith, 1879 – Bradford<sup>23</sup>, Crawford<sup>1</sup>, Cumberland<sup>1,23</sup>, Dauphin<sup>1</sup>, Franklin<sup>1</sup>, Montgomery<sup>1</sup>, Philadelphia<sup>1</sup>, York<sup>1</sup>; 28 Apr<sup>1</sup> – 14 Jul<sup>1</sup> (2007<sup>1</sup>). *Andrena (Trachandrena) nuda* Robertson, 1891<sup>36</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1,23</sup>, Bucks<sup>1,2,8</sup>, Chester<sup>1,23</sup>, Crawford<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1,2,23</sup>, **Lancaster**<sup>5</sup>, Philadelphia<sup>1,2,23</sup>, Westmoreland<sup>1</sup>, York<sup>1,8</sup>; **17 Apr**<sup>8</sup> – 25 Jun<sup>1</sup> (**2017**<sup>3</sup>). *Andrena (Trachandrena) rehni* Viereck, 1907 – Allegheny<sup>1,23</sup>, Carbon<sup>23</sup>, Dauphin<sup>1,23</sup>, Delaware<sup>1,23</sup>, Lehigh<sup>1,2,23</sup>, Northampton<sup>23</sup>, Westmoreland<sup>1,23</sup>; 22 Jun<sup>1</sup> – 29 Jul<sup>1</sup> (1910<sup>1</sup>). *Andrena (Trachandrena) rugosa* Robertson, 1891<sup>36</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1,23</sup>, Blair<sup>1,2</sup>, **Bradford**<sup>8</sup>, **Bucks**<sup>8</sup>, Butler<sup>23</sup>, Centre<sup>1,2,3,5,7</sup>, Crawford<sup>1</sup>, Cumberland<sup>1,23</sup>, Dauphin<sup>1,23</sup>, Delaware<sup>1</sup>, Erie<sup>9</sup>, Forest<sup>1,23</sup>, **Franklin**<sup>6</sup>, Lawrence<sup>1,23</sup>, **Lycoming**<sup>8</sup>, Montgomery<sup>1,23</sup>, Philadelphia<sup>1,23</sup>, Pike<sup>1,2,4</sup>, Potter<sup>1,23</sup>, Somerset<sup>23</sup>, **Susquehanna**<sup>8</sup>, Westmoreland<sup>1,23</sup>, York<sup>1</sup>; **20 Mar**<sup>3</sup> – 22 Jun<sup>1</sup> (**2017**<sup>3</sup>). *Andrena (Trachandrena) sigmundi* Cockerell, 1902 – Beaver<sup>23</sup>, Clinton<sup>1,2,23</sup>, Delaware<sup>1</sup>; 25 Apr<sup>2</sup> – 27 Apr<sup>1</sup> (1966<sup>1,2</sup>). *Andrena (Trachandrena) spiraeana* Robertson, 1895<sup>36</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1,23</sup>, Bedford<sup>2,23</sup>, Berks<sup>2</sup>, **Bucks**<sup>8</sup>, Carbon<sup>23</sup>, Centre<sup>1,7,23</sup>, Columbia<sup>1</sup>, Cumberland<sup>1,23</sup>, Dauphin<sup>1,23</sup>, Delaware<sup>1,2,23</sup>, Forest<sup>1</sup>, Huntingdon<sup>1</sup>, Lancaster<sup>1</sup>, Lehigh<sup>1,23</sup>, Montgomery<sup>23</sup>, Northampton<sup>23</sup>, Philadelphia<sup>1,23</sup>, **Union**<sup>8</sup>, **Washington**<sup>6</sup>, Westmoreland<sup>1,23</sup>, York<sup>1,8</sup>; **30 Apr**<sup>8</sup> – 13 Jul<sup>1</sup> (**2017**<sup>7</sup>). *Andrena (Trachandrena) virginiana* Mitchell, 1960 – Bradford<sup>23</sup>, Centre<sup>1,5,7</sup>, Cumberland<sup>1,23</sup>, **Lackawanna**<sup>4</sup>, **Lancaster**<sup>5</sup>, Lehigh<sup>1</sup>; **25 Apr**<sup>5</sup> – **16–17 Aug**<sup>7</sup> (**2017**<sup>7</sup>).

## Subgenus *Tylandrena* LaBerge

**Revision:** LaBerge and Bouseman (1970).

- Andrena (Tylandrena) erythrogaster* (Ashmead, 1890)<sup>29</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Northumberland<sup>1</sup>, Philadelphia<sup>1</sup>, Potter<sup>1</sup>, Sullivan<sup>1</sup>; **1 May**<sup>3</sup> – 7 Jun<sup>1</sup> (**2014**<sup>3</sup>). *Andrena (Tylandrena) perplexa* Smith, 1853<sup>36</sup> – **Adams**<sup>3,8</sup>, Allegheny<sup>1</sup>, **Bradford**<sup>8</sup>, **Bucks**<sup>6,8</sup>, Centre<sup>1,6</sup>, Cumberland<sup>1</sup>, Delaware<sup>1,2,4,29</sup>, Erie<sup>9</sup>, Fayette<sup>1,29</sup>, **Huntingdon**<sup>8</sup>,

Indiana<sup>1</sup>, **Jefferson**<sup>6</sup>, Lackawanna<sup>1</sup>, Lancaster<sup>1,2,5</sup>, **Lycoming**<sup>8</sup>, Monroe<sup>1</sup>, Montgomery<sup>29</sup>, Perry<sup>1,29</sup>, Philadelphia<sup>1,4,29</sup>, **Susquehanna**<sup>8</sup>, Westmoreland<sup>1,29</sup>, York<sup>1,8,29</sup>; 5 Mar<sup>1</sup> – 7 Jul<sup>6</sup> (**2018**<sup>3</sup>).  
*Andrena* (*Tylandrena*) *wilmattae* Cockerell, 1906 – Allegheny<sup>1,29</sup>, Union<sup>1,29</sup>; 19 May<sup>1</sup> – 2 Jul<sup>1</sup> (1910<sup>1</sup>).

### Subgenus *Xiphandrena* LaBerge

**Revision:** LaBerge (1971). Monotypic.

*Andrena* (*Xiphandrena*) *mendica* Mitchell, 1960 – Allegheny<sup>1</sup>; 15 Jun<sup>1</sup> (1937<sup>1</sup>).

## Panurginae

### Calliopsini

#### Genus *Calliopsis* Smith

**Taxonomy:** Mitchell (1960); Shinn (1967).

#### Subgenus *Calliopsis* Smith s. s.

*Calliopsis* (*Calliopsis*) *andreniformis* Smith, 1853<sup>36,43</sup> – Adams<sup>1,3,6,8</sup>, **Bedford**<sup>6</sup>, **Berks**<sup>6</sup>, **Blair**<sup>6</sup>, Bradford<sup>1,8</sup>, Bucks<sup>1,8</sup>, **Cambria**<sup>6</sup>, Centre<sup>1,6,7,8,15</sup>, **Chester**<sup>6,8</sup>, **Clarion**<sup>6</sup>, **Clearfield**<sup>6</sup>, Crawford<sup>1,4,6</sup>, Cumberland, Dauphin<sup>1,6</sup>, Delaware<sup>1,4</sup>, Erie<sup>1,9</sup>, Franklin<sup>1,6</sup>, Fulton<sup>44</sup>, Huntingdon<sup>2,8</sup>, Jefferson<sup>2,6</sup>, Lackawanna, Lancaster<sup>3,6,8,15</sup>, Lehigh<sup>1,6</sup>, **Lycoming**<sup>8</sup>, Monroe<sup>6</sup>, **Montgomery**<sup>8</sup>, Perry<sup>6</sup>, Pike<sup>1,4</sup>, **Somerset**<sup>6</sup>, **Union**<sup>8</sup>, **Warren**<sup>6</sup>, Westmoreland<sup>1,6</sup>, York<sup>1,6,8</sup>; 12 May<sup>6</sup> – 13 Oct<sup>3</sup> (**2018**<sup>3</sup>).

## Perditini

#### Genus *Perdita* Smith

**Taxonomy:** Mitchell (1960); Timberlake (1954, 1958, 1960, 1968).

#### Subgenus *Perdita* Smith s. s.

**Taxonomy:** Timberlake (1958, 1960, 1968).

*Perdita* (*Perdita*) *halictoides* (*halictoides* group) Smith, 1853 – Union<sup>8</sup>; 15 Jun<sup>8</sup> (**2014**<sup>8</sup>).

*Perdita* (*Perdita*) *octomaculata* (Say, 1824) (*octomaculata* group) – Philadelphia<sup>1</sup>; 15 Sep<sup>1</sup> (1901<sup>1</sup>).

## Protandrenini

### Genus *Protandrena* Cockerell

**Taxonomy:** Mitchell (1960); Timberlake (1967, 1973, 1976); see also Scott et al. (2011).

#### Subgenus *Heterosarus* Robertson

*Protandrena (Heterosarus) parvus* (Robertson, 1892) – Cumberland<sup>47</sup>; dates and year not reported<sup>47</sup>.

*Protandrena (Heterosarus) pauper* (Cresson, 1878)<sup>47</sup> – Lehigh<sup>1</sup>; 29 Jun<sup>1</sup> – 12 Jul<sup>1</sup> (1901<sup>1</sup>).

#### Subgenus *Metapsaenythia* Timberlake

*Protandrena (Metapsaenythia) abdominalis* (Cresson, 1878)<sup>36</sup> – locations, dates, and year not reported<sup>1</sup>.

#### Subgenus *Pterosarus* Timberlake

*Protandrena (Pterosarus) aestivalis* (Provancher, 1882) – Pike<sup>48</sup>; 22 Aug<sup>48</sup> (1895<sup>48</sup>) (AMNH\_BEE00237743).

*Protandrena (Pterosarus) andrenoides* (Smith, 1853) – Adams<sup>3</sup>, Centre<sup>15</sup>; 18 Sep<sup>3</sup> (2010<sup>3</sup>).

*Protandrena (Pterosarus) compositarum* (Robertson, 1893) – Adams<sup>3</sup>, Chester<sup>1</sup>; 16 Jun<sup>3</sup> – 18 Oct<sup>3</sup> (2015<sup>3</sup>).

## Halictidae

### Halictinae

#### Augochlorini

##### Genus *Augochlora* Smith

###### Subgenus *Augochlora* Smith s. s.

*Augochlora (Augochlora) pura pura* (Say, 1837)<sup>36</sup> – Adams<sup>1,3,6</sup>, Allegheny<sup>1</sup>, Armstrong<sup>1</sup>, Beaver<sup>1,44</sup>, Bedford<sup>6</sup>, Berks<sup>1,2,6</sup>, Blair<sup>6</sup>, Bradford<sup>1,6,8</sup>, Bucks<sup>6,8</sup>, Butler<sup>1</sup>, Carbon<sup>6</sup>, Centre<sup>1,6,7,8,15,44</sup>, Chester<sup>1,6,8</sup>, Clarion<sup>6</sup>, Clearfield<sup>1,4,6</sup>, Clinton<sup>1,6</sup>, Columbia<sup>2,5</sup>, Crawford<sup>1,6</sup>, Cumberland<sup>1,6</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1,4</sup>, Elk<sup>1</sup>, Erie<sup>1,6,9</sup>, Fayette<sup>1</sup>, Forest<sup>1</sup>, Franklin<sup>6</sup>, Fulton<sup>44</sup>, Huntingdon<sup>1,2,3,8</sup>, Indiana<sup>1,6</sup>, Jefferson<sup>1,6</sup>, Juniata<sup>1,3,6,44</sup>, Lackawanna<sup>1,4,6</sup>, Lancaster<sup>1,3,5,6,8,15,44</sup>, Lawrence<sup>1</sup>, Lebanon<sup>1,4,6</sup>, Lehigh<sup>1,6</sup>, Luzerne<sup>2</sup>, Lycoming<sup>8</sup>, McKean<sup>1,4</sup>, Monroe<sup>6</sup>, Montgomery<sup>1,6,7,8,44</sup>, Northampton<sup>6</sup>, Perry<sup>1,6</sup>, Philadelphia<sup>1,2</sup>, Pike<sup>1,4</sup>, Schuylkill<sup>1,2</sup>, Somerset<sup>1,6</sup>, Sullivan<sup>1</sup>, Susquehanna<sup>8</sup>, Tioga<sup>1</sup>, Union<sup>8</sup>, Venango<sup>6</sup>, Washington<sup>1</sup>, Westmoreland<sup>1,6</sup>, York<sup>1,4,6,8</sup>; 13 Jan<sup>1</sup> – 14 Nov<sup>1</sup> (2018<sup>3</sup>).

## Genus *Augochlorella* Sandhouse

**Taxonomy:** Coelho (2004); Mitchell (1960); Ordway (1966).

*Augochlorella aurata* (Smith, 1853) (*aurata* group)<sup>36</sup> – Adams<sup>1,3,8</sup>, Allegheny<sup>1</sup>, **Armstrong**<sup>6</sup>, Beaver<sup>44</sup>, **Bedford**<sup>6</sup>, Berks<sup>1,2,6</sup>, **Blair**<sup>6</sup>, Bradford<sup>1,6,8</sup>, Bucks<sup>1,8</sup>, Butler<sup>1</sup>, Cambria<sup>1,4,6</sup>, **Cameron**<sup>6</sup>, Carbon<sup>1</sup>, Centre<sup>1,3,6,7,8,15,44</sup>, Chester<sup>1,6,8</sup>, **Clarion**<sup>6</sup>, **Clearfield**<sup>6</sup>, Clinton<sup>1</sup>, Columbia<sup>1,2,5</sup>, Crawford<sup>1,4,6</sup>, Cumberland<sup>1,6</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1,4</sup>, Erie<sup>1,6,9</sup>, Fayette<sup>1</sup>, Franklin<sup>1,6</sup>, Huntingdon<sup>1,3,6,8</sup>, **Indiana**<sup>6</sup>, **Jefferson**<sup>6</sup>, Juniata<sup>6</sup>, **Lackawanna**<sup>4</sup>, Lancaster<sup>1,3,5,8,15,44</sup>, **Lebanon**<sup>4</sup>, Lehigh<sup>1,6</sup>, Luzerne<sup>1,2</sup>, **Lycoming**<sup>8</sup>, Monroe<sup>1,4</sup>, Montgomery<sup>1,4,7,8</sup>, **Montour**<sup>6</sup>, **Northampton**<sup>6</sup>, Northumberland<sup>1</sup>, Perry<sup>1,6</sup>, Philadelphia<sup>1,40</sup>, Pike<sup>1,4</sup>, **Schuylkill**<sup>4</sup>, Somerset<sup>1,6</sup>, Sullivan<sup>1</sup>, **Susquehanna**<sup>8</sup>, Tioga<sup>1</sup>, Union<sup>1,8</sup>, Venango<sup>1</sup>, **Warren**<sup>6</sup>, Washington<sup>1</sup>, Westmoreland<sup>1</sup>, York<sup>1,6,8</sup>; Feb<sup>1</sup> – 5 Nov<sup>2</sup> (2018<sup>3</sup>).

*Augochlorella persimilis* (Viereck, 1910) (*aurata* group) – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, Bucks<sup>1</sup>, **Clinton**<sup>6</sup>, Delaware<sup>1,40</sup>, Huntingdon<sup>8</sup>, Jefferson<sup>6</sup>, Lehigh<sup>6</sup>; 29 May<sup>6</sup> – 15 Sep<sup>3</sup> (2016<sup>3</sup>).

## Genus *Augochloropsis* Cockerell

**Taxonomy:** Mitchell (1960).

### Subgenus *Paraugochloropsis* Schrottky

*Augochloropsis* (*Paraugochloropsis*) *metallica* sensu lato (Fabricius, 1793) – **Adams**<sup>3</sup>, **Armstrong**<sup>6</sup>, Beaver<sup>1</sup>, **Bradford**<sup>6</sup>, **Bucks**<sup>8</sup>, Centre<sup>1,7,15</sup>, Chester<sup>1,8</sup>, Clinton<sup>1,6</sup>, **Columbia**<sup>5</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1,4</sup>, Elk<sup>1</sup>, **Franklin**<sup>6</sup>, Huntingdon<sup>1,2,3,8</sup>, Lackawanna<sup>2</sup>, Lebanon<sup>1</sup>, Lehigh<sup>1</sup>, Luzerne<sup>1</sup>, **Lycoming**<sup>6</sup>, Monroe<sup>1</sup>, **Montgomery**<sup>8</sup>, **Northampton**<sup>6</sup>, Perry<sup>1</sup>, Philadelphia<sup>1</sup>, Pike<sup>1</sup>, **Union**<sup>8</sup>, York<sup>1,6</sup>; 17 Apr<sup>3</sup> – 21 Oct<sup>3</sup> (2017<sup>3</sup>).

**Notes.** We can not rule out the possibility that the nominotypical subspecies of *A. metallica* does not occur in Pennsylvania. Thus, we present records for specimens not identified to the subspecies level here.

*Augochloropsis* (*Paraugochloropsis*) *metallica* (Fabricius, 1793) *fulgida* (Smith, 1853) – Centre<sup>7</sup>, Erie<sup>9</sup>; 18–20 May<sup>9</sup> – 16–17 Aug<sup>7</sup> (2017<sup>7</sup>).

*Augochloropsis* (*Paraugochloropsis*) *sumptuosa* (Smith, 1853) – Chester<sup>1</sup>, **Clinton**<sup>6</sup>, Dauphin<sup>1</sup>, Elk<sup>6</sup>, Juniata<sup>6</sup>; 16 Apr<sup>1</sup> – 2 Jul<sup>6</sup> (2008<sup>6</sup>).

## Halictini s. l.

### Genus *Agapostemon* Guerin-Meneville

**Taxonomy:** Mitchell (1960); Roberts (1972).

### Subgenus *Agapostemon* Guerin-Meneville s. s.

*Agapostemon (Agapostemon) sericeus* (Förster, 1771) (*sericeus* group)<sup>42</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, Armstrong<sup>1,6</sup>, Beaver<sup>1</sup>, **Bradford**<sup>8</sup>, Bucks<sup>1,8</sup>, Centre<sup>1,15,44</sup>, Columbia<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1</sup>, Elk<sup>1</sup>, Erie<sup>1,6</sup>, Fayette<sup>1</sup>, Huntingdon<sup>1,2,3</sup>, **Lancaster**<sup>3,8</sup>, Lehigh<sup>1</sup>, **Lycoming**<sup>8</sup>, Monroe<sup>1</sup>, Montgomery<sup>1,8,44</sup>, Northumberland<sup>1</sup>, Perry<sup>1</sup>, Philadelphia<sup>1,4</sup>, Somerset<sup>1</sup>, Union<sup>1,8</sup>, **Warren**<sup>6</sup>, Washington<sup>1</sup>, York<sup>1</sup>; 1 Apr<sup>1</sup> – 30 Oct<sup>1</sup> (2015<sup>8</sup>).

*Agapostemon (Agapostemon) splendens* (Lepeletier, 1841) (*splendens* group)<sup>42</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, Centre<sup>1</sup>, Crawford<sup>1</sup>, Delaware<sup>1</sup>, Erie<sup>1</sup>, Fulton<sup>44</sup>, Philadelphia<sup>1</sup>; 5 Jul<sup>3</sup> – 29 Aug<sup>3</sup> (2012<sup>3</sup>).

*Agapostemon (Agapostemon) texanus* Cresson, 1872 (*splendens* group)<sup>42</sup> – Adams<sup>1,3,8</sup>, Allegheny<sup>1</sup>, Armstrong<sup>1,6</sup>, **Bedford**<sup>6</sup>, **Bucks**<sup>8</sup>, Centre<sup>1</sup>, **Chester**<sup>6</sup>, Cumberland<sup>1</sup>, **Dauphin**<sup>6</sup>, Delaware<sup>1,4</sup>, Erie<sup>1,6</sup>, **Franklin**<sup>6</sup>, **Huntingdon**<sup>8</sup>, **Lancaster**<sup>3,8</sup>, Lehigh<sup>1</sup>, **Lycoming**<sup>8</sup>, **Montgomery**<sup>8</sup>, **Northampton**<sup>6</sup>, Northumberland<sup>1</sup>, Philadelphia<sup>1,4</sup>, Pike<sup>1,4</sup>, **Schuylkill**<sup>6</sup>, Union<sup>8</sup>, Westmoreland<sup>1</sup>, **York**<sup>6,8</sup>; 5 Apr<sup>3</sup> – 26 Oct<sup>3</sup> (2018<sup>3</sup>).

*Agapostemon (Agapostemon) virescens* (Fabricius, 1775) (*splendens* group)<sup>42,36</sup> – Adams<sup>1,3,8</sup>, Allegheny<sup>1</sup>, **Armstrong**<sup>6</sup>, Beaver<sup>1</sup>, **Bedford**<sup>6</sup>, Berks<sup>1,2</sup>, **Bradford**<sup>8</sup>, Bucks<sup>1,8</sup>, Butler<sup>1</sup>, **Cambria**<sup>6</sup>, Centre<sup>1,6,8,15,44</sup>, **Chester**<sup>6,8</sup>, **Clarion**<sup>6</sup>, Clearfield<sup>1,6</sup>, Clinton<sup>1,6</sup>, Columbia<sup>1,2,5</sup>, Crawford<sup>1,4</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,2,6</sup>, Delaware<sup>1,4</sup>, **Elk**<sup>6</sup>, Erie<sup>1,6,9</sup>, Fulton<sup>44</sup>, Greene<sup>1</sup>, Huntingdon<sup>1,2,8</sup>, **Jefferson**<sup>6</sup>, **Juniata**<sup>6</sup>, **Lackawanna**<sup>4,6</sup>, Lancaster<sup>1,3,4,5,6,8,15</sup>, Lehigh<sup>1,6</sup>, Luzerne<sup>1</sup>, **Lycoming**<sup>8</sup>, **McKean**<sup>6</sup>, Mifflin<sup>1</sup>, Montgomery<sup>1,7,8</sup>, **Montour**<sup>6</sup>, Northampton<sup>1</sup>, Perry<sup>1,6</sup>, Philadelphia<sup>1</sup>, Pike<sup>1,4</sup>, **Somerset**<sup>6</sup>, Sullivan<sup>1</sup>, Tioga<sup>1</sup>, **Union**<sup>8</sup>, **Warren**<sup>6</sup>, Washington<sup>1,6</sup>, Westmoreland<sup>1,4,6</sup>, York<sup>1,6,8</sup>; 22 Mar<sup>1</sup> – 26 Oct<sup>3</sup> (2018<sup>3</sup>).

### Genus *Halictus* Latreille

**Revision:** Mitchell (1960); Sandhouse (1941).

### Subgenus *Nealictus* Pesenko

*Halictus (Nealictus) parallelus* Say, 1837 – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, **Armstrong**<sup>6</sup>, **Bedford**<sup>6</sup>, **Bradford**<sup>6</sup>, Bucks<sup>8</sup>, Clarion<sup>6</sup>, Crawford<sup>6</sup>, Dauphin<sup>6</sup>, Erie<sup>6</sup>, Juniata<sup>6</sup>, Lancaster<sup>3</sup>, Philadelphia<sup>1</sup>, Somerset<sup>6</sup>, Warren<sup>6</sup>, Wayne<sup>1</sup>, Westmoreland<sup>6</sup>; 30 Apr<sup>8</sup> – 20 Aug<sup>6</sup> (2013<sup>3</sup>).

### Subgenus *Odontalictus* Robertson

*Halictus (Odontalictus) ligatus* Say, 1837<sup>36</sup> – Adams<sup>1,3,6,8</sup>, Allegheny<sup>1,6</sup>, Beaver<sup>1,44</sup>, **Bedford**<sup>6</sup>, Berks<sup>2,6</sup>, **Blair**<sup>6</sup>, Bradford<sup>1,4,6,8</sup>, Bucks<sup>1,6,8</sup>, Butler<sup>1</sup>, Carbon<sup>1,6</sup>, Centre<sup>1,3,5,6,7,8,15,44</sup>, **Chester**<sup>6,8</sup>, **Clarion**<sup>6</sup>, Clearfield<sup>1,4</sup>, Clinton<sup>1,6</sup>, Columbia<sup>2,5</sup>, Crawford<sup>1,6</sup>, Cumberland<sup>1,6</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1,4</sup>, **Elk**<sup>6</sup>, Erie<sup>6,9</sup>, Forest<sup>1</sup>, **Franklin**<sup>6</sup>, Fulton<sup>44</sup>, Hunt-

ingdon<sup>1,2,8</sup>, Jefferson<sup>2,6</sup>, Juniata<sup>1,6,44</sup>, **Lackawanna**<sup>4,6</sup>, Lancaster<sup>1,2,3,4,5,6,8,15</sup>, **Lebanon**<sup>4</sup>, Lehigh<sup>1,6</sup>, Luzerne<sup>1,2</sup>, Lycoming<sup>1,8</sup>, McKean<sup>6</sup>, Monroe<sup>1,2,6</sup>, Montgomery<sup>1,7,8</sup>, **Northampton**<sup>6</sup>, Northumberland<sup>1</sup>, Perry<sup>1,4,6</sup>, Philadelphia<sup>1,4</sup>, Pike<sup>1,4</sup>, Schuylkill<sup>4,6</sup>, Snyder<sup>4</sup>, Somerset<sup>6</sup>, Sullivan<sup>4</sup>, Tioga<sup>1</sup>, **Union**<sup>8</sup>, Warren<sup>6</sup>, Washington<sup>6</sup>, York<sup>4,6,8</sup>; 11 Apr<sup>3</sup> – 25 Oct<sup>3</sup> (2018<sup>3</sup>).

### Subgenus *Protohalictus* Pesenko

*Halictus (Protohalictus) rubicundus* (Christ, 1791)<sup>36</sup> – Adams<sup>1,3,8</sup>, Allegheny<sup>1</sup>, **Strong**<sup>6</sup>, Beaver<sup>44</sup>, **Bedford**<sup>6</sup>, Berks<sup>2,6</sup>, **Bradford**<sup>8</sup>, Bucks<sup>1,8</sup>, Butler<sup>1</sup>, **Cambria**<sup>6</sup>, Centre<sup>1,5,7,15,44</sup>, **Chester**<sup>6,8</sup>, **Clarion**<sup>6</sup>, Clinton<sup>1</sup>, **Columbia**<sup>5</sup>, Cumberland<sup>1,6</sup>, Dauphin<sup>1,4,6</sup>, Delaware<sup>1,4</sup>, Erie<sup>9</sup>, Forest<sup>1</sup>, Franklin<sup>1</sup>, Fulton<sup>44</sup>, **Huntingdon**<sup>3,8</sup>, **Jefferson**<sup>6</sup>, Juniata<sup>6</sup>, Lancaster<sup>3,5,8,15</sup>, Lehigh<sup>1</sup>, Luzerne<sup>1</sup>, **Lycoming**<sup>8</sup>, Monroe<sup>1,2</sup>, Montgomery<sup>1,7,8</sup>, **Northampton**<sup>6</sup>, Northumberland<sup>1</sup>, Perry<sup>1,6</sup>, Philadelphia<sup>1</sup>, **Somerset**<sup>6</sup>, Susquehanna<sup>1</sup>, Tioga<sup>1,4</sup>, **Union**<sup>8</sup>, Warren<sup>6</sup>, Westmoreland<sup>1</sup>, **York**<sup>8</sup>; 13 Apr<sup>1</sup> – 16 Oct<sup>3</sup> (2018<sup>3</sup>).

### Subgenus *Seladonia* Robertson

*Halictus (Seladonia) confusus confusus* Smith, 1853<sup>36</sup> – Adams<sup>1,3,6,8</sup>, Allegheny<sup>1</sup>, Beaver<sup>44</sup>, **Bedford**<sup>6</sup>, **Berks**<sup>6</sup>, Bradford<sup>1,6,8</sup>, Bucks<sup>1,4,6,8</sup>, Cambria<sup>1,4</sup>, Carbon<sup>1</sup>, Centre<sup>1,5,6,7,8,15,44</sup>, **Chester**<sup>8</sup>, Clinton<sup>1</sup>, **Columbia**<sup>5</sup>, Crawford<sup>1,4</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1,4</sup>, Erie<sup>1,6,9</sup>, Huntingdon<sup>2,3,8</sup>, Jefferson<sup>2,6</sup>, Juniata<sup>6,44</sup>, **Lackawanna**<sup>4</sup>, Lancaster<sup>1,2,3,8,15</sup>, Lehigh<sup>1,6</sup>, **Lycoming**<sup>8</sup>, **McKean**<sup>6</sup>, Monroe<sup>1</sup>, Montgomery<sup>1,8</sup>, Northumberland<sup>1</sup>, Perry<sup>1</sup>, Philadelphia<sup>1,4</sup>, Pike<sup>1,4</sup>, **Somerset**<sup>6</sup>, Sullivan<sup>1</sup>, Susquehanna<sup>1</sup>, Tioga<sup>1</sup>, **Union**<sup>8</sup>, Wayne<sup>1</sup>, Westmoreland<sup>1,4,6</sup>, York<sup>1,6,8</sup>; 2 Apr<sup>6</sup> – 5 Nov<sup>1</sup> (2017<sup>3,7</sup>).

### Subgenus *Vestitohalictus* Blüthgen

*Halictus (Vestitohalictus) tectus* Radoszkowski, 1876\* (2005<sup>1,4</sup>) – Philadelphia<sup>1,4</sup>, **Somerset**<sup>6</sup>; 1 Aug<sup>6</sup> – 24 Aug<sup>1,4</sup> (2008<sup>6</sup>).

### Genus *Lasioglossum* Curtis

**Taxonomy:** Gibbs (2010, 2011, 2012); Gibbs et al. (2013); Knerer and Atwood (1964); McGinley (McGinley 1986, 2003); Mitchell (1960).

### Subgenus *Dialictus* Robertson

**Taxonomy:** Gibbs (2010, 2011, 2012); Mitchell (1960).

*Lasioglossum (Dialictus) abanci* (Crawford, 1932) (*viridatum* group) – **Adams**<sup>3</sup>, Bradford<sup>1,8</sup>, Carbon<sup>1</sup>, Centre<sup>7,8</sup>, Franklin<sup>1</sup>, **Huntingdon**<sup>8</sup>, **Lancaster**<sup>8</sup>, Lehigh<sup>1</sup>, **Lycoming**<sup>8</sup>, Perry<sup>1</sup>, **Union**<sup>8</sup>; 23 Apr<sup>8</sup> – 24 Aug<sup>8</sup> (2017<sup>3</sup>).

*Lasioglossum (Dialictus) admirandum* (Sandhouse, 1924) (*viridatum* group)<sup>36</sup> – Adams<sup>1,3,8</sup>, Beaver<sup>44</sup>, Bradford<sup>1,8</sup>, **Bucks<sup>8</sup>**, Centre<sup>1,15,44</sup>, Chester<sup>1,8</sup>, Clearfield<sup>1</sup>, Clinton<sup>1</sup>, Crawford<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1</sup>, Erie<sup>9</sup>, Franklin<sup>1</sup>, Fulton<sup>44</sup>, **Huntingdon<sup>3</sup>**, Juniata<sup>1</sup>, Lancaster<sup>1,3,8,44</sup>, Lehigh<sup>1</sup>, Luzerne<sup>1</sup>, Mifflin<sup>1</sup>, **Montgomery<sup>8</sup>**, Perry<sup>1</sup>, Philadelphia<sup>1</sup>, Pike<sup>1</sup>, Sullivan<sup>1</sup>, Westmoreland<sup>1</sup>, York<sup>1,8</sup>; **2 Apr<sup>3</sup> – 21 Oct<sup>3</sup> (2017<sup>3</sup>)**.

*Lasioglossum (Dialictus) albipenne* (Robertson, 1890)<sup>36</sup> – **Adams<sup>3</sup>**, **Bucks<sup>8</sup>**, **Centre<sup>7</sup>**, Clinton<sup>1</sup>, **Columbia<sup>5</sup>**, **Crawford<sup>4</sup>**, Delaware<sup>1</sup>, **Lancaster<sup>8</sup>**, Lehigh<sup>1</sup>, Luzerne<sup>1</sup>, Montgomery<sup>1</sup>; **5 May<sup>1</sup> – 19–20 Aug<sup>4</sup> (2017)**.

*Lasioglossum (Dialictus) anomalum* (Robertson, 1892) – **Adams<sup>3</sup>**, **Bucks<sup>8</sup>**, **Lycoming<sup>8</sup>**, Pike<sup>1</sup>; **28 Apr<sup>8</sup> – 15 Sep<sup>3</sup> (2016<sup>3</sup>)**.

*Lasioglossum (Dialictus) apocyni* (Mitchell, 1960) (*viridatum* group) – Centre<sup>7</sup>, **Montgomery<sup>7</sup>**, Westmoreland<sup>4</sup>; **31 May–1 Jun<sup>7</sup> – 16–17 Aug<sup>7</sup> (2017<sup>7</sup>)**.

*Lasioglossum (Dialictus) atwoodi* Gibbs 2010 (*viridatum* group) – locations, dates, and year not reported<sup>18</sup>.

*Lasioglossum (Dialictus) bruneri* (Crawford, 1902)<sup>36</sup> – **Adams<sup>3</sup>**, **Bucks<sup>8</sup>**, **Centre<sup>8</sup>**, **Columbia<sup>5</sup>**, Dauphin<sup>1</sup>, **Delaware<sup>4</sup>**, Erie<sup>9</sup>, **Huntingdon<sup>8</sup>**, **Lycoming<sup>8</sup>**, Philadelphia<sup>1,4</sup>, York<sup>8</sup>; **24 Apr<sup>8</sup> – 21 Sep<sup>3</sup> (2017<sup>3</sup>)**.

*Lasioglossum (Dialictus) callidum* (Sandhouse, 1924) – **Adams<sup>3</sup>**, Centre<sup>5</sup>, Chester<sup>8</sup>, Delaware<sup>4</sup>, Lancaster<sup>3,5</sup>, Montgomery<sup>8</sup>; **13 Apr<sup>3</sup> – 26 Oct<sup>3</sup> (2018<sup>3</sup>)**. Notes. Older records for *L. versatum*, especially pre-2010 determinations, may be attributable to *L. callidum* (see Gibbs 2010).

*Lasioglossum (Dialictus) cattellae* (Ellis, 1913) – **Adams<sup>3</sup>**, **Bucks<sup>8</sup>**; **17 Apr<sup>8</sup> – 1 Aug<sup>8</sup> (2008<sup>8</sup>)**.

*Lasioglossum (Dialictus) cephalotes* (Dalla Torre, 1896) (*cephalotes* group) – locations, dates, and year not reported<sup>36</sup>.

*Lasioglossum (Dialictus) coeruleum* (Robertson, 1893)<sup>36</sup> – **Adams<sup>3</sup>**, Bradford<sup>1</sup>, **Bucks<sup>8</sup>**, Butler<sup>1</sup>, Centre<sup>1,15,44</sup>, Clinton<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1,4</sup>, Erie<sup>9</sup>, Fulton<sup>44</sup>, **Huntingdon<sup>8</sup>**, **Jefferson<sup>6</sup>**, **Lancaster<sup>3</sup>**, Lehigh<sup>1</sup>, **Lycoming<sup>8</sup>**, Monroe<sup>1</sup>, Montgomery<sup>1,7</sup>, Perry<sup>1</sup>, Philadelphia<sup>1</sup>, **Susquehanna<sup>8</sup>**, **Union<sup>8</sup>**, York<sup>8</sup>; **17 Apr<sup>1</sup> – 4 Sep<sup>1</sup> (2017<sup>7</sup>)**.

*Lasioglossum (Dialictus) coreopsis* (Robertson, 1902) – **Adams<sup>3</sup>**, **Bradford<sup>8</sup>**, **Bucks<sup>8</sup>**, Pike<sup>1,4</sup>; **30 May<sup>1,4</sup> – 18 Sep<sup>8</sup> (2015<sup>3</sup>)**.

*Lasioglossum (Dialictus) cressonii* (Robertson, 1890)<sup>18,36</sup> – **Adams<sup>3</sup>**, Allegheny<sup>1</sup>, Bradford<sup>1,8</sup>, **Bucks<sup>8</sup>**, Centre<sup>1,7,8</sup>, **Chester<sup>8</sup>**, Clinton<sup>1</sup>, Crawford<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1,4</sup>, Erie<sup>9</sup>, Fulton<sup>1</sup>, Huntingdon<sup>1,2,8</sup>, Indiana<sup>1</sup>, Lackawanna<sup>1</sup>, **Lancaster<sup>8</sup>**, **Lebanon<sup>4</sup>**, Lehigh<sup>1</sup>, **Lycoming<sup>8</sup>**, Monroe<sup>1</sup>, **Montgomery<sup>8</sup>**, Perry<sup>1</sup>, Philadelphia<sup>1</sup>, Pike<sup>1</sup>, **Susquehanna<sup>8</sup>**, **Union<sup>8</sup>**, Washington<sup>1</sup>, York<sup>8</sup>; **15 Apr<sup>8</sup> – 23 Oct<sup>3</sup> (2017<sup>3,7</sup>)**.

*Lasioglossum (Dialictus) dreisbachi* (Mitchell, 1960) – Centre<sup>53</sup>; **28 Sep<sup>53</sup> (2018<sup>53</sup>)**.

*Lasioglossum (Dialictus) ellisiae* (Sandhouse, 1924) (*tegulare* group)<sup>18</sup> – **Bucks<sup>8</sup>**, Carbon<sup>17</sup>, Lehigh<sup>17</sup>, Erie<sup>9</sup>, Monroe<sup>17</sup>, **Montgomery<sup>8</sup>**, Northampton<sup>17</sup>, Somerset<sup>17</sup>, **Union<sup>8</sup>**; **9–11 Jun<sup>9</sup> – 19 Aug<sup>8</sup> (2016<sup>9</sup>)**. Notes. Older records for *L. tegulare*,

especially pre-2009 determinations, may be attributable to *L. ellisiae* (see Gibbs 2009).

*Lasioglossum (Dialictus) ephialtum* Gibbs, 2010 (*viridatum* group)<sup>18</sup> – **Adams<sup>3</sup>, Bradford<sup>8</sup>, Bucks<sup>8</sup>, Centre<sup>5,7,8</sup>, Erie<sup>9</sup>, Huntingdon<sup>8</sup>, Lancaster<sup>8</sup>, Lycoming<sup>8</sup>, Montgomery<sup>4,7,8</sup>**, Philadelphia<sup>17</sup>, **Union<sup>8</sup>, York<sup>8</sup>; 15 Apr<sup>8</sup> – 9 Oct<sup>3</sup> (2017<sup>3,7</sup>)**.

*Lasioglossum (Dialictus) georgeickworti* Gibbs, 2011 (*viridatum* group) – **Lancaster<sup>8</sup>, Lycoming<sup>8</sup>, Montgomery<sup>8</sup>, York<sup>8</sup>; 11 Jun<sup>8</sup> – 24 Jul<sup>8</sup> (2015<sup>8</sup>)**.

*Lasioglossum (Dialictus) gotham* Gibbs, 2011 – **Adams<sup>3</sup>, Bucks<sup>8,18</sup>, Centre<sup>8</sup>, Columbia<sup>5</sup>, Erie<sup>9</sup>, Huntingdon<sup>2,8,18</sup>, Lancaster<sup>3,5</sup>, Lycoming<sup>8</sup>, Union<sup>8</sup>, York<sup>8</sup>; 21 Mar<sup>3</sup> – 26 Sep<sup>3</sup> (2017<sup>3</sup>)**.

*Lasioglossum (Dialictus) heterognathus* (Mitchell, 1960)<sup>18,36</sup> – **Centre<sup>1,7,8,36</sup>, Cumberland<sup>1</sup>, Huntingdon<sup>8</sup>, Lehigh<sup>1</sup>, Luzerne<sup>1</sup>, Lycoming<sup>8</sup>, Union<sup>8</sup>; 28 Apr<sup>1,8</sup> – 28 Sep<sup>8</sup> (2017<sup>7</sup>)**.

*Lasioglossum (Dialictus) hitchensi* Gibbs, 2012<sup>18</sup> – **Adams<sup>3,8</sup>, Bradford<sup>8</sup>, Bucks<sup>8</sup>, Centre<sup>5,7,8</sup>, Chester<sup>8</sup>, Columbia<sup>5</sup>, Delaware<sup>4</sup>, Erie<sup>9</sup>, Huntingdon<sup>8</sup>, Lancaster<sup>3,5,8</sup>, Lehigh<sup>1</sup>, Lycoming<sup>8</sup>, Montgomery<sup>4,8</sup>, Perry<sup>1</sup>, Tioga<sup>4</sup>, Union<sup>8</sup>, York<sup>8</sup>; 2 Apr<sup>3</sup> – 26 Oct<sup>3</sup> (2018<sup>3</sup>)**.

*Lasioglossum (Dialictus) illinoense* (Robertson, 1892)<sup>18,36</sup> – **Adams<sup>3</sup>, Bucks<sup>8</sup>, Centre<sup>8</sup>, Chester<sup>8</sup>, Crawford<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,17</sup>, Delaware<sup>1,4</sup>, Erie<sup>9</sup>, Franklin<sup>1</sup>, Huntingdon<sup>8</sup>, Lancaster<sup>5</sup>, Lehigh<sup>1</sup>, Lycoming<sup>8</sup>, Montgomery<sup>2,7,8</sup>, Union<sup>8</sup>, York<sup>8</sup>; 23 Apr<sup>8</sup> – 19 Oct<sup>3</sup> (2017<sup>3,7</sup>)**.

*Lasioglossum (Dialictus) imitatum* (Smith, 1853)<sup>18,36</sup> – **Adams<sup>1,3,8</sup>, Berks<sup>2</sup>, Blair<sup>1,2</sup>, Bradford<sup>1,4,8</sup>, Bucks<sup>8</sup>, Centre<sup>1,5,7,8,15,44</sup>, Chester<sup>8</sup>, Clinton<sup>1</sup>, Columbia<sup>2,5</sup>, Crawford<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,17</sup>, Delaware<sup>1,4</sup>, Erie<sup>9</sup>, Franklin<sup>1</sup>, Huntingdon<sup>1,2,8</sup>, Lackawanna<sup>4</sup>, Lancaster<sup>1,3,8</sup>, Lebanon<sup>1</sup>, Lehigh<sup>1</sup>, Luzerne<sup>2</sup>, Lycoming<sup>8</sup>, Mifflin<sup>1</sup>, Monroe<sup>1,2</sup>, Montgomery<sup>1,8</sup>, Northampton<sup>1</sup>, Perry<sup>1,4</sup>, Philadelphia<sup>1,4</sup>, Pike<sup>1</sup>, Sullivan<sup>1</sup>, Union<sup>1,8</sup>, York<sup>1,4,8</sup>; 18 Apr<sup>3</sup> – 21 Oct<sup>3</sup> (2017<sup>3</sup>)**.

*Lasioglossum (Dialictus) izawsum* Gibbs, 2011 (*platyparium* group) – Westmoreland<sup>18</sup>; 29 May<sup>18</sup> (1945<sup>18</sup>).

*Lasioglossum (Dialictus) katherineae* Gibbs, 2011 (*viridatum* group) – **Adams<sup>3</sup>; 10 Apr<sup>3</sup> – 11 Sep<sup>3</sup> (2014<sup>3</sup>)**.

*Lasioglossum (Dialictus) laevissimum* (Smith, 1853)<sup>18</sup> – **Adams<sup>3</sup>, Bradford<sup>1,8</sup>, Bucks<sup>8</sup>, Centre<sup>1,5,7,8</sup>, Clinton<sup>1</sup>, Columbia<sup>5</sup>, Crawford<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1</sup>, Huntingdon<sup>8</sup>, Lancaster<sup>3</sup>, Sullivan<sup>1</sup>, Susquehanna<sup>8</sup>, Union<sup>8</sup>; 25 Apr<sup>5</sup> – 9 Oct<sup>3</sup> (2018<sup>3</sup>)**.

*Lasioglossum (Dialictus) leucocomus* (Lovell, 1908) (*pilosum* group) – **Adams<sup>3</sup>, Bradford<sup>8</sup>, Bucks<sup>8</sup>, Centre<sup>7</sup>, Lancaster<sup>8</sup>, Montgomery<sup>8</sup>; 1 Jun<sup>8</sup> – 19 Oct<sup>3</sup> (2018<sup>3</sup>)**.

**Notes.** Older records for *L. pilosum*, especially pre-2010 determinations, may be attributable to *L. leucocomus* (see Gibbs 2010, 2011).

*Lasioglossum (Dialictus) lineatulum* (Crawford, 1906)<sup>18,36</sup> – **Adams<sup>3</sup>, Bradford<sup>1,8</sup>, Centre<sup>1,5,7,8,44</sup>, Clinton<sup>1</sup>, Columbia<sup>5</sup>, Crawford<sup>1</sup>, Dauphin<sup>1</sup>, Erie<sup>9</sup>, Lancaster<sup>8</sup>, Lehigh<sup>1</sup>, Lycoming<sup>8</sup>, Montgomery<sup>1</sup>, Northumberland<sup>1</sup>, Perry<sup>4</sup>, Philadelphia<sup>1</sup>, Pike<sup>1</sup>, Sullivan<sup>1</sup>, Union<sup>8</sup>; 17 Apr<sup>1</sup> – 24 Aug<sup>8</sup> (2017<sup>7</sup>)**.

- Lasioglossum (Dialictus) lionotus* (Sandhouse, 1923) (*cephalotes* group) – **Bradford**<sup>8</sup>, **Centre**<sup>15</sup>, Dauphin<sup>1</sup>, Lebanon<sup>1</sup>, Lehigh<sup>1,4</sup>, Schuylkill<sup>1</sup>; 28 Apr<sup>1</sup> – 15 Sep<sup>8</sup> (2015<sup>8</sup>). *Lasioglossum (Dialictus) marinum* (Crawford, 1904) – Delaware<sup>1</sup>; 18 Jul<sup>1</sup> (1901<sup>1</sup>). *Lasioglossum (Dialictus) michiganense* (Mitchell, 1960) (*platyparium* group) – Erie<sup>9</sup>, **York**<sup>8</sup>; 15 Apr<sup>8</sup> – 18–20 May<sup>9</sup> (2016<sup>9</sup>). *Lasioglossum (Dialictus) nigroviride* (Graenicher, 1911)<sup>18</sup> – **Bucks**<sup>8</sup>, Centre<sup>1,7</sup>, Forest<sup>1</sup>, Jefferson<sup>2</sup>, Lackawanna<sup>1</sup>, Luzerne<sup>2</sup>, **Lycoming**<sup>8</sup>, Monroe<sup>1</sup>, Pike<sup>1</sup>; 28 Apr<sup>8</sup> – 5 Sep<sup>2</sup> (2017<sup>7</sup>). *Lasioglossum (Dialictus) oblongum* (Lovell, 1905) (*viridatum* group)<sup>36</sup> – Bradford<sup>1</sup>, **Bucks**<sup>8</sup>, Centre<sup>1</sup>, Delaware<sup>1</sup>, **Erie**<sup>6</sup>, Forest<sup>1</sup>, **Huntingdon**<sup>8</sup>, Lackawanna<sup>1</sup>, **Lancaster**<sup>8</sup>, Lehigh<sup>1</sup>, **Lycoming**<sup>8</sup>, Monroe<sup>1</sup>, Sullivan<sup>1</sup>, **Susquehanna**<sup>8</sup>, **Union**<sup>8</sup>, Westmoreland<sup>1</sup>; 21 Apr<sup>8</sup> – 23 Sep<sup>8</sup> (2015<sup>8</sup>). *Lasioglossum (Dialictus) obscurum* (Robertson, 1892) (*viridatum* group)<sup>18,36</sup> – Adams<sup>1,3</sup>, **Bucks**<sup>8</sup>, Centre<sup>1,8</sup>, **Chester**<sup>8</sup>, **Columbia**<sup>5</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1,4</sup>, Erie<sup>9</sup>, **Montgomery**<sup>8</sup>, Northumberland<sup>1</sup>, Perry<sup>1</sup>, Westmoreland<sup>1</sup>, **York**<sup>8</sup>; 16 Apr<sup>1</sup> – 28 Sep<sup>8</sup> (2017<sup>3</sup>). *Lasioglossum (Dialictus) oceanicum* (Cockerell, 1916)<sup>18,36</sup> – **Adams**<sup>3,8</sup>, Berks<sup>2</sup>, Bradford<sup>1</sup>, **Bucks**<sup>8</sup>, Centre<sup>1,3</sup>, **Chester**<sup>8</sup>, Clinton<sup>1</sup>, Crawford<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1</sup>, Erie<sup>9</sup>, Huntingdon<sup>1,8</sup>, Lancaster<sup>1,3</sup>, Lehigh<sup>1</sup>, **Lycoming**<sup>8</sup>, Monroe<sup>2,4</sup>, Montgomery<sup>1,8</sup>, Philadelphia<sup>1</sup>, **York**<sup>8</sup>; 10 May<sup>1</sup> – 28 Sep<sup>8</sup> (2016<sup>5,9</sup>). *Lasioglossum (Dialictus) paradmirandum* (Knerer & Atwood, 1966) (*viridatum* group)<sup>18</sup> – **Adams**<sup>3</sup>, Berks<sup>2</sup>, **Bradford**<sup>8</sup>, **Bucks**<sup>8,17</sup>, Carbon<sup>1</sup>, **Centre**<sup>5,7</sup>, **Huntingdon**<sup>8</sup>, Lackawanna<sup>4</sup>, **Lancaster**<sup>5,8</sup>, Lehigh<sup>1</sup>, **Lycoming**<sup>8</sup>, Montgomery<sup>8,17</sup>, **Union**<sup>8</sup>, **York**<sup>8</sup>; 3 Apr<sup>3</sup> – 18 Sep<sup>8</sup> (2016<sup>5,7</sup>). *Lasioglossum (Dialictus) perpunctatum* (Ellis, 1913)<sup>36</sup> – **Adams**<sup>3</sup>, Beaver<sup>44</sup>, **Bradford**<sup>3</sup>, Centre<sup>1,7,8,44</sup>, Erie<sup>9</sup>, Fulton<sup>44</sup>, **Huntingdon**<sup>8</sup>, Juniata<sup>44</sup>, Lancaster<sup>8,44</sup>, Monroe<sup>2</sup>, **Union**<sup>8</sup>; 18–20 May<sup>9</sup> – 24 Aug<sup>8</sup> (2017<sup>7</sup>). *Lasioglossum (Dialictus) pilosum* (Smith, 1853) (*pilosum* group)<sup>18,36</sup> – Adams<sup>1,3,8</sup>, Beaver<sup>44</sup>, Berks<sup>1,2</sup>, **Bradford**<sup>8</sup>, Bucks<sup>1,4,8</sup>, Centre<sup>1,5,6,15,44</sup>, Chester<sup>1,8</sup>, Clinton<sup>1,6</sup>, **Columbia**<sup>2,5</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1,4</sup>, Erie<sup>9</sup>, Franklin<sup>1,6</sup>, Fulton<sup>44</sup>, **Huntingdon**<sup>8</sup>, Lackawanna<sup>4</sup>, Lancaster<sup>3,5,6,8,15,44</sup>, Lehigh<sup>1</sup>, Luzerne<sup>1</sup>, **Lycoming**<sup>8</sup>, Monroe<sup>1</sup>, Montgomery<sup>1,2,8</sup>, Northumberland<sup>1</sup>, Perry<sup>1</sup>, Philadelphia<sup>1,4</sup>, Pike<sup>1</sup>, Sullivan<sup>1</sup>, **Union**<sup>8</sup>, **York**<sup>8</sup>; 23 Mar<sup>3</sup> – 26 Oct<sup>3</sup> (2018<sup>3</sup>). **Notes.** Older records for *L. pilosum*, especially pre-2010 determinations, may be attributable to *L. leucocomus* (see Gibbs 2010, 2011). *Lasioglossum (Dialictus) planatum* (Lovell, 1905) (*viridatum* group) – Adams<sup>3</sup>, **Bradford**<sup>8</sup>, **Bucks**<sup>8</sup>, Crawford<sup>4</sup>, **Montgomery**<sup>8</sup>; 6 May<sup>8</sup> – 21 Oct<sup>3</sup> (2014<sup>8</sup>). *Lasioglossum (Dialictus) platyparium* (Robertson, 1895) (*platyparium* group)<sup>18</sup> – **Adams**<sup>3</sup>, **Bradford**<sup>8</sup>, **Delaware**<sup>4</sup>, **Huntingdon**<sup>8</sup>, **Lancaster**<sup>3,8</sup>, **Lycoming**<sup>8</sup>, **Montgomery**<sup>8</sup>, **York**<sup>8</sup>; 14 Apr<sup>3</sup> – 23 Oct<sup>3</sup> (2017<sup>3</sup>). *Lasioglossum (Dialictus) pruinatum* (Robertson, 1892) (*pilosum* group) – Beaver<sup>44</sup>, Centre<sup>44</sup>; dates not reported<sup>44</sup> (2010 – 20<sup>1244</sup>). *Lasioglossum (Dialictus) rozeni* Gibbs, 2011 (*platyparium* group) – Adams<sup>3</sup>, **Bucks**<sup>8</sup>, **Chester**<sup>8</sup>, **Montgomery**<sup>8</sup>; 5 Apr<sup>3</sup> – 26 Jul<sup>8</sup> (2017<sup>3</sup>).

*Lasioglossum (Dialictus) simplex* (Robertson, 1901)<sup>36</sup> (*platyparium* group) – Centre<sup>1</sup>; Aug<sup>1</sup> (1945<sup>1</sup>).

*Lasioglossum (Dialictus) smilacinae* (Robertson, 1897)<sup>18</sup> – Adams<sup>3</sup>, Erie<sup>9</sup>, Lehigh<sup>4</sup>, Lycoming<sup>8</sup>, Montgomery<sup>8</sup>, Union<sup>8</sup>, York<sup>8</sup>; 15 Apr<sup>8</sup> – 6 Jul<sup>8</sup> (2017<sup>3</sup>).

*Lasioglossum (Dialictus) subviridatum* (Cockerell, 1938) (*viridatum* group) – Adams<sup>3</sup>, Bradford<sup>8</sup>, Bucks<sup>8</sup>, Centre<sup>7,8</sup>, Delaware<sup>4</sup>, Erie<sup>9</sup>, Huntingdon<sup>8</sup>, Lancaster<sup>8</sup>, Lycoming<sup>8</sup>, Montgomery<sup>8</sup>, Susquehanna<sup>8</sup>, Union<sup>8</sup>, York<sup>8</sup>; 15 Apr<sup>8</sup> – 18 Oct<sup>3</sup> (2017<sup>7</sup>).

*Lasioglossum (Dialictus) taylorae* Gibbs, 2010 (*viridatum* group) – Bucks<sup>8</sup>, Delaware<sup>4</sup>, York<sup>8</sup>; 15 Apr<sup>8</sup> – 13–26 Jul<sup>4</sup> (2015<sup>8</sup>).

*Lasioglossum (Dialictus) tegulare* (Robertson, 1890) (*tegulare* group)<sup>36</sup> – Adams<sup>3,8</sup>, Berks<sup>2</sup>, Bradford<sup>1,8</sup>, Bucks<sup>8</sup>, Centre<sup>7,8,15,44</sup>, Chester<sup>8</sup>, Columbia<sup>5</sup>, Crawford<sup>4</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1,4</sup>, Erie<sup>6,9</sup>, Franklin<sup>1</sup>, Fulton<sup>44</sup>, Huntingdon<sup>8</sup>, Juniata<sup>1,44</sup>, Lancaster<sup>3,8,44</sup>, Lehigh<sup>1</sup>, Luzerne<sup>1</sup>, Lycoming<sup>8,44</sup>, Montgomery<sup>1,8</sup>, Perry<sup>1</sup>, Philadelphia<sup>1,4</sup>, Schuylkill<sup>4</sup>, Somerset<sup>1</sup>, Susquehanna<sup>8</sup>, Union<sup>8</sup>, York<sup>8</sup>; 5 Apr<sup>3</sup> – 24 Oct<sup>3</sup> (2018<sup>3</sup>). **Notes.** Older records for *L. tegulare*, especially pre-2009 determinations, may be attributable to *L. ellisiae* (see Gibbs 2009).

*Lasioglossum (Dialictus) timothyi* Gibbs, 2010 – Centre<sup>7</sup>, Lycoming<sup>8</sup>, Union<sup>8</sup>; 27 Apr<sup>8</sup> – 29–30 Jun<sup>7</sup> (2017<sup>7</sup>).

*Lasioglossum (Dialictus) trigeminum* Gibbs, 2011 – Adams<sup>3,8</sup>, Bucks<sup>8</sup>, Centre<sup>7</sup>, Chester<sup>8</sup>, Delaware<sup>4</sup>, Erie<sup>9</sup>, Huntingdon<sup>8</sup>, Lancaster<sup>3,8</sup>, Lycoming<sup>8</sup>, Montgomery<sup>8</sup>, York<sup>8</sup>; 29 Mar<sup>3</sup> – 19 Oct<sup>3</sup> (2017<sup>3,7</sup>).

*Lasioglossum (Dialictus) versans* (Lovell, 1905)<sup>18</sup> (*ruidosense* group) – Adams<sup>3</sup>, Bradford<sup>1,8</sup>, Centre<sup>1,7,8,44</sup>, Columbia<sup>5</sup>, Dauphin<sup>1</sup>, Erie<sup>9</sup>, Huntingdon<sup>8</sup>, Lackawanna<sup>4</sup>, Lancaster<sup>8</sup>, Lycoming<sup>8</sup>, Pike<sup>1</sup>, Sullivan<sup>1</sup>, Susquehanna<sup>8</sup>, Union<sup>8</sup>, York<sup>8</sup>; 23 Apr<sup>8</sup> – 24 Oct<sup>3</sup> (2016<sup>3,7,9</sup>).

*Lasioglossum (Dialictus) versatum* (Robertson, 1902)<sup>18,36</sup> – Adams<sup>1,3,8</sup>, Beaver<sup>44</sup>, Bradford<sup>1,8</sup>, Bucks<sup>8</sup>, Centre<sup>1,5,7,8,44</sup>, Chester<sup>8</sup>, Clearfield<sup>1,4</sup>, Clinton<sup>1</sup>, Columbia<sup>5</sup>, Crawford<sup>1,4</sup>, Dauphin<sup>1</sup>, Delaware<sup>1,4</sup>, Erie<sup>9</sup>, Franklin<sup>1</sup>, Huntingdon<sup>2,3,8</sup>, Juniata<sup>3</sup>, Lackawanna<sup>1,4</sup>, Lancaster<sup>1,3,8</sup>, Lehigh<sup>1</sup>, Lycoming<sup>8</sup>, Monroe<sup>4</sup>, Montgomery<sup>1,7,8</sup>, Northumberland<sup>1</sup>, Perry<sup>1</sup>, Philadelphia<sup>1,4</sup>, Pike<sup>1,4</sup>, Schuylkill<sup>4</sup>, Sullivan<sup>1</sup>, Susquehanna<sup>8</sup>, Tioga<sup>4</sup>, Union<sup>8</sup>, Westmoreland<sup>1</sup>, York<sup>1,8</sup>; 29 Mar<sup>1</sup> – 6 Nov<sup>3</sup> (2017<sup>3,7</sup>). **Notes.** Older records for *L. versatum*, especially pre-2010 determinations, may be attributable to *L. callidum* (see Gibbs 2010).

*Lasioglossum (Dialictus) viridatum* (Lovell, 1905) (*viridatum* group) – Adams<sup>3</sup>, Centre<sup>44</sup>, Erie<sup>6</sup>, Fulton<sup>44</sup>, Lancaster<sup>1,8,44</sup>, Lycoming<sup>8</sup>, Union<sup>8</sup>, York<sup>8</sup>; 15 Apr<sup>8</sup> – 23 Jul<sup>6</sup> (2015<sup>8</sup>).

*Lasioglossum (Dialictus) weemsi* (Mitchell, 1960)<sup>18</sup> – Adams<sup>3</sup>, Bradford<sup>8</sup>, Bucks<sup>8</sup>, Centre<sup>8</sup>, Chester<sup>8</sup>, Columbia<sup>5</sup>, Delaware<sup>4</sup>, Erie<sup>9</sup>, Huntingdon<sup>8</sup>, Lancaster<sup>3,8</sup>, Lycoming<sup>8</sup>, Monroe<sup>4</sup>, Montgomery<sup>8</sup>, Philadelphia<sup>17</sup>, Union<sup>8</sup>, York<sup>8</sup>; 21 Apr<sup>3</sup> – 15 Oct<sup>3</sup> (2017<sup>3</sup>).

*Lasioglossum (Dialictus) zephyrus* (Smith, 1853)<sup>18,36</sup> – Adams<sup>3,8</sup>, Beaver<sup>44</sup>, Blair<sup>2</sup>, Bradford<sup>1,8</sup>, Bucks<sup>8</sup>, Centre<sup>1,8</sup>, Chester<sup>8</sup>, Columbia<sup>2,5</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Delaware<sup>1</sup>, Erie<sup>1,9</sup>, Fulton<sup>44</sup>, Huntingdon<sup>8</sup>, Lancaster<sup>3,5,8,44</sup>, Lehigh<sup>1</sup>, Lycoming<sup>8</sup>, Montgomery<sup>1,8</sup>, Northumberland<sup>1</sup>, Philadelphia<sup>1,4</sup>, Union<sup>1,8</sup>, York<sup>8</sup>; 10 Apr<sup>3</sup> – 23 Oct<sup>3</sup> (2017<sup>3</sup>).

## Subgenus *Evylaeus* Robertson

**Taxonomy:** Gibbs et al. (2013).

*Lasioglossum (Evylaeus) cinctipes* (Provancher, 1888)<sup>36</sup> – Allegheny<sup>20</sup>, Centre<sup>1,5,7</sup>, **Ches-ter**<sup>8</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Erie<sup>9</sup>, Lehigh<sup>20</sup>, Susquehanna<sup>1,20</sup>, Tioga<sup>20</sup>, **Union**<sup>8</sup>, Westmoreland<sup>20</sup>; **28 Apr**<sup>8</sup> – 14 Oct<sup>1</sup> (**2017**<sup>7</sup>).

## Subgenus *Hemibalictus* Cockerell

**Revision:** Gibbs et al. (2013).

*Lasioglossum (Hemibalictus) birkmanni* (Crawford, 1906) – **Adams**<sup>3</sup>, Allegheny<sup>20</sup>, Dauphin<sup>1</sup>, Erie<sup>20</sup>, **Lackawanna**<sup>4</sup>, **Lancaster**<sup>8</sup>, **Union**<sup>8</sup>; **23 Apr**<sup>3</sup> – **21 Jul**<sup>8</sup> (**2017**<sup>3</sup>). **Notes.** Older records for *L. macoupinense*, especially pre-2013 determinations, are attributable to *L. birkmanni* (see Gibbs et al. 2013).

*Lasioglossum (Hemibalictus) foxii* (Robertson, 1895) – **Adams**<sup>3</sup>, Allegheny<sup>20</sup>, **Bucks**<sup>8</sup>, **Centre**<sup>7</sup>, Clinton<sup>20</sup>, Dauphin<sup>1</sup>, Erie<sup>20</sup>, Fayette<sup>20</sup>, Lehigh<sup>1</sup>, **Lycoming**<sup>8</sup>, **Philadelphia**<sup>4</sup>, Pike<sup>20</sup>, Potter<sup>20</sup>, Schuylkill<sup>2</sup>, **Union**<sup>8</sup>, Westmoreland<sup>20</sup>, **York**<sup>8</sup>; **2 Apr**<sup>3</sup> – **2 Jul**<sup>8</sup> (**2017**<sup>3,7</sup>).

*Lasioglossum (Hemibalictus) inconditum* (Cockerell, 1916) – **Susquehanna**<sup>8</sup>; **6 May**<sup>8</sup> (**2014**<sup>8</sup>).

*Lasioglossum (Hemibalictus) macoupinense* (Robertson, 1895) – **Adams**<sup>3</sup>, Allegheny<sup>20</sup>, Bucks<sup>1,8</sup>, Erie<sup>20</sup>, **Susquehanna**<sup>8</sup>; **30 Apr**<sup>8</sup> – **26 Jul**<sup>3</sup> (**2014**<sup>8</sup>). **Notes.** Older records for *L. macoupinense*, especially pre-2013 determinations, are attributable to *L. birkmanni* (see Gibbs et al. 2013).

*Lasioglossum (Hemibalictus) nelumbonis* (Robertson, 1890) – Pike<sup>1,4</sup>; 29 May<sup>1,4</sup> (2005<sup>1</sup>).

*Lasioglossum (Hemibalictus) pectinatum* (Robertson, 1890) – **Adams**<sup>3</sup>, Bucks<sup>8,20</sup>, Lancaster<sup>20</sup>; **10 Jul**<sup>8</sup> – **20 Oct**<sup>3</sup> (**2016**<sup>3</sup>).

*Lasioglossum (Hemibalictus) pectorale* (Smith, 1853) – Adams<sup>1,3</sup>, Allegheny<sup>20</sup>, Bucks<sup>1,2,8</sup>, Centre<sup>44</sup>, Columbia<sup>2</sup>, Cumberland<sup>1</sup>, Erie<sup>9</sup>, Franklin<sup>1</sup>, Huntingdon<sup>1,2,8</sup>, Lehigh<sup>1</sup>, **Lycoming**<sup>8</sup>, Philadelphia<sup>20</sup>, Westmoreland<sup>20</sup>; **16 Apr**<sup>3</sup> – **25 Aug**<sup>3</sup> (**2017**<sup>3</sup>).

## Subgenus *Lasioglossum* Curtis s. s.

**Revision:** McGinley (1986).

*Lasioglossum (Lasioglossum) acuminatum* McGinley, 1986 (*forbesii* group) – **Adams**<sup>3</sup>, Carbon<sup>32</sup>, Centre<sup>1,7,8,15</sup>, Clinton<sup>1</sup>, Huntingdon<sup>1,32</sup>, Lehigh<sup>1,32</sup>, **Lycoming**<sup>8</sup>, Monroe<sup>1,32</sup>, Northampton<sup>32</sup>, Pike<sup>1,2,32</sup>, Somerset<sup>1</sup>, **Union**<sup>8</sup>; **26 Apr**<sup>3</sup> – 7 Oct<sup>1</sup> (**2017**<sup>7</sup>).

*Lasioglossum (Lasioglossum) athabascense* (Sandhouse, 1933)<sup>36</sup> – Adams<sup>1</sup>, Allegheny<sup>1,32</sup>, Bradford<sup>1</sup>, Carbon<sup>32</sup>, Centre<sup>1</sup>, Clearfield<sup>1,4</sup>, Clinton<sup>1</sup>, Crawford<sup>1</sup>, Cumberland<sup>1,32</sup>, Dauphin<sup>1,32</sup>, Lehigh<sup>1,32</sup>, Sullivan<sup>1</sup>, Wyoming<sup>32</sup>; 11 May<sup>1</sup> – 29 Aug<sup>1</sup> (2007<sup>1,4</sup>).

*Lasioglossum (Lasioglossum) coriaceum* (Smith, 1853)<sup>36</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1,32</sup>, Beaver<sup>1,32,44</sup>, Bradford<sup>1,8</sup>, **Bucks**<sup>8</sup>, Butler<sup>1,32</sup>, Centre<sup>1,3,7,8,32</sup>, Clinton<sup>1</sup>, Crawford<sup>1,32</sup>, Cumberland<sup>1,32</sup>, Dauphin<sup>1,32</sup>, Delaware<sup>1,4,32</sup>, Elk<sup>1</sup>, Erie<sup>1,6,9,32</sup>, Fayette<sup>1,32</sup>, Forest<sup>1</sup>, Huntingdon<sup>1,8</sup>, Jefferson<sup>1</sup>, Lancaster<sup>1</sup>, Lehigh<sup>1,32</sup>, **Lycoming**<sup>8</sup>, Monroe<sup>1</sup>, **Montgomery**<sup>7,8</sup>, Northumberland<sup>1,32</sup>, Perry<sup>1</sup>, Pike<sup>1,4,32</sup>, Sullivan<sup>1</sup>, **Susquehanna**<sup>8</sup>, Tioga<sup>1</sup>, Union<sup>1,32</sup>, Washington<sup>1</sup>, Westmoreland<sup>1,32</sup>, York<sup>1,8,32</sup>; 16 Apr<sup>1</sup> – 23 Oct<sup>3</sup> (2017<sup>3,7</sup>).

*Lasioglossum (Lasioglossum) forbesii* (Robertson, 1890) (*forbesii* group)<sup>36</sup> – **Adams**<sup>3</sup>, Cumberland<sup>1</sup>, Fayette<sup>1,32</sup>, Westmoreland<sup>1,32</sup>; 16 Apr<sup>3</sup> – 22 Jul<sup>1</sup> (2015<sup>3</sup>).

*Lasioglossum (Lasioglossum) fuscipenne* (Smith, 1853) – **Adams**<sup>3</sup>, Bradford<sup>1</sup>, **Bucks**<sup>8</sup>, Centre<sup>1</sup>, Crawford<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,32</sup>, Delaware<sup>32</sup>, **Huntingdon**<sup>3</sup>, **Montgomery**<sup>7</sup>, York<sup>1,8,32</sup>; 30 Apr<sup>8</sup> – 23 Oct<sup>3</sup> (2017<sup>7</sup>).

### Subgenus *Leuchalictus* Warncke

**Revision:** McGinley (1986).

*Lasioglossum (Leuchalictus) leucozonium* (Schrenk, 1781)\* (2007<sup>1</sup>) – Adams<sup>1,3</sup>, Beaver<sup>44</sup>, Bradford<sup>1,4,8</sup>, **Bucks**<sup>8</sup>, Centre<sup>7,15,44</sup>, Crawford<sup>1,4</sup>, Erie<sup>9</sup>, **Lackawanna**<sup>4</sup>, Lancaster<sup>44</sup>, **Lycoming**<sup>8</sup>, **Union**<sup>8</sup>; 31 May – 1 Jun<sup>7</sup> – 19 Sep<sup>3</sup> (2017<sup>7</sup>).

*Lasioglossum (Leuchalictus) zonulum* (Smith, 1848)\* (2002<sup>3</sup>) – **Adams**<sup>3</sup>, Bradford<sup>1,8</sup>, Centre<sup>7</sup>, Crawford<sup>1</sup>, Erie<sup>6,9</sup>, **Huntingdon**<sup>3</sup>, **Lackawanna**<sup>4</sup>, **Lycoming**<sup>8</sup>, **Monroe**<sup>6</sup>, **Susquehanna**<sup>8</sup>; 8 May<sup>8</sup> – 11–13 Sep<sup>9</sup> (2017<sup>7</sup>).

### Subgenus *Sphecodogastra* Ashmead

**Revision:** Gibbs et al. (2013).

*Lasioglossum (Sphecodogastra) comagenense* (Knerer & Atwood, 1964) (*fulvicorne* group) – locations, dates, and year not reported<sup>46</sup>.

*Lasioglossum (Sphecodogastra) oenotherae* (Stevens, 1920) (*lusorium* group) – Cumberland<sup>33</sup>, Erie<sup>9</sup>, **Lycoming**<sup>8</sup>; 9–11 Jun<sup>9</sup> – 24 Aug<sup>8</sup> (2016<sup>9</sup>).

*Lasioglossum (Sphecodogastra) quebecense* (Crawford, 1907) (*fulvicorne* group)<sup>36</sup> – **Adams**<sup>3</sup>, **Bradford**<sup>8</sup>, **Bucks**<sup>8</sup>, Centre<sup>1,7</sup>, **Chester**<sup>6</sup>, Clinton<sup>20</sup>, Dauphin<sup>1</sup>, **Delaware**<sup>4</sup>, Erie<sup>9</sup>, Fayette<sup>1</sup>, **Huntingdon**<sup>8</sup>, **Lancaster**<sup>8</sup>, Monroe<sup>2,20</sup>, **Montgomery**<sup>7</sup>, Pike<sup>20</sup>, **Susquehanna**<sup>8</sup>, **Union**<sup>8</sup>, Westmoreland<sup>1,20</sup>, York<sup>8</sup>; 5 Apr<sup>3</sup> – 13 Oct<sup>3</sup> (2018<sup>3</sup>).

*Lasioglossum (Sphecodogastra) truncatum* (Robertson, 1901) (*calceatum* group)<sup>36</sup> – **Adams**<sup>3</sup>, Allegheny<sup>20</sup>, Beaver<sup>20</sup>, Bradford<sup>1,8</sup>, **Bucks**<sup>8</sup>, Centre<sup>1,5,6,7</sup>, **Chester**<sup>8</sup>, **Columbia**<sup>5</sup>, Crawford<sup>1</sup>, **Huntingdon**<sup>8</sup>, Lehigh<sup>20</sup>, **Lycoming**<sup>8</sup>, Montgomery<sup>8,20</sup>, Somerset<sup>20</sup>, Tioga<sup>20</sup>, Westmoreland<sup>20</sup>; 16 Apr<sup>3</sup> – 19 Aug<sup>5</sup> (2017<sup>3,7</sup>).

### Genus *Sphecodes* Latreille

**Taxonomy:** Mitchell (1960). *Sphecodes* is in particular need of revision (Gibbs et al. 2017a).

*Sphecodes antennariae* Robertson, 1891 (*mandibularis* group) – Adams<sup>3</sup>; 9 Oct<sup>3</sup> (2008<sup>3</sup>).

*Sphecodes aroniae* Mitchell, 1960 (*ranunculi* group)<sup>31</sup> – Bucks<sup>8</sup>, Philadelphia<sup>2</sup>; 9 May<sup>8</sup> – 26 May<sup>2</sup> (2007<sup>8</sup>).

*Sphecodes atlantis* Mitchell, 1956 (*mandibularis* group) – Adams<sup>3</sup>, Bradford<sup>8</sup>, Bucks<sup>8</sup>, Centre<sup>8</sup>, Erie<sup>1,2</sup>, Huntingdon<sup>8</sup>, Lancaster<sup>3</sup>, Lycoming<sup>8</sup>, Union<sup>8</sup>, York<sup>8</sup>; 11 Jun<sup>8</sup> – 4 Sep<sup>3</sup> (2015<sup>8</sup>).

*Sphecodes autumnalis* Mitchell, 1956 (*mandibularis* group) – Susquehanna<sup>8</sup>; 28 Aug<sup>8</sup> (2015<sup>8</sup>).

*Sphecodes banksii* Lovell, 1909 (*mandibularis* group) – Adams<sup>3</sup>; 9 Oct<sup>3</sup> (2008<sup>3</sup>).

*Sphecodes clematidis* Robertson, 1897 (*dichrous* group) – Centre<sup>8</sup>, Susquehanna<sup>8</sup>; 24 Jul<sup>8</sup> – 28 Aug<sup>8</sup> (2015<sup>8</sup>).

*Sphecodes confertus* Say, 1837 (*confertus* group) – Crawford<sup>2</sup>; 4 Jul<sup>2</sup> (1960<sup>2</sup>).

*Sphecodes coronus* Mitchell, 1956 (*mandibularis* group) – Adams<sup>3</sup>, Blair<sup>2</sup>, Centre<sup>7</sup>, Lancaster<sup>3</sup>, Monroe<sup>2</sup>, Philadelphia<sup>1</sup>; 16 May<sup>3</sup> – 8 Oct<sup>3</sup> (2017<sup>7</sup>).

*Sphecodes cressonii* (Robertson, 1903) (*mandibularis* group)<sup>36</sup> – Dauphin<sup>1</sup>, Lancaster<sup>8</sup>, Susquehanna<sup>8</sup>, Union<sup>8</sup>; 6 May<sup>8</sup> – 23 Sep<sup>8</sup> (2014<sup>8</sup>).

*Sphecodes dichrous* Smith, 1853 (*dichrous* group)<sup>36</sup> – Centre<sup>1,8</sup>, Chester<sup>8</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1</sup>, Erie<sup>1</sup>, Lancaster<sup>1,3</sup>, Monroe<sup>2</sup>, Warren<sup>6</sup>; 28 Apr<sup>8</sup> – 30 Jul<sup>3</sup> (2015<sup>8</sup>).

*Sphecodes galerus* Lovell & Cockerell, 1907 (*mandibularis* group) – Centre<sup>7</sup>, Lancaster<sup>3</sup>; 16 Jul<sup>3</sup> – 16–17 Aug<sup>7</sup> (2017<sup>7</sup>).

*Sphecodes heraclei heraclei* Robertson, 1897 (*dichrous* group) – Bucks<sup>8</sup>, Centre<sup>1,7</sup>, Delaware<sup>1</sup>, Montgomery<sup>8</sup>; 29–30 Jun<sup>7</sup> – 19 Aug<sup>1</sup> (2017<sup>7</sup>).

*Sphecodes illinoensis* (Robertson, 1903) (*mandibularis* group) – Tioga<sup>6</sup>; 27 Jun<sup>6</sup> (2008<sup>6</sup>).

*Sphecodes levis* Lovell & Cockerell, 1907 (*mandibularis* group) – Erie<sup>1</sup>; 4 Jun<sup>1</sup> (1966<sup>1</sup>).

*Sphecodes mandibularis* Cresson, 1872 (*mandibularis* group) – Blair<sup>2</sup>, Bucks<sup>8</sup>, Erie<sup>6</sup>, Lancaster<sup>8</sup>; 3 May<sup>8</sup> – 21 Jul<sup>8</sup> (2015<sup>8</sup>).

*Sphecodes minor* Robertson, 1898 (*dichrous* group) – Bradford<sup>8</sup>, Dauphin<sup>1</sup>, Delaware<sup>2</sup>, Lancaster<sup>3</sup>, York<sup>1,8</sup>; 15 Apr<sup>8</sup> – 31 Jul<sup>3</sup> (2015<sup>8</sup>).

*Sphecodes pimpinellae* Robertson, 1900 (*mandibularis* group) – Dauphin<sup>1</sup>, Erie<sup>1</sup>; 4 Jul<sup>1</sup> (year not reported<sup>1</sup>).

*Sphecodes prosphorus* Lovell & Cockerell, 1907 (*dichrous* group) – Centre<sup>1,15,44</sup>, Lancaster<sup>3</sup>; 10 Jul<sup>3</sup> – 14 Aug<sup>3</sup> (2013<sup>3</sup>).

*Sphecodes ranunculi* Robertson, 1897 (*ranunculi* group)<sup>36</sup> – Bedford<sup>2</sup>, Bradford<sup>8</sup>, Centre<sup>8</sup>, Dauphin, Delaware<sup>2</sup>, Erie, Huntingdon<sup>1,8</sup>, Montgomery, Philadelphia<sup>2</sup>, Union<sup>8</sup>; 28 Apr<sup>8</sup> – 14 Jul (2015<sup>8</sup>).

*Sphecodes smilacinae* Robertson, 1897 (*mandibularis* group) – Adams<sup>3</sup>; 24 May<sup>3</sup> (2011<sup>3</sup>).

*Sphecodes solonis* Graenicher, 1911 (*dichrous* group) – Adams<sup>3</sup>; 28 Jul<sup>3</sup> (2015<sup>3</sup>).

*Sphecodes townesi* Mitchell, 1956 (*mandibularis* group) – Lycoming<sup>8</sup>; 15 Jun<sup>8</sup> (2014<sup>8</sup>).

**Nomiinae**

**Dieunomiini**

**Genus *Dieunomia* Cockerell**

**Revision:** Blair (1935).

**Subgenus *Dieunomia* Cockerell s. s.**

*Dieunomia* (*Dieunomia*) *heteropoda* *heteropoda* (Say, 1824) – Philadelphia<sup>1</sup>; 10 Sep<sup>1</sup> (1971<sup>1</sup>).

**Nominiini**

**Genus *Nomia* Latreille**

**Taxonomy:** Mitchell (1960); Ribble (1965)

**Subgenus *Acunomia* Cockerell**

*Nomia* (*Acunomia*) *nortoni* Cresson, 1868 – Allegheny<sup>1</sup>; dates and year not reported<sup>1</sup>.

**Colletidae**

**Colletinae**

**Colletini**

**Genus *Colletes* Latreille**

**Taxonomy:** Mitchell (1960); Stephen (1954).

*Colletes aestivalis* Patton, 1879 (*aestivalis* group) – Dauphin<sup>1</sup>, Monroe<sup>1</sup>, Montgomery<sup>45</sup>; 4 Jun<sup>1</sup> – 4 Jul<sup>1</sup> (1918<sup>1</sup>).

*Colletes americanus* Cresson, 1868 (*americanus* group) – Bedford<sup>1</sup>, Delaware<sup>1</sup>, Philadelphia<sup>2</sup>, York<sup>1</sup>; 20 Sep<sup>1</sup> – 8 Oct<sup>2</sup> (1909<sup>1</sup>).

*Colletes compactus* (*compactus* group)<sup>36</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, Bedford<sup>1</sup>, Centre<sup>1</sup>, **Clearfield**<sup>4</sup>, Clinton<sup>1</sup>, Columbia<sup>1,2</sup>, Delaware<sup>2</sup>, Huntingdon<sup>1</sup>, Philadelphia<sup>2</sup>, Tioga<sup>1</sup>; 20 Aug<sup>1</sup> – 8 Oct<sup>2</sup> (**2014**<sup>3</sup>).

*Colletes eupophi* Robertson, 1891 (*simulans* group)<sup>36</sup> – Bedford<sup>1</sup>, Centre<sup>1</sup>; 20 Jul<sup>1</sup> – 20 Sep<sup>1</sup> (1954<sup>1</sup>).

*Colletes inaequalis* Say, 1837 (*inaequalis* group)<sup>36</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, **Bradford**<sup>8</sup>, **Bucks**<sup>8</sup>, Centre<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,6</sup>, Erie<sup>1</sup>, Huntingdon<sup>1,3,8</sup>, **Lancaster**<sup>5</sup>, Lehigh<sup>1</sup>, **Lycoming**<sup>8</sup>, Montgomery<sup>1,2</sup>, Perry<sup>1</sup>, Philadelphia<sup>1,2,4</sup>, Washington<sup>1</sup>, York<sup>1,8</sup>; 17 Mar<sup>6</sup> – 31 Aug<sup>2</sup> (**2018**<sup>3</sup>).

- Colletes latitarsis* Robertson, 1891 (*latitarsis* group)<sup>36</sup> – **Adams**<sup>3</sup>, Allegheny<sup>1</sup>, Centre<sup>1</sup>, Dauphin<sup>1</sup>, **Lancaster**<sup>3,8</sup>, **Montgomery**<sup>8</sup>, Perry<sup>1</sup>, Venango<sup>1</sup>, Washington<sup>1</sup>; **13 Jun**<sup>3</sup> – **23 Sep**<sup>8</sup> (2014<sup>8</sup>).
- Colletes nudus* Robertson, 1898 (*nudus* group)<sup>36</sup> – **Adams**<sup>3</sup>, Dauphin<sup>1</sup>, Erie<sup>1</sup>, Franklin<sup>1</sup>; **20 May**<sup>1</sup> – **23 Jul**<sup>3</sup> (2015<sup>3</sup>).
- Colletes productus* Robertson, 1891 (*productus* group) – Dauphin<sup>1</sup>, Philadelphia<sup>1,2</sup>; **27 Apr**<sup>1</sup> – **9 Jul**<sup>2</sup> (1909<sup>2</sup>).
- Colletes simulans* Cresson, 1868 *armatus* Patton, 1879 (*simulans* group) – Centre<sup>1,7</sup>, Clinton<sup>1</sup>, Huntingdon<sup>1</sup>, Jefferson<sup>1,2</sup>, Monroe<sup>1,2</sup>; **23 Jul**<sup>1</sup> – **16 Sep**<sup>1</sup> (2017<sup>7</sup>).
- Colletes thoracicus* Smith, 1853 (*thoracicus* group) – **Dauphin**<sup>6</sup>, **Delaware**<sup>4</sup>, Huntingdon<sup>1,2</sup>, **Montgomery**<sup>7</sup>; **14 May**<sup>6</sup> – **10 Jun**<sup>1</sup> (2017<sup>7</sup>).
- Colletes validus* Cresson, 1868 (*inaequalis* group)<sup>36,45</sup> – Centre<sup>1,7</sup>, Huntingdon<sup>1</sup>, Philadelphia<sup>2</sup>; **29 Apr**<sup>2</sup> – **24–25 May**<sup>7</sup> (2016<sup>7</sup>).
- Colletes willistoni* Robertson, 1891 (*willistoni* group) – locations, dates, and year not reported<sup>36</sup>.

## Hylaeinae

### Hylaeini

#### Genus *Hylaeus* Fabricius

**Taxonomy:** Mitchell (1960); Snelling (1966, 1968, 1970).

#### Subgenus *Hylaeus* Fabricius s. s.

**Revision:** Snelling (1970).

*Hylaeus* (*Hylaeus*) *annulatus* (Linnaeus, 1758) – **Bradford**<sup>8</sup>, Centre<sup>7,15</sup>, **Clarion**<sup>6</sup>, **Columbia**<sup>5</sup>, Dauphin<sup>1</sup>, Erie<sup>9</sup>, Jefferson<sup>2</sup>, Lackawanna<sup>1</sup>, Monroe<sup>2</sup>, Sullivan<sup>1</sup>, Tioga<sup>1</sup>, **Venango**<sup>6</sup>, **Warren**<sup>6</sup>, **Wyoming**<sup>4</sup>; **6 Jun**<sup>6</sup> – **22 Aug**<sup>5</sup> (2017<sup>7</sup>).

*Hylaeus* (*Hylaeus*) *leptocephalus* (Morawitz, 1871)\* (2005<sup>1,4</sup>) – Centre<sup>15</sup>, Erie<sup>9</sup>, **Lancaster**<sup>3</sup>, Northumberland<sup>1</sup>, Philadelphia<sup>1,4</sup>, **Susquehanna**<sup>8</sup>, **York**<sup>8</sup>; **7 Jun**<sup>8</sup> – **25 Aug**<sup>1,4</sup> (2015<sup>8</sup>).

*Hylaeus* (*Hylaeus*) *mesillae* (Cockerell, 1896) *cressoni* (Cockerell, 1907) – Adams<sup>1,3,8</sup>, Blair<sup>2</sup>, **Bradford**<sup>4,8</sup>, **Bucks**<sup>8</sup>, Centre<sup>7,8,15</sup>, Dauphin<sup>1,4</sup>, Delaware<sup>1,4</sup>, Erie<sup>9</sup>, Franklin<sup>1</sup>, Huntingdon<sup>2</sup>, Lackawanna<sup>4</sup>, **Lancaster**<sup>3</sup>, Lebanon<sup>4</sup>, Lehigh<sup>1</sup>, **Lycoming**<sup>8</sup>, Monroe<sup>1,2</sup>, Montgomery<sup>2,8</sup>, **Tioga**<sup>4</sup>, Union<sup>8</sup>, **York**<sup>4</sup>; **30 Apr**<sup>3</sup> – **21 Oct**<sup>3</sup> (2018<sup>3</sup>).

*Hylaeus* (*Hylaeus*) *saniculae* (Robertson, 1896) – Lehigh<sup>1</sup>; **29 Jun**<sup>1</sup> – **19 Jul**<sup>1</sup> (1903<sup>1</sup>).

#### Subgenus *Metziella* Michener

**Revision:** Snelling (1968).

*Hylaeus* (*Metziella*) *sparsus* (Cresson, 1869)<sup>36</sup> – **Adams**<sup>3</sup>, **Bucks**<sup>8</sup>; **9 May**<sup>8</sup> – **10 Jul**<sup>3</sup> (2015<sup>3</sup>).

## Subgenus *Paraprosopis* Popov

**Revision:** Snelling (1970).

*Hylaeus (Paraprosopis) floridanus* (Robertson, 1893) – Lycoming<sup>8</sup>; 19 Jun<sup>8</sup> (2015<sup>8</sup>).

*Hylaeus (Paraprosopis) pictipes* Nylander, 1852\* (2015<sup>9,19</sup>) – Crawford<sup>19</sup>, Erie<sup>9</sup>; 15 – 17 Jul<sup>19</sup> – 2–4 Aug<sup>9</sup> (2016<sup>9,19</sup>).

## Subgenus *Prosopis* Fabricius

*Hylaeus (Prosopis) affinis* (Smith, 1853)<sup>36</sup> – Adams<sup>1,3</sup>, Allegheny<sup>1</sup>, Berks<sup>6</sup>, Bradford<sup>6,8</sup>, Centre<sup>1,6,7,15,44</sup>, Chester<sup>1,6</sup>, Clinton<sup>6</sup>, Crawford<sup>1</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1,4</sup>, Erie<sup>6</sup>, Franklin<sup>1</sup>, Fulton<sup>1</sup>, Huntingdon<sup>1,2,3</sup>, Jefferson<sup>6</sup>, Juniata<sup>6</sup>, Lackawanna<sup>4</sup>, Lancaster<sup>1,3</sup>, Lebanon<sup>4</sup>, Lehigh<sup>1,6</sup>, Lycoming<sup>8</sup>, Monroe<sup>1,2</sup>, Montgomery<sup>1</sup>, Northumberland<sup>1</sup>, Philadelphia<sup>1</sup>, Schuylkill<sup>4</sup>, Somerset<sup>6</sup>, Sullivan<sup>1</sup>, Susquehanna<sup>1</sup>, Tioga<sup>1</sup>, Venango<sup>1</sup>, Westmoreland<sup>1</sup>, Wyoming<sup>4</sup>, York<sup>1,8</sup>; 4 May<sup>3</sup> – 25 Oct<sup>3</sup> (2018<sup>3</sup>).

*Hylaeus (Prosopis) illinoiensis* (Robertson, 1896) – Adams<sup>3</sup>, Bucks<sup>8</sup>; 19 May<sup>3</sup> – 23 May<sup>8</sup> (2016<sup>3</sup>).

*Hylaeus (Prosopis) modestus modestus* Say, 1837<sup>36</sup> – Adams<sup>1,3</sup>, Allegheny<sup>1</sup>, Bedford<sup>6</sup>, Bradford<sup>1,6,8</sup>, Bucks<sup>1,6</sup>, Butler<sup>1</sup>, Centre<sup>1,7,15,44</sup>, Chester<sup>1,6</sup>, Clarion<sup>6</sup>, Clinton<sup>6</sup>, Crawford<sup>1</sup>, Cumberland<sup>1</sup>, Dauphin<sup>1,6</sup>, Delaware<sup>1,4</sup>, Elk<sup>1</sup>, Erie<sup>1,6,9</sup>, Franklin<sup>1</sup>, Huntingdon<sup>1,2,3</sup>, Jefferson<sup>2</sup>, Lackawanna<sup>4</sup>, Lancaster<sup>3,8,44</sup>, Lehigh<sup>1</sup>, Luzerne<sup>1,2</sup>, Monroe<sup>1</sup>, Montgomery<sup>1</sup>, Perry<sup>1,4</sup>, Philadelphia<sup>1</sup>, Pike<sup>1,4</sup>, Sullivan<sup>1</sup>, Tioga<sup>1,4,6</sup>, Union<sup>8</sup>, Westmoreland<sup>1</sup>, York<sup>4</sup>; 5 Apr<sup>3</sup> – 6 Nov<sup>3</sup> (2017<sup>3,7</sup>).

*Hylaeus (Prosopis) schwarzii* (Cockerell, 1896) – Delaware<sup>4</sup>; dates not reported<sup>4</sup> (2008<sup>4</sup>).

## Subgenus *Spatulariella* Popov

**Taxonomy:** Sheffield et al. (2011a).

*Hylaeus (Spatulariella) hyalinatus* Smith, 1842\* (2009<sup>4</sup>) – Adams<sup>3</sup>, Bradford<sup>8</sup>, Centre<sup>8</sup>, Dauphin<sup>4</sup>, Erie<sup>9</sup>, Lancaster<sup>8</sup>, Lebanon<sup>4</sup>, Lehigh<sup>48</sup> (AMNH\_BEE00270811), Lycoming<sup>8</sup>, Montgomery<sup>8</sup>, Union<sup>8</sup>, York<sup>8</sup>; 18–20 May<sup>9</sup> – 28 Sep<sup>8</sup> (2016<sup>9</sup>).

## Species excluded from the list of bees in Pennsylvania

Several valid bee species have been previously recorded from Pennsylvania, but their occurrence in the state is based on doubtful or erroneous identifications or otherwise cannot be confirmed. These species are listed below with brief comments.

## Apidae

*Nomada bisignata* Say, 1824 (*ruficornis* group) – Donovall and vanEngelsdorp (2010) recorded this species as a new state record but indicated that no location or date data were available. The identity of this species is unclear since the original description could apply to numerous species and the type is likely not extant. Say (1824) did not specify its range below the country level. It is unclear how the identity of this species was determined by Donovall and vanEngelsdorp. It is possible that the specimen(s) reported in Donovall and vanEngelsdorp (2010) were/are located at the Department of Entomology, Academy of Natural Sciences (ANSP).

## Andrenidae

*Andrena (Scaphandrena) nigerrima* Casad, 1896 – Westmoreland<sup>1</sup>; 18 May<sup>1</sup> (1982<sup>1</sup>). This species is not known to occur in the eastern United States (LaBerge and Bouseman 1977). The location of the specimen(s) reported under this name in Donovall and vanEngelsdorp (2010) cannot be confirmed.

*Andrena (Scrapteropsis) kalmiae* Atwood, 1934 (*daeckeii* group) – Centre<sup>1</sup>; dates not reported<sup>1</sup> (2007<sup>1</sup>). Pennsylvania is outside of the known range of the species; the closest records are in Massachusetts and Connecticut (LaBerge 1971). It is possible that the specimen(s) reported in Donovall and vanEngelsdorp (2010) were/are located at PSUB. However, to our knowledge, they were not included in the Biddinger Laboratory Database under this name or as an updated entry.

## Halictidae

*Augochlorella gratiosa* (Smith, 1853)<sup>36</sup> – Berks<sup>6</sup>; 8 Jun<sup>6</sup> (2009<sup>6</sup>). Though this species was reported from Pennsylvania by Mitchell (1960), it has not been reported from north of North Carolina since the genus was revised by Coelho (2004). The specimen in the López-Uribe Laboratory was likely identified using keys in Mitchell (1960) and was not reexamined as part of this study. Until further evidence is available, we regard this species report as dubious.

*Halictus (Odontalictus) poeyi* Lepeletier, 1841 – Delaware<sup>1,4</sup>; 24 May<sup>1,4</sup> (2007<sup>1,4</sup>). Though this species is known from the eastern United States, it is only verified as far north as Maryland (Packer et al. 2016). It is also cryptic and generally considered indistinguishable from *H. ligatus* without genetic analysis (Carman and Packer 1996; Danforth et al. 1998). We are unable to confirm details about the identification methods used for this specimen.

*Lasioglossum (Dialictus) halophitus* (Graenicher, 1927) – Centre<sup>1</sup>; 3 Jul<sup>1</sup> (2007<sup>1</sup>). This species is a coastal salt marsh specialist and its occurrence north of Maryland has yet to be verified (Gibbs 2011). The location of the specimen(s) reported in Donovall and vanEngelsdorp (2010) cannot be confirmed.

*Lasioglossum (Dialictus) subversans* (Mitchell, 1960) – Centre<sup>1</sup>; 25 May<sup>1</sup> – 13 Jul<sup>1</sup> (2007<sup>1</sup>). This species has a generally boreal distribution, and is only confirmed to extend south into the United States in Maine and Michigan (Gibbs 2010, 2011; Gibbs et al. 2017a). It is possible that the specimen(s) reported in Donovall and vanEngelsdorp (2010) were/are located at PSUB. However, to our knowledge, they were not included in the Biddinger Laboratory Database under this name or as an updated entry.

*Lasioglossum (Dialictus) testaceum* (Robertson, 1897) – Pike<sup>1</sup>; 3 Aug<sup>1</sup> (1936<sup>1</sup>). This species seems to occur primarily in the Great Plains, being more uncommon east of the Mississippi (Gibbs 2011). It is possible that the specimen(s) reported in Donovall and vanEngelsdorp (2010) were/are located at the Illinois Natural History Survey Biological Collections (INHS).

## Colletidae

*Colletes brimleyi* Mitchell, 1951 (*nudus* group) – Lawrence<sup>1</sup>; 17 Jun<sup>1</sup> (1961<sup>1</sup>). This is a southeastern species that reaches its northern extent in the New Jersey Pine Barrens (Mitchell 1960). A record from Lawrence County is implausible. We were not able to locate the specimen in the PADA collection to confirm its identity.

## Species expected to occur in Pennsylvania

The following species are anticipated to occur in Pennsylvania based on their known ranges. While they occur in neighboring regions, they have not yet been reported in the state.

## Melittidae

*Melitta americana* (Smith, 1853) – This species is a *Vaccinium* L. specialist that ranges throughout the east and been confirmed from several surrounding states, including New Jersey (Mitchell 1960; Fowler 2016; Dibble et al. 2017).

## Apidae

*Triepeolus cressonii* (Robertson, 1897) – This species is widespread across the eastern United States and has been reported from several surrounding states, including New Jersey (Mitchell 1962).

## Andrenidae

*Andrena (Parandrena) andrenoides* (Cresson, 1878) – This *Salix* L. specialist is notably absent from the state based on its distribution across the eastern United States, which includes Ohio (Mitchell 1960; LaBerge and Ribble 1972).

*Andrena (Cnemidandrena) canadensis* Dalla Torre, 1896 – This *Solidago* L. specialist is notably absent from the state. It has been reported from several neighboring states, including Ohio, New Jersey, and New York, and is widely distributed in the eastern United States (Mitchell 1960; Fowler 2016; Dibble et al. 2017).

*Andrena (Micrandrena) vernalis* Mitchell, 1960 – This species has been treated as a synonym of *Andrena (Micrandrena) ziziae* Robertson, 1891 (*piperi* group) since Ribble (1968). In a recent study, Portman et al. (in press) have shown that *A. vernalis* is a valid species. Mitchell (1960) and Portman et al. (in press) record this species from several northeastern states, including neighboring New York and Ohio. Pennsylvanian specimens identified as *A. ziziae* should be reexamined to confirm their identity and future studies should consider the possibility that both species occur in the state.

*Calliopsis (Verbenapis) nebraskensis* Crawford, 1902 – This *Verbena* L. specialist has been recorded from the northeastern United States, including northern New Jersey (Shinn 1967; Fowler 2016). It is possible that it also occurs in Pennsylvania.

*Perdita novaeangliae* Viereck, 1907 – This rare species has reported from the northeastern United States, including Maryland and New Jersey, and is expected to occur in Pennsylvania (Mitchell 1960; North American Native Bee Collaborative 2017).

*Perdita swenki* Crawford, 1915 – This species has reported from the northeastern United States, including New York, and may occur in Pennsylvania (Mitchell 1960).

## Halictidae

*Sphecodes davisii* (*mandibularis* group) Robertson, 1897 – This species is widespread across the eastern United States (Mitchell 1960; Dibble et al. 2017).

*Sphecodes fattigi* (*mandibularis* group) Mitchell, 1956 – This species occurs across the eastern United States (Mitchell 1960; Gibbs et al. 2017a).

## Colletidae

*Hylaeus (Spatulariella) punctatus* (Brullé, 1832)\* – This exotic species has spread to a number of urban centers in Canada and the United States since its first detection in California in 1981 (Sheffield et al. 2011a; USGS Native Bee Laboratory 2019). It has been reported from the District of Columbia and New York (Ascher et al. 2006; Matteson et al. 2008). It seems likely that it may soon be found in Pennsylvania.

## Data accessibility

Supplementary materials 1–17 are available for download as .csv files. Complete specimen records from databases may be available from the cited literature, future publications, or the contributors (upon request to the appropriate individuals) listed in Table 1.

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## Supplementary material I

### Bee species of Pennsylvania: taxonomy, collection dates, persistence, and distribution data

Authors: Shelby Kerrin Kilpatrick, Jason Gibbs, Martin M. Mikulas, Sven-Erik Spichiger, Nancy Ostiguy, David J. Biddinger, Margarita M. López-Uribe

Data type: species data

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Link: <https://doi.org/10.3897/jhr.77.49622.suppl1>

## **Supplementary material 2**

### **Bartomeus et al. (2013) specimen records**

Authors: Shelby Kerrin Kilpatrick, Jason Gibbs, Martin M. Mikulas, Sven-Erik Spichiger, Nancy Ostiguy, David J. Biddinger, Margarita M. López-Uribe

Data type: specimen records

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Link: <https://doi.org/10.3897/jhr.77.49622.suppl2>

## **Supplementary material 3**

### **Biddinger Database specimen records**

Authors: Shelby Kerrin Kilpatrick, Jason Gibbs, Martin M. Mikulas, Sven-Erik Spichiger, Nancy Ostiguy, David J. Biddinger, Margarita M. López-Uribe

Data type: specimen records

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Link: <https://doi.org/10.3897/jhr.77.49622.suppl3>

## **Supplementary material 4**

### **Droege Database specimen records**

Authors: Shelby Kerrin Kilpatrick, Jason Gibbs, Martin M. Mikulas, Sven-Erik Spichiger, Nancy Ostiguy, David J. Biddinger, Margarita M. López-Uribe

Data type: specimen records

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Link: <https://doi.org/10.3897/jhr.77.49622.suppl4>

## Supplementary material 5

### Integrated Crop Pollination (ICP) Project: Fleischer Laboratory Database specimen records

Authors: Shelby Kerrin Kilpatrick, Jason Gibbs, Martin M. Mikulas, Sven-Erik Spichiger, Nancy Ostiguy, David J. Biddinger, Margarita M. López-Uribe

Data type: specimen records

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Link: <https://doi.org/10.3897/jhr.77.49622.suppl5>

## Supplementary material 6

### López-Uribe Laboratory Database specimen records

Authors: Shelby Kerrin Kilpatrick, Jason Gibbs, Martin M. Mikulas, Sven-Erik Spichiger, Nancy Ostiguy, David J. Biddinger, Margarita M. López-Uribe

Data type: specimen records

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Link: <https://doi.org/10.3897/jhr.77.49622.suppl6>

## Supplementary material 7

### Winfrey Laboratory Database specimen records

Authors: Shelby Kerrin Kilpatrick, Jason Gibbs, Martin M. Mikulas, Sven-Erik Spichiger, Nancy Ostiguy, David J. Biddinger, Margarita M. López-Uribe

Data type: specimen records

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Link: <https://doi.org/10.3897/jhr.77.49622.suppl7>

## **Supplementary material 8**

### **Mahan et al. (in prep) specimen records**

Authors: Shelby Kerrin Kilpatrick, Jason Gibbs, Martin M. Mikulas, Sven-Erik Spichiger, Nancy Ostiguy, David J. Biddinger, Margarita M. López-Uribe

Data type: specimen records

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Link: <https://doi.org/10.3897/jhr.77.49622.suppl8>

## **Supplementary material 9**

### **Choate et al. (2018) specimen records**

Authors: Shelby Kerrin Kilpatrick, Jason Gibbs, Martin M. Mikulas, Sven-Erik Spichiger, Nancy Ostiguy, David J. Biddinger, Margarita M. López-Uribe

Data type: specimen records

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Link: <https://doi.org/10.3897/jhr.77.49622.suppl9>

## **Supplementary material 10**

### **Pennsylvania bee species literature review records**

Authors: Shelby Kerrin Kilpatrick, Jason Gibbs, Martin M. Mikulas, Sven-Erik Spichiger, Nancy Ostiguy, David J. Biddinger, Margarita M. López-Uribe

Data type: specimen records

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Link: <https://doi.org/10.3897/jhr.77.49622.suppl10>

## Supplementary material 11

### Additional Pennsylvania bee specimen records

Authors: Shelby Kerrin Kilpatrick, Jason Gibbs, Martin M. Mikulas, Sven-Erik Spichiger, Nancy Ostiguy, David J. Biddinger, Margarita M. López-Uribe

Data type: specimen records

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Link: <https://doi.org/10.3897/jhr.77.49622.suppl11>

## Supplementary material 12

### Pennsylvanian Andrenidae specimen records from BugGuide

Authors: Shelby Kerrin Kilpatrick, Jason Gibbs, Martin M. Mikulas, Sven-Erik Spichiger, Nancy Ostiguy, David J. Biddinger, Margarita M. López-Uribe

Data type: specimen records

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Link: <https://doi.org/10.3897/jhr.77.49622.suppl12>

## Supplementary material 13

### Pennsylvanian Apidae specimen records from BugGuide

Authors: Shelby Kerrin Kilpatrick, Jason Gibbs, Martin M. Mikulas, Sven-Erik Spichiger, Nancy Ostiguy, David J. Biddinger, Margarita M. López-Uribe

Data type: specimen records

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Link: <https://doi.org/10.3897/jhr.77.49622.suppl13>

## **Supplementary material 14**

### **Pennsylvanian Colletidae specimen records from BugGuide**

Authors: Shelby Kerrin Kilpatrick, Jason Gibbs, Martin M. Mikulas, Sven-Erik Spichiger, Nancy Ostiguy, David J. Biddinger, Margarita M. López-Uribe

Data type: specimen records

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Link: <https://doi.org/10.3897/jhr.77.49622.suppl14>

## **Supplementary material 15**

### **Pennsylvanian Halictidae specimen records from BugGuide**

Authors: Shelby Kerrin Kilpatrick, Jason Gibbs, Martin M. Mikulas, Sven-Erik Spichiger, Nancy Ostiguy, David J. Biddinger, Margarita M. López-Uribe

Data type: specimen records

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Link: <https://doi.org/10.3897/jhr.77.49622.suppl15>

## **Supplementary material 16**

### **Pennsylvanian Megachilidae specimen records from BugGuide**

Authors: Shelby Kerrin Kilpatrick, Jason Gibbs, Martin M. Mikulas, Sven-Erik Spichiger, Nancy Ostiguy, David J. Biddinger, Margarita M. López-Uribe

Data type: specimen records

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Link: <https://doi.org/10.3897/jhr.77.49622.suppl16>

**Supplementary material 17****Pennsylvanian bee specimen records from iNaturalist**

Authors: Shelby Kerrin Kilpatrick, Jason Gibbs, Martin M. Mikulas, Sven-Erik Spichiger, Nancy Ostiguy, David J. Biddinger, Margarita M. López-Uribe

Data type: specimen records

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