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 Specimen data from insect collections, databases, scientific literature, and unpublished records were compared to the original checklist.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-\textit{Apis} and non-\textit{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/accession 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, Pittsburg, 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 warranted 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, Bouman & 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 State 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 |
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; Droge 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), Shruge (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 DeBarros’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) synonomized 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 bishoppi** (Cockerell, 1911): Schwarz and Gusenleitner (2004) synonomized 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) synonomized 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) rohweri (Ellis, 1915): Gibbs (2010) synonomized this name with *Lasioglossum* (Dialictus) versatum (Robertson, 1902).

**Lasioglossum** (Evylaeus) divergens (Lovell, 1905): Gibbs et al. (2013) synonomized 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) nymphaearum (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. nymphaearum.

Lasioglossum (Erylæus) 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 (Eutricharaeæ) concinna Smith, 1879: considered a synonym of Megachile (Eutricharaeæ) 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 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 Droge, 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).
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.).

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 un-assessed; 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. daeckei Viereck, 1907 and Sphecodes smilaciniae 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%).
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.
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(available at 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: 1 = Donovall and vanEngelsdorp (2010); 2 = Bartomeus et al. (2013); 3 = Biddinger Laboratory Database; 4 = Droege Database; 5 = Integrated Crop Polllination (ICP) Project: Fleischer Laboratory Database; 6 = López-Uribe Laboratory Database; 7 = Mahan et al., in prep; 8 = Winfree Laboratory Database; 9 = Choate et al. (2018); 10 = Baker, J.R. (1975); 11 = Bouseman, J.K. and LaBerge, W.E. (1978); 12 = Broemeling, D.K. (1998); 13 = Cockerell, T.D.A. (1908); 14 = Daly, H.V. (1973); 15 = DeBarros, N.B. (2010); 16 = Droege et al. (2010); 17 = Gibbs (2010); 18 = Gibbs (2011); 19 = Gibbs and Dathe (2017); 20 = Gibbs et al. (2013); 21 = LaBerge (1969); 22 = LaBerge (1971); 23 = LaBerge (1973); 24 = LaBerge (1977); 25 = LaBerge (1980); 26 = LaBerge (1985); 27 = LaBerge (1987); 28 = LaBerge (1989); 29 = LaBerge and Bouseman (1970); 30 = LaBerge and Ribble (1972); 31 = Matteson et al. (2008); 32 = McGinley (1986); 33 = McGinley (2003); 34 = Mikulas and Barringer (2018); 35 = Milliron (1973a); 36 = Mitchell (1960); 37 = Mitchell (1962); 38 = Onuferko (2017); 39 = Onuferko (2018); 40 = Ordway (1966); 41 = Rehan and Sheffield (2011); 42 = Roberts (1972); 43 = Shinn (1967); 44 = Sidhu (2013); 45 = Stephen (1954); 46 = Svensson et al. (1977); 47 = Timberlake (1975); 48 = AMNH; 49 = BugGuide; 50 = Swenk (1915); 51 = PSUB; 52 = Rosemary Malfi Insect Collection; 53 = 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 – Bucks¹, Centre⁷, Cumberland¹, Dauphin¹, Delaware¹, Lancaster¹, Lehigh¹, Philadelphia²; 12 Jun¹ – 9 Jul¹ (2017).
Macropis (Macropis) nuda (Provancher, 1882) – Lehigh¹, Pike¹²; 21 Apr¹ – 9 Jul¹ (1983¹).
Macropis (Macropis) patellata Patton, 1880 – Bucks¹, Cumberland¹, Dauphin¹, Huntingdon¹, Lehigh¹, Philadelphia¹²; 3 Jun² – 14 Jul¹ (1922¹).
Melittini

Genus *Melitta* Kirby

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

**Subgenus Cilissa Leach**

*Melitta (Cilissa) melittoides* (Viereck, 1909) \(^3^6\) – Centre\(^1\); 16 Jun\(^1\) (1958\(^1\)).

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* \(^1\) \((2013^3,8)^1\) – Adams\(^3\), Union\(^8\); 10 Apr\(^3\) – 28 Apr\(^8\) (2013\(^3,8\)).

**Subgenus Clisodon Patton**

*Anthophora (Clisodon) terminalis* Cresson, 1869 \(^3^7\) – Adams\(^3,8\), Allegheny\(^1\), Blair\(^1,2\), Bradford\(^8\), Centre\(^1\), Chester\(^1\), Cumberland\(^1\), Dauphin\(^1\), Erie\(^9\), Fayette\(^1\), Franklin\(^1\), Huntingdon\(^1,8\), Lycoming\(^8\), Montgomery\(^1\), Northumberland\(^1\), Perry\(^1\), Philadelphia\(^1\), Susquehanna\(^8\), Union\(^8\), York\(^1\); 14 May\(^3\) – 23 Oct\(^3\) (2018\(^3\)).

**Subgenus Lophanthophora Brooks**

*Anthophora (Lophanthophora) ursina* Cresson, 1869 – Schuylkill\(^1,2\); 28 May\(^2\) – 29 May\(^1\) (1988\(^1,2\)).

**Subgenus Melea Sandhouse**

**Revision:** Brooks (1983).

*Anthophora (Melea) abrupta* Say, 1837 (bomboides group) \(^3^7\) – Adams\(^3\), Allegheny\(^1\), Cumberland\(^1\), Dauphin\(^1\), Lackawanna\(^2\), Lehigh\(^1\), Montgomery\(^1,7\), Tioga\(^1\); 10 Apr\(^3\) – 17 Aug\(^3\) (2018\(^3\)).
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**Anthophora (Melea) bomboides** Kirby, 1837 (bomboides group) – **Adams**³, Allegheny¹, Carbon¹, Centre¹, Dauphin⁶, Huntingdon⁶, Lehigh¹, Montgomery⁷, Northumberland¹, Union⁸, Washington⁶; 23 Apr⁶ – 16 Aug⁵ (2018³).

**Genus Habropoda** Smith

*Habropoda laboriosa* (Fabricius, 1804) – **Adams**³, Bucks⁸, Cumberland¹, Dauphin¹, Huntingdon⁶, Lycoming⁸, Philadelphia¹, York⁸; 21 Mar⁴ – 4 Jun¹ (2015³,⁸).

**Apini**

**Genus Apis** Linnaeus

*Apis (Apis) mellifera mellifera* Linnaeus, 1758* (1887¹)³⁷ – **Adams**³,⁶, Allegheny⁶, Beaver⁴⁴, Bedford⁴, Berks⁶, Bradford⁴,⁶, Bucks⁴, Cambria⁶, Carbon⁶, Centre⁵,⁶,⁷,¹⁵,⁴⁴, Clearfield⁴,⁶, Clinton⁶, Columbia³, Crawford⁴,⁶, Cumberland⁶, Dauphin⁴,⁶, Delaware⁴, Elk⁶, Erie⁶,⁹, Franklin⁶, Fulton⁴⁴, Huntingdon¹, Jefferson⁶, Juniata⁶,⁴⁴, Lackawanna¹, Lancaster³,⁵,⁶,¹⁵,⁴⁴, Lebanon⁴, Lycoming⁶,⁴⁴, McKean⁴, Monroe⁶, Montgomery⁶,⁷,⁴⁴, Montour⁶, Northampton⁵,⁶, Perry⁶, Pike⁴, Schuylkill⁴, Snyder⁴, Somerset⁶, Tioga¹, Warren⁶, Washington⁶, Westmoreland⁴,⁶, York⁴,⁶, 14 Mar¹ – 17 Nov¹ (2017³,⁷). **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**³,⁸, Allegheny¹, Bradford¹, Bucks¹,², Centre¹,⁴,⁴⁴, Cumberland¹, Dauphin¹, Delaware¹,⁴, Erie¹, Fayette¹, Huntingdon¹, Juniata¹, Lancaster³, Lawrence¹, Lebanon¹, Lehigh¹, Montgomery¹,⁸, Northumberland¹, Philadelphia¹, Somerset¹, Tioga¹, Washington¹, Westmoreland¹; 27 Apr¹ – 13 Sep¹ (2017³).

**Subgenus Bombus** Latreille s. s.

*Bombus (Bombus) affinis* Cresson, 1863 – Allegheny¹, Bucks², Centre¹, Clinton¹, Columbia², Cumberland¹, Dauphin¹, Delaware²,⁵, Erie¹, Fayette¹, Forest¹, Fulton¹, Huntingdon¹, Juniata¹, Lackawanna², Lancaster¹, Lawrence¹, Lehigh¹, Luzerne¹,²,
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Lycoming¹, McKean¹, Monroe¹, Northumberland¹, Perry¹, Philadelphia¹, Tioga¹, Venango¹, Warren¹, Washington¹, Westmoreland¹, York¹; 22 Apr¹ – 4 Oct¹ (2006⁶²).

*Bombus* (*Bombus*) *terricola* Kirby, 1837 – Blair¹, Centre¹, Clearfield¹, Clinton¹, Columbia¹, Erie¹, Huntingdon¹, Lackawanna², Luzerne¹, Lycoming¹, McKean¹, Monroe¹, Pike¹, Sullivan¹, Tioga¹, Warren¹; 29 Apr² – 2 Nov³ (2009¹⁵).

**Subgenus Cullumanobombus** Vogt

*Bombus* (*Cullumanobombus*) *griseocollis* (DeGeer, 1773) (*griseocollis* group) – Adams³,⁶,⁸, Allegheny¹, Berks², Bradford¹, Bucks¹, Centre¹, Chester¹,⁴,⁴⁴, Columbia⁵, Cumberland¹, Dauphin¹, Delaware¹,⁴, Erie¹, Fayette¹,⁵, Huntingdon¹, Lancaster¹,⁴,⁵,⁶,¹⁵,⁴⁴, Lebanon⁴, Lehigh¹, Luzerne², Lycoming⁶, Monroe¹, Montgomery⁷,⁸, Perry¹, Philadelphia¹, Pike¹, Snyder¹, Tioga¹, Union⁸, Washington¹, Westmoreland¹, York⁴,⁶,⁸; 10 Apr³ – 12 Oct¹ (2018³).

*Bombus* (*Cullumanobombus*) *rufocinctus* Cresson, 1863 (*rufocinctus* group) – Erie³⁴; 30 Jul³⁴ (2017³⁴).

**Subgenus Psithyrus** Lepeletier

*Bombus* (*Psithyrus*) *ashtoni* (Cresson, 1864) (*bohemicus* group) – Allegheny¹, Berks², Centre¹,²,¹⁵, Columbia², Cumberland¹, Dauphin¹, Erie¹, Lackawanna¹, Perry¹, Westmoreland¹; 12 May¹ – 26 Sep² (2009¹⁵).

*Bombus* (*Psithyrus*) *citrinus* (Smith, 1854) (*citrinus* group) – Allegheny¹, Berks¹, Bucks⁸, Centre¹,¹⁵, Columbia¹, Cumberland¹, Dauphin¹, Erie¹, Fulton¹, Huntingdon¹, Lancaster¹, Lehigh¹, Lycoming¹, Monroe², Northumberland¹, Perry¹, Philadelphia⁴, Pike¹, Westmoreland¹, York¹; 2 Apr¹ – 14 Nov¹ (2012⁸).

*Bombus* (*Psithyrus*) *fernaldae* (Franklin, 1911) (*sylvestris* group) – Adams¹,³, Centre¹,⁶,⁷,¹⁵, Erie²; 6 May⁶ – 15–16 Aug⁶ (2016⁷).

*Bombus* (*Psithyrus*) *insularis* (Smith, 1861) (*citrinus* group) – Centre¹,¹⁵, Cumberland¹, Perry¹; 23 Jun¹ (2009¹⁵).

**Subgenus Pyrobombus** Dalla Torre

*Bombus* (*Pyrobombus*) *bimaculatus* Cresson, 1863 (*lapponicus* group) – Adams¹,³,⁸, Allegheny¹, Beaver⁴⁴, Bedford¹,⁶, Blair⁶, Bradford⁶,⁸, Bucks⁶,⁸, Centre¹,³,⁵,⁶,⁷,¹⁵,⁴⁴, Chester⁸, Columbia⁴, Crawford¹, Cumberland¹, Dauphin¹, Delaware¹,²,⁴, Erie⁹, Fulton¹, Huntingdon¹,²,³,⁸, Jefferson⁶, Juniata¹, Lackawanna¹, Lancaster¹,⁴,⁵,⁸, Lebanon¹, Lehigh¹, Lycoming⁶,⁸, Mifflin¹, Monroe¹, Montgomery⁷,⁸, Northampton⁵,⁶, Northumberland¹, Perry¹, Philadelphia¹,², Pike¹,⁴, Schuylkill¹,², Somerset¹,⁶, Susquehanna³, Union¹,⁸, Washington¹, Westmoreland¹, York¹,²; 14 Mar¹ – 12 Nov¹ (2018³).  

*Bombus* (*Pyrobombus*) *impatiens* Cresson, 1863 (*lapponicus* group)⁵⁷ – Adams³,⁸,⁴⁴, Allegheny¹, Beaver⁴⁴, Bedford⁶, Berks⁶, Blair⁶, Bradford¹,⁴,⁶,⁸, Bucks¹,⁴,⁶,⁸, Butler¹,⁴⁴,
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Subgenus *Subterraneobombus* Vogt

*Bombus (Subterraneobombus) borealis* Kirby, 1837 – Adams, Allegheny, Beaver, Tioga; 11 Aug – 24 Sep (2015).

Subgenus *Thoracobombus* Dalla Torre

*Bombus (Thoracobombus) fervidus* (Fabricius, 1798) (pensylvanicus group) – Adams, Allegheny, Berks, Bradford, Bucks, Centre, Chester, Clearfield, Clinton, Columbia, Crawford, Cumberland, Dauphin, Delaware, Erie, Fayette, Franklin, Fulton, Huntingdon, Indiana, Jefferson, Juniata, Lackawanna, Lancaster, Lebanon, Lehigh, Luzerne, Lycoming, McKean, Mifflin, Monroe, Montgomery, Northampton, Northumberland, Perry, Philadelphia, Schuylkill, Sullivan, Susquehanna, Tioga, Union, Warren, Washington, Wayne, Westmoreland, Wyoming, York.
Luzerne\(^1\), **Lyonning**\(^8\), Mifflin\(^1\), Montgomery\(^1,2,8\), **Northampton**\(^5\), Northumberland\(^1\), Philadelphia\(^1,2,4\), Tioga\(^1\), Washington\(^1\), Westmoreland\(^1\), York\(^1,8\); **31 Mar**\(^3\) – **4 Nov**\(^1\) **(2018)**.

*Bombus (Thoracobombus) pensylvanicus* (DeGeer, 1773) (*pensylvanicus* group)\(^37\) – **Adams**\(^3\), Allegheny\(^1\), Beaver\(^1\), Berks\(^2\), Centre\(^1,4,4\), Chester\(^1\), Clarion\(^1\), Columbia\(^1,2,5\), Crawford\(^1\), Cumberland\(^1\), Dauphin\(^1\), Delaware\(^1,4\), Erie\(^1\), Fayette\(^1\), Jefferson\(^1\), Juniata\(^1\), Lancaster\(^1\), Lebanon\(^1\), Mifflin\(^1\), Monroe\(^2\), Montgomery\(^1\), Philadelphia\(^1,2\), Tioga\(^1\), Union\(^1\), Washington\(^1\), Westmoreland\(^1\), York\(^1\); **23 Apr**\(^1\) – **15 Oct**\(^1\) **(2018)**.

**Emphorini**

**Genus Melitoma** Lepeletier and Serville

**Taxonomy:** Mitchell (1962).

*Melitoma taurea* (Say, 1837) – **Adams**\(^3\), Lancaster\(^3,8\); **12 Jun**\(^3\) – **2 Oct**\(^3\) **(2018)**.

**Genus Ptilothrix** Smith

**Taxonomy:** Mitchell (1962).

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

**Eucerinae**

**Eucerini**

**Genus Eucera** Scopoli

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

**Subgenus Cemolobus** Robertson

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

*Eucera (Cemolobus) ipomoeae* (Robertson, 1891) – **Adams**\(^3\); **5 Jul**\(^3\) – **30 Jul**\(^3\) **(2017)**.

**Subgenus Peponapis** Robertson

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

**Key:** Ayala and Griswold (2012).
Eucera (Peponapis) pruinosa (Say, 1837)\textsuperscript{37} – Adams\textsuperscript{3,8}, Allegheny\textsuperscript{1}, Armstrong\textsuperscript{6}, Beaver\textsuperscript{44}, Berks\textsuperscript{6}, Bradford\textsuperscript{6,8}, Bucks\textsuperscript{8}, Centre\textsuperscript{1,5,6,7,15,44}, Chester\textsuperscript{8}, Columbia\textsuperscript{5}, Crawford\textsuperscript{4}, Cumberland\textsuperscript{6}, Dauphin\textsuperscript{1,6}, Delaware\textsuperscript{4}, Erie\textsuperscript{1,9}, Franklin\textsuperscript{6}, Fulton\textsuperscript{44}, Huntingdon\textsuperscript{3,8}, Jefferson\textsuperscript{6}, Juniata\textsuperscript{44}, Lancaster\textsuperscript{3,5,6,8,15,44}, Lebanon\textsuperscript{6}, Lycoming\textsuperscript{8,44}, Monroe\textsuperscript{6}, Montgomery\textsuperscript{6,8,44}, Perry\textsuperscript{6}, Philadelphia\textsuperscript{1}, Union\textsuperscript{8}, Wayne\textsuperscript{1}, Westmoreland\textsuperscript{1}, York\textsuperscript{1,6,8}, 5 May\textsuperscript{\textsuperscript{1}} – 12 Oct\textsuperscript{3} (2018\textsuperscript{3}).

Subgenus Synhalonia Patton

Revision: Timberlake (1969).

Eucera (Synhalonia) atriventris (Smith, 1854)\textsuperscript{37} – Adams\textsuperscript{3}, Allegheny\textsuperscript{1}, Centre\textsuperscript{1}, Cumberland\textsuperscript{1}, Dauphin\textsuperscript{1}, Delaware\textsuperscript{1}, Franklin\textsuperscript{1}, Huntingdon\textsuperscript{3,8}, Montgomery\textsuperscript{1}, Philadelphia\textsuperscript{1}, York\textsuperscript{1}; 12 Apr\textsuperscript{1} – 29 Jul\textsuperscript{3} (2017\textsuperscript{3}).

Eucera (Synhalonia) dubitata (Cresson, 1878)\textsuperscript{37} – Adams\textsuperscript{3}, Lycoming\textsuperscript{8}; 27 Apr\textsuperscript{3} – 24 Sep\textsuperscript{3} (2017\textsuperscript{3}).

Eucera (Synhalonia) hamata (Bradley, 1942) – Adams\textsuperscript{3,8}, Delaware\textsuperscript{4}, Huntingdon\textsuperscript{8}, Lancaster\textsuperscript{3,5,8}, York\textsuperscript{6}; 31 Mar\textsuperscript{3} – 17 Aug\textsuperscript{3} (2018\textsuperscript{3}).

Eucera (Synhalonia) rosae (Robertson, 1900) – Adams\textsuperscript{3}; 17 Apr\textsuperscript{3} – 5 Jul\textsuperscript{3} (2017\textsuperscript{3}).

Genus Melissodes Latreille

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

Subgenus Apomelissodes LaBerge

Revision: LaBerge (1956b).

Melissodes (Apomelissodes) apicatus Lovell & Cockerell, 1906 – Montgomery\textsuperscript{7}; 26 – 27 Jun\textsuperscript{7} (2017\textsuperscript{7}).

Melissodes (Apomelissodes) fimbriatus Cresson, 1878 – Adams\textsuperscript{3,51}; 21 Jun\textsuperscript{3} – 28 Jun–5 Jul\textsuperscript{51} (2012\textsuperscript{3,51}).

Subgenus Eumelissodes LaBerge

Revision: LaBerge (1961).

Melissodes (Eumelissodes) agilis Cresson, 1878\textsuperscript{37} – Allegheny\textsuperscript{1}, Centre\textsuperscript{15,44}, Dauphin\textsuperscript{1}, Lancaster\textsuperscript{1,8}, Lebanon\textsuperscript{1}, Philadelphia\textsuperscript{1}; 14 Jul\textsuperscript{1} – 12 Aug\textsuperscript{1} (2015\textsuperscript{8}).

Melissodes (Eumelissodes) boltoniae Robertson, 1905\textsuperscript{37} – Centre\textsuperscript{1}, Forest\textsuperscript{1}; 25 Jun\textsuperscript{1} – 27 Aug\textsuperscript{1} (1956\textsuperscript{1}).
Melissodes (Eumelissodes) denticulatus Smith, 1854\textsuperscript{37} – Adams\textsuperscript{3}, Allegheny\textsuperscript{1}, Armstrong\textsuperscript{1}, Beaver\textsuperscript{1}, Centre\textsuperscript{15,44}, Cumberland\textsuperscript{1}, Dauphin\textsuperscript{1}, Elk\textsuperscript{6}, Erie\textsuperscript{9}, Lancaster\textsuperscript{3}, Perry\textsuperscript{1,4}, Philadelphia\textsuperscript{1}, Washington\textsuperscript{1}, York\textsuperscript{1}; 26 May\textsuperscript{3} – 8 Oct\textsuperscript{1} (2018\textsuperscript{3}).

Melissodes (Eumelissodes) dentiventris Smith, 1854\textsuperscript{37} – Adams\textsuperscript{3}, Allegheny\textsuperscript{1}, Carbon\textsuperscript{6}, Cumberland\textsuperscript{1}, Dauphin\textsuperscript{1}, Philadelphia\textsuperscript{1}, York\textsuperscript{1}; 3 Jul\textsuperscript{3} – 17 Oct\textsuperscript{1} (2015\textsuperscript{3}).

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

Melissodes (Eumelissodes) fumosus LaBerge, 1961 – Centre\textsuperscript{44}; dates not reported\textsuperscript{44} (2010 – 2012\textsuperscript{44}).

Melissodes (Eumelissodes) illatus Lovell & Cockerell, 1906\textsuperscript{37} – Adams\textsuperscript{3}, Centre\textsuperscript{15}, Erie\textsuperscript{9}; 11 Jun\textsuperscript{3} – 17 Aug\textsuperscript{3} (2016\textsuperscript{6}).

Melissodes (Eumelissodes) niveus Robertson, 1895 – Center\textsuperscript{44}, Delaware\textsuperscript{1}; 3 Sep\textsuperscript{1} (2010 – 2012\textsuperscript{44}).

Melissodes (Eumelissodes) subillatus LaBerge, 1961\textsuperscript{37} – Adams\textsuperscript{3}, Huntingdon\textsuperscript{2}, Lancaster\textsuperscript{3}; 14 Jun\textsuperscript{3} – 6 Sep\textsuperscript{1} (2014\textsuperscript{3}).

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

**Subgenus Heliomelissodes LaBerge**

**Revision:** LaBerge (1956\textsuperscript{b}).

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

**Subgenus Melissodes Latreille s. s.**

**Revision:** LaBerge (1956\textsuperscript{a}).

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

Melissodes (Melissodes) communis communis Cresson, 1878 – Allegheny\textsuperscript{1}; dates and year not reported\textsuperscript{1}.

Melissodes (Melissodes) tepaneca Cresson, 1878 – Adams\textsuperscript{3}; 13 Aug\textsuperscript{3} (2015\textsuperscript{3}).
Genus *Svastra* Holmberg
Subgenus *Anthedonia* Michener

**Revision:** LaBerge (1955).

*Svastra (Anthedonia) compta* (Cresson, 1878) – Philadelphia¹; dates and year not reported¹.

**Subgenus Epimelissodes Ashmead**

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

*Svastra (Epimelissodes) obliqua* (Say, 1837) *caliginosa* (Cresson, 1878) – Adams³, Delaware⁴, Lancaster³; 30 Jun³ – 9 Sep⁴ (2018³).

**Nomadinae**

Ammobatoidini

Genus *Holcopasites* Ashmead

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

*Holcopasites calliopsidis calliopsidis* (Linsley, 1943) – *Adams⁵,⁸, Centre¹,⁶,⁷, Dauphin¹, Delaware², Indiana¹, Lackawanna¹, Lancaster¹,¹⁵, *Lehigh⁶, Philadelphia¹, Westmoreland⁶, York¹,³, 24–25 May⁷ – 18 Aug³ (2017³).
*Holcopasites illinoiensis* (Robertson, 1891) – Bucks¹; 28 Jun¹ (1936¹).

Epeolini

Genus *Epeolus* Latreille

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

*Epeolus americanus* (Cresson, 1878)³⁷ – Dauphin¹,³³⁷; 6 Jun¹ – 27 Jun³⁷ (1923³⁷).
*Epeolus autumnalis* Robertson, 1902 – Centre¹, Huntingdon¹, Philadelphia²; 27 Apr² – 20 Sep¹ (2003³¹).
*Epeolus bifasciatus* Cresson, 1864³⁷,³⁹ – *Adams³, Berks², Centre¹,¹⁵,³⁸,⁴⁴, Dauphin¹, Huntingdon¹, Lancaster¹,¹⁵, Lehigh¹, Luzerne³, Philadelphia¹; 2 Jul³ – 5 Sep¹ (2016³⁸).
*Epeolus lectoides* Robertson, 1901 – *Adams⁶, Philadelphia¹; 14 Aug⁶ – 17 Sep¹ (2008⁶).
*Epeolus pusillus* Cresson, 1864 – Columbia¹,², *Lycoming⁸, Union⁸; 25 Sep² – 28 Sep⁸ (2014⁸).
*Epeolus scutellaris* Say, 1824³⁷ – Bradford³⁹, Centre¹,⁷, Erie¹, Huntingdon¹, Monroe¹,², Philadelphia²; 9 Aug² – 25 Sep¹/Aug–Oct³⁹ (2017³⁹).
Genus *Triepeolus* Robertson

**Revision:** Rightmyer (2008).

*Triepeolus atripes* Mitchell, 1962 – Lancaster; 5 Sep (1954).

*Triepeolus concavus* (Cresson, 1878) – Adams, Lancaster; 12 Jul - 26 Jul (2012).

*Triepeolus donatus* (Smith, 1854) – Centre, Forest, Westmoreland; 25 May – 24–25 Jul (2017).

*Triepeolus helianthi* (Robertson, 1897) – Beaver, Centre, Franklin; 9 Jul – 19 Aug (2009).

*Triepeolus lunatus* (Say, 1824) – Adams, Allegheny, Bucks, Cumberland, Dauphin, Delaware, Lancaster, Montgomery, Perry, Somerset, York; 25 Jun – 11 Sep (2018).

*Triepeolus nevadensis* (Cresson, 1878) – Adams; 4 Aug (2016).

*Triepeolus pectoralis* (Robertson, 1897) – Columbia, Delaware, York; 4 Sep – 29 Sep (1992).

*Triepeolus quadrifasciatus* (Say, 1823) *atlanticus* Mitchell, 1962 – Huntingdon; 10 Sep (1996).

*Triepeolus remigatus* (Fabricius, 1804) – Adams, Bucks, Centre, Chester, Columbia, Dauphin, Delaware, Huntingdon, Juniata, Lancaster, Lycoming, Montgomery, Philadelphia, York; 9 Jul – 7 Sep (2014).

*Triepeolus rhododontus* Cockerell, 1921 – Huntingdon; 26 Aug (1996).

*Triepeolus rugosus* Mitchell, 1962 – Huntingdon; 26 Aug (1996).

*Triepeolus simplex* Robertson, 1903 – Union, York; 6 Aug – 24 Aug (2015).

Melectini

Genus *Melecta* Latreille

Subgenus *Melecta* Latreille s. s.

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

*Melecta (Melecta) pacifica* Cresson, 1878 – Adams; 13 Apr (2017).

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) – Adams³; 7 Jun³ – 12 Jun³ (2013³).
Nomada armatella Cockerell, 1903 (ruficornis group) – Cumberland⁶, Elk¹; 9 Apr¹ – 16 Apr⁶ (2008⁶).
Nomada articulata Smith, 1854 (erigeronis group)³⁷ – Adams³, Bucks⁸, Cumberland¹, Dauphin¹, Delaware¹, Erie¹⁹, Huntingdon¹²⁸, Luzerne¹, Lycoming⁸, Montgomery¹, Philadelphia¹, Union¹; 25 Apr¹ – 8 Jul¹ (2018⁸).
Nomada australis Mitchell, 1962 (erigeronis group) – Adams³; 24 May³ – 3 Jun³ (2016³).
Nomada bella Cresson, 1863 (ruficornis group: bidentate mandible) – Centre¹², Cumberland¹, Elk¹, Huntingdon¹, Philadelphia¹²; 27 Mar¹ – 12 Jun¹ (2009³).
Nomada bethunei Cockerell, 1903 (ruficornis group) – Centre¹, Cumberland¹⁶, Huntingdon³, Jefferson⁶, Northumberland¹⁶, Perry¹¹⁶, Washington⁶; 16 Apr⁶ – 29 Aug¹ (2008⁶).
Nomada ceanothi Cockerell, 1907 (ruficornis group) – Columbia⁵, Cumberland¹, Delaware¹, Huntingdon³, Montgomery¹, York¹; 19 Apr¹ – 25 Jun¹ (2013³).
Nomada composita Mitchell, 1962 (ruficornis group) – Adams⁴, Centre¹, Huntingdon⁸, Lycoming⁸, Perry⁶, Susquehanna⁸, Union⁸, York⁸; 2 Apr¹ – 30 May³ (2015⁸).
Nomada cressonii Robertson, 1893 (ruficornis group)³⁷ – Adams¹³, Blair¹², Bradford⁶⁸, Bucks⁸, Centre⁷, Crawford¹, Cumberland¹, Dauphin¹, Delaware¹, Elk¹, Erie¹⁹, Huntingdon¹⁸, Lancaster³, Lehigh¹, Lycoming⁸, Montgomery¹, Perry¹¹⁶, Philadelphia¹, Somerset¹, Susquehanna⁸, Tioga¹, Union⁸, York¹¹⁸; 4 Apr⁶ – 20 Aug¹ (2016⁵⁷⁹).
Nomada cuneata (Robertson, 1903) (ruficornis group: bidentate mandible)³⁷ – Adams², Blair¹², Centre¹, Dauphin¹, Erie¹, Franklin¹, Huntingdon¹, Perry¹, Pike¹⁴, Sullivan¹, York¹; 3 Apr¹ – 26 Jun¹ (2006¹²).
Nomada denticulata Robertson, 1902 (ruficornis group)³⁷ – Bradford⁸, Bucks⁸, Centre⁷, Columbia⁵, Cumberland¹, Dauphin¹, Delaware¹, Elk¹, Erie⁹, Franklin¹, Huntingdon³⁸, Pike¹, York¹⁸; 15 Apr⁸ – 15 Jun⁸ (2017⁷).
Nomada depressa Cresson, 1863 (ruficornis group) – Adams³, Bradford⁸, Bucks⁸, Centre¹, Crawford⁶, Cumberland⁶, Dauphin¹⁶, Huntingdon¹³⁸, Lancaster³, Luzerne¹, Lycoming⁸, Perry⁶, Susquehanna⁸, Union⁸, Warren⁸; 4 Apr⁶ – 19 Sep¹ (2016¹).
Nomada fervida Smith, 1854 (vegana group) – Adams³, Erie¹; 3 Jun¹ – 30 Jul¹ (2008³).
Nomada fragariae Mitchell, 1962 (ruficornis group) – Centre¹, Mercer⁶; 5 May¹ (2009⁶).
Nomada gracilis Cresson, 1863 (ruficornis group) – Dauphin⁶, Huntingdon¹, Susquehanna⁸, Union⁸; 11 Apr⁶ – 28 May¹ (2014⁹).
Nomada illinoensis Robertson, 1900 (ruficornis group) – Adams³, Dauphin¹; 26 Apr³ – 1 Jul¹ (2018³).
Nomada imbricata Smith, 1854 (ruficornis group)³⁷ – Adams³, Bradford⁸, Centre¹⁷⁸, Crawford¹, Cumberland¹, Dauphin¹, Delaware¹⁴, Erie⁹, Huntingdon¹²⁸, Lancaster³, Mercer⁶, Montour⁶, Philadelphia¹²⁴, Susquehanna⁸, Union⁸, York¹³; 14 Apr³ – 15 Jun⁸ (2018³).
Nomada integerrima Dalla Torre, 1896 (ruficornis group)\textsuperscript{37} – Somerset\textsuperscript{6}, Washington\textsuperscript{6}; 28 May\textsuperscript{6} – 13 Jun\textsuperscript{6} (2009\textsuperscript{6}).

Nomada lehighensis Cockerell, 1903 (ruficornis group)\textsuperscript{37} – Adams\textsuperscript{16}, Carbon\textsuperscript{16}, Dauphin\textsuperscript{16}, Erie\textsuperscript{16}, Huntingdon\textsuperscript{8}, Lehigh\textsuperscript{1,16,16}, Lycoming\textsuperscript{8}, Northampton\textsuperscript{16}, Schuylkill\textsuperscript{2}; 1 Apr\textsuperscript{16} – 21 Jul\textsuperscript{1} (2015\textsuperscript{8}).

Nomada lepida Cresson, 1863 (ruficornis group: bidentate mandible)\textsuperscript{37} – Adams\textsuperscript{3}, Columbia\textsuperscript{5}, Cumberland\textsuperscript{1}, Dauphin\textsuperscript{1}, Delaware\textsuperscript{1}, Erie\textsuperscript{1}, Huntingdon\textsuperscript{3}, Philadelphia\textsuperscript{1}; 10 Apr\textsuperscript{3} – 30 Jun\textsuperscript{1} (2016\textsuperscript{3}).

Nomada luteola Olivier, 1812 (ruficornis group) – Adams\textsuperscript{3}, Dauphin\textsuperscript{1}, Delaware\textsuperscript{1}, Huntingdon\textsuperscript{1}, Montgomery\textsuperscript{1}, Philadelphia\textsuperscript{1,2}, York\textsuperscript{3}; 23 Apr\textsuperscript{3} – 21 Jun\textsuperscript{1} (2016\textsuperscript{3}).

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

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

Nomada obliterata Cresson, 1863 (ruficornis group) – Cumberland\textsuperscript{1}, Dauphin\textsuperscript{1}, York\textsuperscript{1}; 30 Apr\textsuperscript{1} – 27 Jun\textsuperscript{1} (1970\textsuperscript{1}).

Nomada ovata (Robertson, 1903) (ruficornis group: bidentate mandible)\textsuperscript{37} – Adams\textsuperscript{3}, Centre\textsuperscript{1}, Cumberland\textsuperscript{1}, Huntingdon\textsuperscript{1}; 16 Apr\textsuperscript{3} – 11 Jul\textsuperscript{1} (2013\textsuperscript{3}).

Nomada parva Robertson, 1900 (ruficornis group)\textsuperscript{37} – Chester\textsuperscript{6}, Dauphin\textsuperscript{1}; 6 May\textsuperscript{1} – 13 Jul\textsuperscript{6} (2008\textsuperscript{6}).

Nomada perplexa Cresson, 1863 (ruficornis group: bidentate mandible)\textsuperscript{37} – Centre\textsuperscript{1}, Crawford\textsuperscript{1}, Dauphin\textsuperscript{1}, Erie\textsuperscript{1}, Huntingdon\textsuperscript{1}, Lancaster\textsuperscript{9}, Lehigh\textsuperscript{1}, Monroe\textsuperscript{2}, Philadelphia\textsuperscript{2}; 5 Mar\textsuperscript{1} – 14 Jul\textsuperscript{1} (2013\textsuperscript{3}).

Nomada placida Cresson, 1863 (roberjeotiana group) – Cumberland\textsuperscript{1,12}, Delaware\textsuperscript{1,2}; 28 Aug\textsuperscript{1,12} – 25 Sep\textsuperscript{2} (1947\textsuperscript{1}).

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

Nomada rubicunda Olivier, 1812 (erigeronis group) – Philadelphia\textsuperscript{1}; dates and year not reported\textsuperscript{1}.

Nomada sayi Robertson, 1893 (ruficornis group)\textsuperscript{37} – Adams\textsuperscript{3}, Chester\textsuperscript{6}, Crawford\textsuperscript{1}, Dauphin\textsuperscript{1,6}, Franklin\textsuperscript{1}, Huntingdon\textsuperscript{1}, Montgomery\textsuperscript{1}, Philadelphia\textsuperscript{1}; 17 Apr\textsuperscript{6} – 11 Jul\textsuperscript{1} (2016\textsuperscript{3}).

Nomada skinneri Cockerell, 1908 (ruficornis group)\textsuperscript{37} – Carbon\textsuperscript{13}, Lehigh\textsuperscript{13}, Northampton\textsuperscript{13}; 30 Jun\textsuperscript{13} (year not reported\textsuperscript{13}).

Nomada sulphurata Smith, 1854 (ruficornis group) – Adams\textsuperscript{3}, Dauphin\textsuperscript{1}, Montgomery\textsuperscript{1}; 28 Apr\textsuperscript{1} – 26 May\textsuperscript{3} (2016\textsuperscript{3}).
**Nomada superba** Cresson, 1863 *(superba group)* – Adams³; 5 May³ – 12 May³ (2016³).

**Nomada tiftonensis** Cockerell, 1903 *(vegana group)* – Philadelphia²; 5 May² (1905²).

**Nomada ulsterensis** Mitchell, 1962 *(ruficornis group)*³ – Philadelphia¹⁰; 18 Jun¹⁰ (1905³⁰).

**Nomada valida** Smith, 1854 *(ruficornis group)* – Adams³, Clinton¹, Crawford¹; 3 Apr¹ – 28 May¹ (2015³).

**Nomada vicina** Cresson, 1863 *(ruficornis group)* – Centre¹,⁷, Erie¹, Huntingdon¹; 12 Aug¹ – 20 Sep¹ (2017⁷).

**Nomada xanthura** Cockerell, 1908 *(ruficornis group)* – Centre¹,⁷, Pike¹; 1 May¹ – 31 May–1 Jun⁷ (2017⁷).

**Osirini**

**Genus Epeoloides** Giraud

**Taxonomy:** Mitchell (1962).

**Epeoloides pilosulus** (Cresson, 1878) – Dauphin¹, Lehigh¹; 9 Jun¹ – 30 Jun¹ (1911¹).

**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, 1900¹⁴,³⁷ – Adams¹,³,⁶,⁸, Allegheny¹,⁶, Armstrong⁶, Berks¹,⁶, Bradford¹,⁴,⁶,⁸, Bucks¹,⁶,⁸, *Carbon*⁶, Centre¹,⁶,⁷,⁸,¹⁵,⁴⁴, Chester¹,⁶, Clarion⁶, Clearfield¹,⁴, Clinton¹, *Columbia*⁵, Crawford¹, Cumberland¹,⁶, Dauphin¹,⁶, Delaware¹,⁴, Erie¹,⁶,⁹, Forest¹, *Franklin*⁶, Greene⁶, Huntingdon²,³,⁸, *Indiana*⁶, Jefferson⁶, Juniata¹,⁶, Lackawanna⁴, Lancaster³,⁵,⁶,⁸,¹⁵,⁴⁴, Lehigh¹,⁶, Lycoming⁸, Monroe¹, Montgomery⁴,⁶, Northampton¹,⁶, Northumberland¹, Perry¹,⁴,⁶, Philadelphia¹,⁴, Schuylkill⁶, Somerset¹, Susquehanna⁸, Union⁸, Washington¹, Westmoreland¹, York¹,⁶,⁸; 23 Mar³ – 6 Nov³ (2018³). **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, 1837¹⁴,³⁷ – Adams¹,³,⁶,⁸, Allegheny¹, Berks¹,⁶, Bradford¹,⁶,⁸, Bucks¹,⁶,⁸, *Carbon*¹, Centre¹,⁶,⁷,⁸,¹⁵,⁴⁴, Chester¹,⁶, *Clearfield*¹, *Clinton*¹, *Columbia*⁵, Crawford¹,⁶, Cumberland¹,⁶, Dauphin¹,⁶, Delaware¹,⁴, Erie¹,⁶,⁹, Franklin¹,⁶, Huntingdon¹,⁸, *Indiana*⁶, Jefferson⁶, Juniata³⁶, Lackawanna¹,⁴, Lancaster³,⁵,⁶,¹⁵, Lawrence¹,
Lehigh\textsuperscript{1,6}, Lycoming\textsuperscript{6,8}, Montgomery\textsuperscript{1,4,6,7,44}, Northumberland\textsuperscript{1}, Perry\textsuperscript{1,6}, Philadelphia\textsuperscript{1,6}, Pike\textsuperscript{1}, Schuylkill\textsuperscript{6}, Tioga\textsuperscript{1}, Union\textsuperscript{8}, Warren\textsuperscript{6}, Washington\textsuperscript{6}, York\textsuperscript{1,6,8}; 20 Feb\textsuperscript{1} – 22 Dec\textsuperscript{1} (2018\textsuperscript{3}).

Ceratina (Zadontomerus) floridana Mitchell, 1962 – Delaware\textsuperscript{4}; 21 May\textsuperscript{4} (2007\textsuperscript{4}).

Ceratina (Zadontomerus) mikmaqi Rehan & Sheffield, 2011\textsuperscript{41} – Adams\textsuperscript{3,8}, Bradford\textsuperscript{8}, Bucks\textsuperscript{8}, Centre\textsuperscript{7,8}, Dauphin\textsuperscript{48} (AMNH_BEE00172273), Erie\textsuperscript{3}, Huntingdon\textsuperscript{8}, Lancaster\textsuperscript{3,5,8}, Lycoming\textsuperscript{8}, Montgomery\textsuperscript{7}, Union\textsuperscript{8}, York\textsuperscript{8}; 29 Mar\textsuperscript{3} – 6 Nov\textsuperscript{3} (2018\textsuperscript{3}).

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

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

Xylocopini

Genus \textit{Xylocopa} Latreille

Subgenus \textit{Xylocopoides} Michener

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

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

Megachilidae

Megachilinae

Anthidiini

Genus \textit{Anthidiellum} Cockerell

Subgenus \textit{Loyolanthidium} Urban

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

\textit{Anthidiellum (Loyolanthidium) notatum notatum} (Latreille, 1809) – Centre\textsuperscript{1}, Huntingdon\textsuperscript{1,2}, Lancaster\textsuperscript{3}, Mifflin\textsuperscript{1}, Monroe\textsuperscript{1}, Northampton\textsuperscript{6}, Philadelphia\textsuperscript{1}; 12 Jul\textsuperscript{1,2} – 22 Aug\textsuperscript{1} (2012\textsuperscript{3}).
Genus *Anthidium* Fabricius

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

**Subgenus *Anthidium* Fabricius s. s.

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

**Subgenus *Proanthidium* Friese

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

Genus *Paranthidium* Cockerell and Cockerell

**Taxonomy:** Schwarz (1926).

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

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

Genus *Pseudoanthidium* Friese

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

**Subgenus *Pseudoanthidium* Friese s. s.

*Pseudoanthidium* (Pseudoanthidium) *nanum* (Mocsáry, 1881)* (2008*6) – Allegheny*49 (BugGuide Image IDs: 1538244/1538247/1538248/1538249), Dauphin*6, Lycoming*8; 3 Jun*6 – 28 Aug*8 (2018*9).

Genus *Stelis* Panzer

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

*Stelis* (*Dolichostelis*) *louisea* Cockerell, 1911 – Bucks\(^{49}\) (BugGuide Image IDs: 1417130/1417131/1417132/1416293), Lehigh\(^{49}\) (BugGuide Image IDs: 747710/747711/747712); 28 Jul\(^{49}\) – 1 Aug\(^{49}\) (2017\(^{49}\)).

Subgenus *Stelis* Panzer s. s.

*Stelis* (*Stelis*) *foederalis* Smith, 1854 – Huntingdon\(^{1}\); 17 May\(^{1}\) – 27 May\(^{1}\) (1999\(^{1}\)).

*Stelis* (*Stelis*) *labiata* (Provancher, 1888) – locations, dates, and year not reported\(^{37}\).

*Stelis* (*Stelis*) *lateralis* Cresson, 1864 – Adams\(^{3}\), Allegheny\(^{1}\), Columbia\(^{5}\), Erie\(^{9}\); 7 May\(^{3}\) – 5–7 Jul\(^{9}\) (2015\(^{3,9}\)).

Megachilini

Genus *Coelioxys* Latreille

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

Subgenus *Allococoelioxys* Tkalců

*Coelioxys* (*Allococoelioxys*) *coturnix* Pérez, 1884\(^{*}\) (2014\(^{8}\)) – Lancaster\(^{8}\), York\(^{8}\); 1 Jun\(^{8}\) – 21 Jul\(^{8}\) (2015\(^{8}\)).

Subgenus *Boreocoelioxys* Mitchell

**Revision:** Baker (1975).

*Coelioxys* (*Boreocoelioxys*) *banksi* Crawford, 1914 – Allegheny\(^{1}\), Centre\(^{1}\); 24 Aug\(^{1}\) (1996\(^{1}\)).

*Coelioxys* (*Boreocoelioxys*) *moestus* Cresson, 1864\(^{10}\) – Adams\(^{3}\), Allegheny\(^{1}\), Blair\(^{1,2}\), Centre\(^{7}\), Lawrence\(^{1}\), Philadelphia\(^{1}\); 24 May\(^{3}\) – 15 Sep\(^{3}\) (2017\(^{7}\)).

*Coelioxys* (*Boreocoelioxys*) *octodentatus* Say, 1824\(^{10}\) – Adams\(^{3}\), Allegheny\(^{1}\), Centre\(^{7}\), Dauphin\(^{1}\), Lancaster\(^{3}\), Lehigh\(^{1}\), Philadelphia\(^{1,4}\); 26 May\(^{3}\) – 24 Aug\(^{1,4}\) (2016\(^{5,7}\)).

*Coelioxys* (*Boreocoelioxys*) *porterae* Cockerell, 1900\(^{10}\) – Allegheny\(^{1}\), Centre\(^{1}\), Lehigh\(^{1}\); 25 Jun\(^{1}\) – 23 Jul\(^{1}\) (1954\(^{1}\)).

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

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

**Key:** Baker (1975).

*Coelioxys* (*Cyrtocoelioxys*) *modestus* Smith, 1854[37] – Allegheny[1], Centre[7], Lehigh[1]; Jun[1] – 16–17 Aug[7] (2017[7]).

Subgenus *Paracoelioxys* Gribodo

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

*Coelioxys* (*Paracoelioxys*) *funerarius* Smith, 1854[10,37] – *Northampton*[6]; 25 Jul[6] (2010[6]).

Subgenus *Synocoelioxys* Mitchell

**Revision:** Baker (1975).

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

*Coelioxys* (*Synocoelioxys*) *hunteri* Crawford, 1914 – Washington[1]; 13 Jul[1] (1910[1]).

Subgenus *Xerocoelioxys* Latreille s. s.

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

*Coelioxys* (*Xerocoelioxys*) *immaculatus* Cockerell, 1912 – Allegheny[1], Philadelphia[2]; 8 Jul[2] (2005[2]).

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[i]) – Adams[3], Bradford[1], Bucks[8], Centre[1,6,7,44], Clinton[1], Dauphin[1,3,6], Erie[1], Huntingdon[1], Jefferson[1,2,6], Lycoming[44], Northampton[6], Schuylkill[6], Tioga[1]; 28 Jun[3] – 15 Aug[3] (2018[3]).

Subgenus *Chelostomoides* Robertson

**Revision:** Mitchell (1937c).
Megachile (Chelostomoides) campanulae (Robertson, 1903) – Adams, Allegheny, Beaver, Bucks, Centre, Dauphin, Erie, Huntingdon, Jefferson, Lancaster, Monroe, Philadelphia, 15 May – 24 Aug (2018).

Megachile (Chelostomoides) exilis Cresson, 1872 – Adams, Bucks, Philadelphia; 29 Jun – 23 Aug (2017).

**Subgenus Eutricharaea Thomson**

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

Megachile (Eutricharaea) apicalis Spinola, 1808* – Bucks, Carbon, Dauphin, Lancaster, Lehigh, Lycoming, Northampton, Schuylkill, Union, York; 7 May – 28 Sep (2015).

Megachile (Eutricharaea) pusilla Pérez, 1884* – Bucks, Carbon, Centre, Columbia, Crawford, Cumberland, Dauphin, Delaware, Erie, Franklin, Lancaster, Lehigh, Lycoming, Montgomery, Northampton, Philadelphia, Schuylkill, Union, Westmoreland, York; 7 May – 9 Oct (2016).

**Subgenus Leptorachis Mitchell**

**Taxonomy:** Mitchell (1934).

Megachile (Leptorachis) petulans Cresson, 1878 – Berks, Delaware, Warren; 30 Jul – 12 Aug (2008).

**Subgenus Litomegachile Mitchell**

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

Megachile (Litomegachile) brevis Say, 1837 – Adams, Allegheny, Bradford, Bucks, Centre, Columbia, Crawford, Cumberland, Dauphin, Delaware, Erie, Franklin, Huntingdon, Juniata, Lancaster, Lycoming, Montgomery, Perry, Philadelphia, York; 1 Jun – 15 Oct (2018).

Megachile (Litomegachile) mendica Cresson, 1878 – Adams, Allegheny, Berks, Bradford, Bucks, Carbon, Centre, Chester, Columbia, Crawford, Cumberland, Dauphin, Delaware, Erie, Fulton, Huntingdon, Jefferson, Juniata, Lancaster, Lehigh, Luzerne, Lycoming, Mifflin, Monroe, Montgomery, Northampton, Northumberland, Perry, Philadelphia, Schuylkill, Sullivan, Union, York; 6 Mar – 16 Oct (2018).

Megachile (Litomegachile) texana Cresson, 1878 – Erie, Lehigh, Philadelphia; 7 Jul – 25 Aug (2016).
Subgenus *Megachile* Latreille s. s.

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

*Megachile (Megachile) centuncularis* (Linnaeus, 1758)

- Adams¹, Allegheny¹,², Bradford⁸, Bucks⁴, Centre¹, Dauphin¹, Delaware¹, Erie¹,⁹, Franklin¹, Huntingdon², Montgomery⁸, Philadelphia¹,⁴, York¹,⁶; 15 May¹ – 24 Sep¹ (2016⁹).

*Megachile (Megachile) inermis* Provancher, 1888

- Adams¹, Centre¹, Fayette¹, Forest¹, Huntingdon¹; 24 Jun¹ – 9 Sep¹ (2017⁷).

*Megachile (Megachile) montivaga* Cresson, 1878

- Adams¹, Centre¹, Centre¹,⁷, Chester¹, Crawford¹, Dauphin¹,⁶, Erie⁹, Lancaster³, Lycoming⁸, Montgomery⁷, Pike¹,⁴, Sullivan¹, Washington⁶; 15 May⁶ – 28 Sep⁸ (2018³).

*Megachile (Megachile) relativa* Cresson, 1878

- Adams³, Allegheny¹, Blair¹,⁸, Bradford⁸, Centre¹,⁷,¹⁵, Clearfield¹, Dauphin¹,²,⁶, Erie⁹, Huntingdon¹,²,³, Lancaster¹,⁴, Lycoming⁸, Monroe¹, Perry¹, Somerset¹,², Sullivan¹, Susquehanna⁸, Union⁸, Washington¹, Wyoming⁴; 1 Jun³ – 3 Oct¹ (2017⁷).

Subgenus *Megachiloides* Mitchell

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

*Megachile (Megachilodes) integra* Cresson, 1878

- Adams³, Bucks¹, Dauphin¹, Huntingdon¹, Northampton⁶, Perry¹, Philadelphia¹; 5 May¹ – 18 Sep¹ (2012³).

Subgenus *Sayapis* Titus

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

*Megachile (Sayapis) frugalis frugalis* Cresson, 1872

- Adams³, Carbon⁶, Centre¹, Dauphin¹,⁶, Delaware⁴, Lehigh¹, Northampton⁶; 26 May¹ – 6 Aug⁶ (2017³).

*Megachile (Sayapis) inimica* Cresson, 1872 *sayi* Cresson, 1878

- Adams³, Allegheny¹, Bucks⁴,⁸, Centre¹,⁷,⁸, Cumberland¹, Dauphin¹,⁶, Erie¹, Huntingdon¹, Lancaster³; 10 Jun⁶ – 28 Sep⁸ (2017³,⁷).

*Megachile (Sayapis) pugnata pugnata* Say, 1837

- Adams³, Allegheny¹, Beaver¹, Centre¹,⁷,¹⁵,⁴⁴, Dauphin¹, Huntingdon¹,²,³, Lancaster³, Union¹, Washington¹; 29 May³ – 16–17 Aug⁷ (2018³).

Subgenus *Xanthosarus* Robertson

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

*Megachile (Xanthosarus) addenda* Cresson, 1878

- Adams¹, Allegheny¹, Centre¹⁵, Dauphin¹,⁶, Erie⁹, Lehigh¹; 16 May⁸ – 15 Jul¹ (2015⁹).
**Megachile (Xanthosarus) frigida frigida** Smith, 1853 – Centre¹, Dauphin¹, Erie¹, Forest¹, Lebanon¹, **Lycoming**⁸, Monroe², **Montgomery**⁸, 30 May¹ - 20 Aug¹ (2015⁸).

**Megachile (Xanthosarus) gemula gemula** Cresson, 1878 – **Adams**³, Allegheny¹, **Bucks**⁸, Centre¹, Cumberland¹, Dauphin¹, Elk¹, **Huntingdon**³, Lehigh¹, Monroe¹-², Philadelphia¹, Sullivan¹-²; 30 Apr¹ – 6 Sep³ (2018³).

**Megachile (Xanthosarus) ingenua** Cresson, 1878 – locations, dates, and year not reported³⁷.

**Megachile (Xanthosarus) latimanus** Say, 1823 – **Adams**³, Allegheny¹, **Bradford**⁸, Bucks¹, **Carbon**⁶, Centre¹-⁷, Columbia², Cumberland¹-², Dauphin¹-², Delaware¹, Erie¹, Franklin¹, Huntingdon¹, **Lackawanna**⁶, Lancaster², Lehigh¹, Monroe¹, Philadelphia¹, Schuylkill¹, Sullivan¹-², Washington¹, Westmoreland¹, Wyoming¹; 2–4 Jun⁹ – 1 Oct¹ (2017⁹).

**Megachile (Xanthosarus) melanophaea melanophaea** Smith, 1853 – **Adams**³, Allegheny¹, Dauphin¹, Sullivan¹, **Westmoreland**⁶; 4 Jun¹ – 14 Jul⁶ (2016³).  
**Megachile (Xanthosarus) mucida** Cresson, 1878 – **Crawford**⁶, Forest¹; 19 Jul¹ – 13 Aug⁶ (2008⁶).

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**Osmiini**

**Genus Chelostoma** Latreille  
**Subgenus Gyrodromella** Michener

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

**Chelostoma** (Gyrodromella) *rapunculi* (Lepeletier, 1841)* (2015⁹) – Erie³; 2–4 Jun⁹ – 9–11 Jun⁹ (2016⁹).

**Subgenus Prochelostoma** Robertson

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

**Chelostoma** (Prochelostoma) *philadelphi* (Robertson, 1891)*⁷ – **Adams**³, Allegheny¹, **Bucks**⁸, **Centre**⁶, Dauphin¹, Delaware¹, Erie⁰, Fayette¹, Fulton¹, Lycoming¹, Montgomery¹, Northumberland¹, Perry¹, Philadelphia¹, Pike¹, Westmoreland¹; 18 Apr⁶ – 27 Jul¹ (2018⁸).

**Genus Heriades** Spinola  
**Subgenus Neotrypetes** Robertson

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

**Heriades** (Neotrypetes) *carinata* Cresson, 1864 – **Adams**³, Allegheny¹, **Bucks**⁸, **Centre**¹-², **Chester**³, Cumberland¹, Erie¹, **Lancaster**³, Lehigh¹, Philadelphia¹; 2 Jun¹ – 14 Aug³ (2018³).
**Heriades (Neotrypetes) leavitti** Crawford, 1913 – Adams³, Centre⁷; 4 Jun³ – 24–25 Jul³ (2017³).

**Heriades (Neotrypetes) variolosa** (Cresson, 1872) – Adams⁹, Centre¹⁵, Montgomery⁸; 11 Jul⁸ – 15 Sep³ (2011⁹).

**Genus Hoplitis Klug**

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

**Subgenus Alcidamea Cresson**

*Hoplitis (Alcidamea) albifrons albifrons* (Kirby, 1837) (tuberculata group) – Adams³, Somerset²; 24 Jun² – 10 Jul³ (2015³).

*Hoplitis (Alcidamea) pilosifrons* (Cresson, 1864) (producta group) – Adams³, Blair¹², Bradford⁶, Centre⁷, Dauphin⁶, Delaware³, Huntingdon¹², Lancaster³, Monroe⁶, Montgomery⁷, Northumberland¹, Perry¹, Philadelphia¹², York³; 30 Apr³ – 18 Oct³ (2018³).

*Hoplitis (Alcidamea) producta producta* (Cresson, 1864) (producta group)³⁷ – Adams³, Allegheny¹, Blair⁶, Bradford⁶⁸, Butler, Centre⁶⁷⁸¹⁵, Chester¹, Clinton⁶, Crawford¹, Cumberland¹, Dauphin¹⁶, Delaware⁶, Erie⁶, Jefferson⁶, Lehigh¹, Monroe⁴, Montgomery⁷, Philadelphia³, Union⁸, Washington⁶, York³; 4 May³ – 16–17 Aug³ (2018³).

*Hoplitis (Alcidamea) spoliata* (Provancher, 1888) (tuberculata group) – Centre¹⁷, Crawford³, Dauphin¹⁶, Huntingdon¹²⁸, Lehigh¹, Lycoming⁸, Monroe³, Perry¹; 27 May¹ – 19–20 Aug⁴ (2017³).

*Hoplitis (Alcidamea) truncata truncata* (Cresson, 1878) (truncata group) – Adams³, Bradford⁶, Clarion¹, Cumberland¹, Franklin¹, Lehigh¹, Northumberland⁶, York³; 1 Jun¹ – 9 Aug¹ (2015⁸).

**Subgenus Hoplitis Klug s. s.**

*Hoplitis (Hoplitis) anthocopoides* (Schenck, 1853) (Annosmia–Hoplitis group)* (2012³) – Adams³; 31 May³ – 14 Jun³ (2012³).

**Subgenus Robertsonella Titus**

*Hoplitis (Robertsonella) simplex* (Cresson, 1864) – Bradford⁶, Bucks⁸, Dauphin⁶, Lancaster³, York³; 8 May⁶ – 16 Jun⁶ (2014⁸).

**Genus Osmia Panzer**

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

**Subgenus Diceratosmia Robertson**

**Revision:** Michener (1949).
Osmia (Diceratostoma) conjuncta Cresson, 1864 – Adams, Huntingdon; 27 Apr – 15 Jun (2015).

Subgenus Helicosmia Thomson

Revision: Rust (1974 as Chalcosmia).

Osmia (Helicosmia) caerulescens (Linnaeus, 1758)* (1905) – Adams, Bradford, Butler, Centre, Cumberland, Dauphin, Franklin, Perry, Philadelphia, Pike, Washington; 10 Apr – 29 Aug (2017).

Osmia (Helicosmia) chalybea Smith, 1853 – Delaware, Philadelphia; 16 May – 22 Jun (1907).

Osmia (Helicosmia) coloradensis Cresson, 1878 – Bradford; 13 Jun – 2 Jul (1939).

Osmia (Helicosmia) georgica Cresson, 1878 – Adams, Allegheny, Bradford, Bucks, Centre, Dauphin, Delaware, Erie, Huntingdon, Lancaster, Lycoming, Montgomery, Perry, Susquehanna, Union, York; 15 Apr – 21 Jul (2018).

Osmia (Helicosmia) texana Cresson, 1872 – Adams, Allegheny, Bradford, Centre, Cumberland, Greene, Huntingdon, Lancaster, Washington; 25 May – 15 Sep (2018).

Subgenus Melanosmia Schmiedeknecht

Taxonomy: Rightmyer et al. (2010).

Osmia (Melanosmia) albiventris Cresson, 1864 – Centre, Clarion, Dauphin, Huntingdon, Lehigh, Montgomery, Philadelphia, Tioga, Union, York; 23 Apr – 3 Jul (2015).

Osmia (Melanosmia) atriventris Cresson, 1864 – Adams, Allegheny, Blair, Bradford, Bucks, Centre, Dauphin, Delaware, Huntingdon, Lancaster, Lycoming, Monroe, Montgomery, Perry, Philadelphia, Pike, Susquehanna, Tioga, Union, York; 29 Mar – 26–27 Jul (2018).

Osmia (Melanosmia) bucephala Cresson, 1864 – Adams, Berks, Bradford, Bucks, Centre, Dauphin, Delaware, Erie, Huntingdon, Northumberland, Pike, Schuylkill, Susquehanna, Union, Washington, York; 10 Apr – 4 Jul (2018).

Osmia (Melanosmia) collinsiae Robertson, 1905 – Adams, Allegheny, Bucks, Centre, Cumberland, Perry, York; 12 Apr – 1 Jul (2017).

Osmia (Melanosmia) distincta Cresson, 1864 – Adams, Cumberland, Dauphin, Delaware, Huntingdon, Luzerne, Monroe, Montgomery, Perry, Pike, York; 9 Apr – 1–30 Jun (2017).

Osmia (Melanosmia) felti Cockerell, 1911 – Adams, Perry; 12 Apr – 20 May (2009).
Osmia (Melanosmia) inspergens Lovell & Cockerell, 1907\textsuperscript{37} – Centre\textsuperscript{7}, Huntingdon\textsuperscript{8}, Susquehanna\textsuperscript{8}; 28 Apr\textsuperscript{8} – 24–25 May\textsuperscript{7} (2015\textsuperscript{8}).

Osmia (Melanosmia) proxima Cresson, 1864 – Sullivan\textsuperscript{1}, York\textsuperscript{1}; 27 Apr\textsuperscript{1} – 15 Aug\textsuperscript{1} (1941\textsuperscript{1}).

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

Osmia (Melanosmia) sandhouseae Mitchell, 1927 – Adams\textsuperscript{3}, Huntingdon\textsuperscript{8}; 23 Apr\textsuperscript{3} – 28 Apr\textsuperscript{8} (2015\textsuperscript{3,8}).

Osmia (Melanosmia) similima Smith, 1853 – Adams\textsuperscript{1}, Centre\textsuperscript{1}, Cumberland\textsuperscript{1}, Montgomery\textsuperscript{1}, Philadelphia\textsuperscript{1}, Tioga\textsuperscript{1}; 8 May\textsuperscript{1} – 12 Jul\textsuperscript{1} (1909).\

Osmia (Melanosmia) virga Sandhouse, 1939 – Adams\textsuperscript{3}, Bucks\textsuperscript{8}, Lancaster\textsuperscript{8}, Lycoming\textsuperscript{8}, Union\textsuperscript{8}, York\textsuperscript{8}; 15 Apr\textsuperscript{8} – 15 Jun\textsuperscript{8} (2015\textsuperscript{8}).

Subgenus Osmia Panzer s. s.

Revision: Rust (1974).

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

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

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

Lithurginae

Lithurgini

Genus Lithurgus Berthold

Taxonomy: Snelling (1986).

Lithurgus chrysurus Fonscolombe, 1834* (2007\textsuperscript{1}) – Carbon\textsuperscript{6}, Lehigh\textsuperscript{1,6}, Northampton\textsuperscript{6}; 7 Jul\textsuperscript{1} – 9 Aug\textsuperscript{6} (2009\textsuperscript{6}).
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, 1909²⁵,³⁶ – Centre¹,⁶,⁷, Elk¹, Luzerne¹, *Lycoming*⁸, Philadelphia¹-², Pike¹,⁴; 9 Apr¹ – 15–16 Aug⁷ (2017)².

*Andrena (Andrena) clarkella* (Kirby, 1802) – Forest¹,²⁵, Sullivan¹,²; 30 Mar² – 6 May¹ (1983¹,²).

*Andrena (Andrena) cornelli* Viereck, 1907 – *Adams*³, *Bucks*⁸, Cumberland¹, Erie⁹, Perry⁵, Philadelphia¹,²,²⁵, Schuylkill²; 4 May⁸ – 9–11 Jun⁹ (2016³,⁹).

*Andrena (Andrena) frigida* Smith, 1853 – *Union*⁸, *York*⁸; 24 Apr⁸ – 28 Apr⁸ (2015³).

*Andrena (Andrena) macoupinensis* Robertson, 1900 – *Lancaster*³, Philadelphia¹, Pike¹,⁴; 2 May¹ – 30 May¹,⁴ (2012³).

*Andrena (Andrena) mandibularis* Robertson, 1892³⁶ – *Adams*³, Allegheny¹,²,²⁵, *Bucks*⁸, Centre¹,⁷, Crawford¹, Cumberland², Dauphin¹,²,²⁵, Delaware², Franklin¹, Huntingdon³, *Lycoming*⁸, Montgomery¹,²,²⁵, Philadelphia¹, Susquehanna⁸, Westmoreland¹,²,²⁵; 5 Mar¹ – 13 Jun³ (2016³,⁷).

*Andrena (Andrena) milwaukeensis* Graenicher, 1903³⁶ – Allegheny¹,²,²⁵, Centre¹,³,⁵,⁷, Cumberland¹-², Dauphin¹, Huntingdon⁸, *Lycoming*⁸, Monroe¹,², Somerset¹,²,²⁵, Susquehanna⁸, Westmoreland¹, Wyoming¹; 18 Apr¹ – 22 Jun¹ (2018³).

*Andrena (Andrena) rufosignata* Cockerell, 1902²⁵ – Centre¹, Clinton¹, Forest¹,²,²⁵, Huntingdon⁸, *Lycoming*⁸, Sullivan¹, Susquehanna⁸, Union⁸, Westmoreland¹, York³; 15 Apr⁸ – 16 Jul¹ (2015³).

*Andrena (Andrena) thaspii* Graenicher, 1903 – *Adams*³, Allegheny¹,²,²⁵, Centre¹,²,²⁵, Huntingdon³, Westmoreland²⁵; 1 May³ – 4 Jul¹ (2012³).

*Andrena (Andrena) tridens* Robertson, 1902³⁶ – *Adams*³, Bradford⁸, Centre¹,⁷, Erie⁶,⁹, Franklin¹, Huntingdon³, Jefferson⁶, Lancaster⁸, Lebanon¹,²,²⁵, *Lycoming*⁸, Perry¹, Philadelphia¹, Susquehanna⁸, Union⁸, Westmoreland¹, York³; 13 Mar³ – 24 Jul⁶ (2017³).

**Subgenus Archiandrena** LaBerge

**Revision:** LaBerge (1985).
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Andrena (Archiandrena) banksi Malloch, 1917 – Bucks\textsuperscript{8}, Susquehanna\textsuperscript{8}; 28 Apr\textsuperscript{8} – 22 May\textsuperscript{8} (2015\textsuperscript{8}).

Andrena (Archiandrena) dimorpha Mitchell, 1960 – Philadelphia\textsuperscript{26}; dates and year not reported\textsuperscript{26}.

Subgenus Callandrena Cockerell s. l.

Revision: LaBerge (1967).

Andrena (Callandrena s. l.) aliciae Robertson, 1891 (aliciae group) – Allegheny\textsuperscript{1}, Dauphin\textsuperscript{1}, Fayette\textsuperscript{1}; 6 Aug\textsuperscript{1} – 1 Sep\textsuperscript{1} (1940\textsuperscript{1}).

Andrena (Callandrena s. l.) asteris Robertson, 1891 (simplex group)\textsuperscript{36} – Allegheny\textsuperscript{1}, Beaver\textsuperscript{1}, Bucks\textsuperscript{8}, Chester\textsuperscript{1}, Columbia\textsuperscript{2}, Dauphin\textsuperscript{1}, Delaware\textsuperscript{1,2}, Erie\textsuperscript{9}, Lycoming\textsuperscript{1}, Philadelphia\textsuperscript{1}; 7 Sep\textsuperscript{1} – 29 Sep\textsuperscript{2} (2016\textsuperscript{9}).

Andrena (Callandrena s. l.) asteroides Mitchell, 1960 (simplex group) – Centre\textsuperscript{1}; 5 Mar\textsuperscript{1} (1930\textsuperscript{1}).

Andrena (Callandrena s. l.) gardineri Cockerell, 1906 (gardineri group) – Adams\textsuperscript{3}, Westmoreland\textsuperscript{1}; 18 May\textsuperscript{1} – 21 May\textsuperscript{3} (2013\textsuperscript{3}).

Andrena (Callandrena s. l.) helianthi Robertson, 1891 (helianthi group) – Allegheny\textsuperscript{1}, Chester\textsuperscript{1}, Lackawanna\textsuperscript{6}, Potter\textsuperscript{1}, Westmoreland\textsuperscript{1}; 21 Apr\textsuperscript{1} – 16 Sep\textsuperscript{1} (2008\textsuperscript{8}).

Andrena (Callandrena s. l.) krigiana Robertson, 1901 (krigiana group) – Dauphin\textsuperscript{1}, Montgomery\textsuperscript{1,7}, Perry\textsuperscript{1}, Philadelphia\textsuperscript{1,2}, Susquehanna\textsuperscript{8}; 24 May\textsuperscript{1} – 3 Oct\textsuperscript{1} (2017\textsuperscript{7}).

Andrena (Callandrena s. l.) placata Mitchell, 1960 (simplex group) – Centre\textsuperscript{15}, Erie\textsuperscript{9}, Philadelphia\textsuperscript{1}; 11–13 Sep\textsuperscript{9} – 19 Sep\textsuperscript{1} (2016\textsuperscript{9}).

Andrena (Callandrena s. l.) rudbeckiae Robertson, 1891 (melliventris group) – Huntingdon\textsuperscript{1,2}; 12 Jul\textsuperscript{2} – 13 Jul\textsuperscript{1} (2005\textsuperscript{1,2}).

Andrena (Callandrena s. l.) simplex Smith, 1853 (simplex group)\textsuperscript{36} – Allegheny\textsuperscript{1}, Bradford\textsuperscript{8}, Bucks\textsuperscript{6}, Chester\textsuperscript{1}, Cumberland\textsuperscript{1}, Dauphin\textsuperscript{6}, Delaware\textsuperscript{1,2}, Lycoming\textsuperscript{6,8}, Philadelphia\textsuperscript{1}, Wyoming\textsuperscript{1}, York\textsuperscript{6}; 8 Jun\textsuperscript{6} – 23 Sep\textsuperscript{2,8} (2015\textsuperscript{8}).

Subgenus Cnemidandrena Hedice

Revision: Donovan (1977).

Andrena (Cnemidandrena) chromatricha Cockerell, 1899\textsuperscript{36} – Allegheny\textsuperscript{1}, Cambria\textsuperscript{36}; 25 Aug\textsuperscript{36} (1925\textsuperscript{36}).

Andrena (Cnemidandrena) hirticincta Provancher, 1888\textsuperscript{36} – Allegheny\textsuperscript{1}, Beaver\textsuperscript{1}, Centre\textsuperscript{7}, Chester\textsuperscript{1}, Cumberland\textsuperscript{1}, Delaware\textsuperscript{1}, Forest\textsuperscript{1}, Mercer\textsuperscript{1}, Monroe\textsuperscript{2}, Philadelphia\textsuperscript{1}, Tioga\textsuperscript{1}; 20 Jun\textsuperscript{1} – 2 Oct\textsuperscript{1} (2017\textsuperscript{7}).

Andrena (Cnemidandrena) nubecula Smith, 1853 – Adams\textsuperscript{3}, Allegheny\textsuperscript{1,2}, Centre\textsuperscript{1,7,15}, Clarion\textsuperscript{1}, Cumberland\textsuperscript{1}, Delaware\textsuperscript{1}, Forest\textsuperscript{1}, Luzerne\textsuperscript{1}, Monroe\textsuperscript{1,2}, Montgomery\textsuperscript{1}, Union\textsuperscript{8}, Wyoming\textsuperscript{1}; 21 Jul\textsuperscript{1} – 28 Sep\textsuperscript{8} (2018\textsuperscript{3}).
Subgenus *Conandrena* Viereck

**Revision:** LaBerge (1986).

*Andrena (Conandrena) bradleyi* Viereck, 190726 – Bucks1, Centre6,7, Clinton1,26, Crawford2, Dauphin1,26, Delaware26, Huntingdon6, Lycoming8, Philadelphia2; 16 Apr1 – 31 May–1 Jun7 (2017).

Subgenus *Derandrena* Ribble

**Revision:** Ribble (1968).

*Andrena (Derandrena) uvulariae* Mitchell, 1960 – Westmoreland1; 18 May1 (19821).

*Andrena (Derandrena) ziziaeformis* Cockerell, 190836 – **Bradford**8, **Centre**7, Dauphin1, Delaware1, Huntingdon8, Lycoming8, Monroe1,2, Philadelphia1, Pike1,4, Union8, York1; 30 Apr1 – 15 Jun8 (2017).

Subgenus *Euandrena* Hedicke

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

*Andrena (Euandrena) algida* Smith, 185336 – Centre1, Forest1, Montour6; 8 May1 – 23 Jun1 (20089).

*Andrena (Euandrena) geranii* Robertson, 189136 – Allegheny1,24, Bucks2,8, Centre1, Delaware1, Fayette1, Huntingdon3, Montgomery1, Philadelphia2, Union1,24, Westmoreland1,24; 22 Apr1 – 30 Jun1 (20069).

*Andrena (Euandrena) nigrihirta* (Ashmead, 1890)36 – Bucks1, Centre1, Huntingdon8, Monroe1, Susquehanna8; 28 Apr8 – 16 Jul1 (20159).

*Andrena (Euandrena) phaceliae* Mitchell, 196036 – Centre3; 22 May1 (19471).

Subgenus *Gonandrena* Viereck

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

*Andrena (Gonandrena) fragilis* Smith, 1853 – **Adams**3, Cumberland1, Dauphin1, Huntingdon2, Lackawanna4, Lancaster1,30, Lehigh1, Montgomery1, Philadelphia1, Westmoreland1, York1; 28 May1 – 15 Jul4 (20134).

*Andrena (Gonandrena) integra* Smith, 1853 – Allegheny1,30, Bucks8, Delaware2, Huntingdon1, Philadelphia2, Westmoreland1,30; 7 Apr2 – 20 Jun1 (20078).

*Andrena (Gonandrena) platyparia* Robertson, 189536 – **Adams**3, Allegheny30, Bradford30, Centre1, Columbia1,5, Crawford1, Dauphin1, Lancaster30, Montgomery1; 19 May3 – 12 Jul1 (20173).
Subgenus *Holandrena* Pérez

Revision: LaBerge (1985).

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

Subgenus *Iomelissa* Robertson

Revision: LaBerge (1985). Monotypic.

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

Subgenus *Larandrena* LaBerge

Revision: Ribble (1967).

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

Subgenus *Leucandrena* Hedicke

Revision: LaBerge (1987).

*Andrena* (*Leucandrena*) *barbilabris* (Kirby, 1802)[^36] – Bucks[^2], Butler[^27], Centre[^1], Cumberland[^1], Dauphin[^1,27], Delaware[^1,27], Fayette[^1], Lawrence[^1,27], Montgomery[^1,27], Northumberland[^27], Philadelphia[^1,27], Washington[^6]; 30 Mar[^1] – 28 May[^8] (2008[^6]).

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

Subgenus *Melandrena* Pérez

Revision: Bouseman and LaBerge (1979).
Andrena (Melandrena) barbara Bouseman and LaBerge, 1979 – Adams, Bucks, Centre, Lancaster, Westmoreland, York; 20 Mar – 17 May (2018).

Andrena (Melandrena) carlini Cockerell, 1901 – Adams, Allegheny, Beaver, Berks, Bradford, Bucks, Centre, Delaware, Erie, Franklin, Huntingdon, Jefferson, Lancaster, Lehigh, Luzerne, Lycoming, Montgomery, Northumberland, Perry, Philadelphia, Pike, Sullivan, Susquehanna, Union, Wayne, Westmoreland.

Andrena (Melandrena) commoda Smith, 1879 – Adams, Allegheny, Berks, Butler, Carbon, Centre, Cumberland, Dauphin, Delaware, Erie, Lancaster, Lehigh, Monroe, Montgomery, Northumberland, Philadelphia, Pike, Tioga, York; 3 Apr – 25 Jul (2018).

Andrena (Melandrena) confederata Viereck, 1917 – Adams, Bucks, Crawford, Delaware, May – 6 Jun (2018).

Andrena (Melandrena) dunningi Cockerell, 1898 – Adams, Allegheny, Bradford, Centre, Chester, Cumberland, Dauphin, Huntingdon, Lancaster, Lycoming, Philadelphia, Susquehanna, Union, York; 20 Mar – 21 Jun (2018).

Andrena (Melandrena) nivalis Smith, 1853 – Adams, Centre, Dauphin, Delaware, Philadelphia, Northampton, Perry, Pike, Sullivan, Westmoreland; 5, 8, 20 May – 2 Jun (2016).

Andrena (Melandrena) pruni Robertson, 1891 – Adams, Allegheny, Bedford, Blair, Bucks, Centre, Cumberland, Dauphin, Delaware, Huntingdon, Montgomery, Philadelphia, York; 23 Mar – 20 Jun (2018).

Andrena (Melandrena) regularis Malloch, 1917 – Centre, Clinton, Delaware, Laurens, Montgomery, Northumberland, Philadelphia, Pike, Westmoreland; 5 Apr – 15–16 Aug (2018).

Subgenus Micrandrena Ashmead

Revision: Ribble (1968).

Andrena (Micrandrena) lamelliterga Ribble, 1968 (pupi group) – Beaver; 5 Jun (1931).
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Andrena (Micrandrena) melanochroa Cockerell, 1898 (piperi group) – Adams³, Allegheny¹, York¹; 8 May¹ – 3 Jun³ (2009³).

Andrena (Micrandrena) nigrae Robertson, 1905 (illinoiensis group) – Adams³, Allegheny¹, Northumberland¹, Philadelphia¹, Washington⁶, York¹; 24 Apr¹ – 31 May³ (2018³).

Andrena (Micrandrena) personata Robertson, 1897 (piperi group) – Adams³, Allegheny¹, Northumberland¹, Philadelphia¹, Washington⁶, York¹; 6 Apr¹ – 7 Jun¹ (2018⁴).

Andrena (Micrandrena) salictaria Robertson, 1905 (illinoiensis group) – Allegheny¹, Franklin¹, Huntingdon¹, Westmoreland¹; 9 Apr¹ – 4 May¹ (1966¹).

Andrena (Micrandrena) ziziae Robertson, 1891 (piperi group) – Allegheny¹, Bucks⁸, Dauphin⁶, Tioga¹, Washington⁶; 9 Apr⁶ – 28 May⁶ (2008⁶). 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 – Butler³⁰, Lawrence¹–³⁰; 27 Apr¹ (1940¹).

Subgenus Plastandrena Hedicke

Revision: LaBerge (1969).

Andrena (Plastandrena) crataegi Robertson, 1893 (crataegi group)²¹,³⁶ – Adams³, Allegheny¹, Armstrong¹, Bedford², Butler¹, Centre¹–³, Crawford¹, Cumberland¹–², Dauphin¹–², Delaware², Erie¹–⁹, Forest¹, Fulton¹, Huntingdon¹–³, Indiana¹, Lehigh¹, Luzerne¹, Monroe¹, Montgomery¹–⁷, Northumberland¹, Pike¹–², Potter¹, Snyder¹, Somerset¹, Susquehanna²⁸, Tioga¹, Westmoreland¹; 22 Apr³ – 8 Aug³ (2017³–⁷).

Subgenus Ptilandrena Robertson

Revision: LaBerge (1987).

Andrena (Ptilandrena) distans Provancher, 1888³⁶ – Adams³, Allegheny¹–²⁷, Centre¹, Delaware¹–², Jefferson⁶, Philadelphia², Union¹–²⁷; 17 Apr¹ – 21 Jul¹ (2017³).  

Andrena (Ptilandrena) erigeniae Robertson, 1891 – Adams³, Allegheny¹–²⁷, Bradford⁸, Bucks⁸, Butler¹–²⁷, Centre¹–²⁸, Crawford¹, Cumberland⁶, Dauphin¹–²⁷, Delaware¹–²⁴, Franklin¹–²⁷, Huntingdon⁸, Lycoming⁸, Perry⁶, Philadelphia¹, Pike¹–²⁷, Susquehanna²⁸, Union⁸, Westmoreland¹–²⁷, York¹–²⁷; 15 Apr⁸ – 9 Jun² (2015⁸).

Subgenus Rhacandrena LaBerge

Revision: LaBerge (1977).
Andrena (*Rhacandrena*) *brevipalpis* Cockerell, 1930 – *Adams*², Allegheny¹,², Berks², Butler¹, *Centre*⁷, *Chester*⁶, Cumberland¹,²,²⁴, Dauphin¹,²,²⁴, *Fayette*⁶, Northampton²⁴, Northumberland²⁴, Pike¹,²⁴, Somerset¹,²,²⁴, Westmoreland¹,²,²⁴; 14 May¹ – 10 Oct⁶ (2016³,⁷).

*Andrena* (*Rhacandrena*) *robertsonii* Dalla Torre, 1896³⁶ – *Adams*³, *Bradford*⁴,⁸, *Bucks*⁸, Cumberland¹,²,²⁴, Dauphin¹, Delaware², Franklin¹, *Huntingdon*⁸, *Lancaster*⁸, *Lycoming*⁶, *Montgomery*⁷, Philadelphia¹,²,²⁴, Pike¹,², Potter¹,²,²⁴, Westmoreland¹, York¹; 26 Apr³ – 3 Aug⁴ (2017⁷).

**Subgenus Scaphandrena** Lanham

**Revision:** Ribble (1974).

*Andrena* (*Scaphandrena*) *arabis* Robertson, 1897 (*scurra* group)³⁶ – *Adams*³, *Bradford*⁴, *Bucks*⁸, Carbon¹, *Centre*⁸, Dauphin¹, Delaware¹, *Huntingdon*³,⁸, *Lancaster*⁸, Luzerne¹,², *Lycoming*⁸, Montgomery¹,², Philadelphia¹,², *Union*⁸, Washington¹, Westmoreland¹; 29 Mar¹ – 21 Jun¹ (2017³).

**Subgenus Scrapteropsis** Viereck

**Revision:** LaBerge (1971).

*Andrena* (*Scrapteropsis*) *alleghaniensis* Viereck, 1907 (*alleghaniensis* group) – *Bucks*⁸, Dauphin¹,², Delaware¹, Erie⁹, Monroe²², Philadelphia¹,²,²²; 10 May² – 9–11 Jun⁹ (2016³).

*Andrena* (*Scrapteropsis*) *daeckei* Viereck, 1907 (*daeckei* group) – *Centre*¹, Luzerne²², Mifflin¹; dates not reported¹,²² (2007¹).

*Andrena* (*Scrapteropsis*) *fenningeri* Viereck, 1922 (*imitatrix* group) – *Adams*³, Philadelphia¹,², ², *Venango*⁶; 20 Apr³ – 9 May¹ (2015³).

*Andrena* (*Scrapteropsis*) *ilicis* Mitchell, 1960 (*imitatrix* group) – Philadelphia¹,²,²², Westmoreland¹; 16 May¹ – 8 Jun¹ (1950¹).

*Andrena* (*Scrapteropsis*) *imitatrix* Cresson, 1872 (*imitatrix* group)²²,²⁶ – *Adams*³,⁸, Allegheny¹, Armstrong¹, Beaver¹, Bedford¹, Blair², *Bradford*⁸, *Bucks*²,⁸, Butler¹, *Centre*¹,⁵,⁷, *Crawford*¹,⁶, Cumberland¹, Dauphin¹,⁶, Delaware¹,², Franklin¹, *Huntingdon*¹,², *Lancaster*⁵,⁸, Luzerne¹, *Lycoming*⁸, Montgomery¹, Philadelphia¹, *Pike*¹,², *Susquehanna*⁸, *Union*⁸, Westmoreland¹, York¹,³; 3 Mar³ – 30 Jun¹ (2018³).

*Andrena* (*Scrapteropsis*) *morrisonella* Viereck, 1917 (*imitatrix* group) – Allegheny¹,²², *Lancaster*⁸, *Lycoming*⁸, Philadelphia¹, *Susquehanna*⁸, York¹,³; 24 Apr⁸ – Jul¹ (2014³).

**Subgenus Simandrena** Pérez

**Revision:** LaBerge (1989).
Andrena (Simandrena) nasonii Robertson, 1895 – Adams\(^3\), Allegheny\(^1,28\), Armstrong\(^6\), Bedford\(^1\), Blair\(^2\), Bradford\(^1,6,8\), Bucks\(^8\), Butler\(^1\), Centre\(^1,2,5,7,8\), Chester\(^1,2,28\), Clinton\(^1\), Columbia\(^5\), Crawford\(^1\), Cumberland\(^1,6,28\), Dauphin\(^1,6,28\), Delaware\(^1,2,4,28\), Erie\(^9\), Franklin\(^1\), Huntingdon\(^2,3,8\), Jefferson\(^6\), Lancaster\(^3,8\), Lycoming\(^6,8\), Mercer\(^6\), Monroe\(^1,4\), Montgomery\(^1,2,7,28\), Perry\(^6\), Philadelphia\(^1,2,28\), Pike\(^1,4\), Potter\(^28\), Susquehanna\(^8\), Union\(^8\), Warren\(^6\), Washington\(^6,28\), Westmoreland\(^1\), York\(^8,28\); 5 Mar\(^3\) – 1 Aug\(^6\) (2018\(^3\)).

Andrena (Simandrena) wheeleri Graenicher, 1904 – Adams\(^3\), Centre\(^1\); 16 Apr\(^3\) – 10 May\(^1\) (2008\(^3\)).

Subgenus Taeniandrena Hediche

Revision: LaBerge (1989).

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

Subgenus Thysandrena Lanham

Revision: LaBerge (1977).

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

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

Subgenus Trachandrena Robertson

Revision: LaBerge (1973).

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

Andrena (Trachandrena) forbesii Robertson, 1891\(^23,36\) – Adams\(^3,8\), Allegheny\(^1\), Armstrong\(^1\), Bucks\(^8\), Centre\(^1,5,7,8\), Chester\(^1\), Crawford\(^1\), Cumberland\(^1\), Dauphin\(^1,6\), Dela-
ware\textsuperscript{1,2}, Franklin\textsuperscript{1}, Huntingdon\textsuperscript{8}, Lancaster\textsuperscript{3,8}, Lycoming\textsuperscript{8}, Mifflin\textsuperscript{1}, Montgomery\textsuperscript{1}, Philadelphia\textsuperscript{1}, Pike\textsuperscript{1,2}, Union\textsuperscript{1,8}, Westmoreland\textsuperscript{1}, York\textsuperscript{8}; 20 Mar\textsuperscript{3} – 14 Jul\textsuperscript{1} (2018\textsuperscript{3}).

**Andrena** (*Trachandrena*) *heraclei* Robertson, 1897 – Adams\textsuperscript{4}, Lancaster\textsuperscript{8}, Philadelphia\textsuperscript{1,2}, York\textsuperscript{8}, 29 Mar\textsuperscript{3} – 21 Jun\textsuperscript{3} (2018\textsuperscript{3}).

**Andrena** (*Trachandrena*) *hippotes* Robertson, 1897\textsuperscript{3} – Adams\textsuperscript{4}, Allegheny\textsuperscript{1}, Armstrong\textsuperscript{1}, Bedford\textsuperscript{1}, Centre\textsuperscript{2,3}, Chester\textsuperscript{1}, Cumberland\textsuperscript{1}, Dauphin\textsuperscript{1,2}, Delaware\textsuperscript{1,2}, Franklin\textsuperscript{1}, Huntingdon\textsuperscript{8}, Lancaster\textsuperscript{8}, Lycoming\textsuperscript{8}, Monroe\textsuperscript{1}, Northumberland\textsuperscript{1}, Philadelphia\textsuperscript{1}, Union\textsuperscript{8}, Westmoreland\textsuperscript{1}, York\textsuperscript{8}; 5 Mar\textsuperscript{4} – 21 Sep\textsuperscript{1} (2018\textsuperscript{3}).

**Andrena** (*Trachandrena*) *mariar* Smith, 1891 – Beaver\textsuperscript{1}, Northumberland\textsuperscript{1}, Philadelphia\textsuperscript{1}; 10 May\textsuperscript{3} – 8 Jun\textsuperscript{1} (1951\textsuperscript{1}).

**Andrena** (*Trachandrena*) *miranda* Smith, 1879 – Bradford\textsuperscript{2,3}, Crawford\textsuperscript{1}, Cumberland\textsuperscript{1,2}, Dauphin\textsuperscript{1}, Franklin\textsuperscript{1}, Montgomery\textsuperscript{1}, Philadelphia\textsuperscript{1}, York\textsuperscript{1}; 28 Apr\textsuperscript{1} – 14 Jul\textsuperscript{1} (2007\textsuperscript{1}).

**Andrena** (*Trachandrena*) *nuda* Robertson, 1891\textsuperscript{36} – Adams\textsuperscript{3}, Allegheny\textsuperscript{1,23}, Bucks\textsuperscript{1,8}, Chester\textsuperscript{1,23}, Crawford\textsuperscript{1}, Dauphin\textsuperscript{1}, Delaware\textsuperscript{1,2,23}, Lancaster\textsuperscript{5}, Philadelphia\textsuperscript{1,2,23}, Westmoreland\textsuperscript{1}, York\textsuperscript{1,8}, 17 Apr\textsuperscript{8} – 25 Jun\textsuperscript{1} (2017\textsuperscript{3}).

**Andrena** (*Trachandrena*) *rebnii* Viereck, 1907 – Allegheny\textsuperscript{1,23}, Carbon\textsuperscript{23}, Dauphin\textsuperscript{1,23}, Delaware\textsuperscript{1,23}, Lehigh\textsuperscript{1,2,23}, Northampton\textsuperscript{23}, Westmoreland\textsuperscript{1,23}, 22 Jun\textsuperscript{1} – 29 Jul\textsuperscript{1} (1910\textsuperscript{1}).

**Andrena** (*Trachandrena*) *rugosa* Robertson, 1891\textsuperscript{36} – Adams\textsuperscript{3}, Allegheny\textsuperscript{1,23}, Blair\textsuperscript{1,2}, Bradford\textsuperscript{8}, Bucks\textsuperscript{8}, Butler\textsuperscript{23}, Centre\textsuperscript{1,2,3,5,7}, Crawford\textsuperscript{1}, Cumberland\textsuperscript{1,23}, Dauphin\textsuperscript{1,23}, Delaware\textsuperscript{1}, Erie\textsuperscript{9}, Forest\textsuperscript{1,23}, Franklin\textsuperscript{6}, Lawrence\textsuperscript{1,23}, Lycoming\textsuperscript{8}, Montgomery\textsuperscript{1,23}, Philadelphia\textsuperscript{1,23}, Pike\textsuperscript{1,2,4}, Potter\textsuperscript{1,23}, Somerset\textsuperscript{23}, Susquehanna\textsuperscript{8}, Westmoreland\textsuperscript{1,23}, York\textsuperscript{1}; 20 Mar\textsuperscript{3} – 22 Jun\textsuperscript{1} (2017\textsuperscript{3}).

**Andrena** (*Trachandrena*) *sigmundi* Cockerell, 1902 – Beaver\textsuperscript{23}, Clinton\textsuperscript{1,2,23}, Delaware\textsuperscript{1}; 25 Apr\textsuperscript{2} – 27 Apr\textsuperscript{1} (1966\textsuperscript{1,2}).

**Andrena** (*Trachandrena*) *spineaena* Robertson, 1895\textsuperscript{36} – Adams\textsuperscript{4}, Allegheny\textsuperscript{1,23}, Bedford\textsuperscript{2,23}, Berks\textsuperscript{2}, Bucks\textsuperscript{8}, Carbon\textsuperscript{23}, Centre\textsuperscript{1,2,3,5,7}, Crawford\textsuperscript{1}, Cumberland\textsuperscript{1,23}, Dauphin\textsuperscript{1,23}, Delaware\textsuperscript{1,2,23}, Forest\textsuperscript{1}, Huntingdon\textsuperscript{1}, Lancaster\textsuperscript{1}, Lehigh\textsuperscript{1,2,23}, Montgomery\textsuperscript{23}, Northampton\textsuperscript{23}, Philadelphia\textsuperscript{1,23}, Union\textsuperscript{8}, Washington\textsuperscript{6}, Westmoreland\textsuperscript{1,23}, York\textsuperscript{1,8}, 30 Apr\textsuperscript{8} – 13 Jul\textsuperscript{1} (2017\textsuperscript{7}).

**Andrena** (*Trachandrena*) *virginiana* Mitchell, 1960 – Bradford\textsuperscript{23}, Centre\textsuperscript{1,5,7}, Cumberland\textsuperscript{1,23}, Lackawanna\textsuperscript{4}, Lancaster\textsuperscript{5}, Lehigh\textsuperscript{1}; 25 Apr\textsuperscript{5} – 16–17 Aug\textsuperscript{7} (2017\textsuperscript{7}).

**Subgenus Tylandrena** LaBerge

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

**Andrena** (*Tylandrena*) *erythrogaster* (Ashmead, 1890)\textsuperscript{29} – Adams\textsuperscript{3}, Allegheny\textsuperscript{1}, Cumberland\textsuperscript{1}, Dauphin\textsuperscript{1}, Northumberland\textsuperscript{1}, Philadelphia\textsuperscript{1}, Potter\textsuperscript{1}, Sullivan\textsuperscript{1}; 1 May\textsuperscript{3} – 7 Jun\textsuperscript{1} (2014\textsuperscript{4}).

**Andrena** (*Tylandrena*) *perplexa* Smith, 1853\textsuperscript{36} – Adams\textsuperscript{4,8}, Allegheny\textsuperscript{1}, Bradford\textsuperscript{8}, Bucks\textsuperscript{8}, Centre\textsuperscript{1,6}, Cumberland\textsuperscript{1}, Delaware\textsuperscript{1,2,4,29}, Erie\textsuperscript{9}, Fayette\textsuperscript{1,29}, Huntingdon\textsuperscript{8}, Pennsylvania\textsuperscript{1}, Union\textsuperscript{8}, Westmoreland\textsuperscript{1,23}, York\textsuperscript{4,8}, 20 Apr\textsuperscript{8} – 13 Jul\textsuperscript{1} (2017\textsuperscript{7}).

**Andrena** (*Tylandrena*) *renyi* Mitchell, 1960 – Bradford\textsuperscript{23}, Centre\textsuperscript{1,5,7}, Cumberland\textsuperscript{1,23}, Lackawanna\textsuperscript{4}, Lancaster\textsuperscript{5}, Lehigh\textsuperscript{1}; 25 Apr\textsuperscript{5} – 16–17 Aug\textsuperscript{7} (2017\textsuperscript{7}).
An updated checklist of the bees of Pennsylvania, United States of America

Indiana^1, Jefferson^6, Lackawanna^1, Lancaster^1,2,5, Lycoming^8, Monroe^1, Montgomery^29, Perry^1,29, Philadelphia^1,4,29, Susquehanna^8, Westmoreland^1,29, York^1,8,29; 5 Mar^1 – 7 Jul^6 (2018^3).

*Andrena (Tylandrena) wilmattae* Cockerell, 1906 – Allegheny^1,29, Union^1,29; 19 May^1 – 2 Jul^1 (1910^1).

**Subgenus Xiphandrena LaBerge**

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

*Andrena (Xiphandrena) mendica* Mitchell, 1960 – Allegheny^1; 15 Jun^1 (1937^1).

**Panurginae**

**Calliopsini**

**Genus Calliopsis Smith**

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

**Subgenus Calliopsis Smith s. s.**

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

**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^8; 15 Jun^8 (2014^8).

*Perdita (Perdita) octomaculata* (Say, 1824) (octomaculata group) – Philadelphia^1; 15 Sep^1 (1901^1).
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$^47$; dates and year not reported$^47$.
Protandrena (Heterosarus) pauper (Cresson, 1878)$^47$ – Lehigh$^1$; 29 Jun$^1$ – 12 Jul$^1$ (1901$^1$).

Subgenus Metapsaenythia Timberlake

Protandrena (Metapsaenythia) abdominalis (Cresson, 1878)$^36$ – locations, dates, and year not reported$^1$.

Subgenus Pterosarus Timberlake

Protandrena (Pterosarus) aestivalis (Provancher, 1882) – Pike$^{48}$; 22 Aug$^{48}$ (1895$^{48}$) (AMNH_BEE00237743).
Protandrena (Pterosarus) andrenoides (Smith, 1853) – Adams$^3$, Centre$^{15}$, 18 Sep$^3$ (2010$^3$).
Protandrena (Pterosarus) compositarum (Robertson, 1893) – Adams$^3$, Chester$^1$; 16 Jun$^3$ – 18 Oct$^3$ (2015$^3$).

Halictidae
Halictinae
Augochlorini

Genus Augochlora Smith
Subgenus Augochlora Smith s. s.

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

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

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

*Augochlorella persimilis* (Viereck, 1910) (*aurata* group) – Adams\(^3\), Allegheny\(^1\), Bucks\(^1\), Clinton\(^6\), Delaware\(^1,40\), Huntingdon\(^8\), Jefferson\(^6\), Lehigh\(^6\); 29 May\(^6\) – 15 Sep\(^3\) (2016\(^5\)).

Genus *Augochloropsis* Cockerell

**Taxonomy:** Mitchell (1960).

**Subgenus Paraugochloropsis** Schrottky

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

**Notes.** We cannot 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\(^7\), Erie\(^2\); 18–20 May\(^9\) – 16–17 Aug\(^7\) (2017\(^7\)).

*Augochloropsis* (*Paraugochloropsis*) *sumptuosa* (Smith, 1853) – Chester\(^1\), Clinton\(^6\), Dauphin\(^1\), Elk\(^6\), Juniata\(^6\); 16 Apr\(^1\) – 2 Jul\(^8\) (2008\(^6\)).

**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)*42 – *Adams*3, Allegheny1, Armstrong1,6, Beaver1, *Bradford*8, Bucks1,8, Centre1,15,44, Columbia1, Cumberland1, Dauphin1,6, Delaware1, Elk1, Erie1,6, Fayette1, Huntingdon1,2,3, *Lancaster*5,8, Lehigh1, *Lycoming*8, Monroe1, Montgomery1,8,44, Northumberland1, Perry1, Philadelphia1,4, Somerset1, Union1,8, *Warren*6, Washington1, York1; 1 Apr1 – 30 Oct1 (20158).

*Agapostemon* (*Agapostemon*) *splendens* (Lepeletier, 1841) *(splendens group)*42 – *Adams*3, Allegheny1, Centre1, Crawford1, Delaware1, Erie1, Fulton44, Philadelphia1; 5 Jul3 – 29 Aug3 (20123).

*Agapostemon* (*Agapostemon*) *texanus* Cresson, 1872 *(splendens group)*42 – Adams1,3,8, Allegheny1, Armstrong1,6, *Bedford*6, Bucks8, Centre1, *Chester*6, Cumberland1, Dauphin6, Delaware1,4, Erie1,6, Franklin6, Huntingdon8, Lancaster3,8, Lehigh1, *Lycoming*8, Montgomery8, *Northampton*6, Northumberland1, Philadelphia1,4, Pike1,4, Schuylkill6, Union8, Westmoreland1, *York*6,8; 5 Apr3 – 26 Oct3 (20183).

*Agapostemon* (*Agapostemon*) *virescens* (Fabricius, 1775) *(splendens group)*42,36 – Adams1,3,8, Allegheny1, *Armstrong*6, Beaver1, *Bedford*6, Berks1,2, *Bradford*8, Bucks1,8, Butler1, *Cambria*6, Centre1,6,8,15,44, *Chester*6,8, *Clarion*6, Clearfield1,6, Clinton1,6, Columbia1,2,5, Crawford1,4, Cumberland1, Dauphin1,2,6, Delaware1,4, *Elk*6, Erie1,6,9, Fulton44, Greene1, Huntingdon1,2,8, *Jefferson*6, Juniata6, Lackawanna4,6, Lancaster1,3,4,5,6,8,15, Lehigh1,6, Luzerne1, *Lycoming*8, *McKean*6, Mifflin1, Montgomery1,7,8, *Montour*6, Northampton1, Perry1,6, Philadelphia1, Pike1,4, *Somerset*6, Sullivan1, Tioga1, *Union*8, *Warren*6, Washington1,6, Westmoreland1,4,6, York1,6,8; 22 Mar1 – 26 Oct3 (20183).

Genus *Halictus* Latreille

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

Subgenus *Nealicteus* Pesenko

*Halictus* (*Nealicteus*) *parallelus* Say, 1837 – *Adams*3, Allegheny1, *Armstrong*6, *Bedford*6, *Bradford*6, Bucks8, *Clarion*6, Crawford6, Dauphin6, Erie6, Juniata6, *Lancaster*3, Philadelphia1, *Somerset*6, *Warren*6, Wayne1, *Westmoreland*6; 30 Apr3 – 20 Aug6 (20133).

Subgenus *Odontalictus* Robertson

*Halictus* (*Odontalictus*) *ligatus* Say, 183736 – Adams1,3,6,8, Allegheny1,6, Beaver1,44, *Bedford*6, Berks2,6, Blair6, Bradford1,4,6,8, Bucks1,6,8, Butler1, Carbon1,6, Centre1,3,5,6,7,8,15,44, *Chester*6,8, *Clarion*6, Clearfield1,4, Clinton1,6, Columbia2,5, Crawford1,6, Cumberland1,6, Dauphin1,6, Delaware1,4, *Elk*6, Erie6,9, Forest1, *Franklin*6, Fulton44, Hunt-
ingdon, Jefferson, Juniata, Lackawanna, Lancaster, Lebanon, Lehigh, Luzerne, Lycoming, McKean, Monroe, Montgomery, Northampton, Northumberland, Perry, Philadelphia, Pike, Schuylkill, Snyder, Somerset, Sullivan, Tioga, Union, Warren, Washington, York; 11 Apr – 25 Oct (2018).

Subgenus Protobalictus Pesenko

*Halictus (Protobalictus) rubicundus* (Christ, 1791) – Adams, Allegheny, Armstrong, Beaver, Bedford, Berks, Bradford, Bucks, Butler, Cambria, Centre, Clarion, Clinton, Columbia, Cumberland, Dauphin, Delaware, Erie, Forest, Franklin, Fulton, Huntingdon, Jefferson, Juniata, Lancaster, Lehigh, Luzerne, Lycoming, Monroe, Montgomery, Northampton, Northumberland, Perry, Philadelphia, Somerset, Susquehanna, Tioga, Union, Warren, Westmoreland, York; 13 Apr – 16 Oct (2018).

Subgenus Seladonia Robertson

*Halictus (Seladonia) confusus confusus* Smith, 1853 – Adams, Allegheny, Beaver, Bedford, Berks, Bradford, Bucks, Butler, Cambria, Centre, Clarion, Clinton, Columbia, Crawford, Cumberland, Dauphin, Delaware, Erie, Huntingdon, Jefferson, Juniata, Lancaster, Lehigh, Luzerne, Lycoming, Monroe, Montgomery, Northampton, Northumberland, Perry, Philadelphia, Pike, Somerset, Sullivan, Susquehanna, Tioga, Union, Wayne, Westmoreland, York; 2 Apr – 5 Nov (2017).

Subgenus Vestitohalictus Blüthgen

*Halictus (Vestitohalictus) tectus* Radoszkowski, 1876* (2005) – Philadelphia, Somerset; 1 Aug – 24 Aug (2008).

Genus Lasioglossum Curtis

Taxonomy: Gibbs (2010, 2011, 2012); Gibbs et al. (2013); Knerer and Arwood (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, Bradford, Carbon, Centre, Franklin, Huntingdon, Lancaster, Lehigh, Lycoming, Perry, Union; 23 Apr – 24 Aug (2017).
Lasioglossum (Dicticus) admirandum (Sandhouse, 1924) (viridatum group) – Adams, Beaver, Bradford, Bucks, Centre, Chester, Clearfield, Clinton, Crawford, Cumberland, Dauphin, Delaware, Erie, Franklin, Fulton, Huntingdon, Juniata, Lancaster, Lehigh, Luzerne, Mifflin, Montgomery, Perry, Philadelphia, Pike, Sullivan, Westmoreland, York; 2 Apr – 21 Oct (2017). 

Lasioglossum (Dicticus) albipenne (Robertson, 1890) – Adams, Bucks, Centre, Clinton, Columbia, Crawford, Delaware, Lancaster, Lehigh, Luzerne, Montgomery; 5 May – 19–20 Aug (2017). 

Lasioglossum (Dicticus) anomalum (Robertson, 1892) – Adams, Bucks, Lycoming, Pike; 28 Apr – 15 Sep (2016). 

Lasioglossum (Dicticus) apocyni (Mitchell, 1960) (viridatum group) – Centre, Montgomery, Westmoreland; 31 May – 1 Jun – 16–17 Aug (2017). 

Lasioglossum (Dicticus) atwoodi Gibbs 2010 (viridatum group) – locations, dates, and year not reported. 

Lasioglossum (Dicticus) bruneri (Crawford, 1902) – Adams, Bucks, Centre, Columbia, Dauphin, Delaware, Erie, Huntingdon, Lycoming, Philadelphia, York; 24 Apr – 21 Sep (2017). 

Lasioglossum (Dicticus) callidum (Sandhouse, 1924) – Adams, Centre, Chester, Delaware, Lancaster, Montgomery; 13 Apr – 26 Oct (2018). Notes. Older records for L. versatum, especially pre-2010 determinations, may be attributable to L. callidum (see Gibbs 2010). 

Lasioglossum (Dicticus) cattellae (Ellis, 1913) – Adams, Bucks; 17 Apr – 1 Aug (2008). 

Lasioglossum (Dicticus) cephalotes (Dalla Torre, 1896) (cephalotes group) – locations, dates, and year not reported. 

Lasioglossum (Dicticus) coeruleum (Robertson, 1893) – Adams, Bradford, Bucks, Butler, Centre, Clinton, Dauphin, Delaware, Erie, Fulton, Huntingdon, Jefferson, Lancaster, Lehigh, Lycoming, Monroe, Montgomery, Perry, Philadelphia, Susquehanna, Union, York; 17 Apr – 4 Sep (2017). 

Lasioglossum (Dicticus) coreopsis (Robertson, 1902) – Adams, Bradford, Bucks, Pike; 30 May – 18 Sep (2015). 

Lasioglossum (Dicticus) cresonii (Robertson, 1890) – Adams, Allegheny, Bradford, Bucks, Centre, Chester, Clinton, Crawford, Cumberland, Dauphin, Delaware, Erie, Fulton, Huntingdon, Indiana, Lackawanna, Lancaster, Lebanon, Lehigh, Lycoming, Monroe, Montgomery, Perry, Philadelphia, Pike, Susquehanna, Union, Washington, York; 15 Apr – 23 Oct (2017). 

Lasioglossum (Dicticus) dreisbachi (Mitchell, 1960) – Centre; 28 Sep (2015). 

Lasioglossum (Dicticus) ellisiae (Sandhouse, 1924) (tegulare group) – Bucks, Carbon, Lehigh, Erie, Monroe, Montgomery, Northampton, Somerset, Union; 9–11 Jun – 19 Aug (2016). 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)18 – Adams3, Bradford8, Bucks8, Centre5,7,8, Erie9, Huntingdon8, Lancaster8, Lycoming8, Montgomery4,7,8, Philadelphia17, Union8, York8; 15 Apr8 – 9 Oct3 (20173,7).

*Lasioglossum (Dialictus) georgeickworti* Gibbs, 2011 (*viridatum* group) – Adams8, Lycoming8, Montgomery8, York8; 11 Jun8 – 24 Jul8 (20158).

*Lasioglossum (Dialictus) gotham* Gibbs, 2011 – Adams4, Bucks8, Centre4, Columbia5, Erie9, Huntingdon2,8,18, Lancaster4,5, Lycoming8, Union8, York8; 21 Mar3 – 26 Sep3 (20173).

*Lasioglossum (Dialictus) heterognathus* (Mitchell, 1960)18,36 – Centre1,7,8,36, Cumberland1, Huntingdon8, Lehigh1, Luzerne1, Lycoming8, Union8; 28 Apr1,8 – 28 Sep8 (2017).

*Lasioglossum (Dialictus) hitchensi* Gibbs, 201218 – Adams3,8, Bradford8, Bucks8, Centre5,7,8, Chester3, Columbia5, Delaware4, Erie9, Huntingdon8, Lancaster5,5,8, Lehigh1, Lycoming8, Montgomery4,8, Perry1, Tioga4, Union8, York8; 2 Apr3 – 26 Oct3 (20183).

*Lasioglossum (Dialictus) illinoense* (Robertson, 1892)18,36 – Adams3, Bucks8, Centre8, Chester8, Crawford1, Cumberland1, Dauphin1,7,17, Delaware1,4, Erie9, Franklin1, Huntingdon8, Lancaster8, Lehigh1, Lycoming8, Montgomery2,7,8, Union8, York3; 23 Apr8 – 19 Oct3 (20173,7).

*Lasioglossum (Dialictus) imitatum* (Smith, 1853)18,36 – Adams1,3,8, Berks2, Blair1,2, Bradford1,4,8, Bucks8, Centre1,5,7,8,15,44, Chester8, Clinton1, Columbia2,5, Crawford1, Cumberland1, Dauphin1,17, Delaware1,4, Erie9, Franklin1, Huntingdon1,2,8, Lackawanna4, Lancaster1,3,8, Lebanon1, Lehigh1, Luzerne2, Lycoming8, Mifflin1, Monroe1,2, Montgomery1,8, Northampton1, Perry1,4, Philadelphia1,4, Pike1, Sullivan1, Union1,8, York1,4,8; 18 Apr3 – 21 Oct3 (20173).

*Lasioglossum (Dialictus) izawsum* Gibbs, 2011 (*platyparium* group) – Westmoreland18; 29 May18 (194518).

*Lasioglossum (Dialictus) katherineae* Gibbs, 2011 (*viridatum* group) – Adams3; 10 Apr3 – 11 Sep3 (20143).

*Lasioglossum (Dialictus) laevisissimum* (Smith, 1853)18 – Adams3, Bradford1,8, Bucks8, Centre1,5,7,8, Clinton1, Columbia5, Crawford1, Dauphin1, Delaware1, Huntingdon8, Lancaster3, Sullivan1, Susquehanna8, Union8, 25 Apr5 – 9 Oct3 (20183).

*Lasioglossum (Dialictus) leucocomus* (Lovell, 1908) (*pilosum* group) – Adams3, Bradford8, Bucks8, Centre7, Lancaster3, Montgomery8; 1 Jun8 – 19 Oct8 (20183).

**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)18,36 – Adams3, Bradford1,8, Centre1,5,7,8,44, Clinton1, Columbia5, Crawford1, Dauphin1, Erie9, Lancaster8, Lehigh1, Lycoming8, Montgomery1, Northumberland1, Perry4, Philadelphia1, Pike1, Sullivan1, Union8; 17 Apr1 – 24 Aug8 (20177).
Lasioglossum (Dialictus) lionotus (Sandhouse, 1923) (cephalotes group) – Bradford\(^8\), Centre\(^1\), Dauphin\(^1\), Lebanon\(^1\), Lehigh\(^1,4\), Schuylkill\(^1\); 28 Apr\(^1\) – 15 Sep\(^8\) (2015\(^5\)).

Lasioglossum (Dialictus) marinum (Crawford, 1904) – Delaware\(^1\); 18 Jul\(^1\) (1901\(^1\)).

Lasioglossum (Dialictus) michiganense (Mitchell, 1960) (platyparium group) – Erie\(^9\), York\(^8\); 15 Apr\(^8\) – 18–20 May\(^9\) (2016\(^9\)).

Lasioglossum (Dialictus) nigroviride (Graenicher, 1911)\(^1\) – Bucks\(^8\), Centre\(^1,7\), Forest\(^1\), Jefferson\(^2\), Lackawanna\(^1\), Luzerne\(^2\), Lycoming\(^8\), Monroe\(^1\), Pike\(^1\); 28 Apr\(^8\) – 5 Sep\(^2\) (2017\(^7\)).

Lasioglossum (Dialictus) oblongum (Lovell, 1905) (viridatum group)\(^3\)\(^6\) – Bradford\(^1\), Bucks\(^8\), Centre\(^1\), Delaware\(^1\), Erie\(^6\), Forest\(^1\), Huntingdon\(^8\), Lackawanna\(^1\), Lancaster\(^8\), Lehigh\(^1\), Lycoming\(^8\), Monroe\(^1\), Sullivan\(^1\), Susquehanna\(^8\), Union\(^8\), Westmoreland\(^1\); 21 Apr\(^8\) – 23 Sep\(^8\) (2015\(^8\)).

Lasioglossum (Dialictus) obscureum (Robertson, 1892) (viridatum group)\(^1\)\(^8\)\(^3\)\(^6\) – Adams\(^1,3\), Bucks\(^8\), Centre\(^1,8\), Chester\(^8\), Columbia\(^5\), Cumberland\(^1\), Dauphin\(^1\), Delaware\(^1,4\), Erie\(^9\), Montgomery\(^8\), Northumberland\(^1\), Perry\(^1\), Westmoreland\(^1\), York\(^8\); 16 Apr\(^1\) – 28 Sep\(^8\) (2017\(^3\)).

Lasioglossum (Dialictus) oceanicum (Cockerell, 1916)\(^1\)\(^8\)\(^3\)\(^6\) – Adams\(^3,8\), Berks\(^2\), Bradford\(^1\), Bucks\(^8\), Centre\(^1,3\), Chester\(^8\), Clinton\(^1\), Crawford\(^1\), Cumberland\(^1\), Dauphin\(^1\), Delaware\(^1\), Erie\(^9\), Huntingdon\(^1,8\), Lancaster\(^1,3\), Lehigh\(^1\), Lycoming\(^8\), Monroe\(^2,4\), Montgomery\(^1,8\), Philadelphia\(^1\), York\(^8\); 10 May\(^3\) – 28 Sep\(^8\) (2016\(^5,9\)).

Lasioglossum (Dialictus) paradigmundrandum (Knerer & Atwood, 1966) (viridatum group)\(^1\)\(^8\) – Adams\(^3\), Berks\(^3\), Bradford\(^8\), Bucks\(^8\)\(^4\)\(^17\), Carbon\(^1\), Centre\(^5,7\), Huntingdon\(^8\), Lackawanna\(^4\), Lancaster\(^5,8\), Lehigh\(^1\), Lycoming\(^8\), Montgomery\(^8,17\), Union\(^8\), York\(^8\); 3 Apr\(^3\) – 18 Sep\(^8\) (2016\(^7\)).

Lasioglossum (Dialictus) perpunctatum (Ellis, 1913)\(^3\)\(^6\) – Adams\(^3\), Beaver\(^44\), Bradford\(^8\), Centre\(^1,7,8,44\), Erie\(^9\), Fulton\(^44\), Huntingdon\(^8\), Juniata\(^44\), Lancaster\(^8,44\), Monroe\(^2\), Union\(^8\); 18–20 May\(^9\) – 24 Aug\(^8\) (2017\(^7\)).

Lasioglossum (Dialictus) pilosum (Smith, 1853) (pilosum group)\(^1\)\(^8\)\(^3\)\(^6\) – Adams\(^1,3,8\), Beaver\(^44\), Berks\(^1,2\), Bradford\(^8\), Bucks\(^1,4,8\), Centre\(^1,5,6,15,44\), Chester\(^1,8\), Clinton\(^1,6\), Columbia\(^2,5\), Cumberland\(^1\), Dauphin\(^1\), Delaware\(^1,4\), Erie\(^9\), Franklin\(^1,6\), Fulton\(^44\), Huntingdon\(^8\), Lackawanna\(^4\), Lancaster\(^3,5,6,8,15,44\), Lehigh\(^1\), Luzerne\(^1\), Lycoming\(^8\), Monroe\(^1\), Montgomery\(^1,2,8\), Northumberland\(^1\), Perry\(^1\), Philadelphia\(^1,4\), Pike\(^1\), Sullivan\(^1\), Union\(^8\), York\(^8\); 23 Mar\(^3\) – 26 Oct\(^3\) (2018\(^1\)). 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\(^3\), Bradford\(^8\), Bucks\(^8\), Crawford\(^1\), Montgomery\(^8\); 6 May\(^8\) – 21 Oct\(^3\) (2014\(^8\)).

Lasioglossum (Dialictus) platyparium (Robertson, 1895) (platyparium group)\(^1\)\(^8\) – Adams\(^3\), Bradford\(^8\), Delaware\(^4\), Huntingdon\(^8\), Lancaster\(^3,8\), Lycoming\(^8\), Montgomery\(^8\), York\(^8\); 14 Apr\(^3\) – 23 Oct\(^3\) (2017\(^7\)).

Lasioglossum (Dialictus) pruinum (Robertson, 1892) (pilosum group) – Beaver\(^44\), Centre\(^44\), dates not reported\(^44\) (2010 – 2012\(^4\)).

Lasioglossum (Dialictus) rozeni Gibbs, 2011 (platyparium group) – Adams\(^3\), Bucks\(^8\), Chester\(^8\), Montgomery\(^8\); 5 Apr\(^3\) – 26 Jul\(^8\) (2017\(^3\)).
Lasioglossum (Dialictus) simplex (Robertson, 1901)\textsuperscript{36} (platyparium group) – Centre\textsuperscript{1}; Aug\textsuperscript{1} (1945\textsuperscript{3}).

Lasioglossum (Dialictus) smilacinae (Robertson, 1897)\textsuperscript{18} – Adams\textsuperscript{3}, Erie\textsuperscript{9}, Lehigh\textsuperscript{4}, Lycoming\textsuperscript{8}, Montgomery\textsuperscript{8}, Union\textsuperscript{8}, York\textsuperscript{8}; 15 Apr\textsuperscript{8} – 6 Jul\textsuperscript{8} (2017\textsuperscript{3}).

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

Lasioglossum (Dialictus) tayloareae Gibbs, 2010 (viridatum group) – Bucks\textsuperscript{8}, Delaware\textsuperscript{4}, York\textsuperscript{8}; 15 Apr\textsuperscript{8} – 13–26 Jul\textsuperscript{4} (2015\textsuperscript{8}).

Lasioglossum (Dialictus) tegulare (Robertson, 1890) (tegulare group)\textsuperscript{36} – Adams\textsuperscript{3,8}, Berks\textsuperscript{2}, Bradford\textsuperscript{1,8}, Bucks\textsuperscript{8}, Centre\textsuperscript{7,8,15,44}, Chester\textsuperscript{8}, Columbia\textsuperscript{5}, Crawford\textsuperscript{4}, Cumberland\textsuperscript{1}, Dauphin\textsuperscript{1}, Delaware\textsuperscript{1,4}, Erie\textsuperscript{6,9}, Franklin\textsuperscript{1}, Fulton\textsuperscript{44}, Huntingdon\textsuperscript{8}, Juniata\textsuperscript{1,4}, Lancaster\textsuperscript{3,8,44}, Lehigh\textsuperscript{1}, Luzerne\textsuperscript{1}, Lycoming\textsuperscript{8,44}, Montgomery\textsuperscript{1,8}, Perry\textsuperscript{1}, Philadelphia\textsuperscript{1,4}, Schuylkill\textsuperscript{4}, Somerset\textsuperscript{1}, Susquehanna\textsuperscript{8}, Union\textsuperscript{8}, York\textsuperscript{8}; 5 Apr\textsuperscript{3} – 24 Oct\textsuperscript{3} (2018\textsuperscript{7}). 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\textsuperscript{7}, Lycoming\textsuperscript{8}, Union\textsuperscript{8}; 27 Apr\textsuperscript{8} – 29–30 Jun\textsuperscript{7} (2017\textsuperscript{7}).

Lasioglossum (Dialictus) trigeminum Gibbs, 2011 – Adams\textsuperscript{3,8}, Bucks\textsuperscript{8}, Centre\textsuperscript{7}, Chester\textsuperscript{8}, Delaware\textsuperscript{4}, Erie\textsuperscript{9}, Huntingdon\textsuperscript{8}, Lancaster\textsuperscript{3,8}, Lycoming\textsuperscript{8}, Montgomery\textsuperscript{8}, York\textsuperscript{8}; 29 Mar\textsuperscript{3} – 19 Oct\textsuperscript{3} (2017\textsuperscript{7}).

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

Lasioglossum (Dialictus) versatum (Robertson, 1902)\textsuperscript{18,36} – Adams\textsuperscript{1,3,8}, Beaver\textsuperscript{44}, Bradford\textsuperscript{1,8}, Bucks\textsuperscript{8}, Centre\textsuperscript{1,5,7,8,44}, Chester\textsuperscript{8}, Clearfield\textsuperscript{1,4}, Clinton\textsuperscript{1}, Columbia\textsuperscript{3}, Crawford\textsuperscript{1,4}, Dauphin\textsuperscript{1}, Delaware\textsuperscript{1,4}, Erie\textsuperscript{9}, Franklin\textsuperscript{1}, Huntingdon\textsuperscript{2,3,8}, Juniata\textsuperscript{1}, Lackawanna\textsuperscript{1,4}, Lancaster\textsuperscript{1,3,8}, Lehigh\textsuperscript{1}, Lycoming\textsuperscript{8}, Monroe\textsuperscript{4}, Montgomery\textsuperscript{1,7,8}, Northumberland\textsuperscript{1}, Perry\textsuperscript{1}, Philadelphia\textsuperscript{1,4}, Pike\textsuperscript{1,4}, Schuylkill\textsuperscript{4}, Sullivan\textsuperscript{1}, Susquehanna\textsuperscript{8}, Tioga\textsuperscript{8}, Union\textsuperscript{8}, Westmoreland\textsuperscript{1}, York\textsuperscript{1,3}, 29 Mar\textsuperscript{1} – 6 Nov\textsuperscript{3} (2017\textsuperscript{7}). 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\textsuperscript{3}, Centre\textsuperscript{44}, Erie\textsuperscript{6}, Fulton\textsuperscript{44}, Lancaster\textsuperscript{1,8,44}, Lycoming\textsuperscript{8}, Union\textsuperscript{8}, York\textsuperscript{8}; 15 Apr\textsuperscript{8} – 23 Jul\textsuperscript{6} (2015\textsuperscript{5}).

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

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

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

*Lasioglossum (Evylaeus) cinctipes* (Provancher, 1888) – Allegheny\(^20\), Centre\(^1,5,7\), Chester\(^8\), Cumberland\(^1\), Dauphin\(^1\), Erie\(^9\), Lehigh\(^20\), Susquehanna\(^1,20\), Tioga\(^20\), Union\(^8\), Westmoreland\(^20\); 28 Apr\(^8\) – 14 Oct\(^1\) (2017\(^7\)).

Subgenus *Hemihalictus* Cockerell

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

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

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

*Lasioglossum (Hemihalictus) inconditum* (Cockerell, 1916) – Susquehanna\(^8\); 6 May\(^8\) (2014\(^8\)).

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

*Lasioglossum (Hemihalictus) nelumbonis* (Robertson, 1890) – Pike\(^1,4\); 29 May\(^1,4\) (2005\(^1\)).

*Lasioglossum (Hemihalictus) pectinatum* (Robertson, 1890) – Adams\(^3\), Bucks\(^8,20\), Lancaster\(^20\); 10 Jul\(^8\) – 20 Oct\(^3\) (2016\(^7\)).

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

Subgenus *Lasioglossum* Curtis s. s.

**Revision:** McGinley (1986).

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

*Lasioglossum (Lasioglossum) athabascense* (Sandhouse, 1933)\(^36\) – Adams\(^1\), Allegheny\(^1,32\), Bradford\(^1\), Carbon\(^32\), Centre\(^1\), Clearfield\(^1,4\), Clinton\(^1\), Crawford\(^1\), Cumberland\(^1,32\), Dauphin\(^1,32\), Lehigh\(^1,32\), Sullivan\(^1\), Wyoming\(^32\); 11 May\(^1\) – 29 Aug\(^4\) (2007\(^1,4\)).
Lasioglossum (Lasioglossum) coriaceum (Smith, 1853) – Adams\(^3\), Allegheny\(^1,3,32\), Beaver\(^1,3,24,44\), Bradford\(^1,8\), Bucks\(^8\), Butler\(^1,32\), Centre\(^1,3,7,8,32\), Clinton\(^1\), Crawford\(^1,32\), Cumberland\(^1,3,32\), Dauphin\(^1,3,32\), Delaware\(^1,4,32\), Elk\(^1\), Erie\(^1,6,9,32\), Fayette\(^1,3,32\), Forest\(^1\), Huntingdon\(^1,8\), Jefferson\(^1\), Lancaster\(^1\), Lehigh\(^1,3,32\), Lycoming\(^8\), Monroe\(^1\), Montgomery\(^7,8\), Northumberland\(^1,3,32\), Perry\(^1\), Pike\(^1,3,4,32\), Sullivan\(^1\), Susquehanna\(^8\), Tioga\(^1\), Union\(^1,3,32\), Washington\(^1\), Westmoreland\(^1,3,32\), York\(^1,3,8,32\); 16 Apr\(^1\) – 23 Oct\(^3\) (2017\(^5,7\)).

Lasioglossum (Lasioglossum) forbesii (Robertson, 1890) (forbesii group)\(^36\) – Adams\(^3\), Cumberland\(^1\), Fayette\(^1,3,32\), Westmoreland\(^1,3,32\); 16 Apr\(^3\) – 22 Jul\(^1\) (2015\(^9\)).

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

Subgenus Leuchalictus Warncke

Revision: McGinley (1986).

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

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

Subgenus Sphecodogastra Ashmead

Revision: Gibbs et al. (2013).

Lasioglossum (Sphecodogastra) comagenense (Knerer & Atwood, 1964) (fulvicorne group) – locations, dates, and year not reported\(^66\).

Lasioglossum (Sphecodogastra) oenotherae (Stevens, 1920) (lusorium group) – Cumberland\(^43\), Erie\(^9\), Lycoming\(^8\); 9–11 Jun\(^9\) – 24 Aug\(^8\) (2016\(^9\)).

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

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

Genus Sphecodes Latreille

Taxonomy: Mitchell (1960). Sphecodes is in particular need of revision (Gibbs et al. 2017\(^a\)).
Sphecodes antennariae Robertson, 1891 (mandibularis group) – Adams3; 9 Oct3 (20083).
Sphecodes aroniae Mitchell, 1960 (ranunculi group31 – Bucks8, Philadelphia2; 9 May8 – 26 May2 (20078).
Sphecodes atlantis Mitchell, 1956 (mandibularis group) – Adams3, Bradford8, Bucks8, Centre8, Erie1,2, Huntingdon8, Lancaster3, Lycoming8, Union8, York8; 11 Jun8 – 4 Sep3 (20158).
Sphecodes autumnalis Mitchell, 1956 (mandibularis group) – Susquehanna8; 28 Aug8 (20158).
Sphecodes banksii Lovell, 1909 (mandibularis group) – Adams3; 9 Oct3 (20083).
Sphecodes clematidis Robertson, 1897 (dichrous group) – Centre8, Susquehanna8; 24 Jul8 – 28 Aug8 (20158).
Sphecodes confertus Say, 1837 (confertus group) – Crawford2; 4 Jul2 (19602).
Sphecodes coronus Mitchell, 1956 (mandibularis group) – Adams3, Blair2, Centre7, Lancaster3, Monroe2, Philadelphia1; 16 May3 – 8 Oct3 (2017).
Sphecodes cressonii (Robertson, 1903) (mandibularis group)36 – Dauphin1, Lancaster8, Susquehanna8, Union8; 6 May8 – 23 Sep8 (20148).
Sphecodes dichrous Smith, 1853 (dichrous group)36 – Centre1,8, Chester8, Cumberland1, Dauphin1, Erie1, Lancaster1,3, Monroe2, Warren6; 28 Apr8 – 30 Jul3 (20158).
Sphecodes galerus Lovell & Cockerell, 1907 (mandibularis group) – Centre7, Lancaster3; 16 Jul3 – 16–17 Aug7 (2017).
Sphecodes heraclei heraclei Robertson, 1897 (dichrous group) – Bucks8, Centre1,7, Delaware1, Montgomery8; 29–30 Jun7 – 19 Aug1 (20177).
Sphecodes illinoensis (Robertson, 1903) (mandibularis group) – Tioga6; 27 Jun6 (2008).
Sphecodes levis Lovell & Cockerell, 1907 (mandibularis group) – Erie1; 4 Jun1 (19661).
Sphecodes mandibularis Cresson, 1872 (mandibularis group) – Blair2, Bucks8, Erie6, Lancaster8; 3 May8 – 21 Jul8 (20158).
Sphecodes minor Robertson, 1898 (dichrous group) – Bradford8, Dauphin1, Delaware2, Lancaster3, York1,8, 15 Apr8 – 31 Jul3 (20158).
Sphecodes pimpinellae Robertson, 1900 (mandibularis group) – Dauphin1, Erie1; 4 Jul1 (year not reported1).
Sphecodes phosphorus Lovell & Cockerell, 1907 (dichrous group) – Centre1,15,44, Lancaster3; 10 Jul3 – 14 Aug3 (20133).
Sphecodes ranunculi Robertson, 1897 (ranunculi group)36 – Bedford2, Bradford8, Centre8, Dauphin, Delaware2, Erie, Huntingdon1,8, Montgomery, Philadelphia2, Union8; 28 Apr8 – 14 Jul (20158).
Sphecodes smilacinae Robertson, 1897 (mandibularis group) – Adams3; 24 May3 (20113).
Sphecodes solonis Graenicher, 1911 (dichrous group) – Adams3; 28 Jul3 (20153).
Sphecodes townesi Mitchell, 1956 (mandibularis group) – Lycoming8; 15 Jun8 (20148).
Nomiiinae
Dieunomiini
Genus *Dieunomia* Cockerell

**Revision:** Blair (1935).

**Subgenus *Dieunomia* Cockerell s. s.

*Dieunomia* (*Dieunomia*) *heteropoda* *heteropoda* (Say, 1824) – Philadelphia¹; 10 Sep¹ (1971¹).

Nominiini

**Genus *Nomia* Latreille**

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

**Subgenus *Acunomia* Cockerell**

*Nomia* (*Acunomia*) *nortoni* Cresson, 1868 – Allegheny¹; dates and year not reported¹.

Colletidae
Colletinae
Colletini

**Genus *Colletes* Latreille**

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

*Colletes aestivalis* Patton, 1879 (*aestivalis* group) – Dauphin¹, Monroe¹, Montgomery⁴⁵; 4 Jun¹ – 4 Jul¹ (1918¹).

*Colletes americanus* Cresson, 1868 (*americanus* group) – Bedford¹, Delaware¹, Philadelphia², York¹; 20 Sep¹ – 8 Oct² (1909³).

*Colletes compactus compactus* Cresson, 1868 (*compactus* group)³⁶ – *Adams*³, Allegheny¹, Bedford¹, Centre¹, *Clearfield*¹, Clinton¹, Columbia¹², Delaware², Huntingdon¹, Philadelphia², Tioga¹; 20 Aug¹ – 8 Oct² (2014³).

*Colletes eulophi* Robertson, 1891 (*simulans* group)³⁶ – Bedford¹, Centre¹; 20 Jul¹ – 20 Sep¹ (1954¹).

*Colletes inaequalis* Say, 1837 (*inaequalis* group)³⁶ – *Adams*³, Allegheny¹, *Bradford*⁸, *Bucks*⁸, Centre¹, Cumberland¹, Dauphin¹⁶, Erie¹, Huntingdon¹³⁸, *Lancaster*³, Lehigh¹, *Lycoming*⁸, Montgomery¹², Perry¹, Philadelphia¹²⁴, Washington¹, York¹⁸; 17 Mar⁶ – 31 Aug² (2018³).
Colletes latitarsis Robertson, 1891 (*latitarsis* group) – *Adams*³, Allegheny¹, Centre¹, Dauphin¹, *Lancaster*³,⁸, *Montgomery*⁸, Perry¹, Venango¹, Washington¹; 13 Jun³ – 23 Sep⁸ (2014*⁸).

Colletes nudus Robertson, 1898 (*nudus* group) – *Adams*³, Dauphin¹, Erie¹, Franklin¹; 20 May¹ – 23 Jul³ (2015³).

Colletes productus Robertson, 1891 (*productus* group) – Dauphin¹, Philadelphia¹,²; 27 Apr¹ – 9 Jul² (1909²).

Colletes simulans Cresson, 1868 (*armatus* Patton, 1879 (*simulans* group) – Centre¹,⁷, Clinton¹, Huntingdon¹, Jefferson¹,², Monroe¹,²; 23 Jul¹ – 16 Sep¹ (2017⁷).

Colletes thoracicus Smith, 1853 (*thoracicus* group) – Dauphin⁶, Delaware⁴, Huntingdon¹,², *Montgomery*⁷; 14 May⁶ – 10 Jun¹ (2017⁷).

Colletes validus Cresson, 1868 (*inaequalis* group) – Centre¹,⁷, Huntingdon¹, Philadelphia²; 29 Apr² – 24–25 May⁷ (2016⁷).

Colletes willistoni Robertson, 1891 (*willistoni* group) – locations, dates, and year not reported³⁶.

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**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*⁸, Centre⁷,¹⁵, *Clarion*⁶, *Columbia*⁵, Dauphin¹, Erie⁹, Jefferson², Lackawanna¹, Monroe², Sullivan¹, Tioga¹, Venango⁶, *Warren*⁶, *Wyoming*⁴; 6 Jun⁶ – 22 Aug⁵ (2017⁵).

*Hylaeus* (*Hylaeus*) *leptocephalus* (Morawitz, 1871)*¹⁰* (2005¹⁴) – Centre¹³, Erie⁹, *Lancaster*³, Northumberland¹, Philadelphia¹,⁴, *Susquehanna*⁸, *York*⁸; 7 Jun⁸ – 25 Aug¹,⁴ (2015⁸).

*Hylaeus* (*Hylaeus*) *mesillae* (Cockerell, 1896) *cressoni* (Cockerell, 1907) – Adams¹,³,⁸, Blair², *Bradford*⁴, *Bucks*⁸, Centre⁷,⁸,¹⁵, Dauphin¹,⁴, Delaware¹,⁴, Erie⁹, Franklin¹, Huntingdon², *Lackawanna*⁴, *Lancaster*³, *Lebanon*⁴, Lehigh¹, *Lycoming*⁸, Monroe¹,², Montgomery², *Tioga*⁴, *Union*⁶, *York*⁴, 30 Apr³ – 21 Oct³ (2018³).

*Hylaeus* (*Hylaeus*) *saniculae* (Robertson, 1896) – Lehigh¹; 29 Jun¹ – 19 Jul¹ (1903¹).

**Subgenus Metziella** Michener

**Revision:** Snelling (1968).

*Hylaeus* (*Metziella*) *sparsus* (Cresson, 1869)³⁶ – *Adams*³, *Bucks*⁸; 9 May⁸ – 10 Jul³ (2015³).
Subgenus *Paraprosopis* Popov

**Revision:** Snelling (1970).

*Hylaeus* (*Paraprosopis*) *floridanus* (Robertson, 1893) – Lycoming8; 19 Jun8 (20158).

*Hylaeus* (*Paraprosopis*) *pictipes* Nylander, 1852* (20159,19) – Crawford19, Erie9; 15 – 17 Jul19 – 2–4 Aug9 (20169,19).

Subgenus *Prosopis* Fabricius

*Hylaeus* (*Prosopis*) *affinis* (Smith, 1853)36 – Adams1,3, Allegheny1, Berks6, Bradford6,8, Centre1,6,7,15,44, Chester1,6, Clinton6, Crawford1, Dauphin1,6, Delaware1,4, Erie6, Franklin1, Fulton1, Huntingdon1,2,3, Jefferson6, Juniata6, Lackawanna4, Lancaster1,3, Lebanon4, Lehigh1,6, Lycoming8, Monroe1,2, Montgomery1, Northumberland1, Philadelphia1, Schuylkill4, Somerset6, Sullivan1, Susquehanna1, Tioga1, Venango1, Westmoreland1, Wyoming4, York1,8; 4 May3 – 25 Oct3 (20183).

*Hylaeus* (*Prosopis*) *illinoisensis* (Robertson, 1896) – Adams3, Bucks8; 19 May3 – 23 May8 (20163).

*Hylaeus* (*Prosopis*) *modestus modestus* Say, 183736 – Adams1,3, Allegheny1, Bedford6, Bradford1,6,8, Bucks1,6, Butler1, Centre1,7,15,44, Chester1,6, Clarion6, Clinton6, Crawford1, Cumberland1, Dauphin1,6, Delaware1,4, Elk1, Erie1,6,9, Franklin1, Huntingdon1,2,3, Jefferson2, Lackawanna4, Lancaster3,8,44, Lehigh1, Luzerne1,2, Monroe1, Montgomery1, Perry1,4, Philadelphia1, Pike1,4, Sullivan1, Tioga1,4,6, Union8, Westmoreland1, York4; 5 Apr3 – 6 Nov3 (20173,7).

*Hylaeus* (*Prosopis*) *schwarzii* (Cockerell, 1896) – Delaware4; dates not reported4 (20084).

Subgenus *Spatulariella* Popov

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

*Hylaeus* (*Spatulariella*) *hyalinatus* Smith, 1842* (20094) – Adams3, Bradford8, Centre8, Dauphin4, Erie9, Lancaster8, Lebanon4, Lehigh48 (AMNH_BEE00270811), Lycoming8, Montgomery8, Union8, York8; 18–20 May9 – 28 Sep8 (20169).

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; 18 May (1982). 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*) *kalniae* Atwood, 1934 (*daeckei* group) – Centre; dates not reported (2007). 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) – Berks; 8 Jun (2009). 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; 24 May (2007). 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; 3 Jul (2007). This species is a coastal salt march 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; 25 May – 13 Jul (2007). 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; 3 Aug (1936). 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; 17 Jun (1961). 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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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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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
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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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Supplementary material 6

López-Uribe Laboratory Database specimen records
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Supplementary material 7

Winfree Laboratory Database specimen records
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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
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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
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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
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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
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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
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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
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Supplementary material 15

Pennsylvanian Halictidae specimen records from BugGuide
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Supplementary material 16

Pennsylvanian Megachilidae specimen records from BugGuide
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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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