Corrigenda: An updated checklist of the bees (Hymenoptera, Apoidea, Anthophila) of Pennsylvania, United States of America. Journal of Hymenoptera Research 77: 1–86. https://doi.org/10.3897/jhr.77.49622

Shelby Kerrin Kilpatrick¹, Jason Gibbs², Martin M. Mikulas³,⁴, Sven-Erik Spichiger³,⁵, Nancy Ostiguy¹, David J. Biddinger¹,⁶, Margarita M. López-Uribe¹

¹ Department of Entomology, Center for Pollinator Research, Pennsylvania State University, University Park, Pennsylvania, 16802, USA ² Department of Entomology, University of Manitoba, Winnipeg, Manitoba, R3T 2N2, Canada ³ Pennsylvania Department of Agriculture, Harrisburg, Pennsylvania, 17110, USA ⁴ USDA, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Lancaster, Pennsylvania, 17601, USA ⁵ Washington State Department of Agriculture, Olympia, Washington, 98501, USA ⁶ Fruit Research and Extension Center, Pennsylvania State University, Biglerville, Pennsylvania, 17307, USA

Corresponding author: Shelby Kerrin Kilpatrick (skk30@psu.edu)

Academic editor: M. Ohl | Received 31 December 2020 | Accepted 4 January 2021 | Published 25 February 2021

http://zoobank.org/F20F8439-60E1-4580-B907-B4731F1F4F2E

Citation: Kilpatrick SK, Gibbs J, Mikulas MM, Spichiger S-E, Ostiguy N, Biddinger DJ, López-Uribe MM (2021) Corrigenda: An updated checklist of the bees (Hymenoptera, Apoidea, Anthophila) of Pennsylvania, United States of America. Journal of Hymenoptera Research 77: 1–86. https://doi.org/10.3897/jhr.77.49622. Journal of Hymenoptera Research 81: 181–189. https://doi.org/10.3897/jhr.81.62634

The recently updated checklist of the bees of Pennsylvania, USA (Kilpatrick et al. 2020) contained several unintentional errors and some specimen records require clarification. We address below: 1) GBIF data retrieval, 2) taxonomy, 3) typographical errors in the text and Suppl. material 10, 4) misattributed county-level records, 5) county-level records for species in both Fig. 3 and Suppl. material 1, 6) data sources that were omitted from the text, and 7) state species record validity. These corrections, additional details, and updated files should be used in combination with the data presented in the original publication.
GBIF data

The specimen data retrieved from GBIF.org on 07 January 2020 (GBIF Occurrence Download https://doi.org/10.15468/dl.wghcks) were filtered by “Scientific name”, (Andrenidae, Apidae, Colletidae, Halictidae, Megachilidae, Melittidae), “Continent” (North America), “Country or area” (United States of America), and “State province” (PENNSYLVANIA). We have become aware that applying the geography-based terms excluded numerous records from our search results (i.e., a record was excluded if any of these fields were empty/missing when a record was originally submitted to GBIF or if there was a misspelling/variant of the search term in any of these fields). Applying a polygon/shapefile for the state and adjusting “coordinateUncertaintyInMeters”, in place of using geography-based terms, will return all records that contain coordinates within the state, regardless of how complete their other fields are. Combining this search strategy with searches that use a wider variety of geography-based terms – to retrieve records without coordinates or that have been incorrectly georeferenced – can be used to compile a thorough GBIF dataset. However, the addition of records from searches such as these is outside of the scope of the corrigenda.

Checklist taxonomy

The subfamilial classification within Apidae was intended to follow Bossert et al. (2019), however, Anthophorinae was omitted. Thus, all members of Anthophorini were intended to be included in Anthophorinae, not Apinae. Additionally, all members of Eucerini should be classified within Eucerinae, not Apinae.

The species group, viridatum, was unintentionally omitted from Lasioglossum (Dialictus) dreisbachi (Mitchell, 1960) in both the text and Suppl. material 1. Hoplitis (Hoplitis) anthocopoides (Schenck, 1853) is in the adunca species group, not Annosmia–Hoplitis. Furthermore, L. (Sphecodogastra) truncatum (Robertson, 1901) does not have a species group and is thus not in the calceatum group. Suppl. material 1 has been corrected per this information, and to fully reflect the checklist text, group names for six Lasioglossum spp. were also added: cephalotes group – L. (Dialictus) cephalotes (Dalla Torre, 1896); platyparium group – L. (Dialictus) izawsum Gibbs, 2011, L. (Dialictus) rozeni Gibbs, 2011, and L. (Dialictus) simplex (Robertson, 1901); viridatum group – L. (Dialictus) georgeickworti Gibbs, 2011 and L. (Dialictus) katherinae Gibbs, 2011.

Literature review records

Typographical and formatting errors that were introduced to Suppl. material 10 when the file was reformatted for publication were corrected.
Checklist legend

Some of the citations of the Legend presented on page 17 were incorrectly formatted and/or had the incorrect year listed. The corrected legend is reprinted in full here for clarity and convenience:

**Legend:** 1 = Donovall and vanEngelsdorp (2010); 2 = Bartomeus et al. (2013); 3 = Bidinger Laboratory Database; 4 = Droge Database; 5 = Integrated Crop Pollination (ICP) Project: Fleischer Laboratory Database; 6 = López-Urrie Laboratory Database; 7 = Mahan et al., in prep; 8 = Winfree Laboratory Database; 9 = Choate et al. (2018); 10 = Baker (1975); 11 = Bouseman and LaBerge (1978); 12 = Broemeling (1988); 13 = Cockrell (1908); 14 = Daly (1973); 15 = DeBarros (2010); 16 = Droge 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.

Checklist species records

Specimen records from Choate et al. (2018) (superscript 9) were misattributed to Erie County, instead of Crawford County. The error affected 103 species, ranging across pages 18 to 63. Of these 103 species, 30 have been recorded in both Crawford and Erie counties, and Erie is considered a new county record for nine species: *Apis (Apis) mellifera* *mellifera* Linnaeus, 1758; *Ceratina (Zadontomerus) strenua* Smith, 1879; *Anthidium (Anthidium) manicatum* *manicatum* (Linnaeus, 1758); *Megachile (Eutricharaea) rotundata* Fabricius, 1787); *Osmia (Melanosmia) pumila* Cresson, 1864; *Andrena (Andrena) tridens* Robertson, 1902; *Halictus (Odontalictus) ligatus* Say, 1837; *Lasioglossum (Dialictus) tegulare* Robertson, 1890); and *Lasioglossum (Leuchalictus) zonulum* (Smith, 1848). The remaining 73 species have only been recorded in Crawford County, not Erie County.

The county records for each species have been corrected in Suppl. material 1 and Fig. 3. The following additional changes were made to the species records in Suppl. material 1 and Fig. 3, to accurately reflect data presented in the checklist text: *Nomada imbricata* Smith, 1854 – Lancaster County was added; Lackawanna County was removed. *Nomada luteola* Olivier, 1812 – York County was added. *Osmia (Melanosmia)
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pumila Cresson, 1864 – Jefferson County was added; Juniata County was removed. Andrena (Andrena) cornelli Viereck, 1907 – Schuylkill County was added.

Sources for county and/or date information reported in the checklist were partially omitted in four species’ records in the checklist on pages 37, 47, 49, and 60. The data noted for each of the following species is attributable to the citation for superscript “1”: Hoplitis (Alcidamea) producta producta (Cresson, 1864) – Butler; Andrena (Thysandrena) w-scripta Viereck, 1904 – Potter; Calliopsis (Calliopsis) andreniformis Smith, 1853 – Cumberland and Lackawanna; Sphecodes ranunculi Robertson, 1897 – Dauphin, Erie, Montgomery, and 14 Jul.

Additional remarks on species record verifications

Several state species records, including the following, were included on the checklist based on external data sources as provided in Kilpatrick et al. (2020). However, they were not independently verified. Since these are uncommon species or reach the limit of their ranges in Pennsylvania, it would be useful to validate these records in the future: Bombus (Psithyrus) insularis (Smith, 1861); Melissodes (Eumelissodes) fumosus Laborge, 1961; Triepeolus rugosus Mitchell, 1962; Stelis (Stelis) foederalis Smith, 1854; Andrena (Euandrena) phaceliae Mitchell, 1960; Andrena (Xiphandrena) mendica Mitchell, 1960; Lasioglossum (Dialictus) cephalotes (Dalla Torre, 1896); Lasioglossum (Dialictus) marinum (Crawford, 1904); Lasioglossum (Dialictus) simplex (Robertson, 1901); Lasioglossum (Sphecodogastra) comagenense (Knerer and Atwood, 1964); Sphecodes smilacinae Robertson, 1897; and Sphecodes solonis Graenicher, 1911.
Acknowledgements

Thanks again to Beth Choate for graciously sharing specimen data. John (Jack) Neff (Central Texas Melittological Institute) and John Ascher (National University of Singapore) critically reviewed the published article and their feedback contributed to components of the corrigenda. GBIF Secretariats, Daniel Noesgaard and John Waller, reviewed our occurrence download and contributed suggestions for retrieving additional records in future searches. We also thank Emily Erickson, Rosemary Malfi, and T’ai Roulston for their assistance with confirming a few of the specimen records included in the updated checklist.

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Supplementary material 1

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: classification, phenology, distribution
Explanation note: The classification, earliest and latest dates of collection in both Donovall and vanEngelsdorp (2010) and Kilpatrick et al. (2020), most recent year of collection/observation in both Donovall and vanEngelsdorp (2010) and Kilpatrick et al. (2020), persistence data, and county-level occurrence data is presented for each of the 437 spp. of bees reported in Pennsylvania. This file has been corrected and updated as described in the text of the Corrigenda. This replacement file for Suppl. material 1 should be used in combination with the data in the original publication (Kilpatrick et al. 2020) and the Corrigenda.
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Link: https://doi.org/10.3897/jhr.81.62634.suppl1
Supplementary material 10

Pennsylvania bee species literature review records
Authors: Shelby Kerrin Kilpatrick, Jason Gibbs, Martin M. Mikulas, Sven-Erik Spichiger, Nancy Ostiguy, David J. Biddinger, Margarita M. López-Uribe
Data type: specimen records
Explanation note: Complete specimen literature record details for species of bees reported in Pennsylvania. Citation details, taxonomic classification (past and updated to current), type of report, occurrence details (both verbatim and transformed), and species notes are presented for 1,283 records. This file has been corrected and updated as described in the text of the Corrigenda. This replacement file for Suppl. material 10 should be used in combination with the data in the original publication (Kilpatrick et al. 2020) and the Corrigenda.
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