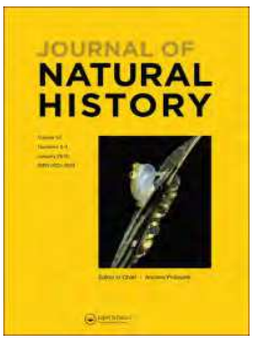

Journal of Natural History

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/tnah20

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To cite this article: Davide Dal Pos, Victoria Heilman & Francisco Welter-Schultes (2022) Platylabini (Hymenoptera: Ichneumonidae: Ichneumoninae) of the south-eastern United States: new distributional data, taxonomic notes, illustrated keys, and an annotated catalogue of the genera and species, Journal of Natural History, 56:45-48, 1869-1938, DOI: 10.1080/00222933.2022.2134061

To link to this article: https://doi.org/10.1080/00222933.2022.2134061

Published online: 02 Dec 2022.

JOURNAL OF NATURAL HISTORY
2022, VOL. 56, NO. 45–48, 1869–1938
https://doi.org/10.1080/00222933.2022.2134061

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Platylabini (Hymenoptera: Ichneumonidae: Ichneumoninae) of the south-eastern United States: new distributional data, taxonomic notes, illustrated keys, and an annotated catalogue of the genera and species

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ABSTRACT

A catalogue of the species of Platylabini from the south-eastern United States is presented, with an updated list of the species, a review of their distribution, and the first illustrated key to the genera and species. *Cyclolabus gracilicornis gracilicornis* (Provancher, 1886) is newly recorded for the province of Nova Scotia (Canada), while eight species are recorded for the first time for the following US states: *Amboplisus ornatus* (Cresson, 1868) for Georgia; *Asthenolabus canadensis* (Cresson, 1877) for West Virginia; *Linycus exhortator thoracicus* (Cresson, 1864) for Virginia, *Neolinycus michaelis* Heinrich, 1971 for Florida; *Platylabus clarus* (Cresson, 1867) for Alabama, Virginia and West Virginia; *Platylabus opaculus americanus* Heinrich, 1962 for North Carolina; *Probolus detritus* (Brullé, 1846) and *Tropicolabus foxi* (Davis, 1898) for Florida. Based on newly discovered and already published material, a new subspecies synonym has been recognised: *Neolinycus michaelis arkansae* Heinrich 1975 is regarded as a junior synonym of *Neolinycus michaelis michaelis* Heinrich, 1971, and the previous subspecies synonymy that regarded *Neolinycus michaelis georgianus* Heinrich, 1972 as a junior synonym of the nominate subspecies has been confirmed and explained. The female of *Tropicolabus foxi* is described for the first time, marking the first record of the species since its original description. Nomenclatural notes and extensive comments for each species are provided, as well as a key to the tribes of Ichneumoninae of North America, and to the genera and species of Platylabini from the south-eastern United States.

http://www.zoobank.org/urn:lsid:zoobank.org:pub:0300FCEB-082A-40CF-9EC8-76495590D037

ARTICLE HISTORY
Received 11 April 2022
Accepted 26 September 2022

KEYWORDS
Taxonomy; catalogue; geographical distribution; new records; synonym

Introduction

Platylabini is a monophyletic tribe of the subfamily Ichneumoninae (Hymenoptera: Ichneumonidae) (Santos et al. 2021) consisting of approximately 38 genera and more than 269 species worldwide (Yu et al. 2016). All the members of the tribe are larval-pupal endoparasitoids of Lepidoptera, attacking mostly Geometridae, with records from

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Published online 02 Dec 2022

Drepanidae, Noctuidae and other moths as well (Riedel 2008; Tereshkin 2009; Kikuchi and Konishi 2018).

Until now, efforts to uncover the fauna of the Platylabini of North America have been mainly focused on the study of the north-eastern part of the region, with extensive work across two decades on the Nearctic Ichneumoninae carried out by the renowned entomologist Gerd Heinrich (e.g. Heinrich 1961). Heinrich (1962b) was able to provide the first key to the Nearctic species of the tribe, recognising 10 genera. Subsequent contributions revealed the presence of two new genera (Heinrich 1971, 1972; Carlson 1979) and several additional new species (Heinrich 1971, 1975, 1977, 1978), increasing the total number of species to 69. Despite all these extensive contributions, the fauna of Platylabini (and of Ichneumoninae in general) of North America is far from being completely understood. Heinrich (1977) acknowledged the fact that despite his efforts studying the Nearctic Ichneumoninae in his previous papers, the south-eastern part of the region was still understudied.

The overall focus of the current contribution is to provide a review and an update on the fauna of Platylabini from the south-eastern United States, based also on the recent phylogenetic results by Santos et al. (2021). Seven genera are recorded for the first time for the following US states: *Ambloplisus* Heinrich, 1930 for Georgia; *Asthenolabus* Heinrich, 1951 for West Virginia; *Linycus* Cameron, 1903 for Virginia and West Virginia; *Neolinycus* Heinrich, 1971 for Florida; *Platylabus* Wesmael, 1845 for Alabama; *Probolus* Wesmael, 1845 for Florida; and *Tropicolabus* Heinrich, 1959 for Florida. Moreover, the distribution of the species has been reviewed, updated and corrected where necessary as we have found some inconsistency between Yu et al. (2016) and the previous literature. Distributional maps have also been produced for each species.

The subspecies of *Neolinycus michaelis* Heinrich, 1971 have been analysed and revised based on new records, confirming the synonymisation by Carlson (1979) of *N. michaelis georgicus* Heinrich, 1972 with *N. michaelis michaelis* Heinrich, 1971 and recognising *Neolinycus michaelis arkansae* Heinrich, 1977 as a junior synonym of *N. michaelis michaelis* Heinrich, 1971.

The female of *Tropicolabus foxi* (Davis, 1898) is described for the first time, marking the first record of the species since its original description. The identity of the genus is also discussed based on examination of the holotype and the newly discovered material, with comparison to morphologically similar genera (*Ambloplisus* and *Platylabus*), and a new character for its identification is proposed.

Necessary comments and taxonomic notes to all genera and species are also provided, as well as the first illustrated key to the tribes of Ichneumoninae for North America, and the genera and species of Platylabini from the south-eastern United States.

Materials and methods

Photographs

An OPTIKA SZM-2 stereo microscope was used for observation and study. Photographs were taken with a Canon Eos 7D, lens Canon MP-E 65 mm f/2.8 1–5 × Macro and Canon Macro Lens EF 100 mm, using Zerene for the stacking. The images of *Apaeleticus americanus* and *Cyclolabus gracilicornis gracilicornis* were downloaded from the USNM (National Museum of Natural History, Washington, DC, USA) and CNCI (Canadian

National Collection of Insects, Arachnids and Nematodes, Ottawa, Ontario, Canada) websites, respectively. Images were enhanced using Photoshop 23.0.2.

Mapping

Distribution maps were produced using QGIS 3.20 with cartographic boundary files produced by the United States Census Bureau, available at https://www.census.gov/geographies/mapping-files/time-series/geo/carto-boundary-file.html.

Treatment of taxa

The overall morphological terminology follows Broad et al. (2018).

For each genus, a comparative diagnosis is compiled based on the relevant literature, namely Heinrich (1962b, 1977), Tereshkin (2009) and Valemberg (2014). In the section 'Range and diversity', the worldwide distribution and number of species for the south-eastern United States are also included. A complete list of synonyms is provided below the valid genus-level name.

For each species, type information, material examined, and relevant comments are provided. Moreover, a complete list of synonyms is listed below the valid species-level name, together with the original combination as well as subsequent combinations. For each name (valid or invalid), an exhaustive list of the known references is presented with indications of their contribution. Meanings for the abbreviations present in the text are as follows:

descr. = description
key = presence of a key
type = catalogue or list of type specimens
notes = taxonomic notes
cat. = catalogue
fig. = presence of figure(s)
distr. = new records for the species, notes on the distribution or checklist
host = new records for host or confirmation of previous records

Data of examined material

Label information for the type specimen series examined is reported verbatim, using the following conventions: / = different lines; // = different labels; italic = handwriting. For non-type specimens, names of collecting localities have been standardised.

Depositories and abbreviations

The abbreviations used in the text are as follows:

ANSP: Academy of Natural Sciences, Drexel University, Philadelphia, Pennsylvania, USA
CNCI: Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, Ontario, Canada
EMUS: Entomology Museum, Utah State University, Logan, Utah, USA

FSCA: Florida State Collection of Arthropods, Gainsville, Florida, USA
LUEC: Laval University Entomological Collection, Québec, Canada
MNHN: Muséum National d'Histoire Naturelle, Paris
UCFC: University of Central Florida Collection, Orlando, Florida, USA
UNHC: University of New Hampshire Collection, Durham, New Hampshire, USA
USNM: National Museum of Natural History, Washington, DC, USA
VMNH: Virginia Museum of Natural History, Martinsville, Virginia, USA
ZSM: Zoologische Staatssammlung München, München, Germany.

Except where otherwise stated, all the specimens listed in the non-type material section have been identified by the first author (DDP), following Heinrich (1962b, 1977).

Geographic scope

There is not a clear delimitation of or consensus on where the division is between the north and south-eastern United States. In this paper, we employ the definition of south-eastern USA provided by Milesi et al. (2003), with some degree of freedom for those species occurring in the neighbouring states that are not considered south-eastern USA *sensu stricto* (Figure 1). When the species has a clearly northern distribution, reaching North Carolina as the southernmost state, we acknowledge this in the comments.

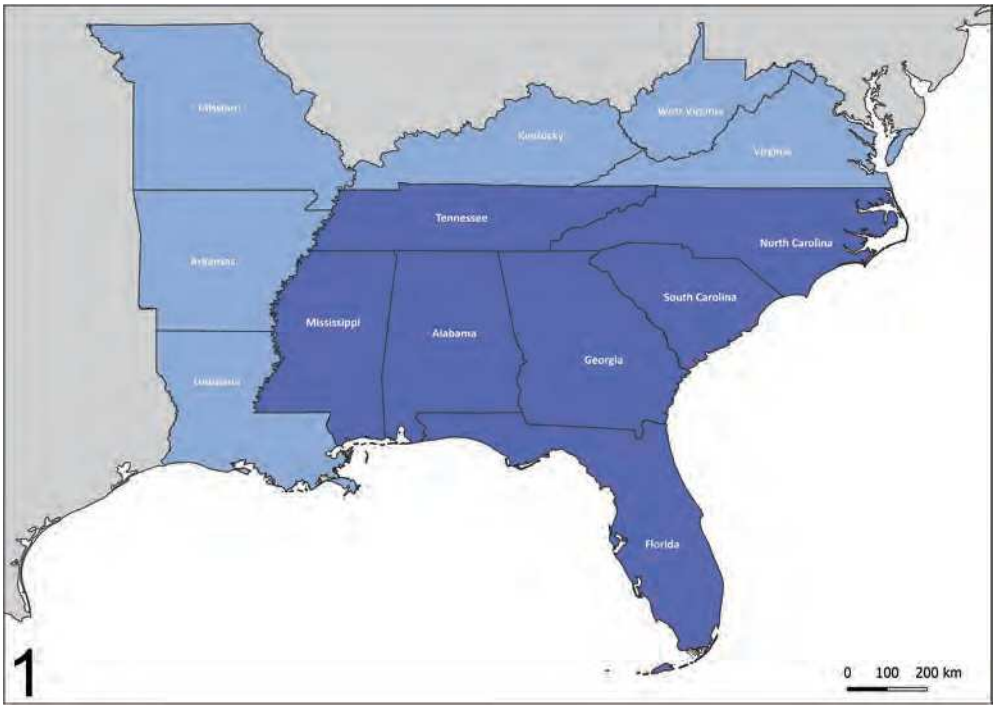

Figure 1. The south-eastern part of the USA: the core states (Milesi et al. (2003)) (dark blue), and the non-core states (light blue).

Allotype and neallotype designation

Over his lengthy career, Gerd Heinrich employed consistently the term 'neallotype' (e.g. Heinrich 1962b) when describing the first specimen of the opposite sex from the type designated after the original description, and the term 'allotype' when referring to the first specimen of the opposite sex from the holotype designated by him in the original description (and therefore belonging to the original type series). These designations are pervasive in Heinrich's work and need to be clarified for further studies. While, the term 'allotype' is not regulated by the Code of the International Commission on Zoological Nomenclature (ICZN 1999, Glossary) and it is simply use 'to indicate a specimen of opposite sex to the holotype', the term 'neallotype' is not present in any part of the Code. According to Evenhuis (2008, p. 15), a neallotype is 'An allotype of the opposite sex from that described in the publication of a neotype', linking it to a precise act ruled by Article 75 of the Code (ICZN 1999). According to Santiago-Bay et al. (2008), the term was originally introduced by Talbot (1921) to identify the specimens of the opposite sex from the holotype designated or described after the original description in a period where the term 'allotype' was mostly used by several authors (e.g. Mayr et al. 1953) to refer only to those specimens belonging to the original type series (therefore one of the paratypes). From his work, it is clear that Heinrich applied these latter definitions when referring to the two terms, as he did not concurrently designate any neotype. Therefore, the 'allotype' for Heinrich is actually a paratype of the opposite sex, while the neallotype is simply a description of a specimen of the opposite sex from the holotype. In this paper, we will point out with 'neallotype designation' and 'allotype designation' when Heinrich applied these two terms.

Results

Tribe Platylabini Berthoumieu 1904 (Ichneumonidae, Ichneumoninae)

Traditionally, the diagnostic traits used to identify the tribe Platylabini have been the following: (1) a convex clypeus; (2) first metasomal tergite broader than high with postpetiole dorsally strongly flattened; and (3) amblypygous metasoma in females (Heinrich 1961, 1967a, 1967b; Townes et al. 1961; Tereshkin 2009). However, as extensively discussed by Santos et al. (2021, supplement S8) the tribe, as above defined, excludes at least two genera well nested within the tribe: *Probolus* Wesmael, 1845, and *Cotiheresiarches* Telenga, 1929. The authors concluded that, for the moment, it is impractical to provide a succinct diagnosis of the tribe and, with a couple of exceptions (*Eurylabus* Wesmael, 1845 and *Levansa* Townes, 1961), all the Ichneumoninae with a flattened petiole are surely Platylabini.

Even though more in-depth morphological analyses will be necessary to better delineate the diagnosis of the tribe, we also believe that a practical key to the tribes and to the Platylabini genera can facilitate identification.

Key to the tribes of Ichneumoninae of North America and genera of Platylabini of the south-eastern United States

The following key is based on the results from Santos et al. (2021) and adapted from Heinrich (1961, 1962b), Tereshkin (2009), and Valemberg (2014). Since the character 'first metasomal tergite broader than high' (first couplet) can be difficult to score, *Apaeleticus* and *Probolus* can be keyed out from both statements in the first couplet.

1. First metasomal tergite wider than high with postpetiole dorsally strongly flattened (Figure 2a); clypeus gently to strongly convex (Figure 3a); metasoma of females amblypygous (Figures 13b, 22b, 26b, 32b, 34b, 36a) **2**

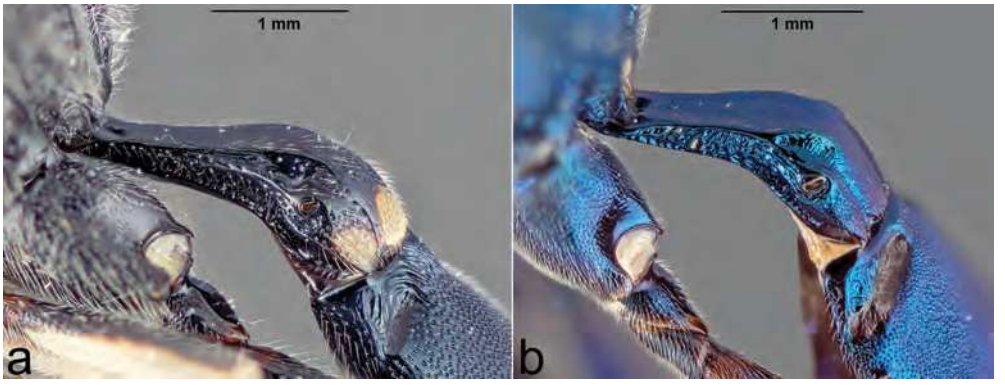

Figure 2. Comparison of a petiole between Ichenumonini and Platylabini, dorso-lateral view. a) *Coelichneumon azotus* (Cresson, 1864) (Ichneumonini). b) *Platylabus clarus* (Cresson, 1867) (Platylabini).

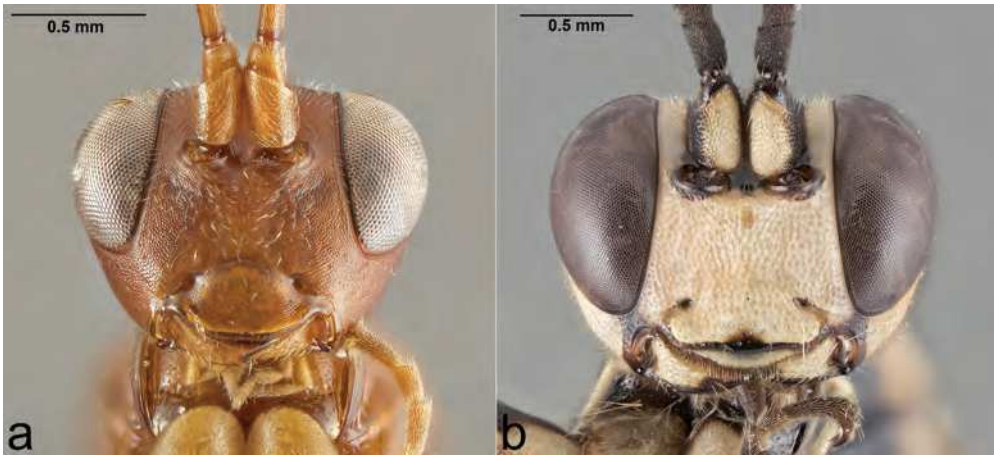

Figure 3. Comparison of the clypeus between Phaoegenini (convex) and Ichneumonini (flat), frontal view. a) *Terebraella culiciops* Heinrich, 1972 (Phaeogenini). b) *Coelichneumon azotus* (Cresson, 1864) (Ichneumonini).

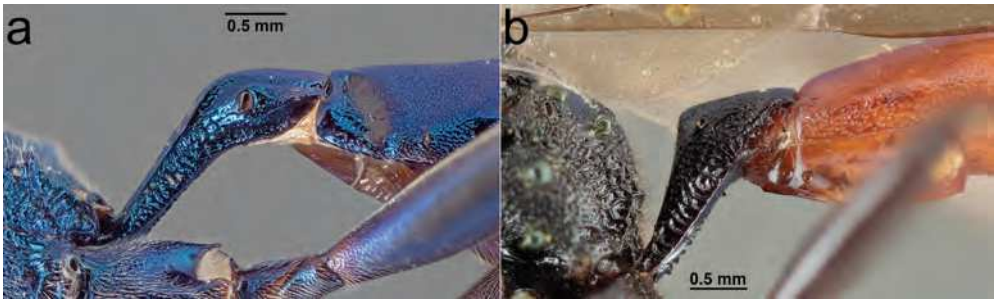

Figure 4. Petiole, lateral view. a) *Platylabus clarus* (Cresson, 1867). b) *Probolus detritus* (Brullé, 1846).

(Platylabini)

- First metasomal tergite not wider than high with postpetiole not dorsally strongly flattened (Figure 2b); clypeus either gently to strongly convex or entirely flat and wide (Figure 3b); metasoma of females amblypygous, oxypygous or semyamblypygous (fig. 2 in Santos et al. (2021)) **10**

2. Postpetiolus, in lateral view, with an anterior hump medially (Figure 4b); sternites strongly sclerotised (Figure 34b); horizontal part of propodeum lacking distinct carinae (Figure 43d)..... ***Probolus*** Wesmael, 1845

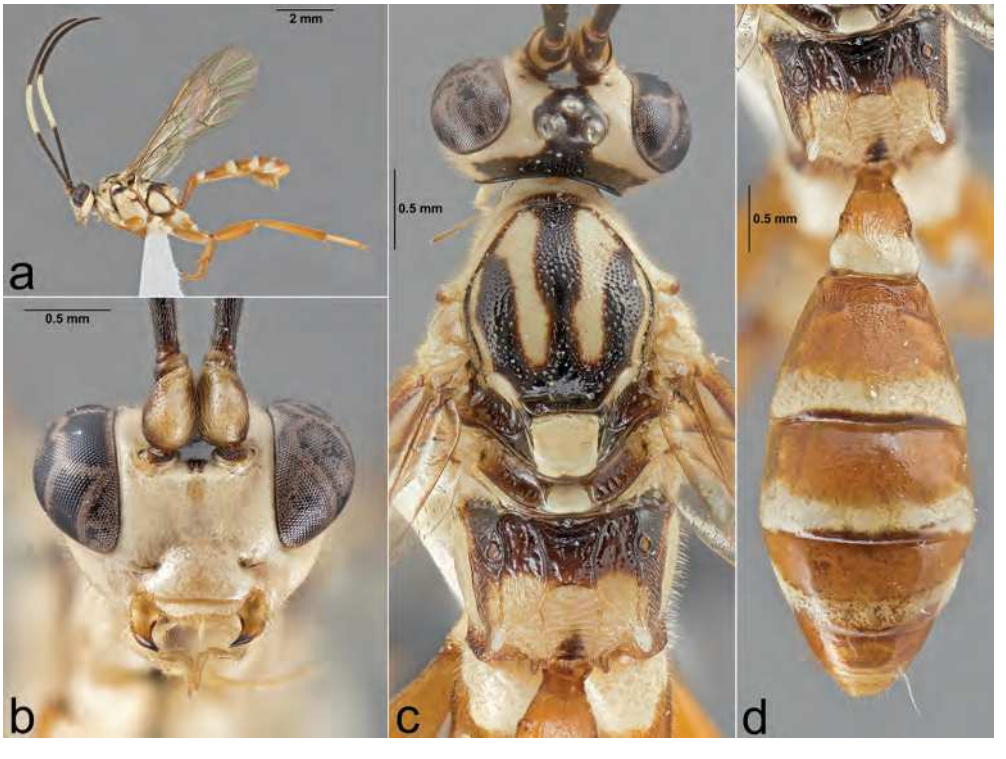

Figure 5. *Ambloplisus ornatus* (Cresson, 1868), ♀. a) Habitus, lateral view. b) Head, frontal view. c) Head and mesosoma, dorsal view. d) Propodeum and metasoma, dorsal view.

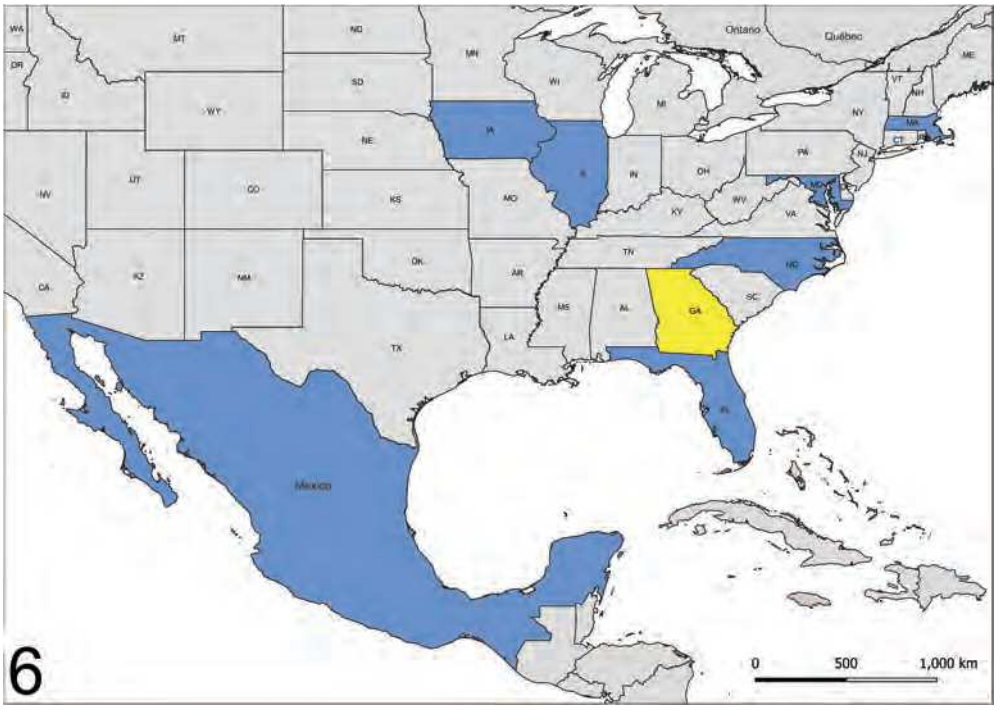

Figure 6. *Ambloplisus ornatus* (Cresson, 1868), distributional map: known records (in blue) and newly recorded state (in yellow).

- Postpetiolus, in lateral view, without an anterior hump medially (Figure 4a); sternites not strongly sclerotised (Figures 5a, 7c, 9b, 11b, 13b, 40a, 40d); horizontal part of propodeum with distinct carinae or with a rough reticulate-cellular sculpture (Figures 5d, 7a, 15d, 26d)..... **3**

3. Propodeum with long, pointed apophyses in both sexes (Figures 5d, 37a); area superomedia and area basalis not separated but forming together an area gradually widening towards the scutellum (Figure 5d); gastrocoeli relatively superficial, with thyridia smaller than the space between them (Figure 5d)..... ***Ambloplisus*** Heinrich, 1930

- Propodeum without long apophyses, or at most with short, tooth-like projections (Figures 22b, 26d, 32b, 37b); area superomedia otherwise shaped, not fused with area basalis (Figures 13e, 20b, 22d, 26d); gastrocoeli and thryridia of various shapes..... **4**

4. Spiracles of propodeum elongate, usually considerably longer than wide (ovate or linear) (Figures 9b, 22b, 22d, 37b)..... **5**

- Spiracles of propodeum small and circular (Figures 11b, 13e)..... **7**

5. Gastrocoeli superficial; thyridia indistinct (Figure 9d)..... ***Asthenolabus*** Heinrich, 1951

- Gastrocoeli large and rather deep; thyridia usually larger than the space between them (Figures 4a, 22d, 36c)..... **6**

6. Mandible not twisted, appearing bidentate in frontal view; propodeal carinae not lamellate (Figure 22d); face not broad in frontal view, genae not strongly inflated

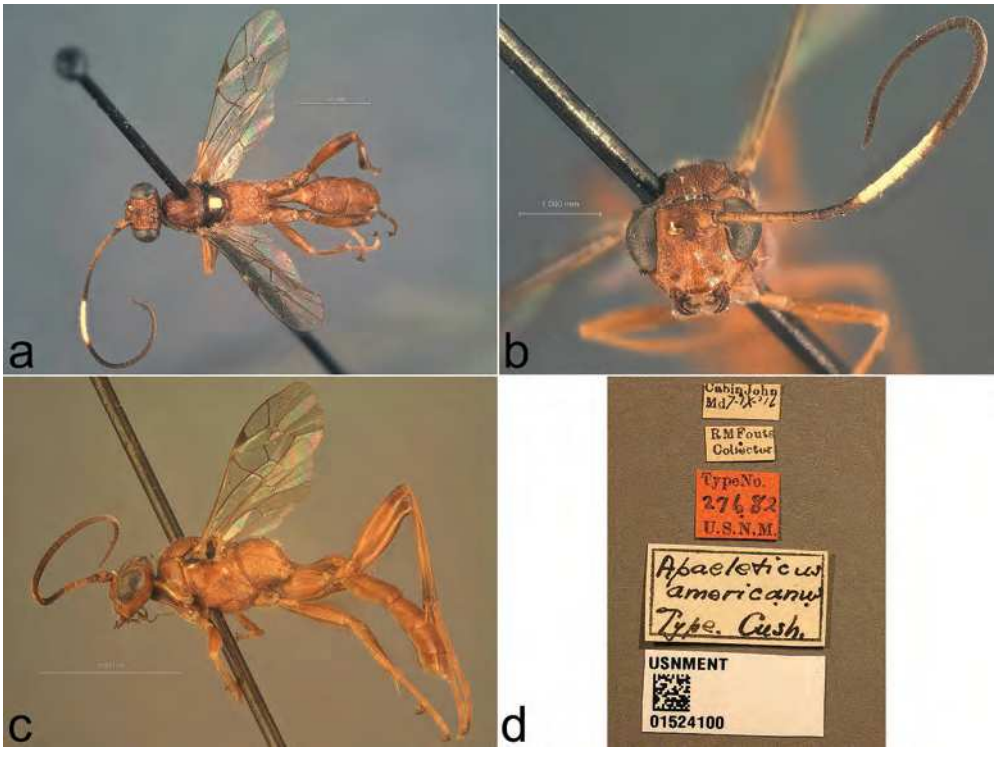

Figure 7. *Apaeleticus americanus* Cushman, 1926, holotype ♀. a) Habitus, dorsal view. b) Head, frontal view. c) Habitus, lateral view. d) Labels. Downloaded from the public USNM database (available also at http://n2t.net/ark:/65665/3b8484f3e-e496-4e57-a931-64842bace133).

(Figure 22c) ..... ***Platylabus*** Wesmael, 1845

- Mandibles twisted, appearing unidentate in frontal view; propodeal carinae strong and lamellate (Figure 37b); face broad in frontal view, genae strongly inflated (Figure 38b) ..... ***Tropicolabus*** Heinrich, 1859

7. Propodeum with rough reticulate-cellular sculpture, carinae of propodeal areas indistinct, sinuate (Figure 7a); middle field of face strongly protruding (Figure 7c); gastrocoeli transverse and rather distinct; in females tergites 6 and 7 retracted under the 5th tergite (Figure 7c)..... ***Apaeleticus*** Wesmael, 1845

- Propodeum usually without rough reticulate-cellular sculpture, carinae of propodeum distinct (Figures 13e, 15d, 20b); gastrocoeli either distinct or subobsolete (Figures 13e, 15d); apical tergites of females not retracted (Figures 13b, 5b).. **8**

8. Gastrocoeli strongly impressed; thyridia larger than the space between them (Figure 13e) ..... ***Cyclolabus*** Heinrich, 1836

- Gastrocoeli superficial; thyridia indistinct or at most as large as the space between them (Figures 15d, 20b)..... **9**

9. Gastrocoeli represented by a narrow and superficial, oblique, longitudinal depression, bearing some coarse, irregular, longitudinal rugae, their interspace and anterior half of 2nd tergite coarsely and densely, irregularly rugose; thyridia indistinct (Figure 15d); areolet clearly pentagonal (Figure 15b); temples not very reduced in lateral

view (Figure 15b)..... ***Linycus*** Cameron, 1903

- Gastrocoeli superficial and thyridia transverse, each about as wide as their interspace; anterior part of 2nd tergite, including space of gastrocoeli, without rugosity (Figures 17a, 18, 19, 20b, 20c, 20f); areolet rhomboidal (Figure 20e); temples very reduced in lateral view (Figures 20a, 20d, 20e)..... ***Neolinycus*** Heinrich, 1971

10. Spiracles of propodeum small and circular (Figures 9b, 22b, 26d, 37b); clypeus from gently to strongly convex (Figures 3a, 7b) **11**

- Spiracles of propodeum elongate, usually considerably longer than wide (ovate or linear) (Figures 22b, 26d); clypeus flat and wide or slighlty convex (Figures 3b, 34c)..... **12**

11. Propodeum with rough reticulate-cellular sculpture, carinae and propodeal areas indistinct, sinuate (Figure 13c)..... ***Apaeleticus*** Wesmael, 1845 (Platylabini)

- Propodeum without rough reticulate-cellular sculpture, carinae and propodeal areas distinct ..... **Phaeogenini** (not treated here)

12. Horizontal part of the propodeum without distinct carinae (Figure 34b); postpetiolus, in lateral view, with an anterior hump medially (Figure 5b); sternites strongly sclerotised (Figure 34b); clypeus slightly convex (Figure 34c); female metasoma always amblypygous (Figure 34b) ..... ***Probolus*** Wesmael, 1845 (Platylabini)

- Horizontal part of the propodeum with distinct carinae; postpetiolus, in lateral view, usually without an anterior hump medially, if hump present (e.g. *Patrocloides montanus* (Cresson, 1864)), then propodeum with distinct carinae; sternites from strongly sclerotised to completely unsclerotised; female metasoma amblypygous, semiamblypygous or oxypygous (fig. 2 in Santos et al. (2021))..... **Ichneumonini** (not treated here)

Ambloplisus Heinrich, 1930

Ambloplisus Heinrich, 1930: 551. Type species: *Ambloplisus primus*, 1930, by monotypy.
Thaumatoteles Hopper, 1938: 103. Type species: *Hoplismenus ornatus* Cresson, 1868, by original designation. Synonymised by Heinrich (1959: 216).

Comparative diagnosis

Ambloplisus closely resembles *Tropicolabus* Heinrich, 1959 due to size and the almost identical colour pattern (Figures 5, 40). However, the shallow gastrocoeli with thyridia smaller than the space between them and the lack of a clear separation between the area superomedia and area basalis allows the differentiation of *Ambloplisus* from *Tropicolabus*. For a better comparison between the two genera, see the treatment for *Tropicolabus* below. In some species of *Platylabus*, the propodeum bears tooth-like projections (Figures 22b, 22d), but these are never very elongate or pointed. Moreover, the presence of shallow gastrocoeli and thyridia smaller than the space between them in *Ambloplisus* allow an easy separation from *Platylabus* (Figures 5d, 22d) (Heinrich 1961, 1962b; Tereshkin 2009).

Range and diversity

The genus is confined to the New World, with only one species, *Ambloplisus ornatus* (Cresson 1868), occurring in the Nearctic (Yu et al. 2016).

Ambloplisus ornatus (Cresson, 1868)

(Figures 5, 6, 37a, 38a, 39a, 40a–c)

Hoplismenus ornatus Cresson, 1868: 92 (descr.); Cresson 1916: 47 (type).
?*Amblyteles ornatus* Cresson 1877: 194 (key, descr., notes).
Amblyteles ornatus Cresson 1887: 190 (cat.); Dalla Torre 1902: 828 (cat.); Cushman 1928: 924 (cat., notes); Nason 1905: 149 (distr.).
Hoplismenus ovatus [sic]; Berthoumieu 1904: 30 (cat., distr., incorrect subsequent spelling).
Thaumatoteles ornatus Hopper 1938: 105 (descr.); Townes 1944: 314 (cat, syn.); Townes and Townes 1951: 281 (distr.; cat.).
Ambloplisus ornatus Heinrich 1959: 216 (notes); Heinrich 1962b: 790 (descr., distr., neallotype designation, key); Peck 1964: 918 (index); Heinrich 1977: 277 (descr., distr., key); Carlson 1979: 547 (cat., distr., notes); Yu and Horstmann 1997: 672 (cat.); Tereshkin 2009: 1486, 1589 (descr., fig.); Tereshkin 2013: 1235 (fig.); Yu et al. 2016 (cat.).

Original type series

Holotype ♀, by monotypy (ANSP). Cresson (1868, p. 92) clearly stated that the description was based on only 'one ♀ specimen' from New York. This specimen can be referred to as the holotype designated by monotypy (ICZN 1999, Article 73.1.2).

Type locality

United States of America, New York.

Type specimens examined (Figures 38a, 40a–c)

Holotype: '[White label] N. Y. // [White label] *ornatus/Cres*. // [Red label] TYPE No./*1244* – ' (specimen examined).

Material examined

UNITED STATES OF AMERICA, FLORIDA: Alachua Co., Gainesville, Florida Rock Cr., M. Trap 2, 09–15 May 1983, leg. Gupta, 1♀ (FSCA); idem, 01–08 April 1983, 1♀ (FSCA); idem, May 1984, 1♀ (FSCA); idem, 24-30 June 1983, 2♀♀ (FSCA); Orange Co., UCF MacKay Tract, Sawgrass Marsh/Red Maple, 29 November 2012, leg. S. McCarthy & S.M. Fullerton, 1♀ (UCFC); Seminole Co, Oviedo, Bayhead/LLP Scrubby, Flatwoods Transition, Malaise trap, 28.6219°N, 81.1736°W, 22 May 2011, leg. Gochnour, 1♀ (UCFC); idem, 12 June 2011, 1♀ (UCFC); idem, 03 July 2021, 1♀ (UCFC); GEORGIA: Athens, Bot. Garden M.Tr., 04 May 1983, leg. Gupta, 4♂♂ (FSCA); Cobb Co., Smyrna, M. Trap 3, leg. Gupta, 1♀ (FSCA); MASSACHUSETTS: Groton, Middlesex Co., 21 July 2011, det. B. Carlson, 1♂ (BugGuide); idem, 22 July 2011, 2♂ (BugGuide); idem, 29 July 2011, 1♀ (BugGuide); 30 July 2011, 1♂ (BugGuide).

Updated distribution (Figure 6)

MEXICO (Berthoumieu 1904); UNITED STATES OF AMERICA: Florida (Heinrich 1977), Georgia (**new state record**), Iowa (Heinrich 1962b, wrongly mentioned as Idaho, see Comments), Illinois (Nason 1905), Maryland (Townes and Townes 1951), Massachusetts (Carlson 2011), New York (Cresson 1868), North Carolina (Heinrich 1962b).

Host

Unknown.

Male

The first description of a male was provided by Heinrich (1962b, p. 790), who referred to the specimen as the neallotype and stated that the specimen was tentatively placed under *Ambloplisus ornatus* because of the colour variation between the two sexes. The association was later confirmed by Heinrich (1977, p. 277), who collected on the 'same small bush' first the female and subsequently thereafter the male.

Comments

Townes and Townes (1951, p. 281) reported the species for Maryland (not recorded by Yu et al. 2016), New York, and New Jersey. However, the New Jersey record belongs to *Tropicolabus foxi* (Davis, 1898), a species that was synonymised under *Ambloplisus ornatus* by Townes (1944, p. 314) (as *Platylabus foxi*), and later resurrected by Heinrich (1959, p. 216), who placed it under the newly described genus *Tropicolabus* Heinrich (see below). Therefore, *Ambloplisus ornatus* is not known for New Jersey.

The records from Massachusetts and Ohio are from BugGuide and identified by Carlson (2011) as *Ambloplisus ornatus*. However, these have not been recorded in any paper or catalogue (see Yu et al. 2016). Another record missing from Yu et al. (2016) is the one from Illinois by Nason (1905, p. 149) whose specimens were identified by the Ichneumonid expert G.C. Davis.

Heinrich (1962b, p. 790) reported a specimen in the USNM from Idaho, but as noted by Carlson (1979, p. 547), who analysed the same specimen, the actual locality is in Iowa. Unfortunately, Yu et al. (2016) listed Idaho as a locality for the species, without mentioning Iowa.

Berthoumieu (1904, p. 30) reported the species '*Hoplismenus ovatus* Cress'. for Mexico. We are not aware of Cresson having used the name *ovatus* for a species in this insect group, and all other circumstances suggest that Berthomieu must have had *H. ornatus* in mind. Therefore, and in agreement with Townes (1944, p. 314), we regard *H. ovatus* as an incorrect subsequent spelling of *Hoplismenus ornatus* Cresson, 1868 (ICZN 1999, Article 33.3). Yu et al. (2016) failed to report Berthoumieu (1904) and Mexico was not included in the distribution of the species.

Apaeleticus Wesmael, 1845

Apaeleticus Wesmael, 1845: 166. Type species: *Apaeleticus bellicosus* Wesmael, 1885, by subsequent designation of Ashmead (1900a: 22).

Comparative diagnosis

From all the other Nearctic Platylabini genera, *Apaeleticus* can be easily distinguished by this combination of characters: (1) strongly developed sternauli; (2) middle field of face strongly protruding (Figure 7c); (3) roughly irregularly cellular-wrinkled sculpture of propodeum with small, sharp teeth (Figure 7a); and (4) truncated apex of metasoma, with hidden sixth and seventh tergites retracted under the fifth (Figure 7c) (Heinrich 1961, 1962b; Tereshkin 2009).

Range and diversity

Only two species in the Nearctic, of which only one occurs in the south-eastern United States, *Apaeleticus americanus* Cushman, 1926.

Notes

There is a discrepancy in reporting the year of description of the genus, with Heinrich (1962b, p. 791) reporting 1844 and Yu et al. (2016) reporting 1845. The work by Wesmael (1845) has '1844' printed on the cover of the article, but it was included in the journal *Nouveaux Mémoires de l'Académie Royale des Sciences, des Lettres et Beaux-Arts de Belgique*, volume 18, published in 1845, as reported by the cover of the journal itself. Therefore, the correct year of publication should be 1845.

Apaeleticus americanus Cushman, 1926

(Figures 7a–8)

Apaeliticus americanus Cushman, 1926: 4 (descr.); Townes 1944: 310 (cat.); Townes and Townes 1951: 280 (distr.; cat.); Strickland 1952: 120 (distr.); Heinrich 1962b: 792 (descr., distr., neallotype designation, fig., key); Heinrich 1977: 282 (descr., distr., key); Carlson 1979: 542 (cat., distr.); Yu and Horstmann 1997: 673 (cat.); Yu et al. 2016 (cat.).

Original type series

Holotype ♀, by original designation (USNM); paratype ♀ (USNM). Cushman (1926, p. 4) described the species based on two female specimens, clearly referring to the one collected on 7 September 1916 as 'the type', providing a catalogue number for it, and the one collected on Mount Katahdin as 'the paratype'.

Type locality

United States of America, Maryland, '*Cabin John*'.

Type specimens examined (Figure 7a–7d)

Holotype: '[White Label] Cabin John/Md *7.ix'.16* // [White Label] RM Fouts/Collector // [Red label] Type No./*27,682*/U.S.N.M. // [White Label] *Apaeleticus/americanus/Type. Cush*. // [White Label] USNMENT/[Barcode]/01524100' (USNM) (images examined).

Updated distribution (Figure 8)

CANADA: Alberta (Townes and Townes 1951). UNITED STATES OF AMERICA: Alabama (Heinrich 1977), Arizona (Carlson 1979), District of Columbia (Carlson 1979), Florida

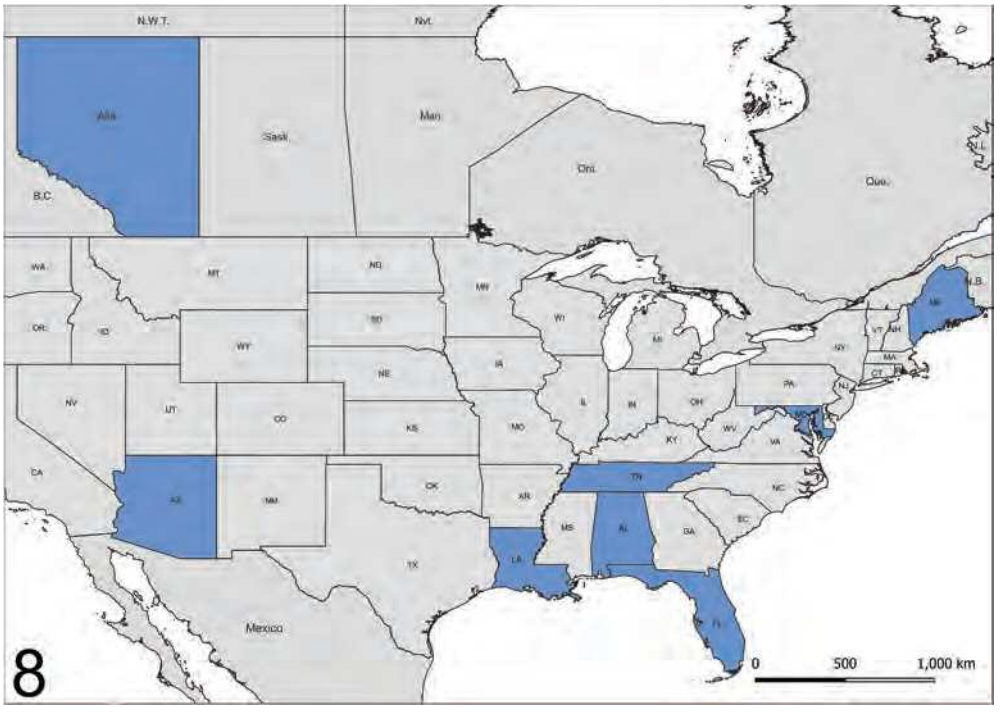

Figure 8. *Apaeleticus americanus* Cushman, 1926, distributional map: known records (in blue).

(Heinrich 1977), Louisiana (Heinrich 1977), Maine (Cushman 1926), Maryland (Cushman 1926), Tennessee (Heinrich 1977).

Host

Unknown.

Male

The first description of a male was provided by Heinrich (1962b, p. 792), who referred to the specimen as the neallotype.

Comments

The two records by Carlson (1979, p. 542) (Arizona and District of Columbia) were not listed in the catalogue by Yu et al. (2016).

Heinrich (1977) acknowledged the possibility that the other Nearctic species of the genus, *A. brunnescens* Heinrich, 1962b, is simply a subspecies of *A. americanus*, while treating it as separate.

Asthenolabus Heinrich, 1951

Stenolabus Heinrich, 1935: 197. Type species: *Platylabus lastiscapus* Thomson, 1894, by original designation. Preoccupied by *Stenolabus* Schulthess-Rechberg, 1910 (Hymenoptera: Vespidae).

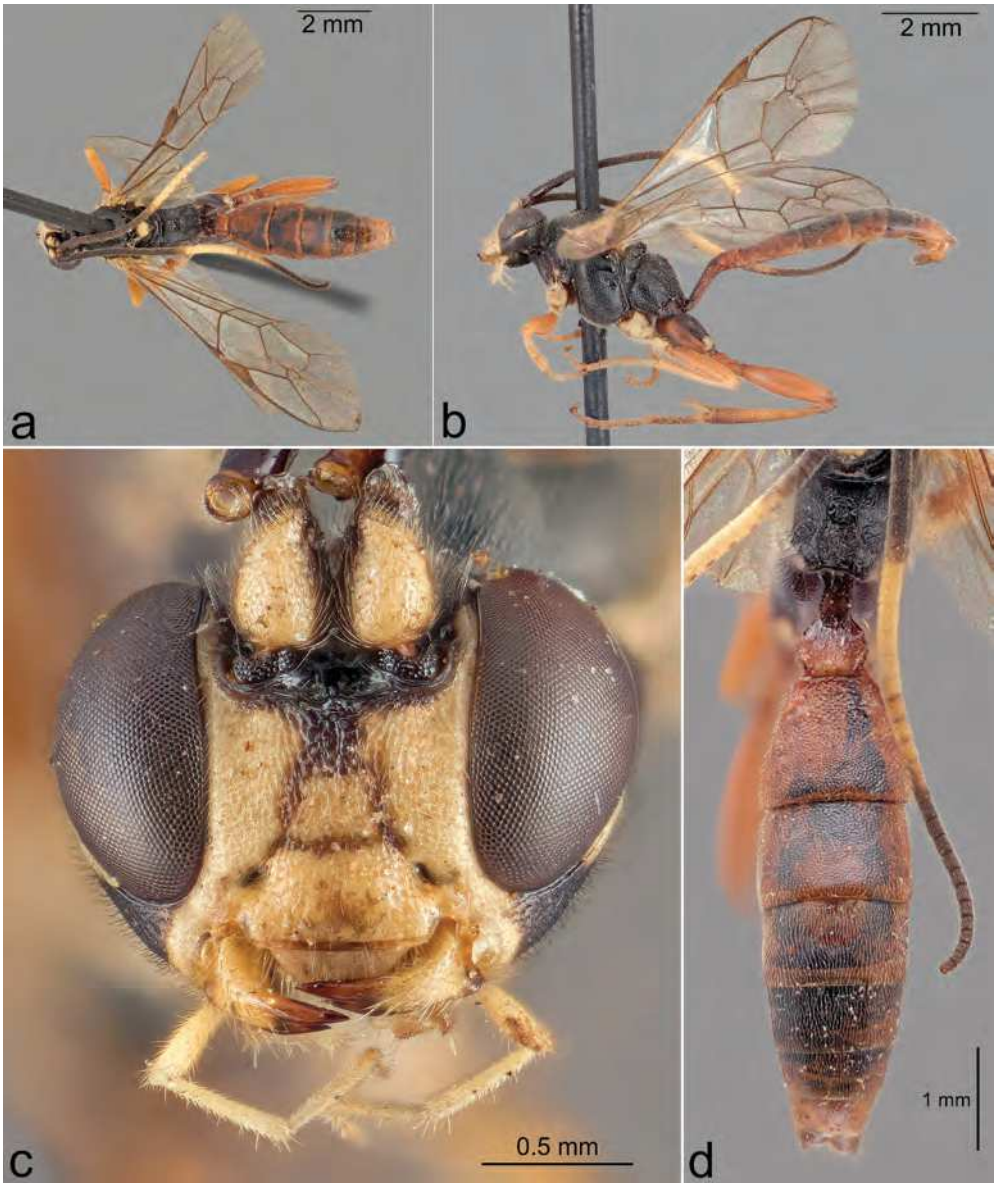

Figure 9. *Asthenolabus canadensis* (Cresson, 1877), ♀. a) Habitus, dorsal view. b) Habitus, lateral view. c) Head, frontal view. d) Propodeum and metasoma, dorsal view.

Asthenolabus Heinrich, 1951: 240. New replacement name for *Stenolabus*, 1935.

Comparative diagnosis

The very elongate and narrow sickle-shaped propodeal spiracles (Figure 9b) set *Asthenolabus* apart from *Apaeleticus, Carlsonia, Cyclolabus* and *Lincyus* (all with small and round propodeal spiracles). However, this feature places *Asthenolabus* close to *Platylabus* and *Tropicolabus* from which it can be distinguished by the very superficial,

almost obsolete, gastrocoeli and thyridia (Figure 9d), and to *Probolus* from which it can be distinguished by the presence of propodeal carinae and the absence of a hump in the anterior part of the postepetiole (Heinrich 1961, 1962b; Tereshkin 2009).

Range and diversity

The genus is known only from the Nearctic, Palearctic and Indomalayan regions, with three species in North America, of which only one, *Asthenolabus canadensis* (Cresson, 1877), occurs in the south-eastern United States (Heinrich 1962b; Yu et al. 2016).

Asthenolabus canadensis (Cresson, 1877)

(Figures 9, 10)

Platylabus canadensis Cresson, 1877: 200 (descr., key); Cresson 1887: 191 (cat.); Dalla Torre 1902: 781 (cat.); Bradley 1903: 282 (distr., key, fig.); Berthoumieu 1904: 57 (cat.); Cresson 1916: 23 (type); Johnson 1927: 143 (distr.); Strickland 1946: 41 (distr.); Townes 1944: 311 (cat.); Townes and Townes 1951: 280 (distr., cat.).

Asthenolabus canadensis Heinrich 1962b: 776 (descr., distr., neallotype designation, key); Carlson 1979: 546 (cat., distr.); Yu and Horstmann 1997: 673 (cat.); Yu et al. 2016 (cat.).

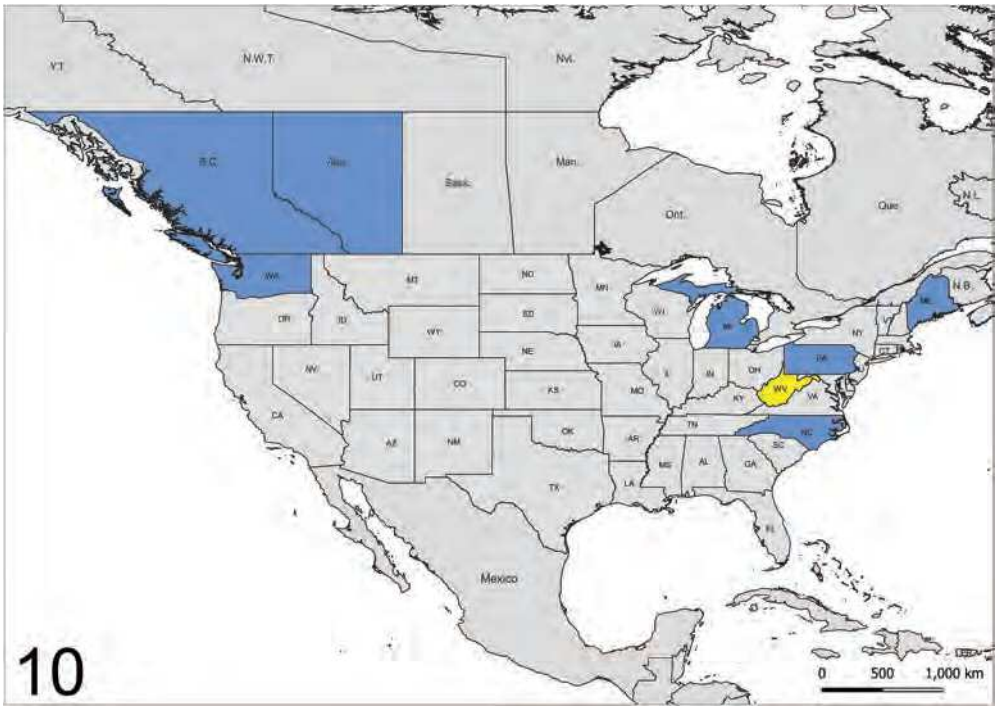

Figure 10. *Asthenolabus canadensis* (Cresson, 1877), distributional map: known records (in blue) and newly recorded state (in yellow).

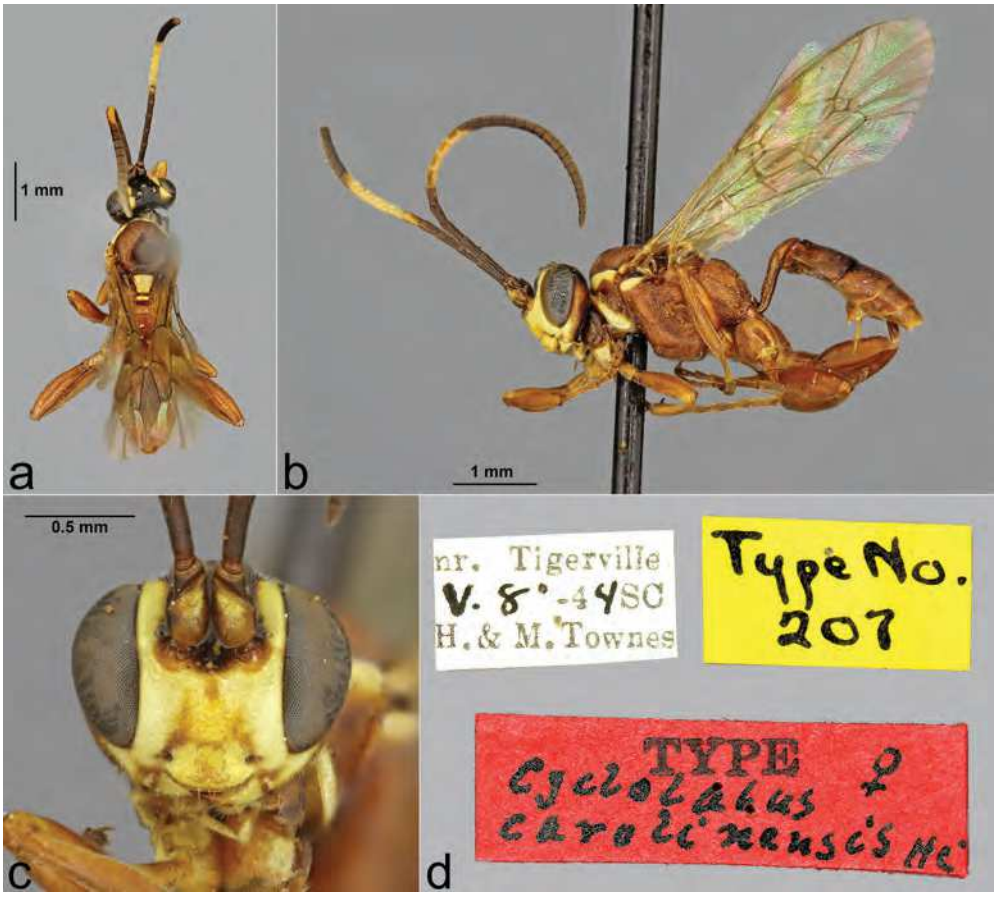

Figure 11. *Cyclolabus carolinensis* Heinrich, 1962, holotype ♀. a) Habitus, dorsal view. b) Habitus, lateral view. c) Head, frontal view. d) Labels.

Original type series

Lectotype ♀ (ANSP). Cresson (1877, p. 200) described *Platylabus canadensis* from 'Hab.–Canada' without specifying the number of specimens included in the description. Cresson (1916, p. 23) in his list of types, simply reported the type to be a female and in '*I*n good condition', without clarifying the number of specimens. Townes (1944, p. 311) and Townes and Townes (1951, p. 280) did not specify any number of specimens either. Later on, Heinrich (1962b, p. 776) referred to the specimen as the 'Holotypus'. Carlson (1979, p. 317) expressed the assumption that Cresson (1916) 'indicated which single specimen was to be regarded as the type for each; thus he selected lectotypes for those cases in which he had described a species from more than one specimen'. Hopper (1984, p. 968) reported being unable to see how it can be claimed that Cresson (1916) indicated a single specimen to be the type. This statement contradicted Cresson's (1916, p. 1) own statement that 'In selecting the single type the author has been governed by the present condition of the original material, and has always selected the perfect, or more nearly perfect specimen' and suggests that Hopper (1984) overlooked this clear indication of Cresson's (1916) intention to select a single name-bearing type (i.e.

a lectotype in the modern sense). Cresson's (1916) lectotype designation was valid and no subsequent lectotype designation has any validity (ICZN 1999, Article 74.1.1). The fact that the selected specimen eventually could no longer be traced, as suggested by various subsequent authors (Heinrich 1962b, p. 780; Hopper 1984), could be explained by collection mismanagement and has no influence on the validity of the lectotype selection. Only a careful study of Cresson's collection can provide more insights. Heinrich's (1962b, p. 776) employment of the term 'holotypus' is in error.

Type locality

Canada.

Material examined

UNITED STATES OF AMERICA, WEST VIRGINIA: Cranberry Gls, 3 June 1955, leg. H.V. Weems, Jr., det. Townes, 1956, 1♂ (FSCA).

Updated distribution (**Figure 10**)

CANADA: Alberta (Strickland 1946), British Columbia (Carlson 1979). UNITED STATES OF AMERICA: Maine (Johnson 1927), Michigan (Carlson 1979), North Carolina (Heinrich 1962b), Pennsylvania (Carlson 1979), Washington (Carlson 1979), West Virginia (**new state record**).

Host

Unknown.

Male

The first description of a male was provided by Heinrich (1962b, p. 776), who referred to the specimen as the neallotype. The specimen that we examined represents the second ever known male specimen.

Comments

This species has a northern distribution but has been recorded by Heinrich (1962b) for North Carolina without any other detail. According to Townes and Townes (1951, p. 280) the species occurs in parts of the Transition zone. However, no specific records for states have been provided. The new record for West Virginia is based on a male specimen found at the FSCA that Townes identified as *Platylabus canadensis* in 1956, and that DDP double checked, confirming Townes' identification.

Cyclolabus Heinrich, 1935

Cyclolabus Heinrich, 1935: 198. Type species: *Platylabus nigricollis* Wesmael, 1845 by original designation.

Comparative diagnosis

From all the other four Nearctic Platylabini genera with small circular or roundish propodeal spiracles – *Apaeleticus, Carlsonia, Cyclolabus* and *Linycus* – *Cyclolabus* can be easily distinguished by: the strongly pronounced gastrocoeli; thryidia larger than the space

between them; and the presence of distinct propodeal carinae (Figure 10). *Cyclolabus* is also morphologically similar to *Platylabus* Wesmael, 1845, mainly differing from it by the presence of small and circular propodeal spiracles (Figure 22) (Heinrich 1961, 1962b; Tereshkin 2009). However, as already noted by Heinrich (1962b), the small species of *Platylabus* can also possess roundish and relatively small spiracles, rendering the demarcation of the two genera ambiguous for certain specimens. In these latter cases, the observation of other characters is necessary, and we have listed them under the genus *Platylabus*.

Range and diversity

Cyclolabus has a worldwide distribution, with 11 species in the Nearctic and only two species occurring in the south-eastern United States (Heinrich 1961, 1962b; Yu et al. 2016).

Key to the species of *Cyclolabus* from the south-eastern United States (adapted from Heinrich (1962b))

1. Scutellum and mesoscutum ferruginous (Figures 13a–13e); pronotal ridge ferruginous (Figure 13a); inner orbit ferruginous or light ferruginous (Figure 13c)..... ..... ***gracilicornis gracilicornis*** (Provancher, 1886)
- Scutellum yellowish white, mesoscutum ferruginous (Figure 11a); pronotal ridge yellowish white (Figure 11a); entire face yellowish white (Figure 11c)..... ..... ***carolinensis*** (Heinrich, 1962)

***Cyclolabus carolinensis* Heinrich, 1962**

(Figures 11, 12)

Cyclolabus carolinensis Heinrich, 1962b: 764 (descr., distr., key); Carlson 1979: 543 (cat., distr.); Yu and Horstmann 1997: 674 (cat.); Porter 2003: 178 (misidentification), Yu et al. 2016 (cat.).

Original type series

Holotype ♀, by original designation (EMUS).

Type locality

United States of America, South Carolina, 'near Tigerville'.

Type specimens examined (Figure 11)

Holotype: '[White label] nr. Tigerville/*V.8 – 44* SC/H. & M. Townes // [Red label] TYPE ♀/*Cyclolabus/carolinensis He* // [Yellow label] *Type No. 207*'.

Updated distribution (Figure 12)

UNITED STATES OF AMERICA: Michigan (Carlson 1979), South Carolina (Heinrich 1962b).

Host

Acasis Duponchel and *Eupithecia* Curtis (Lepidoptera, Geometridae) (Heinrich 1962b).

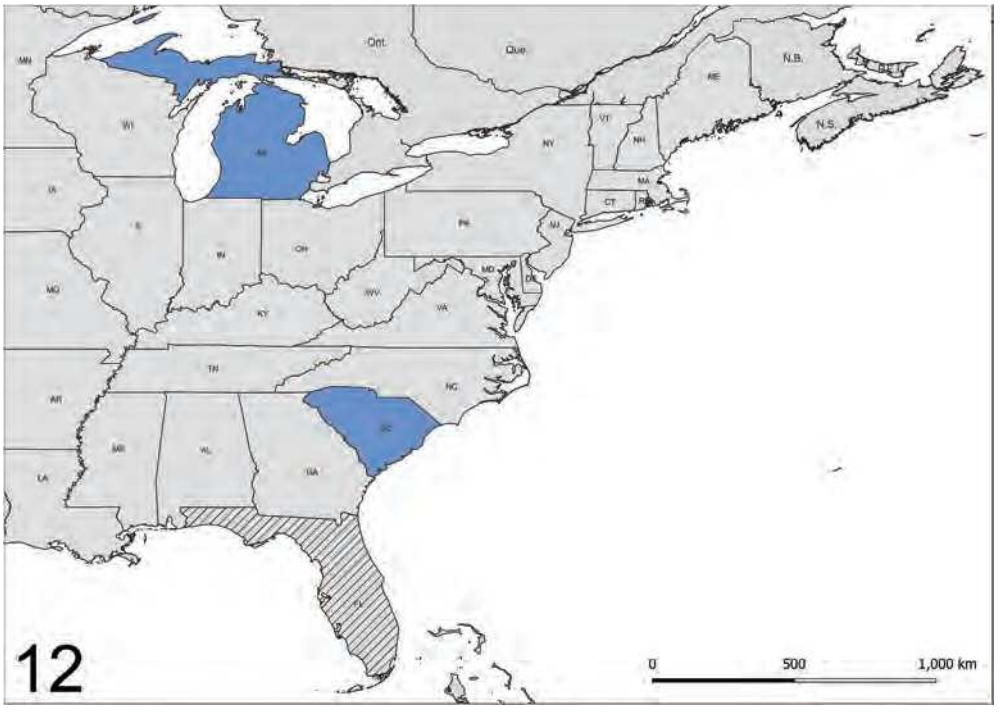

Figure 12. *Cyclolabus carolinensis* Heinrich, 1962, distributional map: known records (in blue) and record no longer valid (striped).

Male

Unknown.

Comments

This species was described by Heinrich (1962b, p. 764) with an original distribution confined to the north-western part of South Carolina (Tigerville). Later on, Porter (2003, p. 178) reported the species for northern Florida, based on 10 females and 73 males, making it the southernmost record for the species. DDP examined the material housed at the FSCA that Porter (2003) identified as *Cyclolabus carolinensis*. The specimens do not belong to *Cyclolabus* but are in fact *Neolinycus michaelis* Heinrich, 1971, which is newly recorded for Florida in this paper (see under *Neolinycus*).

Carlson (1979, p. 543) reported the species for Michigan, without providing any depositories or indications for the specimen he examined. Yu et al. (2016) did not report the species for Michigan.

Cyclolabus gracilicornis gracilicornis (Provancher, 1886)

(Figures 13, 14)

Phygadeuon gracilicornis Provancher, 1886: 56 (descr., key); Cresson 1887: 194 (cat.); Gahan and Rohwer 1918b: 136 (lectotype designation).

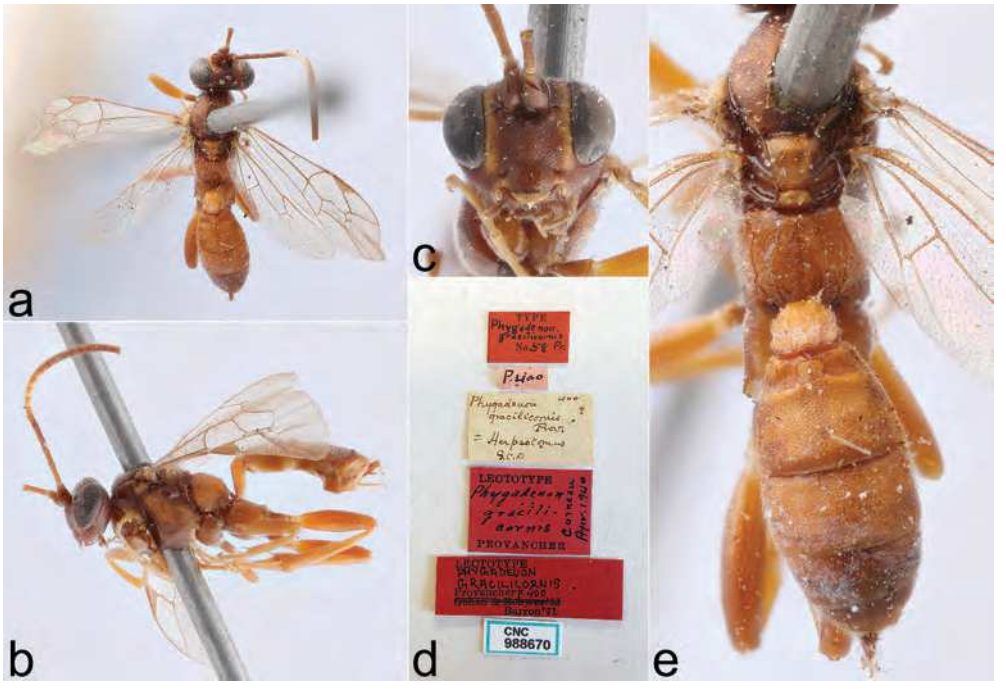

Figure 13. *Cyclolabus gracilicornis gracilicornis* (Provancher, 1886), lectotype ♀. a) Habitus, dorsal view. b) Habitus, lateral view. c) Head, frontal view. d) Labels. e) Mesosoma and metasoma, dorsal view. Downloaded from the public CNCI database (available also at https://www.cnc.agr.gc.ca/taxonomy/Gallery.php).

Herpistomus [sic] *gracilicornis* Davis 1895: 287 (incorrect subsequent spelling of genus, notes).

Herpestomus gracilicornis Dalla Torre 1902: 764 (cat.).

Ectopius gracilicornis Townes 1944: 315 (cat.); Townes and Townes 1951: 281 (distr., cat.).

Cyclolabus gracilicornis gracilicornis Heinrich 1962b: 763 (descr., distr., neallotype designation, key); Heinrich 1975: 779 (distr.); Barron 1975: 478 (invalid lectotype designation, notes); Bradley 1978: 3 (distr., host); Carlson 1979: 543 (cat., distr.); Sarazin 1987: 55 (cat.); Yu and Horstmann 1997: 675 (cat.); Yu et al. 2016 (cat.).

Original type series

Lectotype ♀, designated by Gahan and Rohwer (1918b, p. 136) (CNCI). Provancher (1886, p. 56) described *Phygadeuon gracilicornis* from 'Ottawa (Harrington) [= collected by Harrington]' without specifying the number of female specimens included in the description. Gahan and Rohwer (1918b, p. 136) designated a lectotype, addressing it as 'Type–Female, Harrington Coll. Left antenna broken'. Subsequently, Heinrich (1962b, p. 763) incorrectly employed the term 'Holotypus' for a female specimen from 'Ontario (Ottawa). C.N.C'. Barron (1975, p. 478) designated a lectotype, arguing that both Gahan and Rohwer's (1918b) and Heinrich's (1962b) actions did not constitute valid lectotype designations since the authors 'did not specify a particular specimen'. Barron's (1975) observations appear to be wrong. Not being able to recognise the specimen in the collection does

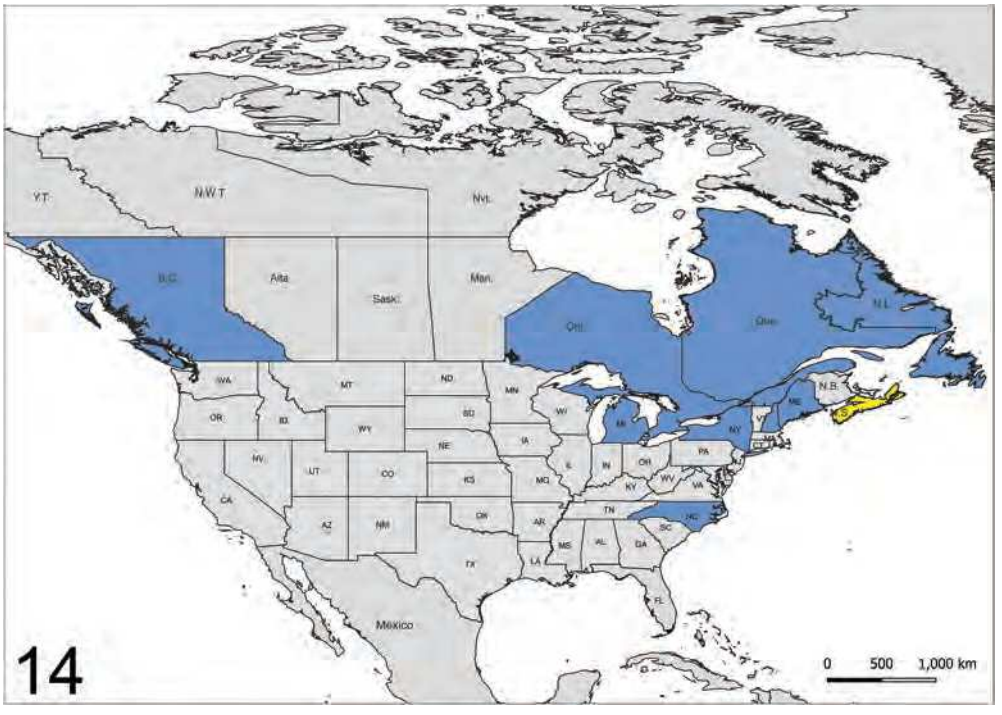

Figure 14. *Cyclolabus gracilicornis gracilicornis* (Provancher, 1886), known records (in blue) and newly recorded province (in yellow).

not invalidate the designation (ICZN 1999, Article 74.1.1). Gahan and Rohwer's (1918b, p. 136) designation is valid and Barron's (1975) invalid. Heinrich (1962b, p. 763), on the other hand, was relatively more specific in referring to a female specimen housed at the CNCI. However, his employment of the term 'holotypus' was in error. Therefore, the valid lectotype designation is the one established by Gahan and Rohwer (1918b, p. 136), while Barron's (1975, p. 478) designation should be considered invalid.

Type locality

Canada, Ottawa. No type locality is given on the lectotype labels, but the species has been described from Ottawa in the Harrington collection, now housed at CNCI.

Type specimens examined (Figure 13)

Lectotype. '[Red Label] TYPE/*Phygadeuon/gracilicornis*/No. *58 Pr.* // [Pink Label] *P. 400* // [Yellow Label] *400/Phygadeuon/gracilicornis* ♀/*Prov./ = Herpestomus/G.C.P.* // [Red Label] LECTOTYPE/*Phygadeuon/gracili-/cornis/*PROVANCHER/[Written vertically on right side] *Comeau/Apr. 1940* // LECTOTYPE *PHYGADEUON/GRACILICORNIS/*Provancher *P.400/* [Strikethrough] Gahan & Rohwer'15/Barron'71 // [White Label with blue contour] CNC/ 988670' (CNCI) (images examined).

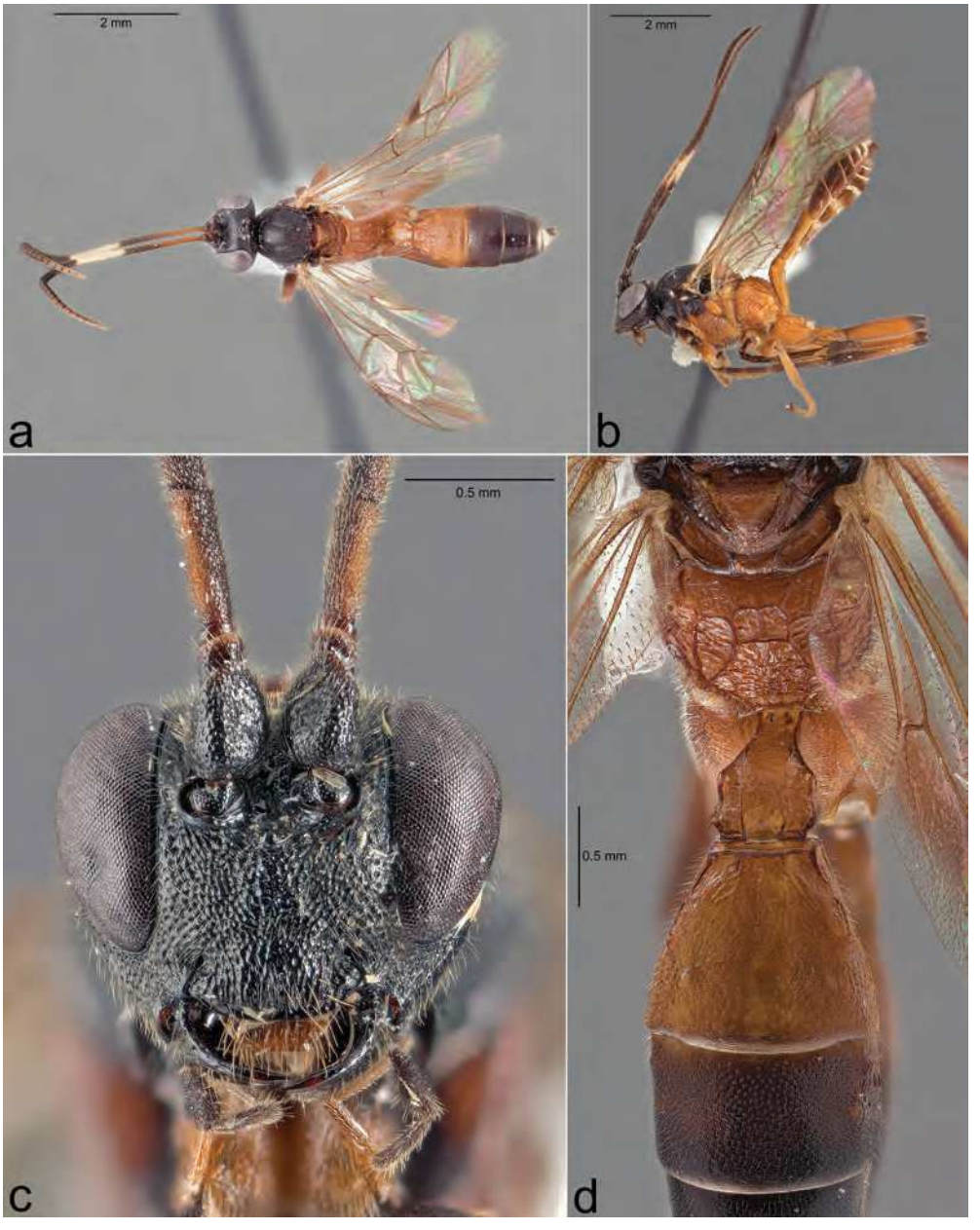

Figure 15. *Linycus exhortaor thoracicus* (Cresson, 1864), ♀. a) Habitus, dorsal view. b) Habitus, lateral view. c) Head, frontal view. d) Propodeum and metasoma, dorsal view.

Material examined

CANADA, NOVA SCOTIA: Victoria Co., Baddeck, Beinn Bhreagh, Insect flight trap, 01–02 July 1977, leg. G.B. Fairchild, 1♂ (FSCA); idem, Highland Road, Mile 15, Insect Flight Trap, 04 August 1977, leg. G.B. Fairchild, 1♀(FSCA). UNITED STATES OF AMERICA, NEW YORK: Westchester Co., Armonk, Calder Center, Malaise trap, leg. C. Calmbacher, 12–18 July 1974, 1♀ (FSCA).

Updated distribution (Figure 11a)

CANADA: British Columbia (Bradley 1978); Newfoundland and Labrador (Heinrich 1962b; Bradley 1978; Heinrich 1975), Nova Scotia (**new province record**), Ontario (Provancher 1886; Bradley 1978), Québec (Bradley 1978). UNITED STATES OF AMERICA: Maine (Heinrich 1962b), Michigan (Carlson 1979), New Hampshire (Heinrich 1962b), New York (Heinrich 1962b), North Carolina (Heinrich 1962b).

Host

Cladara limitaria nigroangulata Strecker, *Eupithecia ornata* Hulst (Lepidoptera: Geometridae) (Bradley 1978).

Male

The first description of a male was provided by Heinrich (1962b, p. 763), who referred to the specimen as the neallotype.

Comments

Davis (1895, p. 285) provides a new combination of this species under the generic name '*Herpistomus*'. We are not aware of Provancher having used the name *Herpistomus* for a genus in ichneumonids, and all other circumstances suggest that Berthoumieu must have had *Herpestomus* in mind. Therefore, and in agreement with Townes (1944, p. 315), we regard *Herpistomus* as an incorrect subsequent spelling of *Herpestomus* Wesmael, 1845 (ICZN 1999, Article 33.3).

Following Heinrich (1959, p. 216), *Probolus subdentatus* Ashmead, 1902 is treated as a subspecies of *Cyclolabus gracilicornis*.

This subspecies has a northern distribution but has been recorded by Heinrich (1962b) for North Carolina without any other information on the specificity of the record. Carlson (1979) reported the species for Michigan, but Yu et al. (2016) did not record it for the state. There is another subspecies, *Cyclolabus gracilicornis subdentatus* (Ashmead, 1902), within North America, but it does not occur in the south-east of the United States (Heinrich 1962b, p. 763).

Linycus Cameron, 1903

Linycus Cameron, 1903: 234. Type species: *Linycus rufipes* Cameron, 1903, by monotypy.

Comparative diagnosis

From all the other four Nearctic Platylabini genera with small, circular or roundish propodeal spiracles – *Apaeleticus, Carlsonia, Cyclolabus* and *Neolinycus* – *Linycus* can be easily distinguished by the combination of different features. The subobsolete gastrocoeli, represented only by narrow and shallow, oblique, longitudinal depressions, bearing some coarse, irregular, longitudinal rugae (Figure 15d), set *Linycus* apart from *Cyclolabus* (which has strongly pronounced gastrocoeli, with thyridia larger than the space between them (Figure 13e)) and, in addition to these features, the presence of distinct propodeal carinae (Figure 15d) allows separation from *Apaeleticus* (which has a strongly reticulated and completely areolated propodeum (Figure 7a)). Lastly, *Linycus* differs from *Carlsonia* by the structure of the head, which is not as broad and strongly convex, but narrower and less

bulging, and from *Neolinycus* Heinrich, by the structure of the temples, which are not strongly reduced, but moderately developed (Figure 15b) (Heinrich 1961, 1962b, 1977; Tereshkin 2009).

Range and diversity

The genus *Linycus* has a Holarctic and Oriental distribution, with four species in the Nearctic, only one occurring in the south-eastern United States (Heinrich 1962b, 1971, 1975; Yu et al. 2016).

Linycus exhortator thoracicus (Cresson, 1864)

(Figures 15, 16)

Hoplismenus thoracicus Cresson, 1864: 288 (descr.); Cresson 1916: 59 (cat.).

Platylabus thoracicus Cresson 1877: 201 (distr., key, notes, syn.); Provancher 1879: 37 (descr., key); Provancher 1883: 306 (descr., key); Provancher 1886: 36 (key); Smith 1890: 23 (distr.); Cresson 1887: 191 (cat.); Ashmead 1900b: 567 (distr.); Dalla Torre 1902: 790 (cat.); Cushman 1928: 927 (cat.).

Apaeleticus thoracicus Bradley 1903: 275 (notes).

Platylabus (*Apaeleticus*) *thoracicus* Viereck 1917: 343 (key).

Ectopius thoracicus Townes 1944: 316 (cat.); Townes and Townes 1951: 282 (distr., cat.).

Ectopius exhortator thoracicus Heinrich 1956: 651 (descr.).

Linycus exhortator thoracicus Heinrich 1962b: 780 (descr., distr., key); Heinrich 1977: 279 (descr., distr.); Carlson 1979: 542 (cat., distr.); Yu and Horstmann 1997: 675 (cat.); Yu et al. 2016 (cat.).

Original type series

Lecotype ♀ (originally described as ♂ by Cresson (1864), see below) (ANSP). Cresson (1864, p. 288) described *Hoplismenus thoracicus* from 'Hab.– Pennsylvania. Mr.Tryon Reakirt [= collected by Mr.Tryon Reakirt]' reporting it as a male but without specifying the number of specimens included in the description. Cresson (1916, p. 59), in his list of types, reported the lectotype having the 'Left antenna off'. Townes (1944, p. 316) and Townes and Townes (1951, p. 282) did not specify any number of specimens, but simply reported the information given in the literature. Later on, Heinrich (1962b, p. 780) referred to the specimen as the 'Holotypus', highlighting the fact that the actual sex is female and not male. Carlson (1979, p. 317) stated that Cresson (1916, p. 1) 'indicated which single specimen was to be regarded as the type for each; thus he selected lectotypes for those cases in which he had described a species from more than one specimen'. Hopper (1984, p. 968) reported being unable to see how it can be claimed that Cresson (1916) indicated a single specimen to be the type. This statement contradicted Cresson's (1916) own statement that 'In selecting the single type the author has been governed by the present condition of the original material, and has always selected the perfect, or more nearly perfect specimen' and suggests that Hopper (1984) overlooked this clear indication of Cresson's (1916) intention of selecting a single name-bearing type (i.e. a lectotype in the modern sense). Cresson's (1916) lectotype designation was valid and no subsequent lectotype designation has any validity (ICZN 1999, Article 74.1.1). The fact that the

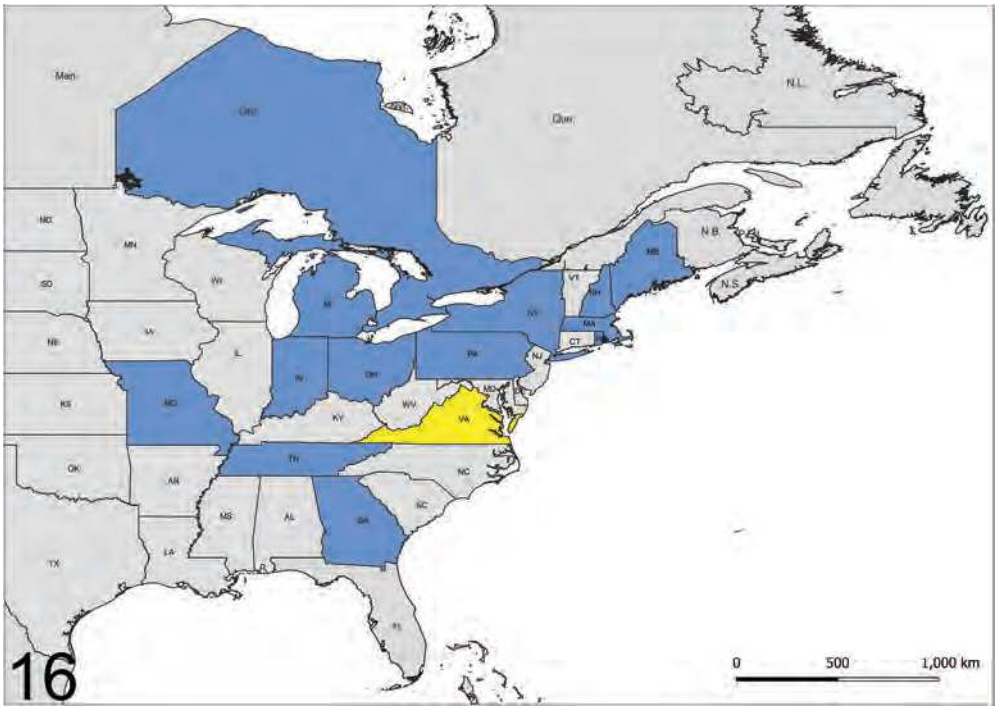

Figure 16. *Linycus exhortaor thoracicus* (Cresson, 1864), distributional map: known records (in blue) and newly recorded state (in yellow).

selected specimen eventually could no longer be traced, as suggested by various subsequent authors (Heinrich 1962b, p. 780; Hopper 1984), could be explained by collection mismanagement and has no influence on the validity of the lectotype selection. Only a careful study of Cresson's collection can provide more insights. Moreover, the mismatch between the original sex description by Cresson (1916, p. 59) (male) and the observation of a female by Heinrich (1962b, p. 780) is troubling. Hopper (1984, p. 968) experienced a similar situation when, looking at Cresson's type housed at ANSP and stored in a separate case, he found a mismatch of sexes between the original description and the segregated specimen. Apparently, the two former curators of the collection had personally hand-picked the specimens from the original type series and stored them in a different drawer, and because they both worked on different taxa, they were not skilled in identifying the sex of Ichneumonidae (Hopper 1984, p. 968). Therefore, there is a real possibility that the original description contained more than one specimen and that the curators at ANSP selected only one specimen that later was regarded as the 'holotype' by Heinrich (1962b, p. 780). Only a careful study of Cresson's collection can resolve the issue.

Type locality

United States of America, Pennsylvania.

Material examined

UNITED STATES OF AMERICA, MASSACHUSETTS: Cambridge, Middlesex County, 02 October 2010, det. B. Carlson, 2♂♂ (BugGuide); idem, Worcester County, Bolton, 1 September 2010, 2♂♂ (BugGuide); OHIO: Greene County, Beavercreek, 14 September 2013, det. B. Carlson, 1♂ (BugGuide); NEW HAMPSHIRE: Grafton Co., Bedell Bridge S.P., Oliverian Brook, Malaise Trap, 30 September–21 October 1992, leg. D.S. Chandler, 1♀ (UNHC); Westchester Co., Armonk, Calder Center, Malaise Trap, 26 July–02 August 1974, leg. C. Calmbacher, 1♂ (UNHC); idem, 12–18 July 1974 (UNHC); NEW YORK: Albany Co., nr. Rensselaerville Huyck Preserve, Malaise trap, 17 August 1967, 1♂ (FSCA); TENNESSEE: Sevier Co., GSMNP Twin Creek R.C., old field, Malaise Trap, 1945 ft, 35.685972°N, 83.500361°W, 20–22 October 2003, leg. Steck, Sutton & Mayor, 2♀♀ (UCFC); idem, 07–14 May 2004, 1♂ (UCFC); Blount Co., GSMNP Cades Co., Abrams Crk., old field – gallery forest edge, 1720 ft, 35.593056°N, 83.842500°W, 09–17 July 2003, leg. Steck, Sutton & Mayor, 1♂ (UCFC); VIRGINIA: Smyth Co., 09 May 1975, 1♀ (VMNH).

Updated distribution (**Figure 16**)

CANADA: Ontario (Heinrich 1962b); UNITED STATES OF AMERICA: Georgia (Heinrich 1977), Indiana (Heinrich 1962b), Maine (Heinrich 1962b), Massachusetts (Carlson 2010a), Michigan (Heinrich 1962b), Missouri (Heinrich 1962b), New Hampshire (Cresson 1877), New Jersey (Smith 1890), New York (Cresson 1877), Ohio (Carlson 2011), Pennsylvania (Cresson 1864, 1877), Rhode Island (Townes and Townes 1951); Tennessee (Heinrich 1977), Virginia (**new state record**).

Host

Although host records for the subspecies *thoracicus* are unknown, the nominate subspecies (Europe) is a parasitoid of Geometridae (Lepidoptera) (Shaw et al. 2015).

Male

The first description of a male was provided by Heinrich (1956, p. 651). However, Heinrich (1956, p. 651) did not realise the problem with the sex of the syntypes (see above, Type series), and believed he had described the female for the first time.

Comments

The species *Linycus exhortator* (Fabricius, 1787) is represented by three subspecies, one with a European distribution (the nominotypical subspecies), and the other two occurring in the Nearctic (Heinrich 1962b, p. 780). Of these two, only one occurs in the south-eastern United States, *L. exhortator thoracicus*. Unfortunately, there are some issues regarding the state distribution of this latter subspecies within the US. Townes and Townes (1951, p. 282) reported only three states for the distribution of the subspecies, namely New York, Pennsylvania and Rhode Island. Yu et al. (2016) did not report Rhode Island in their catalogue. Another issue revolves around Carlson (1979, p. 542). In his catalogue, the author mentioned the species as occurring from 'Maine s. to Va., w. to Wis. And Mo'. This distribution probably stems from the idea already advanced by Heinrich (1977, p. 279) that the taxon is probably widespread throughout the eastern part of the country, 'From Michigan and Ontario south to Georgia and Tennessee'. However, these statements are too vague and inconsistent, and it is not clear whether they are substantiated by any

specimens. Therefore, we are not considering Heinrich's (1977) and Carlson's (1979) vague statements to represent valid distributional records – even though they are very probably true. The records from Massachusetts and Ohio are from BugGuide and identified by Carlson (2010a, 2013) as *Linycus exhortator*.

Neolinycus Heinrich, 1971

Neolinycus Heinrich, 1971: 1025. Type species: *Neolinycus michaelis* Heinrich, 1971, by original designation.

Comparative diagnosis

From all the other four Nearctic Platylabini genera with small circular or roundish propodeal spiracles – *Apaeleticus, Carlsonia, Cyclolabus* and *Linycus* – *Neolinycus* can be easily distinguished by the combination of several characters. The structure of gastrocoeli, which are never strongly pronounced, and thyridia, not larger than the space between them (Figures 20b, 20d, 20f), sets *Neolinycus* apart from *Cyclolabus*. In addition to these features, the presence of distinct propodeal carinae (Figures 20b, 20d, 20f) allows separation from *Apaeleticus* (which has a strongly reticulated and completely areolated propodeum (Figure 7a)) (Heinrich 1961, 1962b, 1977; Tereshkin 2009). *Neolinycus* differs from *Carlsonia* and *Linycus* by the strongly reduced temple profile, which slopes down abruptly and almost perpendicularly to the hind margin (Figures 20d, 20e). Moreover, *Linycus* also presents a pentagonal areolet (Figure 15b), while this feature is clearly rhomboidal in *Neolinycus* (Figure 20e) (Heinrich 1977; Tereshkin 2009).

Range and diversity

Neolinycus is a monotypic genus with a Nearctic distribution. The only species known, *Neolinycus michaelis* Heinrich, 1971, has been subdivided by Heinrich (1972, 1977) into three subspecies – the nominotypical one, *N. michaelis arkansae* Heinrich, 1977, and *N. michaelis georgianus* Heinrich, 1971 – all occurring in the south-eastern United States (Heinrich 1977; Yu et al. 2016). Below, we provide evidence in support of the synonymisation of the ssp. *arkansae* with ssp. *michaelis* and the confirmation of Carlson's (1979, p. 542) synonymisation of the ssp. *georgianus* with the nominotypical subspecies based on several specimens collected in Florida.

Neolinycus michaelis Heinrich, 1971

(Figures 17–21)

Neolinycus michaelis Heinrich, 1971: 1025 (descr.); Tereshkin 2009: 1458, 1579 (descr., fig.).

Neolinycus michaelis michaelis Heinrich 1972: 210 (distr., neallotype designation); Heinrich 1977: 280 (descr., distr.); Carlson 1979: 542 (cat., distr., syn.); Yu and Horstmann 1997: 677 (cat.); Schmidt and Schmidt 2011: 86 (cat.); Yu et al. 2016 (cat.).

Neolinycus michaelis georgianus Heinrich, 1972: 210 (descr.); Heinrich 1977: 281 (descr., distr., key); Carlson 1979: 542 (cat., distr., syn.); Yu and Horstmann 1997: 677 (cat.); Schmidt and Schmidt 2011: 86 (cat.); Yu et al. 2016 (cat.). Synonymised under the nominate subspecies by Carlson (1979: 542).

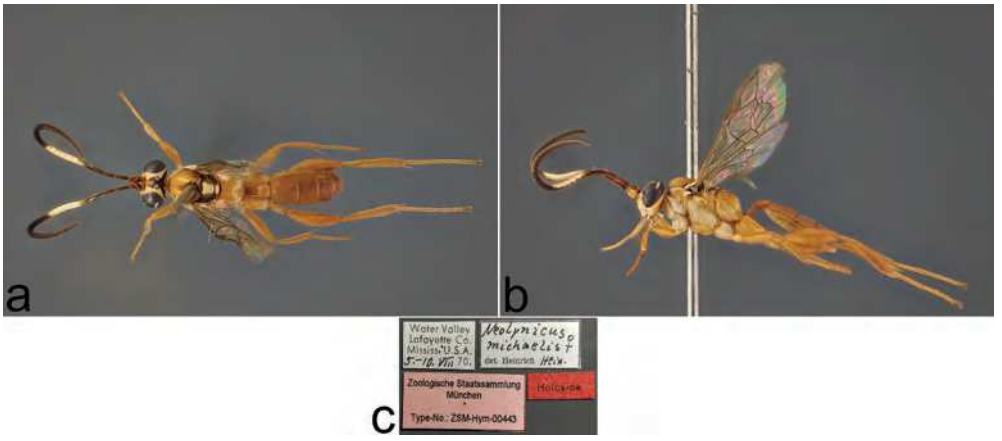

Figure 17. *Neolinycus michaelis* Heinrich 1971, holotype ♀. a) Habitus, dorsal view. b) Habitus, lateral view. c) Labels. From Schmidt (2021a).

Neolinycus michaelis arkansae Heinrich, 1977: 282 (descr.); Yu and Horstmann 1997: 677 (cat.); Schmidt and Schmidt 2011: 86 (cat.); Yu et al. 2016 (cat.). Hereby regarded as a synonym of the nominate subspecies.

Original type series

Holotype ♀ of *L. michaelis michaelis*, by original designation (ZSM); holotype ♀ of *L. michaelis georgianus*, by original designation (ZSM); holotype ♂ *L. michaelis arkansae*, by original designation in (ZSM); paratype: 1♂ *L. michaelis arkansae* (ZSM).

Type locality

United States of America, Mississippi, Lafayette Co., Water Valley (*L. michaelis michaelis*); Georgia, Monroe Co., Forsyth (*L. michaelis georgianus*); Arkansas, Garaland Co. (*L. michaelis arkansae*).

Type specimens examined (Figures 17–19)

Holotype of *L. michaelis michaelis*: '[White Label] Water Valley/Lafayette Co./Mississ. U.S.A./ *5.–10. VIII* 70. // *Neolinycus/michaelis* ♀/det. Heinrich *Hein*. // [Red Type] Holotype // [Pink Label] Zoologische Staatssammlung/München/Type-No.: ZSM-Hym-00443' (images examined). Holotype of *L. michaelis georgianus*: '[White Label] Forsyth, Monroe Co./ Georgia, U.S.A./*7.–27. VIII* 19*7*1 [originally 1969, then overwritten "71"]/[White Label] *Neolinycus/*♀ *michaelis/georgianus*/det. Heinrich *Hein*. // *michaelis/georgianus/72* det. G. Heinrich *Hei*. // [Red Type] Holotype // [Pink Label] Zoologische Staatssammlung/ München/Type-No.: ZSM-Hym-00444' (ZSM) (images examined). Holotype *L. michaelis arkansae*: '[White Label] Arkansas, USA/Garland Co./*12-17*. May 72 // [White Lable] *Neolinycus/michaelis/arkansae* ♂/det. Heinr. *Heinr*. //' [Red Type] Holotype // [Pink Label] Zoologische Staatssammlung/München/Type-No.: ZSM-Hym-00445" (ZSM) (examined).

Material examined

UNITED STATES OF AMERICA, FLORIDA: USA, FL, Alachua Co., Gainsville, Pierce's Homestead, S9-T10S-R18E, Malaise Trap, 01 November 1974, leg. W.H. Pierce, 1♀ (FSCA); idem, 03 November 1973, 1♂ (FSCA); idem, 09 May 1974 1♀ (FSCA); Alachua Co., San Felasco Hammock, Insect Flight Trap, 22 April 1977, leg. G.B. Fairchild & H.V. Weems, 1♀ (FSCA); Gainsville, Doyle Conner Building, Malaise Trap, 03 September 1973, leg. E. E. Grissell, 1♀ (FSCA); idem, 06 November 1973, 1♀ (FSCA); idem, 24 October 1973, 1♀ (FSCA); idem, 21–25 April 1975, 1♀ (FSCA); Baker Co., Glen St. Mary, Rural Yard/Mxd Woods, Malaise trap, 30 November 2006, leg. E. Zoll & S. Fullerton, 1♀ (UCFC); idem, 16 November 2006, 1♀ (UCFC); idem, 05 April 2007, 1♂ (UCFC); Clay Co., Gold Head State Park, Ravine Hardwoods, 20 March 1995, leg. C. Porter & L. Strange, 19♂♂ & 1♀ (FSCA) (wrongly identified as *Cyclolabus carolinensis* by Porter); idem, 05 May 1995, 1♂ (FSCA); idem, 07 October 1996, 1♂ (FSCA); idem, 15February–12 March 1997, 3♂♂ (FSCA); idem, 15 March–02 April 1997, 3♂♂ & 1♀ (FSCA); idem, 1–15 May 1997, 2♂♂ (FSCA); idem, June 1997, 2♂♂ (FSCA); idem, July 1997, 2♂♂ &1♀ (FSCA); idem, Ravine-mixed woods, 15 May 1996, 14♂♂ & 1♀ (FSCA); idem, 05–26 April 1996, 7♂♂ (FSCA); idem, 02 April–15 May 1997, 13♂♂ & 4♀♀ (FSCA); Collier Co., Naples, Tr.17, 10 March 1988, leg. Belmont, 11♂♂ & 1♀ (FSCA); idem, 29 June 1987, 5♂♂(FSCA); idem, 31 May 1987 2♂♂ & 1♀ (FSCA); idem, 22 July 1987, 3♂♂ & 1♀ (FSCA); idem, 02 August 1987, 1♂ (FSCA); idem, 24 May 1987, 5♂♂ (FSCA); Columbia & Baker Co. Line, Osceola Nat. For., Jct. Rt. 90, Malaise Trap, 29 March–13 April 1977, leg. J.R. Wiley, 1♂ (FSCA); Gadsen Co., Quincy, NFREC, 28 July 1989, leg. Gupta, 1♂ (FSCA); Lake Co., Green Swamp, W. M. Dist., 08 May 1987, leg. Nigg., 1♂ (FSCA); idem, 28 August 1987, 1♀ (FSCA); GEORGIA: Athens, Bot. Garden M.Tr., 05 May 1983, leg. Gupta, 1♂ (FSCA); idem, 05 June1983, leg. Gupta, 2♂♂ (FSCA).

Updated distribution (**Figure 21**)

UNITED STATES OF AMERICA: Arkansas (Heinrich 1977), Florida (**new state record**), Georgia (Heinrich 1972), Louisiana (Heinrich 1972), Mississippi (Heinrich 1971), Tennessee (Heinrich 1977).

Host

Unknown.

Male

The first description of a male was provided by Heinrich (1972, p. 210), who referred to the specimen as the neallotype.

Comments

Heinrich (1971, p. 1025) described the genus *Neolinycus* and the species *N. michaelis* based on a single female from Mississippi (Figure 17). The same author, a year later, described a new subspecies, *Neolinycus michaelis georgianus* Heinrich, 1972, based on a female from Georgia that was 'Chromatically strikingly different, particularly by color of mesoscutum and pleuron' (Figure 18) (Heinrich 1972, p. 210). According to Heinrich (1972), *N. michaelis georgianus* differs from the nominotypical subspecies by the following characters: black mesoscutum (orange in *michaelis*); longitudinal white lines running across the mesoscutum (small and reduced in *michaelis*); mostly orange pleura (mostly

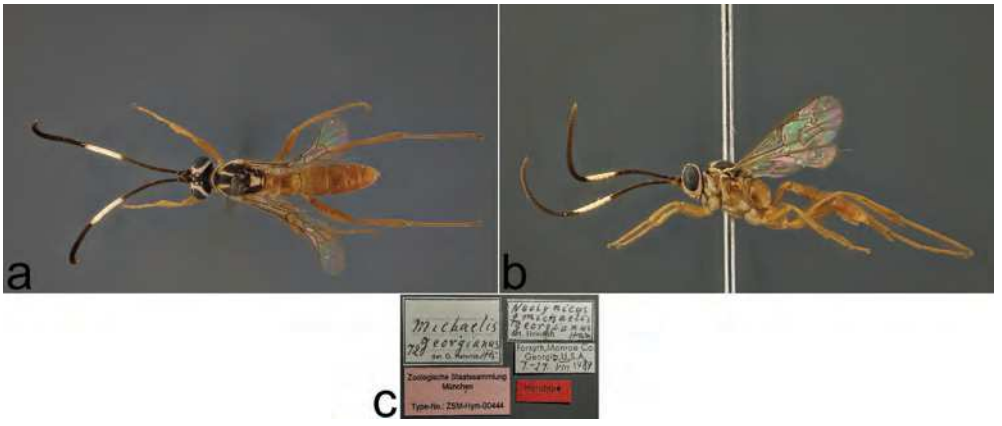

Figure 18. *Neolinycus michaelis georgianus* Heinrich, 1972, holotype ♀. a) Habitus, dorsal view. b) Habitus, lateral view. c) Labels. From Schmidt (2021b).

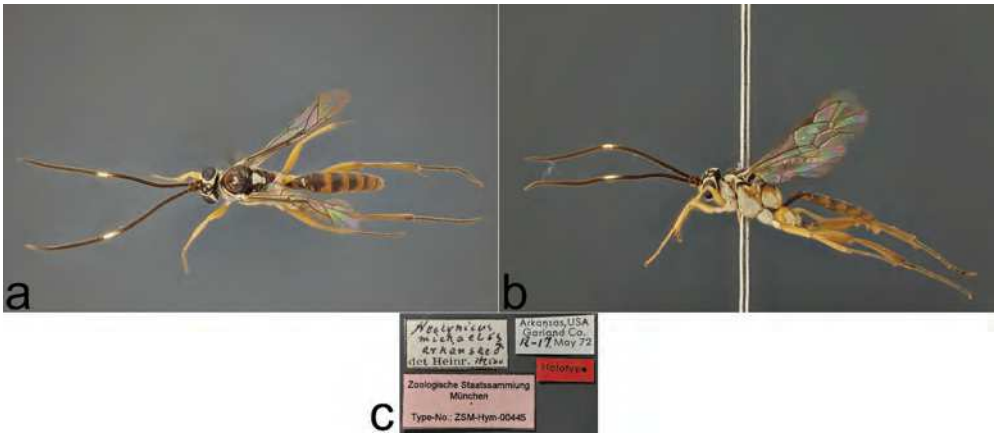

Figure 19. *Neolinycus michaelis arkansae* Heinrich, 1977, holotype ♂. a) Habitus, dorsal view. b) Habitus, lateral view. c) Labels. From Schmidt (2021c).

white in *michaelis*); white prescutellar carinae (orange in *michaelis*). In the same work, he also described the male of *N. michaelis michaelis* for the first time, acknowledging the presence of slight infuscation of the metasoma on tergites 2–5, and the different colouration of the mesoscutum, with the lateral lobes black and the median lobe orange. Later on, Heinrich (1977, p. 282) proposed another new subspecies, *Neolinycus michaelis arkansae*, this time based on two male specimens from Arkansas (Figure 19), that differ from the other two subspecies by: the entirely black mesoscutum (character revised below); the black bands on metasoma covering more than half of 2–5 tergites; the mostly white mesopleuron; prescutellar carinae not white marked. The differences among all these subspecies are summarised in Table 1. Carlson (1979, p. 542) synonymised *N. michaelis georgianus* without providing any evidence or comments for the new proposed treatment and failed to list *N. michaelis arkansae* in his catalogue of

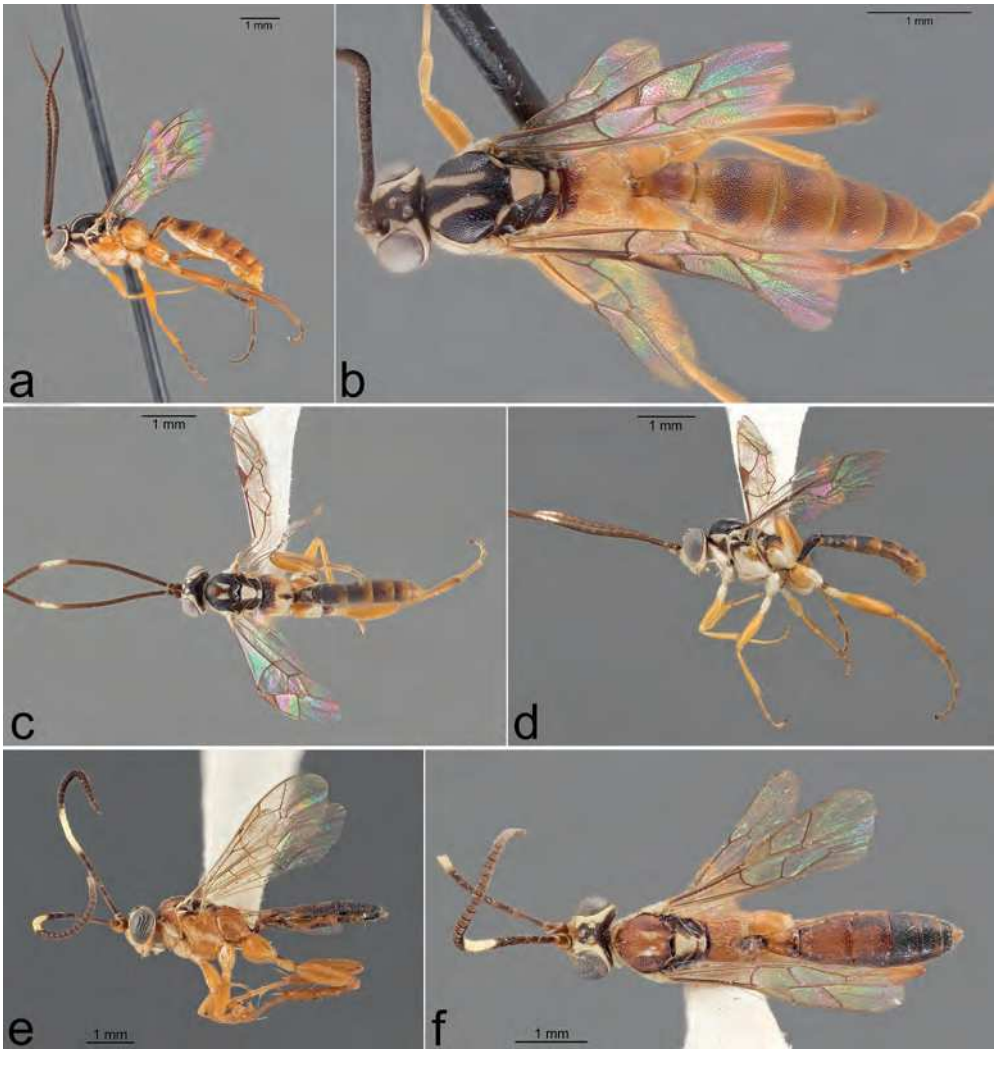

Figure 20. *Neolinycus michaelis* Heinrich, 1971, colour variation. a) Habitus, lateral view, ♂. b) Habitus, dorsal view, ♂. c) Habitus, dorsal view, ♂. d) Habitus lateral view, ♂. e) Habitus, lateral view, ♀. f) Habitus, dorsal view, ♀.

Ichneumoninae of North America. It is not clear whether Yu et al. (2016) reocrded Carlson's (1979) treatment and considered the subspecies *georgianus* to be a synonym.

Reading Heinrich (1972, 1977), it is pretty clear that the author's subspecies hypotheses are mostly based on two factors: colour pattern and distribution. After studying the type specimens of the different subspecies, we realised that the 'entire mesoscutum black' that Heinrich (1977, p. 282) listed among the characters important for the separation of *N. michaelis arkansae* from the other two subspecies is incorrect: two reduced white stripes are clearly present on the mesoscutum, and the pin simply obscures part of them (Figure 19a). The character has been revised in Table 1. Moreover, we have also analysed several specimens of *Neolinycus* from Florida and Georgia, and the same

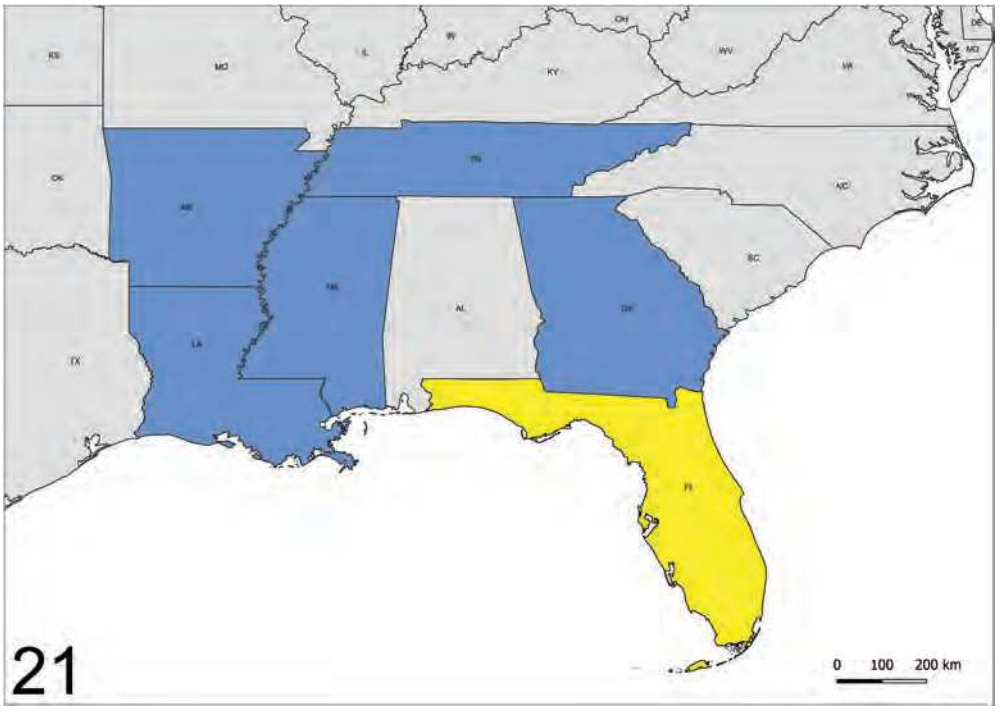

Figure 21. *Neolinycus michaelis* Heinrich, 1971, distributional map: known records (in blue) and newly recorded state (in yellow).

specimens that Porter (2003) examined and wrongly identified as *Cyclolabus carolinenesis* Heinrich, 1962. Because of this new material, we provide here three lines of evidence that, when analysed together, falsify the subspecies concepts proposed by Heinrich and that support both Carlson's (1979) synonymisation and the establishment of a further new junior synonym *N. michaelis michaelis* = *N. michaelis arkansae*. The first evidence derives from the observation of specimens that have a colour pattern halfway between the purportedly different subspecies. For instance, a male specimen from Florida has tergites 2–5 of the metasoma infuscate (condition considered diagnostic for *N. michaelis michaelis*) but associated with a complete black mesoscutum with well-developed longitudinal white lines (condition considered diagnostic for *N. michaelis georgianus*) (Figure 20a–b). Nine male specimens have very reduced longitudinal white lines on the mesoscutum that are partially red (median lobe) and partially black (lateral lobes) (typical of males of *N. michaelis michaelis*) but with black bands covering more than half of tergites 2–5 (typical of *N. michaelis arkansae*) (Figure 20c–d). Eight other females fitting the colour pattern expected for the latter subspecies were collected among male specimens with colour pattern halfway between *N. michaelis georgianus* and *N. michaelis arkansae*. The second line of evidence is composed of specimens collected in the 'wrong range' – that is, the range expected/ascertained/assumed to be that of the other subspecies. This is the case for four males that correspond to the holotype of *N. michaelis arkansae* and were collected in Georgia, which is the typical range of *N. michaelis georgianus*. The third line of evidence is composed of specimens well matching with the colour pattern expected for

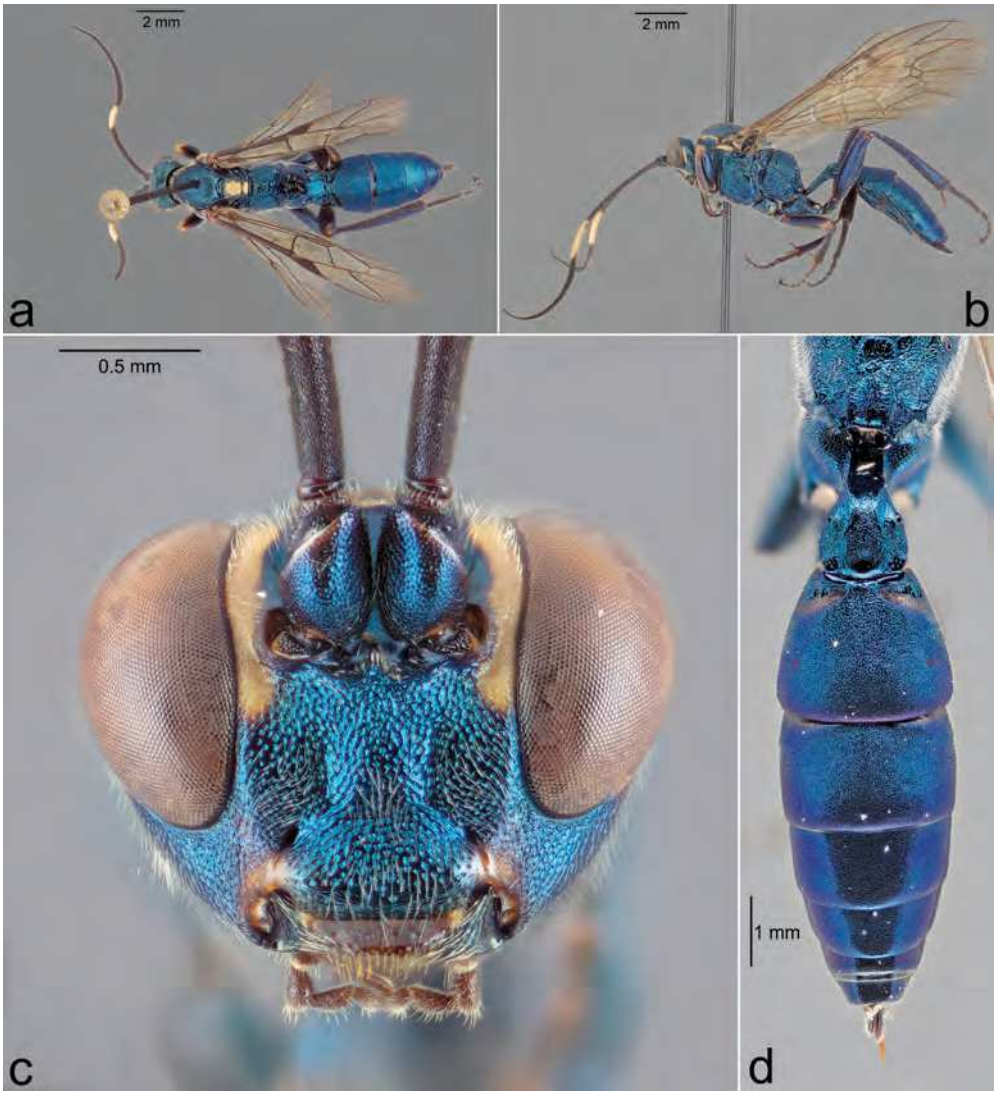

Figure 22. *Platylabus clarus* (Cresson, 1867), ♀. a) Habitus, dorsal view. b) Habitus, lateral view. c) Head, frontal view. d) Propodeum and metasoma, dorsal view.

two different subspecies but collected together in the same location. This is the case for a female that agrees chromatically with the definition of *N. michaelis michaelis* by having an orange mesoscutum with very reduced white longitudinal stripes but was collected in Florida among specimens matching the colour pattern of *N. michaelis georgianus* (Figures 20e–f).

From all the above evidence, it is clear that a continuum in colour pattern and distribution exists, and the subspecies cannot be unequivocally differentiated based either on consistent morphological traits or on clear distributional patterns. Therefore, we hereby regard for the first time *N. michaelis arkansae* as a junior synonym of

Table 1. Morphological differentiation of the subspecies of *Neolinycus michaelis* Heinrich, 1971, according to Heinrich (1972, 1977). The type locality and the distribution known previous to this work are also reported.

	Michaelis michaelis		*Michaelis georgianus*	*Michaelis arkansae*
Sex	Female	Male	Female	Male
Mesoscutum, colour	Orange	Lateral lobes black, median lobe reddish orange	Black	Black
Mesocustum, white longitudinal stripes	Short	Short	Running across mesoscutum	Absent according to Heinrich (1977), but reduced according to holotype
Prescutellar carinae, colour	Orange	Black	White	Black
Mesopleuron, colour	Mostly orange	Mostly orange	Mostly orange	Mostly white
Metasoma, basal bands of tergites 2–5	Absent	Present, but only on the anterior part of tergites	Absent	Present, but only on the anterior part of tergites
Type locality	Mississippi	-	Georgia	Arkansas
Distribution	Louisiana, Mississippi, Tennessee		Georgia	Arkansas

N. michaelis michaelis and confirm the synonymisation by Carlson (1979) of *N. michaelis georgianus* with *N. michaelis michaelis*.

Heinrich (1971, p. 1025) reported Michael Horan as the collector of the type for *N. michaelis*. There is no collector information on the labels (Figure 17c).

Heinrich (1972, p. 210) reported F. Naumann as the collector of the type for *N. michaelis georgianus*. There is no collector information on the labels (Figure 18c).

Platylabus Wesmael, 1845

Platylabus Wesmael, 1845: 150. Type species: *Platylabus rufus* Wesmael, 1845, by subsequent designation of Ashmead (1900a: 19).

Comparative diagnosis

The genus can generally be easily distinguished from *Cyclolabus* by the structure of the propodeal spiracles which are longer than wide (Figure 19b). However, as already discussed (see *Cyclolabus*), some small species of *Platylabus* approach a rather circular shape for the propodeal spiracles and can be difficult to tell apart from *Cyclolabus* species. In addition to the propodeal spiracle, *Platylabus* can be easily distinguished from all the other genera by the following characters: the apices of areae dentiparae are always without long apophyses (at the most with tooth-like projections, as in Figure 22b); the area superomedia is clearly defined (Figure 5a) and not merging with area basalis as in *Ambloplisus* (Figures 5c–5d); the gastrocoeli are transverse, deeply impressed, and usually considerably wider than the interval between them (Figures 19a, 20a, 20e, 22a); the apex of the metasoma is always without white anal spots (Figures 22a, 22d, 26a, 26d); the mandibles are not twisted (Heinrich 1977; Tereshkin 2009). For a full account of the differences between *Platylabus* and *Tropicolabus*, see under the latter genus.

Range and diversity

Platylabus has a worldwide distribution and with its 40 species in the Nearctic, it is the largest genus among Nearctic Platylabini. In the south-eastern United States, six species have been recorded so far (Heinrich 1977; Yu et al. 2016).

Key to the species of *Platylabus* from the south-eastern United States (adapted from Heinrich (1962b) and Heinrich (1975))

Males of *P. flavidoclarus* Heinrich, 1977 and *P. rubristernatus* Heinrich, 1962 are unknown.

1. Female **2**
- Male **8**
2. Metasoma bright metallic blue (Figure 22d) **3**
- Metasoma of different colour (Figures 26d, 28c, 30c, 32b, 32d) **5**
3. Postepetiole and hind femur with apical yellow bands; malar space yellow; sculpture of tergites fine ..... ***flavidoclarus*** Heinrich, 1977
- Postpetiole and hind femur without apical yellow bands (Figure 22b); malar space not yellow marked (Figure 22c); sculpture of tergites coarse **4**
4. Flagellum distinctly to considerably widened beyond the middle (Figures 22a, 22b) ..... ***clarus*** (Cresson, 1867)
- Flagellum not at all widened beyond the middle ..... ***hyperetis*** Heinrich, 1962

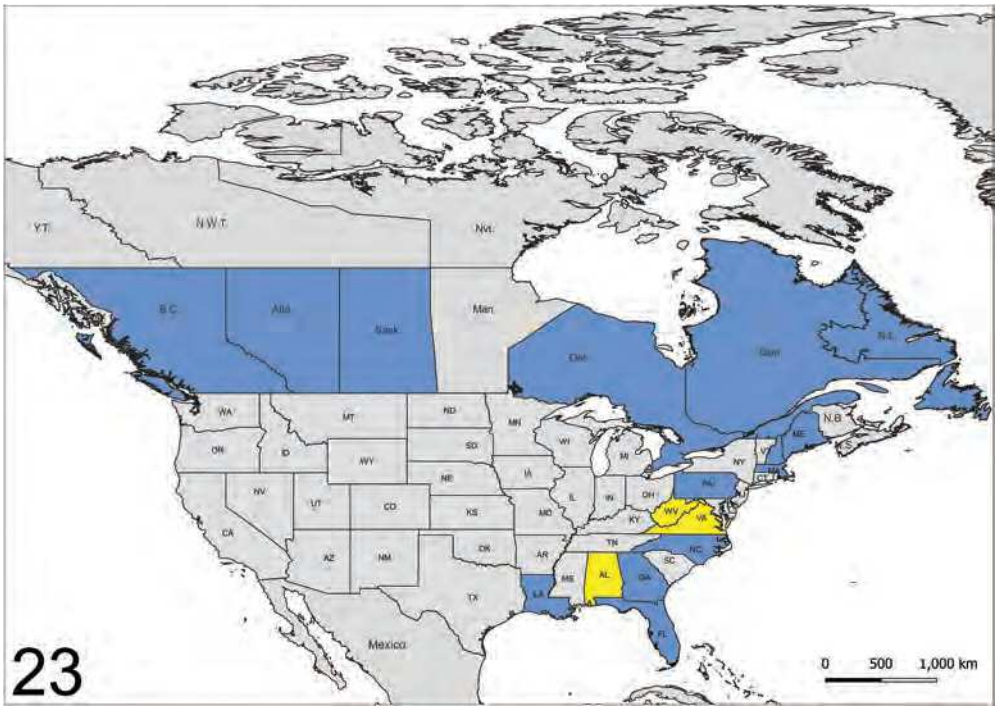

Figure 23. *Platylabus clarus* (Cresson, 1867), distributional map: known records (in blue) and newly recorded states (in yellow).

5. Metasoma ferruginous, with yellow posterior bands on tergites 1–3 (Figure 28c)..... ..... ***ornatus*** (Provancher, 1875)
- Metasoma black (Figure 26d)..... **6**
6. Coxae entirely black (Figure 26b) ..... ***opaculus americanus*** Heinrich, 1962
- Coxae entirely ferruginous or sometimes with white spots, never with black markings (Figures 30c, 32b)..... **7**
7. Scutellum entirely white, convex, laterally not carinated except anteriorly (Figure 32a); gastrocoeli less marked and not as distinctly wider than the interval between them as in the following species; reddish-orange colouration on the mesopleuron, metapleuron and mesosternum more extensive (Figure 32b)..... ..... ***rubristernatus*** Heinrich, 1962
- Scutellum apically white and anteriorly black, carinate beyond the middle (Figure 30a); gastrocoeli strongly marked, distinctly wider than the interval between them (Figure 30a); reddish-orange colouration on the mesopleuron reduced to a spot in the postero-ventral corner (Figure 30c)..... ..... ***rubricapensis*** (Provancher, 1882)
8. Metasoma bright metallic blue (Figure 22d) **9**
- Metasoma of different colour (Figures 26d, 28c, 30c, 32b, 32d)..... **10**
9. Outer orbits white from temple region down to base of mandibles, white colour gradually widening downward over most of the surface of apical part of cheeks; flagellum without annulus..... ***clarus*** (Cresson, 1867)
- Face and clypeus entirely white; flagellum with annulus.... ***hyperetis*** Heinrich, 1962
10. Metasoma ferruginous-red, with a yellow posterior band on tergites 1–3..... ..... ***ornatus*** (Provancher, 1875)
- Metasoma black..... **11**
11. Coxa III entirely or predominantly black; face black with inner orbit white .... ***opaculus americanus*** Heinrich, 1962
- Coxa III entirely or predominantly red or ferruginous; face either entirely white or black with inner orbits white ..... ***rubricapensis*** Provancher, 1882

Platylabus clarus **(Cresson, 1867)**

(Figures 22, 23)

Ichneumon clarus Cresson, 1867: 297 (descr.); Berthoumieu 1904: 42 (distr.); Cresson 1916: 24 (cat.).

Platylabus clarus Cresson 1877: 199 (distr., key, notes); Cresson 1887: 191 (cat.); Dalla Torre 1902: 781 (cat.); Bradley 1903: 280 (distr., key, fig., syn.); Viereck 1917: 343 (key); Townes 1944: 311 (cat., syn.); Guppy 1948: 13 (distr.); Townes and Townes 1951: 280 (cat.); Strickland 1952: 120 (distr.); Foxlee 1954: 13 (distr.); Short 1959: 449 (larva descr.); Heinrich 1959: 215 (notes, syn.); Heinrich 1962b: 705 (descr., distr., neallotype designation, key); Heinrich 1977: 274 (descr., distr., key); Short 1978: 120 (larva descr.); Bradley 1978: 6 (distr., host); Carlson 1979: 544 (cat., distr.); Bugg et al. 1989: 112 (distr., host); Yu and Horstmann 1997: 678 (cat.); Yu et al. 2016 (cat.).

Platylabus magnificus Provancher, 1886: 36 (descr., key); Cresson 1887: 191 (cat.); Dalla Torre 1902: 784 (cat.); Bradley 1903: 280 (distr., key, syn.); Berthoumieu 1904: 57 (cat.);

Gahan and Rohwer 1918a: 168 (invalid lectotype designation); Barron 1975: 503 (notes). Regarded as synonym of *I. clarus* by Bradley (1903: 280).

Original type series

Holotype ♀ of *Platylabus clarus*, by monotypy (ANSP); holotype ♀ of *Platylabus magnificus*, by monotypy (LUEC).

Cresson (1867, p. 297) described *Platylabus clarus* based on 'One ♀ specimen'. Therefore, this specimen is here referred to as the holotype fixed by monotypy (ICZN 1999, Article 73.1.2).

Provancher (1886, p. 36) described *Platylabus magnificus* based on 'Une seule ♀ capturée Bécàncour' (= only one ♀ captured at Bécàncour). Gahan and Rohwer (1918a, p. 168) designated a lectoype, but as Barron (1975, p. 503) acknowledged, there is no need for a lectotype as Provancher clearly mentioned only one specimen. Therefore, this specimen is here referred to as the holotype fixed by monotypy (ICZN 1999, Article 73.1.2) and Gahan and Rohwer's (1918a, p. 168) designation should be considered an invalid lectotype designation.

Type locality

United States of America, Massachusetts, Ridings (*Platylabus clarus*). Canada, Québec, 'Bécancour' (*Platylabus magnificus*). Heinrich (1962b, 1977) reported New Hampshire as the type locality for *Platylabus clarus*, even though the type locality, as reported by Cresson (1867, p. 297), is Massachusetts, while New Hampshire is a locality later added by Cresson (1877, p. 199).

Material examined

UNITED STATES OF AMERICA, ALABAMA: Madison Co., Huntsville, Monte Sand [Sano] St. Park, blacklight trap, 24 May–02 June 1982, leg. L.L. Lampert, 1♀ (FSCA); FLORIDA: Leon Co., Tall Timb. R. S., M. Trap 6, 13–20 November 1983, leg. Gupta, 1♂ & 1♀ (FSCA); GEORGIA: Athens, Bot. Garden M.Tr., 04 May 1983, leg. Gupta, 1♂ (FSCA); idem, 05 July 1983, 1♀ (FSCA); idem, 05 June 1983, ♀ (FSCA);; Cobb Co., Smyrna, M. Trap 3, 04 May 1983, leg. Gupta, 2♂♂ (FSCA); NEW YORK: Westchester Co., Armonk, Calder Center, Malaise trap, 12–18 July 1974, leg. C. Calmbacher, 1♂ (FSCA); VIRGINIA: Carrol Co., 14 October 1969, leg. R.G. Gardner, 1♀ (VMNH); Essex Co., 1.5 km SE of Dunnsville, Malaise Trap, 11 October 1991, leg. D.R. Smith, 2♀♀ (VMNH); Mecklenburg Co., Elm Hill S.G.M.A., Cyde's Pond, Malaise Trap, 1–30 October 1995, leg. VMNH Sruvey, 1♀ (VMNH); University of Richmond, 11 February 1962, 1♀ (VMNH).

Updated distribution (Figure 23)

CANADA: Alberta (Strickland 1952), British Columbia (Guppy 1948; Foxlee 1954; Bradley 1978), Newfoundland and Labrador (Bradley 1978), Ontario (Heinrich 1962b; Bradley 1978), Quebec (Provancher 1886; Bradley 1978), Saskatchewan (Bradley 1978); UNITED STATES OF AMERICA: Alabama (**new state record**), Florida (Heinrich 1977), Georgia (Heinrich 1977), Louisiana (Heinrich 1977), Maine (Heinrich 1962b), Massachusetts (Cresson 1867), New Hampshire (Cresson 1877), North Carolina (Heinrich 1962b), Pennsylvania (Heinrich 1962b), Virginia (**new state record**), West Virginia (**new state record**).

Host

Caripeta divisata Walker (Bradley 1978), *Eutrapela clemataria* J.E. Smith (Bradley 1978; Bugg et al. 1989), *Phaeuora quernaria* J.E. Smith (Bradley 1978) (Lepidoptera: Geometridae). Bradley (1978, p. 6) reported also one '*Noctuidae*' among the possible hosts for the species, without mentioning any genus or species. Further investigations are needed to confirm the record.

Male

The first description of a male was provided by Cresson (1877, p. 199), but Heinrich (1962b, p. 705) believed that he himself was describing the male for the first time (referring to it as neallotype).

Comments

This species is widespread across the entire eastern part of North America, as stated by Townes and Townes (1951) and Carlson (1979), where it is the *Platylabus* with the southernmost distribution (reaching Florida) (Heinrich 1977; Yu et al. 2016). Heinrich (1962b) stated that he has never seen specimens of this species from the west, but the species was reported by Guppy (1948, p. 13) for Vancouver Island (British Columbia). However, this last record is inconsistent as the author listed the species for the island but also added a comment by Henry Townes – the one responsible for the determination – who stated that the species was 'not recorded from the West'. It is unclear whether he was referring to the western United States or more generally to western North America. Subsequent records by Foxlee (1954, p. 13) and Bradley (1978, p. 6) provided new evidence of the species occurring in the West, specifically at Robson, British Columbia.

There are several images of the species on BugGuide. However, we preferred to be cautious with including those records within this publication as there are species morphologically very similar to *Platylabus clarus* (e.g. *Platylabus divisatae* Heinrich, 1963 or *Platylabus hyperetis* Heinrich, 1962), which could prevent a correct identification from photos.

Townes (1944) proposed that *Platylabus metallicus* Bradley, 1903 was a junior synonym of *P. clarus* without providing any comments, while Heinrich (1959, p. 215) rejected this view, noting that Townes (1944) misidentified some specimens as *Platylabus clarus* when they actually belonged to the former species.

Platylabus flavidoclarus Heinrich, 1977

(Figure 24)

Platylabus flavidoclarus Heinrich, 1977: 275 (descr., key); Yu and Horstmann 1997: 678 (cat.); Schmidt and Schmidt 2011: 75 (cat.); Yu et al. 2016 (cat.).

Original type series

Holotype ♀, by original designation (ZSM).

Type locality

United States of America, Louisiana, Evangeline Co., 'Chicot'.

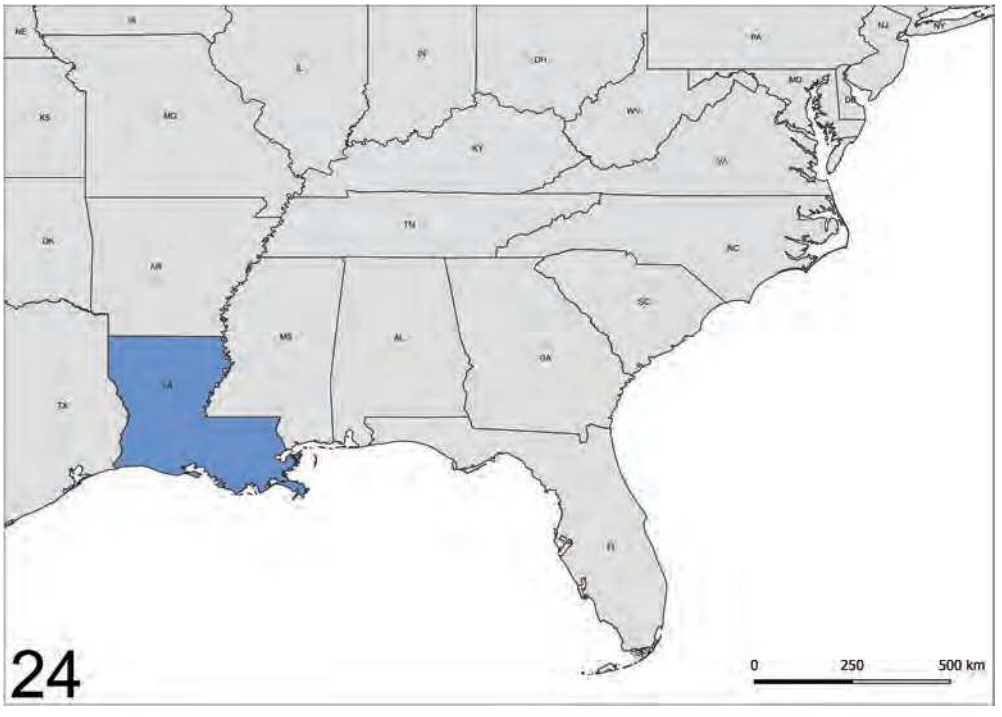

Figure 24. *Platylabus flavidoclarus* Heinrich, 1977, distributional map: known record (in blue).

Current distribution (Figure 24)

UNITED STATES OF AMERICA: Louisiana (Heinrich 1977).

Host

Unknown.

Male

Unknown.

Comments

This species is known only from the type locality and a single female specimen. Heinrich (1977, p. 275), while describing this species, acknowledged that it could represent a subspecies of *P. clarus* Cresson, 1867, adding the fact that if this is the case, then the male of *P. clarus* recorded for Louisiana should be attributed to the new taxon. However, he tentatively ranked *P. flavidoclarus* as a species. We have examined a male specimen, collected in Georgia, and housed at the FSCA, that could be a male of this species, due to the very extensive white markings on the entire body. However, more material is needed to corroborate our hypothesis and, therefore, we do not describe it here.

Platylabus hyperetis Heinrich, 1962

(Figure 25)

Platylabus hyperetis Heinrich, 1962b: 707 (descr., key, allotype designation); Heinrich 1977: 275 (descr., distr., key); Bradley 1978: 7 (distr., host); Carlson 1979: 544 (cat., distr.); Butler 1993: 506 (host); Schmidt and Schmidt 2011: 79 (cat.); Yu and Horstmann 1997: 679 (cat.); Yu et al. 2016 (cat.).

Original type series

Holotype ♀, by original designation (ZSM); Allotype 1♂ (ZSM); paratypes: 3♀♀ and 1♂ (ZSM), 1♂ (CNCI).

Type locality

United States of America, Maine, 'New Portland'.

Updated distribution (Figure 25)

CANADA: British Columbia (Heinrich 1962b; Bradley 1978), Saskatchewan (Bradley 1978); UNITED STATES OF AMERICA: Arkansas (Heinrich 1977), Maine (Heinrich 1962b), West Virginia (Butler 1993).

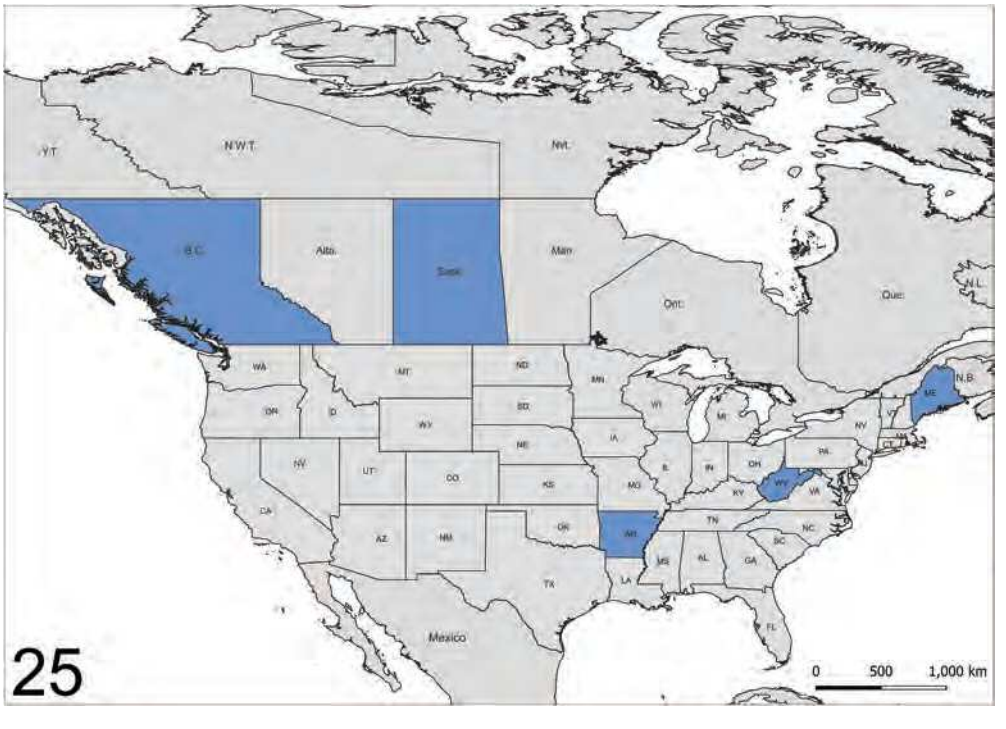

Figure 25. *Platylabus hyperetis* Heinrich, 1962, distributional map: known records (in blue).

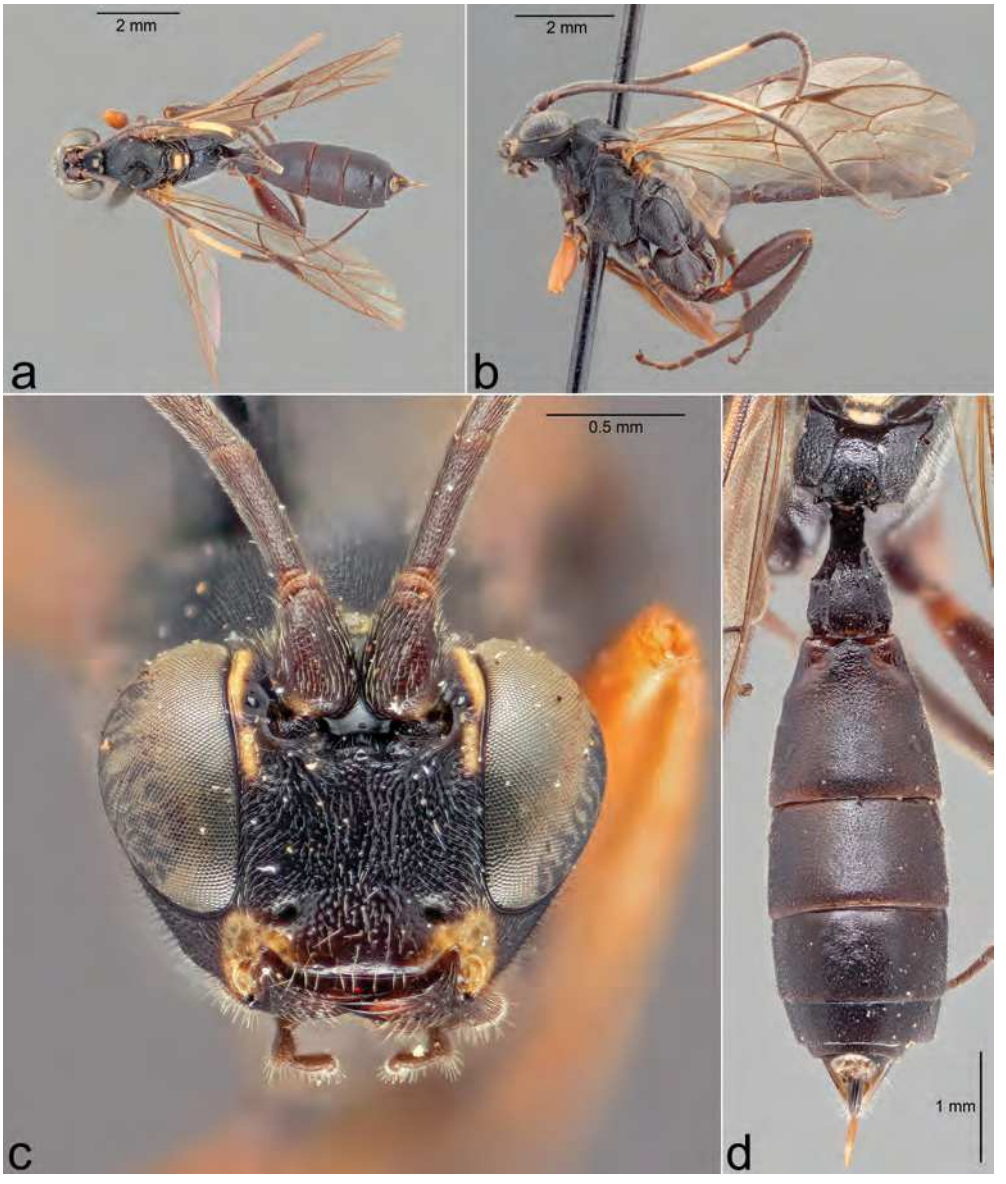

Figure 26. *Platylabus opaculus americanus* Heinrich, 1962, ♀. a) Habitus, dorsal view. b) Habitus, lateral view. c) Head, frontal view. d) Propodeum and metasoma, dorsal view.

Host

Plagodis alcoolaria Guenée (Bradley 1978), *Plagodis serinaria* Herrich-Schaffer (Butler 1993), *Probole amicaria* Herrich-Schaffer (Heinrich 1962b; Heinrich 1977) (Lepidoptera: Geometridae).

Male

Described by Heinrich (1962b, p. 707) from three males, one of which was designated as allotype.

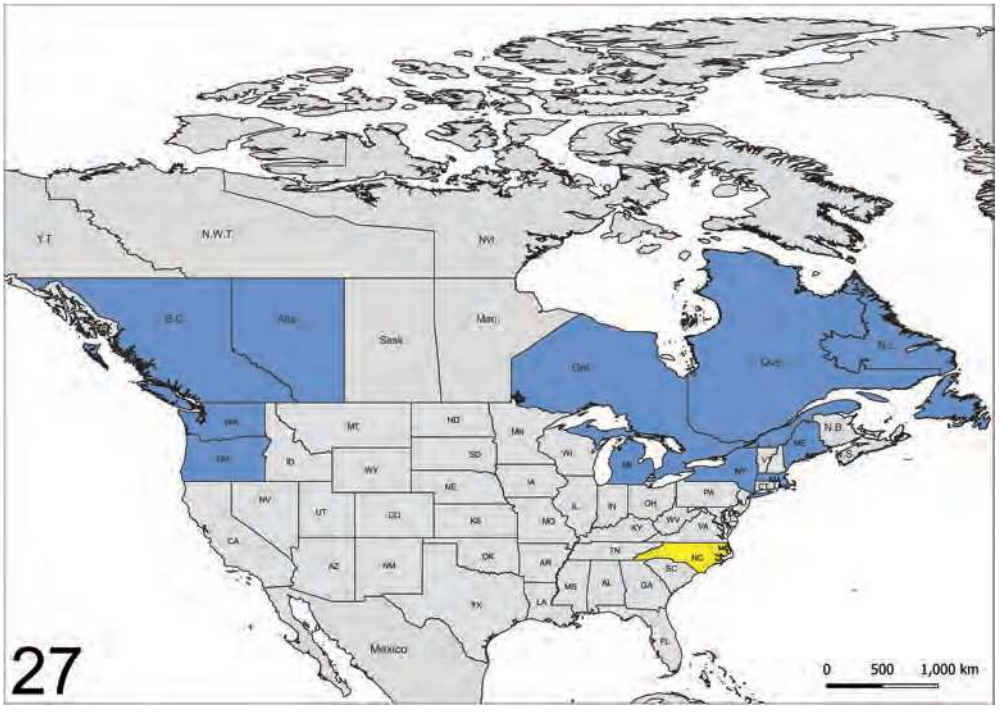

Figure 27. *Platylabus opaculus americanus* Heinrich, 1962, distributional map: known records (in blue) and newly recorded state (in yellow).

Comments

Carlson (1979, p. 544) did not take Bradley's (1978) paper into consideration and listed only *Probole amicaria* Herrich-Schaffer as the species host. Butler (1993, p. 506), in listing the parasitoids from Macrolepidoptera, indirectly recorded the species for the first time from West Virginia.

Platylabus opaculus americanus Heinrich, 1962

(Figures 26, 27)

Platylabus opaculus americanus Heinrich, 1962b: 730 (descr., key, allotype designation); Heinrich 1975: 774 (distr.); Carlson 1979: 545 (cat., distr., notes); Yu and Horstmann 1997: 679 (cat.); Schmidt and Schmidt 2011: 90 (cat.); Yu et al. 2016 (cat.).

Original type series

Holotype ♀, by original designation (ZSM); allotype 1♂ (CNCI); paratypes: 3♀♀ (ZSM), 3♀♀ (CNCI), 3♀♀ (EMUS).

Type locality

United States of America, Maine, Alagash.

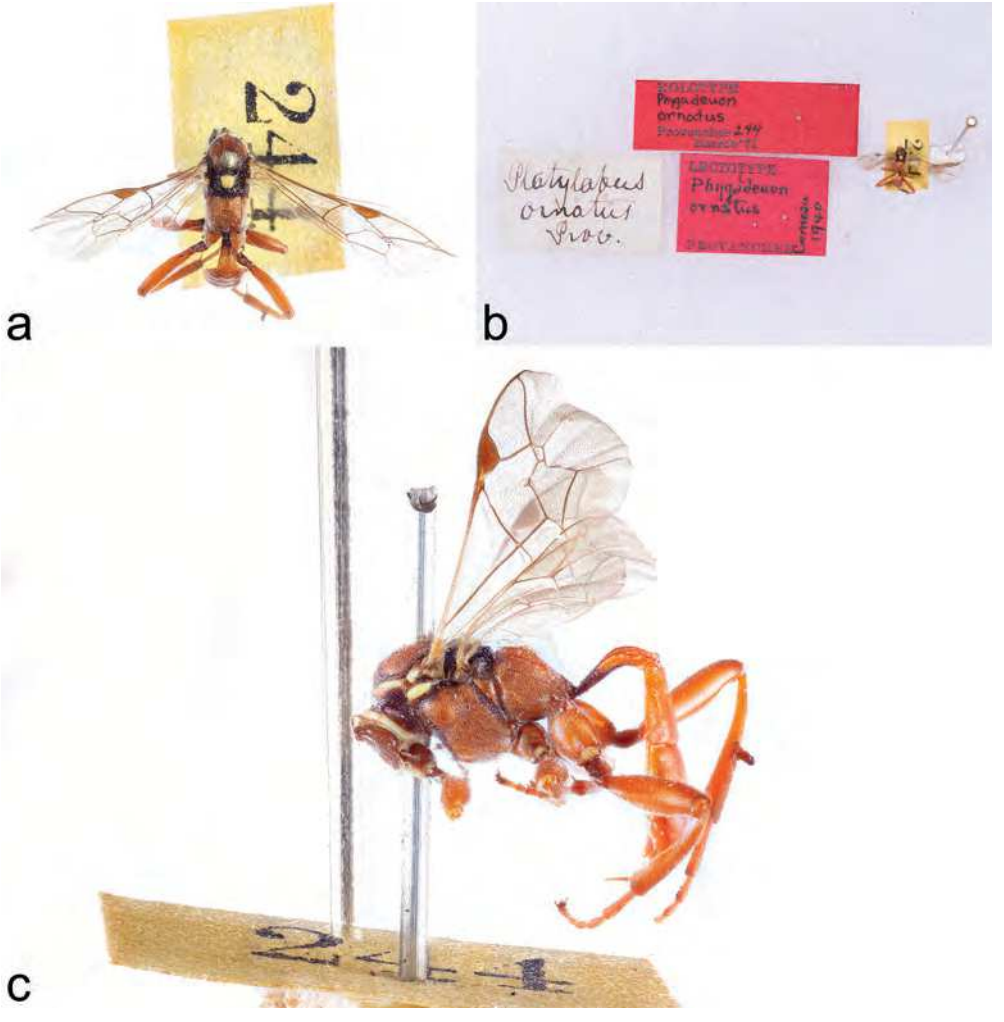

Figure 28. *Platylabus ornatus* (Provancher, 1875), holotype ♀. a) Habitus, dorsal view. b) Labels. c) Habitus, lateral view.

Material examined

UNITED STATES OF AMERICA, MASSACHUSETTS: Rowley, Essex Country, 30 August 2010, det. R. Carlson, 2♀♀ (BugGuide); NORTH CAROLINA: Mt. Pisgah, elevation 4[000]–5000 ft., 5 July 1959, leg. H.V. Weems, det. Townes 1967, 1♀ (FSCA).

Updated distribution (Figure 27)

CANADA: Alberta (Heinrich 1962b); British Columbia (Heinrich 1962b); Québec (Heinrich 1962b); Newfoundland and Labrador (Heinrich 1975); Ontario (Heinrich 1962b); UNITED STATES OF AMERICA: Maine (Heinrich 1962b); Massachusetts (Carlson 2010b) Michigan (Heinrich 1962b); New York (Heinrich 1962b); North Carolina (**new state record**); Oregon (Heinrich 1962b); Washington (Heinrich 1962b).

Host
Unknown.

Male
Described by Heinrich (1962b, p. 730) in the original description, based on a single male that he designated as allotype. The other two known male specimens of the species are from Newfoundland and Labrador, recorded by Heinrich (1975, p. 774).

Comments
Platylabus opaculus Thomson, 1888, is split in two subspecies, one with European distribution (the nominotypical subspecies), and the other occurring in the Nearctic (Heinrich 1962b, p. 730). According to Heinrich (1962b, p. 730), the only difference between the two is the colour of the legs, which are entirely black in *Platylabus opaculus opaculus* and rufous in *Platylabus opaculus americanus*.

The records from Massachusetts are from BugGuide and identified by Carlson (2010b) as *Platylabus opaculus*. However, these have not been recorded in any paper or catalogue (see Yu et al. 2016). The new record for North Carolina is based on a female specimen found at the FSCA that Townes identified as *Platylabus opaculus americanus* in 1967, which DDP double checked, confirming Townes' identification. The record has never been reported in any paper or catalogue (cf. Yu et al. 2016), and apparently Heinrich (1975) was not aware of it since no mention of it appears in his paper.

The record of *Platylabus opaculus americanus* for North Carolina also marks the southernmost distributional record for the subspecies and the first for the south-eastern United States (Figure 22b).

Platylabus ornatus (Provancher, 1875)

(Figures 28, 29)

Phygadeuon ornatus Provancher, 1875: 181, 183 (descr., key).

Platylabus ornatus Cresson 1877: 200 (descr., key); Provancher 1879: 36 (descr., key); Provancher 1883: 305 (descr., key); Provancher 1886: 36 (key); Cresson 1887: 191 (cat.); Dalla Torre 1902: 786 (cat.); Bradley 1903: 283 (distr., key, fig.); Gahan and Rohwer 1918a: 168 (invalid lectotype designation); Brown 1941: 10; Townes 1944: 312 (cat.); Townes and Townes 1951: 281 (distr., cat.); Heinrich 1962b: 747 (descr., distr., neallotype designation, key); Heinrich 1971: 1019, 1975: 774 (distr.); Barron 1975: 523 (notes); Bradley 1978: 16 (distr., host); Carlson 1979: 545 (cat., distr.); Gillespie and Finlayson 1983: 22 (fig., host, key, larva descr.); Yu and Horstmann 1997: 679 (cat.); Yu et al. 2016 (cat.).

Original type series
Holotype ♀, by monotypy (LEUC). Provancher (1875, p. 181) mentioned 'Un seul specimen ♀' (= only one female specimen) in the original description. Gahan and Rohwer (1918a, p. 168) designated a lectotype, but as Barron (1975, p. 523) acknowledged, there is no need for a lectotype as Provancher clearly mentioned only one specimen. Therefore, this specimen is here referred to as the holotype fixed by monotypy (ICZN 1999, Article 73.1.2)

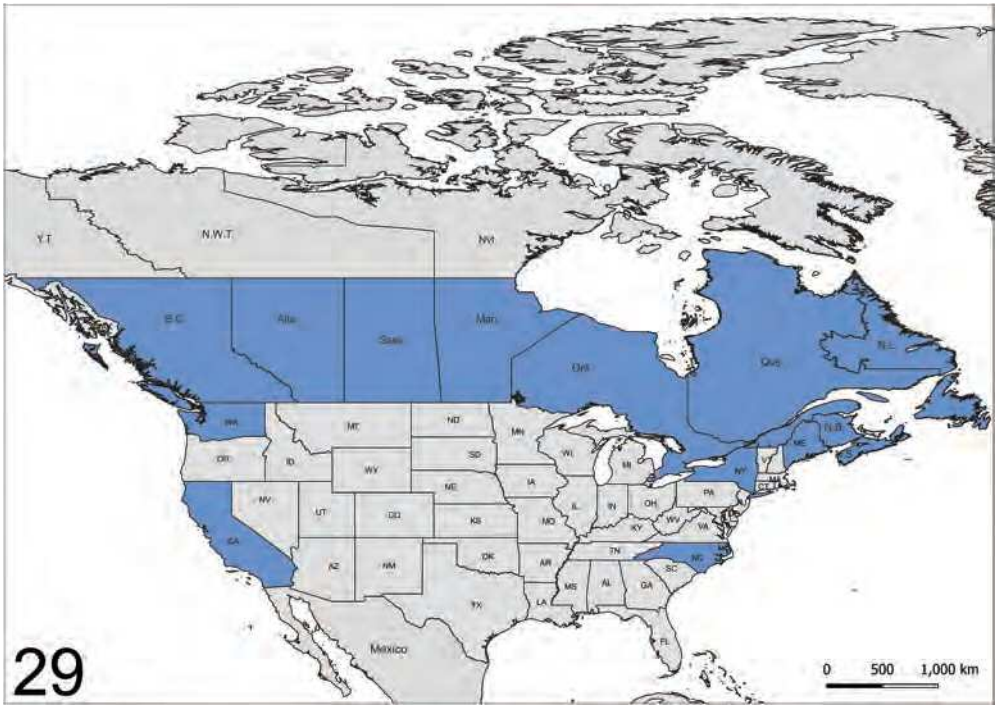

Figure 29. *Platylabus ornatus* (Provancher, 1875), distributional map: known records (in blue).

and Gahan and Rohwer's (1918a, p. 168) designation should be considered an invalid lectotype designation.

Type locality

Canada, Québec. No type locality is given on the holotype labels, but the species has been described in 'Les Ichneumonides de Québec' (Provancher 1875).

Type specimens examined (Figures 28, 29)

Holotype: '[Yellow label] 244 // [White label] *Platylabus/ornatus/Prov*. // [Red label] LECTOTYPE/*Phygadeuon/ornatus/*PROVANCHER/[Written vertically on right side] *Comeau/1940* // [Red lable] HOLOTYPE/*Phygadeuon/ornatus/*Provancher *244/*Barron '71' (images examined).

Updated distribution (Figure 29)

CANADA: Alberta (Heinrich 1962b; Bradley 1978), British Columbia (Heinrich 1962b; Bradley 1978), Manitoba (Bradley 1978); New Brunswick (Heinrich 1962b; Bradley 1978), Newfoundland and Labrador (Heinrich 1975; Bradley 1978), Nova Scotia (Bradley 1978); Ontario (Bradley 1978), Québec (Provancher 1875; Bradley 1978), Saskatchewan (Bradley 1978); UNITED STATES OF AMERICA: California (Townes and Townes 1951), Maine (Heinrich 1962b), New York (Heinrich 1971), North Carolina (Heinrich 1962b), Washington (Townes and Townes 1951).

Figure 30. *Platylabus rubricapensis* Provancher, 1882, lectotype ♀. a) Habitus, dorsal view. b) Head, frontal view. c) Habitus, lateral view. d) Labels.

Host

Eupithecia intricata (Zetterstedt) (Bradley 1978), *Macaria bicolorata* Fabricius (Bradley 1978), *Macaria granitata* Guenée (Brown 1941; Townes 1944), *Macaria oweni* (Heinrich 1962b; Bradley 1978), *Macaria pustularia* (Bradley 1978), *Macaria sexmaculata* Swett (Bradley 1978), *Macaria signaria dispuncta* Walker (Bradley 1978), *Macaria unipuctaria perplexa* McDonnough (Bradley 1978) (Lepidoptera: Geometridae).

Male

The first description of a male was provided by Heinrich (1962b, p. 747), who referred to the specimen as the neallotype.

Comments

Bradley (1978, p. 16, fig. 11 reported the species from 'Newfoundland to British Columbia', plotting the records on a map without pointing out the Canadian provinces. This is probably why subsequent authors (Carlson 1979; Yu and Horstmann 1997; Yu et al. 2016) did not report the species occurring in Manitoba and Nova Scotia. Yu et al. (2016) also failed to report California and Washington, reported by Townes and Townes (1951, p. 281), as state records for the species. According to Heinrich (1962b, p. 748), these western populations are slightly less melanistic than the eastern ones and could also be interpreted as different subspecies.

Platylabus rubricapensis Provancher, 1882

(Figures 30, 31)

Platylabus Rubri Capensis Provancher, 1882: 329 (descr.).
Platylabus Rubricapensis Provancher 1886: 35 (key).
Platylabus rubricapensis Cresson 1887: 191 (cat.); Dalla Torre 1902: 788 (cat.); Bradley 1903: 281 (distr., key, fig.); Berthoumieu 1904: 57 (cat.); Gahan and Rohwer 1918a: 168 (lectotype designation); Brimley 1942: 30 (distr.); Townes 1944: 313 (cat.); Townes and Townes 1951: 281 (distr., cat.); Strickland 1952: 120 (distr.); Heinrich 1962b: 712 (descr., distr., key); Heinrich 1975: 774 (distr., neallotype designation); Barron 1975: 546 (notes); Carlson 1979: 545 (cat., distr., notes); Yu and Horstmann 1997: 680 (cat.); Yu et al. 2016 (cat.).

Original type series

Lectotype ♀, designated by Gahan and Rohwer (1918a, p. 168) (LUEC). Provancher (1882, p. 329) described '*Platylabus Rubri Capensis*' from Québec without specifying the number of specimens included in the description. Gahan and Rohwer (1918a, p. 168) designated the lectotype, addressing it as 'Type– Female, yellow label 717. 2nd Coll. Pub. Mus., Quebec'. Subsequently, Heinrich (1962b, p. 774) incorrectly employed the term 'Holotypus' for the same specimen. Barron (1975, p. 546) considered valid the designation of Gahan and Rohwer (1918a, p. 168).

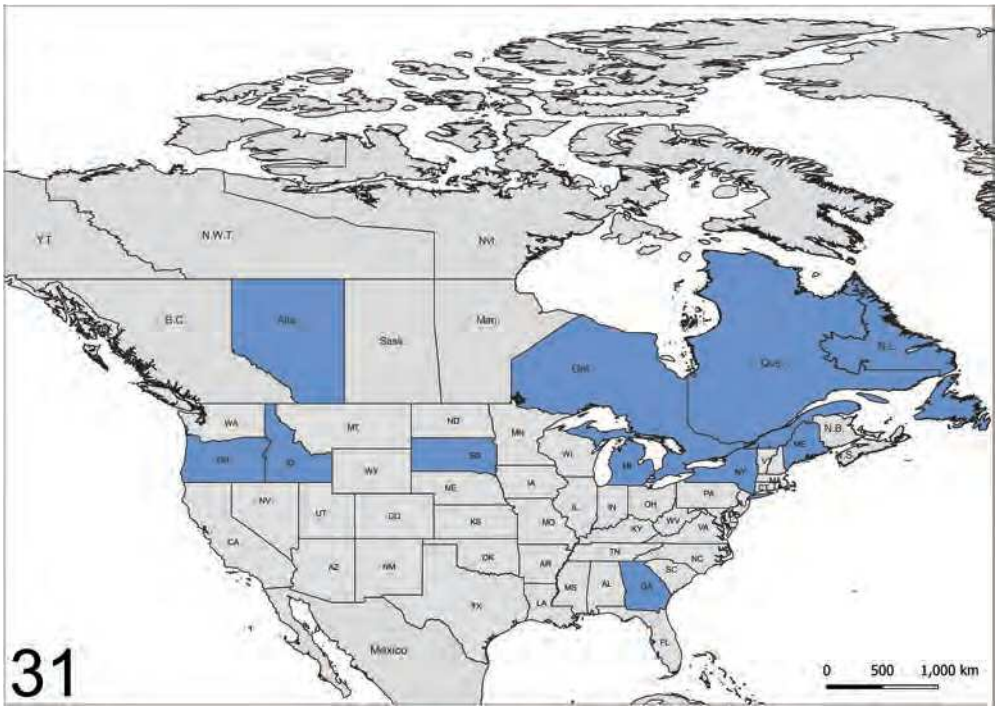

Figure 31. *Platylabus rubricapensis* Provancher, 1882, distributional map: known records (in blue).

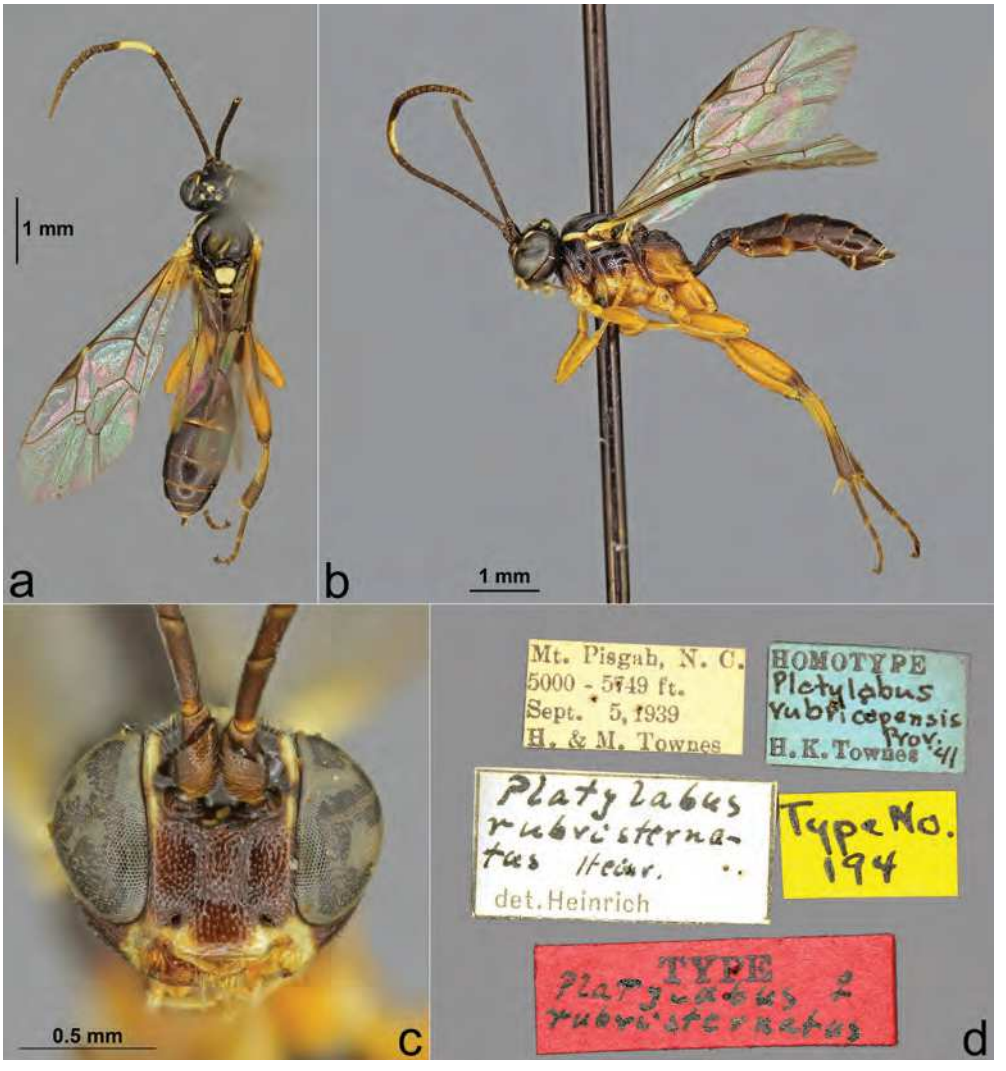

Figure 32. *Platylabus rubristernatus* Heinrich, 1962, holotype ♀. a) Habitus, dorsal view. b) Habitus, lateral view. c) Head, frontal view. d) Labels.

Type locality

Canada, Québec, 'Cap-Rouge'. No type locality is given on the lectotype labels or in the original description, but the species has been described as 'Platylabe du-CapRouge' (= Platylabus from Cap-Rouge). Cap-Rouge is a former city in central Québec.

Type specimens examined (Figure 30)

Holotype: '[Yellow label] 717/[White label] *Platylabus/rubricapensis/Prov*. // [Red label] LECTOTYPE/*PLATYLABUS/RUBRI CAPENSIS/*Provancher *717/*Gahan & Rohwer '15/Barron '71' (images examined).

Updated distribution (Figure 31)

CANADA: Alberta (Strickland 1952), Newfoundland and Labrador (Heinrich 1975), Ontario (Heinrich 1962b), Québec (Provancher 1882); UNITED STATES OF AMERICA: Georgia (Fattig 1950), Idaho (Heinrich 1962b), Michigan (Carlson 1979), New York (Heinrich 1962b), Oregon (Carlson 1979), South Dakota (Heinrich 1962b).

Host

Unknown.

Male

The first description of a male was provided by Heinrich (1975, p. 774), who referred to the specimen as the neallotype.

Comments

Townes and Townes (1951, p. 281) recorded the species for Québec, New York and North Carolina. However, as noted by Heinrich (1962b, p. 712), these last two state records refer to *Platylabus rubristernatus* Heinrich, 1962b (see below). The correct first record for New York must be attributed to Heinrich (1962b, p. 712), while the species has yet to be recorded for North Carolina. Yu et al. (2016) failed to list the type locality (Québec) and all the records provided by Heinrich (1962b, p. 712) and Carlson (1979, p. 545) among the distribution locality of the species.

Provancher (1882) described the species under the name '*Rubri Capensis*'. Carlson (1979, p. 545) considered it an 'invalid' name because it was not binomial, and proposed the use of *Platylabus rubricapensis* Provancher, 1886, since the redescription contained a 'valid binomen'. Subsequent authors kept using *rubricapensis* Provancher, 1882 as a valid authorship without adding any reason for rejecting Carlson's (1979) observation (Yu and Horstmann 1997; Yu et al. 2016). We hereby provide a rationale to solve the confusion. Firstly, Carlson (1979) used the term 'invalid'; however, the name would have been unavailable rather than invalid (see differences between Chapters 4 and 6 of ICZN (1999)). Secondly, the two words together refer to a single entity (i.e., from Red Cape (= Cap Rouge, Québec, Canada)) and are accepted to form a species-group name; they are deemed to form a single word and are united without a hyphen (*rubricapensis*) (ICZN 1999, Articles 11.9.5 and 32.5.2.2). Therefore, *Platylabus rubricapensis* Provancher 1882 is an available name.

Platylabus rubristernatus Heinrich, 1962

(Figures 32, 33)

Platylabus rubristernatus Heinrich, 1962b: 713 (descr., key); Carlson 1979: 545 (cat., distr.); Yu and Horstmann 1997: 680 (cat.); Yu et al. 2016 (cat.).

Original type series

Holotype ♀, original designation (EMUS); paratypes: 2♀♀ (USNM) and 1♀ (ZSM).

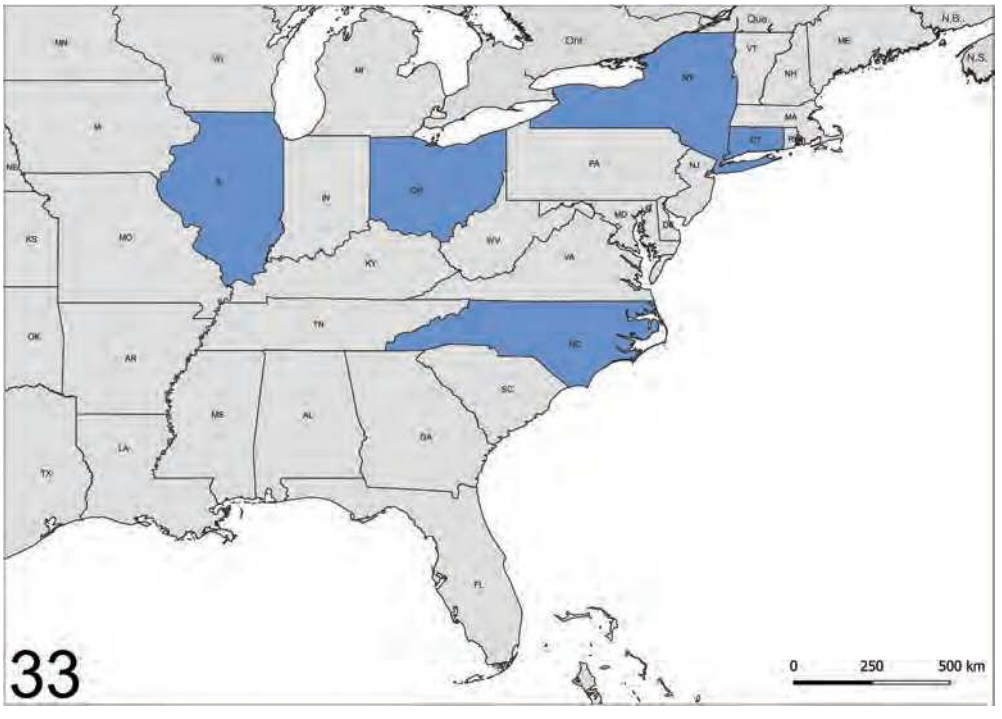

Figure 33. *Platylabus rubristernatus* Heinrich, 1962, distributional map: known records (in blue).

Type locality

United States of America, North Carolina, 'Mt. Pisgah'.

Type specimens examined (Figure 32)

Holotype: '[Yellow label] Mt. Pisgah, N. C./5000 – 5749 ft./5 September 1939/H. & M. Townes // [Blue label] HOMOTYPE/*Platylabus/rubricapensis/Prov./*H. K. Townes *'41* // [White label] *Platylabus/rubristerna- i/ tus Heinr./*det. Heinrich // [Yellow label] *Type No./ 194* // [Red label] TYPE/*Platylabus* ♀*/rubristernatus*'.

Updated distribution (Figure 33)

UNITED STATES OF AMERICA: Connecticut (Carlson 1979), Illinois (Heinrich 1962b), New York (Heinrich 1962b), North Carolina (Heinrich 1962b), Ohio (Heinrich 1962b).

Host

Unknown.

Male

Unknown.

Comments

The holotype of this species is one of the specimens that Townes and Townes (1951, p. 281) identified as *Platylabus rubricapensis* from New York. It also bears a label that reads

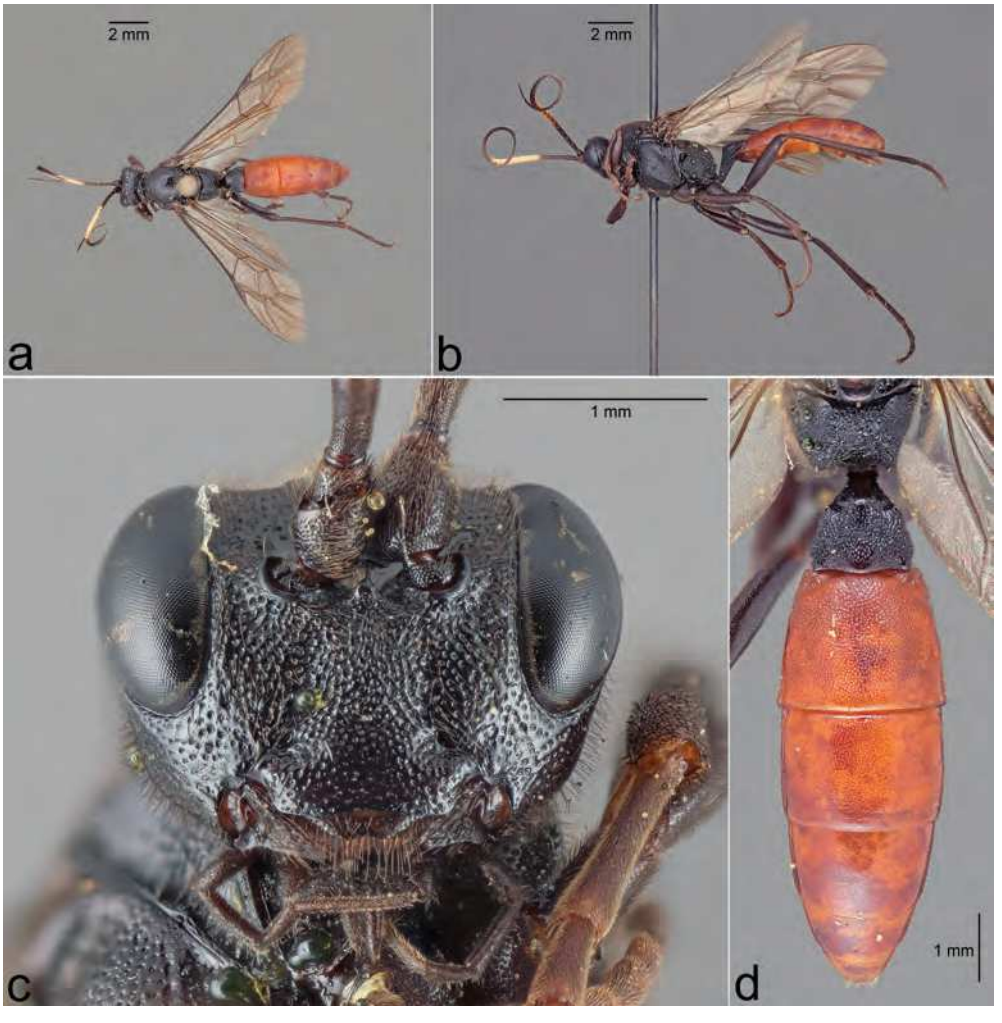

Figure 34. *Probolus detritus* (Brullé, 1846), ♀. a) Habitus, dorsal view. b) Habitus, lateral view. c) Head, frontal view. d) Propodeum and metasoma, dorsal view.

'HOMOTYPE *Platylabus rubricapensis*' (Figure 32d), which identifies the hypothesis of species that Townes had in 1941.

Probolus Wesmael, 1845

Ichneumon (*Probolus*) Wesmael, 1845: 150. Type species originally *Ichneumon fossorius* Linnaeus, 1758, by monotypy. This type species was set aside because it was misidentified, and a new type species *Ichneumnon culpatorius* Linnaeus, 1758 was fixed under ICZN Article 70.3.2, by Horstmann (2000).

Notes

Type species originally fixed as *Ichneumon fossorius* Linnaeus, 1758, by monotypy, with a second species *Ichneumon alticola* Gravenhorst, 1820 included with doubts (not

belonging to the originally included nominal species under ICZN 1999, Article 67.2.5). Wesmael (1845) did not cite an authorship for *I. fossorius*. Subsequent authors attributed the name incorrectly to Gravenhorst (1820) and recognised this as a different species (Ashmead 1900a, p. 19; Viereck 1914, p. 122; Townes et al. 1965, p. 509).

Gravenhorst (1820, p. 285) used the Linnean name subsequently and did not establish a new name. Under 'No. 9 *Ichneumon subsericans*', Gravenhorst reported *I. fosssorius* as used by Linnaeus and other authors, to belong to the species *I. subsericans* Gravenhorst, 1820. Under 'No. 10 *Ichneumon fossorius*', Gravenhorst (1820, p. 285) presented a species under the name *I. fossorius* and explained that he used this name in the sense of Fabricius (and Walckenaer and Müller), not of Linnaeus. Gravenhorst (1820) did not intend to establish a new name, but used subsequently the previously established name *I. fossorius* Linnaeus, 1758, in the taxonomic sense of Fabricius and other authorities. So, this usage was a misidentification of *I. fossorius* Linnaeus, 1758 sensu Fabricius, Walckenaer and Müller (Gravenhorst did not provide bibliographic references). Such a misidentified name cannot be taken to establish a new available name (ICZN 1999, Article 49). Thus, no new name was established, either by Fabricius or by Gravenhorst (1820).

Carlson (1979, p. 513) interpreted '*Ichneumon fossorius* Gravenhorst, 1820' as a deliberate misidentification of *Ichneumon fossorius* Linnaeus, 1758 by Gravenhorst (1829, p. 164). Such a case would fall under ICZN Articles 11.10 and 67.13, but only if the deliberately misidentified species was employed to establish a new genus or subgenus. This situation does not apply here. Wesmael (1845) did not demonstrate awareness of a misidentification when establishing *Probolus*.

Horstmann (2000) reported that Wesmael (1845) misidentified the type species (confirming previous statements by Wesmael (1848) and Wesmael (1853)), and that three female specimens in the collection matched the description of the *Probolus* type species by Wesmael (1845). These specimens belonged to *Ichneumon culpatorius* Linnaeus, 1758 in the taxonomic judgement of Horstmann (2000). Horstmann (2000) cited Article 70.3, stating that *I. culpatorius* Linnaeus, 1758 shall be the type, originally misidentified as *I. fossorius* in the type fixation by monotypy by Wesmael (1845). Horstmann (2000) attributed *I. fossorius* to 'Gravenhorst 1820'; however, incorrect authorship and date citations are immaterial in such acts, and in any case the authorship does not form part of the name (ICZN 1999, Articles 67.7 and 51.1). By this action Horstmann (2000) validly fixed *I. culpatorius* as the type species of *Probolus*.

***Probolus detritus* (Brullé, 1846)**

(Figures 4a, 34, 35)

Ichneumon detritus Brullé, 1846: 302 (descr.); Cresson 1862: 208 (dist.); Berthoumieu 1904: 44 (cat.); Townes 1944: 376 (as a synonym of *Ctenichneumon syphax* (Cresson)); Townes and Townes 1951: 296 (as a synonym of *Ctenichneumon syphax* (Cresson)).

Ichneumon indistinctus Provancher, 1875: 23, 75 (descr., key); *Ichneumon indistinctus* Berthoumieu 1904: 43 (cat.); Barron 1975: 487 (cat., syn.). Synonymised by Barron (1975: 487).

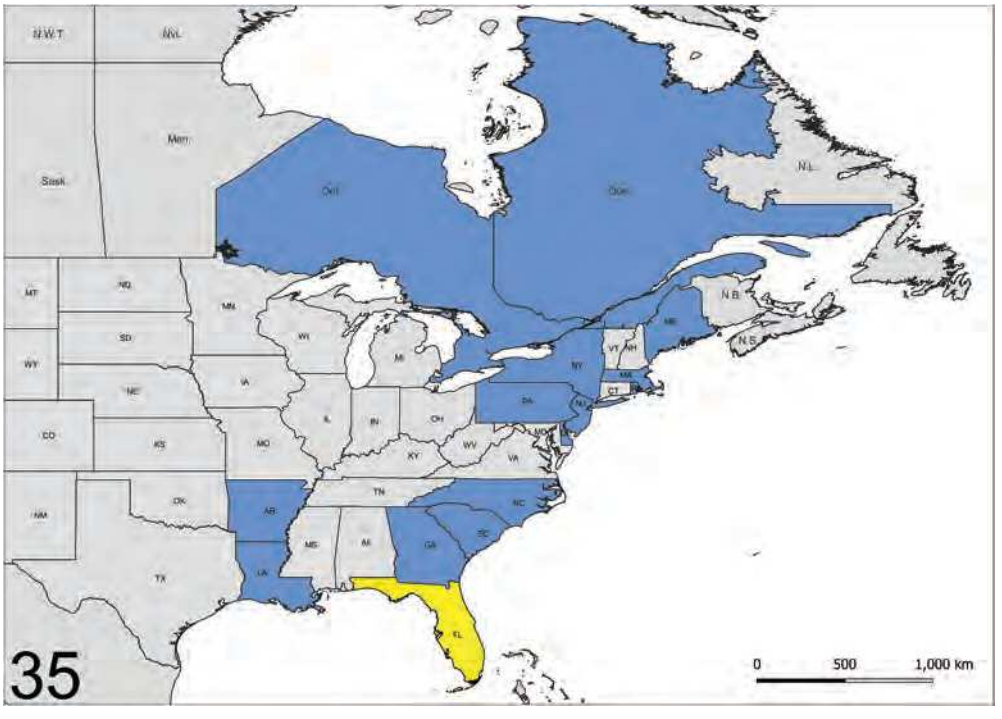

Figure 35. *Probolus detritus* (Brullé, 1846), distributional map: known records (in blue) and newly recorded state (in yellow).

Amblyteles illaetabilis Cresson, 1877: 190 (descr., key); Dalla Torre 1902: 817 (cat.); Berthoumieu 1904: 53 (cat.); Cresson 1916: 35 (cat.); Brimley 1938: 404 (dist.). Synonymised by Townes (1961: 107). Synonymised by Townes (1961: 107).

Amblyteles innotabilis [sic] Ashmead 1900b: 567 (cat., dist., incorrect subsequent spelling). First reviser (ICZN 1999, Article 24.2): Townes (1944: 319).

Amblyteles detritus Cresson 1877: 192 (descr., dist., key, notes); Provancher 1879: 11 (descr., key); Provancher 1883: 293, 299 (descr., dist., key); Cresson 1887: 184 (cat.); Smith 1890: 22 (dist.); Ashmead 1900b: 567 (cat.); Dalla Torre 1902: 809 (cat.); Johnson 1927: 144 (dist.); Cushman 1928: 923 (dist.); Johnson 1930: 98 (dist.).

Amblyteles indistinctus Cresson 1877: 192 (descr., dist., key); Provancher 1879: 11 (descr., key); Provancher 1883: 293, 300 (descr., dist., key); Cresson 1887: 189 (cat.); Smith 1890: 22 (dist.); Fyles 1894: 54 (dist.); Slosson 1896 (dist.); Ashmead 1900b: 567 (cat.); Dalla Torre 1902: 818 (cat.); Fyles 1916: 56 (dist.); Gahan and Rohwer 1917: 306 (cat., lectotype designation); Johnson 1930: 98 (dist.).

Amblyteles (*Amblytelesi*) *detritus* Viereck 1917: 360 (key).

Probulus illaetabilis Townes 1944: 319 (cat.); Fattig 1950: 30 (dist.); Townes and Townes 1951: 283 (cat., dist.).

Probulus indistinctus Townes 1944: 319 (cat.); Fattig 1950: 30 (dist.); Townes and Townes 1951: 283 (cat., dist.); Heinrich 1962a: 520 (as a synonym of *Probolus expunctus* (Cresson)).

Probulus detritus Townes 1961: 107; Heinrich 1962a: 519 (descr., dist., key, notes); Heinrich 1977: 121 (descr., dist., key, notes); Carlson 1979: 514 (cat.); Yu and Horstmann 1997: 640 (cat.); Yu et al. 2016.

Original type series

Syntypes ♀ of *Ichneumon detritus* (MNHN); lectotype ♂ of *Amblyteles illaetabilis* (ANSP); lectotype ♀ of *Ichneumon indistictus*, designated by Gahan and Rohwer (1917, p. 306) (LUEC).

Brullé (1846, p. 302) described *Ichneumon detritus* without specifying the number of specimens included in the description.

Townes (1944, p. 376) and Townes and Townes (1951, p. 283) did not specify any number of specimens either. Later on, Heinrich (1962a, p. 519) referred to the specimen as the 'Holotypus'. Heinrich's (1962a, p. 776) employment of the term 'holotypus' did not constitute a valid lectotype designation (ICZN 1999, Article 74.5). In this paper, we decided to take a more conservative approach, referring to the specimen(s) as 'syntypes' ICZN (1999, Article 73.2).

Cresson (1877, p. 190) described *Amblyteles illaetabilis* without specifying the number of specimens included in the description. Cresson (1916, p. 35), in his list of types, simply reported the type to be a male from Georgia and 'In good condition', without clarifying the number of specimens. Townes (1944, p. 319) and Townes and Townes (1951, p. 283) did not specify any number of specimens either. Later on, Heinrich (1962a, p. 519) referred to the specimen as the 'Holotypus'. Carlson (1979, p. 317) stated that Cresson (1916) 'indicated which single specimen was to be regarded as the type for each; thus he selected lectotypes for those cases in which he had described a species from more than one specimen'. Hopper (1984, p. 968) reported being unable to see how it can be claimed that Cresson (1916) indicated a single specimen to be the type. This statement contradicted Cresson's (1916, p. 1) own statement that 'In selecting the single type the author has been governed by the present condition of the original material, and has always selected the perfect, or more nearly perfect specimen'. Furthermore, it suggests that Hopper (1984) overlooked this clear indication of Cresson's (1916) intention of selecting a single name-bearing type (i.e. a lectotype in the modern sense). Cresson's (1916) lectotype designation was valid and no subsequent lectotype designation has any validity (ICZN 1999, Article 74.1.1). The fact that the selected specimen eventually could no longer be traced, as suggested by various subsequent authors (Heinrich 1962b, p. 780; Hopper 1984), could be explained by collection mismanagement and has no influence on the validity of the lectotype selection. Only a careful study of Cresson's collection can provide more insights. Heinrich's (1962a, p. 519) employment of the term 'holotypus' was in errror.

Provancher (1875, p. 75) described *Ichneumon indistinctus* from Québec without specifying the number of specimens included in the description. Gahan and Rohwer (1917, p. 306) designated the lectotype, addressing it as 'Type– Female, yellow label 185. 2nd Coll. Pub. Mus., Quebec'. Subsequently, Heinrich (1962a, p. 519) incorrectly employed the term 'Holotypus' for the same specimen. Barron (1975, p. 487) considered valid the designation of Gahan and Rohwer (1917, p. 75).

Type locality

United States of America, 'la Caroline' (*Ichneumon detritus*), Georgia (*Amblyteles illaetabilis*); Canada, Québec (*Ichneumon indistinctus*).

Brullé (1846, p. 304) reported *Ichneumon detritus* for 'la Caroline'. The same author, when reporting the locality for *Ephialtes irritatus* Fabricius, stated 'l'Amérique du Nord (la Caroline)'. It is not clear what Brullé (1846, p. 304) was referring to with 'la Caroline' – possibly the region encompassed by the two Carolinas (North and South).

Type specimens examined

Syntypes ♀ of *Ichneumon detritus*: '[White round label] *Caroline/L'herminier* // [White label] *Ich./detritus Br.* // [White label, red writing] TYPE // [Green label] MUSEUM PARIS // [White label] Muséum Paris/EY9952' (images examined; available at https://science.mnhn.fr/institution/mnhn/collection/ey/item/ey9952)

Material examined

UNITED STATES OF AMERICA, FLORIDA: Okaloosa Co., 1 mi. N. Holt, Blackwater River For., 03 November 1978, leg. L. Stange & H.V. Weems, Jr., 1♀ (FSCA).

Updated distribution (Figure 35)

CANADA: Ontario (Heinrich 1962a), Québec (Provancher 1875; Fyles 1894); UNITED STATES OF AMERICA: Arkansas (Heinrich 1977), Delaware (Cresson 1877), Florida (**new state record**), Georgia (Cresson 1877; Fattig 1950), Louisiana (Heinrich 1977), Maine (Cresson 1877; Heinrich 1962a), Massachusetts (Cresson 1877; Johnson 1930), New Hampshire (Cresson 1877; Slosson 1896), New Jersey (Cresson 1877; Smith 1890), New York (Cresson 1877; Cushman 1928), North Carolina (Heinrich 1962a), Pennsylvania (Cresson 1877; Heinrich 1962a), Rhode Island (Heinrich 1962a), South Carolina (Heinrich 1962a).

Host

Unknown.

Male

The syntypes of *Amblyteles illaetabilis* Cresson, 1877 are males and thus their description functions as a description of the male. Moreover, Heinrich (1962a, p. 520) also provided a description of the males.

Comments

The taxonomic history of *detritus* is complicated. Cresson (1877, p. 192) synonymised *Ichneumon syphax* Cresson, 1864 under *Amblyteles detritus* (Brullé, 1846). Conversely, Townes (1944, p. 376) transferred *syphax* under the genus *Ctenichneumon*, and synonymised *detritus* under *syphax* disregarding that detritus was the senior name that should have had precedence (ICZN 1999, Article 23.1). In the same work, Townes (1944, p. 319) maintained as valid both *illaetabilis* and *indistinctus*, transferring them under the genus *Probolus*. This view was followed by Townes and Townes (1951, p. 283, 296). After Townes (1961, p. 107) examined the syntypes at MNHN, *detritus* was resurrected and transferred to the genus *Probolus*, treating *Amblyteles illaetabilis* as its synonym. Heinrich (1962a, p. 519)

followed Townes' (1961, p. 107) view, but treated *indistictus* as a synonym of *Probulus expunctus* (Cresson, 1864). It was Barron (1975, p. 487) who, based on the original type series of *indistinctus*, recognised *indistictus* as junior synonym of *detritus* instead of *expunctus*.

Tropicolabus Heinrich, 1959

Tropicolabus Heinrich, 1959: 216. Type species *Platylabus foxi* Davis, 1898, by original designation.

Comparative diagnosis

Heinrich (1959, p. 216), and later Heinrich (1962b, p. 754), specified that *Tropicolabus* differed from *Platylabus* because of the 'upwards curbed [sic] apophyses of the propodeum', a character shared instead with *Ambloplisus*. After a careful examination of the type species and the first female, it is safe to conclude that the upward apophyses are in fact simply tooth-like projections formed by the conjunction of the strongly lamellate propodeal carinae (Figure 37b). This character can be seen in several other Platylabini species (e.g. *Platylabus clarus*), and does not constitute apophyses as in the case of *Ambloplisus ornatus* (Figure 37a) or as delineated by Ronquist and Nordlander (1989). Therefore, the primary diagnostic character proposed by Heinrich (1959) during the

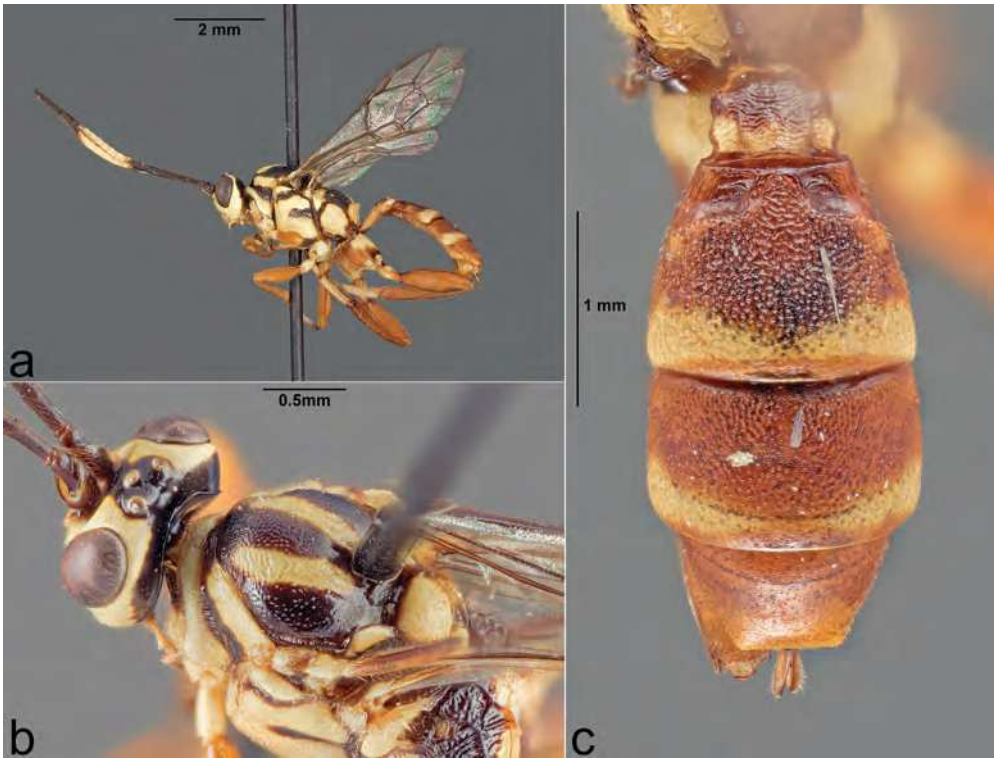

Figure 36. *Tropicolabus foxi* (Davis, 1898), ♀. a) Habitus, lateral view. b) Mesoscutum and head, dorsolateral view. c) Metasoma, dorsal view.

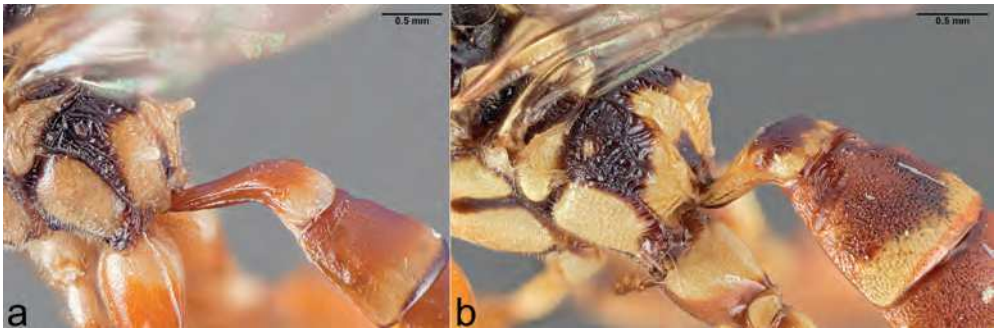

Figure 37. Propodeum and metasoma, dorso-lateral view. a) *Ambloplisus ornatus* (Cresson, 1868). b) *Tropicolabus foxi* (Davis, 1898).

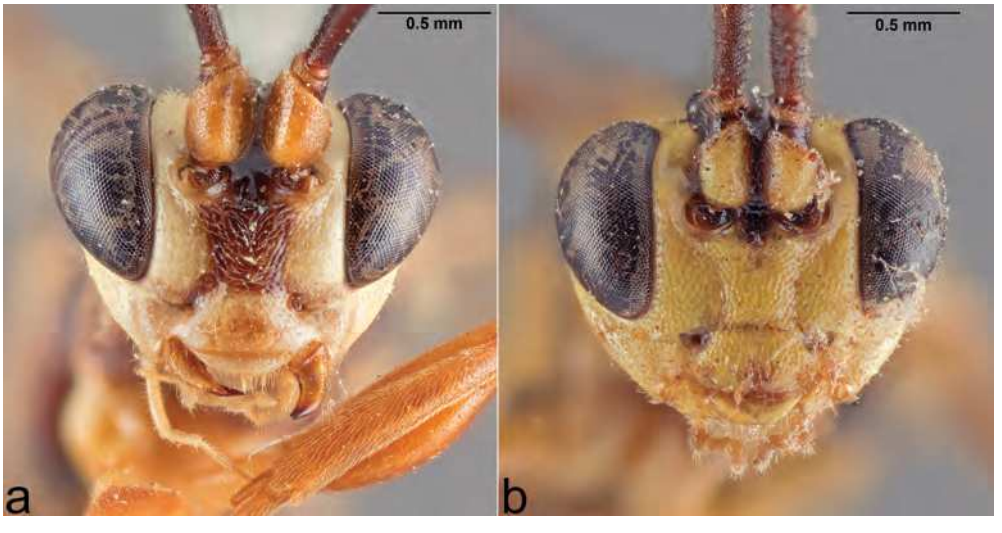

Figure 38. Face, frontal view. a) *Ambloplisus ornatus* (Cresson, 1868), holotype ♀. b) *Tropicolabus foxi* (Davis, 1898), holotype ♀.

establishment of the new genus does not allow an unambiguous separation between *Tropicolabus* and *Platylabus*. However, we do not feel the need to synonymise the two genera (and therefore restore the original combination for the species), to avoid further complications within the tribe. For the purpose of this contribution, *Tropicolabus* can be easily separated from *Platylabus* employing other characters, one of which was not previously mentioned by Heinrich (1959, 1962b). According to our examination, *Tropicolabus* can be distinguished from *Platylabus* by the following combination of characters: presence of twisted mandibles, appearing unidentate in frontal view (bidentate in *Platylabus*); the predominantly smooth and shining mesoscutum, with dense punctures only in the anterior half (Figure 36b); and lamellate propodeal carinae (Figure 37b) (never lamellate in *Platylabus*).

The misinterpretation of the propodeal tooth-like projection also impacts the separation between *Tropicolabus* and *Ambloplisus*, which can now be easily distinguished by the

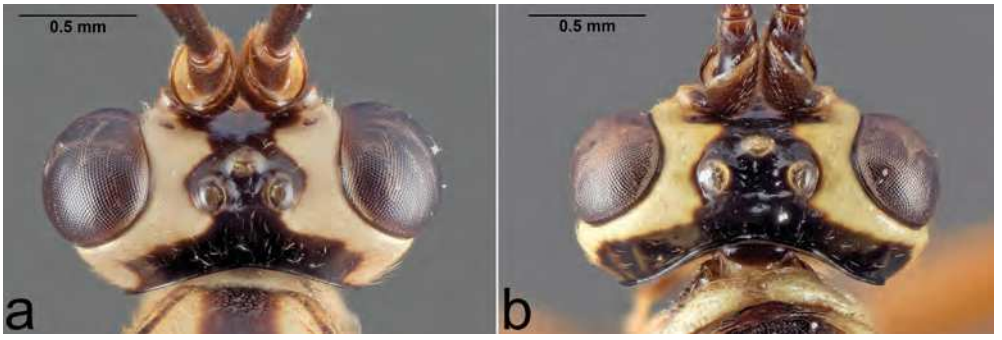

Figure 39. Head, dorsal view. a) *Ambloplisus ornatus* (Cresson, 1868), ♀. b) *Tropicolabus foxi* (Davis, 1898), ♀.

following characters: the tooth-like propodeal carinae (Figure 37b) (and not long apophyses as in *Aploplisus*, Figure 37a); the strongly impressed gastrocoeli and thyridia as large as or larger than the space between them, the strong and large gastrocoeli (Figure 36c) (superficial and small in *Amploplisus*, Figure 5d); the broad genae in frontal view (Figure 38b) (convergent in *Ambloplisus*, Figure 38a); temples roundly narrowed in dorsal view (Figure 39b) (steeply, almost concavely narrowed in *Ambloplisusi*, Figure 39a) the propodeum with the area superomedia separated from the area basalis (Figure 37b) (a single elongate area in *Ambloplisus*, Figure 5c).

Range and diversity

The genus is monotypic and, so far, has been recorded only in the Nearctic, even though some comments in Santos et al. (2021, supplement S8) seem to confirm its presence in Costa Rica (unpublished material). Heinrich (1962b, p. 755) already hypothesised a more tropical distribution of the genus based on the rich yellow colour pattern on the thorax, typical of Neotropical species. Prior to this contribution, the genus was known only for the north-eastern United States and only from the type locality.

Tropicolabus foxi (Davis 1898)

(Figures 36, 36c, 37b, 38b, 39b, 40d-f, 41)

Platylabus foxi Davis, 1898: 352 (descr.); Ashmead 1900b: 567 (cat.); Dalla Torre, 1900: 783 (cat.); Bradley 1903: 282 (cat., key); Cresson 1928: 17 (cat.); Townes 1944: 314 (as a synonym of *Thaumatoteles ornatus* (Cresson)).

Platylabus Foxy; Bethoumieu, 1904: 57 (cat.).

Tropicolabus foxi Heinrich 1959: 216 (cat., notes, resurrection); Heinrich 1962b: 754 (descr.); Carlson 1979: 546 (cat.); Yu and Horstmann 1997: 683 (cat.); Yu et al. (2016).

Original type series

Holotype ♂, by monotypy (ANSP). Davis (1898, p. 353) clearly stated that the description was based on only 'One specimen from Camden, N.J'. This specimen can be referred to as the holotype designated by monotypy (ICZN 1999, Article 73.1.2).

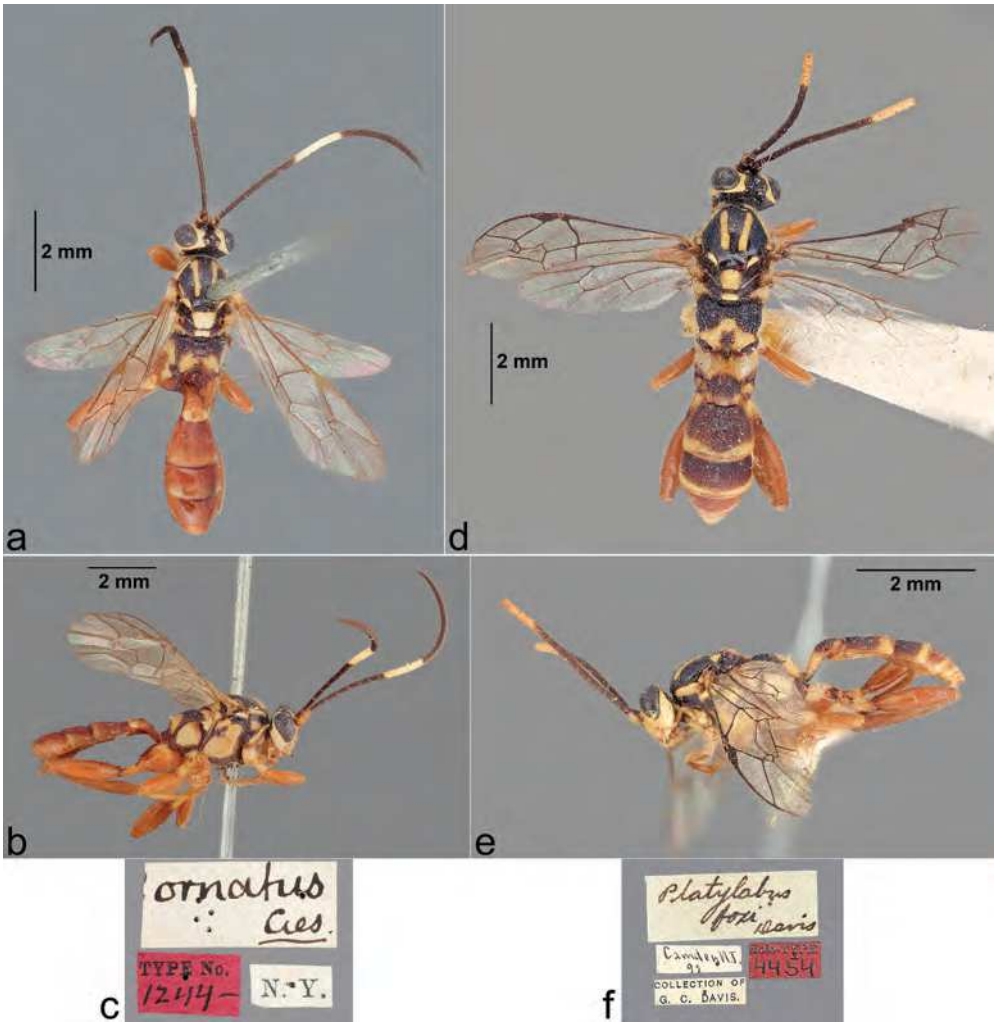

Figure 40. Comparison of holotypes of *Ambloplisus ornatus* (Cresson, 1868) and *Tropicolabus foxi* (Davis, 1898). a) *Ambloplisus ornatus* (Cresson, 1868), habitus, dorsal view. b) *Ambloplisus ornatus* (Cresson, 1868), habitus, lateral view. c) *Ambloplisus ornatus* (Cresson, 1868), labels. d) *Tropicolabis foxi* (Davis, 1898), habitus, dorsal view. e) *Tropicolabus foxi* (Davis, 1898), habitus, lateral view. f) *Tropicolabis foxi* (Davis, 1898), labels.

Type locality

United States of America, New Jersey, Camden.

Type specimens examined (Figures 38b, 40d-f)

Holotype: '[White label] *Camden N.J./92* // [White label] *Platylabus/foxi/Davis/*[White label] COLLECTION OF/G. C. DAVIS. // [Red label] Holo-TYPE/*4454*' (specimen examined).

Material examined

UNITED STATES OF AMERICA, FLORIDA: Alachua Co., Gainsville, Beville Hts., 02 July 1980, Black Light Trap, L.A. Stange, 1♀ (FSCA).

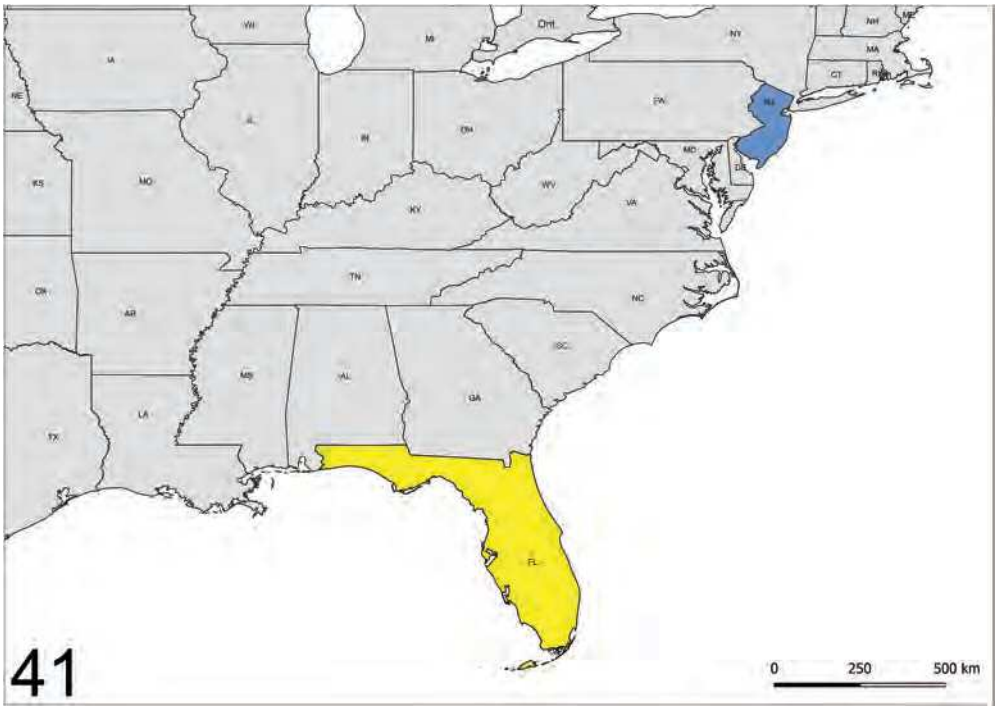

Figure 41. *Tropicolabus foxi* (Davis, 1898), distributional map: known records (in blue) and newly recorded state (in yellow).

Updated distribution (Figure 41)

New Jersey (Davis 1898); Florida (**new state record**).

Host

Unknown

Female

Hereby described for the first time (see below).

Comments

Davis (1898, p. 352) described *Platylabus foxi* based on a single male specimen from Camden (New Jersey). The taxon was later synonymised under *Thaumatoteles ornatus* (= *Ambloplisus ornatus*) by Townes (1944, p. 314) without adding any evidence or comments for the new synonym. Heinrich (1959, p. 216), after examining the holotype, resurrected *foxi*, noting that it can be easily distinguished from *Ambloplisus ornatus* by the characters mentioned above (see Comparative diagnosis).

The specimen hereby examined and described represents the first record since the original description as well as the first record for the south-eastern United States, and the first female of the species. The current scattered distribution (Figure 40f) indicates that the

species has been overlooked in collections for many years, due to the considerable chromatic convergence with *Ambloplisus ornatus*.

Description of female (Figures 36, 37b, 39b)

Body length about 8.5 mm. Fore wing length 6 mm.

Colour. Head mostly yellowish white, with frons, ocellar triangle, central part of vertex, temple (except for outer orbit), and occiput (except ventral part) black; central part of clypeus and apical segments of maxillary palpi orangish yellow; flagellum dark brown-black, with ventral part of scape and flagellomeres 6/7 to 13/14 yellowish white. Mesosoma mostly yellowish white, with the following black: pronotal collar, meoscutum (except two yellow central lines), area below subtegular ridge, the area corresponding to the mesopleural pit, most of the mesopleuron, axilla, anterior part of propodeum, and posterior part of area petiolaris; fore and mid leg reddish orange with coxae and trochanters yellowish white, hind leg reddish orange with a yellowish-white spot on dorsal side of coxa and trochanter, and segments 3–5 of tarsus infuscate; wing hyaline. Metasoma mostly reddish orange, with tergite 1 yellowish white and a dark brown spot on postpetiole, and tergites 1–3 each with a yellowish-white continuous posterior band.

Head. Face about 0.4–0.5× as high as wide (width between compound eyes at level of antennal socket; height from antennal socket to clypeal suture), moderately matt with well-defined and dense punctation; clypeus matt with dense punctation, concave in lateral view and with apical margin lenticular in frontal view, tentorial pit relatively large and well defined; mandible twisted, with internal tooth 0.5× as long as external tooth; malar space 1.5–1.6× as long as mandible width; malar sulcus absent. Frons smooth right behind antennal sockets, transversely irregularly striate going towards front ocellus; ocellar triangle slightly elevated, distance between lateral ocellus and internal margin of eye about 0.9× as long as interocellar distance; vertex smooth and shagreened. Gena smooth, shining, without punctation, and roundly narrowed behind eye in dorsal view; occipital carina complete, meeting hypostomal carina at base of mandible. Antenna with 23 flagellomeres (antenna broken), with 13–23 flagellomeres ventrally flattened.

Mesosoma. Pronotal neck and ventral part of pronotum matt and coarsely rugose, central part of pronotum smooth and shining with irregular, short striations, dorsolateral part of pronotum matt with rugose coarse punctures; epomia indistinct. Mesoscutum matt, rugose punctate in anterior part, with wrinkles where notauli are located, and smooth and impunctate towards the middle and posterior part, notaulus distinguishable only in anterior part; scutellum slightly elevated above metascutellum, globular, matt, and indistinctly rugose-punctate, lateral carina of scutellum present and reaching apex. Mesopleuron, except for speculum, shining with superficial punctures, speculum smooth without any punctures. Mesosternum almost matt, with dense and superficial punctures, posterior transverse carina absent at level of middle coxa. Metapleuron densely punctured throughout, juxtacoxal carina present but weak. Propodeum irregularly wrinkled with area superomedial well separated from area basalis which is slightly projecting in short tooth-like projections; area externa well separated from area dentipara, area petiolaris well defined. Fore wing areolet rhomboidal, 1cu-a

slightly distal to M&RS. Fore and middle coxa polished and shining on dorsal side, matt and irregularly punctured on ventral side; hind coxa densely punctured on ventral side, shining and smooth on dorsal side.

Metasoma. Metasoma modified, with only 5 tergites visible in dorsal view. T1 dorsally flattened with lateral carinae running across entire length of tergite, postpetiole from rugose to striate, median field slightly indicated; T2 anteriorly rugose and medio-posteriorly punctate, gastrocoeli and thyridia wider that space between them, gastrocoeli irregularly striate; T3 densely punctate anteriorly, sparsely punctate posteriorly; rest of metasoma superficially and sparsely punctate; hypopygium large, covering base of ovipositor; ovipositor slightly downcurved.

Discussion

As already discussed by Klopfstein et al. (2019), Ichneumonidae are severely understudied and lack many modern taxonomic contributions despite being one of the largest families among insects (Broad et al. 2018). In this framework, even though Heinrich's extensive work and knowledge of the subfamily Ichneumoninae have been a fundamental contribution to the advancement of taxonomic knowledge of the group, several issues for the subfamily still need to be resolved, even in the Nearctic, as can be observed also from the present contribution.

Based on data from Yu et al. (2016), the distribution of Nearctic Ichneumoninae is fragmentary, with most states of the US and provinces of Canada recording less than 50 species in a total Nearctic fauna of more than 700 species (Figures 42, 43). The eastern part of the US is better studied than the rest of the country (Figure 43), but a large number of undetermined specimens, housed in different collections, need to be studied, and several genera with many undescribed species (DDP pers. observ.) will require revisionary works in order to produce meaningful taxonomic treatments, aiming to continue and improve Heinrich's legacy.

The elucidation of misidentifications in the literature (e.g. *Tropicolabus foxi* being identified as *Ambloplisus ornatus*) could affect our understanding of the distribution of species. However, it is impossible now to assess the dimensions of this phenomenon, and a thorough study of the original type series of both Cresson's and Provancher's collections will be necessary to improve the curation of the already existing names, an action as essential as propsing new species names, especially in extremely diverse families like Ichneumonidae (Zamani et al. 2022a, 2022b).

Another set of problems resides in the compilation of previous catalogues. As noted by Broad (2021), Yu et al. (2016) is an invaluable resource for ichneumonoid workers, but it is not devoid of issues. In our specific case, some distributional records were not recorded by Yu et al. (2016) (e.g. *Cyclolabus gracilicornis gracilicornis*), some taxonomic combinations were not reported (e.g. *Platylabus clarus*) and, in a few cases, some references were not included (e.g. Johnson 1927). Even if these issues can be considered trivial, their correction is essential for a comprehensive knowledge of the taxon, and if not resolved, they could potentially misguide researchers over time. Therefore, we encourage the community to carefully and thoroughly check the entire literature when compiling taxonomic treatments. In the future, an online updatable catalogue (like Myriatrix (Martínez-Muñoz

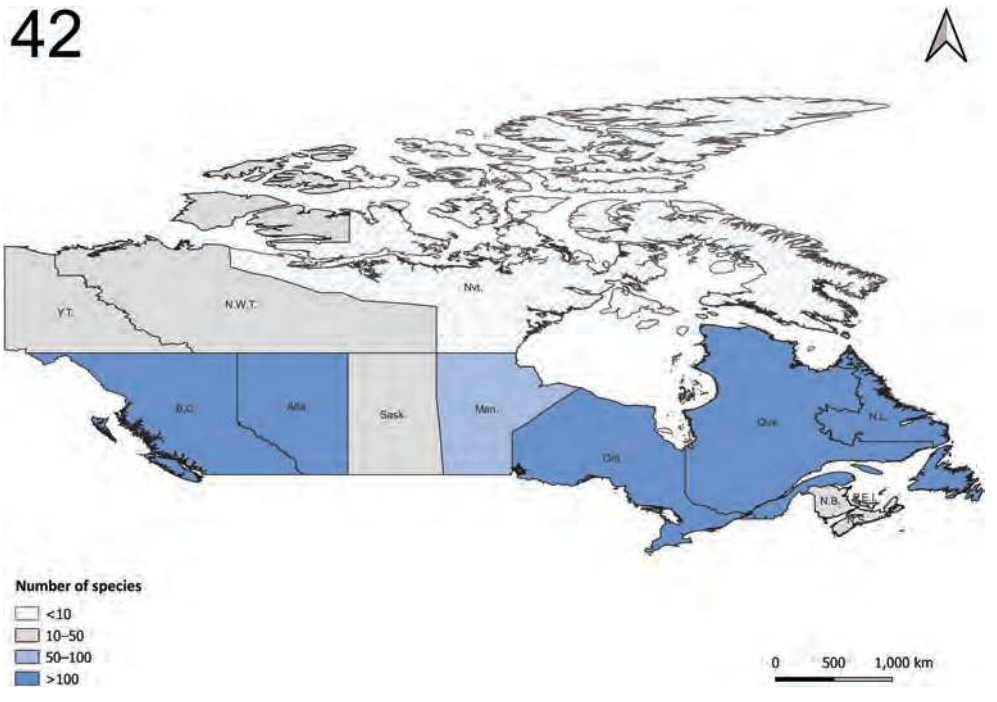

Figure 42. Number of Ichneumoninae species per region in Canada.

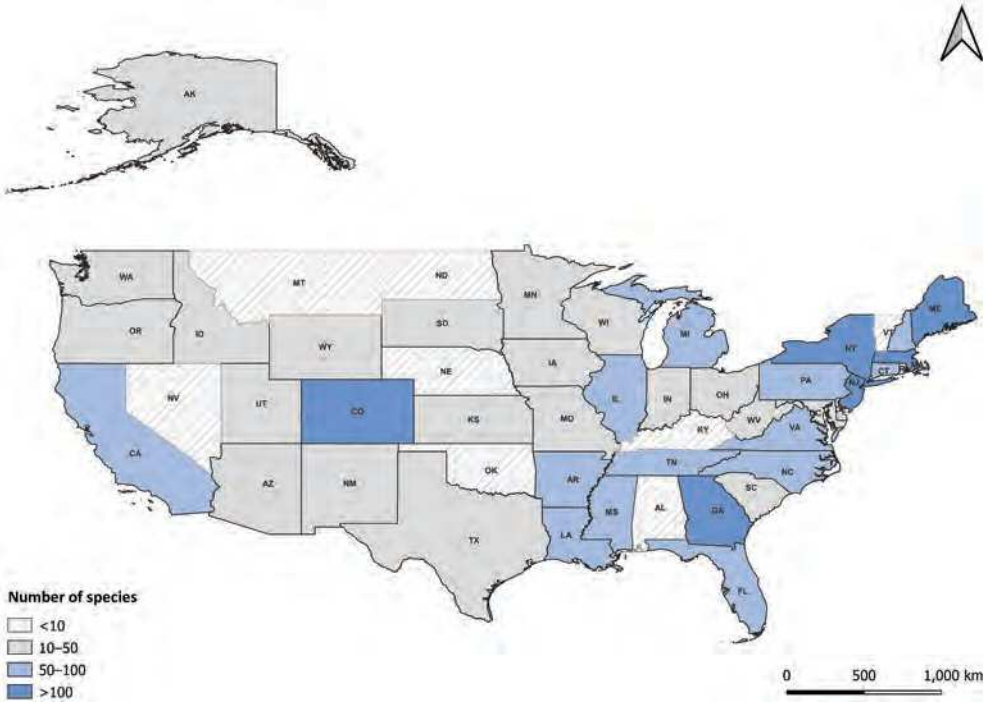

Figure 43. Number of Ichneumoninae species per state in the United States of America.

2019), available from: http://myriatrix.myspecies.info) will probably be essential for the correct advancement of the taxonomy of the entire family Ichneumonidae.

Acknowledgements

We are very grateful to Stefan Schmidt and Olga Schmidt (ZSM) for their constant support and availability in providing images and specimens of Ichneumoninae from Heinrich's collection. We thank Elijah Talamas (FSCA), Istvan Mikó (UNHC), Kaloyan Ivanov (VMNH) and Sandor Kelly (UCFC), for allowing the study of specimens in their respective collections, and for supporting the first author (DDP) over the years (in one way or another). We are indebited to Joseph Moisan-De Serres (LUEC) for sending us the images from Provancher's collection, and Brandon Claridge (EMUS) for taking the time to image *Cyclolabus carolinensis* and *Platylabus rurbisternatus*. DDP is very grateful to Carlos Alberto Martínez Muñoz (Zoological Museum, University of Turku, Finland) for the many and continuous discussions over correct taxonomic practice as well as for insights regarding the Code. A big thanks goes to Jason Weintraub and Greg Cowper (ANSP) for their availability, kindness and support when DDP visited the collection; Daniele Sommaggio (University of Bologna, Italy) for crucial comments on an early draft of the paper; Marco Uliana (Natural History Museum of Venice, Italy) for a thorough review before submission; and Barbara Sharanowski (University of Central Florida, Orlando) for supporting the conception and development of the paper. We also thank Gavin Broad (NHMUK) for thoroughly reviewing the manuscript, providing insights that substantially improved the overall product. DDP is also grateful to Alessandra Pandolfi (University of Central Florida, Orlando) for her constant support over the years and for taking up the challenge of a life among insects. Without all of the above-mentioned scientists, friends and collegues, this paper would have never been completed. Funding support for this project was partially provided by the National Science Foundation (NSF) (Award Number: DEB-1916914) granted to Dr Barbara Sharanowski.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

The authors reported there is no funding associated with the work featured in this article.

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