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# Identity and synonymy of *Dicroscelio* Kieffer and description of *Axea*, a new genus from tropical Africa and Asia (Hymenoptera: Platygastroidea: Platygastridae)

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## Table of contents

Introduction ..... 2
Materials ..... 3
*Dicroscelio* Kieffer ..... 4
List of world species of *Dicroscelio* ..... 7
*Axea* Masner & Johnson, **n.gen.** ..... 9
Key to world species of *Axea* ..... 12
*Axea adro* Valerio & Yoder, **n.sp.** ..... 13
*Axea atai* Valerio & Yoder, **n.sp.** ..... 15
*Axea atriceps* (Kieffer), n.comb. ..... 17
*Axea dorothae* Valerio & Yoder, **n.sp.** ..... 20
*Axea eshu* Valerio & Yoder, **n.sp.** ..... 23
*Axea fisherhala* Valerio & Yoder, **n.sp.** ..... 23
*Axea kalanoro* Valerio & Yoder, **n.sp.** ..... 25
*Axea kilen* Valerio & Yoder, **n.sp.** ..... 26
*Axea mena* Valerio & Yoder, **n.sp.** ..... 29
*Axea mwari* Valerio & Yoder, **n.sp.** ..... 31
*Axea nommo* Valerio & Yoder, **n.sp.** ..... 32
*Axea talana* Valerio & Yoder, **n.sp.** ..... 34
*Axea yama* Valerio & Yoder, **n.sp.** ..... 36
*Axea yasigi* Valerio & Yoder, **n.sp.** ..... 37
*Axea yurugu* Valerio & Yoder, **n.sp.** ..... 39
*Axea zanahary* Valerio & Yoder, **n.sp.** ..... 41
Acknowledgments ..... 43

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## Abstract

*Dicroscelio* Kieffer is proposed as the senior synonym of *Anteromorpha* Dodd, *Govinda* Nixon, *Aegyptoscelio* Priesner, and *Afroscelio* Risbec, **new synonymies**. Members of the genus are found worldwide, but is most diverse in the Afrotropical and Oriental regions. The generic synonymies result in the following new combinations: *D. abdominalis* (Sundholm), **new comb.**, *D. africanus* (Risbec), **new comb.**, *D. ancillus* (Kozlov & Lê), **new comb.**, *D. cernatus* (Kozlov & Lê), **new comb.**, *D. cuberatus* (Kozlov & Lê), **new comb.**, *D. deccanensis* (Sharma), **new comb.**, *D. depressus* (Galloway), **new comb.**, *D. dubiosus* (Perkins), **new comb.**, *D. ferrierei* (Masner), **new comb.**, *D. frequens* (Priesner), **new comb.**, *D. glaber* (Sharma), **new comb.**, *D. incertus* (Nixon), **new comb.**, *D. latus* (Sundholm), **new comb.**, *D. malabaricus* (Narendran), **new comb.**, *D. nonus* (Nixon), **new comb.**, *D. obscurus* (Sundholm), **new comb.**, *D. poussi* (Risbec), **new comb.**, *D. reus* (Nixon), **new comb.**, *D. rufipes* (Ashmead), **new comb.**, *D. tuberculatus* (Sharma), **new comb.**, *D. ueleensis* (Risbec), **new comb.**, *D. undinus* (Nixon), **new comb.** Lectotypes are designated for *Anteromorpha australica* Dodd and *Afroscelio poussi* Risbec.

The name *Dicroscelio* was misapplied by Masner for an undescribed genus in the tribe Scelionini *s.str.; Axea* Masner & Johnson **n.gen.**, is formally described, and 16 species are treated: *A. adro* Valerio & Yoder **n.sp.**, *A. atai* Valerio & Yoder **n.sp.**, *A. atriceps* (Kieffer) **n.comb.**, *A. dorothae* Valerio & Yoder **n.sp.**, *A. eshu* Valerio & Yoder **n.sp.**, *A. fisherhala* Valerio & Yoder **n.sp.**, *A. kalanoro* Valerio & Yoder **n.sp.**, *A. kilen* Valerio & Yoder **n.sp.**, *A. mena* Valerio & Yoder **n.sp.**, *A. nommo* Valerio & Yoder **n.sp.**, *A. mwari* Valerio & Yoder **n.sp.**, *A. talana* Valerio & Yoder **n.sp.**, *A. yama* Valerio & Yoder **n.sp.**, *A. yasigi* Valerio & Yoder **n.sp.**, *A. yurugu* Valerio & Yoder **n.sp.**, and *A. zanahary* Valerio & Yoder **n.sp.**

**Key words:** Scelionidae, Platygastridae, Discroscelio, Axea, tropical Africa, Asia, taxonomy, key

*urn:lsid:zoobank.org:pub:36048C9E-A505-44EB-BF7C-5D001B4B1D5A*

## Introduction

The genus *Anteromorpha* Dodd (*sensu* Masner 1976, 1980) is a widespread group of platygastrid wasps of the subfamily Scelioninae characterized by a flat, platelike metascutellum, the presence of fanlike striae arising from the base of the mandibles, the absence of a skaphion, a *Scelio*-type ovipositor, and, in general, an elongate, depressed body. Member species are found on all continents, save Antarctica, but appear to be most diverse in tropical Africa and Asia.

We recently studied the holotype of the type species of *Dicroscelio* Kieffer, deposited in the collection of the Muséum National d'Histoire Naturelle (Paris). This genus was included in the key to world genera of Masner (1976) as a member of the tribe Scelionini *sensu stricto*. We were surprised to discover that the type species *Dicroscelio flavipes* Kieffer does not conform to Masner's concept of *Dicroscelio*. Rather, it belongs to *Anteromorpha*, and because Kieffer's description predates that of Dodd, this discovery precipitates a series of nomenclatural changes. *Dicroscelio sensu* Masner is a new genus, described below, and the species of this group are also described.

This work is a product of the Platygastroidea Planetary Biodiversity Inventory, a project funded by the U.S. National Science Foundation (N.F. Johnson and A.D. Austin, University of Adelaide, principal investigators). One of the primary objectives of this project is to use biodiversity informatics tools to accelerate the taxonomic process and to make real-time collaboration possible among the narrow community of researchers with appropriate expertise. The contributions of the individual authors are: A.A. Valerio: species concept development, key development, imaging, databasing of specimen data; M.J. Yoder: species concept development, key development, imaging, databasing of specimen data; L. Masner: character definition, generic concept development, species concept development, development of collection; N.F. Johnson: project coordination, character definition, generic concept development, imaging, manuscript preparation. The authorship of the new taxa reflects the contribution of each individual.

**Materials**

This work is based upon specimens in the following collections: CASC, California Academy of Sciences, San Francisco, CA[1]; CNCI, Canadian National Collection of Insects, Ottawa, Ontario, Canada[2]; ISNB, Institut Royal des Sciences Naturelles de Belgique, Brussells, Belgium[3]; MNHN, Muséum National d'Histoire Naturelle, Paris, France[4]; OSUC, C.A. Triplehorn Insect Collection, Columbus[5], OH; ROME, Royal Ontario Museum, Toronto, Ontario, Canada[6]; SAMA, South Australian Museum, Adelaide, Australia[7]; SAMC, Iziko Museums of Cape Town, South Africa[8]; USNM, National Museum of Natural History, Washington, DC[9]; WINC, Waite Insect and Nematode Collection, Adelaide, South Australia, Australia[10].

Abbreviations and morphological terms used in text: A1, A2, ... A12: antennomere 1, 2, ... 12; claval formula: distribution of the large, multiporous basiconic sensilla on the underside of apical antennomeres of the female, with the segment interval specified followed by the number of sensilla per segment (Bin 1981); OOL: ocular ocellar line, shortest distance from inner orbit and outer margin of lateral ocellus (Masner and Huggert 1989); S1, S2, ... S6: metasomal sternite 1, 2, ... 6; T1, T2, ... T7: metasomal tergite 1, 2, ... 7; T1 depression: sublateral impression on the first metasomal tergite into which the inner propodeal projection fits. Morphological terminology otherwise follows Masner (1980) and Mikó et al. (2007).

Under the Material Examined sections, the locality data reported for holotypes are not literal transcriptions of the labels: abbreviations are expanded, additional data from the collectors is also included. Holotypes should be unambiguously identifiable by means of the unique identifier or the red holotype label. The numbers prefixed with "OSUC " and "CASENT " are unique identifiers for the individual specimens. Details on the data associated with these specimens may be accessed at the following link, http://purl.oclc.org/NET/hymenoptera/hol, and entering the identifier in the form.

The species descriptions are generated by a database application, vSysLab[11], designed to facilitate the generation of taxon by character data matrices, to integrate these with the existing taxonomic and specimen-level database, and to export the data both as text and as input files for other applications. The output is in the format of "Character: Character state(s)." Images were taken with a JVC 3 CCD camera (model KY-575U) attached to a Leica Z16 APO with a Planapo 1.0x objective. Specimens were illuminated with a 4 channel LED dome light from Advanced Illumination with light levels at maximum output. Figures were produced from stacks of images that vertically transected the specimen. These were combined automatically into a single image using Auto-Montage Pro version 5.1 or Cartograph. For those images produced with Auto-Montage the resulting image was in most cases manually corrected. Some images were post-processed for contrast and light levels in Adobe™ Photoshop© or similar software. The individual images are archived with MorphBank[12] and at the image database at The Ohio State University.[13] A standard set of images is presented for each species, supplemented by additional images to help clarify specific points.

In this article we have followed the precedent of Pyle *et al.* (2008) in the implementation of biodiversity informatics standards within a taxonomic publication. The electronic version of the paper contains hyperlinks

1. http://biocol.org/urn:lsid:biocol.org:col:1011
2. http://biocol.org/urn:lsid:biocol.org:col:1012
3. http://biocol.org/urn:lsid:biocol.org:col:33545
4. http://biocol.org/urn:lsid:biocol.org:col:33864
5. http://biocol.org/urn:lsid:biocol.org:col:1014
6. http://biocol.org/urn:lsid:biocol.org:col:1017
7. http://biocol.org/urn:lsid:biocol.org:col:34982
8. http://biocol.org/urn:lsid:biocol.org:col:1018
9. http://biocol.org/urn:lsid:biocol.org:col:1019
10. http://biocol.org/urn:lsid:biocol.org:col:34593
11. http://purl.oclc.org/NET/hymenoptera/vSysLab
12. http://www.morphbank.net
13. http://purl.oclc.org/NET/hymenoptera/specimage

to external resources and, within the paper, to the first mention or full treatment of the subject. Insofar as possible the external information conforms to standards developed and maintained through Biodiversity Information Standards[14] (Taxonomic Database Working Group). All new species have been prospectively registered with Zoobank (Polaszek *et al.*, 2005a, 2005b) and other taxonomic names, where required, have been retrospectively registered. The external hyperlinks are marked by endnote numbers and, in the electronic version, in blue color. The appendix specifies the external URL for each of these hyperlinks so that users of the printed version of this article have access to the same resources. Life sciences identifiers, lsids, may be resolved at the specified URLs or at http://lsid.tdwg.org.

### *Dicroscelio* Kieffer

Figures 1–16; Morphbank[15]

*Dicroscelio* Kieffer, 1913b: 16. Type: *Dicroscelio flavipes* Kieffer, by monotypy and original designation. Holotype in MNHN. Original concept: urn:lsid:zoobank.org:act: 02AEA286-482D-44F5-9D30-39F85A6DA848; current concept: urn:lsid:biosci.ohio-state.edu:osuc_concepts:471

*Anteromorpha* Dodd, 1913: 131, 145. Type: *Anteromorpha australica* Dodd, by original designation. Original concept: urn:lsid:zoobank.org:act:B72A3D97-DB2D-438E-AAE3-6622F8AEB4DC. **New synonymy.** Syntype in SAMA. Current concept: urn:lsid:biosci.ohio-state.edu:osuc_concepts:445

*Govinda* Nixon, 1933: 292, 465. Type: *Govinda mila* Nixon, by original designation. Original concept: urn:lsid:zoobank.org:act:30ED1364-809C-43B1-9CDC-AB666E40E2FE.

Synonymized with *Anteromorpha* by Kozlov (1971). **New synonymy.** Current concept: urn:lsid:biosci.ohio-state.edu:osuc_concepts:8311

*Aegyptoscelio* Priesner, 1951: 133. Type: *Aegyptoscelio frequens* Priesner, by monotypy and original designation. Original concept: urn:lsid:zoobank.org:act:21A8BE31-55A8-4914-97D2-881CA2B640F8. Synonymized with *Govinda* Nixon by Sundholm (1970). **New synonymy.** Current concept: urn:lsid:biosci.ohio-state.edu:osuc_concepts:8312

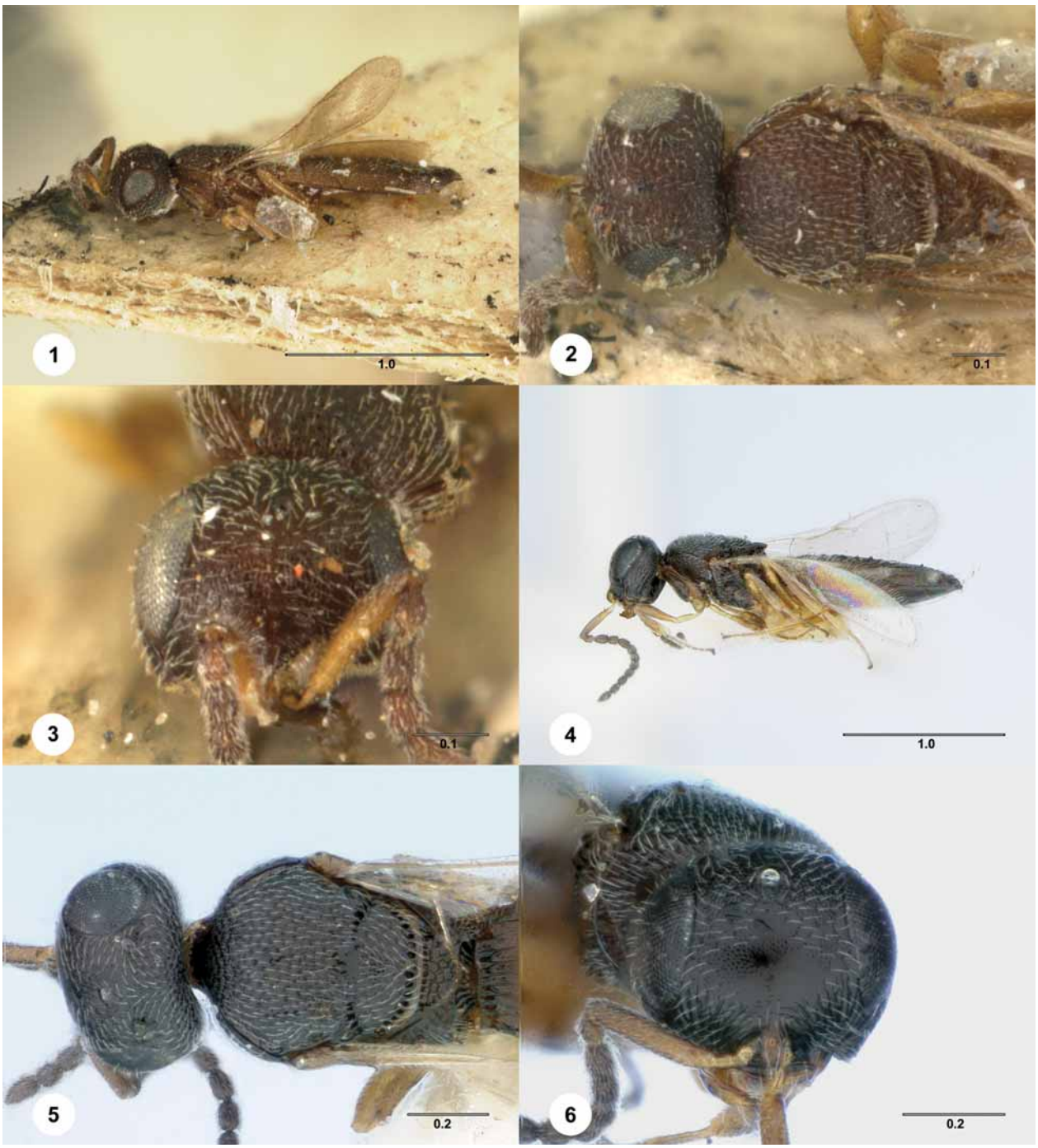
*Afroscelio* Risbec, 1956: 827. Type: *Afroscelio poussi* Risbec, by monotypy. Original concept: urn:lsid:zoobank.org:act:2540228A-FD51-4C6E-A42B-99B1D4BE52A8. Synonymized with *Aegyptoscelio* Priesner by Masner (1958). **New synonymy.** Current concept: urn:lsid:biosci.ohio-state.edu:osuc_concepts:8313

The precocious and talented teenager Alan P. Dodd proposed the name *Anteromorpha* in 1913 for a species from Australia, *A. australica* Dodd (Figs. 1–3). Nixon (1933) described *Govinda* (Figs. 4–6) for a group of three species from Africa. Priesner (1951) and Risbec (1956), apparently in ignorance of the work of both Dodd and Nixon, proposed the genera *Aegyptoscelio* (Figs. 7–9) and *Afroscelio* (Figs. 10–12) respectively, both from Africa.

The consensus of taxonomic opinion quickly settled on the conclusion that the names of Nixon, Priesner, and Risbec should all be considered to be synonyms of *Anteromorpha* (Masner 1958, Sundholm 1970, Kozlov 1971, Masner 1976). In large part, this opinion was based on a few, widely distributed and common species. These are characterized by a very wide oral cavity, extremely short malar space, long and bidentate mandibles, and hairy eyes.

The name *Dicroscelio* was introduced by Kieffer (1913b) for a single female specimen, *D. flavipes*, from Kenya (Figs. 13–16). Kieffer repeated his description in 1926, but subsequently the taxon was not substantively treated until Masner (1976: 14). Masner discussed *Dicroscelio* as a putative member of the tribe Scelionini, but the use of the name was conjectural, as he was unable to study the type specimen of *D. flavipes*. The taxonomic concept presented in that paper was based upon numerous specimens in the collection of the Canadian National Collection of Insects, and its association with the tribe Scelionini was based on the reduction of vein R in the hind wing, the enlarged seventh female antennomere, and 3-2 palpal formula.

14. http://www.tdwg.org
15. http://www.morphbank.net/?id=226921




**FIGURES 1–6.**[16] Figs. 1–3, *Anteromorpha australica* Dodd, lectotype male. 1, Lateral habitus; 2, Head and mesosoma, dorsal view; 3, Head, anterior view. Figs. 4–6, *Govinda mila* Nixon, holotype male. 4, Lateral habitus; 5, head and mesosoma, dorsal view; 6, Head, anterior view. Scale bars in millimeters.

After studying the type specimen, we propose that *Dicroscelio flavipes* belongs to the current concept of the genus *Anteromorpha*. This species is rather atypical in that the body is generally shorter and more robust, but it agrees in the structure of the metanotum, wing venation, and mandibles. There is a delicate problem of priority between the two names. The paper containing Dodd's original description has the note that it was read before the Royal Society of South Australia on August 14, 1913. There is a short note preceding Kieffer's paper, reporting on the results of the voyage of C.A. Alluaud and R. Jeannel, stating that the paper was

16. http://www.morphbank.net/?id=226888

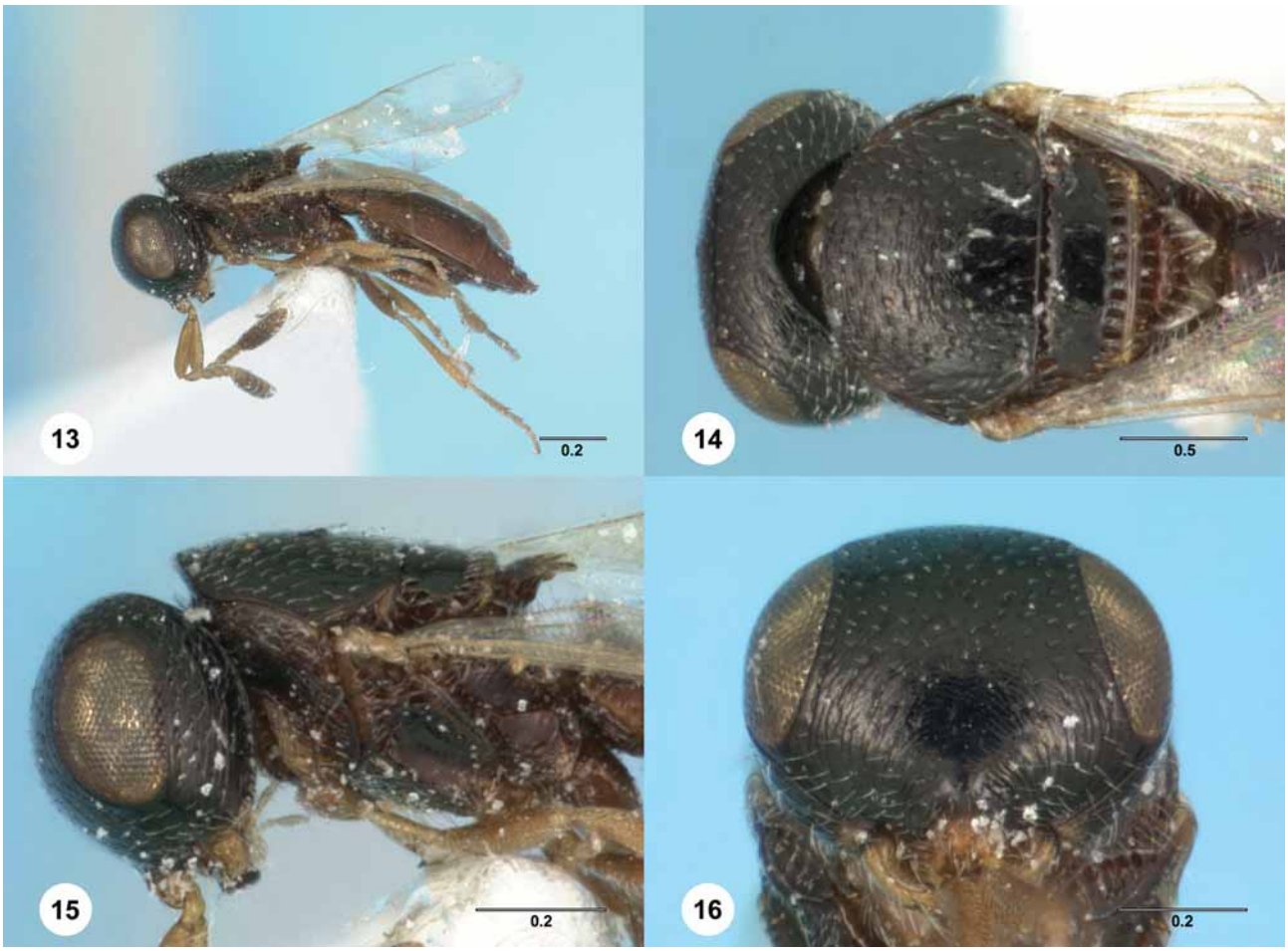
published on 15 August, 1913. We conclude that it is very likely that Kieffer's work was published shortly before Dodd's, and, therefore, the name *Dicroscelio* has priority over *Anteromorpha*. In the 95 years since, the name *Anteromorpha* has been used in only 25 other taxonomic papers; because the host is unknown, it is not a subject in the literature of applied entomology. Thus, we do not believe that there is sufficient justification to argue for conservation of the name *Anteromorpha*.


**FIGURES 7–12.**[17] Figs. 7–9, *Aegyptoscelio frequens* Priesner, holotype female. 7, Lateral habitus; 8, Head and mesosoma, dorsal view; 9, Head, anterior view. Figs. 10–12, *Afroscelio poussi* Risbec, lectotype female. 10, Lateral habitus; 11, Head and mesosoma, dorsal view; 12, Head, anterior view. Scale bars in millimeters.

17. http://www.morphbank.net/?id=226895

Two short notes concerning types follow. Galloway (1976) reported that the female holotype of *Anteromorpha australica* could not be located, but he did report the presence of a male allotype. However, in the original description, Dodd (1913) stated: "TYPE. — I.1383, South Australian Museum. A male, tagmounted, plus a slide bearing male and female antennae, head, and forewings." Thus, Dodd included more than one specimen in the type series and no single holotype exists. In the interest of stability of nomenclature, we designate the tagmounted male (Figs. 1–3) as the lectotype. Similarly, Risbec (1956) described *Afroscelio poussi* from a syntype series. In the interest of stability of nomenclature, we designate the specimen illustrated in Figs. 10–12 and bearing the identifier OSUC 207808 as the lectotype.

*Dicroscelio* is one of the more commonly collected genera of Scelioninae. It is found throughout the world, and seems to be most diverse in the Afrotropical and Oriental regions. The number of described species is rather modest. They are listed below and all except *D. flavipes* are new combinations in *Dicroscelio*. Over 80 species of *Dicroscelio* are estimated to exist.




**FIGURES 13–16.**[18] *Dicroscelio flavipes* Kieffer, holotype female. 13, Lateral habitus; 14, Head and mesosoma, dorsal view; 15, Head and mesosoma, lateral view; 16, Head, anterior view. Scale bars in millimeters.

## List of world species of *Dicroscelio*

The genus of the original combination is indicated within parentheses and junior synonyms are indented below the name of the senior name. Each name is followed by its Zoobank and Hymenoptera Name Server life sciences identifiers.

18. http://www.morphbank.net/?id=226898

*D. abdominalis* (Sundholm, 1970), **new comb.** (*Govinda*)
urn:lsid:zoobank.org:act:1E433FE6-2F19-4B50-97A0-E37F2C6EB0FB;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231932
*D. africanus* (Risbec, 1953), **new comb.** (*Anteromorpha*)
urn:lsid:zoobank.org:act:E3B62C8B-66F5-47A2-A99E-982511E11A41;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231933
*D. ancillus* (Kozlov & Lê, in Lê, 2000), **new comb.** (*Anteromorpha*)
urn:lsid:zoobank.org:act:A0B4EA09-4F16-450C-A4D4-724E4D3CE0F9;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231934
*D. cernatus* (Kozlov & Lê, in Lê, 2000), **new comb.** (*Anteromorpha*)
urn:lsid:zoobank.org:act:6ACD3E3F-5940-4362-8735-C2FC232E4C30;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231935
*D. cuberatus* (Kozlov & Lê, in Lê, 2000), **new comb.** (*Anteromorpha*)
urn:lsid:zoobank.org:act:0594A9F4-09D3-47DE-A1D3-3A3746B78232;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231936
*D. deccanensis* (Sharma, in Saraswat & Sharma, 1978), **new comb.** (*Anteromorpha*)
urn:lsid:zoobank.org:act:0DB41A41-EA9F-4A9B-A64C-0EB63486C807;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231937
*D. depressus* (Galloway, in Galloway & Austin, 1984), **new comb.** (*Anteromorpha*)
urn:lsid:zoobank.org:act: 7B5222AB-FDE3-4B7D-A5CC-DFB866AA9722;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231938
*D. dubiosus* (Perkins, 1910), **new comb.** (*Opisthacantha*)
urn:lsid:zoobank.org:act:6AA527BB-F9A6-461D-8CAC-81E8AE333F3A;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231939
Synonym: *Anteromorpha australica* Dodd, 1913
urn:lsid:zoobank.org:act:62810B97-F02F-478D-ADF1-55C741EEE408;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:5675
Synonym: *Anteromorpha assimilis* Dodd, 1913
urn:lsid:zoobank.org:act:762E41F6-4B24-4099-BD27-39E704C34911;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:5676
Synonym: *Govinda mila* Nixon, 1933
urn:lsid:zoobank.org:act:0CC939B2-6A17-4EB4-8F33-E986AED9FB97;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:5677
*D. ferrierei* (Masner, 1958), **new comb.** (*Aegyptoscelio*)
urn:lsid:zoobank.org:act:EEEFF8F0-BF83-442E-B349-272F65EAF5C4;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231940
*D. flavipes* Kieffer, 1913b
urn:lsid:zoobank.org:act:3F340E4E-AFEA-43E3-928C-22D25030CB7D;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:4246
*D. frequens* (Priesner, 1951), **new comb.** (*Aegyptoscelio*)
urn:lsid:zoobank.org:act:A0B58869-90DD-4EB2-B060-053A8A9895D4;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231941
*D. glaber* (Sharma, 1982), **new comb.** (*Anteromorpha*)
urn:lsid:zoobank.org:act:37EC2A4D-1B81-4552-9A43-1EF9747AACD1;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231942
*D. incertus* (Nixon, 1933), **new comb.** (*Govinda*)
urn:lsid:zoobank.org:act:9ED8CBFE-0073-44A7-928D-66C448EDA34F;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231944
*D. latus* (Sundholm, 1970), **new comb.** (*Govinda*)

urn:lsid:zoobank.org:act:69BE4759-442E-4665-88B0-ED5CFA8FEA4F;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231946

*D. malabaricus* (Narendran, in Narendran *et al.*, 2001), **new comb.** (*Anteromorpha*)
urn:lsid:zoobank.org:act:594B04B2-DDC4-41D4-A6CF-80011B9156E3;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231947

*D. nonus* (Nixon, 1933), **new comb.** (*Govinda*)
urn:lsid:zoobank.org:act:0760D5AF-780B-404A-8B83-95AB6DAA1DCA;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231950

*D. obscurus* (Sundholm, 1970), **new comb.** (*Govinda*)
urn:lsid:zoobank.org:act:8FBB5435-2997-4C04-B443-389B75172174;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231952

*D. poussi* (Risbec, 1956), **new comb.** (*Afroscelio*)
urn:lsid:zoobank.org:act:FA988C42-BA6C-4862-BA3C-2CE1519C6BFB;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231954

*D. reus* (Nixon, 1933), **new comb.** (*Govinda*)
urn:lsid:zoobank.org:act:E659EC03-304C-467B-975F-FB74FBCEECFE;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231956

*D. rufipes* (Ashmead, 1894), **new comb.** (*Anteris*)
urn:lsid:zoobank.org:act:3A4D1663-F242-4DA9-B895-3BD00D5D6A0F;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231958

*D. tuberculatus* (Sharma, 1980), **new comb.** (*Anteromorpha*)
urn:lsid:zoobank.org:act:5D3970DF-3D3C-4494-A153-6EF9AA4E0747;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231959

*D. ueleensis* (Risbec, 1958), **new comb.** (*Chromoteleia*)
urn:lsid:zoobank.org:act:D37B0911-1DA7-4136-B76A-5DB3A14FC19D;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231961

*D. undinus* (Nixon, 1933), **new comb.** (*Govinda*)
urn:lsid:zoobank.org:act:401E6D04-B569-4944-A10E-022873EB316B;
urn:lsid:biosci.ohio-state.edu:osuc_concepts:231962

Further details on *Dicroscelio* taxonomy, distribution, and biology are available on-line at the data portal to the Platygastroidea PBI project.[19]

**Link to Distribution Map**.[20] *Dicroscelio* is a widespread genus, becoming less common a higher latitudes. It is apparently absent from New Zealand.

***Axea* Masner & Johnson, n.gen.**
urn:lsid:zoobank.org:act:67A4E007-110E-47A7-8A4E-75360B4D5861
urn:lsid:biosci.ohio-state.edu:osuc_concepts:197361
Figures 17–124; Morphbank[21]

*Dicroscelio* (misidentification): Masner, 1976: 7, keyed; Johnson, 1992: catalogued.

**General habitus**. Length: 1.5–3.4 mm. Color pattern variable, xanthic to rufous throughout; bicolored with black head, rufous body; or entirely dark brown. Body generally stocky, squat, head closely attached to

19. http://purl.oclc.org/NET/hymenoptera/Platygastroidea
20. http://atbi.biosci.ohio-state.edu/HymOnline/map-large.html?id=471&view=all
21. http://www.morphbank.net/?id=226922

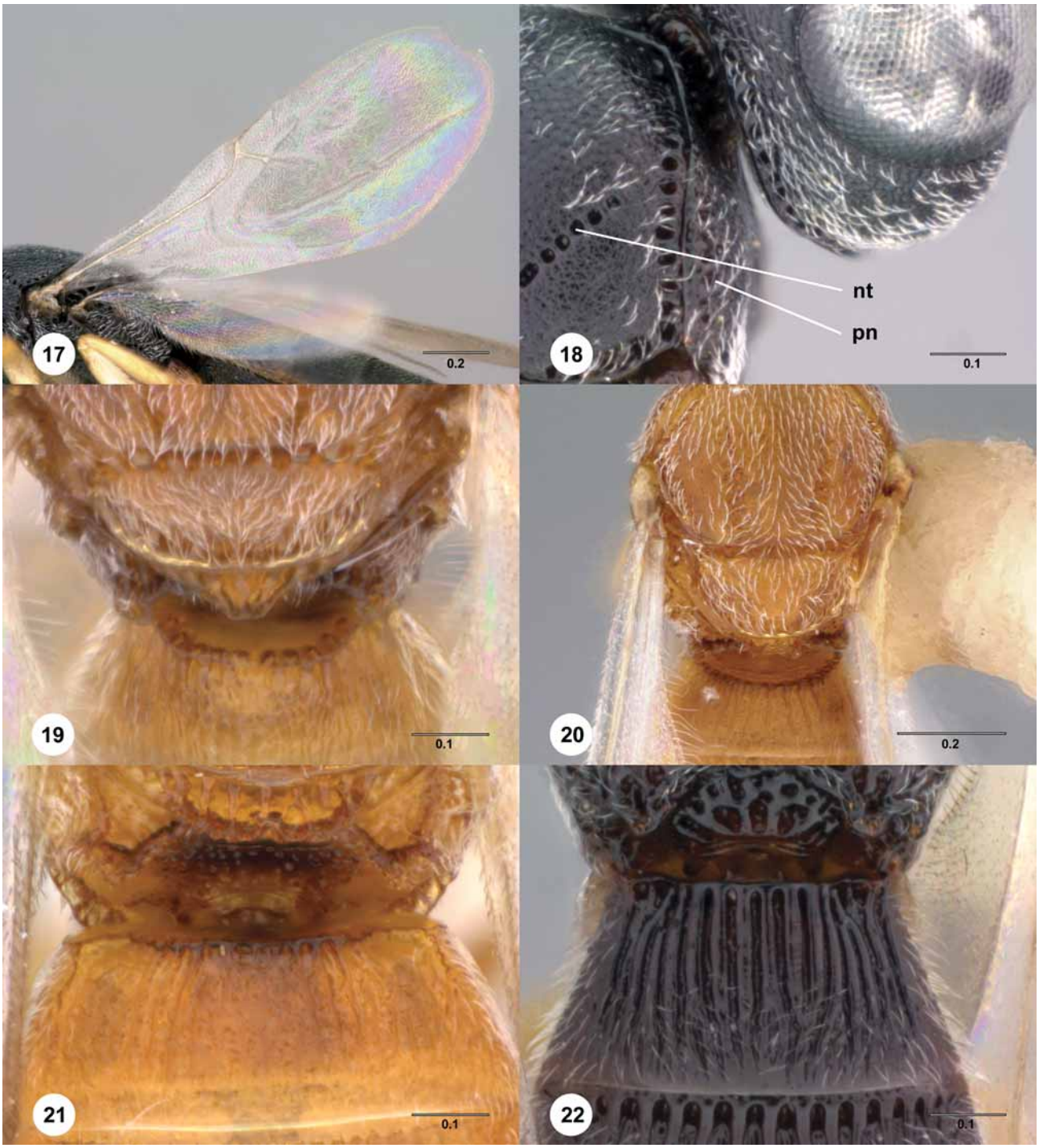
prothorax; dorsum of head, mesosoma rather flat; head with cheek large, bulging. Body entirely sculptured, head and mesosoma with regular, fine granular-punctate sculpture.

**Head** transverse to subquadrate in dorsal view; hyperoccipital carina absent; occipital carina complete, crenulate, closely approximated to foramen magnum dorsally; lateral ocellus contiguous with inner orbit, OOL very short; eye glabrous or sparsely setose; frons nearly flat, antennal scrobe not developed; inner orbits distinctly diverging ventrally; central keel on frons absent; submedian carina absent; orbital carina absent; frontal depression shallow, unmargined; clypeus very small narrow, subquadrate, height greater than or equal to width, apical margin truncate or weakly emarginate, corners not produced laterally; malar sulcus indicated as fine, sharp carina, strongly arched, running from lower margin of eye to mandibular articulation; gena with carina parallel to malar sulcus; cheek with only short dorsoventral costae arising from anterior mandibular articulation; interantennal prominence moderately produced, torulus opening on anterofrontal surface of prominence; in lateral view malar region broad, strongly expanded below, behind eye; mandible broad, distinctly short, outer surface strongly convex, apex deeply tridentate, teeth subequal in length, acute, apical teeth arranged transversely; palpal formula 3-2; radicle inserted parallel to long axis of scape; antenna 12-merous in both sexes; length of female A3 subequal to length of A2; female antennal clava subcylindrical, 6-merous, A7 largest claval segment, distinctly larger than A6, length greater than length of each antennomere A7–A11; A6, A5 broadened, clava non-abrupt; claval formula A7–A12/2-2-2-2-2-1; male antenna with A5–A11 as long as wide, A5 with tyloid, otherwise not visibly modified.

**Mesosoma** depressed dorsally, height subequal to width, longer than high, longer than wide in dorsal view; transverse pronotal carina absent; pronotal shoulders strongly developed, rounded anteriorly; mesoscutum weakly convex; skaphion absent; admedian lines absent; notaulus present, usually deeply incised, crenulate, usually abbreviate anteriorly; parapsidal line indicated as smooth line; humeral, suprahumeral sulci distinctly crenulate; transscutal articulation deep, crenulate; mesoscutellum semiellipsoidal, weakly convex, unarmed, posterior rim crenulate; metascutellum produced into thick, irregular transverse plate, sometimes with weak notch or protruding medially; propodeum unarmed, in dorsal view reduced and deeply excavate medially, almost vertical between submedian carinae, concealed beneath metascutellum, median propodeal keels strongly diverging diagonally, inner propodeal projection short, truncate, fitting into shallow depression on T1, outer propodeal corners not projecting; lateral surface of pronotum broadly concave, with row of large foveolae along lower anterior margin; epomial carina not developed; netrion present, broad, closed ventrally, often concealed by sculpture; mesopleuron covered by dense, fine appressed pilosity; mesopleural depression deep; mesopleural carina not developed; mesopleural pit not clearly differentiated from coarse background sculpture; ventral portion of mesepisternum not protruding anteriorly between fore coxae; posterodorsal corner of mesopleuron rounded, epimeral hook absent; metapleuron entirely sculptured, with dense appressed fine pilosity; legs slender, setose, without strong spines; posterior surface of hind coxa smooth, setose; trochantellus present on all legs; tibial spur formula 1-1-1; macropterous, fore wings variable in length, extending to or beyond T5, appearing relatively short, broad, marginal cilia minute; fore wing (Fig. 17) with R distant from costal margin, especially from basal vein to origin of r-rs, strongly arched apically toward costal margin, without strong dark bristles, r-rs arising at or basad apex of R1; basal vein absent; pseudostigma absent; R terminating at costal margin or sometimes short and not attaining margin (i.e., marginalis punctate, postmarginalis absent); r-rs (stigmal vein) arising at or before R reaches costal margin of wing; R1 (postmarginal vein) usually absent, sometimes weakly indicated as marginal extension of bulbous apex of R; hind wing either with R short, truncate, terminating far from hamuli (Afrotropical species) or complete, extending to hamuli (Oriental species); hind wing with 3 hamuli.

**Metasoma** appearing broadly sessile, moderately short, broad, depressed, with 6 terga, 6 sterna visible externally, homonomously segmented, T2–T3 subequal in length, T2 slightly the longest; T1 with anterior carinate margin, sublaterally with shallow depressions, without horn in female, usually longitudinally costate; laterotergites well developed, narrow; T2 usually longitudinally ruguose; T3–T5 usually punctate; T6 subtriangular, often longer than T5, often apically produced into sharp, flat medial bladelike projection, with

pair of subapical spines, appearing subtridentate; S1 laterally compressed, not projecting anteriorly between insertions of hind coxae; S6 with bladelike margin, i.e., flattened, apically rounded or acute; *Scelio*-type ovipositor, gonoplacs relatively strongly sclerotized, straight.




**FIGURES 17–22.**[22] Characters of *Axea*. 17, *Axea kalanoro*, fore wing, paratype female (CASENT 2042985); 18, *A. atai*, anterolateral mesosoma, dorsal view, paratype female (OSUC 211601); 19, *A. atriceps*, posterior mesosoma, dorsal view, female (OSUC 167058); 20, *A. yama*, posterior mesosoma, dorsal view, holotype female (OSUC 56308); 21, *A. yasigi*, anterior metasoma, dorsal view, holotype female, (OSUC 211772); 22, *A. kilen*, anterior metasoma, dorsal view, holotype female, (OSUC 167051). *nt*, notaulus; *pn*, pronotum. Scale bars in millimeters.

22. http://www.morphbank.net/?id=226901

**Diagnosis.** The African and most Malagasy species may be distinguished from other genera with the reduced R in the hind wing (*Heptascelio, Nixonia, Oreiscelio, Scelio, Sparasion*) by the 1-1-1 tibial spur formula, the short, broad metascutellum, the lower frons with at most very short and fine striae arising from the mandible, and the unarmed mesoscutellum. The Asian and one Malagasy species, in which the hind wing R extends to the costal margin and hamuli, may be distinguished by the short tridentate mandibles, the armature of T6, and the punctiform marginal vein. The genus *Oxyscelio* Kieffer also has the fore wing radial vein (submarginal) remote from the costal margin of the wing, the "punctiform" marginal vein, and the *Scelio*-type ovipositor. *Axea* may be distinguished by the granular to punctate microsculpture, in *Oxyscelio* usually coarsely rugulose to areolate; 3-2 palpal formula, *Oxyscelio* 4-2; the lack of epomial carina; lack of a carina surrounding the antennal scrobe. *Oreiscelio* is similar to Afrotropical *Axea* in having similar fore wing venation, a reduced R in the hind wing and 12-merous male antenna. *Axea* is distinguished by the reduction of the medial portion of the pronotum such that there is no dorsal component, tridentate mandibles, expanded cheeks, and posteriorly rounded scutellum.

**Type**. *Axea dorothae* Valerio & Yoder, n.sp.

**Etymology.** The name *Axea* is an arbitrary combination of letters, inspired by an Ontario license plate. The name is to be treated as feminine gender.

**Link to Distribution Map**.[23] *Axea* is found throughout the Old World tropics (excluding Australia), in continental Africa from Guinea-Bissau east to Somalia and south to South Africa; in Asia from Yemen, India, and Southeast Asia east to the Philippines and Sulawesi.

**Comments.** *Axea* is similar to genera of the tribe Scelionini *s.str.* in that it has the so-called punctiform marginal vein, that is, the stigmal vein (r-rs) arises from R before the latter merges with the costal margin of the fore wing, and many species have the radial vein in the hind wing vestigial. Both of these character states are shared also with other scelionine genera. For example, the punctiform marginalis is found also in *Oxyscelio* Kieffer and *Chromoteleia* Ashmead; and the abbreviate hind wing radius is characteristic in *Sparasion* Latreille, *Sceliomorpha* Ashmead and *Nixonia* Masner. The discovery that the three Asian and a Malagasy species have the hind wing radius completely developed is inconsistent with the placement of *Axea* within Scelionini. This group of species does not appear to be closely related to any other genus in the subfamily; details of its relationships are currently part of a larger combined morphological and molecular analysis of platygastroid phylogeny. Therefore, we are proposing a new genus for this group.

**Key to world species of *Axea***

1 Hind wing with submarginal vein complete, tubular (Asian species) ..... 2
- Hind wing with submarginal vein absent all but basally (Africa, Yemen) ..... 4
2 Metascutellum not projecting, smooth and shining (Fig. 73); mesosoma anterior to propodeum orange, metasoma nearly black, concolorous with head (Figs. 71, 72) ..... *A. kilen* Valerio & Yoder, **n.sp.**
- Metascutellum projecting, sculptured (Figs. 19, 20); mesosoma and metasoma concolorous, yellow to orange yellow with head black ..... 3
3 Metascutellum bilobed (Fig. 20) (India) ..... *A. yama* Valerio & Yoder, **n.sp.**
- Metascutellum bluntly pointed medially (Fig. 19) (Southeast Asia) ..... *A. atriceps* (Kieffer)
4 Head and mesosoma orange, metasoma black (Figs. 77, 78) (Madagascar) ..... *A. mena* Valerio & Yoder, **n.sp.**
- Color pattern not as above (Figs. 47, 53, 59) ..... 5
5 Head and mesosoma black, metasoma medially yellow with lateral areas black for metasomal terga 2–5, T1 mainly black with a reduced yellow area posteromedially (Figs. 119, 120); legs including coxae yellow (Madagascar; male unknown) ..... *A. zanahary* Valerio & Yoder, **n.sp.**
- Color pattern not as described above ..... 6
6 Lateral ocellus separated from eye margin (Fig. 58; known only from male) ..... *A. eshu* Valerio & Yoder, **n.sp.**
- Lateral ocellus contiguous with eye margin ..... 7
7 Head and mesosoma completely brown to black; metasoma concolorous with the exception of some individuals of

[23] http://atbi.biosci.ohio-state.edu/HymOnline/map-large.html?id=197361&view=all

*A. adro* that have anterior areas of the dorsal metasoma contrastingly light brown ..... 8
- Head or mesosoma yellow to orange; metasoma also typically lighter colored..... 13
8 Female with horn on T1 well developed, glabrous and rounded at apex (Fig. 97) .... *A. talana* Valerio & Yoder, **n.sp.**
- Horn not well developed, anterior of T1 sculptured throughout (Figs. 21, 22), at most with a tiny polished tip (Figs. 65, 67) ..... 9
9 T6 lateral spines absent or apparently so (Fig. 34); T6 wider than long, in lateral view sharply sloping; shiny patch of central frons large, at times almost completely unsculptured (Fig. 33); dorsal pronotal area with well developed scrobes or crenulations (Fig. 18, *pn*) (Ivory Coast, Nigeria, Central African Republic) *A. atai* Valerio & Yoder, **n.sp.**
- T6 lateral spines present; T6 subtriangular with length subequal to width, in lateral view more or less horizontal; shiny patch of central frons sculptured throughout; pronotal shoulders generally not deeply scrobed, at most with very slight crenulation..... 10
10 Lateral carina of T6 elongate, length greater than 1/2 the distance to the base of tergite (Fig. 91); female S6 apex elongate and narrow, rounded at tip; large, black to very dark brown (Zimbabwe) .*A. nommo* Valerio & Yoder, **n.sp.**
- Lateral carina of T6 sometimes absent, if developed (Figs. 28, 70, 88) then not extending beyond half the distance to the base of the tergite; female S6 apex broadly rounded, S6 usually more or less forming an equilateral triangle ...11
11 Frons immediately surrounding and below anterior ocellus with minute reticulate sculpture with distinct longitudinal elements; netrion setose; on each sternite 3–5 the punctures decrease in size posteriorly (Madagascar) ..... ..... *A. kalanoro* Valerio & Yoder, **n.sp.**
- Frons immediately surrounding and below anterior ocellus with punctures or sculpture that is primarily transversely oriented and uniform throughout; netrion glabrous; sternal sculpture more or less uniform throughout (continental Africa)..... 12
12 Legs entirely yellow, without any trace of infuscation (Fig. 24); T6 lateral spine and carina very short to absent, T6 much wider than long, apex narrowly rounded (Fig. 28); very variable in body size.. *A. adro* Valerio & Yoder, **n.sp.**
- Legs with brown infuscations, coxa brown (Fig. 84); T6 lateral spines and carina well developed, T6 subtriangular, only slightly wider than long, apex broadly rounded (Fig. 88) (Kenya, Uganda) ..... *A. mwari* Valerio & Yoder, **n.sp.**
13 Head black, mesosoma yellow to amber, metasoma light brown (Figs. 47, 48); female T6 lateral spines absent to very minute (Fig. 52); fore wing apex extending distinctly beyond apex of metasoma (Fig. 47) ..... .. ..... *A. dorothae* Valerio & Yoder, **n.sp.**
- Head yellow to orange, at most with some brown infuscation (Figs. 59–62, 107–110, 113–116); female T6 lateral spines present; fore wing apex not or slightly surpassing apex of metasoma..... 14
14 Netrion setose (Fig. 61, *n*) ..... *A. fisherhala* Valerio & Yoder, **n.sp.**
- Netrion without setae (Figs. 110, 116, *n*) ..... 15
15 Notaulus indicated by line of separated pits (Fig. 109, cf. Fig. 18, *nt*) ..... *A. yasigi* Valerio & Yoder, **n.sp.**
- Notaulus indicated by an uninterrupted channel (Fig. 115)..... *A. yurugu* Valerio & Yoder, **n.sp.**

***Axea adro* Valerio & Yoder, n.sp.**

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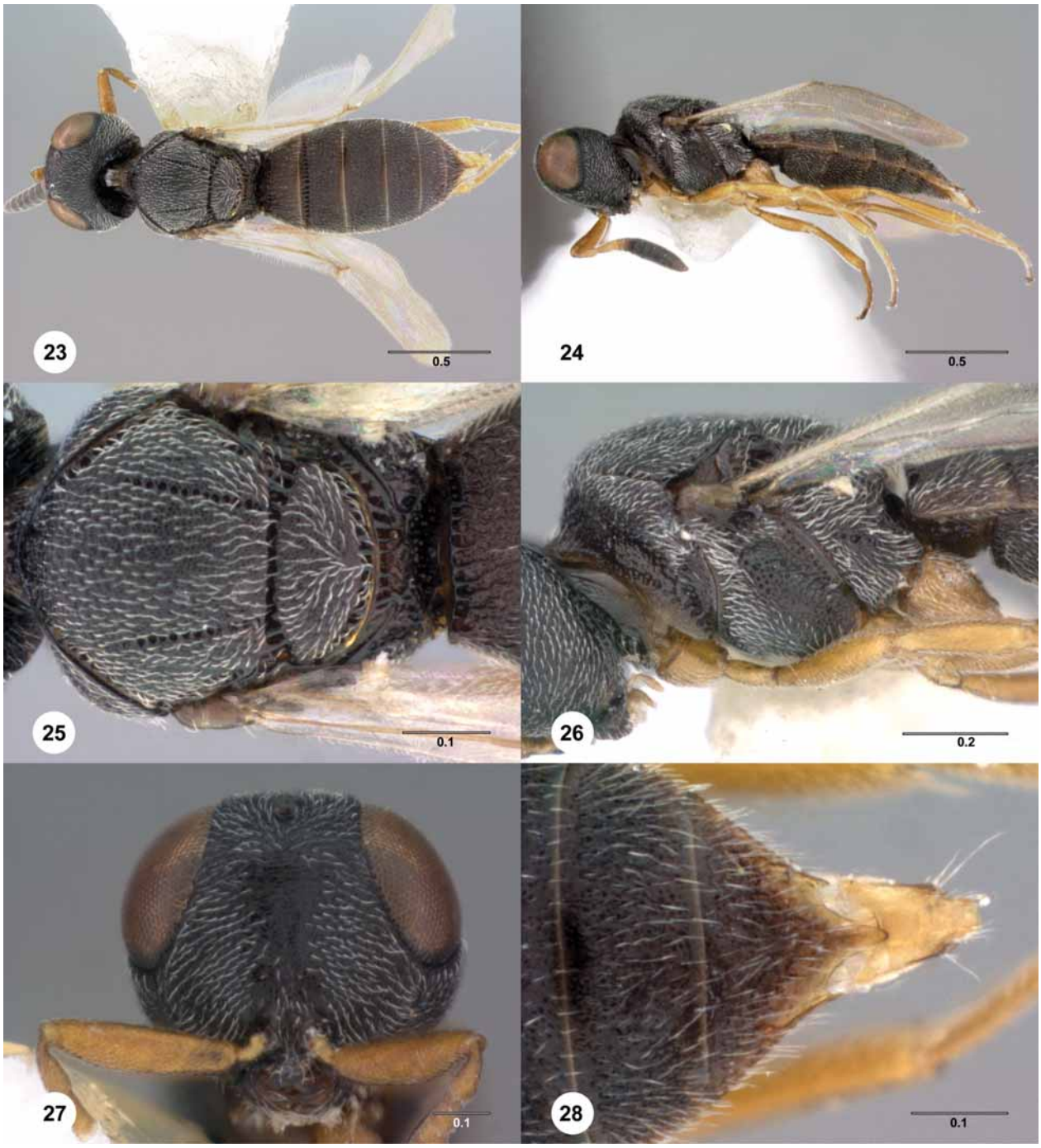
Figures 23–28; Morphbank[24]

**General** (Figs 23, 24): Female body length: 1.8–2.1 mm (n=20). Male body length: unknown. **Head**: Color of female head: black. Mandible color: mostly dark brown to black. Body color of male: unknown. Lateral ocellus position: touching compound eye. Pilosity of medial frons between anterior ocellus and apex of torular triangle: absent, a small patch without setae clearly visible. Sculpture of medial glabrous area of frons: present, with horizontal to slightly arcuate striae or, if patch minute, then irregularly rugulose (Fig. 27). **Mesosoma** (Figs. 25, 26): Color of female mesosoma: dark brown to nearly black. Dorsal surface of lateral pronotal area adjacent to mesoscutal suprahumeral sulcus: with uniform microsculpture only. Setae on netrion: absent. Notaulus: indicated by a row of pits. Metascutellum: projecting, truncated throughout, roughly rectangular. Mesopleural depression sculpture: irregularly foveate, majority of fovea not transverse, fovea interspersed with nitid areas, in some individuals some fovea reduced to punctures, or mostly transversely rugulose, larger fovea absent. Pilosity bounding anterior margin of posterior mesepimeral area: completely absent, or partially present dorsally. **Legs**: Coxae color: yellow (as in remainder of leg). Color of

[24] http://www.morphbank.net/?id=226855




**FIGURES 23–28**.[25] *Axea adro*, paratype female (OSUC 211775). 23, dorsal habitus; 24, lateral habitus; 25, mesosoma, dorsal view; 26, mesosoma, lateral view; 27, head, anterior view; 28, apex of metasoma, dorsal view. Scale bars in millimeters.

legs beyond coxae: uniformly yellow, without infuscations. **Wings**: Length of fore wing: not or just reaching posterior margin of metasoma, or surpassing posterior margin of metasoma. Hind wing submarginal vein: absent to spectral everywhere but basal stub that is nebulous to tubular. **Metasoma**: Color of female metasoma: dark brown to nearly black, or yellow to amber or orange yellow, or light brown. Longitudinal sculpture of T1: carinate, parallel to subparallel, interspersed with fine rugulose sculpture. Female T1 horn: absent, sculpture more or less uniform throughout T1. Anterior strip of T2: punctulate. Female T6 width to

25. http://www.morphbank.net/?id=226902

length ratio: more or less equal in length (subtriangular). Female T6 carinate basal extension of lateral spine: short, not extending past 1/2 length of T6. T6/S6 apical curvature: absent, sclerites more or less linear in lateral view, or present, tips flexed outwards in lateral view. T6 posterolateral margin: with sharp spine (Fig. 28). S6 shape at tip: broadly rounded to very slightly angular, without obvious lobe.

**Diagnosis**. Differentiated from all other species of *Axea* by the combination of the absence or extreme reduction of the lateral projections and associated carina of T6 (Fig. 28) and the presence of yellow legs on an otherwise brown to dark brown body (Figs. 23–24).

**Etymology**. Named in reference to a male god of the Lugbara people of Uganda and the Democratic Republic of Congo.

**Link to Distribution Map.**[26]

**Comments.** *Axea adro* is presently the most widespread species within Africa. While there is some slight variation in the degree of development of the lateral spines on T6 the overall morphology is quite uniform throughout its range. This is the only species for which we have some information pertaining to the potential hosts of species of *Axea*. A long series of males collected in the Democratic Republic of Congo (specimens deposited in ISNB) have labels stating "ex oothéque Phasmidae". This record is remarkable in two ways. First, Phasmatidae do not produce oothecae. The hosts may instead be mantids, which do so. Second, all of the numerous specimens are males, suggesting perhaps that this host may not have been optimal in some way.

**Material Examined**. Holotype female: **MALAWI**: Kasungu, Mtunthama, VII–IX.1983, J. Feehan, Malaise trap, OSUC 211753 (deposited in CNCI). *Paratypes*: 49 females, 12 males. **BENIN**: 3 females, OSUC 167042, OSUC 211725 (CNCI), OSUC 148188 (OSUC). **CENTRAL AFRICAN REPUBLIC**: 3 females, OSUC 180936, OSUC 214001, OSUC 214219 (SAMC). **DEMOCRATIC REPUBLIC OF THE CONGO**: 10 males, OSUC 181956, OSUC 214371–214374, OSUC 214376–214380 (ISNB). **GABON**: 4 females, OSUC 167041, OSUC 211605, OSUC 211699, OSUC 211700 (CNCI). **GUINEA-BISSAU**: 1 female, OSUC 167034 (CNCI). **IVORY COAST**: 7 females, OSUC 167032, OSUC 167036, OSUC 211732, OSUC 211736, OSUC 211747, OSUC 211764, OSUC 211781 (CNCI). **KENYA**: 7 females, OSUC 167026, OSUC 211734, OSUC 211767, OSUC 214388, OSUC 214397 (CNCI); OSUC 56309, OSUC 56310 (OSUC). **MALAWI**: 2 females, OSUC 167076, OSUC 211724 (CNCI). **NIGERIA**: 9 females, OSUC 167021, OSUC 167064, OSUC 211714, OSUC 211722, OSUC 211726, OSUC 211760, OSUC 211773, OSUC 211782 (CNCI); OSUC 56311 (OSUC). **SOUTH AFRICA**: 2 females, 1 male, OSUC 167044, OSUC 167067, OSUC 213805 (CNCI). **YEMEN**: 2 females, OSUC 167069, OSUC 211776 (CNCI). **ZIMBABWE**: 9 females, 1 male, OSUC 211615, OSUC 211720, OSUC 211740, OSUC 211742, OSUC 211746, OSUC 211756, OSUC 211770, OSUC 211775, OSUC 211778, OSUC 213804 (CNCI).

***Axea atai* Valerio & Yoder, n.sp.**

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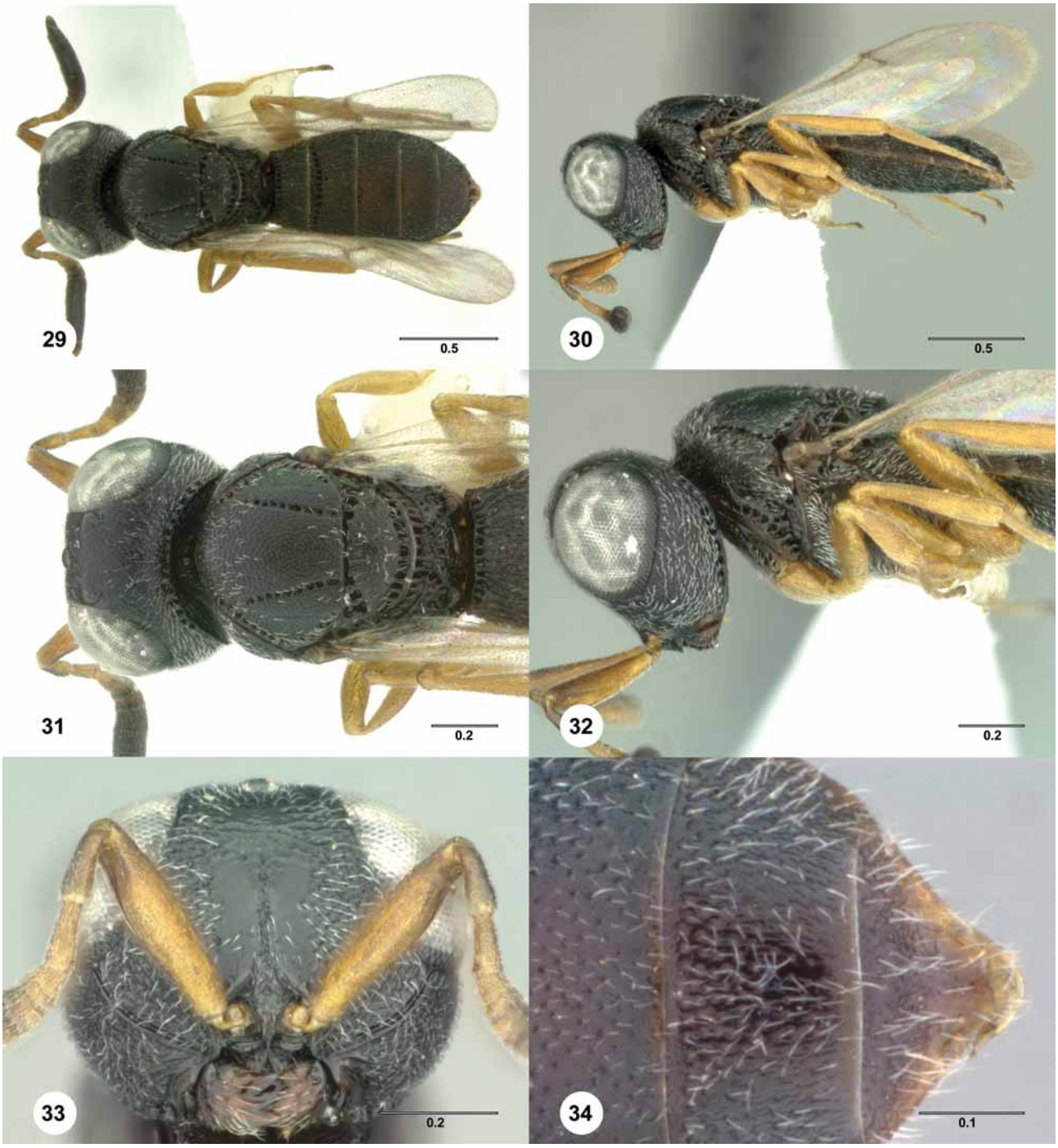
Figures 18, 29–34; Morphbank[27]

**General** (Figs. 29, 30): Female body length: 2.1–2.4 mm (n=11). Male body length: unknown. **Head**: Color of female head: black. Mandible color: mostly dark brown to black. Body color of male: unknown. Lateral ocellus position: touching compound eye. Pilosity of medial frons between anterior ocellus and apex of torular triangle: absent, a small patch without setae clearly visible. Sculpture of medial glabrous area of frons: present, with horizontal to slightly arcuate striae or, if patch minute, then irregularly rugulose (Fig. 33). **Mesosoma** (Figs. 31, 32): Color of female mesosoma: black, or dark brown to nearly black. Dorsal surface of lateral pronotal area adjacent to mesoscutal suprahumeral sulcus: with conspicuous crenulations or scrobes.

26. http://atbi.biosci.ohio-state.edu/HymOnline/map-large.html?id=223463

27. http://www.morphbank.net/?id=226857

Setae on netrion: absent. Notaulus: indicated by a row of pits. Metascutellum: projecting, broadly bilobed. Mesopleural depression sculpture: irregularly foveate, majority of fovea not transverse, fovea interspersed with nitid areas, in some individuals some fovea reduced to punctures. Pilosity bounding anterior margin of posterior mesepimeral area: present along full length of margin, completely absent, or partially present dorsally. **Legs**: Coxae color: yellow (as in remainder of leg). Color of legs beyond coxae: uniformly yellow,




**FIGURES 29–34**.[28] *Axea atai*, paratype female (OSUC 211601). 29, dorsal habitus; 30, lateral habitus; 31, head and mesosoma, dorsal view; 32, head and mesosoma, lateral view; 33, head, anterior view; 34, apex of metasoma, dorsal view. Scale bars in millimeters.

28. http://www.morphbank.net/?id=226903

without infuscations. **Wings**: Length of fore wing: not or just reaching posterior margin of metasoma, or surpassing posterior margin of metasoma. Hind wing submarginal vein: absent to spectral everywhere but basal stub that is nebulous to tubular. **Metasoma**: Color of female metasoma: dark brown to nearly black. Longitudinal sculpture of T1: carinate, parallel to subparallel, interspersed with fine rugulose sculpture. Female T1 horn: absent, sculpture more or less uniform throughout T1. Anterior strip of T2: punctate, punctures nearly the length of strip, puncture borders confluent. Female T6 width to length ratio: wider than long (striplike). Female T6 carinate basal extension of lateral spine: absent. T6/S6 apical curvature: absent, sclerites more or less linear in lateral view. T6 posterolateral margin: without short spine or carinate expansion absent or apparently so (Fig. 34). S6 shape at tip: broadly rounded to very slightly angular, without obvious lobe.

**Diagnosis**. Differs from all other species of *Axea* by the relatively large, shining, and weakly sculptured patch of the frons in combination with the relatively well-developed scrobes of the dorsal surface of lateral pronotal area adjacent the meososcutal suprahumeral sulcus.

**Etymology**. Named in reference to the wife of the god Abassi of the Efik people of Nigeria and Cameroon.

**Link to Distribution Map.**[29]

**Material Examined**. Holotype female. **IVORY COAST**: Lamto Research Station, 06°13'N 05°02'W, 160 km NW Abijan, 1.XI.1988, J.S. Noyes, Malaise trap, OSUC 211777 (deposited in CNCI). *Paratypes*: 13 females. **CENTRAL AFRICAN REPUBLIC**: OSUC 213809, OSUC 244016 (SAMC). **IVORY COAST**: OSUC 167043, OSUC 211735, OSUC 211741, OSUC 211762, OSUC 211766, OSUC 211774 (CNCI). **NIGERIA**: OSUC 211601, OSUC 211602, OSUC 211603, OSUC 211604 (CNCI). **UGANDA**: OSUC 167035 (CNCI).

***Axea atriceps* (Kieffer), n.comb.**

urn:lsid:zoobank.org:act:AA2D132F-0BBF-4A36-B64A-3CE44ACC000C

urn:lsid:biosci.ohio-state.edu:osuc_concepts:234167

Figures 19, 35–46; Morphbank[30]

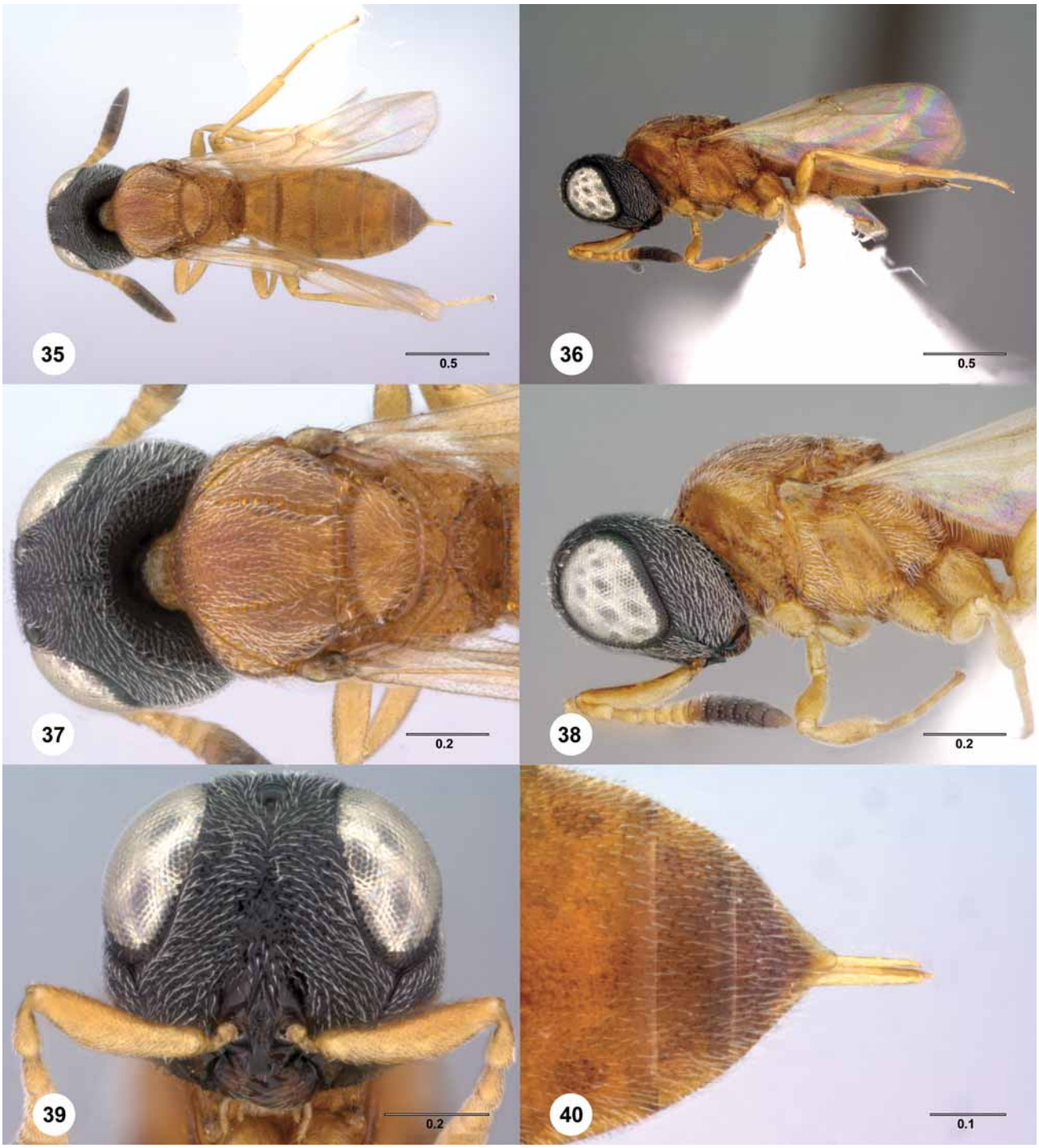
*Anteris atriceps* Kieffer, 1913a: 428. Original description, preoccupied by *Paratrimorus atriceps* Kieffer (1910); Kelner-Pillault, 1958: 149 (type information); Masner, 1976: 41 (description, taxonomic position).

*Psilanteris atriceps*: Kieffer, 1916: 177 (generic transfer); Kieffer, 1926: 433, 434 (description, keyed).

**General** (Figs. 35, 36): Female body length: 1.5–2.6 mm (n=14). Male body length: 1.5 mm (n=1). **Head**: Color of female head: black. Mandible color: mostly yellow to amber or orange yellow. Body color of male: yellow laterally and ventrally, darkening to light brown to brown dorsally. Lateral ocellus position: touching compound eye. Pilosity of medial frons between anterior ocellus and apex of torular triangle: present. Sculpture of medial glabrous area of frons: inapplicable, glabrous patch absent (Fig. 39). **Mesosoma** (Figs. 37, 38): Color of female mesosoma: yellow to amber or orange yellow. Dorsal surface of lateral pronotal area adjacent to mesoscutal suprahumeral sulcus: with uniform microsculpture only, or with conspicuous crenulations or scrobes. Setae on netrion: absent. Notaulus: indicated by a row of pits. Metascutellum: projecting, particularly medially where it comes to a truncated point or projecting, truncated throughout, roughly rectangular. Mesopleural depression sculpture: upper half more or less nitid, lower rugulose (smaller individuals) to irregularly foveate (larger individuals). Pilosity bounding anterior margin of posterior mesepimeral area: completely absent, or partially present dorsally. **Legs**: Coxae color: yellow (as in remainder of leg). Color of legs beyond coxae: uniformly yellow, without infuscations. **Wings**: Length of fore wing: not

29. http://atbi.biosci.ohio-state.edu/HymOnline/map-large.html?id=223470

30. http://www.morphbank.net/?id=226858

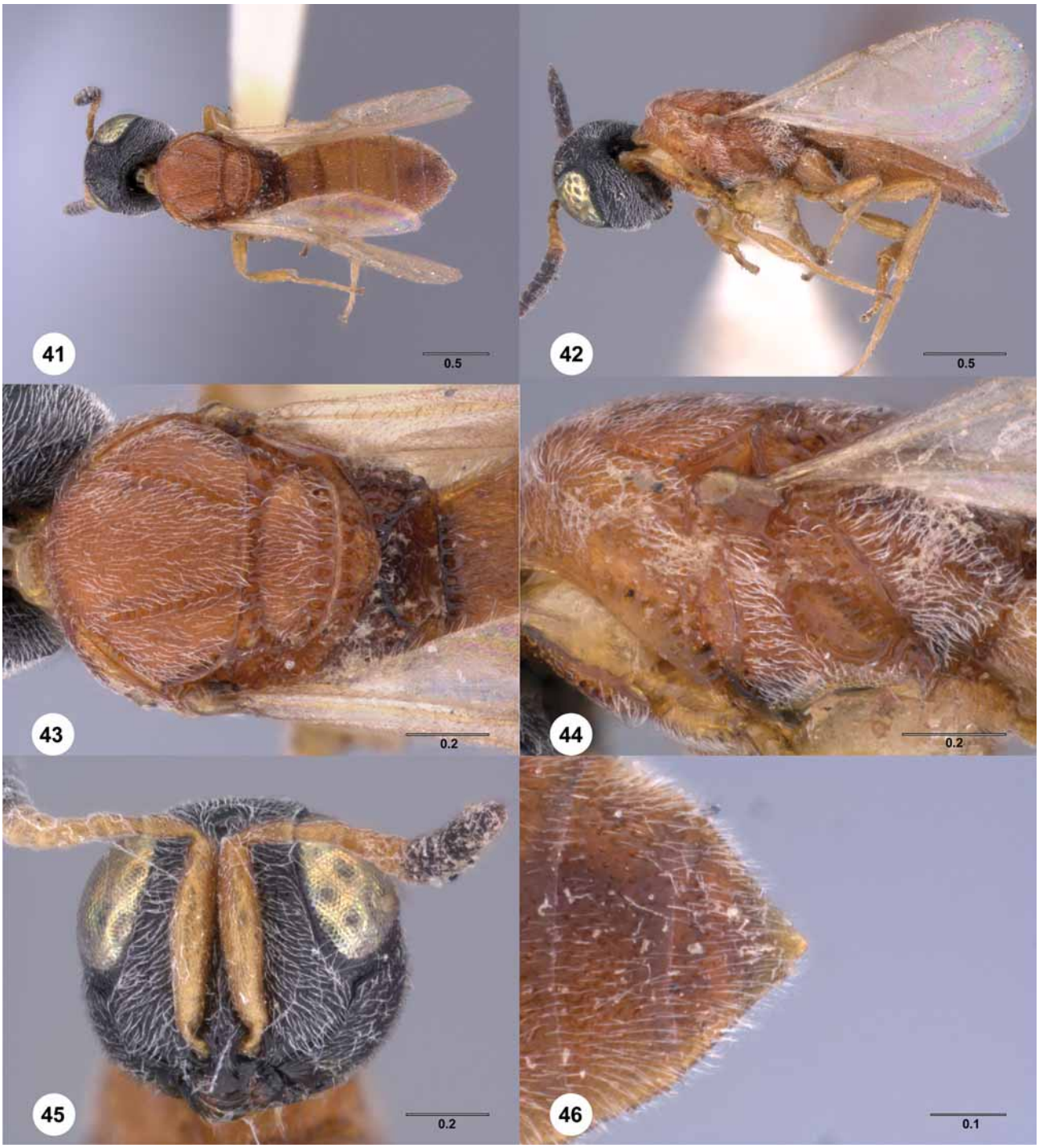



**FIGURES 35–40**.[31] *Axea atriceps* (Kieffer) (OSUC 167059). 35, dorsal habitus; 36, lateral habitus; 37, head and mesosoma, dorsal view; 38, head and mesosoma, lateral view; 39, head, anterior view; 40, apex of metasoma, dorsal view. Scale bars in millimeters.

or just reaching posterior margin of metasoma or surpassing posterior margin of metasoma. Hind wing submarginal vein: tubular from wing base to hamuli. **Metasoma**: Color of female metasoma: yellow to amber or orange yellow. Longitudinal sculpture of T1: carinate, parallel to subparallel, interspersed with fine rugulose sculpture. Female T1 horn: absent, sculpture more or less uniform throughout T1. Anterior strip of T2: nitid. Female T6 width to length ratio: wider than long (striplike). Female T6 carinate basal extension of

31. http://www.morphbank.net/?id=226904

lateral spine: absent. T6/S6 apical curvature: absent, sclerites more or less linear in lateral view. T6 posterolateral margin: without short spine or carinate expansion absent or apparently so (Fig. 40). S6 shape at tip: broadly rounded to very slightly angular, without obvious lobe.




**FIGURES 41–46**.[32] *Axea atriceps* (Kieffer), holotype female. 41, dorsal habitus; 42, lateral habitus; 43, mesosoma, dorsal view; 44, mesosoma, lateral view; 45, head, anterior view; 46, apex of metasoma, dorsal view. Scale bars in millimeters.

**Diagnosis**. Differs from other species in which the hind wing submarginal vein is present by the bluntly pointed metascutellum (Fig. 19).

32. http://www.morphbank.net/?id=226905

**Link to Distribution Map.**[33]

**Comments**. *Axea atriceps* has a relatively broad distribution throughout Southeast Asia. Though there is noticeable size variation we were unable to discern corroborating characters which might suggest the existence of more than one species. The species is remarkably similar to the new species described here from India, *A. yama*. If variation in the form of the metascutellum is ultimately observed then the distinction between *A. atriceps* and *A. yama* should be revisited.

**Material Examined**. Holotype female (Figs. 41–46): **PHILIPPINE ISLANDS**: Los Baños, Baker (deposited in MNHN). *Additional material*: 21 females, 3 males. **INDONESIA**: 11 females, 1 male, OSUC 167050, OSUC 167055, OSUC 167058, OSUC 211691–211697, (CNCI); OSUC 244014 (ROME), OSUC 148626 (WINC). **MALAYSIA**: 2 females, OSUC 167053 (CNCI); OSUC 148625, (WINC). **THAILAND**: 6 females, 2 males, OSUC 167054, OSUC 167056, OSUC 167057, OSUC 211606, OSUC 214393 (CNCI); OSUC 235271, OSUC 244012, OSUC 244013 (OSUC). **VIETNAM**: 2 females, OSUC 167052 (CNCI); OSUC 167059 (ROME).

***Axea dorothae* Valerio & Yoder, n.sp.**

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urn:lsid:biosci.ohio-state.edu:osuc_concepts:223425

Figures 47–52; Morphbank[34]

**General** (Figs. 47, 48): Female body length: 2.0–2.3 mm (n=20). Male body length: unknown. **Head**: Color of female head: dark brown to nearly black. Mandible color: mostly yellow to amber or orange yellow. Body color of male: unknown. Lateral ocellus position: touching compound eye. Pilosity of medial frons between anterior ocellus and apex of torular triangle: absent, a small patch without setae clearly visible. Sculpture of medial glabrous area of frons: present, with horizontal to slightly arcuate striae or, if patch minute, then irregularly rugulose (Fig. 51). **Mesosoma** (Figs. 49, 50): Color of female mesosoma: yellow to amber or orange yellow. Dorsal surface of lateral pronotal area adjacent to mesoscutal suprahumeral sulcus: with conspicuous crenulations or scrobes. Setae on netrion: present. Notaulus: indicated by a row of pits. Metascutellum: projecting, truncated throughout, roughly rectangular. Mesopleural depression sculpture: rugose, rugae broad and smooth. Pilosity bounding anterior margin of posterior mesepimeral area: present along full length of margin. **Legs**: Coxae color: yellow (as in remainder of leg). Color of legs beyond coxae: uniformly yellow, without infuscations. **Wings**: Length of fore wing: surpassing posterior margin of metasoma. Hind wing submarginal vein: absent to spectral everywhere but basal stub that is nebulous to tubular. **Metasoma**: Color of female metasoma: light brown. Longitudinal sculpture of T1: carinate, parallel to subparallel, interspersed with fine rugulose sculpture. Female T1 horn: absent, sculpture more or less uniform throughout T1. Anterior strip of T2: punctulate. Female T6 width to length ratio: wider than long (striplike). Female T6 carinate basal extension of lateral spine: absent. T6/S6 apical curvature: absent, sclerites more or less linear in lateral view or present, tips flexed outwards in lateral view. T6 posterolateral margin: without short spine or carinate expansion absent or apparently so (Fig. 52). S6 shape at tip: broadly rounded to very slightly angular, without obvious lobe.

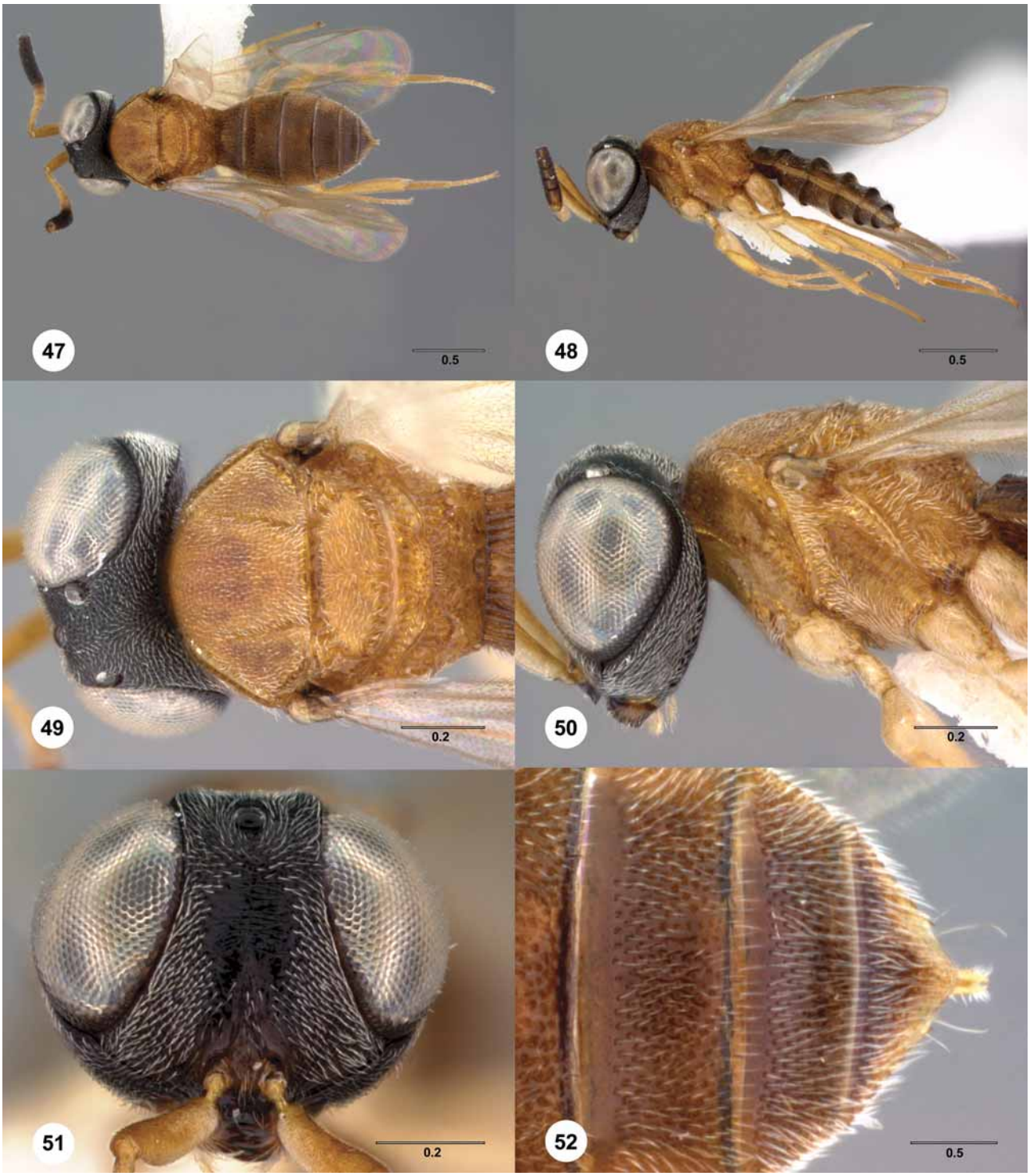
**Diagnosis**. Differs from all other species of *Axea* by the combination of the extremely reduced or absent spines on lateral T6, the color pattern of black head, yellow to amber mesosoma and light brown metasoma, and the relatively long fore wings.

**Etymology**. Named in honor of the collector, Dorothy Jackson.

**Link to Distribution Map**.[35]

33. http://atbi.biosci.ohio-state.edu/HymOnline/map-large.html?id=234167
34. http://www.morphbank.net/?id=226859
35. http://atbi.biosci.ohio-state.edu/HymOnline/map-large.html?id=223425

**Comments**. This species was first recognized and delimited by LM. While *A. dorothae* is remarkable for the relative length of the fore wing we noted wing length variation in a number of species including *A. adro*, *A. yurugu*, *A. talana*, *A. atai*, and A. *fisherhala*.




**FIGURES 47–52**.[36] *Axea dorothae*, paratype female (OSUC 211749). 47, dorsal habitus; 48, lateral habitus; 49, head and mesosoma, dorsal view; 50, head and mesosoma, lateral view; 51, head, anterior view; 52, apex of metasoma, dorsal view. Scale bars in millimeters.

36. http://www.morphbank.net/?id=226906


**FIGURES 53–58**.[37] *Axea eshu*, holotype male (OSUC 167023). 53, dorsal habitus; 54, lateral habitus; 55, head and mesosoma, dorsal view; 56, head and mesosoma, lateral view; 57, head, anterior view; 58, lateral ocellus, dorsal view. Scale bars in millimeters.

**Material Examined**. Holotype female: **CAMEROON**: Nkoemvom, 02.X.1979, D. Jackson, Malaise trap, OSUC 211800 (deposited in CNCI). *Paratypes*: 21 females. **CAMEROON**: 19 females, OSUC 211800, OSUC 167025, OSUC 211707, OSUC 211708, OSUC 211709, OSUC 211710, OSUC 211711, OSUC 211712, OSUC 211713, OSUC 211737, OSUC 211744, OSUC 211748, OSUC 211749, OSUC 211754, OSUC 211755, OSUC 211768, OSUC 211779, OSUC 211784, OSUC 211785 (CNCI). **CENTRAL**

37. http://www.morphbank.net/?id=226907

**AFRICAN REPUBLIC**: 2 females, OSUC 211730, 213980 (SAMC).

***Axea eshu* Valerio & Yoder, n.sp.**
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urn:lsid:biosci.ohio-state.edu:osuc_concepts:223462
Figures 53–58; Morphbank[38]

**General** (Figs. 53, 54): Male body length: 1.8 mm (n=2). **Head**: Color of female head: unknown. Mandible color: mostly yellow to amber or orange yellow. Body color of male: dark brown to black. Lateral ocellus position: distant from compound eye (Fig. 58). Pilosity of medial frons between anterior ocellus and apex of torular triangle: absent, a small patch without setae clearly visible. Sculpture of medial glabrous area of frons: present, with horizontal to slightly arcuate striae or, if patch minute, then irregularly rugulose (Fig. 57). **Mesosoma** (Figs. 55, 56): Color of female mesosoma: unknown. Dorsal surface of lateral pronotal area adjacent to mesoscutal suprahumeral sulcus: with uniform microsculpture only. Setae on netrion: absent. Notaulus: indicated by a row of pits. Metascutellum: projecting, more or less truncate, but with a narrow medial notch. Mesopleural depression sculpture: mostly transversely rugulose, larger fovea absent. Pilosity bounding anterior margin of posterior mesepimeral area: present along full length of margin. **Legs**: Coxae color: yellow (as in remainder of leg). Color of legs beyond coxae: uniformly yellow, without infuscations. **Wings**: Length of fore wing: surpassing posterior margin of metasoma. Hind wing submarginal vein: absent to spectral everywhere but basal stub that is nebulous to tubular. **Metasoma**: Color of female metasoma: dark brown to nearly black. Longitudinal sculpture of T1: carinate, parallel to subparallel, interspersed with fine rugulose sculpture. Female T1 horn: unknown. Anterior strip of T2: punctate, punctures nearly the length of strip, puncture borders confluent. Female T6 width to length ratio: unknown. Female T6 carinate basal extension of lateral spine: unknown. T6/S6 apical curvature: unknown. T6 posterolateral margin: unknown. S6 shape at tip: broadly rounded to very slightly angular, without obvious lobe.

**Diagnosis**. Known only from the male sex, but differing from all other known species of *Axea* by the large gap between the lateral ocellus and the compound eye (Fig. 58).

**Etymology**. Named in reference to the trickster god of the Yoruba people of West Africa.

**Link to Distribution Map.**[39]

**Material Examined**. Holotype male: **KENYA**: Nairobi Game Park, Nairobi, Nairobi Area, 28.III.1980, D. Levin, pan trap (deposited in CNCI). *Paratype*: **KENYA**: 1 male, OSUC 167070 (CNCI).

***Axea fisherhala* Valerio & Yoder, n.sp.**
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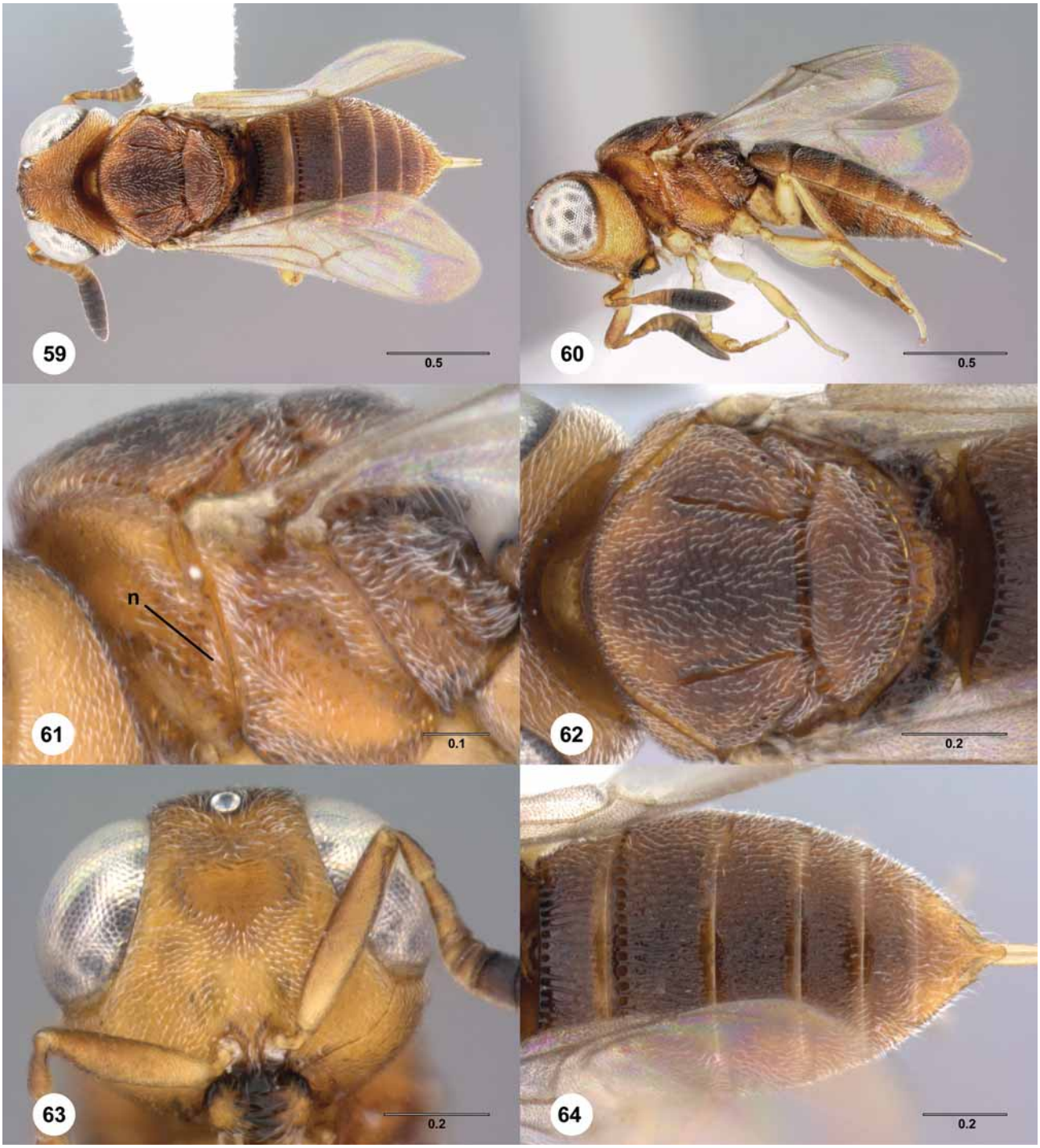
urn:lsid:biosci.ohio-state.edu:osuc_concepts:223468
Figures 59–64; Morphbank[40]

**General** (Figs. 59, 60): Female body length: 2.1–2.4 mm (n=12). Male body length: 2.1–2.2 mm (n=9). **Head**: Color of female head: yellow to amber or orange yellow. Mandible color: mostly dark brown to black. Body color of male: yellow orange to orange laterally and ventrally, darkening to light brown to brown dorsally. Lateral ocellus position: touching compound eye. Pilosity of medial frons between anterior ocellus and apex of torular triangle: absent, a small patch without setae clearly visible, or present. Sculpture of medial glabrous area of frons: present, with horizontal to slightly arcuate striae or, if patch minute, then irregularly

38. http://www.morphbank.net/?id=226860
39. http://atbi.biosci.ohio-state.edu/HymOnline/map-large.html?id=223462
40. http://www.morphbank.net/?id=226862

rugulose (Fig. 63). **Mesosoma** (Figs. 61, 62): Color of female mesosoma: orange brown with light to dark brown infuscations. Dorsal surface of lateral pronotal area adjacent to mesoscutal suprahumeral sulcus: with uniform microsculpture only. Setae on netrion: present. Notaulus: indicated by a row of pits. Metascutellum: projecting, broadly bilobed, or projecting, more or less truncate, but with a narrow medial notch. Mesopleural depression sculpture: irregularly foveate, majority of fovea not transverse, fovea




**FIGURES 59–64.**[41] *Axea fisherhala*, paratype female (OSUC 2042887). 59, dorsal habitus; 60, lateral habitus; 61, mesosoma, lateral view; 62, mesosoma, dorsal view; 63, head, anterior view; 64, metasoma, dorsal view. *n*, netrion. Scale bars in millimeters.

41. http://www.morphbank.net/?id=226908

interspersed with nitid areas, in some individuals some fovea reduced to punctures. Pilosity bounding anterior margin of posterior mesepimeral area: present along full length of margin, completely absent, or partially present dorsally. **Legs**: Coxae color: yellow (as in remainder of leg). Color of legs beyond coxae: uniformly yellow, without infuscations. **Wings**: Length of fore wing: not or just reaching posterior margin of metasoma, or surpassing posterior margin of metasoma. Hind wing submarginal vein: absent to spectral everywhere but basal stub that is nebulous to tubular. **Metasoma** (Fig. 64): Color of female metasoma: dark brown to nearly black, or yellow to amber or orange yellow. Longitudinal sculpture of T1: carinate, parallel to subparallel, interspersed with fine rugulose sculpture. Female T1 horn: absent, sculpture more or less uniform throughout T1. Anterior strip of T2: punctulate. Female T6 width to length ratio: more or less equal in length (subtriangular). Female T6 carinate basal extension of lateral spine: short, not extending past 1/2 length of T6. T6/S6 apical curvature: absent, sclerites more or less linear in lateral view. T6 posterolateral margin: with sharp spine. S6 shape at tip: broadly rounded to very slightly angular, without obvious lobe.

**Diagnosis**. Differs from all other species with orange or light-colored heads (i.e., not brown or black) by the setose netrion (Fig. 61, *n*).

**Etymology**. The specific epithet is derived from the names of the two principal collectors of specimens of this species in Madagascar, Brian Fisher and Rin'ha Harin'hala.

**Link to Distribution Map.**[42]

**Material Examined**. Holotype female: **MADAGASCAR**: Mahajanga Auto. Prov., Ankarafantsika (Ampijoroa) National Park, 16°19.16'S 46°48.80'E, 43 m, MA-25-14, deciduous forest, on RN 04, 160 km N Maevatanana, 7–14.IX.2003, Malaise trap, Harin'Hala, CASENT 2042942 (deposited in CASC). *Paratypes*: 36 females, 34 males. **MADAGASCAR**: 31 females, 34 males, CASENT 2042638–2042641, CASENT 2042730, CASENT 2042887, CASENT 2042894, CASENT 2042895, CASENT 2042936–2042938, CASENT 2042941, CASENT 2043019, CASENT 2043020, CASENT 2043067, CASENT 2043068, CASENT 2043171–2043177, CASENT 2043179–2043184, CASENT 2043189, CASENT 2043190, CASENT 2043954–2043956, CASENT 2132534–2132537, CASENT 2132539–2132543, CASENT 2132547, CASENT 2132548, CASENT 2132550, CASENT 2132561–2132564, CASENT 2132838, CASENT 2134147, CASENT 2134146, CASENT 2134577, CASENT 8106019, CASENT 8106020, CASENT 8106025–8106033 (CASC, OSUC). **MALI**: 1 female, OSUC 167066 (CNCI). **NIGERIA**: 2 females, OSUC 211763, OSUC 211792 (CNCI). **ZIMBABWE**: 2 females, OSUC 211786, OSUC 211796 (CNCI).

***Axea kalanoro* Valerio & Yoder, n.sp.**

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Figures 65–70; Morphbank[43]

**General** (Figs. 65, 66): Female body length: 2.8–3.0 mm (n=12). Male body length: 2.3–2.7 mm (n=6). **Head**: Color of female head: dark brown to nearly black. Mandible color: mostly dark brown to black. Body color of male: yellow orange to orange laterally and ventrally, darkening to light brown to brown dorsally, or dark brown to black. Lateral ocellus position: touching compound eye. Pilosity of medial frons between anterior ocellus and apex of torular triangle: absent, a small patch without setae clearly visible. Sculpture of medial glabrous area of frons: present, with horizontal to slightly arcuate striae or, if patch minute, then irregularly rugulose (Fig. 69). **Mesosoma** (Figs. 67, 68): Color of female mesosoma: dark brown to nearly black. Dorsal surface of lateral pronotal area adjacent to mesoscutal suprahumeral sulcus: with uniform microsculpture only, or with conspicuous crenulations or scrobes. Setae on netrion: present. Notaulus:

42. http://atbi.biosci.ohio-state.edu/HymOnline/map-large.html?id=223468

43. http://www.morphbank.net/?id=226864

indicated by an uninterrupted channel, with slight irregular sculpture along bottom. Metascutellum: projecting, broadly bilobed. Mesopleural depression sculpture: irregularly foveate, fovea frequently somewhat elongate. Pilosity bounding anterior margin of posterior mesepimeral area: present along full length of margin. **Legs**: Coxae color: brown to dark brown (contrasting remainder of leg which is yellow). Color of legs beyond coxae: femur light to dark brown with base and tip lighter, yellowish, remaining yellow. **Wings**: Length of fore wing: not or just reaching posterior margin of metasoma. Hind wing submarginal vein: absent to spectral everywhere but basal stub that is nebulous to tubular. **Metasoma**: Color of female metasoma: dark brown to nearly black. Longitudinal sculpture of T1: carinate, parallel to subparallel, interspersed with fine rugulose sculpture. Female T1 horn: absent, sculpture more or less uniform throughout T1, or present, not distinctly bulging and with only a small nitid patch. Anterior strip of T2: punctulate. Female T6 width to length ratio: more or less equal in length (subtriangular). Female T6 carinate basal extension of lateral spine: short, not extending past 1/2 length of T6. T6/S6 apical curvature: present, tips flexed outwards in lateral view. T6 posterolateral margin: with sharp spine (Fig. 70). S6 shape at tip: broadly rounded to very slightly angular, without obvious lobe.

**Diagnosis**. Differs from other brown-bodied species by the combination of the unique longitudinal microsculpture of the frons surrounding the anterior ocellus and the setose netrion.

**Etymology**. The specific epithet comes from the Malagasy language, referring to a particular kind of short hairy spirit that lives in the wild.

**Link to Distribution Map.**[44]

**Material Examined**. Holotype female: **MADAGASCAR**: Toliara Auto. Prov., Berenty Private Reserve, 25°00.40'S 46°18.20'E, 85 m, MA-02-22-10, gallery forest, 8 km NW Amboasary, 16–27.XII.2002, Malaise trap, Irwin, Parker & Harin'Hala, CASENT 2043030 (deposited in CASC). *Paratypes*: 23 females, 8 males. **MADAGASCAR**: CASENT 2042001, CASENT 2042002, CASENT 2042889, CASENT 2042922, CASENT 2042923, CASENT 2042985, CASENT 2043026, CASENT 2043028, CASENT 2043029, CASENT 2043031, CASENT 2043040, CASENT 2043146, CASENT 2043855, CASENT 2043967, CASENT 2043973, CASENT 2132095, CASENT 2132448, CASENT 2132449, CASENT 2132531, CASENT 2133251, CASENT 2133289, CASENT 2133297, CASENT 2133347, CASENT 2133348, CASENT 2133446, CASENT 2133447, CASENT 2134267, CASENT 2134299, CASENT 6106029, CASENT 2043283, CASENT 2118446 (CASC).

***Axea kilen* Valerio & Yoder, n.sp.**

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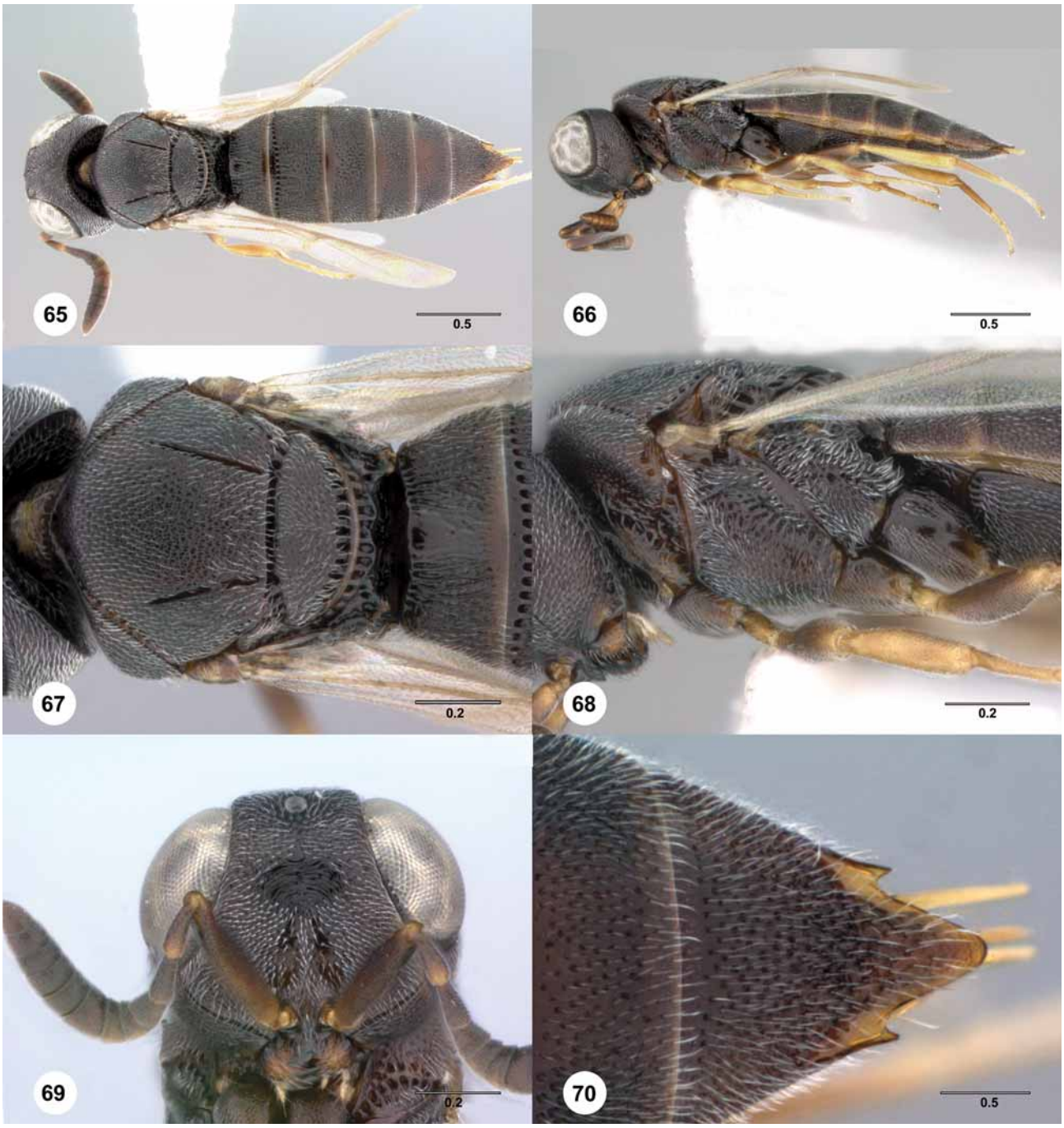
Figures 22, 71–76; Morphbank[45]

**General** (Figs. 71, 72): Female body length: 3.0 mm (n=1). Male body length: unknown. **Head**: Color of female head: black. Mandible color: mostly dark brown to black. Body color of male: unknown. Lateral ocellus position: touching compound eye. Pilosity of medial frons between anterior ocellus and apex of torular triangle: absent, a small patch without setae clearly visible. Sculpture of medial glabrous area of frons: present, with horizontal to slightly arcuate striae or, if patch minute, then irregularly rugulose (Fig. 75). **Mesosoma** (Fig. 73, 74): Color of female mesosoma: yellow to amber or orange yellow. Dorsal surface of lateral pronotal area adjacent to mesoscutal suprahumeral sulcus: with conspicuous crenulations or scrobes. Setae on netrion: absent. Notaulus: indicated by an uninterrupted channel, with slight irregular sculpture along bottom. Metascutellum: not projecting. Mesopleural depression sculpture: rugose, rugae broad and smooth.

44. http://atbi.biosci.ohio-state.edu/HymOnline/map-large.html?id=223432

45. http://www.morphbank.net/?id=226866

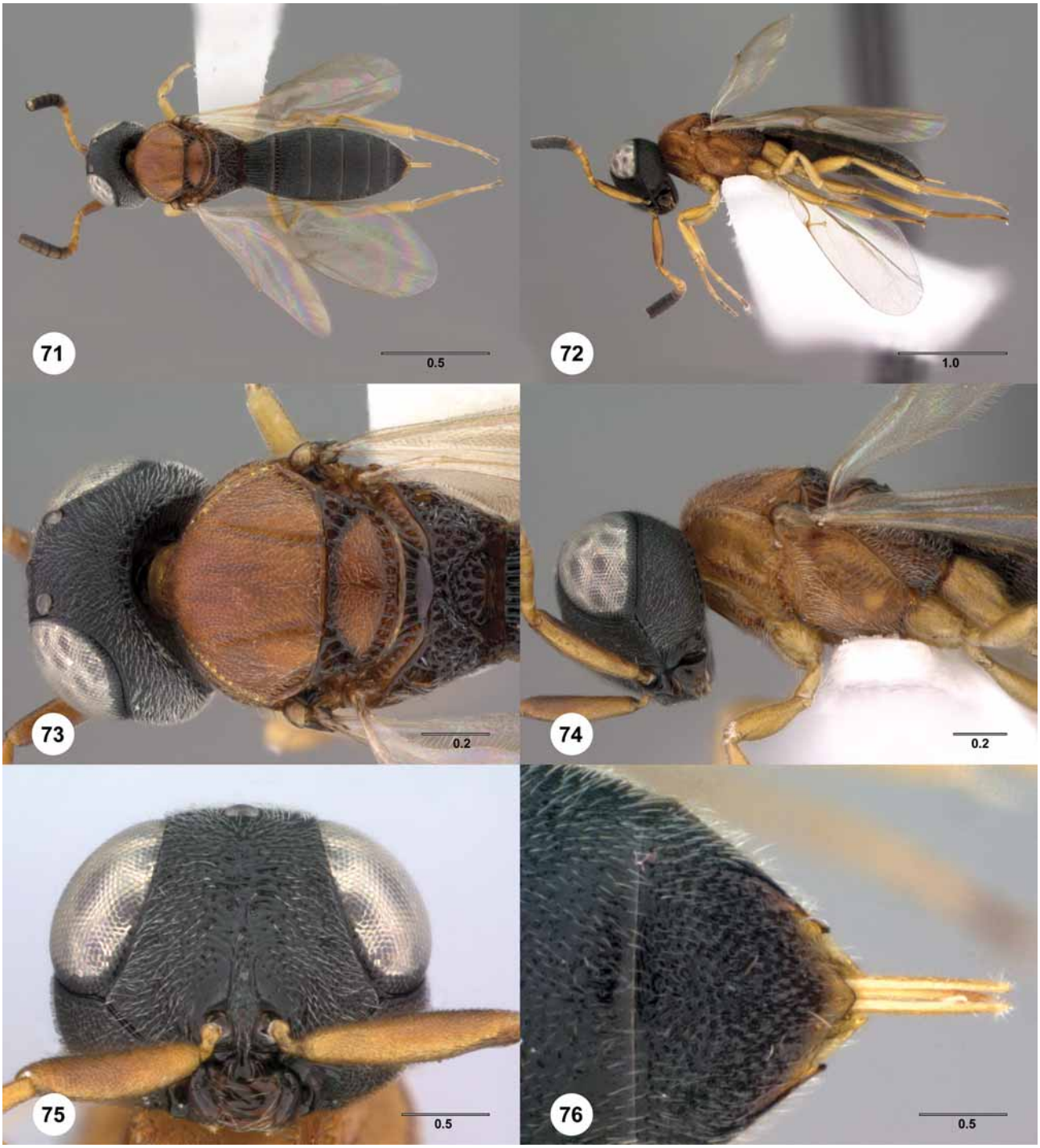



**FIGURES 65–70.**[46] *Axea kalanoro*, paratype female (CASENT 2043283). 65, dorsal habitus; 66, lateral habitus; 67, mesosoma, dorsal view; 68, mesosoma, lateral view; 69, head, anterior view; 70, apex of metasoma, dorsal view. Scale bars in millimeters.

Pilosity bounding anterior margin of posterior mesepimeral area: completely absent, or partially present dorsally. **Legs**: Coxae color: yellow (as in remainder of leg). Color of legs beyond coxae: uniformly yellow, without infuscations. **Wings**: Length of fore wing: surpassing posterior margin of metasoma. Hind wing submarginal vein: tubular from wing base to hamuli. **Metasoma**: Color of female metasoma: black. Longitudinal sculpture of T1: consisting of parallel sulci separated by smooth strips. Female T1 horn: absent, sculpture more or less uniform throughout T1. Anterior strip of T2: unknown. Female T6 width to length

46. http://www.morphbank.net/?id=226909

ratio: more or less equal in length (subtriangular). Female T6 carinate basal extension of lateral spine: short, not extending past 1/2 length of T6. T6/S6 apical curvature: present, tips flexed outwards in lateral view. T6 posterolateral margin: with sharp spine (Fig. 76). S6 shape at tip: broadly rounded to very slightly angular, without obvious lobe.




**FIGURES 71–76**[47]**.** *Axea kilen*, holotype female (OSUC 167051). 71, dorsal habitus; 72, lateral habitus; 73, head and mesosoma, dorsal view; 74, head and mesosoma, lateral view; 75, head, anterior view; 76, apex of metasoma, dorsal view. Scale bars in millimeters.

47. http://www.morphbank.net/?id=226910

**Diagnosis**. Differs from *A. yama* and *A. atriceps*, in which the hind wing submarginal vein is present and tubular, by the presence of a smooth and shining metascutellum (Fig. 73) and the well-impressed longitudinal sculpture of T1 (Fig. 22).

**Etymology**. The specific epithet is a reference to a magical half-horse half-dragon in a famous Thai fable.

**Link to Distribution Map**.[48]

**Comments**. Most species of *Axea* are remarkably similar in overall form. *Axea kilen* is unusual in this regard, with several notable features not observed in other species. These include the smooth and flattened metascutellum (Fig. 73), the deeply impressed longitudinal sculpture of dorsal T1 (Fig. 22), and the unique color pattern of the body.

**Material Examined**. Holotype female: **THAILAND**: Chiang Mai Prov., Doi Inthanon National Park, 1700 m, oak forest, 70 km SW Chiang Mai, 27.IV–3.V.1990, Malaise trap, B.V. Brown, OSUC 167051 (deposited in CNCI).

***Axea mena* Valerio & Yoder, n.sp.**

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urn:lsid:biosci.ohio-state.edu:osuc_concepts:223431

Figures 77–82; Morphbank[49]

**General** (Figs. 77, 78): Female body length: 2.8 mm (n=1). Male body length: 2.5–2.7 mm (n=2). **Head**: Color of female head: orange. Mandible color: mostly yellow to amber or orange yellow. Body color of male: yellow orange to orange laterally and ventrally, darkening to light brown to brown dorsally. Lateral ocellus position: touching compound eye. Pilosity of medial frons between anterior ocellus and apex of torular triangle: absent, a small patch without setae clearly visible. Sculpture of medial glabrous area of frons: present, with horizontal to slightly arcuate striae or, if patch minute, then irregularly rugulose (Fig. 81). **Mesosoma** (Figs. 79, 80): Color of female mesosoma: orange. Dorsal surface of lateral pronotal area adjacent to mesoscutal suprahumeral sulcus: with uniform microsculpture only. Setae on netrion: present. Notaulus: indicated by an uninterrupted channel, with slight irregular sculpture along bottom. Metascutellum: projecting, broadly bilobed. Mesopleural depression sculpture: mostly absent, posterior margin with some transverse crenulation and minute punctures. Pilosity bounding anterior margin of posterior mesepimeral area: completely absent, or partially present dorsally. **Legs**: Coxae color: yellow (as in remainder of leg). Color of legs beyond coxae: uniformly yellow, without infuscations. **Wings**: Length of fore wing: not or just reaching posterior margin of metasoma, or surpassing posterior margin of metasoma. Hind wing submarginal vein: absent to spectral everywhere but basal stub that is nebulous to tubular. **Metasoma**: Color of female metasoma: black. Longitudinal sculpture of T1: carinate, parallel to subparallel, interspersed with fine rugulose sculpture. Female T1 horn: absent, sculpture more or less uniform throughout T1. Anterior strip of T2: nitid, or punctulate. Female T6 width to length ratio: more or less equal in length (subtriangular). Female T6 carinate basal extension of lateral spine: short, not extending past 1/2 length of T6. T6/S6 apical curvature: absent, sclerites more or less linear in lateral view. T6 posterolateral margin: with sharp spine (Fig. 82). S6 shape at tip: broadly rounded to very slightly angular, without obvious lobe.

**Diagnosis**. Differs from all other species of *Axea* by the unique color pattern, with the head and mesosoma orange and the metasoma black.

**Etymology**. The specific epithet is from the Malagasy language referring to red or shades thereof.

**Link to Distribution Map.**[50]

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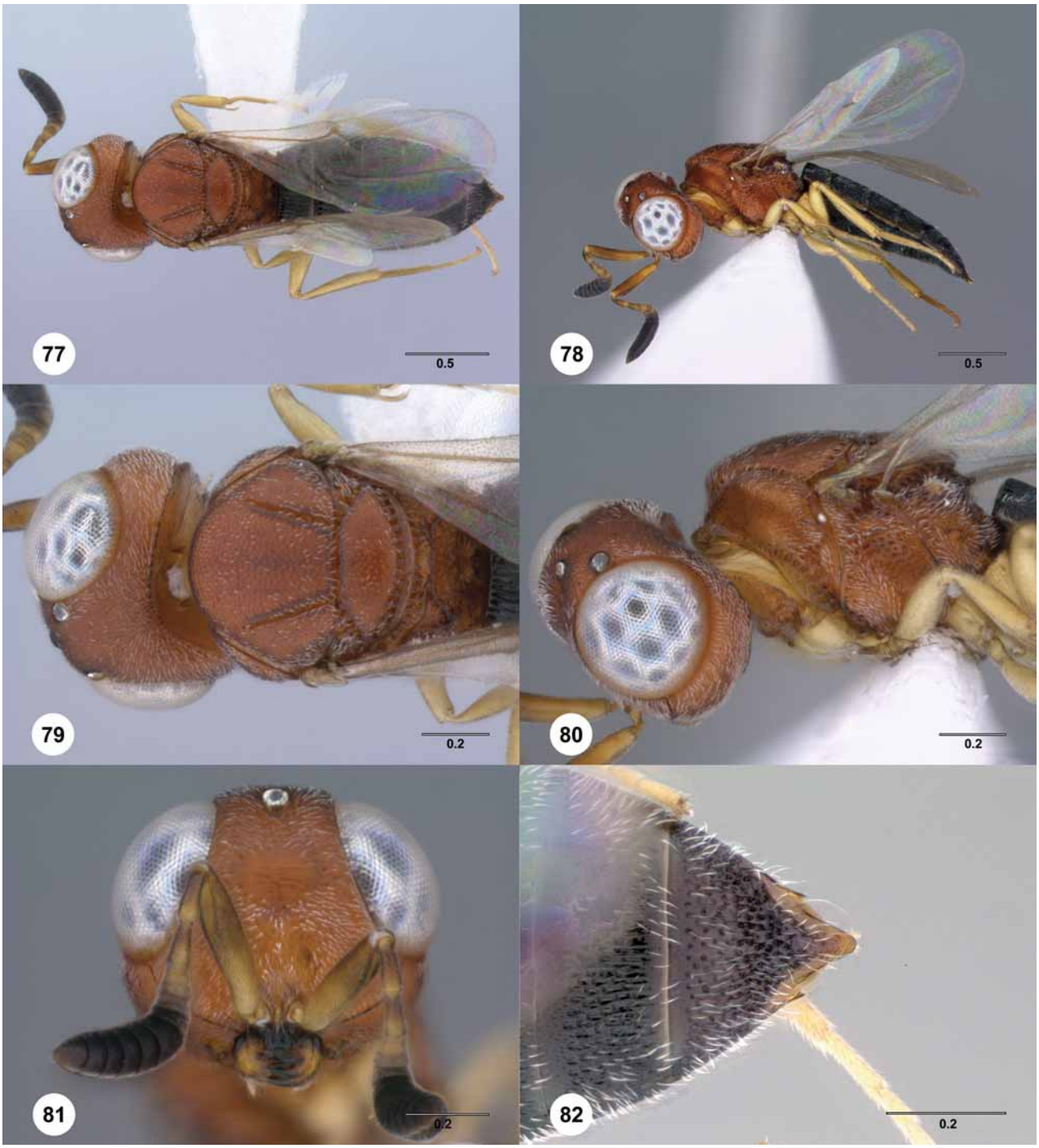
48. http://atbi.biosci.ohio-state.edu/HymOnline/map-large.html?id=223461
49. http://www.morphbank.net/?id=226868
50. http://atbi.biosci.ohio-state.edu/HymOnline/map-large.html?id=223431

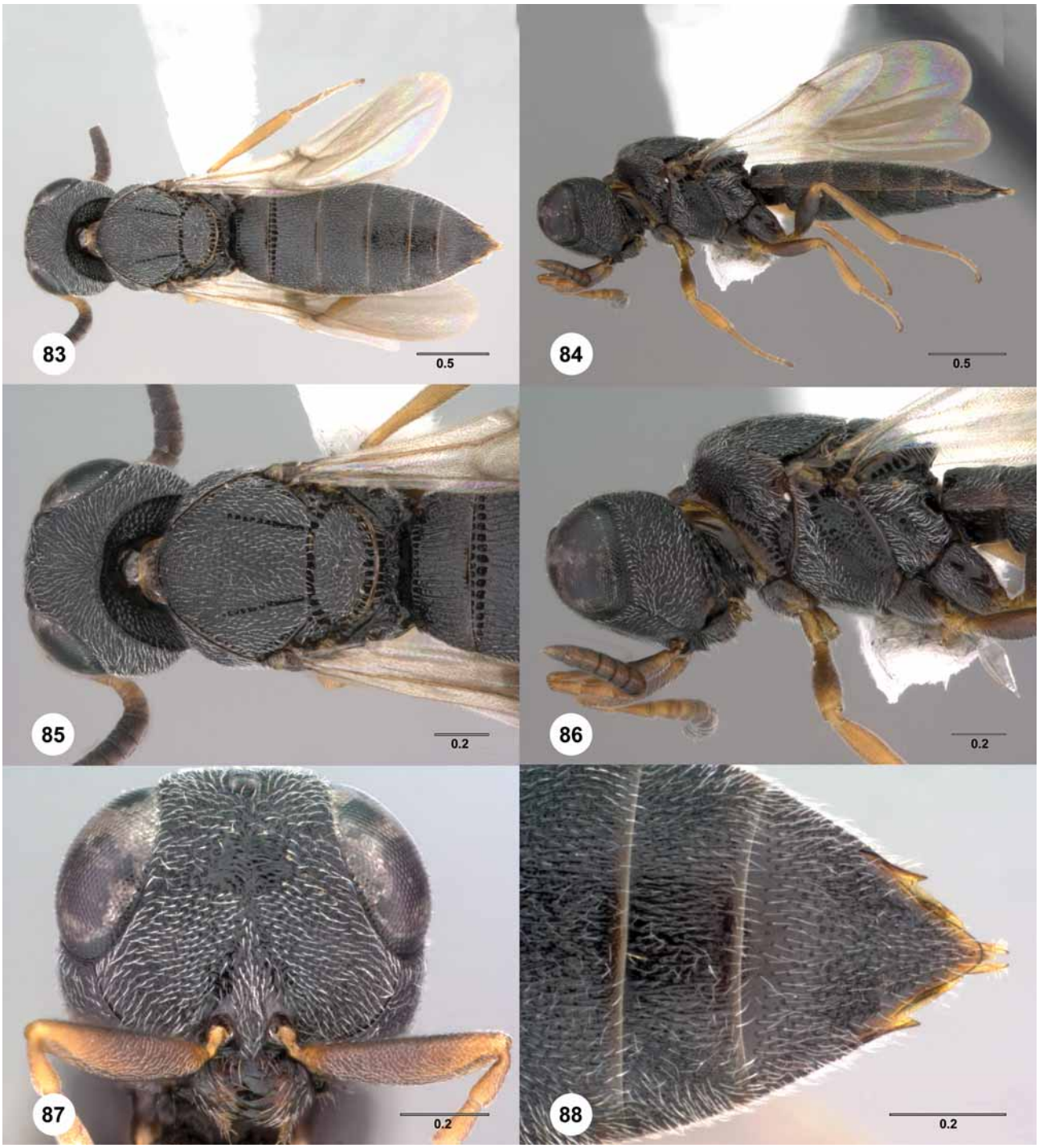
**Material Examined**. Holotype female: **MADAGASCAR**: Antsiranana Auto. Prov., Binara Forest, 13°15'18"S 49°37'00"E, 375 m, BLF9557, tropical dry forest, 7.5 km (230°) SW Daraina, 1.XI.2003, Malaise trap, B.L. Fisher (CASC). *Paratypes*: 2 males. **MADAGASCAR**: CASENT 2042000, CASENT 2042888 (CASC).




**FIGURES 77–82.**[51] *Axea mena*, holotype female (CASENT 2132568) . 77, dorsal habitus; 78, lateral habitus; 79, head and mesosoma, dorsal view; 80, head and mesosoma, lateral view; 81, head, anterior view; 82, apex of metasoma, dorsal view. Scale bars in millimeters.

51. http://www.morphbank.net/?id=226911

***Axea mwari* Valerio & Yoder, n.sp.**
urn:lsid:zoobank.org:act:5A2E4DD8-96C9-4175-A0C2-9B86D0191713
urn:lsid:biosci.ohio-state.edu:osuc_concepts:223460
Figures 83–88; Morphbank[52]




**FIGURES 83–88.**[53] *Axea mwari*, paratype female (OSUC 167048). 83, dorsal habitus; 84, lateral habitus; 85, head and mesosoma, dorsal view; 86, head and mesosoma, lateral view; 87, head, anterior view; 88, apex of metasoma, dorsal view. Scale bars in millimeters.

52. http://www.morphbank.net/?id=226870
53. http://www.morphbank.net/?id=226912

**General** (Figs. 83, 84): Female body length: 3.3–3.4 mm (n=5). Male body length: unknown. **Head**: Color of female head: black. Mandible color: mostly yellow to amber or orange yellow. Body color of male: unknown. Lateral ocellus position: touching compound eye. Pilosity of medial frons between anterior ocellus and apex of torular triangle: absent, a small patch without setae clearly visible. Sculpture of medial glabrous area of frons: present, with horizontal to slightly arcuate striae or, if patch minute, then irregularly rugulose (Fig. 87). **Mesosoma** (Figs. 85, 86): Color of female mesosoma: black. Dorsal surface of lateral pronotal area adjacent to mesoscutal suprahumeral sulcus: with conspicuous crenulations or scrobes. Setae on netrion: absent. Notaulus: indicated by an uninterrupted channel, with slight irregular sculpture along bottom. Metascutellum: projecting, more or less truncate, but with a narrow medial notch. Mesopleural depression sculpture: irregularly foveate, majority of fovea not transverse, fovea interspersed with nitid areas, in some individuals some fovea reduced to punctures. Pilosity bounding anterior margin of posterior mesepimeral area: completely absent, or partially present dorsally. **Legs**: Coxae color: brown to dark brown (contrasting remainder of leg which is yellow). Color of legs beyond coxae: femur light to dark brown with base and tip lighter, yellowish, remaining yellow. **Wings**: Length of fore wing: not or just reaching posterior margin of metasoma. Hind wing submarginal vein: absent to spectral everywhere but basal stub that is nebulous to tubular. **Metasoma**: Color of female metasoma: dark brown to nearly black. Longitudinal sculpture of T1: carinate, parallel to subparallel, interspersed with fine rugulose sculpture. Female T1 horn: absent, sculpture more or less uniform throughout T1. Anterior strip of T2: punctate, punctures nearly the length of strip, puncture borders confluent. Female T6 width to length ratio: more or less equal in length (subtriangular). Female T6 carinate basal extension of lateral spine: short, not extending past 1/2 length of T6. T6/S6 apical curvature: present, tips flexed outwards in lateral view. T6 posterolateral margin: with truncate lateral projection, outer corner of which is rarely slightly spinelike (Fig. 88). S6 shape at tip: broadly rounded to very slightly angular, without obvious lobe.

**Diagnosis**. Differs from other brown-bodied species by the combination of the strongly developed spines of lateral T6, short carinae on T6 (not longer than one-half the length of T6), brown legs, and glabrous netrion.

**Etymology**. Named in reference to the supreme creator god of Kalanga and Shona mythology.

**Link to Distribution Map.**[54]

**Material Examined**. Holotype female: **KENYA**: Nyanza Prov., Gemba (Gembe) Hills, 00°29.36'S 34°14.60'E, 1362 m, dry gallery woodland with *Olea europaea cuspidata*, 27–29.I.2005, R. Copeland, OSUC 211698 (deposited in CNCI). *Paratypes*: 7 females. **KENYA**: OSUC 16704, OSUC 167075, OSUC 214389 (CNCI); OSUC 167074 (USNM). **UGANDA**: OSUC 167022, OSUC 214390, OSUC 214396 (CNCI).

***Axea nommo* Valerio & Yoder, n.sp.**

urn:lsid:zoobank.org:act:D595C7E0-4AB3-4897-B33A-6B4532C298CD

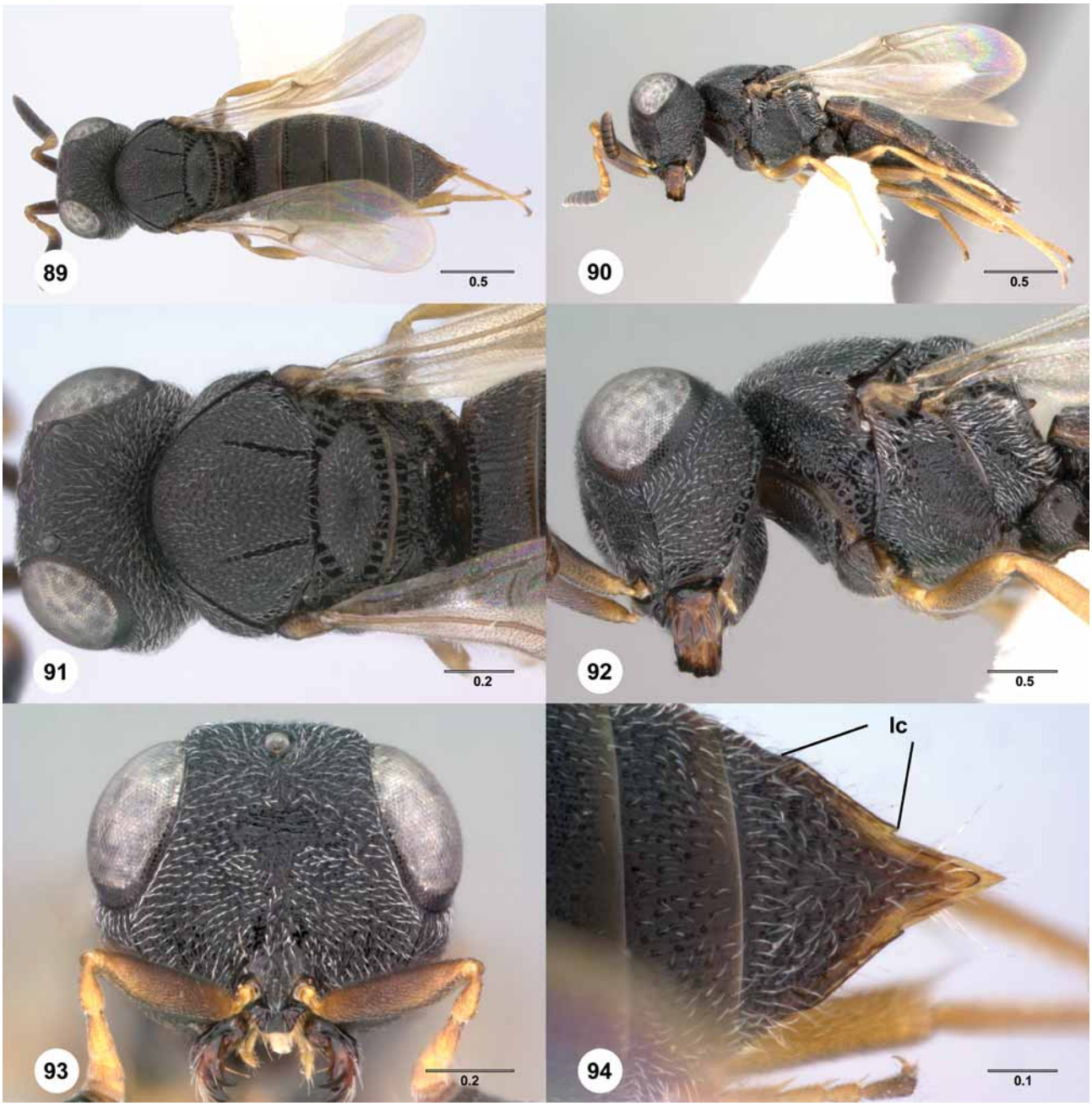
urn:lsid:biosci.ohio-state.edu:osuc_concepts:223471

Figures 89–94; Morphbank[55]

**General** (Figs. 89–90): Female body length: 2.7–3.0 mm (n=7). Male body length: unknown. **Head**: Color of female head: dark brown to nearly black. Mandible color: mostly dark brown to black. Body color of male: unknown. Lateral ocellus position: touching compound eye. Pilosity of medial frons between anterior ocellus and apex of torular triangle: absent, a small patch without setae clearly visible, or present. Sculpture of medial glabrous area of frons: present, with horizontal to slightly arcuate striae or, if patch minute, then irregularly rugulose (Fig. 93). **Mesosoma** (Figs. 91–92): Color of female mesosoma: dark brown to nearly black. Dorsal surface of lateral pronotal area adjacent to mesoscutal suprahumeral sulcus: with uniform microsculpture only. Setae on netrion: absent or present. Notaulus: indicated by an uninterrupted channel, with slight irregular

54. http://atbi.biosci.ohio-state.edu/HymOnline/map-large.html?id=223460

55. http://www.morphbank.net/?id=226874




**FIGURES 89–94.**[56] *Axea nommo*, paratype female (OSUC 211612). 89, dorsal habitus; 90, lateral habitus; 91, head and mesosoma, dorsal view; 92, head and mesosoma, lateral view; 93, head, anterior view; 94, apex of metasoma, dorsal view. *lc*, lateral carina on T6. Scale bars in millimeters.

sculpture along bottom. Metascutellum: projecting, more or less truncate, but with a narrow medial notch. Mesopleural depression sculpture: mostly transversely rugulose, larger fovea absent. Pilosity bounding anterior margin of posterior mesepimeral area: completely absent, or partially present dorsally. **Legs**: Coxae color: brown to dark brown (contrasting remainder of leg which is yellow). Color of legs beyond coxae: femur light to dark brown with base and tip lighter, yellowish, remaining yellow. **Wings**: Length of fore wing: not or just reaching posterior margin of metasoma. Hind wing submarginal vein: absent to spectral everywhere but basal stub that is nebulous to tubular. **Metasoma**: Color of female metasoma: dark brown to nearly black. Longitudinal sculpture of T1: carinate, parallel to subparallel, interspersed with fine rugulose sculpture.

56. http://www.morphbank.net/?id=226913

Female T1 horn: absent, sculpture more or less uniform throughout T1. Anterior strip of T2: punctate, punctures nearly the length of strip, puncture borders confluent. Female T6 width to length ratio: more or less equal in length (subtriangular). Female T6 carinate basal extension of lateral spine: long, extending past 1/2 length of T6. T6/S6 apical curvature: present, tips flexed outwards in lateral view. T6 posterolateral margin: without short spine or carinate expansion absent or apparently so or with truncate lateral projection, outer corner of which is rarely slightly spinelike (Fig. 94). S6 shape at tip: constricted, forming a slight lobe.

**Diagnosis**. Differs from other brown-bodied species, particularly *A. mwari*, by the well-developed spines of lateral T6 and the associated carinae which extend beyond one-half the length of T6.

**Etymology**. Named in reference to an early god of the Dogon people of Mali, Sudan, and Upper Volta.

**Link to Distribution Map.**[57]

**Material Examined**. Holotype female: **ZIMBABWE**: Harare, XII.1981, A. Watsham, OSUC 211608 (deposited in CNCI). *Paratypes*: 6 females. **ZIMBABWE**: OSUC 211607, OSUC 211609–211613 (CNCI).

***Axea talana* Valerio & Yoder, n.sp.**

urn:lsid:zoobank.org:act:666B735F-FBA1-47D5-97DD-68745B7324F9

urn:lsid:biosci.ohio-state.edu:osuc_concepts:223469

Figures 95–100; Morphbank[58]

**General** (Figs. 95, 96): Female body length: 2.2 mm (n=1). Male body length: unknown. **Head**: Color of female head: black. Mandible color: mostly dark brown to black. Body color of male: unknown. Lateral ocellus position: touching compound eye. Pilosity of medial frons between anterior ocellus and apex of torular triangle: absent, a small patch without setae clearly visible. Sculpture of medial glabrous area of frons: absent, area more or less smooth throughout (Fig. 99). **Mesosoma** (Figs. 97, 98): Color of female mesosoma: black. Dorsal surface of lateral pronotal area adjacent to mesoscutal suprahumeral sulcus: with conspicuous crenulations or scrobes. Setae on netrion: absent. Notaulus: indicated by a row of pits. Metascutellum: projecting, broadly bilobed. Mesopleural depression sculpture: irregularly foveate, fovea frequently somewhat elongate. Pilosity bounding anterior margin of posterior mesepimeral area: present along full length of margin, completely absent, or partially present dorsally. **Legs**: Coxae color: brown to dark brown (contrasting remainder of leg which is yellow). Color of legs beyond coxae: femur light to dark brown with base and tip lighter, yellowish, remaining yellow. **Wings**: Length of fore wing: not or just reaching posterior margin of metasoma, surpassing posterior margin of metasoma. Hind wing submarginal vein: absent to spectral everywhere but basal stub that is nebulous to tubular. **Metasoma**: Color of female metasoma: dark brown to nearly black. Longitudinal sculpture of T1: carinate, parallel to subparallel, interspersed with fine rugulose sculpture. Female T1 horn: present, a large nitid area at apex. Anterior strip of T2: punctulate. Female T6 width to length ratio: wider than long (striplike). Female T6 carinate basal extension of lateral spine: absent. T6/S6 apical curvature: absent, sclerites more or less linear in lateral view. T6 posterolateral margin: without short spine or carinate expansion absent or apparently so (Fig. 100). S6 shape at tip: broadly rounded to very slightly angular, without obvious lobe.

**Diagnosis**. Differs from all other species by the very strongly developed T1 horn and the absence of sculpture dorsally on T1 (Fig. 97).

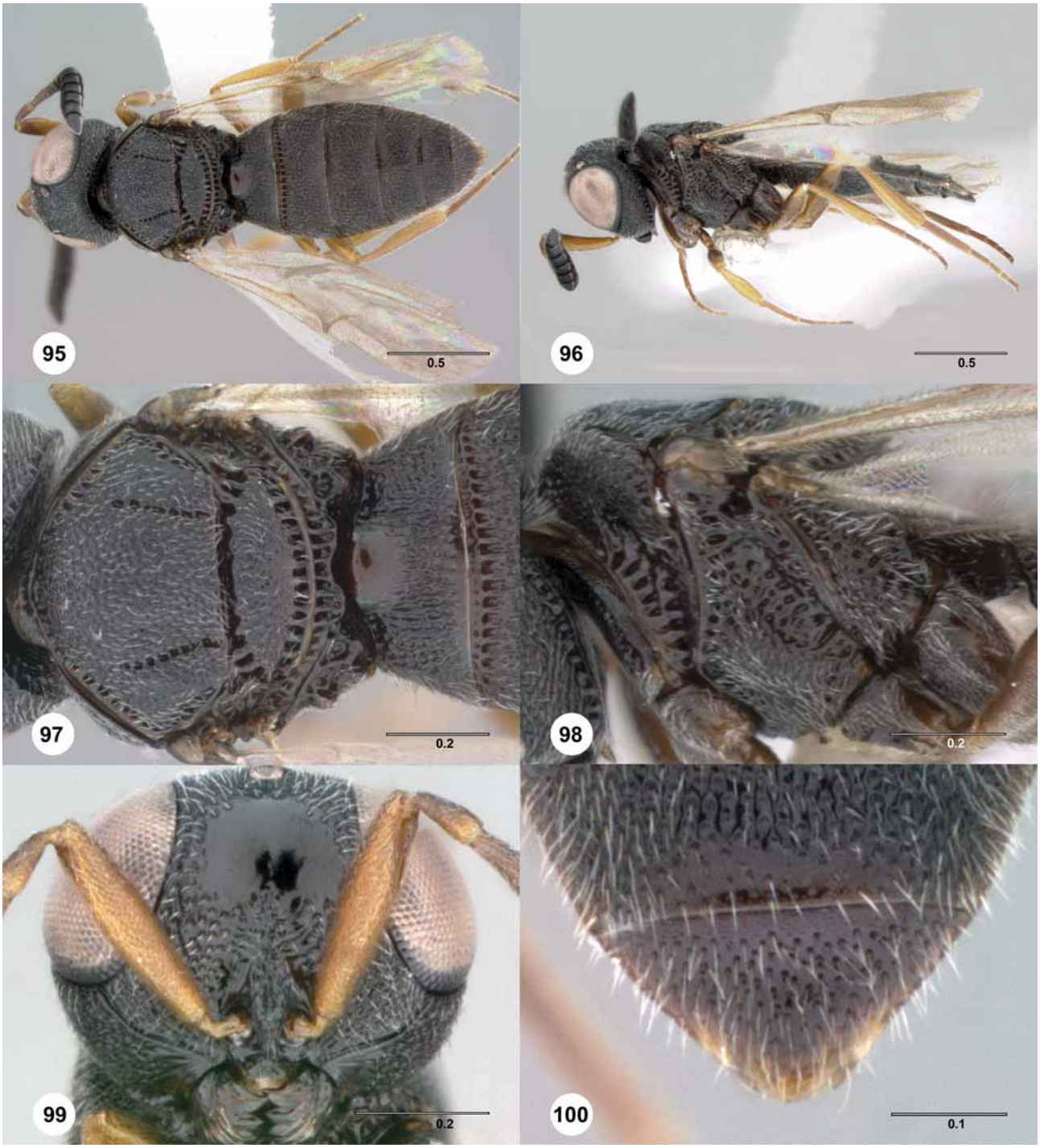
**Etymology**. The specific epithet is an arbitrary combination of letters.

**Link to Distribution Map.**[59]

**Material Examined**. Holotype female: **CENTRAL AFRICAN REPUBLIC**: Sangha-Mbaéré Préf. Écon., Dzanga-Ndoki National Park, 03°02.01'N 16°24.57'E, 510 m, CAR01-M03, lowland rainforest/marsh

57. http://atbi.biosci.ohio-state.edu/HymOnline/map-large.html?id=223471
58. http://www.morphbank.net/?id=226875
59. http://atbi.biosci.ohio-state.edu/HymOnline/map-large.html?id=223469

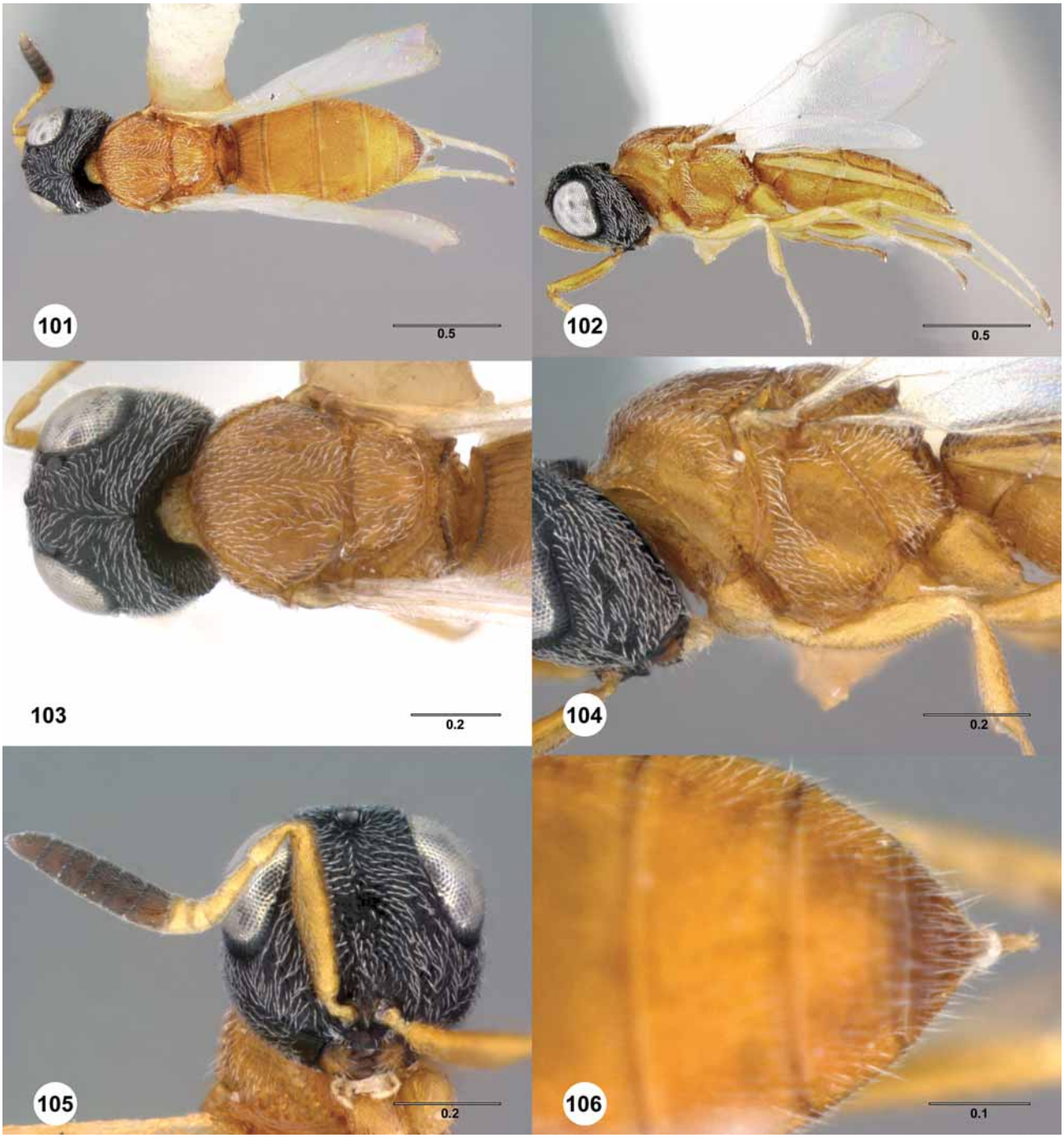
clearing, Mabéa Bai, 21.4 km (53°) NE Bayanga, 1–2.V.2001, Malaise trap, S. van Noort, OSUC 176080 (deposited in SAMC). *Paratypes*: 1 female. **CENTRAL AFRICAN REPUBLIC**: OSUC 244015 (SAMC).




**FIGURES 95–100.**[60] *Axea talana*, holotype female (OSUC 176080). 95, dorsal habitus; 96, lateral habitus; 97, mesosoma and base of metasoma, dorsal view; 98, mesosoma, lateral view; 99, head, anterior view; 100, apex of metasoma, dorsal view. Scale bars in millimeters.

60. http://www.morphbank.net/?id=226914

***Axea yama* Valerio & Yoder, n.sp.**
urn:lsid:zoobank.org:act:0AEC50AE-9FEC-4D14-A55C-835CA5EAB4E2
urn:lsid:biosci.ohio-state.edu:osuc_concepts:223467
Figures 20, 101–106; Morphbank[61]




**FIGURES 101–106.**[62] *Axea yama*, holotype female (OSUC 56308). 101, dorsal habitus; 102, lateral habitus; 103, head and mesosoma, dorsal view; 104, mesosoma, lateral view; 105, head, anterior view; 106. apex of metasoma, dorsal view. Scale bars in millimeters.

61. http://www.morphbank.net/?id=226876
62. http://www.morphbank.net/?id=226915

**General** (Figs. 101,102): Female body length: 2.0 mm (n= 1). Male body length: unknown. **Head**: Color of female head: black. Mandible color: mostly yellow to amber or orange yellow. Body color of male: unknown. Lateral ocellus position: touching compound eye. Pilosity of medial frons between anterior ocellus and apex of torular triangle: absent, a small patch without setae clearly visible. Sculpture of medial glabrous area of frons: present, with horizontal to slightly arcuate striae or, if patch minute, then irregularly rugulose (Fig. 105). **Mesosoma** (Figs. 103, 104): Color of female mesosoma: yellow to amber or orange yellow. Dorsal surface of lateral pronotal area adjacent to mesoscutal suprahumeral sulcus: with uniform microsculpture only. Setae on netrion: absent. Notaulus: indicated by a row of pits. Metascutellum: projecting, broadly bilobed. Mesopleural depression sculpture: mostly transversely rugulose, larger fovea absent. Pilosity bounding anterior margin of posterior mesepimeral area: completely absent, or partially present dorsally. **Legs**: Coxae color: yellow (as in remainder of leg). Color of legs beyond coxae: uniformly yellow, without infuscations. **Wings**: Length of fore wing: not or just reaching posterior margin of metasoma, surpassing posterior margin of metasoma. Hind wing submarginal vein: tubular from wing base to hamuli. **Metasoma**: Color of female metasoma: yellow to amber or orange yellow. Longitudinal sculpture of T1: carinate, parallel to subparallel, interspersed with fine rugulose sculpture. Female T1 horn: absent, sculpture more or less uniform throughout T1. Anterior strip of T2: nitid. Female T6 width to length ratio: wider than long (striplike). Female T6 carinate basal extension of lateral spine: absent. T6/S6 apical curvature: absent, sclerites more or less linear in lateral view. T6 posterolateral margin: without short spine or carinate expansion absent or apparently so (Fig. 106). S6 shape at tip: broadly rounded to very slightly angular, without obvious lobe.

**Diagnosis**. Differs from other species in which the hind wing submarginal vein is present by the presence of a bilobed metascutellum (Fig. 20).

**Etymology**. The specific epithet is a reference to the Hindu god of death.

**Link to Distribution Map.**[63]

**Material Examined**. Holotype female: **INDIA**: Uttar Pradesh St., 5 km W Lucknow, 24.IX.1986, OSUC 56308 (deposited in OSUC).

***Axea yasigi* Valerio & Yoder, n.sp.**

urn:lsid:zoobank.org:act:8E51DDA5-60FA-46BE-AE0A-72923A90BA9F

urn:lsid:biosci.ohio-state.edu:osuc_concepts:223464

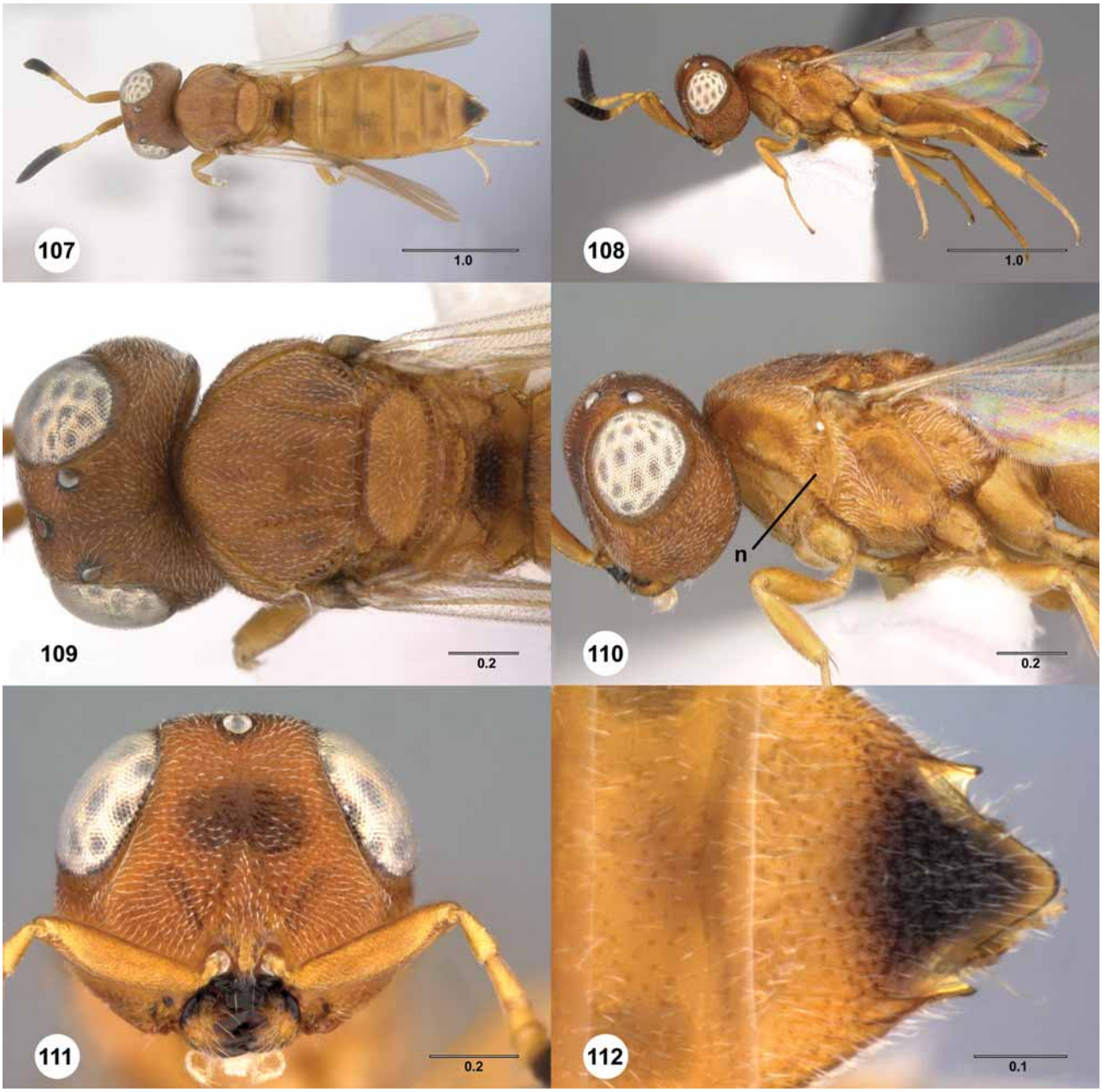
Figures 21, 107–112; Morphbank[64]

**General** (Figs. 107, 108): Female body length: 2.2–3.2 mm (n=19). Male body length: 2.4–2.5 mm (n=2). **Head**: Color of female head: yellow to amber or orange yellow. Mandible color: mostly yellow to amber or orange yellow. Body color of male: yellow laterally and ventrally, darkening to light brown to brown dorsally. Lateral ocellus position: touching compound eye. Pilosity of medial frons between anterior ocellus and apex of torular triangle: absent, a small patch without setae clearly visible. Sculpture of medial glabrous area of frons: present, with horizontal to slightly arcuate striae or, if patch minute, then irregularly rugulose (Fig. 111). **Mesosoma** (Figs. 109, 110): Color of female mesosoma: yellow to amber. Dorsal surface of lateral pronotal area adjacent to mesoscutal suprahumeral sulcus: with conspicuous crenulations or scrobes. Setae on netrion: absent. Notaulus: indicated by a row of pits. Metascutellum: projecting, more or less truncate, but with a narrow medial notch. Mesopleural depression sculpture: irregularly foveate, majority of fovea not transverse, fovea interspersed with nitid areas, in some individuals some fovea reduced to punctures. Pilosity bounding anterior margin of posterior mesepimeral area: completely absent, or partially present dorsally. **Legs**: Coxae color: yellow (as in remainder of leg). Color of legs beyond coxae: uniformly yellow, without

63. http://atbi.biosci.ohio-state.edu/HymOnline/map-large.html?id=223467

64. http://www.morphbank.net/?id=226877

infuscations. **Wings**: Length of fore wing: not or just reaching posterior margin of metasoma, or surpassing posterior margin of metasoma. Hind wing submarginal vein: absent to spectral everywhere but basal stub that is nebulous to tubular. **Metasoma**: Color of female metasoma: yellow to amber or orange yellow, or light brown. Longitudinal sculpture of T1: carinate, parallel to subparallel, interspersed with fine rugulose sculpture. Female T1 horn: absent, sculpture more or less uniform throughout T1. Anterior strip of T2: punctate, punctures nearly the length of strip, puncture borders confluent. Female T6 width to length ratio: wider than long (striplike). Female T6 carinate basal extension of lateral spine: short, not extending past 1/2 length of T6. T6/S6 apical curvature: present, tips flexed outwards in lateral view. T6 posterolateral margin: with sharp spine (Fig. 112). S6 shape at tip: broadly rounded to very slightly angular, without obvious lobe.




**FIGURES 107–112.**[65] *Axea yasigi*, holotype female (OSUC 211772). 107, dorsal habitus; 108, lateral habitus; 109, head and mesosoma, dorsal view; 110, head and mesosoma, lateral view; 111, head, anterior view; 112, apex of metasoma, dorsal view. *n*, netrion. Scale bars in millimeters.

65. http://www.morphbank.net/?id=226916

**Diagnosis**. Differs from most species by the orange head. *Axea yasigi* may be separated from *A. yurugu* by the numerous carina interrupting the course of the notaulus, resulting in the appearance of a row of pits (Fig. 109, cf. Fig. 18, *nt*).

**Etymology**. Named in reference to a goddess of the Dogon people of Mali, Sudan, and Upper Volta.

**Link to Distribution Map.**[66]

**Material Examined**. Holotype female: **ZIMBABWE**: Harare, IV.1981, A. Watsham, OSUC 167028 (deposited in CNCI). *Paratypes*: 21 females, 2 males. **BENIN**: 1 female, OSUC 211701 (CNCI). **GABON**: 2 females, OSUC 211616, OSUC 211703 (CNCI). **IVORY COAST**: 6 females, OSUC 211702, OSUC 211704–211706, OSUC 211718, OSUC 211799 (CNCI). **KENYA**: 2 females, OSUC 211745, OSUC 214399 (CNCI). **SOUTH AFRICA**: 1 male, OSUC 167029 (CNCI). **ZIMBABWE**: 11 females, 1 male, OSUC 167047, OSUC 211721, OSUC 211731, OSUC 211733, OSUC 211738, OSUC 211739, OSUC 211750, OSUC 211752, OSUC 211772, OSUC 211783, OSUC 213806 (CNCI).

***Axea yurugu* Valerio & Yoder, n.sp.**

urn:lsid:zoobank.org:act:86D93516-A071-4F52-978F-8E3FB4C9F765

urn:lsid:biosci.ohio-state.edu:osuc_concepts:223465

Figures 113–118; Morphbank[67]

**General** (Fig. 113, 114): Female body length: 1.8–2.5 mm (n=14). Male body length:1.9 mm (n=4). **Head**: Color of female head: yellow to amber or orange yellow. Mandible color: mostly yellow to amber or orange yellow. Body color of male: yellow laterally and ventrally, darkening to light brown to brown dorsally. Lateral ocellus position: touching compound eye. Pilosity of medial frons between anterior ocellus and apex of torular triangle: absent, a small patch without setae clearly visible. Sculpture of medial glabrous area of frons: present, with horizontal to slightly arcuate striae or, if patch minute, then irregularly rugulose (Fig. 117). **Mesosoma** (Fig. 115, 116): Color of female mesosoma: yellow to amber or orange yellow. Dorsal surface of lateral pronotal area adjacent to mesoscutal suprahumeral sulcus: with uniform microsculpture only. Setae on netrion: absent. Notaulus: indicated by a row of pits, or indicated by an uninterrupted channel, with slight irregular sculpture along bottom. Metascutellum: projecting, broadly bilobed, or projecting, more or less truncate, but with a narrow medial notch. Mesopleural depression sculpture: irregularly foveate, majority of fovea not transverse, fovea interspersed with nitid areas, in some individuals some fovea reduced to punctures. Pilosity bounding anterior margin of posterior mesepimeral area: present along full length of margin, completely absent, or partially present dorsally. **Legs**: Coxae color: yellow (as in remainder of leg). Color of legs beyond coxae: uniformly yellow, without infuscations. **Wings**: Length of fore wing: not or just reaching posterior margin of metasoma, or surpassing posterior margin of metasoma. Hind wing submarginal vein: absent to spectral everywhere but basal stub that is nebulous to tubular. **Metasoma**: Color of female metasoma: dark brown to nearly black, yellow to amber or orange yellow, or light brown. Longitudinal sculpture of T1: carinate, parallel to subparallel, interspersed with fine rugulose sculpture. Female T1 horn: absent, sculpture more or less uniform throughout T1. Anterior strip of T2: punctulate. Female T6 width to length ratio: wider than long (striplike). Female T6 carinate basal extension of lateral spine: short, not extending past 1/2 length of T6. T6/S6 apical curvature: absent, sclerites more or less linear in lateral view, or present, tips flexed outwards in lateral view. T6 posterolateral margin: with sharp spine (Fig. 118). S6 shape at tip: broadly rounded to very slightly angular, without obvious lobe.

**Diagnosis**. Distinguished from most species by the orange head. *Axea yurugu* may be separated from *A. yasigi* by the uninterrupted course of the notaulus.

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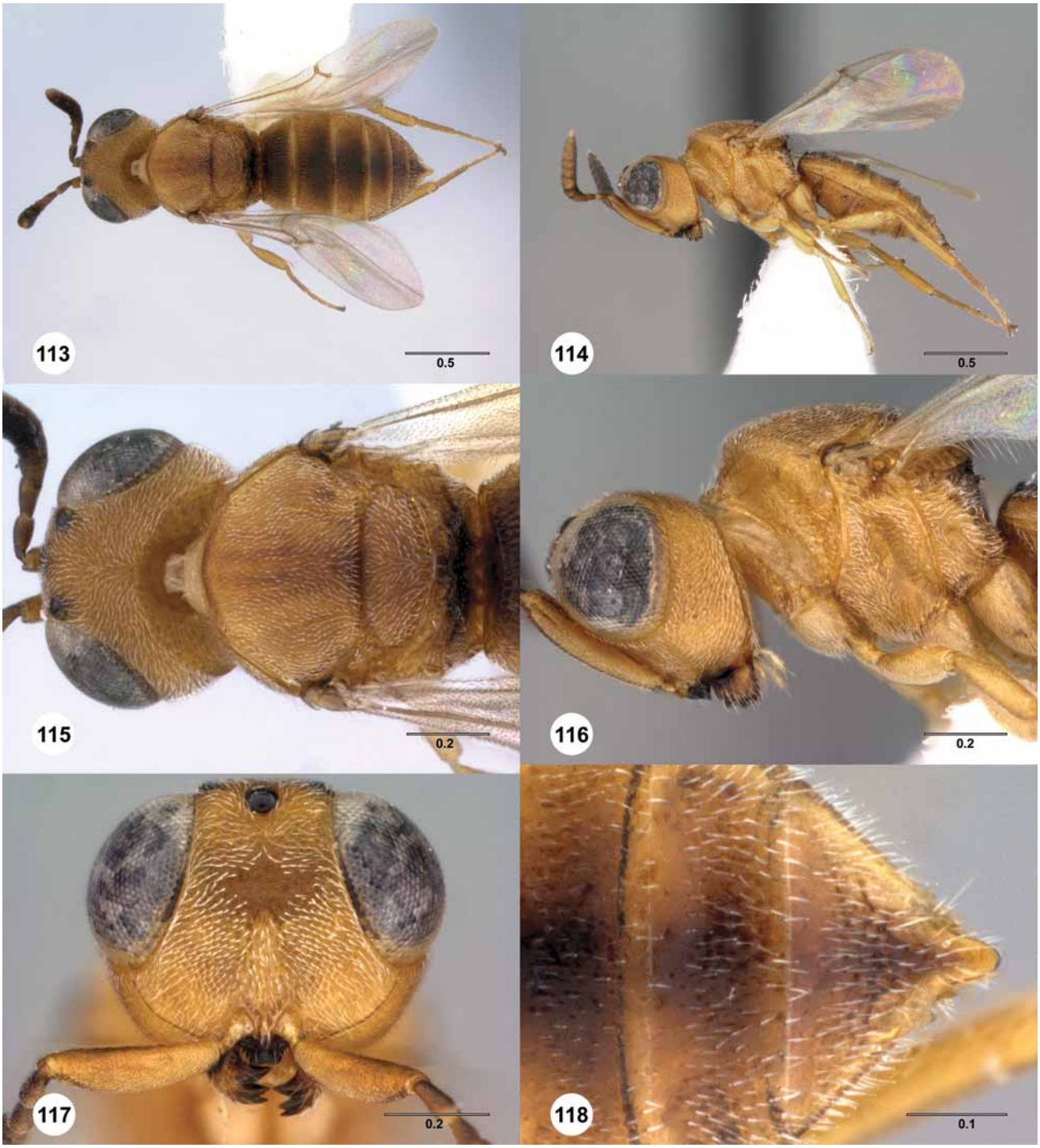
66. http://atbi.biosci.ohio-state.edu/HymOnline/map-large.html?id=223464

67. http://www.morphbank.net/?id=226878

**Etymology**. The specific epithet is a reference to the mythological being of the Dogon people of Mali, Sudan, and Upper Volta.

**Link to Distribution Map**.[68]

**Comments**. As delimited here, *A. yurugu* is relatively variable in color. Smaller individuals can be bright yellow, with little to no infuscation, while larger individuals may have the dorsal metasoma light brown throughout.




**FIGURES 113–118.**[69] *Axea yurugu*, paratype female (OSUC 211761). 113, dorsal habitus; 114, lateral habitus; 115, head and mesosoma, dorsal view; 116, head and mesosoma, lateral view; 117, head, anterior view; 118, apex of metasoma, dorsal view. Scale bars in millimeters.

68. http://atbi.biosci.ohio-state.edu/HymOnline/map-large.html?id=223465
69. http://www.morphbank.net/?id=226917

**Material Examined**. Holotype female: **SOUTH AFRICA**: Eastern Cape Prov., Grootrivierberge Range, 33°11.46'S 24°09.51'E, 700 m, SA-15, 37 km NW Willowmore, 19–24.XI.1999, Malaise trap, M. Irwin, et al., OSUC 211798 (deposited in CNCI). *Paratypes*: 27 females, 13 males. **BENIN**: 1 female, OSUC 211795 (CNCI). **IVORY COAST**: 1 female, OSUC 211765 (CNCI). **KENYA**: 26 females, OSUC 167049, OSUC 167078, OSUC 211715, OSUC 211717, OSUC 211719, OSUC 211727–211729, OSUC 211743, OSUC 211751, OSUC 211758, OSUC 211761, OSUC 211780, OSUC 211789, OSUC 211790, OSUC 211793, OSUC 211794, OSUC 214368–214370, OSUC 214391, OSUC 214392, OSUC 214394, OSUC 214395, OSUC 214398, OSUC 214400 (CNCI). **MALAWI**: 1 female, OSUC 167068 (CNCI). **SOMALIA**: 2 females, OSUC 167038, OSUC 211723 (CNCI). **SOUTH AFRICA**: 6 females, OSUC 167039, OSUC 167046, OSUC 211716, OSUC 211771 (CNCI); OSUC 211769 (OSUC). **ZIMBABWE**: 4 females, OSUC 167031, OSUC 211788, OSUC 211791, OSUC 211797 (CNCI).

***Axea zanahary* Valerio & Yoder, n.sp.**
urn:lsid:zoobank.org:act:883E4F43-4717-447F-952C-962488354069
urn:lsid:biosci.ohio-state.edu:osuc_concepts:223989
Figures 119–124; Morphbank[70]

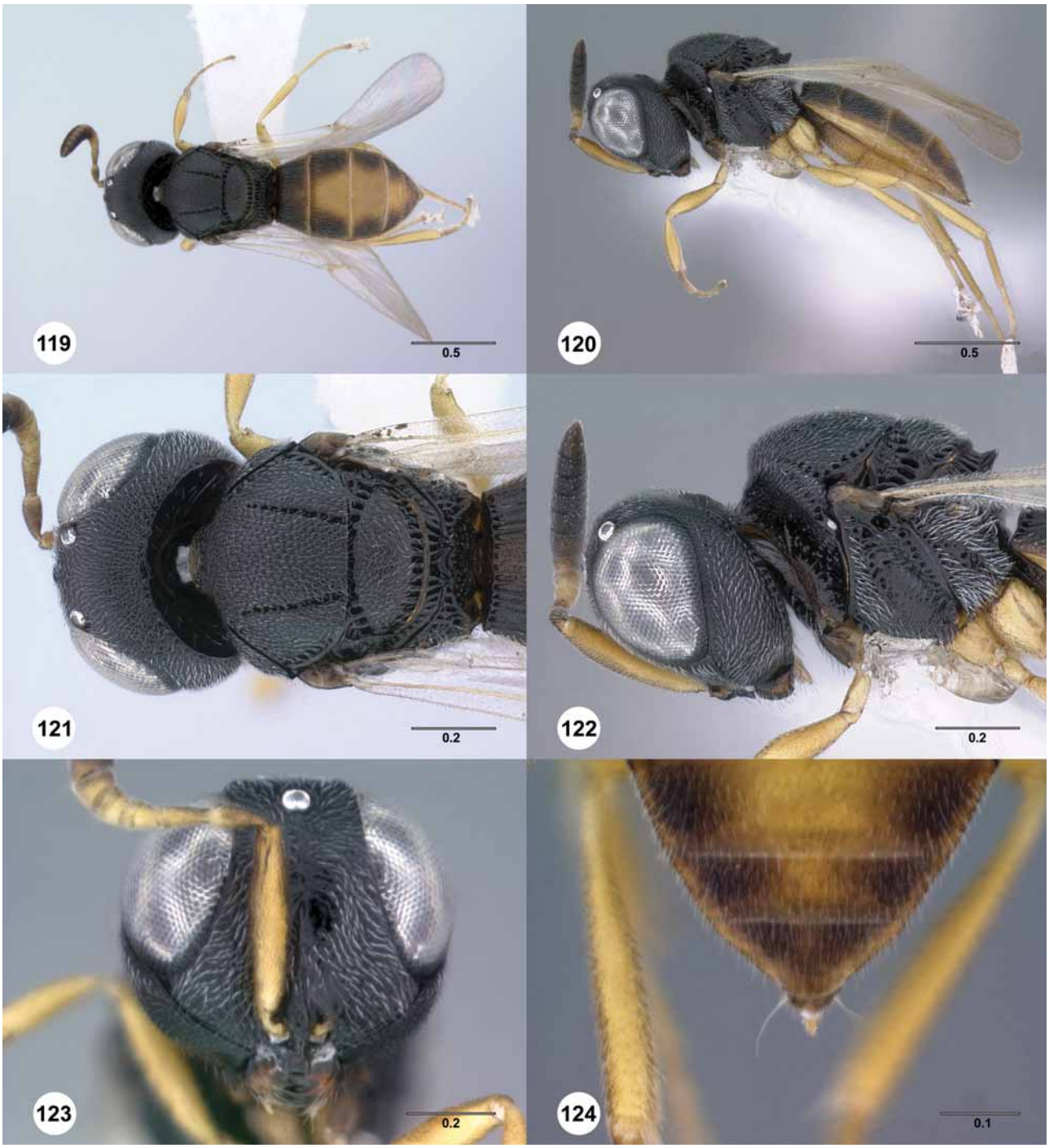
**General** (Figs. 119, 120): Female body length: 1.9 mm (n=1). Male body length: unknown. **Head**: Color of female head: black. Mandible color: mostly dark brown to black. Body color of male: unknown. Lateral ocellus position: touching compound eye. Pilosity of medial frons between anterior ocellus and apex of torular triangle: absent, a small patch without setae clearly visible. Sculpture of medial glabrous area of frons: present, with horizontal to slightly arcuate striae or, if patch minute, then irregularly rugulose (Fig. 123). **Mesosoma** (Figs. 121, 122): Color of female mesosoma: black. Dorsal surface of lateral pronotal area adjacent to mesoscutal suprahumeral sulcus: with conspicuous crenulations or scrobes. Setae on netrion: absent. Notaulus: indicated by an uninterrupted channel, with slight irregular sculpture along bottom. Metascutellum: projecting, broadly bilobed. Mesopleural depression sculpture: mostly absent, posterior margin with some transverse crenulation and minute punctures. Pilosity bounding anterior margin of posterior mesepimeral area: completely absent, or partially present dorsally. **Legs**: Coxae color: yellow (as in remainder of leg), or brown to dark brown (contrasting remainder of leg which is yellow). Color of legs beyond coxae: uniformly yellow, without infuscations. **Wings**: Length of fore wing: surpassing posterior margin of metasoma. Hind wing submarginal vein: tubular from wing base to hamuli. **Metasoma**: Color of female metasoma: dark brown to nearly black, or yellow to amber or orange yellow. Longitudinal sculpture of T1: carinate, parallel to subparallel, interspersed with fine rugulose sculpture. Female T1 horn: absent, sculpture more or less uniform throughout T1. Anterior strip of T2: nitid. Female T6 width to length ratio: wider than long (striplike). Female T6 carinate basal extension of lateral spine: absent. T6/S6 apical curvature: absent, sclerites more or less linear in lateral view. T6 posterolateral margin: without short spine or carinate expansion absent or apparently so (Fig. 124). S6 shape at tip: broadly rounded to very slightly angular, without obvious lobe.

**Diagnosis**. This single specimen differs from all others by the uniquely colored metasoma in which the margins are dark in contrast to the yellow more central portion (Figs. 119, 124).

**Etymology**. Named in reference to the supreme god of the Malagasy pantheon.

**Link to Distribution Map.**[71]

70. http://www.morphbank.net/?id=226881
71. http://atbi.biosci.ohio-state.edu/HymOnline/map-large.html?id=223989




**FIGURES 119–124.**[72] *Axea zanahary*, holotype female (CASENT 2133065). 119, dorsal habitus; 120, lateral habitus; 121, head and mesosoma, dorsal view; 122, head and mesosoma, lateral view; 123, head, frontal view; 124, apex of metasoma, dorsal view. Scale bars in millimeters.

**Material Examined**. Holotype female: **MADAGASCAR**: Toliara Auto. Prov., Zombitse-Vohibasia National Park, 22°50'36"S 44°42'36"E, 770 m, BLF7505, tropical dry forest, 19.8 km (84°) E Sakaraha, 5–9.II.2003, yellow pan trap, Fisher, Griswold, et al., CASENT 2133065 (deposited in CASC). *Paratype*: **MADAGASCAR**: 1 female, CASENT 2136033 (CASC).

72. http://www.morphbank.net/?id=226918

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**References**

[73]Ashmead, W.H. (1894) Report on the parasitic Cynipidae, part of the Braconidae, the Ichneumonidae, the Proctotrypidae, and part of the Chalcidinae. Part III. *Zoological Journal of the Linnean Society of London*, 25, 188–254.

[74]Bin, F. (1981) Definition of female antennal clava based on its plate sensilla in Hymenoptera Scelionidae Telenominae. *Redia*, 64, 245–261.

[75]Dodd, A.P. (1913) Australian Hymenoptera Proctotrypoidea. No. 1. *Transactions of the Royal Society of South Australia*, 37, 130–181.

[76]Galloway, I.D. (1976) The types of Australian species of the subfamily Scelioninae (Hymenoptera: Scelionidae). *Queensland Journal of Agricultural and Animal Sciences*, 33, 83–114.

[77]Galloway, I.D. and Austin, A.D. (1984) Revision of the Scelioninae (Hymenoptera: Scelionidae) in Australia. *Australian Journal of Zoology Supplementary Series*, 99, 1–138.

[78]Johnson, N.F. (1992) Catalog of world Proctotrupoidea excluding Platygastridae. *Memoirs of the American Entomological Institute*, 51, 1–825.

[79]Kelner-Pillault, S. (1958) Catalogue de quelques types d'Hyménoptères provenant de la collection de l'Abbé J. J. Kieffer. *Bulletin du Museum National d'Histoire Naturelle*, (2)30, 146–153.

[80]Kieffer, J.J. (1910) Diagnoses de nouveaux genres et de nouvelles espèces de Scelionides (Hym.) des îles Sechêlles. *Bulletin de la Société Entomologique de France*, 1910, 292–294.

[81] Kieffer, J. J. (1913a) Serphides des Îles Philippines. *Insecta*, 3, 253–462.

[82]Kieffer, J.J. (1913b) Proctotrupidae, Cynipidae et Evaniidae. *Voyage de Ch. Alluaud et R. Jeannel en Afrique Orientale (1911–1912). Résultats scientifiques. Hyménoptères*, 1, 1–35.

[83]Kieffer, J.J. (1916) Neue Scelioniden aus den Philippinen-Inseln. *Brotéria*, 14, 58–187.

---

73. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:75; urn:lsid:zoobank.org:pub:179D131E-30EB-49CB-A09C-32DCAC3C713E

74. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:131

75. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:343; urn:lsid:zoobank.org:pub:5EB1BC36-A813-47BE-BBFE-4E93BCB4D8D5

76. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:353

77. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:339; urn:lsid:zoobank.org:pub:4FBE9CB9-3B71-4DFB-BCE0-781664A31929

78. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:229

79. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:327

80. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:386

81. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:402; urn:lsid:zoobank.org:pub:19B21A57-854A-4B27-914A-FF8F69F2D6D5

82. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:493; urn:lsid:zoobank.org:pub:F4CC5F4A-F98F-42D9-810C-63E476DC9B9

[84]Kieffer, J.J. (1926) Scelionidae. Das Tierreich. Vol. 48. Walter de Gruyter & Co., Berlin. 885 pp.
[85]Kozlov, M.A. (1971) [Proctotrupoids (Hymenoptera, Proctotrupoidea) of the USSR.] *Trudy Vsesoyuznogo Entomologicheskogo Obshchestva*, 54, 3–67.
[86]Lê X. H (2000) [Egg-parasites of family Scelionidae (Hymenoptera).] Fauna of Vietnam, vol. 3. Science and Technics Publishing House, Hanoi. 386 pp.
[87]Masner, L. (1958) Neue Scelioniden aus Grotten von Französisch Äquatorial-Afrika (Hym. Scelionoidea). *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*, 31, 45–51.
[88]Masner, L. (1976) Revisionary notes and keys to world genera of Scelionidae (Hymenoptera: Proctotrupoidea). *Memoirs of the Entomological Society of Canada*, 97, 1–87.
[89]Masner, L. (1980) Key to genera of Scelionidae of the Holarctic region, with descriptions of new genera and species (Hymenoptera: Proctotrupoidea). *Memoirs of the Entomological Society of Canada*, 113, 1–54.
[90]Masner, L. and Huggert, L. (1989) World review and keys to genera of the subfamily Inostemmatinae with reassignment of the taxa to the Platygastrinae and Sceliotrachelinae (Hymenoptera: Platygastridae). *Memoirs of the Entomological Society of Canada*, 147, 1–214.
[91]Mikó, I., Vilhelmsen, L., Johnson, N.F., Masner, L. and Pénzes, Z. (2007) Skeletomusculature of Scelionidae (Hymenoptera: Platygastroidea): head and mesosoma. *Zootaxa*, 1571, 1–78.
[92]Narendran, T.C., Ramesh Babu, M.G. and Ushakumari, R. (2001) A new species and a key to species of *Anteromorpha* Dodd (Hymenoptera: Scelionidae) of India. *Journal of Ecobiology*, 13, 293–296.
[93]Nixon, G.E.J. (1933) A further contribution to the study of South Africa Scelionidae (Insecta, Hymenoptera, Proctotrupoidea). *Annals and Magazine of Natural History*, (10)12, 288–324, 465–479, 549–563.
[94]Perkins, R.C.L. (1910) Supplement to Hymenoptera. *Fauna Hawaiiensis*, 2, 600–686.
[95]Polaszek, A., Agosti, D., Alonso-Zarazaga, M., Beccaloni, G., de Place Bjørn, P., Bouchet, P., Brothers, D.J., Earl of Cranbrook, Evenhuis, N.L., Godfray, H.C.J., Johnson, N.F., Krell, F.T., Lipscomb, D., Lyal, C.H.C., Mace, G.M., Mawatari, S.F., Miller, S.E., Minelli, A., Morris, S., Ng, P.K.L., Patterson, D.J., Pyle, R.L., Robinson, N., Rogo, L., Taverne, J., Thompson, F.C., van Tol, J., Wheeler Q.D. & Wilson, E.O. (2005a) Commentary: A universal register for animal names. *Nature*, 437, 477.
Polaszek, A., Alonso-Zarazaga, M., Bouchet, P., Brothers, D.J., Evenhuis, N.L., Krell, F.T., Lyal, C.H.C., Minelli, A., Pyle, R.L., Robinson, N., Thompson, F.C. & van Tol, J. (2005b) ZooBank: the open-access register for zoological taxonomy: technical discussion paper. *Bulletin of Zoological Nomenclature*, 62, 210–220.
[96]Priesner, H. (1951) New genera and species of Scelionidae (Hymenoptera, Proctotrupoidea) from Egypt. *Bulletin de l'Institut Fouad I du Desert*, 1(2), 119–149.
[97]Pyle, R.L., Earle, J.L. & Greene, B.D. (2008) Five new species of the damselfish genus *Chromis* (Perciformes: Labroidei: Pomacentridae) from deep coral reefs in the tropical western Pacific. *Zootaxa*, 1671, 3–31.

---

83. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:492
84. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:310
85. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:317
86. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:9718; urn:lsid:zoobank.org:pub:FDD7212C-4C24-48CE-A6C0-C05B000EECE1
87. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:349; urn:lsid:zoobank.org:pub:C0C05B56-B694-4D1E-85D1-ADABD86471BD
88. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:311
89. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:474
90. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:1420
91. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:21300; urn:lsid:zoobank.org:pub:FD8F3527-11BC-411E-BF8C-1CD601E8C9EB
92. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:9513
93. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:336; urn:lsid:zoobank.org:pub:34296CF4-63FC-4F1F-97D5-DC560F53AA76
94. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:351; urn:lsid:zoobank.org:pub:4651E054-4ABA-41C6-9963-31B84CEEEC00
95. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:20959
96. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:345; urn:lsid:zoobank.org:pub:D80C6F56-054C-44BA-832C-DE5692CEE255
97. http://www.mapress.com/zootaxa/2008/f/zt01671p031.pdf

[98]Risbec, J. (1953) Chalcidoïdes et Proctotrupoïdes de l'Afrique occidentale française. *Bulletin de l'Institut Français d'Afrique Noire*, 15, 549–609.

[99]Risbec, J. (1956) Hyménoptères du Cameroun (3[e] contribution). *Bulletin de l'Institut Français d'Afrique Noire, (A)*, 18, 806–833.

[100] Risbec, J. (1958) Contributions à la connaissance de Hyménoptères Chalcidoïdes et Proctotrupoïdes de l'Afrique Noire. IV. Prototrupoïdes du Congo Belge. *Annales du Musee Royal du Congo Belge, Tervuren, Sciences Zoologiques, Serie 8to*, 64, 106–138.

[101]Saraswat, G.G. and Sharma, S.K. (1978) On some Scelionidae (Hymenoptera: Proctotrupoidea) from India. *Memoirs of the School of Entomology, St. John's College*, 5, 1–46.

[102]Sharma, S.K. (1980) On two species of *Anteromorpha* Dodd (Hymenoptera: Proctotrupoidea) from India. *Oriental Insects*, 14, 387–390.

[103]Sharma, S.K. (1982) On some Scelionidae (Proctotrupoidea: Hymenoptera) from India. *Records of the Zoological Survey of India*, 79, 319–342.

[104]Sundholm, A. (1970) Hymenoptera: Proctotrupoidea. *South African Animal Life*, 14, 305–401.

98. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:346; urn:lsid:zoobank.org:pub:DFF4401B-31ED-4385-AF1B-203C87195140

99. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:347; urn:lsid:zoobank.org:pub:BE3A9246-7563-47AF-A31D-37549AC69911

100. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:355; urn:lsid:zoobank.org:pub:1D3BD547-0302-4EBB-ADAD-F6FFF08D10BB

101. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:316; urn:lsid:zoobank.org:pub:09748539-D2E1-4767-A08C-1E58C3D0A97F

102. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:350

103. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:354; urn:lsid:zoobank.org:pub:846D1A20-ED96-49E6-BBE2-6BEDCE7AF726

104. http://lsid.tdwg.org/urn:lsid:biosci.ohio-state.edu:osuc_pubs:379; urn:lsid:zoobank.org:pub:43E6FCEE-03B3-4F75-8C8D-97C088714F9D