

# Nomenclatural Act

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## Breaking a 120-year gap: *Isosomodes kopenawai* sp. nov. (Hymenoptera, Eurytomidae), a newly discovered species from the Brazilian Amazon Rainforest

Nelson W. Perioto<sup></sup>, Rogéria I. R. Lara<sup></sup>

Instituto Biológico, Ribeirão Preto, SP, Brazil.

 Corresponding author: [nperioto2@gmail.com](mailto:nperioto2@gmail.com)

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**Abstract.** In this study, *Isosomodes kopenawai* Perioto & Lara, sp. nov. (Hymenoptera, Eurytomidae) is described and illustrated, based on a female specimen collected near Manaus, Amazonas, Brazil. The new species is distinguished by a combination of morphological characters, including head coloration (brown to orange), mesosomal orange pigmentation, and propodeal structure (foveate with a deep, narrow, laterally carinate median channel). An updated identification key to *Isosomodes* species is provided.

**Keywords:** *Bucrates capitatus*, Chalcidoidea, *Conocephalus*, egg parasitoids, Tettigoniidae.

*Isosomodes* Ashmead, 1888 (Hymenoptera, Eurytomidae) is a small genus of parasitic wasps, predominantly Neotropical in distribution, comprising ten extant species (Gates & Hanson 2013; UCD Community 2023). Gates & Hanson (2009) conducted a revision of *Isosomodes*, which included the redescription of *Isosomodes gigantea* (Ashmead, 1886) and *Isosomodes nigriceps* Ashmead, 1904; they also proposed the synonymy of *Isosomodes brasiliensis* Ashmead, 1904 under *Isosomodes gigantea*, and described *Isosomodes azofiefai* Gates & Hanson, 2009, *Isosomodes colombia* Gates & Hanson, 2009, *Isosomodes landoni* Gates & Hanson, 2009, *Isosomodes paradoxus* Gates & Hanson, 2009, *Isosomodes parkeri* Gates & Hanson, 2009, and *Isosomodes similis* Gates & Hanson, 2009. Later, Gates & Hanson (2013) described and illustrated two additional species: *Isosomodes monteria* Gates & Hanson, 2013 from Colombia, and *Isosomodes dorado* Gates & Hanson, 2013 from Venezuela.

Host records of *Isosomodes* are limited for *Isosomodes gigantea* (Ashmead, 1886), reared from eggs of *Bucrates capitatus* (De Geer, 1773) (Orthoptera: Tettigoniidae) (De Santis 1989; Gates & Hanson 2009), and *Isosomodes monteria* Gates & Hanson, 2013, parasitizing *Conocephalus* (Thunberg, 1815) (Orthoptera: Tettigoniidae) eggs in rice leaf sheaths (Gates & Hanson 2013).

In Brazil, only two species of *Isosomodes* were previously recorded: *I. gigantea*, from the states of Pará and Mato Grosso and *Isosomodes nigriceps* Ashmead, 1904, from Pará (De Santis 1980; Gates & Hanson 2009).

Here we describe and illustrate *Isosomodes kopenawai* sp. nov., the first new *Isosomodes* species reported from Brazil in 120 years, based on a female specimen collected using a modified Malaise trap in Amazonian rainforest vegetation near Manaus (2°35'21"S, 60°06'55"W), Amazonas, Brazil.

The specimen studied was identified using Gates & Hanson (2013) and deposited in the Entomological Collection of the Instituto Nacional de Pesquisas da Amazônia (INPA) (curator: Dr. Marcio Luiz de Oliveira).

Images and measurements were taken with a Leica MC170 HD camera mounted on a Leica M205C APO stereomicroscope, using Leica Application Suite (v. 4.12.0) and Helicon Focus (v. 5.3) for stacking. The studied specimen was illuminated with a Leica LED5000 HDI high diffuse dome of illumination system (Kerr et al. 2008). Figures were

prepared using Adobe Photoshop (v. 11.0).

The consistency of anatomical data with the Hymenoptera Anatomy Ontology project (Yoder et al. 2010; Seltsmann et al. 2012) was determined using the tool available through the Hymenoptera Glossary (HAO 2019). Terminology for surface sculpturing follows Harris (1979).

Figures from Gates & Hanson (2009; 2013) are cited with a lower case *f* (i.e., fig. 21). Illustrations of the aforementioned mentioned species are marked in the key with subscripts where “<sub>1</sub>” denotes figures from Gates & Hanson (2009) and “<sub>2</sub>” refers to those from Gates & Hanson (2013).

Abbreviations for morphology: *Fn*, funicular segment (*n* = number of the funicular segment); *Mtn*, metasomal tergum (*n* = number of the metasomal tergum); OOL/POL, ocular ocellar line/posterior ocellar line; and for localities: PA (Pará), MT (Mato Grosso), USA (United States of America), NC (North Carolina), MD (Maryland).

Label data of the examined specimen in the "Type material" section are transcribed verbatim.

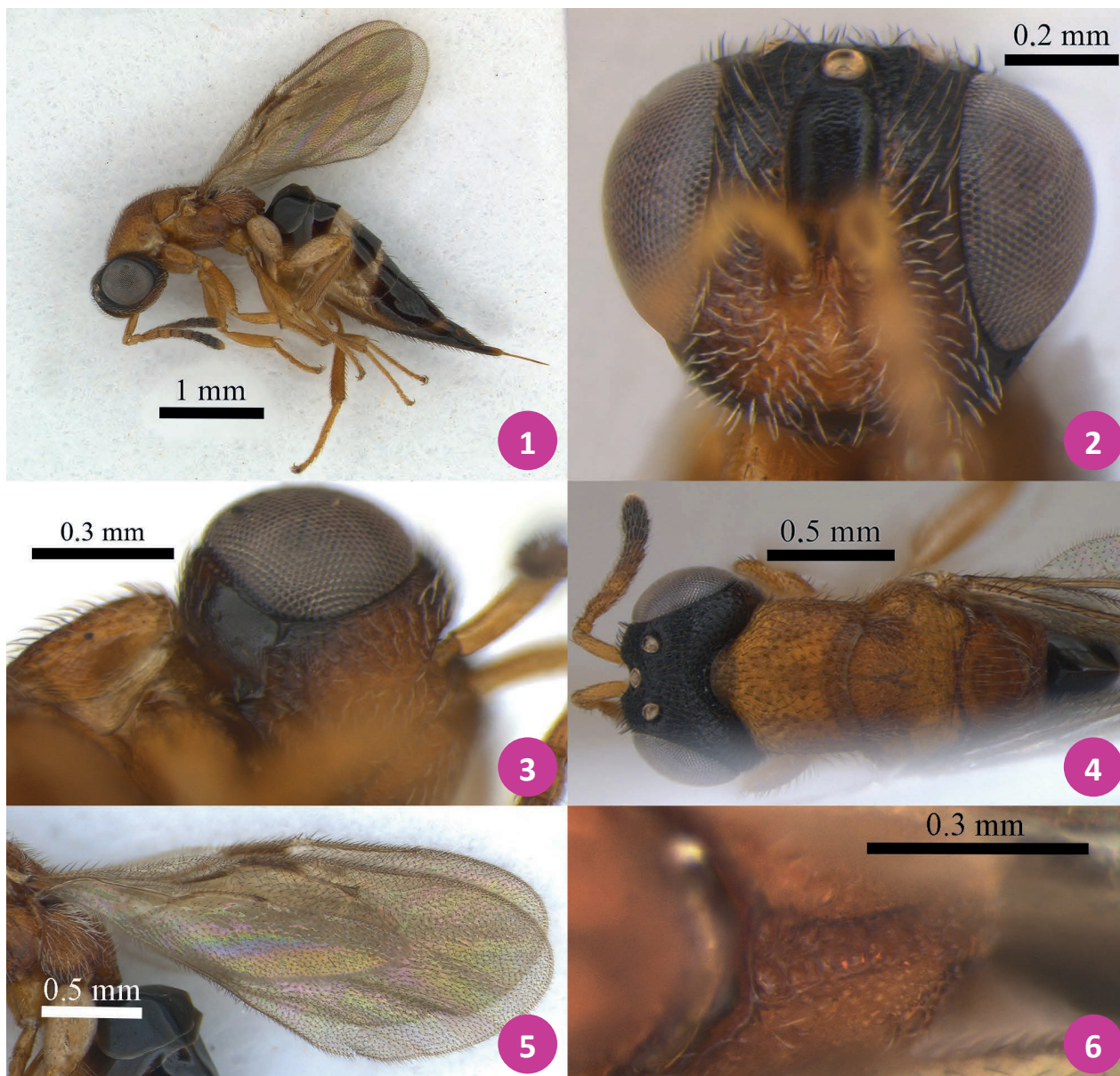
### *Isosomodes* Ashmead, 1888

*Isosomodes* Ashmead, 1888: 42, 43. Type species:  
*Isosoma gigantea* Ashmead, by subsequent monotypy.

### Key to species of *Isosomodes* (adapted from Gates & Hanson 2013)

1. Metasoma entirely yellow (female; fig. 1<sub>2</sub>) or primarily golden in ventral half (male; fig. 2<sub>2</sub>) in combination with completely dark brown head + mesosoma [Venezuela] .....  
..... *Isosomodes dorado* Gates & Hanson, 2013
- Metasoma not as above, dark brown to black, but if partially golden then mesosoma with some gold or orange color ..... 2
- 2(1). Mesosoma with considerable orange coloration; male flagellomeres cylindrical or asymmetrical, setae 1.2× longer than width of flagellomere ..... 3
- Body all black (except for small yellow spot on anterior lateral corner of pronotum); male flagellomeres cylindrical, setae 1.1× longer than width of flagellomere ..... 9
- 3(2). Scutellum orange ..... 4

- Scutellum black, at least posteriorly ..... 8
- 4(3). Fore wing with infusate spot (fig. 57<sub>1</sub>); propodeum with median channel deep, distinct, and reticulate [Ecuador] .....  
..... *Isosmodes paradoxus* Gates & Hanson, 2009
- Fore wing hyaline ..... 4
- 5(4). Propodeum with median channel shallow, less distinct, foveate (fig. 59<sub>1</sub>) ..... 6
- Propodeum with median channel deep, narrow, asetose, laterally carinate, areolate along its length (Fig. 6) [Brazil] .....  
..... *Isosmodes kopenawai* Perioto & Lara, **sp. nov.**
- 6(5). Male flagellomeres symmetrical, either spindle-shaped or parallel-sided; female vertex and propodeum completely black ..... 7
- Male flagellomeres asymmetrical (fig. 63<sub>1</sub>); female unknown [Brazil: PA] ..... *Isosmodes nigriceps* Ashmead, 1904
- 7(6). Apex of female clava angled, with dense micropilosity (fig. 60<sub>1</sub>); head mostly black; male antenna with flagellomeres asymmetrical, with long setae 2.0–3.0× as long as maximum diameter of flagellomere (fig. 61<sub>1</sub>) [Costa Rica] ..... *Isosmodes azofiefai* Gates & Hanson, 2009
- Apex of female clava tapered, with sparser ring of micropilosity; head orange (fig. 23<sub>1</sub>); male antenna with flagellomeres parallel-sided, with long setae at most 2.0× as long as maximum diameter of flagellomere [USA: MD, NC] ..... *Isosmodes landoni* Gates & Hanson, 2009
- 8(3). Apex of female clava tapered, with moderate micropilosity; mesoscutum and scutellum mostly black (fig. 26<sub>1</sub>); male antenna with flagellomeres parallel-sided, with long setae about as long as maximum diameter of flagellomere (fig. 64<sub>1</sub>) [USA: MD] .....  
..... *Isosmodes parkeri* Gates & Hanson, 2009
- Apex of female clava conical with dense micropilosity (fig. 65<sub>1</sub>); mesoscutum orange; scutellum black, at least posteriorly (fig. 22<sub>1</sub>); male antenna with flagellomeres spindle-shaped, with long setae 2.0–3.0× as long as maximum diameter of flagellomere (fig. 66<sub>1</sub>) [Colombia] ..... *Isosmodes colombia* Gates & Hanson, 2009
- 9(2). Female petiole 2.0× as long as broad (fig. 5<sub>2</sub>); both sexes with vertex relatively shiny (foveae indistinct), lateral ocellus separated from eye margin by a distance greater than its own diameter (fig. 6<sub>2</sub>) [Colombia] ..... *Isosmodes monteria* Gates & Hanson, 2013
- Female petiole no more than 1.5× as long as broad (fig. 71<sub>1</sub>); both sexes with vertex foveate, lateral ocellus separated from eye margin by a distance roughly equal to its own diameter ..... 10
- 10(9). Female petiole 1.5× as long as broad (fig. 71<sub>1</sub>); male flagellum mostly bright yellow [Costa Rica] .....  
..... *Isosmodes similis* Gates & Hanson, 2009
- Female petiole less than 1.0× as long as broad (fig. 67<sub>1</sub>); male flagellum dark brown (fig. 69<sub>1</sub>) [USA; Brazil: PA, MT; Central and South America] ..... *Isosmodes gigantea* (Ashmead, 1886)



**Figures 1–6.** *Isosmodes kopenawai* Perioto & Lara, **sp. nov.** (Hymenoptera, Eurytomidae), female. 1. Habitus, lateral view. 2. Head, anterior view. 3. Head and pronotum, lateroventral view. 4. Head and mesosoma, dorsal view. 5. Fore wing. 6. Propodeum.

# *Isosomodes kopenawai* Perioto & Lara, sp. nov.

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(Figures 1–6)

**Diagnosis:** Females of *Isosomodes kopenawai* Perioto & Lara, sp. nov. differs from congeners by the following combination of characters: head brown (orange to light brown on lower face); mesosoma and legs orange (hind coxa and femur pale yellow); propodeum foveate, median channel deep, narrow, asetose, laterally carinate, areolate along its length.

**Type material:** **Holotype female.** "BRASIL, Amazonas, Manaus, ZF-2, km 14, 2°35'21"S, 60°06'55"W, 1-18.ix.2018, Malaise gde, solo, nascente, JARafael - RedeBia", "female HOLOTYPE, *Isosomodes kopenawai* sp. nov., Perioto & Lara (INPA)". The holotype glued on pin is in good condition.

**Geographical distribution:** Manaus, state of Amazonas, Brazil.

**Etymology:** The specific epithet honors Davi Kopenawa, indigenous leader and shaman of the Yanomami people, in recognition of his tireless efforts to protect indigenous lands and Amazonian biodiversity.

**Female:** Body length 4.5 mm.

**Color:** predominantly orange (Fig. 1). Head vertex, occiput and gena brown to black, lower face orange to light brown, F3–4 light brown, F5 and clava brown; mesosoma mostly orange, hind coxa and femur pale yellow; metasoma predominantly dark brown to black (Mt4–5 partially pale yellow dorsolaterally). Fore wing hyaline, setae and veins brown (Fig. 5).

**Head:** (Fig. 2): rectangular in anterior view, foveolate, interstice finely granulate, 1.3× as broad as high; POL/OOL = 4.1; frontal depression coriarius, carinate laterally; antenna: scape 3.9× and pedicel 1.6× as long as wide; F1 1.4× as long as F2 and F3, 1.6× as long as F4, 1.7× as long as F5 and clava 2.7× as long as wide; F1–3 rectangular (F1 bent basally), F4–5 quadrangular; apex of clava conical; clypeus with ventral margin straight, smooth, without radiating carinae; malar space short, about 0.3× eye height; malar sulcus present; gena finely coriarius (Fig. 3); head covered by white setae, except on vertex, brown ones.

**Mesosoma** (Fig. 4): 2.3× as long as broad, dorsally covered by shallow foveae, interstice finely granulate; pronotum, midlobe of mesoscutum and scutellum 1.6×, 1.5× and 1.1× as broad as long, respectively; dorsal surfaces of scutellum and propodeum forming an angle of approximately 145 degrees with each other; mesofemoral depression smooth, shiny; upper mesepimeron finely striate dorsally; propodeum foveate, median channel deep, narrow, asetose, laterally carinate, areolate along its length (Fig. 6). Fore wing (Fig. 5) 2.7× as long as broad; ratio of marginal: postmarginal: stigmal veins as 1.0: 4.0: 1.9.

**Metasoma:** 2.6× as long as high; Mt1 larger than long; ratio of Mt2–7 (measured dorsally) as 1.3: 1.0: 2.0: 3.6: 1.9: 4.0.

**Biology:** Unknown.

**Remarks:** *Isosomodes kopenawai* sp. nov. differs from *I. dorado* in having metasoma predominantly dark brown to black (vs. entirely yellow in *I. dorado*); from *I. gigantea* and *I. similis* in having body with considerable orange coloration (vs. mostly black or dark brown in *I. gigantea*, *I. similis*, and *I. monteria*); from *I. parkeri* and *I. landoni* in having orange scutellum (vs. black scutellum, at least partially, in *I. parkeri* and *I. landoni*); from *I. paradoxus* in having hyaline forewing (vs. forewing with infuscated spot in *I. paradoxus*); and from *I. nigriceps*, *I. azofiefai*, and *I. landoni* in having propodeum with a deep, narrow, asetose median channel, laterally carinate and areolate along its length (vs. propodeum with shallow, less distinct, foveate median channel in *I. nigriceps*, *I. azofiefai*, and *I. landoni*).

## Taxonomic Authorities

*Isosomodes* Ashmead, 1888 in Ashmead (1888). *Isosomodes gigantea* (Ashmead, 1886) in Ashmead (1886). *Isosomodes nigriceps* Ashmead, 1904 in Ashmead (1904). *Isosomodes brasiliensis* Ashmead, 1904 in Ashmead (1904). *Isosomodes azofiefai* Gates & Hanson, 2009 in Gates & Hanson (2009). *Isosomodes colombia* Gates & Hanson, 2009 in Gates & Hanson (2009). *Isosomodes landoni* Gates & Hanson, 2009 in Gates & Hanson (2009). *Isosomodes paradoxus* Gates & Hanson, 2009 in Gates & Hanson (2009). *Isosomodes parkeri* Gates & Hanson,

2009 in Gates & Hanson (2009). *Isosomodes similis* Gates & Hanson, 2009 in Gates & Hanson (2009). *Isosomodes monteria* Gates & Hanson, 2013 in Gates & Hanson (2013). *Isosomodes dorado* Gates & Hanson, 2013 in Gates & Hanson (2013). *Bucrates capitatus* (De Geer, 1773) in De Geer (1773). *Conocephalus* (Thunberg, 1815) in Thunberg (1815).

## Authors' Contributions

NWP: Conceptualization, Writing - original draft, Writing – review & editing; RIRL: Conceptualization, Writing - original draft, Writing – review & editing.

## Conflict of Interest Statement

Authors declare there are no conflicts of interest.

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