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TRABAJOS ORIGINALES

A new species of *Sesioctonus* Viereck (Hymenoptera, Braconidae, Agathidinae) from Peru

Una Nueva especie de *Sesioctonus* Viereck (Hymenoptera, Braconidae, Agathidinae) del Perú

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Abstract
A new species of *Sesioctonus* (Braconidae: Agathidinae), *Sesioctonus alvaradae* sp. nov. from Peru, is described and illustrated. With the addition of this new species, *Sesioctonus* genus has 36 species.

Resumen
Una nueva especie de *Sesioctonus* (Braconidae: Agathidinae), *Sesioctonus alvaradae* sp. nov. para Perú, es descrita e ilustrada. Con la adición de esta nueva especie, el género *Sesioctonus* tiene 36 especies.

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Insect; taxonomy; biodiversity; parasitoid; Neotropical.

Palabras claves:
Insecto; taxonomía; biodiversidad; parasitoide; Neotropical.

Introduction

Sesioctonus Viereck, 1912 is a Neotropical genus of the Agathidinae subfamily. Its biology is largely unknown, and the only species with a known host is *S. parathyridis* Viereck, 1912 recorded as a larval parasitoid of the moth *Arrhenophanes perspicilla* Stoll, 1790 (Lepidoptera, Arrhenophanidae) (Viereck 1912, 1914). Briceño (2003) revised the species of *Sesioctonus* and found 26 new species. Later, Sharkey and Briceño (2005) described five new species from Colombia, and Sulca and Sharkey (2012) described three new species from Peru. With the addition of this new species, *Sesioctonus* now comprises 36 species.

The majority of *Sesioctonus* species were collected between 100m and 2800 m above sea level, but *S. philipi* Sharkey and Briceño 2005 was collected at 3350 m. The material used in this study comes from collections between 4000 – 4500m above sea level, representing the

highest elevation records of the genus. Here I present the description of a new Andean species, and an extended key to *Sesioctonus* species of the world, modified from Sulca and Sharkey (2012).

Material and methods

Morphological terminology follows that of Sharkey and Wharton (1997) and the key to genera follows that of Sharkey et al. (2021). Figures mentioned in this paper that are followed by the letter 'B' refer to those in Briceño (2003). The species description is based on the holotype, with variation given in parenthesis. Specimens are deposited in the Museo de Historia Natural, Universidad Nacional Mayor de San Marcos (MUSM) collection in Lima, Peru.

Taxonomy and descriptions

Sesioctonus Viereck, 1912

Viereck 1912:1. Type species: *Sesioctonus parathyridis* Viereck. (Monobasic and original designation). Viereck 1914: 133.

Diagnosis. *Sesioctonus* species may be distinguished from other agathidines using the following combination of characters: Mesoscutum smooth, lacking notauli; tarsal claws simple, lacking a distinctive basal claw; hind coxal cavities open, sharing a common opening with the metasomal foramen.

Distribution. Members of *Sesioctonus* are restricted to the Neotropical Region.

List of all *Sesioctonus* species described

Sesioctonus acrolophus Briceño, 2003; ***S. alvaradae* sp. nov**; *S. amazonensis* Briceño, 2003; *S. ammosakron* Briceño, 2003; *S. analogus* Briceño, 2003; *S. areolatus* Briceño, 2003; *S. ariasi* Briceño, 2003; *S. armandoi* Briceño, 2003; *S. bina* Sulca & Sharkey, 2012; *S. biospleres* Briceño, 2003; *S. boliviensis* Briceño, 2003; *S. brasiliensis* Briceño, 2003; *S. chaconi* Briceño, 2003; *S. chrestos* Briceño, 2003; *S. clavijoi* Briceño, 2003; *S. diazi* Briceño, 2003; *S. dichromus* Briceño, 2003; *S. dominions* Briceño, 2003; *S. eumenetes* Briceño, 2003; *S. galeos* Briceño, 2003*; S. garciai* Briceño, 2003; *S. grandis* Briceño, 2003; *S. huggerti* Sulca & Sharkey, 2012*; S. kompsos* Briceño, 2003; *S. longinoi* Sharkey & Briceño, 2005; *S. miyayensis* Briceño, 2003; *S. parathyridis* Viereck, 1912; *S. peruviensis* Briceño, 2003; *S. philipi* Sharkey & Briceño, 2005; *S. qui* Briceño, 2003; *S. theskelos* Briceño, 2003; *S. venezuelensis* Briceño, 2003; *S. torresi* Sharkey & Briceño, 2005; *S. stephaniai* Sharkey & Briceño, 2005*; S. susanai* Sharkey & Briceño, 2005 and *S. wayquecha* Sulca & Sharkey, 2012.

Key to *Sesioctonus* species of the world modified from Sulca & Sharkey (2012)

1. Occipital tubercles present (Figs. 16B–18B) **2**

— Occipital tubercles absent. (Figs. 19B) **17**

2(1). Epicnemial carina straight medially or absent, not indented at midline, between forecoxae) (Figs. 4B, 23B) **3**

— Epicnemial carina bilobed medially, (indented at midline, between forecoxae) (Figs. 3B, 22B) **6**

3(2) Epicnemial carina complete laterally (Figs. 3B, 22B) **4**

— Epicnemial carina incomplete or absent laterally (Fig. 23B) **5**

4(3) Interantennal space with longitudinal rounded keel, face without median longitudinal carinae ***garciai* Briceño**

— Interantennal space lack of longitudinal keel, face with median longitudinal carinae ***huggertii* Sulca & Sharkey**

5(3) Face with median longitudinal carina (Fig. 13B) ***acrolophus* Briceño**

— Face without median longitudinal carina (similar to Figs. 12B,14B) ***analogus* Briceño**

6(3) Midcoxa not completely melanic, color variable **7**

— Midcoxa completely melanic **10**

7(6) Forewing banded from base: yellow, black, yellow, black ***chaconi* Briceño**

— Forewing infuscate (melanic) **8**

8(7) Fore tibias with spines; mid femur yellowish orange **9**

— Fore tibia without spines; mid femur melanic ***longinoi* (part) Sharkey & Briceño**

9(8) Median longitudinal carinae of propodeum absent, median areola of metanotum and with lateral carinae not meeting posteriorly, subpronope triangular ***peruviensis* Briceño**

— Median longitudinal carinae of propodeum present, median areola of metanotum and with lateral carinae meeting posteriorly, subpronope oval ***bina* Sulca & Sharkey**

10(6) Longitudinal carina(e) of scutellar depression present and forewing banded from base: yellow, black, yellow, black ***venezuelensis* Briceño**

— Longitudinal carina(e) of scutellar depression absent and/or forewing not banded **11**

11(10) Mesoscutum black; median areola of metanotum with longitudinal rugosities (Fig. 29B); median tergite of first metasomal segment without pair of lateral longitudinal carinae (similar to Fig. 34B); forewing (RS+M)a vein complete (Fig. 10B) ***kompsos* Briceño**

— Mesoscutum yellowish orange; or if black then not combining other character **12**

12(11) Mesoscutum melanic **13**

— Mesoscutum yellowish orange **14**

13(12) Forewing infuscate with large hyaline spot; metasoma reddish brown except last few segments melanic ***brasiliensis* Briceño**

— Forewing either infuscate without hyaline spot or hyaline basally, infuscate apically; metasoma yellowish orange ***dichromus* Briceño**

14(12) Median longitudinal carina of propodeum present and complete ***ariasi* Briceño**

— Median longitudinal carina of propodeum absent or incomplete **15**

15(14) Subpronope triangular, three sides almost equal (Fig. 1B); forewing 3RSa vein absent (Fig. 10B) ***boliviensis* Briceño**

— Subpronope more oval-shaped, weak triangle with vertical sides longer than dorsal side (Fig. 2B); forewing 3RSa vein present (Fig. 9B) **16**

16(15) Wings banded from base: yellow, black, yellow, black ***diazi* Briceño**

— Wings infuscate (melanic) ***longinoi* (part) Sharkey & Briceño**

17(1) Occiput excavated (similar to Figs. 16B–18B) **18**

— Occiput not excavated (Fig.19B) **19**

18(17) Propodeum with central areola absent; Epicnemial carina bilobed medially (between forecoxae) (similar to Fig.3B) ***eumenetes* Briceño**

— Propodeum with central areola present (Fig.7); Epicnemial carina straight medially (between forecoxae) (Fig.8). ***alvaradae* sp. nov.**

19(17) Interantennal space without sharp longitudinal keel **20**

— Interantennal space with sharp longitudinal keel (Fig. 11B) **35**

20(19) Basal sterna of metasoma chalk-white **21**

— Basal sterna of metasoma not chalk-white, rather melanic or yellowish orange **23**

21(20) Head orange ***susanai* Sharkey & Briceño**

— Head black **22**

22(21) Fore and hind coxa pale yellow ***stephaniai* Sharkey & Briceño**

— Fore and hind coxa melanic ***philipi* Sharkey & Briceño**

23(20) Median areola of metanotum with lateral carinae meeting posteriorly (Figs. 25B, 26B) **24**

— Median areola of metanotum with lateral carinae absent or, if present, not meeting posteriorly (Figs. 27B, 28B) **33**

24(23) Epicnemial carina present (Figs. 3B, 4B) **25**

— Epicnemial carina absent **29**

25(24) Epicnemial carina complete laterally (Fig. 3B) **26**

— Epicnemial carina incomplete laterally (Fig. 4B) **31**

26(25) Hind tibia melanic ***amazonensis* Briceño**

— Hind tibia mostly yellowish orange **27**

27(26) Propodeum with central areola absent **28**

— Propodeum with central areola present ***areolatus* Briceño**

28(27) Antenna with more than 29 flagellomeres; interantennal space with rounded longitudinal keel (similar to Fig. 12B); hind tibia yellowish orange in basal half, melanic apically ***miyayensis* Briceño**

— Antenna with less than 28 flagellomeres; interantennal space without longitudinal keel; hind tibia mostly yellowish orange, melanic apically ***clavijoi* Briceño**

29(24) Scutellar depression with longitudinal carinae; body color yellow, white, and black ***torresi* Sharkey & Briceño**

— Scutellar depression without longitudinal carinae; body color yellowish orange and black **30**

30(29) (RS+M)a vein of forewing complete, median tergite of first metasomal segment with pair of lateral longitudinal carinae ***ammosakron* Briceño**

— (RS+M)a vein forewing incomplete, median tergite of first metasomal segment without pair of lateral longitudinal carinae ***wayquecha* Sulca & Sharkey**

31(25) Epicnemial carina straight medially (between forecoxae) (Fig. 4B); body length less than 3mm ***dominicus* Briceño**

— Epicnemial carina bilobed medially (indented at midline, between forecoxae) (Fig. 3B); body length more than 3mm **32**

32(31) Forewing (RS+M)a vein complete (Fig. 10B) ***armandoi* Briceño**

— Forewing (RS+M)a vein incomplete (Fig. 9B) ***biospleres* Briceño**

33(23) Epicnemial carina present complete, or incomplete laterally (Figs. 3B, 4B) **34**

— Epicnemial carina completely absent ***chrestos* Briceño**

34(35) Forewing banded, yellow, black, yellow, black; labial palpus 3-segmented ***galeos* Briceño**

— Forewing infuscate; labial palpus 4-segmented ***theskelos* Briceño**

35(19) Third and fourth labial palpomeres not fused; first metasomal median tergite with depression posterad spiracle (Figs. 36B, 37B) ***grandis* Briceño**

— Third and fourth labial palpomeres fused, first metasomal median tergite with or without depression posterad spiracle **36**

36(35) First metasomal median tergite with depression posterad spiracle (similar to Figs. 3B, 36B) ***qui* Briceño**

— First metasomal median tergite without depression posterad spiracle ***parathyridis* Viereck**

Sesioctonus alvaradae sp. nov.

(Fig. 1–8)

Holotype. 1♀, PERU: AP [APURIMAC] : Mina Las Bambas, Sector Sagrapeña, 14°4’37.24’’S/ 72°18’33’’W, 4265 m, 01.iii.2020, L. Pérez.

Paratype. 3♀, PERU: AP: Mina Las Bambas, Sector Sagrapeña, 14°4’37.4’’S/ 72°18’33’’W, 4265 m, 07–10.xii.2019, L. Pérez; 4♀, PERU: AP: Mina Las Bambas, Sector Sagrapeña, 14°4’37.4’’S/ 72°18’33’’W, 4265 m, 20–24. i.2021, R. Angulo; 1♀, PERU: AP: Mina Las Bambas, Sector Sagrapeña, 14°4’37.4’’S/ 72°18’33’’W, 4265 m, 03–10.iii.2021, R. Angulo; 2♀, PERU: AP: Mina Las Bambas, Sector Sagrapeña, 14°4’37.24’’S/ 72°18’33’’W, 4265 m, 02.x.2020, Y. Nina; 2♀, PERU: AP: Mina Las Bambas, Sector Sagrapeña, 14°4’37.11’’S/ 72°18’32.63’’W, 4178 m, 21– 23.ii.2019, L. Pérez; 2♀PERU: AP: Mina Las Bambas, Sector Sagrapeña, 14°4’37.24’’S/ 72°18’33’’W, 4265 m, 29.xi–03.xii.2018, L. Pérez; 3♀, PERU: AP: Cotabambas, Challhuahuacho, Pumamarca (Sallahue), 14°2’56.53’’S/ 72°19’19’’W, 4291 m, 03–04. iii.2020, N. Zenteno y A. Silva; 1♀, PERU: AP: Cotabambas, Challhuahuacho, Pumamarca (Sallahue), 14°3’6.1’’S/ 72°18’39.9’’W, 4201 m, 03–04. iii.2020, N. Zenteno y A. Silva; 1♀, PERU: AP: Cotabambas, CC Antuyo, 14°4’32.89’’S/ 72°16’46.25’’W, 4353 m, 6. iii.2020, N. Zenteno y A. Silva; 1 ♀, PERU: AP: Cotabambas, Challhuahuacho, Ferrobamba, 14°5’18.5’’S/ 72°20’51.01’’W, 4376 m, N. Zenteno y A. Silva; 1 ♀, PERU: AP: Gran Progreso, 14°1’30.24’’S/ 72°26’6.85’’W, 4029 m, 25.vii.2021, N. Zenteno y A. Silva; 1 ♀, PERU: AP: Chalcobamba, 14°3’38.86’’S/ 72°20’20.42’’W, 4509 m, 25.viii.2019, L. Perez; 1 ♀, PERU: AP: Cotabambas, Challhuahuacho, Ferrobamba, 14°3’28.6’’S/ 72°19’55.72’’W, 4438 m, 17.x.2021, L. Villena; 1 ♀, PERU: AP: Cotabambas, Challhuahuacho, CCPP. Cconchaccota, 14°11’17.6’’S/ 72°4’5.4’’W, 4438 m, 12– 13.iii.2015, L. Sulca & I. Medina; 1 ♀, PERU: AP: Cotabambas, Challhuahuacho, CCPP. Ccahuanhuire, 14°10’34.5’’S/ 72°23’52.8’’W, 4079m, 13– 14.iii.2015, L. Sulca & I. Medina; 1 ♀, PERU: CU: Paruro, Omacha, 14°8’26.7’’S/ 71°53’17.1’’W, 4178m, 1– 5.iii.2022, A. Nuñez; 1 ♀, PERU: CU: Chumbivilca, Uchucarco, 14°23’29.64’’S/

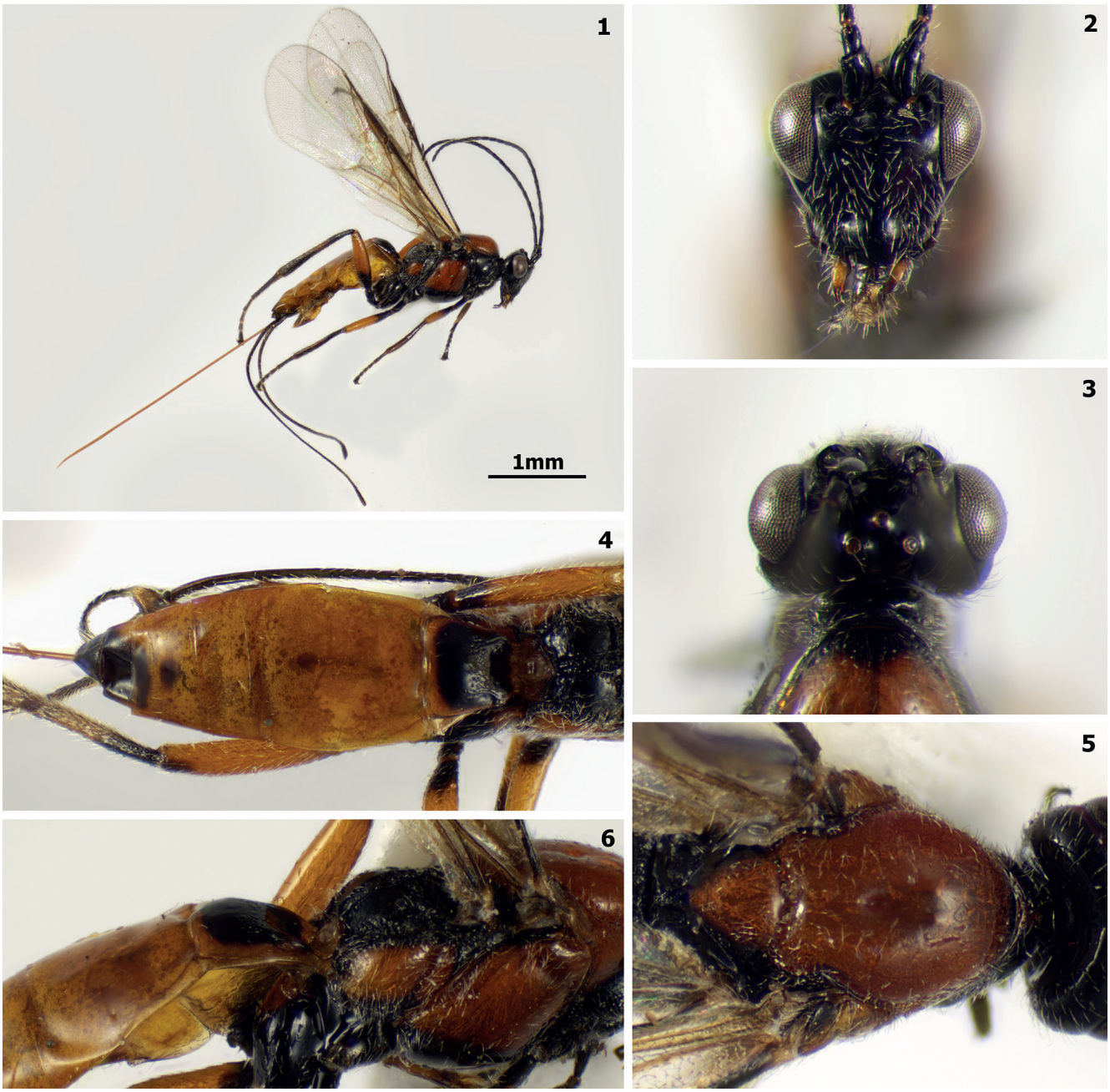
71°47’6.72’’W, 4544m, 16.ix.2022, A. Ayala; 1 ♀, PERU: CU: Espinar, Mina Constancia, 13°33’54’’S/ 71°42’41’’W, 4309m, 15–23.ix.2017, L. Huerto.

Diagnosis. Distinguished from all other known species of *Sesioctonus* by the following combination of characters: occipital tubercles absent, occiput excavated, gena moderately expanded posteroventrally, subpronope elongate-oval, epicnemial carina complete and straight medially, propodeum with a central areola.

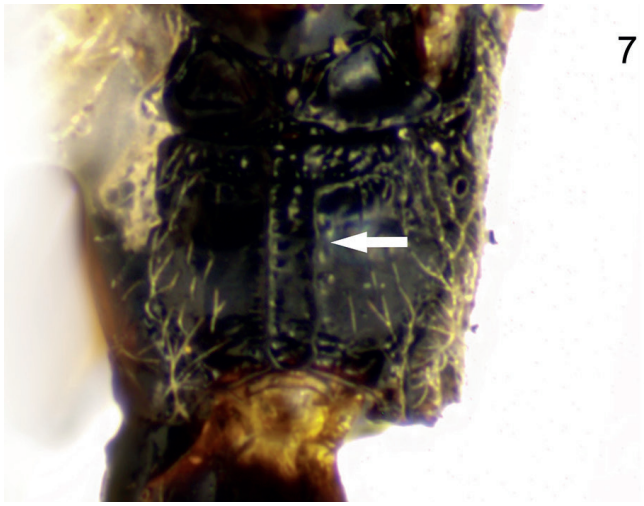
Sesioctonus alvaradae sp. nov. is similar to *S. eumenetes*, as they are the only two species that have an occiput excavated; but the first one has a central areola on the propodeum that is lacking in *S. eumenetes*.

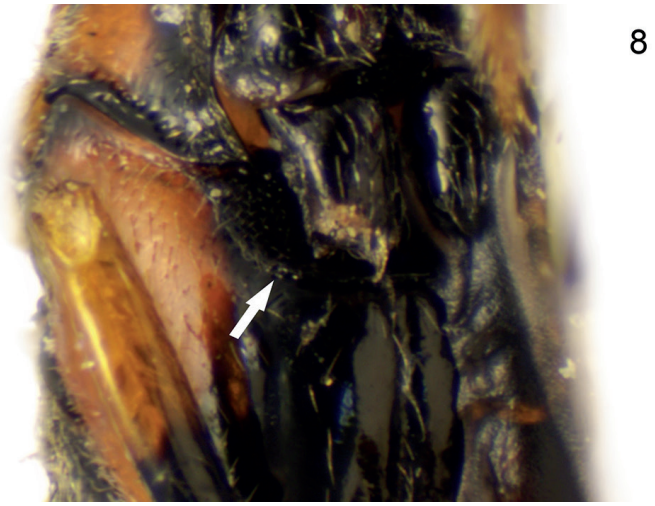
Briceño (2003) indicates in the *S. eumenetes* diagnosis the presence of a median longitudinal carina on the propodeum, but contradicts the description indicating absence. I was able to verify the absence of a longitudinal carina by reviewing the photos of the *S. eumenetes* holotype hosted in the website of the Canadian National Collection (https://www.cnc.agr.gc.ca/taxonomy/Specimen.php?id=5878).

♀ **Length.** Length of body, excluding ovipositor, 4.1 mm.



Figures 1 – 6. Details of *Sesioctonus alvaradae* sp. nov. Holotype:(1) habitus; (2) head, frontal; (3) head, dorsal; (4), metasomal tergo (5); mesonotum, dorsal; (6) propodeum and metasomal terga 1–2.





Figures 7 – 8. Details of *Sesioctonus alvaradae* sp. nov. Paratype:(7) Propodeum with central areola present (indicated by arrow); (8) Epicnemial carina straight medially (indicated by arrow).

Head. Flagellum with 23 flagellomeres. Interantennal space lacking longitudinal keel. Antennal sockets not excavated. Face without median longitudinal carina. Gena moderately expanded posteroventrally. Occipital tubercles absent. Occiput excavated. Mandible concave, outer tooth of mandible not longer than inner tooth. Maxillary palpus with 4 palpomeres. Third and fourth labial palpomeres not fused. ***Mesosoma*.** Subpronope elongate-oval. Longitudinal carinae of scutellar depression absent. Scutellum convex. Median areola of metanotum smooth; without median longitudinal carina; and with lateral carinae meeting posteriorly. Propodeum convex, with a central areola. Epicnemial carina complete, straight medially (between forecoxae). Foretibial spines present. Midtibia with 8 spines. Hind tibia with 8 spines. Hind femur 4 times as long as wide. (RS+M)a vein of forewing incomplete. 3RSa vein of forewing absent. 2–1A vein of hind wing tubular. Cub vein of hind wing absent. Hind wing with 3 hamuli. ***Metasoma*.** Median tergite of first metasomal segment with pair of lateral longitudinal carinae. First metasomal median tergite without depression postered spiracle. Length/width ratio of first metasomal median tergite 1.5. Ovipositor 3.7 mm. ***Color*.** Head melanic. Antenna melanic. Maxillary palpomeres melanic. Labial palpomeres melanic. Mandible yellowish with melanic teeth. Mesosoma mostly melanic except mesoscutum orangish red with two spots melanic around of tegulae and mesopleuron, anterior scutellum, middle of metapleuron orangish red. Legs mostly melanic except yellowish orange at apical of femur; basal 1/3 melanic and apical 2/3 yellowish orange. Forewing entirely infuscate. Stigma melanic. Hind wing entirely infuscate. First metasomal tergum melanic. Second metasomal tergum yellowish orange. Third metasomal tergum yellowish orange. Fourth metasomal tergum yellowish orange. Fifth and sixth metasomal terga yellowish orange with melanic spot. Seventh and to eighth metasomal terga melanic. Ovipositor yellowish orange.

Male. As in the female (above) with the color of the metasomal terga slightly different. First metasomal tergum melanic. Second metasomal tergum yellowish orange. Third -to fifth metasomal terga yellowish orange with melanic spot. Sixth and to eighth metasomal terga melanic.

Variation. Legs with variable color, but always melanic to yellow. Sometimes propodeum with a yellow spot medially.

Etymology. Named in honor of Mabel Alvarado, a Peruvian specialist in ichneumonoid wasps, for her support during the author's entomological studies.

Distribution. Known only from Apurimac and Cusco, in southeastern Peru.

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The author declares no conflict of interest.

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LS: Conceptualization; Formal analysis; Investigation; Writing-Preparation of the original draft; Drafting: review and editing.

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The authors declare that they have not violated or omitted ethical or legal norms when carrying out the research and this work.