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## On the type series of *Stenosigma humerale* Giordani Soika with the description of a new species (Hymenoptera, Vespidae, Eumeninae)



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### ABSTRACT

A new species, *Stenosigma quechua* Hermes & Ferreira **sp. nov.**, is described from specimens previously included in the type series of *Stenosigma humerale* Giordani Soika, 1990. Details on the differences between the two species as well as comments of taxonomic implications are presented.

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### Introduction

*Stenosigma* Giordani Soika, 1978 currently comprises four Neotropical species. The genus was proposed by Giordani Soika to include a single species, *S. allegrum* (Zavattari, 1912), previously placed within *Eumenes* Latreille, 1802. Later, Giordani Soika (1990) included three additional species within *Stenosigma*: *S. testaceum* (Fox, 1899), *S. imitans* (Ducke, 1911) and *S. humerale* Giordani Soika, 1990.

Zavattari (1912) and Giordani Soika (1978) compared *Eumenes allegrum* to the division *Pachymenes* de Saussure, 1852, but despite considering both very similar, argued that these similarities were only superficial. Recent phylogenetic analyses recovered *Stenosigma* as monophyletic and sister to *Pararhaphidoglossa* von Schulthess, 1910, supported by the presence of a pretegular carina on the lateral surface of the pronotum and the shape of the apical lamella of the lower posterior propodeum (Hermes et al., 2014).

Modern revisions of some Neotropical taxa of eumenine wasps were recently produced (e.g. Hermes and Melo, 2008; Garcete-Barrett, 2011; Grandinete et al., 2015), and others are under way. As part of these upcoming revisions, we were able to examine the type series of *Stenosigma humerale*, and detected consistent structural differences among series of included specimens. Of a total of seven specimens, five were examined: the holotype female and one paratype male remain as their current status as included in the type

series of *S. humerale*; the other three specimens (two females and one male), previously treated as putative paratypes of *S. humerale*, are here considered as a new species.

### Material and methods

The examined material belongs to the “Museo Civico di Storia Naturale di Venezia” (MSNVE), Venice, Italy (Dr. Marco Uliana), and the Natural History Museum (NHM), London, England (Dr. Gavin Broad). Examination of the external morphology was carried out with a Leica S8 APO stereomicroscope. Photographs were obtained with a digital camera attached to a Leica DFC 295 stereomicroscope, and then treated with the Auto-Montage Pro 5.03.0040 software. The morphological terminology follows Carpenter and Garcete-Barrett (2002 [2003]) for external features and Bohart and Stange (1965) for body sculpture. Antennal flagellomeres are cited as F1–F11 and metasomal terga and sterna as T1–T7 and S1–S7, respectively.

Labels were literally transcribed in the Type Material section. Information of one label is given between quotation marks, and backslashes indicate different lines in the same label.

### Results

*Stenosigma humerale* Giordani Soika, 1990 (Figs. 1–9)

*Stenosigma humerale* Giordani Soika, 1990: 148 (key), 155. Type data: holotype female (MSNVE). Type locality: Mapiri, Bolivia.

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**Figs. 1–9.** *Stenosisigma humerale* holotype female. 1, habitus; 2, lower head in lateral view; 3, lateral surface of pronotum in lateral view; 4, mesepisternum; 5, mesoscutum and scutellum in dorsal view; 6, metanotum in dorsal view; 7, T1 in dorsal view; 8, T1 in lateral view; 9, S1 in ventral view. Scale bars for Fig. 1=2 mm, Figs. 2–4=0.5 mm, and Figs. 5–9=1 mm.

*Stenosisigma humerale* resembles some wasps of the genus *Pachymenes* (e.g., *P. ater* de Saussure, 1852 and *P. ghilianii* (Spinola, 1851)) in both shape/size and color. It is likely that this species is part of a mimetic ring that includes other genera such as *Montezumia* de Saussure, 1852 (e.g., *M. cortesia* de Saussure, 1852 and *M. cortesioides* Willink, 1982) and *Agelaiia* Lepeletier, 1836 (e.g., *A. angulata* (Fabricius, 1804)), besides *Pachymenes*, which may present a great deal of variation in the distribution of yellow markings upon a brownish background body coloration. These mimetic rings are common among eumenines and polistines, and other examples may be found in [Hermes \(2010\)](#) and [Garcete-Barrett \(2014\)](#).

The type material of *S. humerale* housed at the Museo Civico di Storia Naturale di Venezia and at the Natural History Museum of London was studied. It was previously composed by the holotype female and the allotype male, both from Bolivia, two male paratypes also from Bolivia, two female paratypes from Peru and one male paratype from Colombia. One of the female paratypes from Peru was identified by Bequaert ([Fig. 10](#)) as *Pachymenes velutina* Ducke, 1911. Later, this specimen was examined by van der Vecht, who attached a label to it ([Fig. 11](#)) and contradicted Bequaert's conclusion, considering *P. velutina* similar to *P. ghilianii*. Finally, when revising a series of Neotropical genera, [Giordani Soika \(1990\)](#) placed this specimen within *Stenosisigma* and attributed it to a new species, including it in its type series ([Fig. 12](#)). Clearly, the specimen is not a *Pachymenes* for it bears the lateral pronotal carina and a pre-apical fossa on T1 (both features are absent in *Pachymenes*).

This female specimen (MSNVE), as well as one additional female and one male paratypes (NHM), however, show consistent

structural differences when compared to the holotype and allotype, which is evidence to treat them as a separate species. The mentioned male from Colombia at the NHM is labeled as a paratype, but it is not mentioned in [Giordani Soika's \(1990\)](#) paper. According to Article 72.4 of The International Code of Zoological Nomenclature, this specimen is to be considered as part of the type series, for it was known to and labeled by [Giordani Soika](#) himself.

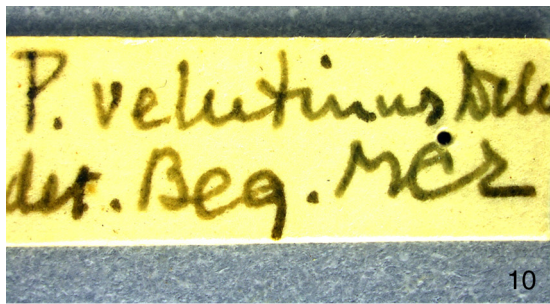
There are two additional male paratypes from Bolivia mentioned by [Giordani Soika \(1990\)](#), but they were not found among the type series of *S. humerale*. [Giordani Soika](#) was known to retain specimens in his private collection, as cited in his own papers (e.g., [Giordani Soika, 1990: 158](#)), and common depositories are the two presently studied collections. Until these two specimens are found and properly studied, they remain as paratypes of *S. humerale*, whose type series is currently composed by four specimens.

Examined Type Material. Bolivia, Mapiri: holotype female (MSNVE), 'Mapiri\Bolivia' '60' '64' 'velutinum\Ducke' 'Holotypus\Stenosisigma\humerale' (red label) 'clipeo' (handwritten label). Bolivia, Coroico: allotype male (MSNVE), 'Coroico\Bolivia' '♂' 'Allotypus\Stenosisigma\humerale' (red label) 'clipeo' (handwritten label).

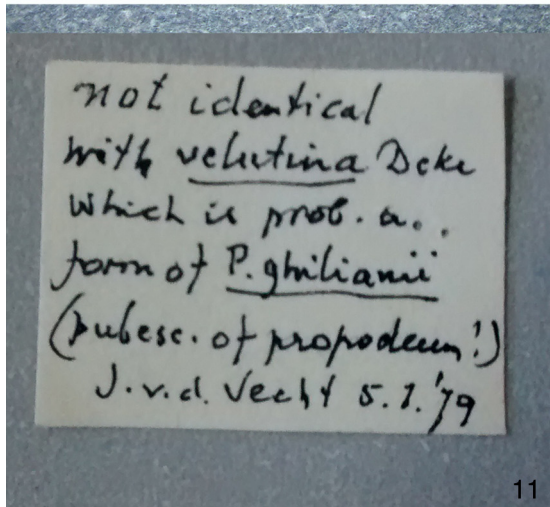
*Stenosisigma quechua* Hermes and Ferreira, new species ([Figs. 13–21](#))

*Stenosisigma humerale* [Giordani Soika, 1990: 158](#) (misidentification). Type data: holotype female (MSNVE). Type locality: exact location in Peru not specified (see below).

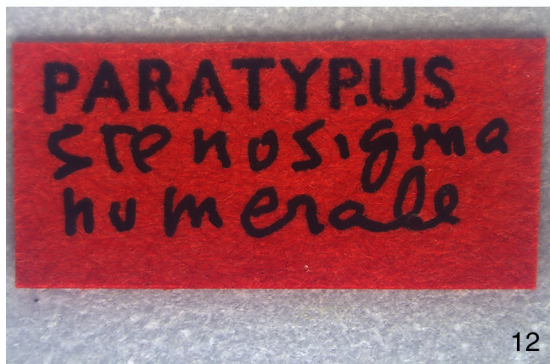




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11



12

**Figs. 10–12.** Labels attached to the putative female paratype of *S. humerale*, presently attributed to a new species.

### Diagnosis

*Stenosigma quechua* is similar to *S. humerale*, sharing with it and differing from the remaining *Stenosigma* by: (i) clypeus longer than wide; (ii) basal filiform portion of T1 longer than the apical half; (iii) lateral surface of pronotum depressed, with humerus somewhat projected in dorsal view; (iv) punctures on the lateral surface of pronotum and mesoscutum sparser. *Stenosigma quechua* differs particularly from *S. humerale* by: (i) distance between eye and occipital carina near mandible wider (very narrow in *S. humerale*; compare Figs. 2 and 14); (ii) pronotal fovea narrow, slitlike (rounded in *S. humerale*; compare Figs. 3 and 15); (iii) scrobal sculpturation coarser (less evident in *S. humerale*; compare Figs. 4 and 16); (iv) punctures on pronotum, mesoscutum and scutellum less coarse (compare Figs. 5 and 17); (v) apical margin of metanotum rounded (somewhat angled in *S. humerale*; compare Figs. 6 and 18); (vi) pre-apical fossa of T1 narrow, slitlike (rounded in *S. humerale*; compare Figs. 7 and 19); (vii) T1 in lateral view with basal filiform portion shorter (longer in *S. humerale*; compare Figs.

8 and 20); and (viii) S1 apical sclerite triangular (semi-circular in *S. humerale*; compare Figs. 9 and 21).

**Description.** Holotype female. Approximate body length 15 mm; approximate fore wing length 12 mm. Color: Integument blackish-brown. Antenna with pedicel and scape reddish brown. Head with light brown marks as follows: along mandibles; stripes on inner orbits of compound eyes at emargination; gena entirely. Mesosoma dark brown, with light brown marks as follows: lateral surface of pronotum; humeral region; pronotal lobe; band along the apical margin of pronotum adjacent to mesoscutum; large maculae on mesepisternum; tegulae and parategulae; maculae on metapleura right above hind coxa; large maculae on posterior surface of propodeum. Fore legs light brown; mid and hind legs reddish brown. Metasoma blackish brown; T1 with dark reddish brown maculae; apical light brown stripes on T2–6. Pubescence: golden, covering most of the body. Long and erect pilosity on lateral margins of clypeus, vertex, dorsal surface of pronotum, tegulae, alar sclerites, mesepisternum and posterior surface of propodeum. Metasoma with conspicuous pubescence, with long and erect pilosity on apex of T2–6 and S2–6. Integumental surface: clypeus micropunctate; frons, pronotum, mesoscutum, scutellum, metanotum and posterior surface of propodeum with sparse and shallow macropunctuation; mesepisternum very shallowly and sparsely punctate, punctures almost obsolete; metasoma close micropunctate, without macropunctures. Scrobal sculpturation coarse. Structure: clypeus longer than wide, with apex little emarginated, almost truncate; clypeal teeth rounded and carinate, with carinae well developed and extending as far as one third of clypeus length; distance between eye and occipital carina near mandible wide; pronotal carina well developed along its entire length; pronotal fovea narrow, slitlike; lateral surface of pronotum depressed, with humerus somewhat projected in dorsal view; pretegular carina well developed; parategulae narrowed, digitiform; metanotum with apical margin rounded; longitudinal median carina of posterior surface of propodeum conspicuous; basal filiform portion of T1 longer than the apical half; pre-apical fossa of T1 narrow, slitlike; T2 wider than long in dorsal view.

**Paratype male.** Differs from the female only by the usual sexual dimorphism features, such as number of antennal flagellomeres and number of metasomal sclerites.

**Etymology.** The specific epithet, Quechua, refers to the first indigenous groups to inhabit the Province of Dos de Mayo in Peru, where the holotype was collected.

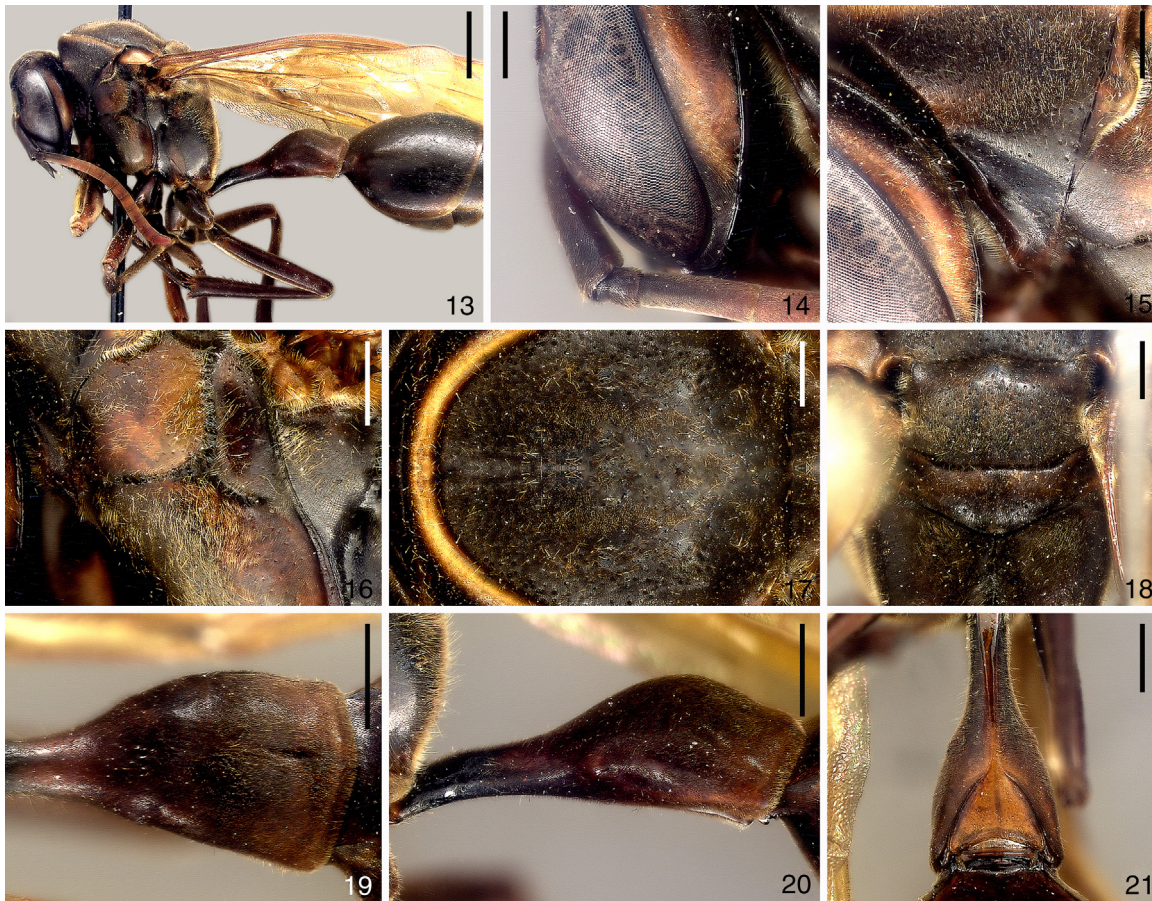
**Examined Type Material.** Peru, Dos de Mayo to El Porvenir: holotype female (MSNVE), 'Dos de Mayo to El Porvenir, Cam, del Pichis\PERU July6, 1920' '414' 'P. *velutinus* Duc\det. Beq. MCZ' 'not identical\with *velutina* Duke\which is prob. a\form of *P. ghiliani*\(pubesc. of propodeum?)\J. v. d. Vecht 5.1.79' (handwritten label) 'Paratypus\ *Stenosigma*\umerale' (red label) 'AGS'. Peru, Chanchamayo: paratype female (NHM), 'Peru\Chanchamayo\27.III.1949\J.M.Schunke\B.M. 1952-645' 'PARATYPUS\Stenosigma\humerale'. Colombia, Narino: paratype male, 'COLOMBIA: Narino,\Barbacoas\2-6.v.1976\M.Cooper\B.M. 1976-290'.

### Remarks

Antonio Giordani Soika (1913–1997) was an Italian entomologist who greatly contributed to the knowledge of Neotropical Eumeninae (e.g., [Giordani Soika, 1978, 1990](#)). Many taxonomic keys currently employed in the identification of these organisms were produced by him, including most of the taxa placed within the Eumenini sensu [Hermes et al. \(2014\)](#).

In his papers, [Giordani Soika \(1978, 1990\)](#) proposed keys for 14 Neotropical Eumenini genera. We performed a complete survey





**Figs. 13–21.** *Stenosigma quechua* holotype female. 13, habitus; 14, lower head in lateral view; 15, lateral surface of pronotum in lateral view; 16, mesepisternum; 17, mesoscutum and scutellum in dorsal view; 18, metanotum in dorsal view; 19, T1 in dorsal view; 20, T1 in lateral view; 21, S1 in ventral view. Scale bars for Fig. 13 = 2 mm, Figs. 14–17 = 0.5 mm, and Figs. 18–21 = 1 mm.

on his couplets in order to verify which features were employed in these taxonomic keys. Of a total of 126 couplets, the three features used more often were integument sculpture (punctuation) (64 couplets – 50.79%), coloration (48 couplets – 38.1%), and clypeal morphology (38 couplets – 30.16%). It is a remarkable fact that Giordani Soika relied mainly on characters that show a great deal of variation among vespids, namely punctuation and coloration (for discussion on color variation among vespids see [Carpenter, 1987](#) and [Carpenter, 2002 \[2003\]](#) and references therein), and neglected much more evident aspects of body structure as shown in the present contribution.

Careful examination of external morphology are revealing several features of both taxonomic and phylogenetic importance that were ignored by Giordani Soika in his papers. One remarkable example is the differences in the expansion and retraction of the sclerites related to the axillary region of eumenine wasps, as exemplified by [Garcete-Barrett \(2011\)](#) for the genus *Stenonartonia* Giordani Soika, 1973. Giordani Soika's approach to vespid taxonomy may be a result of the different concepts adopted by him at that time, such as acceptance of variation to establish subspecies, for example. Nevertheless, this alone does not diminish the impact of his work, which includes some monographic papers, on vespid systematics.

#### Conflicts of interest

The authors declare no conflicts of interest.

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