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PROTOPOLYBIA BITUBERCULATA, A NEW NEOTROPICAL SOCIAL WASP (HYMENOPTERA: VESPIDAE; POLISTINAE)

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Abstract.—Protopolybia bituberculata, a new polistine species from the Neotropics, is described and the nest illustrated.

Protopolybia Ducke is a genus of small neotropical social wasps, belonging to a tribe, Epiponini, the members of which found new colonies by swarms of queens and workers (Carpenter, 1993). The most recent revision (Richards, 1978) recognized 23 species, but with the synonymy of *Pseudochartergus* with *Protopolybia* (Carpenter and Wenzel, 1990) five more species are now included in the genus, for a total of 28. To this total we are adding a new species.

The presently described species has not been properly recognized as a distinct taxon. Ducke (1910:475) misidentified it as a color form of *Protopolybia sedula* var. *exigua* (Saussure). In the collection of the Goeldi Museum there are specimens labelled *Protopolybia minutissima* var. *sedula* (Saussure), probably following the revision of the genus by Bequaert (1944). This latter name is a misidentification of *Protopolybia exigua* (see Richards, 1978). The name *sedula* is the senior synonym of a different species, called *Protopolybia pumila* (Saussure) by Bequaert (Richards, 1978).

Protopolybia bituberculata, new species

(Figs. 1A, 2A, 3)

Protopolybia sedula var. *exigua* (de Saussure): Ducke, 1910:474 (in part). Misidentification.

Diagnosis: Propodeum with posterior face projecting symmetrically to either side of median furrow, forming two moderately high protuberances (Fig. 1A); first metasomal tergum petiolate, clearly longer than wide at apex. Male genitalia with the medial lobes of the aedeagus pointed laterally and strongly sclerotized (Fig. 2A). Small species; color brown or black and yellow.

Description:

Female: Mean forewing length 4.0 mm. *Structure*—cuticle finely reticulate, unpunctured except for shallow punctures on posterior margin of metasomal segments; clypeus a little higher than wide, ventral margin forming a rounded median lobe; dorsal pronotal carina low, obtuse, but distinct at sides, gradually sloping posteriad on the humeri; fovea well developed, anterior carina low, obtuse; mesoscutum as long as wide; scutellum slightly convex with an incomplete median line; metanotum

about 1.25× as wide as long, lobe moderately acute apically; propodeum with posterior surface projecting to either side of the median furrow, forming two moderately developed protuberances (Fig. 1A); first tergum about 1.2 times longer than wide at apex, with a distinct basal petiole; second tergum a little wider than long, about twice as wide as first tergum at apex.

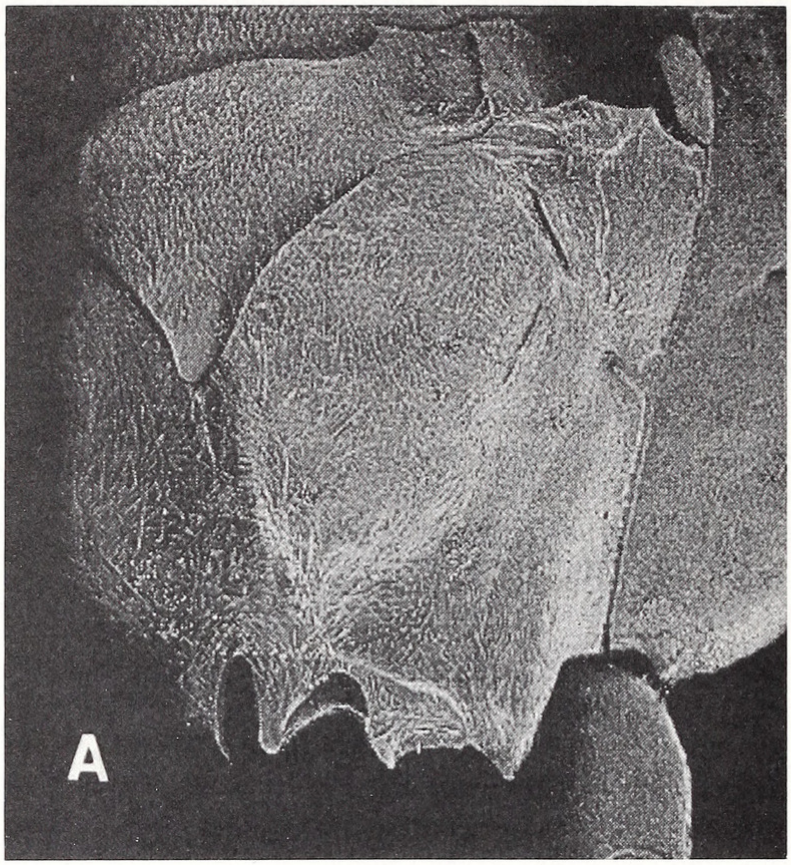
Color—ground color black to brown; margin of mandibular teeth and ventral margin of clypeus, reddish; antennae testaceous brown to black, scape yellow beneath with flagellum orange; abundant yellow markings, including most of clypeus aside from central inverted bifid mark, bifid frontal mark, ocular loops, most of pronotum except band on anterior surface down to level of foveae and humeral mark, two narrow stripes on mesoscutum, large mesepisternal mark, sometimes connected to spot below scrobe posteriorly, most of tegula yellow except outer margin, most of scutellum, axilla, and metanotum anteriorly, spot on upper part of metapleuron, most of propodeum except two antero-dorsal spots and central stripe, all of forecoxae, trochanters and femora ventrally, midcoxae anteriorly, posterior margin of first tergum, broad transverse band on second tergum basally, posterior bands on terga II–V, two lateral spots on base of second sternum, posterior bands on sterna II–IV; wings hyaline with dark brown venation.

Vestiture—body covered by short appressed pubescence and more scattered short outstanding bristles, sometimes lacking in poorly preserved specimens; longer hairs on lower margin of clypeus, on propodeum, and distal metasomal segments.

Variation: The color pattern described above is not constant but the degree of variation is nevertheless small, with regard to differences in the proportions of yellow and dark. The yellow on the legs is variable, with often the tibiae and tarsi, and most of the forelegs, yellow. The specimens from Peru and Ecuador tend to be darker, and to have the propodeal protuberances somewhat more pronounced.

Male: General structure and color like the female, aside from the usual sexual dimorphism. Clypeus narrower and ventrally somewhat depressed, extensively covered by silvery hairs; antennae with 13 articles; eyes more swollen below; genae narrower; last metasomal sternum is flattened. There is proportionally less yellow, so that on the vertex two small yellow spots are defined behind the posterior ocelli, and the pronotum has just narrow transverse and humeral yellow stripes. The second metasomal tergum has a pair of basal spots, not a transverse band.

The male genitalia appear to provide excellent diagnostic features. They are quite different from *P. bella* (von Ihering) (based on dissection of a male from Panama), *P. exigua exigua* (male from Brasil, Goiás), *P. holoxantha* (Ducke) (specimen from Guyana), *P. panamensis* (Zavattari) (specimen from Panama), *P. sedula* (Saussure) (two males from Peru, Loreto), *P. weyrauchi* (specimen from Peru, Junín) and *P. wheeleri* Bequaert (specimen from Panama). Most notably, the medial lobes of the aedeagus taper to laterally-directed points and are strongly sclerotized in *bituberculata* (Fig. 2A), appearing almost like hooks. In the other species examined, these lobes are apically more or less truncate (although differing in shape, Fig. 2b, c, and with a nipplelike tubercle in *panamensis*), directed ventrally, and much more weakly sclerotized. In the other species the volsella projects as a distinct medial angle in ventral view, about where the cuspis joins the lamina volsellaris ventral to the base of the digitus, but it is essentially flat in *bituberculata.* A definitive judgement on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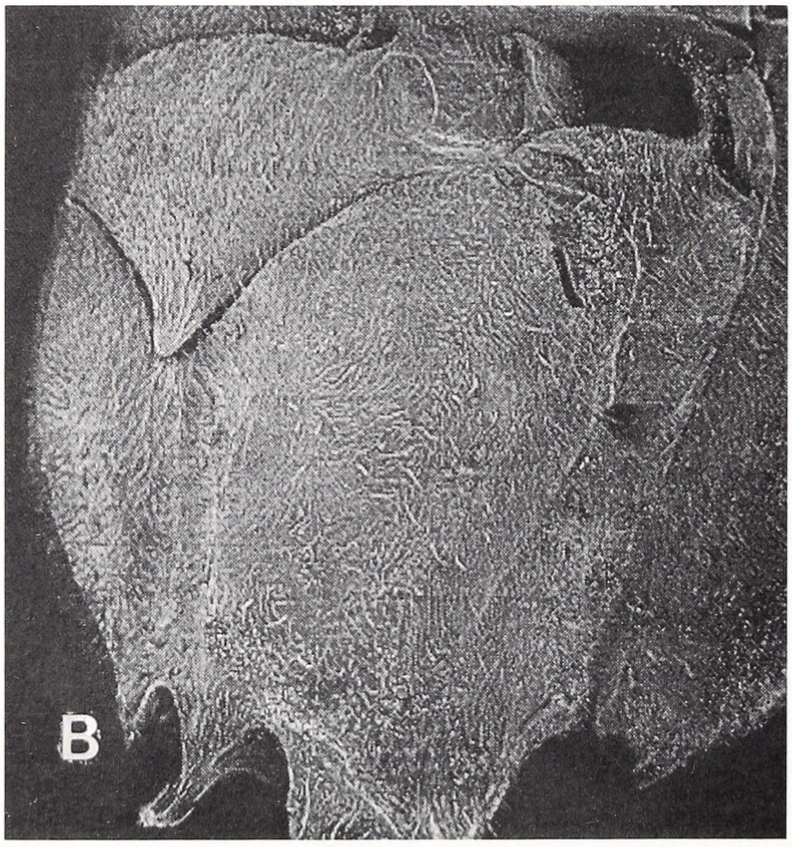
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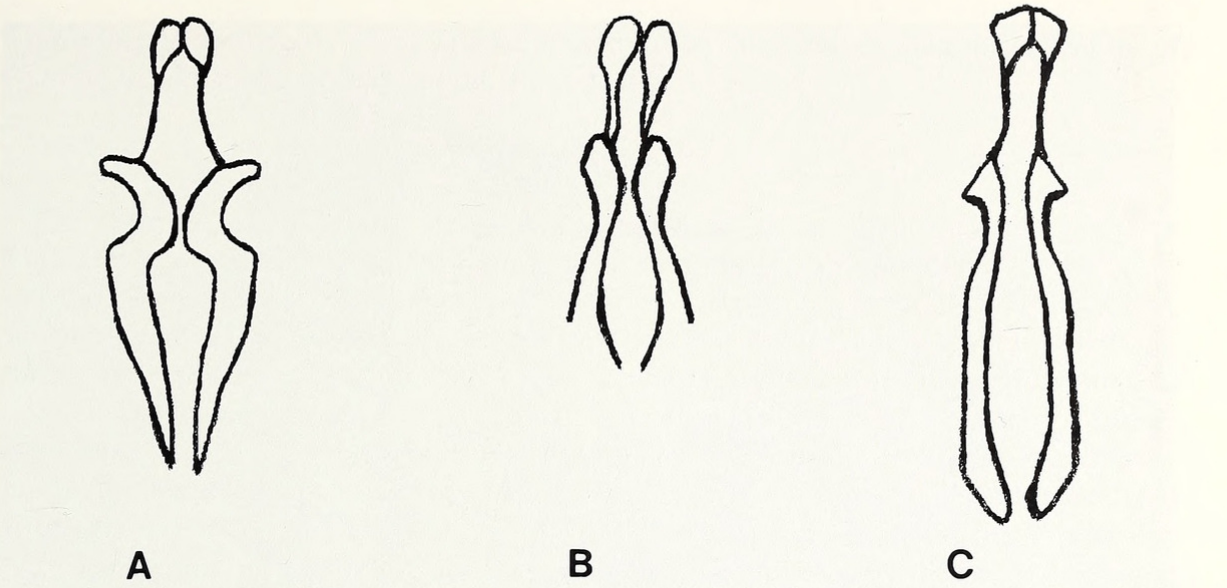

Fig. 2. Aedeagus, ventral view. A, *Protopolybia bituberculata.* B, *P. exigua binominata.* C, *P. weyrauchi.* The magnification is 62.5×.

the utility of these characters, however, must await study of more species of *Protopolybia,* which like other polistines have received little study of male genitalia.

Nest: Nine colonies of *P. bituberculata,* including nests, were collected by JMC and John W. Wenzel in Ecuador and Peru. A further two nests were seen in the Goeldi Museum collection. The nests show typical features of the genus (Fig. 3). The comb is suspended from the supporting leaf by one central and several lateral auxiliary peduncles, and is covered by an envelope with one or more lateral exit-holes. The envelope is brown, usually mottled with whitish streaks which may be spot-like. The envelope ranges in shape from more or less oval (e.g., Fig. 3A, 30 × 20 mm) to quite slender and spindle-shaped (e.g., Fig. 3B, 45 × 15 mm). Six of the nests from Peru and Ecuador, and one from Brasil, were somewhat enveloped by the adjacent leaves, to which the envelope was attached. In three of these nests, 901224-10, 901225-6 and 901227-3, the comb followed the curvature of the supporting leaf, to the extent that the comb almost folded back on itself lengthwise. In one of the Brazilian nests, a second lateral comb was being constructed (Fig. 3B), and in nest 901227-3 a complete second comb was separate and provided with its own envelope. One of the nests, 901217-19, was incipient, with a single naked comb (17 × 15 mm) suspended by a central peduncle. In another nest, 901229-6, the comb was only partly covered by the envelope.

Distribution: Brasil: Amazonas, Pará, and Maranhão; Peru: Loreto; Ecuador: Napo.

Type material: holotype female Brasil, Pará, Vigia, Campo do Palha, 08-xii-1988 (I. S. Gorayeb). Paratypes: Brasil, Amazonas, Tefé, 9-1904, 1 female, 28-9-1904, 1

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Fig. 1. Propodeum, oblique posterior view. A, *Protopolybia bituberculata.* B, *P. exigua binominata.*

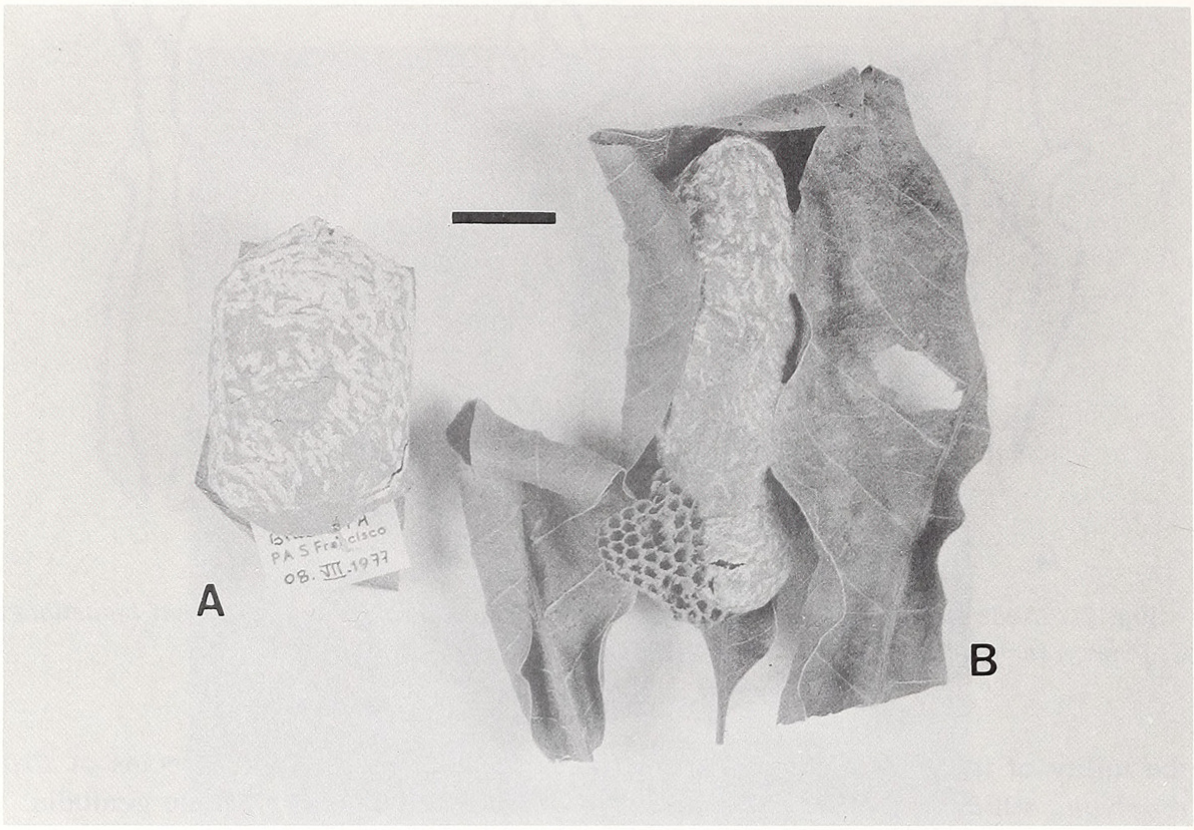

Fig. 3. Two nests of *P. bituberculata*. The scale bar is 1 cm.

male; Maranhão, S. Luiz, 3-6-1907, 1 female; Pará, Benevides, 81-911, 3 females; Pará, 16-12-1911, 1 female; 1912, 1 female (A. Ducke); Pará, Belém, Utinga, 14-xi-1967, 12 females (R. L. Jeanne); Pará, S. Francisco, 8-vii-1977, 13 females (W. L. Overal); Pará, S. Miguel, 11-iv-1979, 24 females (F. F. Ramos, W. França, and R. B. Neto); Pará, Vigia, Campina, 7-xii-1988, 1 female (I. S. Gorayeb); Pará, Capitão Poço, 25-ii-1978, 1 female (W. França); Amazonas, Alvarães, 17-6-1994, 26 females (O. T. Silveira and I. S. Gorayeb); Peru, Loreto, 80 km NE Iquitos, 22-12-1990, nest 901222-10, 81 females, 2 males (J. M. Carpenter and J. W. Wenzel); Loreto, 80 km NE Iquitos, 22-12-1990, nest 901222-14, 11 females (J. M. Carpenter and J. W. Wenzel); Loreto, Rio Sucusari at Napo, 24-12-1990, nest 901224-10, 240 females, 4 males (J. M. Carpenter and J. W. Wenzel), 4 females emerged 25-12-1990; Loreto, Rio Sucusari at Napo, 25-12-1990, nest 901225-6, 170 females, 31 males (J. M. Carpenter and J. W. Wenzel); Loreto, 80 km NE Iquitos, 27-12-1990, nest 901227-3, 70 females (J. M. Carpenter and J. W. Wenzel); Loreto, 40 km NE Iquitos, 29-12-1990, nest 901229-6, 26 females, 1 male (J. M. Carpenter and J. W. Wenzel); Loreto, 40 km NE Iquitos, 29-12-1990, nest 901229-7, 218 females (J. M. Carpenter and J. W. Wenzel); Ecuador, Napo, Tena, 16-12-1990, nest 901216-12, 115 females preserved in ethanol (J. M. Carpenter and J. W. Wenzel); Napo, Tena, 17-12-1990, nest 901217-19, 40 females (J. M. Carpenter and J. W. Wenzel).

Holotype and 93 paratypes deposited in the Goeldi Museum (Museu Paraense Emílio Goeldi, Belém/PA, Brazil). More than 1000 paratype specimens in the American Museum of Natural History (New York, USA).

Etymology: the specific name is a reference to the outstanding diagnostic feature of *P. bituberculata,* the posterolateral propodeal projections.

REMARKS

Protopolybia bituberculata is evidently related to those species of the genus in which the first metasomal segment is petiolate, being longer than broad at the apex, and the propodeal concavity is a narrow furrow. These are probably derived traits, but phylogenetic relationships among the species of *Protopolybia* are unclear (Carpenter and Wenzel, 1990). In the key of Richards (1978), *P. bituberculata* runs to couplet 7, which leads either to *P. rubrithorax* Bequaert or *P. exigua* (Saussure). *P. rubrithorax* has a color pattern unique in the genus, with the pronotum and mesoscutum light reddish and the metasoma mostly black. It also has a very localized distribution, hitherto recorded only from Peru. *P. exigua* is most similar in color to *P. bituberculata* but, as shown above, is readily distinguished by the propodeum and the male genitalia. In *P. bituberculata* the posterior face of the propodeum projects on each side of the median furrow (Fig. 1A). In *P. exigua* that surface is evenly rounded, not projecting (Fig. 1B). Males of *P. bituberculata* differ from *P. exigua* in having the medial lobes of the aedeagus pointed laterally and strongly sclerotized, appearing hooklike (Fig. 2A) rather than truncate (Fig. 2B).

Ducke (1910:475) treated his specimens of *P. bituberculata* from Belém and Tefé (Brazil, Amazonia) as variants of *P. sedula* var. *exigua,* recognizable by a ferruginous ground color. Ducke treated this color form as corresponding to *Polybia palmarum* Blanchard, described from Guatemala and according to Ducke (1910:474), a synonym of *P. sedula* var. *exigua.* This synonymy was questioned by Bequaert (1944: 110), because Bequaert had not seen *P. sedula* [= *exigua*] specimens from north of Panama. Bequaert also commented on the very poor description of *Polybia palmarum* given by Blanchard saying "The figures of the nest, as well as the size of the wasp, merely allow the conclusion that it was a *Protopolybia.*" While noting that Ducke apparently saw specimens of *Polybia palmarum* at the Paris Museum, Bequaert concluded as more probable that Blanchard's species was in fact *Protopolybia acutiscutis* (Cameron), a species common in Guatemala. The name *palmarum* was overlooked by Richards (1978), but one of us (JMC) has seen 10 females in the Paris Museum, labelled "Mexique" and marked as types of *palmarum.* These are evidently syntypes despite the imprecise locality; the specimen bearing the type and determination label is also labelled as *exigua* by Buysson. Six of the specimens are callows, paler than the other specimens and with crumpled wings. Their color is fundamentally yellow, as stated by Blanchard, not ferruginous as stated by Ducke. However, Ducke's synonymy with the typical form of *exigua* is correct, and *bituberculata* is quite distinct from this taxon.

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