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A new species of *Partamona* (Hymenoptera: Apidae) endemic to eastern Panama and notes on *P. grandipennis*

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Abstract: A new species of stingless bee of the genus *Partamona* from the lowlands of eastern Panama is described. It is a large *Partamona* characterized by a black head and thorax, and a chestnut yellow abdomen. The long yellow ferruginous wings, the yellowish pterostigma, and presence of long and well impressed sulcus on frontal median line, just above the supraclypeal area, suggest closest relation with *Partamona grandipennis* (Schwarz 1951), endemic to high altitudes of western Panama and Costa Rica. The male of *P. grandipennis* is also described. It can be recognized by the wings that are long and coloured as in workers, and by the long malar area (ca. 1.5x as long as the diameter of 2nd flagellomere).

Key words: Apoidea, Meliponini, *Partamona*, taxonomy, biogeography.

Partamona Schwarz ranges from Mexico to southern Brazil. The main autapomorphic features of this genus are: posterior tibia of workers almost one half as wide as long, the corbicula hollowed from the apex almost to base, with two or three exceedingly long hairs sinuous towards the apex, anterior contour nearly as convex as the posterior (Schwarz 1938: 475). It was partially revised by Camargo (1980) who studied the yellow species ("*testacea* Klug group") and now it is again being revised, including all the species (Pedro in prep.). The new species is only known from the lowlands of central Panama and is the probable sister species of *P. grandipennis*. Of all the known species (17 described and several new ones, Pedro in prep.), *P. grandipennis* (Schwarz) is the most divergent in the external morphology of workers, being characterized especially by its relatively large size, conspicuously long wings, and very long malar space (Schwarz 1951: 4). This species is endemic to the highlands of Costa Rica and western Panama. Recently we examined one male of *P. grandipennis*, described here.

Endemism in the region of Panama and Costa Rica, related to Pleistocene events, has been recorded for many species (or geographic races) of Meliponini genera with wide distribution in South America, such as *Scaptotrigona*, *Melipona* (see Roubik 1992), *Paratrigona* (Camargo and Moure 1994), *Trigona* (Camargo and Roubik 1991) and *Geotrigona* (Camargo and Moure 1996 in press). However, the presence of divergent taxa, such as *Nogueirapis*, with a fossil species from the Miocene amber of Chiapas, Mexico (Wille 1959, 1962), and the recently discovered monotypic genus *Meliwillea* (Roubik *et al.* 1996 in press), endemic to the cloudforests of Costa Rica, indicates a much more ancient history of vicariant events and faunistic exchange between Central and South America.

MATERIAL AND METHODS

The terminology used is that of Camargo *et al.* (1967) and Camargo (1980) with some modifications.

The following institutions contributed with material for this study:

MICR - Museo de Insectos, Universidad de Costa Rica (Jorge Arturo Lobo Segura); STRI - Smithsonian Tropical Research Institute (David Roubik); SEMK - Snow Entomological Museum of University of Kansas (C.D. Michener, R.W. Brooks); FFCL - Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto, Universidade de São Paulo (J.M.F. Camargo).

RESULTS

Partamona xanthogastra, sp. n.

Partamona aff. grandipennis; Roubik, 1992, chapter 31, in: **Insects of Panama and Mesoamerica**, Quintero & Aiello (eds.): 500 (key), 515 (fig. 31.12b.), 516, 523.

Diagnosis. Large size (maximum head width 2.76-2.96 mm; anterior wing length from apex of costal sclerite to tip of wing 6.56-7.39 mm; see Table 1). Blackish integument on head and thorax, abdomen entirely chestnut yellowish. Yellow maculations very nitidous; paraocular stripes approximately the same width along its length or a little wider below (0.8-1.1x diameter of 2nd flagellomere), the internal contour irregularly sinuous (Fig. 1). Along the frontal median line, a long and well impressed sulcus, just above the supraclypeal area. Membrane of wings yellow ferruginous, slightly brighter towards the apex; venation dull ferruginous on basal half, brighter ferruginous to orange on apical half including pterostigma; microtrichia predominantly blackish, ferruginous on pterostigma. Pilosity predominantly blackish but on ventral side of mesepisterna, coxae, trochanters and sterna, pale whitish. Basal region of propodeum uniformly covered by hairs, or with a very narrow longitudinal glabrous stripe. Mandibular denticles widely spaced (Fig. 3). Malar area about 1.20x longer than diameter of 2nd flagellomere. Interocellar distance a little less than ocellorbital and ocellorbital 1.56x the diameter of median ocellus (Fig. 1). Vertex flattened on sides, the inferior edge of lateral ocelli at the level of the superior orbital tangent (Fig.1). Posterior tibia normal, about 0.45x to half wider than long and its length less than maximum head width (Fig. 2). Anterior wing 2.4-2.5 longer than maximum head width. Erect hairs of scape about 1.3x scape diameter.

Worker

Dimensions. Total length, 6.64 mm; anterior wing length, from apex of costal sclerite to tip of wing, 7.06 mm, including tegula, 7.93 mm; maximum head width, 2.84 mm; maximum width of abdomen, 2.14 mm.

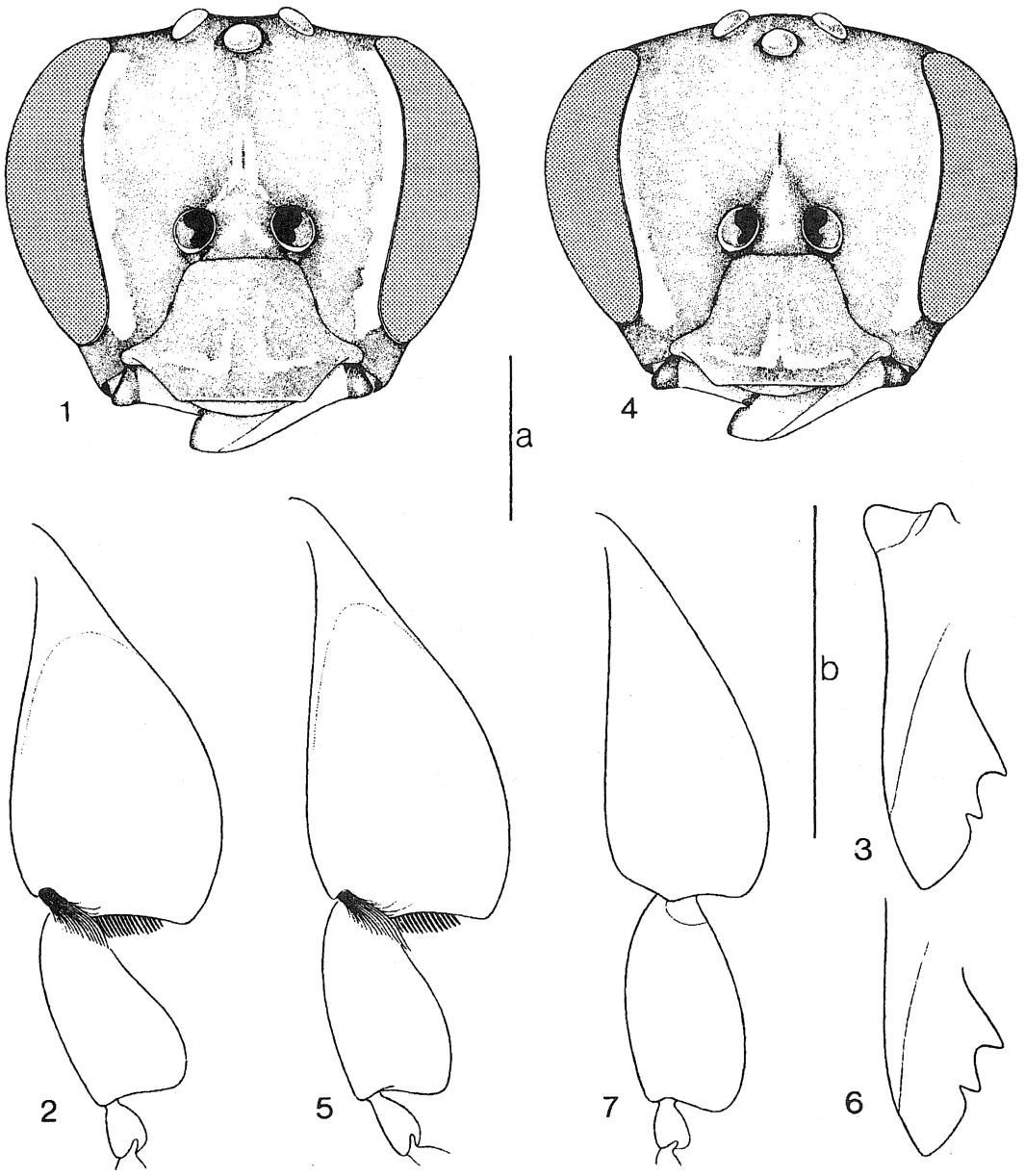
Colour of Integument. Head and thorax blackish, abdomen chestnut yellow. Metanotum, posterior tibia and basitarsus brownish, distitarsi of all legs and anterior basitarsus, lighter. Flagellum and scape dark brown, yellowish beneath, the last two flagellomeres a little lighter than the others, and the first one yellowish. Labrum yellowish. Basal third of mandible yellowish, gradually chestnut to apex, and condylar region, blackish. Pronotal lobes yellowish brown. Maculations ivory yellow, nitidous: two opposite spots, L-shaped on clypeus, one spot circumflex-shaped on supraclypeal region and one spot approximately triangular covering the frontal sulcus, one spot drop-shaped just before the median ocellus (length, 0.10 mm: maximum width 0.30); paraocular stripes approximately of uniform width, or a little broadened below (0.8-1.1x diameter of 2nd flagellomere), their internal contour irregularly sinuous, above finishing a little before the summit of eyes (Fig. 1); a stripe along part of external orbit, widened on lower third, and connected with a larger discoloured area on hypostomal region. Pronotum with wide transverse yellowish stripe (ca. 1/3 of pronotum width) interrupted in the middle; pronotal lobes discoloured, with a small median yellowish spot. Mesoscutum with yellowish lateral stripes along lateral borders. Tegulae brownish with translucid discal area. Axillae yellowish on anterior 3/4. Scutellum without maculation. Membrane of anterior wing yellow ferruginous (= dull yellowish, Schwarz 1951) on basal half (including radial and 2nd cubital cells), a little lighter on apical half; microtrichia fuscous, ferruginous on pterostigma; venation dull ferruginous on basal half (C, R, M, M+Cu, V) and yellowish on apical half, especially pterostigma.

TABLE 1

Measurements (mm) of Partamona xanthogastra *sp.n. and* P. grandipennis *(Schwarz)*

Features	*Partamona xanthogastra.* sp. n.					*Partamona grandipennis*						
	n	X (mm)	Range	SD	Holotype	n	X(mm)	Range	SD	Paratype R. Sucio	Paratype Irazú	Male
Maximum head width	26	2.88	2.76-2.96	0.057	2.84	26	2.83	2.68-2.88	0.049	2.82	2.78	2.72
Clypeocellar distance	24	2.07	1.96-2.14	0.041	2.06	25	2.06	1.97-2.12	0.030	2.04	2.04	1.98
Eye length	26	1.83	1.76-1.90	0.041	1.82	26	1.71	1.64-1.78	0.038	1.66	1.71	1.70
Eye width	24	0.76	0.72-0.79	0.021	0.75	26	0.69	0.64-0.72	0.020	0.72	0.66	0.76
Superior interorbital dist.	26	1.61	1.56-1.66	0.026	1.60	26	1.70	1.60-1.76	0.040	1.70	1.70	1.56
Maximum interorbital dist.	26	1.94	1.85-2.00	0.034	1.94	26	1.95	1.89-1.98	0.024	1.91	1.94	1.68
Inferior interobital dist.	26	1.61	1.56-1.66	0.030	1.59	26	1.67	1.58-1.75	0.037	1.65	1.66	1.36
Diameter of median ocellus	26	0.25	0.24-0.28	0.010	0.26	26	0.26	0.23-0.26	0.006	0.23	0.24	0.26
Dist. between lateral ocelli (interocelar)	26	0.38	0.36-0.40	0.013	0.36	26	0.38	0.34-0.40	0.016	0.37	0.38	0.39
Ocellorbital dist.	26	0.39	0.36-0.42	0.014	0.40	26	0.46	0.42-0.51	0.020	0.46	0.46	0.38
Interalveolar dist.	24	0.35	0.32-0.38	0.014	0.36	26	0.33	0.28-0.34	0.010	0.34	0.32	0.28
Alveolorbital dist.	24	0.48	0.44-0.51	0.018	0.48	26	0.52	0.48-0.54	0.015	0.51	0.51	0.38
Alveolocellar dist.	23	1.11	1.06-1.14	0.021	1.10	25	1.10	1.07-1.14	0.016	1.08	1.10	0.98
Alveolus diameter	24	0.25	0.23-0.24	0.011	0.26	26	0.26	0.24-0.30	0.014	0.26	0.26	0.26
Clypeus length	25	0.81	0.74-0.84	0.026	0.80	26	0.82	0.78-0.87	0.022	0.80	0.84	0.84
Clypeus max. width	24	1.41	1.36-1.46	0.028	1.40	26	1.39	1.28-1.44	0.035	1.42	1.38	1.20
Intertentorial dist.	24	0.86	0.84-0.88	0.013	0.84	26	0.84	0.82-0.86	0.014	0.82	0.82	0.76
Malar area length	26	0.21	0.20-0.22	0.008	0.20	26	0.27	0.24-0.30	0.018	0.26	0.27	0.20
Scape length	26	1.08	1.00-1.10	0.025	1.08	25	1.08	1.02-1.12	0.031	1.04	1.06	0.80
Scape diameter	26	0.16	0.16-0.18	0.006	0.17	26	0.16	0.16-0.18	0.005	0.16	0.16	0.22
2nd flagellomere diameter	24	0.18	0.17-0.20	0.010	0.20	26	0.18	0.16-0.19	0.010	0.18	0.18	0.20
Mandible length	26	1.18	1.12-1.26	0.031	1.16	26	1.18	1.11-1.21	0.021	1.18	1.16	0.80
Ant. wing length (costal esclerite to tip)	26	7.03	6.56-7.39	0.184	7.06	26	8.01	7.55-8.30	0.161	8.05	7.97	7.47
Ant. wing width	20	2.56	2.42-2.72	0.078	2.60	26	2.84	2.72-3.00	0.078	2.88	2.84	2.64
Hamuli		6	5-7		6-6		6	5-7		6-6	6-6	6-6
Scutellum width	25	1.14	1.04-1.20	0.044	1.12	26	1.20	1.14-1.26	0.032	1.16	1.18	1.18
Scutellum length	25	0.55	0.52-0.60	0.022	0.54	26	0.59	0.54-0.61	0.019	0.60	0.58	0.58
Median tibia length	24	1.62	1.52-1.68	0.040	1.56	25	1.65	1.56-1.74	0.044	1.66	1.58	1.60
Median basitarsus length	24	1.19	1.08-1.24	0.043	1.22	25	1.20	1.12-1.26	0.040	1.26	-	1.22
Median basitarsus width	24	0.40	0.36-0.44	0.023	0.40	24	0.40	0.36-0.44	0.022	0.44	-	0.36
Posterior tibia length	26	2.78	2.60-2.88	0.075	2.72	25	2.87	2.72-3.00	0.070	2.84	2.80	2.60
Posterior tibia width	26	1.30	1.18-1.36	0.041	1.26	25	1.23	1.14-1.30	0.039	1.26	1.18	1.02
Setae of scape	26	0.21	0.15-0.24	0.019	0.20	26	0.25	0.20-0.30	0.027	0.28	0.24	0.20
Setae of clypeus	24	0.15	0.13-0.20	0.020	0.14	25	0.20	0.14-0.24	0.020	0.22	0.20	0.28
Setae of front	24	0.21	0.18-0.30	0.031	0.18	26	0.31	0.22-0.34	0.030	0.38	0.34	0.34
Setae of vertex	24	0.35	0.30-0.38	0.028	0.36	26	0.41	0.36-0.48	0.028	0.46	0.40	0.48
Setae of sides of mesepisterna	24	0.33	0.24-0.37	0.031	0.36	26	0.42	0.30-0.52	0.053	0.48	0.42	0.34
Setae of disc of mesonotum	24	0.23	0.18-0.23	0.030	0.20	26	0.30	0.25-0.36	0.030	0.30	0.24	0.36
Setae of scutellum	26	0.55	0.40-0.66	0.066	0.54	26	0.65	0.58-0.70	0.065	0.66	0.58	0.60

Pilosity. Decumbent micropilosity on face and gena, pale yellowish. Erect hairs on clypeus, inferior para-ocular areas, front and scape predominantly ferruginous; on superior para-ocular and supraclypeal areas, and vertex, predominantly blackish, some shortly branched. Erect hairs at base of scape 1.2x longer than its diameter (0.20: 0.17); on clypeus 0.14 mm; on vertex 0.36 mm. The longer bristles on discal area of mesonotum, ca. 0.20 mm; on lateral region of mesepisterna, hairs long (0.36 mm) and blackish. On ventral region of mesepisterna, coxae and trochanters,



Figs. 1-7. *P. xanthogastra*, sp. n., worker, paratype from Chepo, Panama Prov., Panama: 1.head; 2.tibia and basitarsus of posterior leg; 3.mandible. Figures 4,5,6, *P. grandipennis*, worker from Las Alturas, Puntarenas, Costa Rica, 1,600 m: 4.head; 5.tibia and basitarsus of posterior leg; 6.mandible. Fig.7, *P. grandipennis*, male from Monteverde, Guanacaste, Costa Rica: tibia and basitarsus of posterior leg. Scale a (figs. 1,2,4,5,7) = 1 mm. Scale b (figs. 3,6) = 1 mm.

whitish. On scutellum blackish, distributed through the whole surface, the longer bristles a little longer than scutellum length (0.50: 0.54). Basal region of propodeum with long, sparse and plumose pale yellowish pilosity, without median longitudinal glabrous stripe; lateral region of propodeum with dense short plumose whitish tomentum. On abdomen, the tergal bristles blackish; on sterna whitish. Pilosity of internal surface of legs predominantly ferruginous; on external surface blackish, except anterior basitarsus and distitarsi of all legs, ferruginous.

Integument. Only the piligerous punctuation, typical of *Partamona*, except the punctures more marked on basal region of propodeum.

Form and Proportions. Head 1.21x wider than long (2.84: 2.34), 1.38x wider than clypeocellar distance (2.06), and also wider than 2nd tergum (2.14). Eyes 2.43x longer than wide (1.82: 0.75) and 0.64x as long as maximum head width, subparallel; superior interorbital distance shorter than eye length (superior interorbital dist., 1.60: maximum interorb. dist., 1.94: inferior interorb. dist., 1.59). Length of malar area equal to diameter of 2nd flagellomere (0.20:0.20). Clypeus relatively long, 4/7(0.57x) longer than wide and about 2/5 (0.39x) as long as the clypeocellar distance (0.80:1.40). Mandible (1.16) as long as 2/5 (0.41x) of maximum head width and 5/9 (0.56) as long as clypeocellar distance; with two denticles, largely spaced (0.23), on inner 2/5 of apical border (Fig. 3). Labrum normal. Interalveolar distance 1.38x the alveolus diameter and 3/4 alveolorbital distance (0.36:0.26:0.48). Scape half as long as pedicel+flagellum together (1.08:2.34) and nearly equal alveolocelar lateral distance (1.10). First flagellomere oblique truncate, longer than 2nd and nearly equal 3rd (0.20-0.23 :0.18:0.20). Front weakly depressed along median line, with frontal sulcus long and well impressed just above supraclypeal area. Distance between lateral ocelli less (9/10) than ocellorbital and 1.38x the diameter of median ocellus (0.36:0.40:0.26). Vertex flattened on sides, the inferior edge of lateral ocelli at the level of the superior orbital tangent (Fig. 1). Mesonotum approximately as long as wide (1.62:1.64). Scutellum semicircular, a little shorter than half width (0.54: 1.12). Posterior tibia more than twice as long as wide (2.72: 1.26), and a little shorter than maximum head width; posterodistal corner, angled, projected; distal border sinuous (Fig. 2). Posterior basitarsus 0.58x wider than long (0.66:1.14). Anterior wing 2.72x longer than wide (7.06:2.60) and 2.5x longer than maximum head width; pterostigma 3.68x longer than wide (0.92: 0.25); marginal cell 4.46x longer than wide (2.50: 0.56), nearly closed to apex; submarginal cells weakly demarcated; bifurcation of M+Cu a little anterior to cu-anal; submarginal angle, 95°. Hamuli, 6.

Types. Holotype, worker with the following labels: "Colon Prov. Panamá Portobelo 15 Km SW 'Santa Rita Ridge'", "18-VIII-1985 Camargo leg 851748", "4"; "HOLOTYPE Partamona xanthogastra Pedro & Camargo, 1995"; plus 11 paratypes, workers, from same locality, in FFCL. Other paratypes: 3 workers from "PANAMA: Colon Prov, Santa Rita Ridge-12 Km SW Portobelo, 20 Aug 1985, D. Roubik coll." (STRI); 1 worker from "PANAMÁ: Colon Prov. 30 Km. SE. Colon (Santa Rita Ridge) 20-___-1983, Doug Yanega", and additional handwritten labels, "Santa Rita, Pan. 20 Jan 1983 D. Yanega G", "Partamona n. sp. aff. grandipennis Det. D. W. Roubik, 1991" (SEMK)

Material Examined. Besides type material, the following specimens were studied: **PANAMA**. **Colon**: Puerto Pilon, __ km NE, 15 Apr. 1983, D. Roubik, No. 87 (2 workers, STRI); Puerto Pilon, 24 Km NE S.R. 20 Jan. 1983, D. Roubik, No. 77 (3 workers, FFCL); **Panama**: Chepo, 23 Km E. Carti Rd. 10 June 1982, D. Roubik No. 50 (3 workers, STRI); Chepo, __ km E. Carti, 1 oct. 1980, D. Roubik, No. 34 (1 worker, STRI); *idem, ibidem* (5 workers, FFCL); E. Cerro Jefe, 27 march 1982, D. Roubik, No. 1 (1 worker, STRI).

Geographic Distribution. Lowlands of central Panama, east of Canal Area (Colon and Panama Prov.; Fig. 12).

Nesting. According to Roubik (1992), it nests outside of tree cavities, in rootlet masses under epiphytes.

Partamona grandipennis (Schwarz, 1951)

Trigona (Partamona) grandipennis Schwarz, 1951, **Am. Mus. Novitates**, no. **1505**: 4-7;

Trigona grandipennis; Michener, 1954, **Bull. Am. Mus. Nat. Hist., 104**: 170

Partamona grandipennis; Michener, 1990, **Univ. Kansas Sci. Bull., 54**(4): 75-164: 115.; Roubik, 1992, ch. 31, in **Insects of Panama and Mesoamerica**, Quintero & Aiello (eds.) : 495-524: 500, 515, 516, 523; Bravo, 1992, **Revta. bras. Ent., 36**(4): 863-878: 864; Moure, J.S., 1992, **Acta Biol. Par., 21**: 132-133 (due to a lapsus, the comments on this species is headed with the name

Parapartamona); Michener & Roubik, 1993, in: **Evol. of Insect Socs.: Comparative Sociology of Bees, Wasps and Ants**, Inoue & Yamane (eds.): 251-266: 256.

Parapartamona grandipennis; Camargo, 1980, **Acta Amazonica, 10** (4, supl.): 1-175: 8.

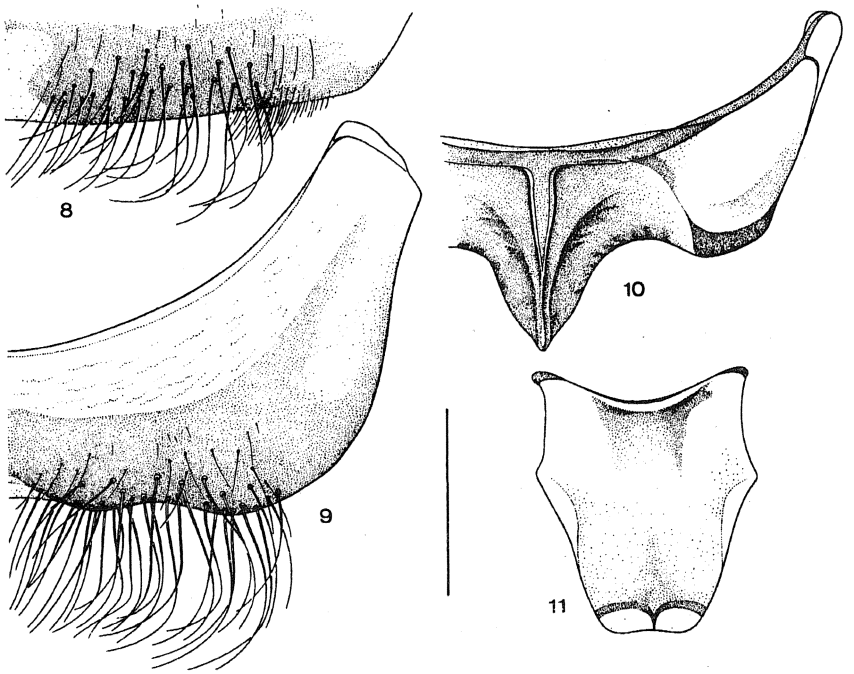
Diagnosis: Large size (maximum head width: 2.68-2.88 mm; anterior wing length from apex of costal sclerite to tip of wing: 7.55-8.30 mm; Table 1). Head, thorax and abdomen black. Yellow maculations feeble (specimens from Costa Rica) or nitidous (Panama); para-ocular stripes broadened below (ca. 1.5x the diameter of 2nd flagellomere), more feeble and narrow above (Fig. 4). Colour of wings, pilosity, propodeum, frontal sulcus and mandibular denticles similar to *P. xanthogastra*. Malar area very long, about 1.5-1.8 x as long as the diameter of 2nd flagellomere. Interocellar distance smaller (ca. 0.83x) than ocellorbital distance, the last one twice the diameter of median ocellus. Vertex round on sides, the inferior edge of lateral ocelli above the level of superior orbital tangent (Fig. 4). Posterior tibia long and narrow, more than twice (2.2-2.4x) as long as wide (Fig. 5). Anterior wing very long, ca. 2.8x longer than maximum head width. Erect hairs at the base of scape about 1.6x (1.24-1.81) as long as the scape is wide.

Male

The description is based on one specimen from "COSTA RICA: Guanacaste Monteverde Nat. Park, 17 July 1983 D. Roubik" (STRI). The abdomen without genitalia.

Dimensions: Total length, 7.30 mm; anterior wing length from apex of costal sclerite to tip of wing, 7.47 mm, including tegula, 8.38 mm; maximum head width, 2.72 mm.

Colour of Integument. Predominantly blackish. Abdomen and legs dark brown, basitarsi light brown. Antennal flagellum dark brown, a little lighter beneath; first flagellomere entirely lighter; scape and pedicel blackish. Mandibles yellow, black at base; labrum blackish. Tegulae brownish. Maculations yellow, a little brighter than in workers; para-ocular stripes a little wider below, about 1.5x wider than diameter of 2nd flagellomere, above narrow and feeble, finishing a little before the summit of the eye; a small spot drop-shaped below the median ocellus; stripe along the external orbit a little wider than diameter of 2nd flagellomere, and above ending a little before the superior orbital tangent. A narrow stripe about half wide as diameter of 2nd flagel-



Figs. 8-11. *P. grandipennis*, male: abdominal sterna V, VI, VII and VIII, respectively. Scale = 0.5 mm.

lomere along the lateral borders of mesonotum, and the axillae almost entirely yellowish; a transverse stripe on posterior half of pronotum interrupted in the middle. On preapical region of clypeus and apex of scutellum only a little brownish stain, indicating vestigial maculation. Membrane of wings yellow ferruginous, a little lighter at apical half (including radial and cubital cells); microtrichia mostly fuscous, ferruginous on pterostigma; venation ferruginous on basal half of wings (C, R, M, M+Cu, V) and yellowish to apex including pterostigma.

Pilosity. Denser and more slender than in worker, predominantly pale yellowish. On internal surface of tibiae and tarsi ferruginous. Erect bristles of vertex, mesonotum and scutellum fuscous. On superior half of mesepisterna fuscous hairs mixed with pale. Terga with blackish bristles; sterna with pale yellowish ones. Long hairs on clypeus (0.28), front (0.34), vertex (0.48), sides of mesepisternum (0.34), discal region of mesonotum (0.36). On scutellum the longest bristles with 0.60 mm, a little longer than scutellum length (0.58). The erect hairs of scape nearly as long as the diameter of scape (0.20: d. 0.20), some of them curved apically. Pilosity of propodeum long, slender and plumose; only with a very narrow longitudinal median glabrous stripe. Terga with blackish bristles and sterna with pale yellowish ones. External surface of posterior and median tibiae with blackish bristles. The rest of legs with pilosity ferruginous to pale yellowish on trochanters and coxae.

Integument. Smooth and shiny, with the piligerous punctuation a little denser than in workers. Clypeus and supraclypeal area with denser and coarser punctuation. Front with the spaces among punctures not so shiny due to very fine transversal rugosity of integument.

Form and Proportions. (measures in mm) Head 1.19x wider than longer (2.72: 2.28), and 1.37x wider than clypeocellar distance (1.98). Eyes 2.24x longer than wider (1.70: 0.76) and 0.63x as long as the head is wide, convergent below; maximum interorbital distance nearly as long as eye length (superior interorbital dist., 1.56: max. int. dist., 1.68: inferior int. dist., 1.36). Malar area as long as diameter of 2nd flagellomere (0.20: d. 0.20). Clypeus long, its length about 2/3 (0.70x) of its maximum width (0.84: 1.20) and about 3/7 (0.42x) of clypeocellar distance (1.98). Mandible (0.80) as long as 2/7 (0.29x) of maximum head width and 2/5 (0.40x) of clypeocellar distance; only with a small denticle on apical border. Labrum normal. Interalveolar distance 1.08x the alveolus diameter and about 3/4 (0.74x) of alveolorbital distance (0.28: 0.26: 0.38). Scape a little longer than 1/4 (0.27x) of pedicell+flagellum length together (0.80: 2.98), and nearly 5/6 (0.82x) shorter than the alveolocellar distance (0.98); diameter of scape (0.22) bigger than 2nd flagellomere (0.20). First flagellomere short, oblique truncate, the longest part less than half as long as the 2nd flagellomere is long, the third one a little shorter than 2nd one and 0.82x shorter than the last one (0.12: 0.28: 0.26: 0.34). Front slightly impressed along median line, with a shallow frontal sulcus. Interocellar distance (between lateral ocelli) nearly equal ocellorbital and 1.5x longer than diameter of median ocellus (0.39: 0.38: 0.26). Vertex round. Mesonotum a little longer than wide (1.82: 1.74). Scutellum aproximately semicircular nearly half longer than wide (0.58: 1.18). Posterior tibia 2.55x longer than wide and a little shorter than maximum head width (2.60: 1.02). Posterior basitarsus swollen, 1.77x longer than wide (1.24: 0.70) and a little wider than 2/3 of posterior tibia width (fig. 7). Anterior wings 2.83x longer than wide and 2.75x longer than maximum head width (7.47: 2.64); pterostigma 3.75x longer than wide (0.90: 0.24). Marginal cell 4.74x longer than wide (2.56: 0.54), pratically closed at apex; submarginal cells weakly demarcated. Bifurcation of M+Cu coinciding with cu-anal; submarginal angle, between M and Rs+M, 98°. Hamuli, 6. Pregenital sterna, Figs. 8-11.

Types. Holotype, worker, and some paratypes of same caste, from Costa Rica, Sucio River and Irazu (6000 e 7000 ft), collected by H. Rogers, deposited in AMNH and NHMU, and two paratypes from Panama, Chiriqui, Boquete, March.20.1923 collected by F.M. Gaige, in AMNH (according to Schwarz, 1951). The examined paratypes with the following labels: "R. Susio (*sic*). Costa Rica. H. Rogers" and "Irazu, 6-7000 ft. H. Rogers", impressed, and both with manuscript labels of "PARATYPE", in red, and "Trigona (Partamona) grandipennis H.F. Schwarz".

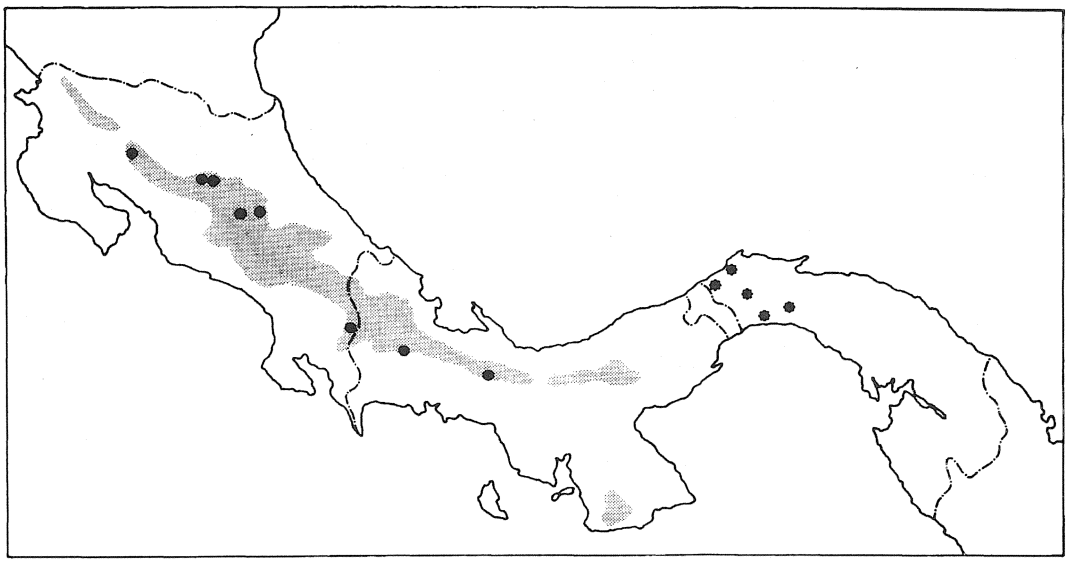


Fig. 12. Distribution of *Partamona xanthogastra*, sp. n. (asterisk) and *P. grandipennis* (black circle) on Panama and Costa Rica. The shady area indicates altitudes above 1 000 m along the Talamanca, Central, Tilarán and Guanacaste Cordilleras.

Material Examined. COSTA RICA. **Alajuela**: SE slope of Volcan Poas, 15 July 1963, 6450 ft. (Michener & Kerfoot) (8 workers, SEMK); **Cartago**: Irazu, 6-7000 ft. H. Rogers (1 worker, paratype, NHMU); **Guanacaste**: Monteverde Nat. Park, 17 July 1983, D. Roubik (1 male, STRI); **Heredia**: 10 mi. N Vara Blanca, 1400m, 17 April 1965, D.H. Janzen (18 workers, SEMK); **Puntarenas**: Las Alturas, II.1992 82°50' W, 8°56' N, 1600 m, J. Lobo leg. (5 workers, FFCL); Monteverde Reserve (trails near lab), 25 May 1993, C. Michalski, ex: flight intercept trap (2 workers, SEMK); *ibidem, idem*, 1 June 1993, ex: flight intercept trap (1 op., SEMK); Monte Verde Campbell's Woods, V-29-1992, 1520 m, M. Jameson, B. Ratcliffe (1 worker, SEMK); San Vito, Estac. Biol. Las Alturas, 2000 mt., Hanson & Godoy (1 worker, MICR); **San Jose**: Braulio Carrillo Nat. PK., 8 Dec. 1981, D. Roubik (2 workers, STRI); 20 Km N. Braulio Carrillo Nat. Park, 8 December 1981, D. Roubik coll. (4 workers, FFCL, NHMU). **PANAMÁ. Chiriqui**: 6 Km N. Bouquete (*sic*), Cerro Pate Macho, 1000 m, 25 Apr. 1981, Robt. W. Brooks (2 workers SEMK); Cerro Colorado, 1400 m by road 20 Jan 1988, D W Roubik collector (3 workers, STRI); Prov?: R. Susio (*sic* = Sucio), H. Rogers (1 worker, paratype, NHMU).

Variation. Specimens from Costa Rica have more feeble maculations, especially on clypeus.

Geographic Distribution. Highlands (1000-2300 m.) of western Panama (Chiriqui) and Costa Rica (Fig. 12).

Nesting. Unknown.

DISCUSSION

P. xanthogastra can be recognized by the colour pattern of the integument, entirely chestnut yellowish on the abdomen and blackish on the head and thorax. Its probable sister species is *P. grandipennis*. They share the following presumable synapomorphies: wings yellow ferruginous and pterostigma yellowish and frontal sulcus long and well impressed. They are also similar in the form of mandibular teeth (Figs. 3,6), colour of pilosity, maculation pattern, setal length at base of scape and absence of a wide glabrous stripe on the propodeum, which are also present in different combinations, in some other species of *Partamona* (Pedro in prep.).

P. grandipennis is the most divergent species of *Partamona,* being easily distinguished especially by its great size, very long wings, malar area about 1.5x longer than diameter of 2nd flagellomere and posterior tibia long and relatively narrow (see diagnosis). The male shows identical wing colour pattern and the long malar area, 1.5x as long as the diameter of 2nd flagellomere (in males of other species, about half shorter than diam. of 2nd flagellomere; Pedro in prep.). Further, the posterior basitarsus strongly swollen (Fig. 7), very long pilosity on head and thorax, and the form

of sternum VII permit us to distinguish the male of this species.

P. xanthogastra occurs in the lowlands of central Panama (Colon and Panama prov.) and does not overlap with *P. grandipennis*, which is apparently restricted to high altitude forests (1,000-2,300 m) in the central Cordillera of western Panama and Talamanca, Central and Tilarán Cordilleras in Costa Rica (Fig. 12).

P. xanthogastra and *P. grandipennis* are very divergent and probably constitute a clade independent of the other *Partamona* species, which are quite uniform in relation to external morphology, and also widely distributed (South Brazil to North Mexico).

The biogeographic patterns of Meliponini in Central America are very complex and remain unclear. The patterns reported in the literature (Camargo and Roubik 1991, Roubik 1992, Camargo and Moure, 1994, except Camargo and Moure 1996 in press) were not accompanied by phylogenetic hypotheses or analysed by procedures of historical biogeography. In this sense, we can say little about the history of *P. xanthogastra* and *P. grandipennis*; however, if these species do indeed constitute an independent branch, one can suppose that this clade was derived from a pre-Pleistocene vicariant event, before the origin of the other sympatric species of *Partamona*, such as *P. musarum* (Cockerell 1917) and undescribed species which are closely related to South American groups. This matter will be better approached in the study of the group as a whole.

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RESUMEN

Se describe una nueva especie de abeja sin aguijón del género *Partamona*, proveniente de las tierras bajas del Este de Panamá. Es una *Partamona* grande que se caracteriza por tener la cabeza y el tórax negros y el abdomen amarillo castaño. Las largas alas, de color amarillo ferruginoso y el pterostigma amarillento, junto con la presencia de un surco largo y bien definido en la linea frontal media, justo arriba del área supraclipeal, sugieren una relación estrecha con *Partamona grandipennis* (Schwarz 1951), endémica de las tierras altas del oeste de Panamá y Costa Rica. El macho de *P. grandipennis* también se describe. Este puede ser reconocido por sus alas largas y coloridas como en las obreras, y por su ancho espacio malar (ca. 1.5x tan grande como el diámetro del 2$^{do.}$ flagelomero).

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