

Two new species of the *Pyramica gundlachi*-group from Ecuador (Hymenoptera Formicidae)***

Fabrizio Rigato* - Antonio Scupola**

* Museo Civico di Storia Naturale, Corso Venezia 55, I-20121 Milano (Italy). Fabrizio.Rigato@comune.milano.it

** Museo Civico di Storia Naturale, Lungadige Porta Vittoria 9, I-37129 Verona (Italy). Antonio_Scupola@comune.verona.it

*** Results of the WBA Program "Biological Research in South America". XIII contribution.

Abstract

Pyramica osellai n. sp. and *P. heterodonta* n. sp. from Ecuador are here described and assigned to the *Pyramica gundlachi*-group because of their long mandibles, and to the *P. gundlachi*-complex because of their long trigger hairs, the presence of just 2 intercalary denticles between apical mandibular teeth and absence of a large preapical denticle around the midlength of each mandible. Both new species differ from other members of the complex for their preapical mandibular dentition and some minor characters and may form a separate species cluster.

Key words: ants, *Pyramica*, Dacetini, Neotropics, taxonomy.

Resumen

Se describen *Pyramica osellai* n. sp. y *P. heterodonta* n. sp. de Ecuador. Ambas especies son asignadas al grupo-*Pyramica gundlachi*, por sus largas mandíbulas, y al complejo-*P. gundlachi* por sus largos pelos de alarma, la presencia sólo de 2 denticulos intercalares entre los dientes apicales mandibulares y la ausencia de un ancho denticulo preapical cerca de la zona media de cada mandíbula. Estos dos nuevos táxones difieren de otras especies del complejo por su dentición preapical mandibular y algunos otros caracteres de menor importancia y pueden formar un grupo de especies independientes.

Palabras clave: hormigas, *Pyramica*, Dacetini, Neotropical, taxonomía.

Introduction

In 2006 one of us (AS) participated in a scientific expedition to Ecuador, organized by WBA (World Biodiversity Association, non-profit organization) in collaboration with prof. Giovanni Onore ("Pontificia Universidad Católica del Ecuador"), where some ant material was collected. Among those specimens there were some interesting ones, including two still undescribed species of the genus *Pyramica* with long mandibles and belonging in the *gundlachi*-group as defined by Bolton (2000) in his recent worldwide revision of Dacetini.

Materials and methods

Measurements and indices are as in Bolton (2000):

Total length (TL). The length of the outstretched specimen from the mandibular apex to the gastral tip.

Head length (HL). In full face view, excluding the mandibles, from the occipital border to the clypeal margin. In case of concave occiput and/or clypeus, it is taken from a line tangent to the most protruding portions of occiput and/or clypeus.

Head width (HW). The maximum head width in full face view.

Cephalic index (CI). $HW \times 100 / HL$

Mandibular length (ML). In full face view with fully closed mandibles, from the mandibular apex to the clypeal margin.

Mandibular index (MI). $ML \times 100 / HL$.

Scape length (SL). Excluding the basal condylar bulb and "neck".

Scape index (SI). $SL \times 100 / HW$.

Pronotal width (PW). The maximum pronotal width in dorsal view.

Alitrunk length (AL). Weber's length of the alitrunk: in profile from the anteriormost point where pronotal convexity meets the cervical shield to the posteriormost angle of the metapleuron.

All measurements were taken by means of a Leica 9.5 stereomicroscope with an ocular graticule and a "carrier AX", which allows to work on a single optic path and a fully perpendicular view in order to obtain more precise data.

Photographs were taken from uncoated specimens by means of a SEM Jeol JSM 5610-LV.

Depositories

ASPC: Antonio Scupola personal collection.

MSNM: Museo Civico di Storia Naturale di Milano, Italy.

MSNV: Museo Civico di Storia Naturale di Verona, Italy.

QCAZ: Museo de Zoología, Pontificia Universidad Católica del Ecuador, Quito, Ecuador.

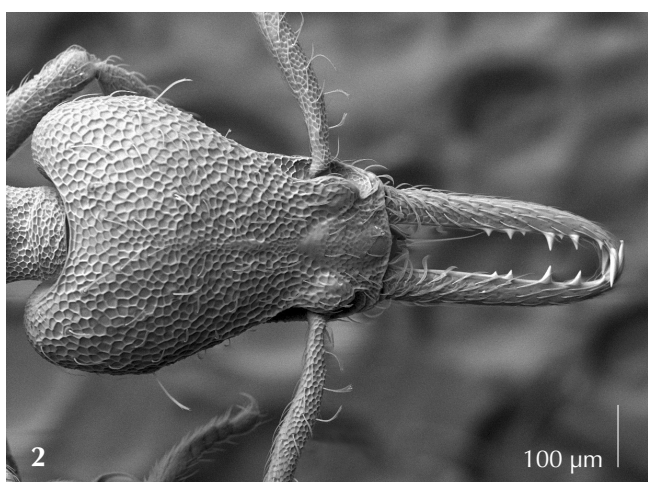
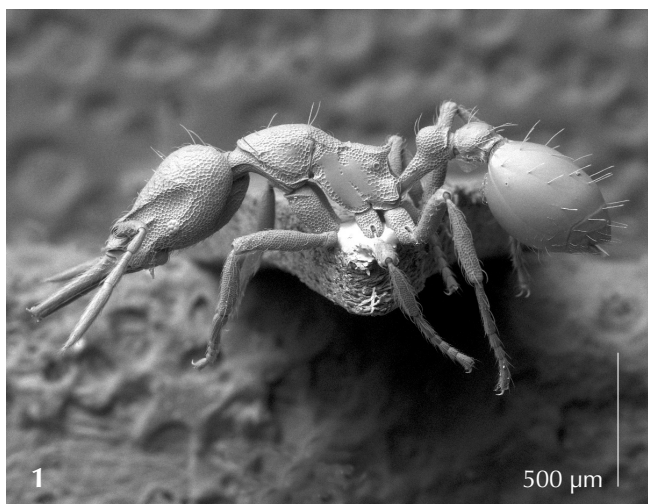
Pyramica osellai n. sp.

(figs. 1-3)

Holotype worker. TL 2.5, HW 0.45, HL 0.60, CI 75, ML 0.38, MI 63, SL 0.35, SI 78, PW 0.30, AL 0.65.

Mandibles relatively long and narrow with several preapical teeth and denticles: 7 on the left and 5 on the right; the right mandible lacks two of the smallest denticles. The distalmost preapical tooth is very close

to the base of the apicodorsal teeth on both mandibles. The two largest teeth are at the apical third of each mandible. Apical fork with two intercalary denticles. Labral lobes well developed but distinctly shorter than trigger hairs. Anterior clypeal border convex medially. Antennal scrobe moderately impres-



Figs. 1-3. *Pyramica osellai*, holotype worker: body profile (1); head (2); apical forks of the mandibles (3).

sed. Postoral transverse groove visible in profile, but not very deep.

Pronotum anteriorly delimited by a transverse carina marking a step above the cervical shield. Alitrunk profile with a convex promesonotum; mesonotum sloping gradually to the weakly convex base of the propodeum. Metanotal impression faint. Mesonotum and metanotal groove laterally marked by a weak carina. Propodeal teeth strong, slightly upturned and somewhat raised; their posterior edge forms a carina bordering the propodeal declivity. Petiole with a dome-like node, slightly convex above and posteriorly delimited by a transverse lamella just before the insertion of the postpetiole. Postpetiole much wider than petiole; in profile slightly lower and weakly convex above. The postpetiolar tergite bears anteriorly a transverse spongiform carina and posteriorly a transverse spongiform lamella at the insertion of the gaster; this lamella laterally widens and becomes lobiform. Postpetiolar sternite with a well developed spongiform appendage, which is bluntly subtriangular in profile.

Gaster anteriorly with a transverse spongiform thin lamella fitting that of the postpetiolar tergite.

Sculpture. Head, alitrunk and waist mostly densely reticulate-punctate; meso and metapleuron and postpetiolar disc chiefly smooth and shining. Gaster smooth with very short longitudinal costulae basally. **Pilosity.** Main erect setae on the body long and slightly clavate (remiform) and with the following arrangement: a pair apicoscrobial, two pairs on head dorsum (one on the vertex and one on the occiput), a humeral pair, a pair anteriorly on mesonotum, two pairs on the petiolar node, 8 hairs on the postpetiole arranged in two transverse rows. Gastral tergites bear several regularly arranged hairs. Ground pilosity (pubescence) sparse and slightly raised on head and alitrunk, a little more abundant on the appendages, including mandibles. Gastral sternites apically with long simple hairs, proximally the first sternite bears the usual transverse fringe of curled hairs. Anterior clypeal border fringed with spatulate hairs. Leading edge of scape with several standing, curved, simple to weakly spatulate hairs: the first two are bent toward the apex of the scape, the following 2 or 3 are bent toward the base and the few remaining ones are bent toward the apex.

Colour. Body brown; mandibles, antennae and tarsi testaceous; coxae, femurs and tibiae light brown.

Paratype gyne. TL 2.8, HW 0.49, HL 0.66, CI 74, ML 0.41, MI 62, SL 0.38, SI 78, PW 0.35, AL 0.75.

Mostly as the worker, and with the usual caste differences.

Preapical mandibular dentition differs as follows: left mandible with 5 preapical teeth and denticles, right one with 6. When compared with worker's mandibles the gyne keeps these consistent features: at least two close proximal denticles, well separated by

the following two, relatively large, teeth on the distal third, and one minute denticle very close to the base of the apicodorsal tooth.

Propodeal teeth large and horizontal; their ventral edge form a conspicuous lamella running along the sides of propodeal declivity.

The female has 4 pairs of setae on the mesoscutum and 1 on the scutellum. Mesopleuron mostly smooth as in the worker; metapleuron with a small unsculptured patch only.

Holotype worker: ECUADOR, Pichincha, Nanegalito, 0°03' N – 78°41' W, 1560 m, 27.VII.2006, leg. C. Bellò, G. Osella & M. Pogliano, collected by soil sifting in "bosque nublado" [MSNV].

Paratype gyne: same data as the holotype [MSNM]

Etymology

This species is dedicated to Prof. Giuseppe Osella, one of the collector of this ant.

Comment

This species has a unique combination of characters: dorsum of postpetiole mostly smooth and shining (see couplet 7, in Bolton, 2000: 138) and relatively numerous preapical teeth and denticles on the mandibles. The number of preapical teeth varies as shown comparing worker's and gyne's conditions; anyway I infer they cannot be less than 5. This species and the following one belong in the *gundlachi*-complex for their short labral lobes with very long trigger hairs, the presence of just 2 denticles between apicodorsal and apicoventral teeth of the mandibular fork, and mandibles without a distinctly larger median or submedian tooth. Also, *P. osellai* cannot be assigned to any of the species clusters identified within the *gundlachi*-complex (Bolton, 2000: 178, and see below under *P. heterodonta*).

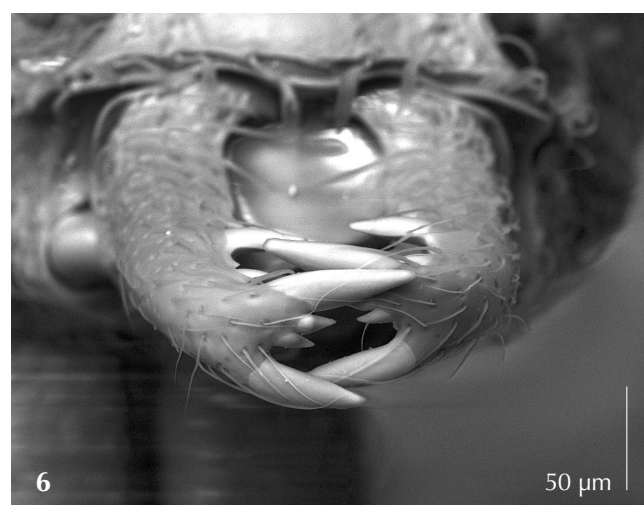
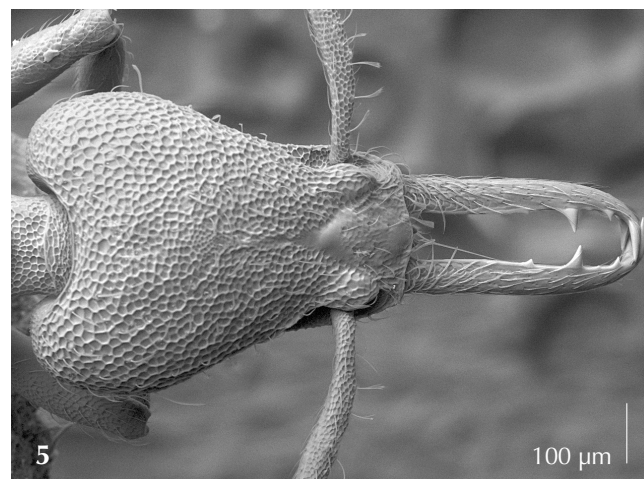
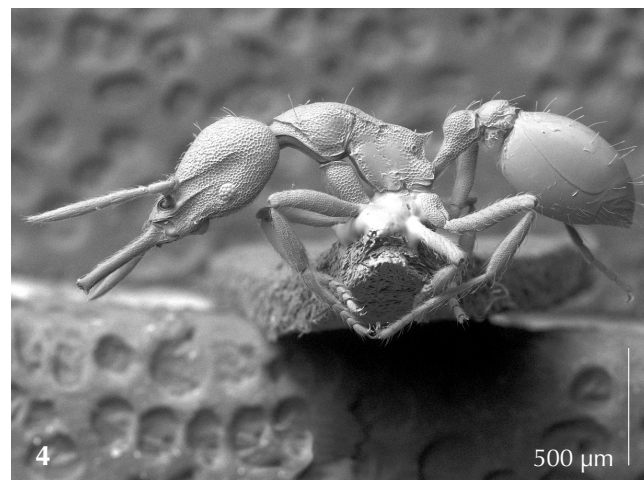
Pyramica heterodonta n. sp. (figs. 4-6)

Holotype worker. TL 2.8, HW 0.50, HL 0.66, CI 76, ML 0.41, MI 62, SL 0.41, SI 82, PW 0.35, AL 0.74.

Mandibles relatively long and narrow with 4 preapical teeth and denticles. The largest tooth is placed at the apical third of the mandible. Apical fork with two intercalary denticles. Labral lobes well developed but distinctly shorter than trigger hairs. Anterior clypeal border convex medially. Antennal scrobe moderately impressed. Postoral transverse groove visible in profile but not very deep.

Pronotum anteriorly delimited by a transverse carina marking a step above the cervical shield. Alitrunk in profile with a weakly convex promesonotum; mesonotum sloping very gradually to the nearly flat base of the propodeum. Mesonotum laterally bordered by a weak carina. Metanotal impression absent.

Propodeal teeth strong; their posterior edges form a lamella bordering the propodeal declivity. Petiole with a dome-like node, slightly convex above and posteriorly delimited by a transverse lamella just before the insertion of the postpetiole. Postpetiole much wider than petiole; in profile slightly lower and



Figs. 4-6. *Pyramica heterodonta*, holotype worker: body profile (4); head (5); apical forks of the mandibles (6).

weakly convex above. The postpetiolar tergite bears anteriorly a transverse spongiform carina and posteriorly a transverse spongiform lamella at the insertion of the gaster; this lamella laterally widens and becomes lobiform. Postpetiolar sternite with a well developed spongiform appendage, which is subtriangular in profile.

Gaster anteriorly with a transverse spongiform thin lamella fitting that of the postpetiolar tergite.

Sculpture. Head, alitrunk and waist mostly densely reticulate-punctate; meso- and metapleuron chiefly smooth and shining. Postpetiolar disc weakly sculptured, superficially reticulate-punctate and anteriorly extensively smooth and shining. Gaster smooth with very short longitudinal costulae basally.

Pilosity. Main erect setae on the body long and slightly clavate (remiform) and with the following arrangement: a pair apicoscrobial, two pairs on head dorsum (one on the vertex and one on the occiput), a humeral pair, a pair anteriorly on mesonotum; two pairs on the petiolar node; 8 hairs on the postpetiole arranged in two transverse rows. Gastral tergites bear several regularly arranged hairs. Ground pilosity (pubescence) sparse and slightly raised on head and alitrunk, a little more abundant on the appendages, including mandibles. Gastral sternites apically with long simple hairs, proximally the first sternite bears the usual transverse fringe of curled hairs. Anterior clypeal border fringed with spatulate hairs. Leading edge of scape with several standing, curved, simple to weakly spatulate hairs: the first two and the apical ones are bent toward the apex of the scape, setae 3 and/or 4 are bent toward the base.

Colour. Concolorous testaceous.

Paratype workers. TL 2.8-3, HW 0.49-0.51, HL 0.64-0.67, CI 75-78, ML 0.40-0.42, MI 61-64, SL 0.39-0.42, SI 78-84, PW 0.33-0.35, AL 0.71-0.75 (7 measured).

The preapical mandibular dentition is variable: minute denticles may either miss or be even more abundant. I could count 3 to 5 preapical teeth and denticles, but the most usual number is 4 on both mandibles. The two largest teeth are always present, although the minor apicalmost one can be quite reduced; also, any denticle between those two teeth often misses and basalmost denticles are usually 1 or 2, but they can be so minute to be hardly visible. Another variable character is the sculpture of the postpetiolar disc, which usually is mostly smooth and shining; yet a weakly reticulate-punctate sculpture can be moderately developed. The inclination of setae on the scape is somewhat consistent with at least one hair (usually n°4 from the base) curved toward the base.

Holotype worker: ECUADOR, Pichincha, Paschoa, 2940 m, 0°25'19" S - 78°30'57" W, 26.VII.2006, leg. G. Caoduro, A. Scupola, under bark [MSNV]

Paratypes (7 workers): same data as the holotype [ASPC, MSNV, MSNM, QCAZ].

Etymology

From the Greek *héteros*, different, and *odoús, odón-tos*, tooth, for its four mandibular preapical teeth and denticles all different in size from one another.

Comment

Another species in the *gundlachi*-complex (see "Comment" under *P. osellai*). Its preapical dentition easily separates this species from its close relatives. Using Bolton's revision it might be even keyed out with some difficulties either as *P. jamaicensis* or even as *P. gundlachi*; yet both are distinctly smaller and the former much darker too (see also "N.B." after the "Updating of the key to the Neotropical Pyramica").

Discussion

P. osellai and *P. heterodonta* seem very closely related: the main difference between them is the preapical mandibular dentition. *P. osellai* bears a higher number of elements, with two large ones and a definitely smaller one very close to the apicodorsal tooth; *P. heterodonta* has just one large tooth on its mandibular shaft. Yet general morphology, pilosity, sculpture, development of spongiform appendages on waist, measurements and indices are highly comparable. They cannot be easily assigned to any species clusters within the *gundlachi*-complex as defined by Bolton (2000); yet in many respects they look close to *P. gundlachi* itself. About the position of their intercalary denticles in the apical fork one may wonder whether they "belong" to the apicodorsal tooth. As apical teeth form an angle between themselves, rather than a curved surface, the intercalary denticles seem to stem from the base of the apicodorsal one. Our SEM pictures show a difference in colour (due to the presence of some metal as usual in the mandibular teeth of insects) that would suggest that intercalary denticles arise from the space between apical teeth.

Comparing both new species with *gundlachi* cluster they have a preapical dentition formed by alternatively large teeth and small denticles. In *P. gundlachi* and its relatives preapical dentition is formed by a series of quite similar denticles looking not as variable as in *P. osellai* and *P. heterodonta*. Also, postpetiolar disc is not strongly reticulate-punctate as in *P. gundlachi* and allies.

P. osellai cluster could be defined as follows:

1: mandibles of moderate length, MI 61-64, their inner margin weakly convex in their proximal half and slightly concave in the distal one;

2: two intercalary denticles arising from the space between apical mandibular teeth;

3: preapical dentition formed by 3 to 7 teeth and denticles placed in the distal two third or half of the mandibular shaft. These are strongly heteromorph with alternation of very small and large ones;

4: main pilosity formed by several pairs of elon-

gate, somewhat remiform, hairs: apicoscrobial, 2 pairs on the head dorsum, humeral hairs, one pair on the anterior mesonotum. Leading edge of scape with simple to narrowly spatulate curved hairs;

5: postpetiolar disc smooth to weakly reticulate-punctate.

Updating of the key to the Neotropical *Pyramica*

Bolton's key (2000: 138) can be partially modified as follows in order to include both new species (original couplets' numbers are in brackets and two new couplets are added; most of the original couplets have been partially rewritten).

- 7 Disc of postpetiole smooth or weakly sculptured in parts, never densely reticulate-punctate 8
 - Disc of postpetiole densely reticulate-punctate over most or all of its surface 14 [12]
- 8 Cephalic dorsum with 2 pairs of long, filiform to weakly remiform standing hairs, one pair near highest point of vertex, the other near the occipital margin. Apicoscrobial and pronotal humeral hairs narrow, filiform to weakly remiform. 9
 - Cephalic dorsum with a single pair of stoutly remiform standing hairs, located close to the occipital margin. Apicoscrobial and pronotal humeral hairs thick, remiform. (Venezuela, Colombia) *nubila*
- 9 Mandible with 2 preapical teeth or denticles. (Colombia) *xenognatha*
 - Mandible with 3 or more preapical teeth or denticles 10
- 10 Mandible with 3 preapical teeth or denticles, of which the basalmost is distinctly the largest. (Colombia) *gemella*
 - Mandible with 3 (or more) preapical teeth or denticles, of which the basalmost is not the largest 11
- 11 Mandibles relatively long, MI 61-70. Postpetiolar tergite anteriorly with a thin transverse lamella or carina. Basigastral costulae present but short. 12
 - Mandibles shorter, MI 55-57. Postpetiolar tergite anteriorly without a thin transverse lamella or carina. Basigastral costulae absent. (Colombia) *laevipleura*
- 12 MI 66-70. In full face view the whole inner margin of mandible shallowly concave. (Colombia, Ecuador) *vartana*
 - MI 61-64. In full face view inner margin of mandible slightly convex in its proximal half . . . 13
- 13 Mandible with 5 or more preapical teeth or denticles, always with a pair of subequal, relatively close, large ones at its apical third and one relatively small stemming very close to the apicodorsal tooth (Fig. 2). (Ecuador) *osellai*
 - Mandible usually with 4 preapical teeth or denticles, always with a single large one at its apical third and none stemming very close to the apicodorsal tooth (Fig. 4). (Ecuador) . . . *heterodonta*

N.B. Some *P. heterodonta* specimens might have a more strongly reticulate-punctate postpetiolar disc. In such a case they could be keyed out from couplet 7 through couplet 14 [12] and one could hardly determine them either as *P. gundlachi* or even as *P. jamaicensis*. Yet *P. heterodonta* is larger, has a higher SI and nearly always a lower number of preapical teeth and denticles, which are also by far more heterogeneous in size than in both the above-mentioned species.

Acknowledgements

We wish to express our gratitude to Michele Zilioli (MSNM) for his excellent SEM photographs and to Barry Bolton (Isle of Wight, UK) who kindly revised the manuscript.

-o-

References

Bolton B., 2000. The ant tribe Dacetini. - Memoirs of the American entomological Institute, 65(1-2): 1-1028.