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Two new species of the genus *Plumaroides* Brothers, 1974 (Hymenoptera: Chrysidoidea, Plumariidae) from Argentina

PATRICIA A. DIEZ & PATRICIO FIDALGO
Centro Regional de Investigaciones Científicas y Transferencia Tecnológica (CRILAR-CONICET), Entre Ríos y Mendoza s/n, 5301 Anillaco, La Rioja, Argentina. E-mail: pdiez@crilar-conicet.gob.ar

Abstract

Two new species of the genus *Plumaroides* Brothers, 1974 from Catamarca and La Rioja provinces of Argentina *P. aquilus* Diez & Fidalgo, **sp. nov.** and *P. tapilophus* Diez & Fidalgo**, sp. nov.** are described and illustrated. A key to separate males of five known species of *Plumaroides* is provided.

Key words: Plumariidae, *Plumaroides*, taxonomy, Argentina

Introduction

Plumariidae belong to the superfamily Chrysidoidea (Hymenoptera: Aculeata), and are distributed in xeric regions of southern Africa and South America, with maximal diversity in the latter. Plumariid wasps are represented by seven genera, *Myrmecopterinella* Day, 1977 and *Myrmecopterina* Bischoff, 1914 occur in southern Africa, *Plumarius* Philippi, 1873, *Maplurius* Roig-Alsina, 1994, *Plumaroides* Brothers, 1974, *Mapluroides* Diez, Fidalgo & Roig-Alsina, 2007, and *Pluroides* Diez, Roig-Alsina & Fidalgo, 2010 in South America (Brues 1924; Bradley 1972; Brothers 1974; Day 1977; Roig-Alsina 1994; Diez *et al.* 2007, 2010; Brothers 2011). The knowledge of this family is based mainly on males since females are rarely collected. These wasps have nocturnal habits and show extreme sexual dimorphism with apterous females and winged males.

Plumaroides was originally described from Catamarca province, Argentina (Brothers 1974), and it is distributed in Salta, San Juan, Mendoza and Santiago del Estero provinces. This genus is the most specious after *Plumarius*, with three species described: *P. andalgalensis* Brothers, 1974 *P. brothersi* Diez & Roig-Alsina, 2008, and *P. tiphlus* Diez, 2008.

Plumariid wasps have a strong sexual dimorphism. Females are apterous, prognathous, have a flattened body and short legs with strong spiniform setae and stout femora. *Myrmecopterina*, *Plumarius* and *Plumaroides* are the only genera for which females are known (Evans 1966, Brothers 1985, Diez 2008). Currently the female *P. tiphlus* was attributed to Bethylidae (Quintero & Cambra 2010); this is still under discussion and further studies on morphology and molecular biology will determine the correct position of this specimen.

In this contribution, two new species are described and illustrated, *Plumaroides aquilus* **sp. nov.**, and *P. tapilophus* **sp. nov.**, and a key for males of the five known species is provided.

Methods

Specimens were collected at night with a camping lantern provided with a fluorescent light (“U” tube, 360 degrees bright light), and placed on a white sheet spread on the ground. Adult males were collected in alcohol and then chemically dried.

Specimens are deposited in: Museo Argentino de Ciencias Naturales “Bernardino Rivadavia”, Buenos Aires, Argentina (MACN), Instituto Fundación Miguel Lillo, Tucumán, Argentina (IFML), Museo de La Plata, La Plata, Argentina (MLP).

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Plumaroides Brothers, 1974

(Figs 1–10)

Plumaroides Brothers 1974: 351–365; Day 1977: 171; Roig-Alsina 1994: 91; Brothers 2006: 389; Diez & Roig-Alsina 2008: 45; Diez 2008: 25.
Type species *Plumaroides andalgalensis* Brothers, 1974, by original designation and monotypy.

The diagnosis of the male of the genus is mainly given by: palpar formula (5:2); first nebulous vein on fore wing, arising at the base of marginal cell; scape with a distinct ventral apical swelling; seventh tergum sharp-pointed and with one medial longitudinal carina.

Plumaroides aquilus Diez & Fidalgo, sp. nov.

(Figs 1–4)

Diagnosis. This species is easily distinguished from all other species of the genus by its characteristic black coloration.

Description. MALE. Holotype male. Total length 6.0 mm (paratypes 4.0 to 6.5 mm). *Color*: Black with dark brown areas as follows: radicle, central area of mandible, distal area of maxillary palpus, seventh tergum in dorsal view, pterostigma. *Sculpture*: Alutaceous, body with abundant, regular hairs. Head and mesosoma with conspicuous punctures separated by approximately 1 their diameter.

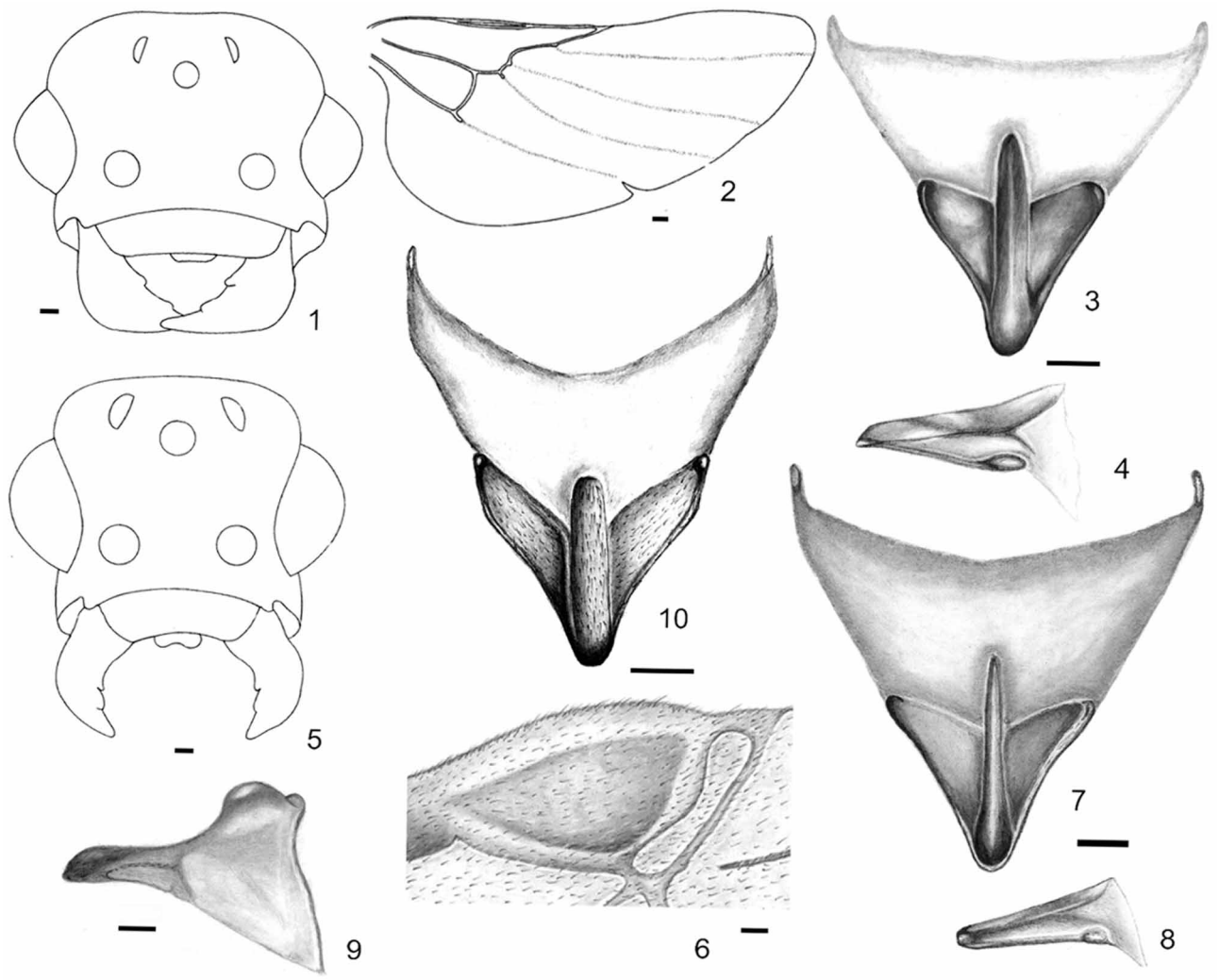
Head. 0.7 x as high as wide, in frontal view; equal to maximum width of the mesosoma between tegulae. Ocellocular distance 2.7 x the diameter of lateral ocellus, postocellar distance 1.4 x ocellocular distance. Antennocular distance 1 x diameter of antennal socket; interantennal distance 2.7 x antennocular distance. Distance between socket and clypeus 0.8 x diameter of socket. Malar space 0.2 x height of eye. Apex of clypeus in frontal view slightly emarginate medially, apical margin recessed, epistomal suture distinct and curved medially (Fig. 1). Apical setae of clypeus variable in size being the longest as the height of clypeus, medially. Labrum small, distinct in frontal view, lightly emarginated apically. Mandible with three blunt teeth; with setae variable in size, the longest 0.4 x basal width of mandible. Labial palpus with two segments, basal 1.7 x as long as apical. Maxillary palpus with five segments; proportions of segments (length: width): 1.5: 0.5; 1.1: 0.5; 1.7: 0.3; 1.0: 0.4; 1.0: 0.4. Antenna with 13 segments tapering to apex; scape subrectangular, shorter than pedicel and first flagellomere together. Proportion of flagellomeres (lengths), from base to apex: 1.2; 1.2; 1.4; 1.5; 1.3; 1.4; 1.3; 1.3; 1.2; 1.2; 1.9. Flagellomeres with short, decumbent and abundant setae, longest setae nearly 0.2 x as long as width of flagellomere; ovoid sensory plates present on flagellomeres 1 to 10, being more abundant on the first four flagellomeres, in dorsal view.

Mesosoma. 1.6 x as long as wide. Proportions of lengths of mesoscutum, mesoscutellum, metanotum, metapostnotum and propodeum in dorsal view, along median axis: 39: 36: 22: 6: 21. Pronotum not distinct, except for small part of pronotal lobe in front of tegula; ventrolateral angle rounded. Mesoscutum with parapsidal line and notaulus distinct. Metanotum subrectangular, 0.5 x as long as mesoscutum. Propodeum convex, subrectangular in dorsal view, 2.5 x as wide as long; spiracle loop-shaped and separated from the basal margin of the propodeum by a distance less than the length of the spiracle. *Wings*: Fore wing approximately 2.1 x as long as wide; marginal cell with anterior margin 2.2 x as long as posterior margin, and basal margin slightly curved forward. Hind wing with vannal lobe 3.8 x the length of the submedial cell (Fig. 2); seven hamuli. *Legs*: Slender; tibiae and tarsi with scattered weak setae; fore tibia with 15 strong spiniform setae apically and along outer margin; these setae approximately 18 on mid tibia and absent on hind tibia. Tibial spurs 1-2-2; anterior spur curved and weakly pectinate on inner margin; fore basitarsus with shallow strigilar concavity approximately one third as long as basitarsus, bearing strigilar comb of fine setae.

Metasoma. 1.6 x as long as its maximum width. Seventh tergum with subtriangular shape and polished distal zone; lateral carina well developed; longitudinal carina even height from base to apex (Figs 3, 4).

FEMALE. Unknown.

Type mterial. Holotype ♂: Argentina, Province Catamarca, 5 km North Palo Blanco, 23-II-07, Diez, Fidalgo (MACN). Paratype: 32 ♂ same data as holotype (MACN); 3 ♂, 5 km North Palo Blanco, 8-II-06, Diez, Fidalgo (MLP); 6 ♂, 30 km N de Fiambala, 6-II-07, Diez, Fidalgo (IFML). Province La Rioja, 1 ♂, RN 27 between San Ramon and Valle Fertil, 14-XII-06, Diez, Fidalgo (MACN).



FIGURES 1–10. *Plumaroides*. 1–4. *P. aquilus* **sp. nov.** 1, Head; 2, Hind wing; 3, Seventh tergum, dorsal view; 4, Seventh tergum, apical area, lateral view. 5–8. *P. tapilophus* **sp. nov.** 5, Head; 6, Fore wing, marginal cell; 7, Seventh tergum, dorsal view; 8, Seventh tergum apical area, lateral view. 9. *P. brothersi*, seventh tergum apical area, lateral view. 10. *P. tiphlus*, seventh tergum, dorsal view. Scale bar = 0.1 mm.

Variation. In the marginal cell the anterior margin varies from 2.0 to 2.6 x as long as posterior margin. The coloration varies, with the following parts sometimes lighter: distal region of scape, a thin apical band in tergum 1 to 5, distal regions of trochanter, femur, tibia, tarsus and pretarsus of all legs.

Discussion. *Plumaroides aquilus* **sp. nov.** can be distinguished from other species of *Plumaroides* by: ocellocular distance is 2.7 x diameter of lateral ocellus in *P. aquilus* **sp. nov.**, while it is 1.6 x in *P. andalgalensis* and *P. brothersi*, and 2.0 x in *P. tiphlus*; interantennal distance is 2.7 x antennocular distance in *P. aquilus* **sp. nov.**, while it is 6.7 x in *P. andalgalensis* , 4.9 x in *P. brothersi*, and 4.3 x in *P. tiphlus*; vannal lobe is 3.8 x the length of the submedial cell in *P. aquilus* **sp. nov.**, while it is 2.2 x in *P. andalgalensis* , 3.5 x in *P. brothersi*, and 2.6 x in *P. tiphlus*.

Etymology. This species was named after its characteristic black coloration (Latin *aquilus*: dark coloration).

Plumaroides tapilophus Diez & Fidalgo, sp. nov.

(Figs 5–8)

Diagnosis. This species can be distinguished from other known species of the genus by the almost flat longitudinal medial carina on the seventh tergum.

Description. MALE. Holotype male. Total length 3.8 mm (paratypes 3.6 to 5.6 mm). *Color*: Body light brown with head significantly darker and the following parts slightly light: antennae, front, clypeus, gena, base of mandi-

ble, labial and maxillary palpus, legs, pterostigma. *Sculpture*: Alutaceous, body with abundant, regular hairs. Head and mesosoma with conspicuous punctures separated approximately by 1 x their diameter.

Head. 0.7 x as high as wide, in frontal view, equal to maximum width of the mesosoma between tegulae. Ocellocular distance 1.1 x the diameter of lateral ocellus, postocellar distance 2.1 x the ocellocular. Antennocular distance 0.5 x the diameter of antennal socket; interantennal distance 3.4 x the antennocular. Distance between socket and clypeus 0.8 x the diameter of socket. Malar space 0.2 x height of eye. Clypeus slightly curved in the basal margin; apex of clypeus in frontal view emarginate medially, apical margin recessed, epistomal suture distinct and curved medially (Fig. 5). Discal setae of clypeus vary in size, being the longest as long as height of clypeus, medially. Labrum small, distinct in frontal view, weakly emarginated apically. Labial palpus two segmented both segments equal lengths. Maxillary palpus five segmented; proportions of segments (length/width): 1.3: 0.3; 1.2: 0.4; 1.5: 0.4; 1.2: 0.5; 1.0: 0.4. Mandible with three blunt teeth, with setae varying in length, being the longest 0.5 x the basal width of mandible. Antenna with 13 segments tapering to apex. Scape subrectangular, shorter than pedicel and first flagellomer together. Proportion of flagellomeres (lengths), from base to apex 0.8; 1.2; 1.4; 1.4; 1.2; 1.2; 1.1; 1.2; 1.1; 1.1; 1.3. Flagellomeres with short, decumbent and abundant setae, longest setae 0.1 x as long as width of flagellomere; ovoid sensory plate, present on flagellomeres in varying numbers, 8 to 14 in flagellomeres 2 to 4, and 1 to 4 in flagellomeres 1 and 5 to 10; last flagellomer without sensilias.

Mesosoma. 1.8 x as long as wide. Proportions of length of mesoscutum, mesoscutelum, metanotum, metapostnotum and propodeum in dorsal view, along median axis: 37: 33: 19: 4: 14. Pronotum not distinct, except for small part of pronotal lobe in front of tegula; ventrolateral angle rounded. Mesoscutum with parapsidal line and notaulus distinct. Metanotum subrectangular 0.5 x as long as mesoscutum. Propodeum convex, subrectangular in dorsal view, 4 x wider than long; spiracles loop-shaped and separated from the basal margin of the propodeum by a distance less than the length of the spiracle. Wings: Fore wing: 2.3 x as long as wide; marginal cell with anterior margin 1.6 x as long as posterior margin; basal margin slightly curved forward (Fig. 6). Hind wing with vannal lobe 1.3 x the length of submedial cell; seven hamuli. *Legs*: Slender; tibiae and tarsi with scattered weak setae; fore tibiae with 13 strong spiniform setae apically and along outer margin; mid tibiae with approximately 30 strong spiniform setae apically and along outer margin; hind tibiae without spiniform setae. Tibial spurs 1-2-2; anterior spur curved and weakly pectinate on inner margin; fore basitarsus with shallow strigilar concavity approximately as half as length of basal region, bearing strigilar comb of fine setae.

Metasoma. 1.7 x as long as its maximum width. Seventh tergum with subtriangular shape and polished distal zone; lateral carinae well developed; longitudinal medial carina almost flat, uniformly increasing its heights from base to apex (Fig. 7 and 8).

FEMALE. Unknown.

Type material. Holotype ♂: Argentina, province Catamarca, 10 km north Fiambal, 16-II-07, Diez, Fidalgo (MACN). Paratypes: 20 ♂, same data as holotype (MACN); 4 ♂, same data as holotype (MLP); 4 ♂, same data as holotype (IFML). Province La Rioja**:** 1 ♂, RN 27 between San Ramon and Valle Vertil, 14-XII-06, Diez, Fidalgo (MACN).

Variation. The ocellocular distance varies 1.0 to 1.6 x the diameter of lateral ocellus; postocellar distance varies 1.5 to 2.3 x the ocellocular; antenocular distance varies 0.3 to 0.6 x the diameter socket; interantennal distance varies 3.5 to 5.1 x the antenocular distance; distance between clypeus and socket varies 0.5 to 1.0 x the diameter socket. In marginal cell, anterior margin varies 1.5 to 2.0 x longer than posterior margin. Conspicuous punctures separated by more than 1 x their diameter. In some specimens fore tibiae have 4 to 6 strong spiniform setae. Lateral carinae of seventh tergum may be poorly developed.

Distribution. Catamarca and La Rioja provinces, Argentina

Discussion. *Plumaroides tapilophus* **sp. nov.** can be distinguished from other species of *Plumaroides* by: ocellocular distance is 1.1 x the diameter of lateral ocellus in *P. tapilophus* **sp. nov.**, while it is 1.6 x in *P. andalgalensis* and *P. brothersi*, and 2.0 x in *P. tiphlus*; length of anterior margin of marginal cell is 1.5 to 2.0 x as long as posterior margin in *P. tapilophus* **sp. nov.**, while it is 2.2 x in *P. andalgalensis*, 2.8 x in *P. brothersi* and 4.3 x in *P. tiphlus*; *P. tapilophus* **sp. nov.** has long setae on coxa and femur of fore leg in dorsal view, while these long setae are absent on the coxae in *P. andalgalensis*, *P. brothersi* and *P. tiphlus*.

Etymology. This species was named after the almost flat longitudinal medial carina of seventh tergum (from Greek *tapeinos*: low and *lophos*: crest).

Key to males of the species of *Plumaroides*

1. General body coloration dark brown to pale brown; comparatively larger ocellus, ocellocular distance between 1.6 and 2.0 x the diameter of lateral ocellus 2
- General body coloration very dark, almost black; comparatively smaller ocellus, ocellocular distance is 2.7 x the diameter of lateral ocellus . . . . . *P. aquilus* **sp. nov.**
2. Mid longitudinal carina of seventh tergum, in lateral view, uniformly increasing its height from base to apex 3
- Mid longitudinal carina of seventh tergum, in lateral view, strongly elevated in basal fourth (Fig. 9) . . . . . *P. brothersi* Diez & Roig Alsina 2008
3. Mid longitudinal carina of the seventh tergum, in dorsal view rounded, fore wing with anterior margin of marginal cell 1.5–2.8 x length of posterior margin 4
- Mid longitudinal carina of the seventh tergum, in dorsal view, flat (Fig. 10); fore wing anterior margin of marginal cell is 4.3 x length of posterior margin . . . . . *P. tiphlus* Diez, 2008
4. Mid longitudinal carina of seventh tergum, in lateral view, well developed; mandible with basal preapical tooth well differentiated; scape as long as pedicel and first flagellomere together . . . . . *P. andalgalensis* Brothers 1974
- Mid longitudinal carina of seventh tergum, in lateral view, almost flat (Fig. 8); mandible with basal preapical tooth not differentiated or barely differentiated; scape shorter than pedicel and first flagellomere together . . . . . *P. tapilophus* **sp. nov.**

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