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The genera of Plumariidae, with description of a new genus and species from Argentina (Hymenoptera: Bethyloidea)*

by

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The family Plumariidae comprises two subfamilies and four genera. The Heterogyninae includes only *Heterogyna* from Greece; the Plumariinae includes *Myrmecopterina* (southern Africa), *Plumarius* and the new genus *Plumaroides* (both from South America). Selected characters of each genus are figured and a key to subfamilies and genera is included for males (the female is known for *Plumarius* only). The new genus and species *Plumaroides andalgalensis* is described from Catamarca province, Argentina.

The Plumariidae is a small family of aculeate wasps of confused affinities. Until recently only males were known, and these are of very generalized body form although with highly characteristic wing venation, the forewing having four longitudinal dark streaks apically in the membrane and an extremely large pterostigma, amongst other characters. The family has most commonly been placed in the "Scolioidea", although Evans (1967) regarded it as possibly intermediate between this superfamily and the "Bethyloidea".

During a recently completed investigation of the higher classification of the aculeate Hymenoptera (Brothers, in press), I was fortunate to be able to examine a number of specimens of Plumariidae, including a female collected in Peru at the same time and locality as the two specimens seen by Evans (1967). In addition to the bethyloid characters listed by Evans, the female possesses a highly characteristic articulation within section 1 of gonocoxite IX (terminology of Smith, 1970) such as is found in other members of the Bethyloidea (see Oeser, 1961; Brothers, in press). This character, as well as the absence of a jugal lobe in the hind wing of the male, has led to my conclusion that the Plumariidae should be considered a member of the Bethyloidea. The possibility remains, however, that the female attributed to *Plumarius* by Evans (1967) is wrongly placed. Despite the remarkable modifications of the mesosoma in the female, the characters associating it with the male of *Plumarius*, especially those of the propleura and prosternum, nevertheless seem to be significant.

In addition to *Plumarius* Philippi (= *Konowiella* André) from South America (Bradley, 1972), the family has thus far been considered to include only *Myrmecopterina* Bischoff (= *Archihymen* Enderlein) which occurs in southern Africa (Brues, 1924). (Although *Archihymen* has in the past been considered to date from 1918, the date of publication given on the part of the journal involved is 1914 (Enderlein, 1914), the same year as that in which *Myrmecopterina* was published (Bischoff, 1914). I have been unable

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to pin down actual dates of publication for these works, so that it is possible that *Archihymen* may be the senior name. Despite this possibility, and also since *Archihymen* has not been used in the primary literature since its description, retention of the name *Myrmecopterina* for this taxon is appropriate in the interests of stability.) The Siberian Cretaceous genus *Cretavus* Sharov has been considered possibly closely related to *Plumarius* on the basis of wing venation although placed in the family Cretavidae (Sharov, 1957).

A further genus showing affinities with Plumariidae and Cretavidae is *Heterogyna* Nagy. This genus contains a single species from Greece and was made the type of a new family by its author (Nagy, 1969). (Although the family name Heterogynidae was attributed to Latreille, 1825, it must actually be considered to date from Nagy's 1969 description which first made the genus *Heterogyna* available for use as the basis for a family group name.) Nagy (1969) also suggested that *Myrmecopterina* was a member of the Heterogynidae. Although I have not seen a specimen of *Heterogyna*, Nagy's description and figures indicate marked similarities between this genus, *Plumarius* and *Myrmecopterina*, especially in the form and venation of the wings (figs 1–3), form of the metasoma and the male genitalia. Indeed, these similarities, and especially the wing venation, lead me to the conclusion that *Heterogyna* should be considered a member of the Plumariidae, although probably justifiably placed in the monotypic subfamily Heterogyninae. (The second subfamily of "Heterogynidae"—Ticoplinae, described by Nagy in 1970—is clearly a subfamily of Mutillidae; see Brothers, in press.)

In addition to these three genera of Plumariidae, I have discovered males of a fourth from Argentina, which is described below. This genus, *Plumaroides*, is superficially most similar in general form to *Myrmecopterina*, but differs in some fundamental characters, such as the form of the clypeus, antennal pubescence, palpal segmentation and extent of the plical ("anal") lobe of the hind wing. (Various differentiating characters of all four genera are illustrated in figs 1–9.) The subfamilies and genera of Plumariidae may be distinguished as follows in the male sex:

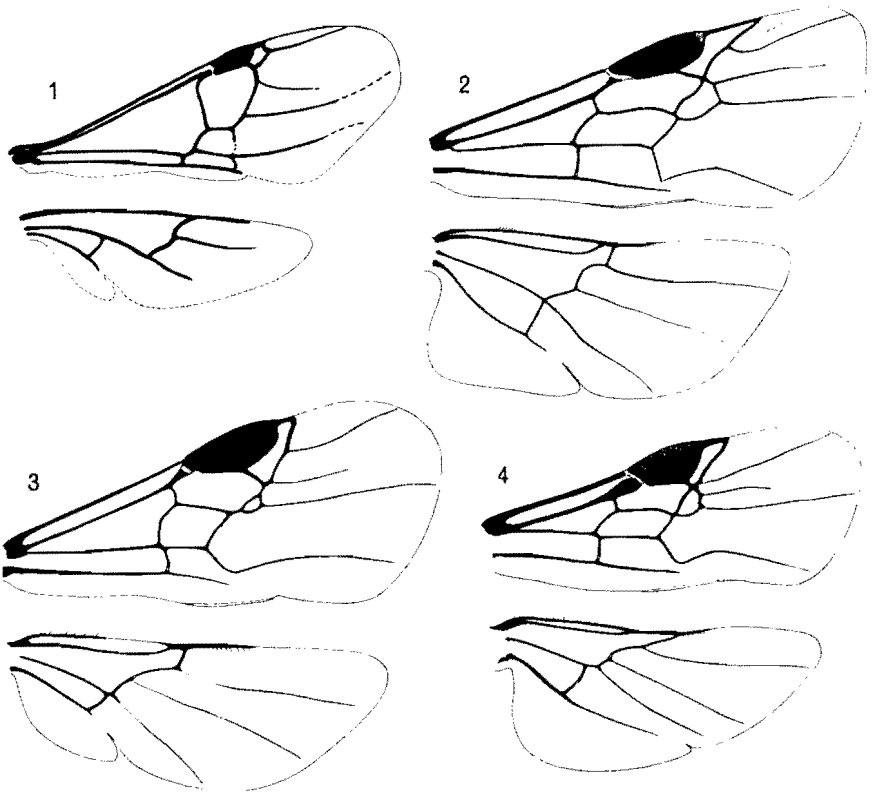
1 Eye glabrous; labial palpus with fewer than four segments; propodeum with disc and declivity merging (Plumariinae) 2
— Eye pubescent; labial palpus four-segmented; propodeal disc and declivity distinct (Heterogyninae) (Greece) . . . . . **Heterogyna**
2 Antenna with conspicuous erect pubescence; labial palpus three-segmented; seventh tergum simple, rounded apically 3
— Antenna with inconspicuous appressed pubescence; labial palpus two-segmented; seventh tergum with middorsal carina and acute apex (Argentina) . . **Plumaroides**
3 Antenna with erect setae at least four times as long as width of flagellomeres and in transverse rows; malar space at least 0,3 times height of eye (South America) **Plumarius**
— Antenna with erect setae about as long as width of flagellomeres, scattered; malar space less than 0,1 times height of eye (southern Africa) . . . . **Myrmecopterina**

The family Plumariidae is thus more extensive than has hitherto been realised. It is unfortunate that females are virtually unknown and further specimens, especially if definitely associated with males, will undoubtedly provide valuable additional insight into the relationships within the family and of the family to other Aculeata.

PLUMAROIDES gen. nov.

Type-species: *Plumaroides andalgalensis* spec. nov.

MALE. Body very finely and evenly sculptured, with sparse, very short pubescence. *Head* somewhat transverse, hypognathous. Vertex slightly swollen with large



Figs 1–4. Wings of Plumariidae (not to same scale). 1. *Heterogyna protea* Nagy (from Nagy, 1969). 2. *Plumarius* sp. (Argentina, Rio Negro, Laguna Blanca). 3. *Myrmecopterina filicornis* Bischoff. 4. *Plumaroides andalgalensis* spec. nov. (paratype).

ocelli set in depressions. Eye broadly oval, almost hemispherical, distinctly facetted, glabrous. Frons convex, with antennal sockets broadly separated. Clypeus transverse, apically emarginate, not produced. Malar space moderate. Antenna fairly slender, 13-segmented; scape short; flagellum with very fine appressed pubescence. Mandible robust, strongly angulate, with acute apex and strong tooth along inner margin. Maxillary palpus five-segmented. Labial palpus minute, two-segmented. *Mesosoma* ovate. Pronotum transverse, very short mesally, with barely differentiated collar; posterolateral angle notched, attaining tegula; ventral angle rounded. Propleuron swollen, anteriorly produced beyond pronotum; posteromesally rounded, exposing prosternum. Proepimeron barely distinguishable. Mesoscutum convex, with weak parapsidal furrow. Mesoscutellum and axillae forming flattened, triangular surface medially, smoothly declivous posterolaterally. Mesopleuron strongly convex, somewhat produced posteroventrally. Mesepimeron distinct dorsally, barely distinguishable ventrally. Prepectus (= postspiracular

sclerite?) freely articulating, forming a short sclerotized sliver. Meso- and meta-nota and pleura freely articulating. Metanotum about 0,7 times as long as mesoscutellum, transversely convex. Metapostnotum forming a distinct transverse depressed area, fused to propodeum, shortened laterally. Metapleuron with endophragmal pit indistinct, close to anterior margin; metapleural-propodeal suture barely distinguishable above pit, indistinct below. Propodeum short, somewhat flattened. *Wings* broad, with membrane finely rugose apically. Tegula small, flattened. Forewing with veins C and SC + R + S (Terminology of Hamilton, 1972 a & b) well separated; pterostigma large, triangular, sclerotized; marginal cell (cell R) short; two submarginal cells (cells SC + R and 1S), the second triangular, subpetiolate anteriorly; second recurrent vein (cross-vein 2m-cu) absent; four dark longitudinal streaks in membrane apically. Hind wing with vein cu-e originating proximal to separation of veins M and Cu; plical lobe very well-developed, indicated by a notch distally; jugal lobe absent. *Legs* slender; coxae slightly separated; tibial spurs 1–2–2; trochanters one-segmented. Foretibia with numerous weak spines externally, calcar curved, strongly tapered and finely pectinate on inner margin; foretarsus with arolium well-developed; claws simple, the inner markedly shorter than the outer. Mid-tibia with numerous weak spines externally; hind tibia with very few weak spines. Mid- and hind tarsi with arolia extremely reduced, claws simple and of equal length. *Metasoma* sessile, elongate, almost parallel-sided but tapered posteriorly. First tergum about as wide as second, with a longitudinal groove anteromedially. Seventh tergum acute apically, with strong mid-dorsal longitudinal carina. First sternum long, with weak mid-ventral carina, broadly overlapping second sternum. Seventh sternum short and transverse. Hypopygium broadly triangular, simple. Cercus well-developed. *Genitalia* of generalised form (fig. 9), with small basal ring, simple paramere and penis valve with lamellate ventral tooth but no lateral projection apically.

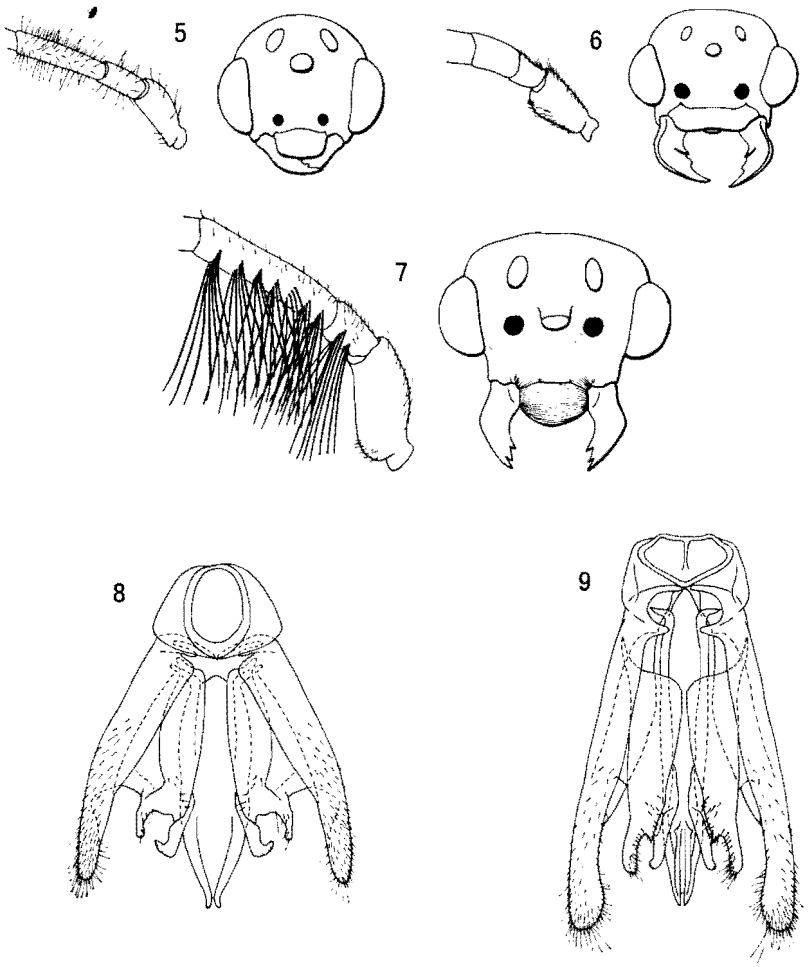
FEMALE. Unknown.

Plumaroides andalgalensis spec. nov., figs 4, 6, 9

MALE. Length 6,9 mm. Colour not uniform, basically testaceous but with head (especially dorsally) and mesosoma (except scutellum) somewhat darker, vertex darkest. Wing veins pale, almost colourless; veins C and SC + R + S of forewing and anterior third of pterostigma stramineous. *Head* 1,3 times as wide as high, 0,8 times as wide as mesosoma. Vertex produced behind eye, about 0,4 times as long as eye length. Post-ocellar distance 1,4 times ocellocular. Interantennal distance 6,7 times antennocular. Malar space 0,2 times eye height. Antenna with scape as long as pedicel plus first flagellomere; pedicel 0,6 times as long as first flagellomere which about equals second. *Mesosoma* 1,3 times as long as wide; lengths of mesoscutum, scutellum, metanotum and metapostnotum (measured from above) in ratio of 7:6:4:1. *Metasoma* about 2,2 times as long as wide, with ventral pubescence sparser but longer than dorsal. First tergum about 1,2 times as long as second. Genitalia as figured (fig. 9).

FEMALE. Unknown.

Variation. This species is highly variable in both size and coloration. Paratypes vary in length from 3,5 to 7,0 mm. Colour varies from pale stramineous to dark testaceous, the vertex consistently being darkest.



Figs 5–9. Base of antenna and head (5–7) and male genitalia (8–9) of Plumariidae (not to same scale). 5, 8. *Myrmecopterina filicornis* Bischoff. 6, 9. *Plumaroides andalgalensis* spec. nov. (paratype). 7. *Plumarius* sp. (Argentina, Rio Negro, Laguna Blanca).

MATERIAL EXAMINED. Holotype, ♂, ARGENTINA, Prov. de Catamarca, Andalgalá, 24 Dec. 1971 (D. J. Brothers), at light; deposited in National Museum of Natural History (U.S.N.M.), Washington, D.C. Paratypes: 40♂♂, same data as holotype; in collections of U.S.N.M., Snow Entomological Museum (University of Kansas, Lawrence), Instituto Miguel Lillo (Tucumán, Argentina), California Academy of Sciences (San Francisco), British Museum (Natural History) (London), and my own.

The type-series was collected a few kilometres west of Andalgalá at lights in the bed of a dry wash. The area is desertic with fairly sparse vegetation consisting of *Prosopis*, *Larrea* and similar shrubs. The soil is very sandy.

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