

New Cretaceous Scoliidae (Vespida=Hymenoptera) from the Lower Cretaceous of Spain and Brazil



*A. P. Rasnitsyn and †X. Martínez-Delclòs

*Paleontological Institute, Russian Academy of Sciences, Moscow, 117647, Russia; e-mail: rasna@glasnet.ru

†Departament d'Estratigrafia i Paleontologia, Fac. Geologia, Universitat de Barcelona, 08028 Barcelona, Spain; e-mail: delclos@natura.geo.ub.es

Revised manuscript accepted 16 August 1999

A new genus, *Cretaproscolia*, and three new species of scoliid wasps, *Archaeoscolia hispanica*, *Cretoscolia montsecana* and *Cretaproscolia josai*, are described from the Lower Cretaceous of Spain and Brazil. The species representing the new genus is attributed to the plesiomorphic extant subfamily Proscoliinae, while the two other new species are assigned to two previously described genera in the extinct, archaic subfamily Archaeoscoliinae. The Brazilian species is the first Mesozoic scoliid to have been described from the New World.

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KEY WORDS: Hymenoptera; Scoliidae; taxonomy; Cretaceous; Spain; Brazil.

1. Introduction

The Scoliidae is a rather small family of aculeate wasps embracing some 500 extant species (Brothers, 1975). There are two extant subfamilies, the primitive Proscoliinae, with only two species from the eastern Mediterranean in a single relict genus (Rasnitsyn, 1977; Day *et al.*, 1981), and the diverse and world-wide Scoliinae. The fossil history of the family is poorly known. Besides reviewing several Tertiary findings, Rasnitsyn (1993) described three Cretaceous fossils. They were attributed to two genera and placed in a subfamily of their own. Three more Cretaceous fossils have been identified recently in some public and private collections. These are described below.

The Spanish Lower Cretaceous record of fossil insects, as compressions, is directly related to two zones within lithographic limestones of lacustrine origin: firstly, the Montsec Range (Lleida Province), two exposures named 'La Pedrera de Meià' and 'La Cabrua', and secondly the Serranía de Cuenca (Cuenca Province), the 'Las Hoyas' fossil site. The exposures in the Montsec Range are, as at 'Las Hoyas', Barremian in age (Martínez-Delclòs, 1995).

The Brazilian Lower Cretaceous record of fossil insects is from the northern Araripe Plateau, in the southern part of the state of Ceará. The insects are found in the Crato Formation of the Araripe Group

and are Aptian or Albian in age (Martill, 1993). The fossil site of the specimen described here is unknown.

2. Systematic palaeontology

Order: Vespida Laicharting, 1781 (=Hymenoptera)

Family: Scoliidae Latreille, 1802

Subfamily: Archaeoscoliinae Rasnitsyn, 1993

Remarks. The subfamily Archaeoscoliinae was created by Rasnitsyn (1993) and houses three genera and four species of archaic wasps that lacked many of the characteristic scoliid characters such as a wide, veinless and corrugated outer wing membrane and a basal position of the hindwing r-m in respect to RS and M bases. One of these taxa, *Archaeoscolia senilis*, comes from the middle Lower Cretaceous of central Mongolia. Two species of another genus were collected from the lower Upper Cretaceous of NE Siberia and northern Kazakhstan, namely *Cretoscolia promissiva* and *C. patiens*, respectively. The third monotypic genus, *Floriscolia*, species *F. relict*, was described from the Lower Oligocene of Colorado, USA (Rasnitsyn, 1993). This last finding makes the distribution of the subfamily exceptional: it is very rare for an insect taxon, and possibly unique among hymenopterans, to have appeared in the Mesozoic and died

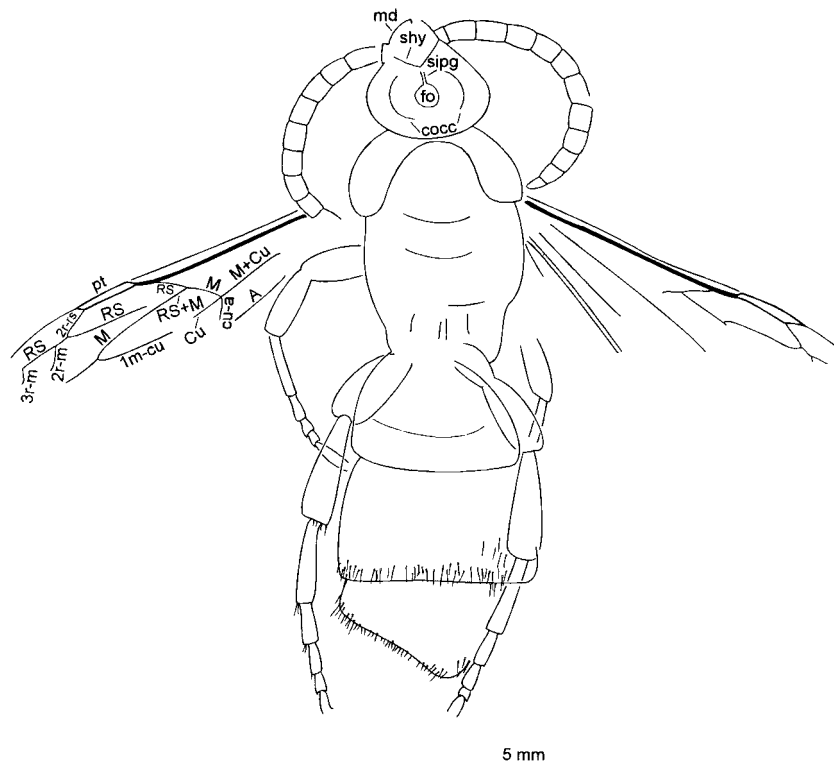


Figure 1. *Archaeoscolia hispanica* sp. nov., LH-13.827; cocc, occipital carina; fo, occipital foramen; md, mandible; shy, hypostomal suture; sipg, interpostgenal suture; venational symbols are standard.

out in the Tertiary. Normally, insect taxa originating in the Mesozoic (or Palaeozoic) either died out before the Tertiary, or are still extant.

The archaeoscoliinid fossils described here from the Lower Cretaceous of Spain are referred to two genera previously described from Cretaceous deposits, namely *Cretoscolia* Rasnitsyn, 1993 and *Archaeoscolia* Rasnitsyn, 1993. Although *Cretoscolia* was described originally as being younger than *Archaeoscolia*, its venation and leg characters are both less advanced. Hence, its discovery in Lower Cretaceous rocks was expected.

Genus *Archaeoscolia* Rasnitsyn, 1993

Type species. *Archaeoscolia senilis* Rasnitsyn, 1993: Lower Cretaceous of Central Mongolia.

Archaeoscolia hispanica Rasnitsyn & Martínez-Delclòs, sp. nov.

Figures 1, 2a

Etymology. From Hispania, the Roman name for Spain.

Material. Only the holotype LH-13.827 (male) from Las Hoyas in Serranía de Cuenca (Cuenca Province,

Spain). It has been deposited provisionally in the Unidad de Paleontología, Universidad Autónoma de Madrid, Spain. Its long-term home will be the Museo de Cuenca, Cuenca, Spain.

Diagnosis. Unlike *A. senilis* Rasnitsyn, 1993, occipital carina subcircular, does not bend towards mandibular bases; most flagellomeres, apart from two apical ones, are of subequal width; pterostigma narrow. In addition, species is apparently smaller (forewing length close to 10 mm vs. 15 mm in *A. senilis*) and body and legs are less robust; however, these differences may be of a sexual nature and not taxonomically significant.

Description. Male (Figure 1); female unknown. Body and appendages are dark, and general stature moderately robust. Flagellum is thick, of equal width except for one subconical penultimate flagellomere, and one short, narrow, conical, apical flagellomere. Head with occipital carina is subcircular, apparently interrupted both dorsally and ventrally, ventrally directed near to junction of hypostomal and interpostgenal sutures. Femora and tibiae are short, moderately thick and the hind femur is almost half as wide as long. The hind tibia are slightly longer than the femur, about three times as long as wide, with no strong spines on the outer surface. Tarsi are comparatively long and

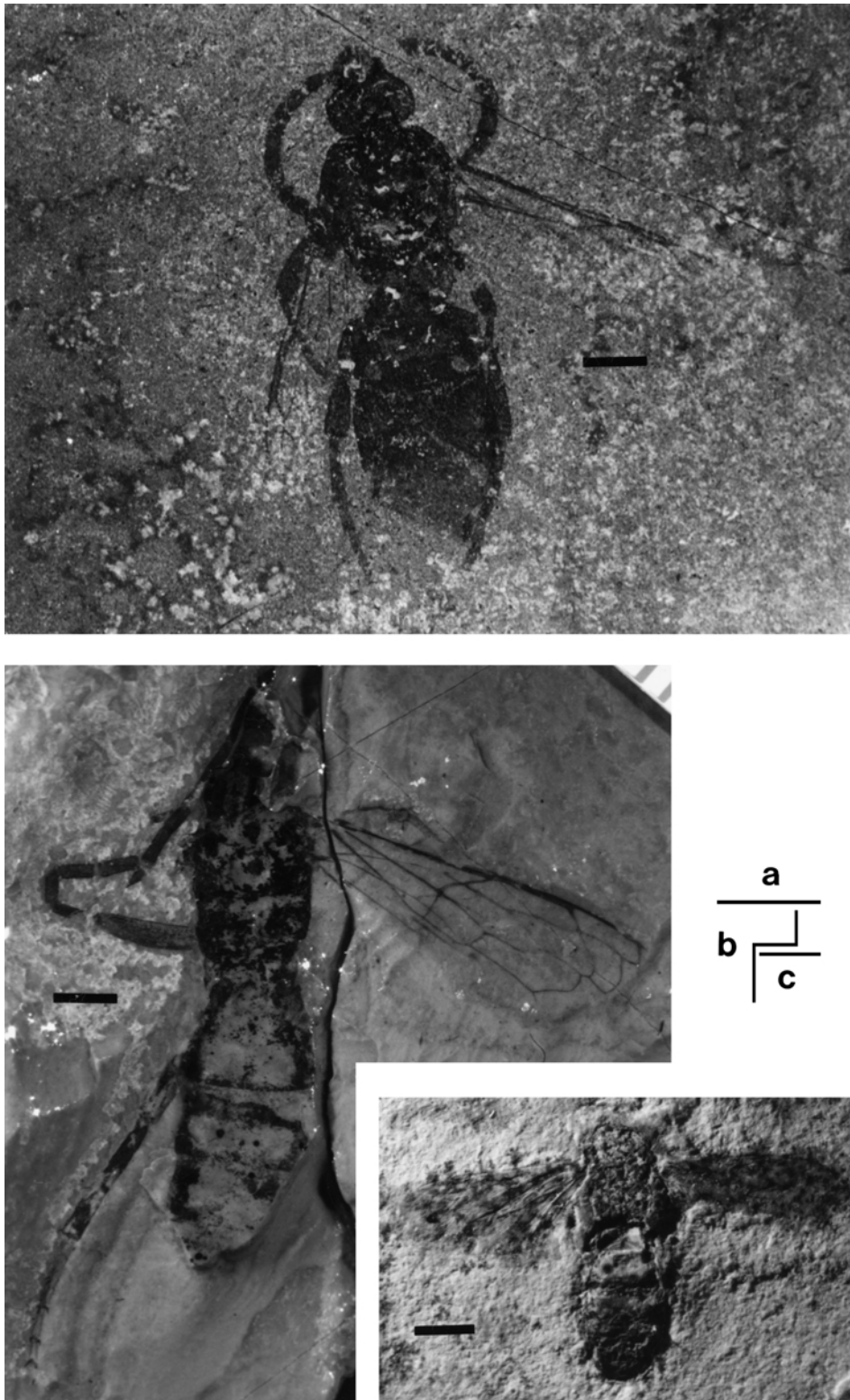


Figure 2. a, *Archaeoscolia hispanica* sp. nov., LH-13.827; b, *Cretoscolia montsecana* sp. nov., LC-1.962-IEI, see also [Figure 3](#); c, *Cretaproscolia josai* sp. nov., IS-028-JJ. Scale bar=1 mm.

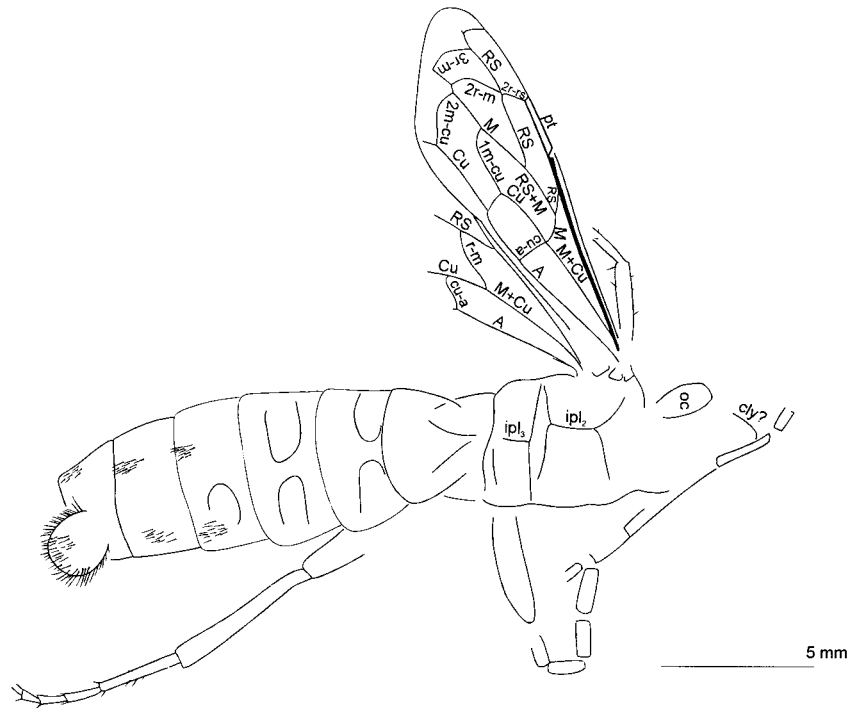


Figure 3. *Cretoscolia montsecana* sp. nov., LC-1.962-IEI; cly?, supposed clypeal margin; oc, eye; ipl₂, ipl₃, meso- and metathoracic interpleural suture (discrimen); [Figure 2b](#) is counterpart.

narrow, mid tarsus more than twice, and hind tarsus almost twice as long as respective tibia. The hind basitarsus is about as long as tarsomeres 2–4 combined, with the shortest tarsomere 4 clearly elongate. The forewing with pterostigma is narrow, 2r–rs distant from 2r–m by about half its length, 2r–m more distant from pterostigma than from 3r–m, cu–a meeting M+Cu fork. Metasoma is long, setose at least along hind margin of terga and/or sterna (apical metasomal segments and genitalia not preserved). Body length, as preserved, is 16 mm; forewing length, as preserved (up to anterior end of 3r–m), 9 mm.

Remarks. The species is ascribed to *Archaeoscolia* solely on the basis of its robust stature and thick legs. More reliable differences between this genus and *Cretoscolia* cannot be identified because the fossil is incomplete.

Genus *Cretoscolia* Rasnitsyn, 1993

Type species. *Cretoscolia promissiva* Rasnitsyn, 1993; Upper Cretaceous of Northeast Siberia.

Cretoscolia montsecana Rasnitsyn & Martínez-Delclòs, sp. nov.

[Figures 2b, 3](#)

Etymology. From the Montsec Range (Lleida, Spain).

Material. Holotype LC-1.962-IEI (male) from La Cabrera outcrop in the Montsec Range. The species is housed in the Institut d'Estudis Ilerdencs (Lleida, Spain).

Diagnosis. This new species differs from the Late Cretaceous species *C. promissiva* Rasnitsyn, 1993 from NE Siberia and *C. patiens* Rasnitsyn, 1993 from northern Kazakhstan, particularly in its slender stature (including long, narrow legs) and, venationally, in 2r–rs almost coinciding with 2r–m and in R leaving the wing margin at an angle to reach the apex of cell 3r. The other species have 2r–rs distant from 2r–m; in *C. promissiva*, R leaves the wing margin very gradually to reach the distant 3r cell apex; and in *C. patiens* R does not leave the wing margin at all because the 3r apex is rounded at the wing margin.

Description. Male ([Figure 3](#)); female unknown. Body and appendages are dark, metasomal terga at their midlength with sublateral, transversally elongate, light spots. Flagellum is thin, (sub?)-basal flagellomere several times (four or more) longer than wide; subapical flagellomeres are slightly wider, more than twice as long as wide. Clypeus is probably

protruding (if correctly interpreted), eye elongate, ovate. Thoracic structure difficult to interpret. Legs are long and thin; the mid femur is more than four times as long as wide; the hind tibia about seven times longer than wide, lacking strong spines; the hind basitarsus is slightly shorter than tarsomeres 2–4 combined; the shortest tarsomere is four times as long as wide.

Forewing with pterostigma is narrow, 2r–rs almost reaching 2r–m, the 3r cell obliquely truncate apically, with R abruptly bent from wing margin toward distant cell apex; the 3rm cell along RS is twice as long as along M. Metasoma is long, narrow, with terga of similar size except for the first which is longer and narrower than those following; terga 4–6 with sub-lateral patches of long setae. Genital claspers are rounded, long setose at least along margins. Body length, as preserved is 21 mm, forewing 11.6 mm (10.8 up to apex of 3r).

Subfamily: Proscoliinae Rasnitsyn, 1977

Remarks. The subfamily Proscoliinae was proposed by Rasnitsyn (1977) for a single genus with two closely related species, *Proscolia archaica* Rasnitsyn, 1977 and *P. spectator* Day, 1981 (Day *et al.*, 1981). The fossil described here is known mostly from its wings, the body being poorly preserved. In wing venation it differs considerably from *Proscolia* Rasnitsyn, 1977 (see diagnosis below) and yet it is clearly more similar to *Proscolia* than to Scoliidæ. Taking into consideration the preservation-state of the new fossil, the most applicable diagnostic characters of the subfamilies are those in the area around the pterostigmal base. We interpret them as follows: the costal vein is interrupted before the pterostigma in Proscoliinae (in Scoliidæ it is confluent with it); the radial vein is very narrow at the pterostigmal base in Proscoliinae (uninterrupted in the Scoliidæ); the concave fold of the membrane running from pterostigmal base to near base of the 2rm cell distinct in Proscoliinae (absent or, in larger species, replaced by line of thinner, clearer membrane in Scoliidæ).

Genus *Cretaproscolia* Rasnitsyn & Martínez-Delclòs, gen. nov.

Type species. *Cretaproscolia josai* Rasnitsyn & Martínez-Delclòs, sp. nov.; Lower Cretaceous, Santana Fm, Ceará, Brazil.

Etymology. From Cretaceous and *Proscolia*, the type genus of the subfamily Proscoliinae.

Material. Type species only.

Diagnosis. *Cretaproscolia* gen. nov. differs from *Proscolia* in having a narrow outer (veinless and corrugated) wing membrane, long forewing cells 3r and 2+3rm, with 3r 1.5 times as long and 2+3rm more than twice as long as the pterostigma, RS lacking a 1r–rs rudiment or an angulation at its position, 3r cell acuminate at the wing fore-margin, the presence of crossvein 2m–cu, and hindwing RS before r–m being twice as long as r–m.

Cretaproscolia josai Rasnitsyn & Martínez-Delclòs, sp. nov.

Figures 2c, 4

Etymology. In honour of Mr Joan Josa (La Roca, Barcelona) who kindly provided the specimen.

Material. Holotype IS-028-JJ from Ceará Province, Brazil; collection of Mr Joan Josa. The specimen will be deposited provisionally in the Departament d'Estratigrafia i Paleontologia, Universitat de Barcelona, Spain.

Description. Sex and coloration unknown (organic matter not preserved). Stature is robust (Figure 4). Thoracic structure is difficult to interpret (sections of some internal structures are visible within thoracic contour). The forewing with pterostigma is fairly narrow, 3r cell more than twice as long as wide, distant from wing apex by less than its own length, cells 1+2r and 2+3rm of equal length, 2r–rs distant from 3r–m by almost its own length, 1m–cu and 2m–cu both within middle third of 2+3rm cell, 2m–cu almost vertical to Cu, distant from outer wing margin by less than its own length, cu–a oblique meeting Cu slightly beyond M+Cu fork. The r–m hindwing is far beyond the level of midlength of forewing 2cu–a cell, with Cu absent as a free vein (possibly nebulous and not preserved because of discoloration of the fossil). Metasoma is short and wide (rounded apically, possibly a result of postmortem modification). First sternum with well delimited, oblique, crescent-like, apical area is similar to that common in various Scolioidea but not in extant Scoliidæ (see Rasnitsyn, 1980, fig. 162). Length of body without head, as preserved, is 8.4 mm; forewing length 6.2 mm.

Acknowledgements

We are grateful to Mr J. Josa for putting the specimen of *Cretaproscolia josai* at our disposal. We thank Dr J. L. Sanz of the Universidad Autónoma de Madrid

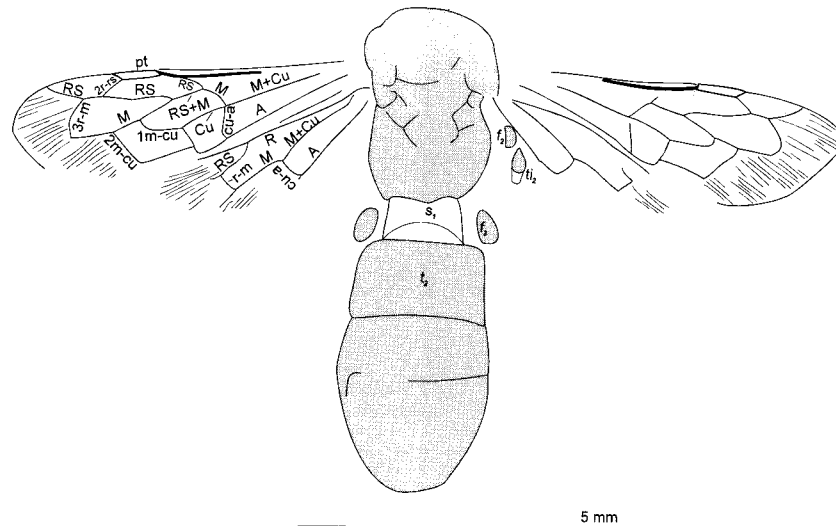


Figure 4. *Cretaproscolia josai* sp. nov., IS-028-JJ; shading indicates uncovered internal space of body and legs, with their internal structures sectioned; f, femur; s₁, first metasomal sternum; t₂, second metasomal tergum; ti, tibia.

and Dr J. Borrell of the Institut d'Estudis Ilerdencs for consultation on the holotypes of *A. hispanica* and *C. montsecana* respectively, and Dr E. A. Jarzembowski, Dr D. Brothers and Prof. D. J. Batten for their comments and suggestions. This work was supported by the Fossil Insects Network of the European Science Foundation and is within the limits of Grant DGES PB98-0061 of the Ministerio de Educación y Cultura de España. It is also part of a Royal Society Joint Project with the FSU for APR.

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