



## Research article

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# The first Cenozoic roproniid wasp from the Paleocene of Menat, France (Hymenoptera: Proctotrupoidea)

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**Abstract.** *Paleoropronia salamonei* gen. et sp. nov., the first Cenozoic Roproniidae, is described from the Paleocene of Menat (Massif Central, France) on the basis of its fore wing venation. The Roproniidae range between the Mesozoic and the present time. *P. salamonei* gen. et sp. nov. was perhaps a parasitoid on tenthredinid sawfly larvae, as these insects were present in the wasp fauna from Menat outcrop.

**Keywords.** Hymenoptera, Proctotrupoidea, Roproniidae, Cenozoic, gen. et sp. nov.

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## Introduction

Roproniidae is a small wasp family that comprises three modern and five Mesozoic genera. They share their very particular forewing venation with the strictly fossil family Mesoserphidae. There is no described Cenozoic representative of these Proctotrupoidea families. Here we describe a Paleocene fossil that corresponds to the first Cenozoic Roproniidae.

## Material and methods

Preparation was made using a compressed air needle. The specimen was examined under Nikon SZ10 stereo microscope and with the Environmental SEM of the MNHN Collection Department, using the mode BSE. Photos were taken with an Olympus E-3 digital camera. Several digital pictures were

reconstructed using Helicon Focus and Adobe Photoshop CS2 software. The terminology of body structures and fore wing venation is from Huber & Sharkey (1993).

## Results

Order Hymenoptera Linné, 1758  
Superfamily Proctotrupoidea Latreille, 1802  
Family Roproniidae Viereck, 1916

Genus *Paleoropronia* gen. nov.

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### Type species

*Paleoropronia salamonei* gen. et sp. nov.

### Diagnosis

See species.

### Etymology

Named after the Paleocene period and Ropronia. Gender feminine.

*Paleoropronia salamonei* gen. et sp. nov.

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Figs 1–4

### Diagnosis

Fore wing venation only. Cell [1M] very narrow, much narrower than cell [2Cu], only 0.2 times as wide as [2Cu]; pterostigma linear, not triangular; base of pterostigma well distal of [1M]; cell [1R1] elongate.

### Etymology

Named after Mattéo Salamone, who helped us to make the photographs and drawing of the type specimen.

### Type material

#### Holotype

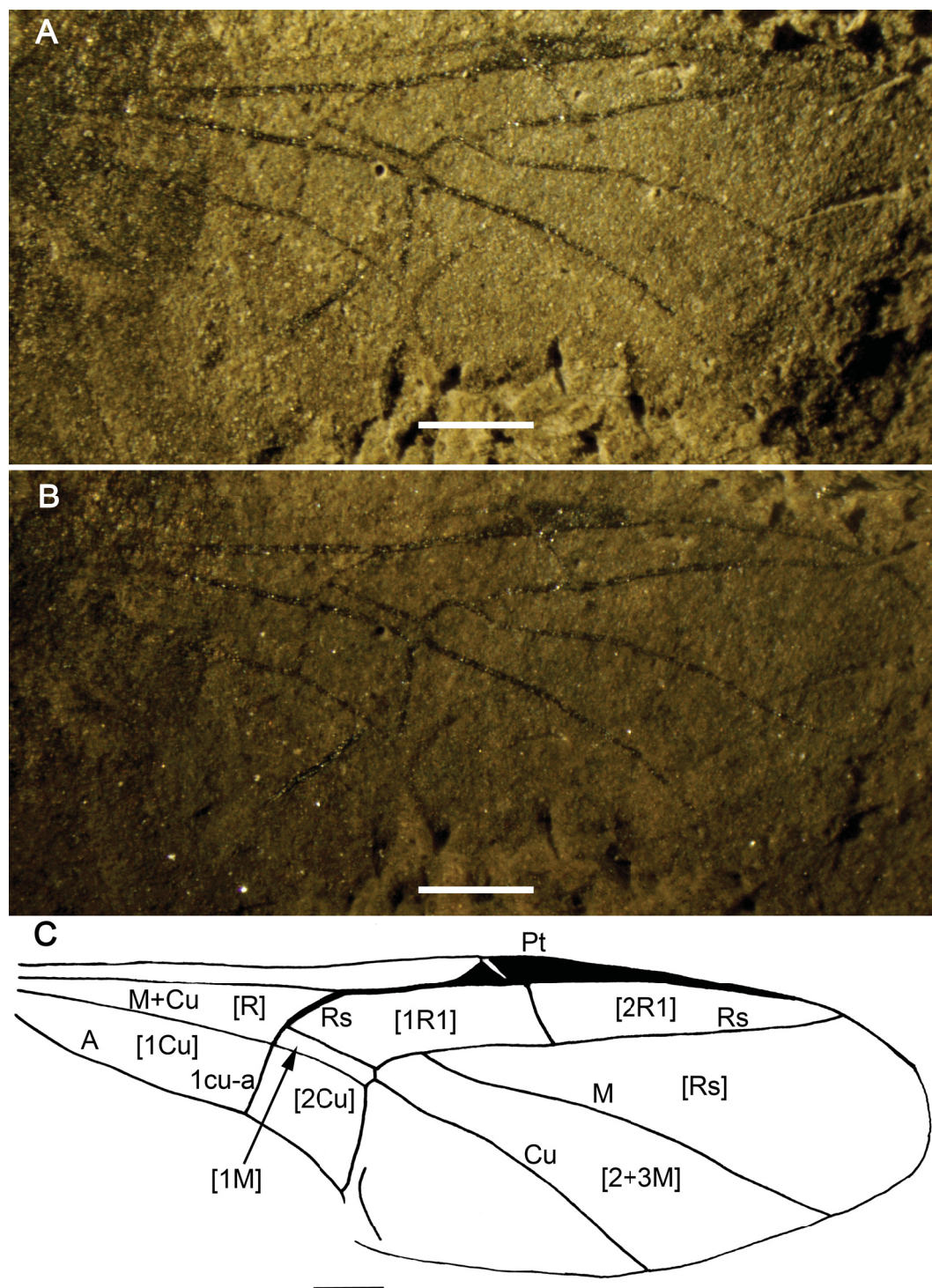
FRANCE: MNHN.F.A57266, stored in the collection of Palaeontology (MNHN, Paris).

### Type stratum and locality

FRANCE: Paleocene, spongo-diatomite maar Palaeolake, Menat, Puy-de-Dôme.

### Description

A body in rather poor condition with the two fore wings attached. Head 2.3 mm long, 2.8 mm wide, broader than long; head structures hardly visible, except for fragments of the two antennae. Mesosoma 3.9 mm long, 3.6 mm wide; structures hardly visible. Metasoma in poor condition and incomplete but the first segment seems to be narrow tubular, not conical. Fore wing 7.6 mm long, 2.8 mm wide, apparently hyaline except for black pterostigma, 1.7 mm long, 0.23 mm wide, narrow and elongate, situated well distal of cell [1M]; pterostigma and veins covered with small punctuations probably corresponding to the bases of macrotrichiae; cell [1M] quadrangular, 0.7 mm long, 0.1 mm wide, very narrow, much narrower than cell [2Cu]; cell [1R1] very long, 1.9 mm long, 0.4 mm wide; cell [2R1] triangular.

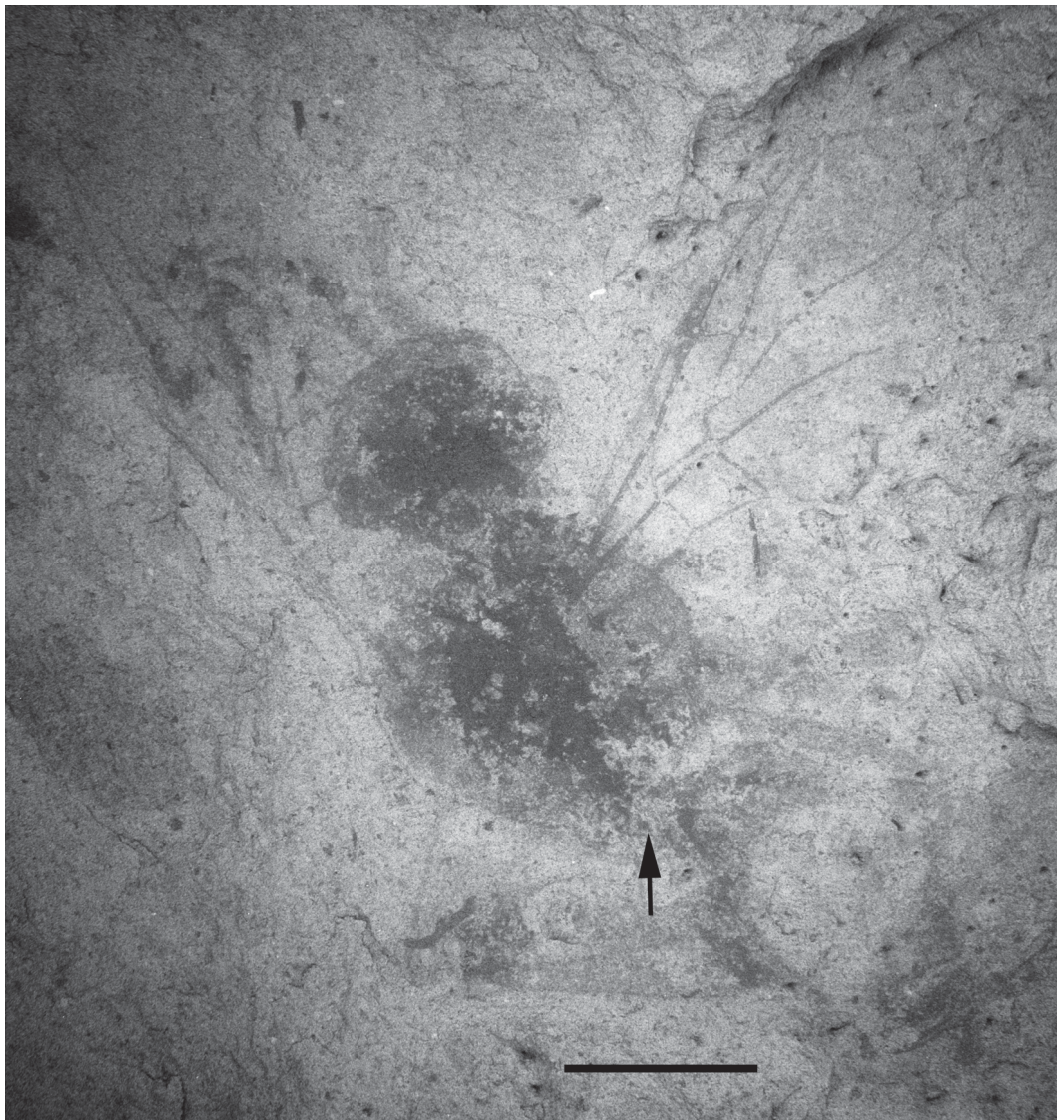


**Fig. 1.** *Paleoropronia salamonei* gen. et sp. nov., holotype (MNHN.F.A57266), right fore wing. A. Photograph. B. Photograph under alcohol. C. Reconstruction. Scale bars: A–B = 1 mm; C = 0.5 mm.



## Discussion

*Paleoropronia salamonei* gen. et sp. nov. can be attributed to the Proctotrupoidea because of the pattern of venation of the distal half of the wing, especially in the triangular cell [2R1], lost 2–3r-m and 2m-cu crossveins, and straight (M+Cu) vein in the fore wing (Zhang *et al.* 2013). In this superfamily, some groups have a relatively complete venation, as in *Paleoropronia salamonei* gen. et sp. nov.: Vanhorniidae Crawford, 1909, Heloridae Foerster, 1856, Austroniidae Kozlov, 1970, Monomachidae Ashmead, 1902, Roproniidae, and Mesozoic Mesoserphidae Kozlov, 1970. *P. salamonei* gen. et sp. nov. can be attributed to the Roproniidae or to the Mesoserphidae on the basis of the rectangular cell [1M] and the pterostigma elongate but neither linear nor triangular in shape, even if some Roproniidae and Mesoserphidae have a relatively triangular pterostigma. Some Mesoserphidae (viz. *Sinoserphus wui* Shih, Feng & Ren, 2011) have a fore wing venation very similar to that of *P. salamonei* gen. et sp. nov. (Shih *et al.* 2011). The Mesoserphidae differs mainly from the Roproniidae in the metasoma, especially the first segment which

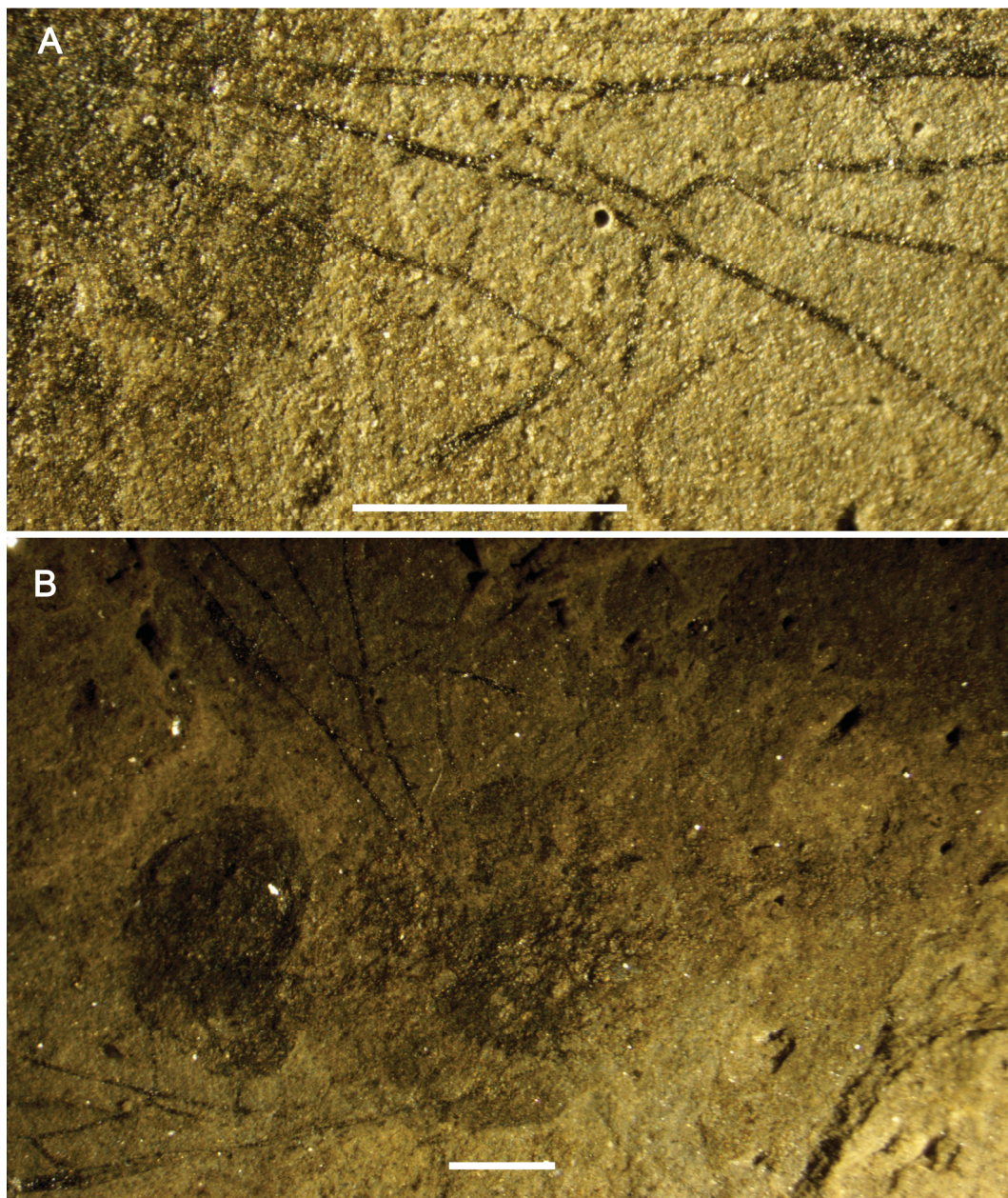


**Fig. 2.** *Paleoropronia salamonei* gen. et sp. nov., holotype (MNHN.F.A57266), SEM photograph of habitus (arrow = first metasomal segment). Scale bar: 2 mm.



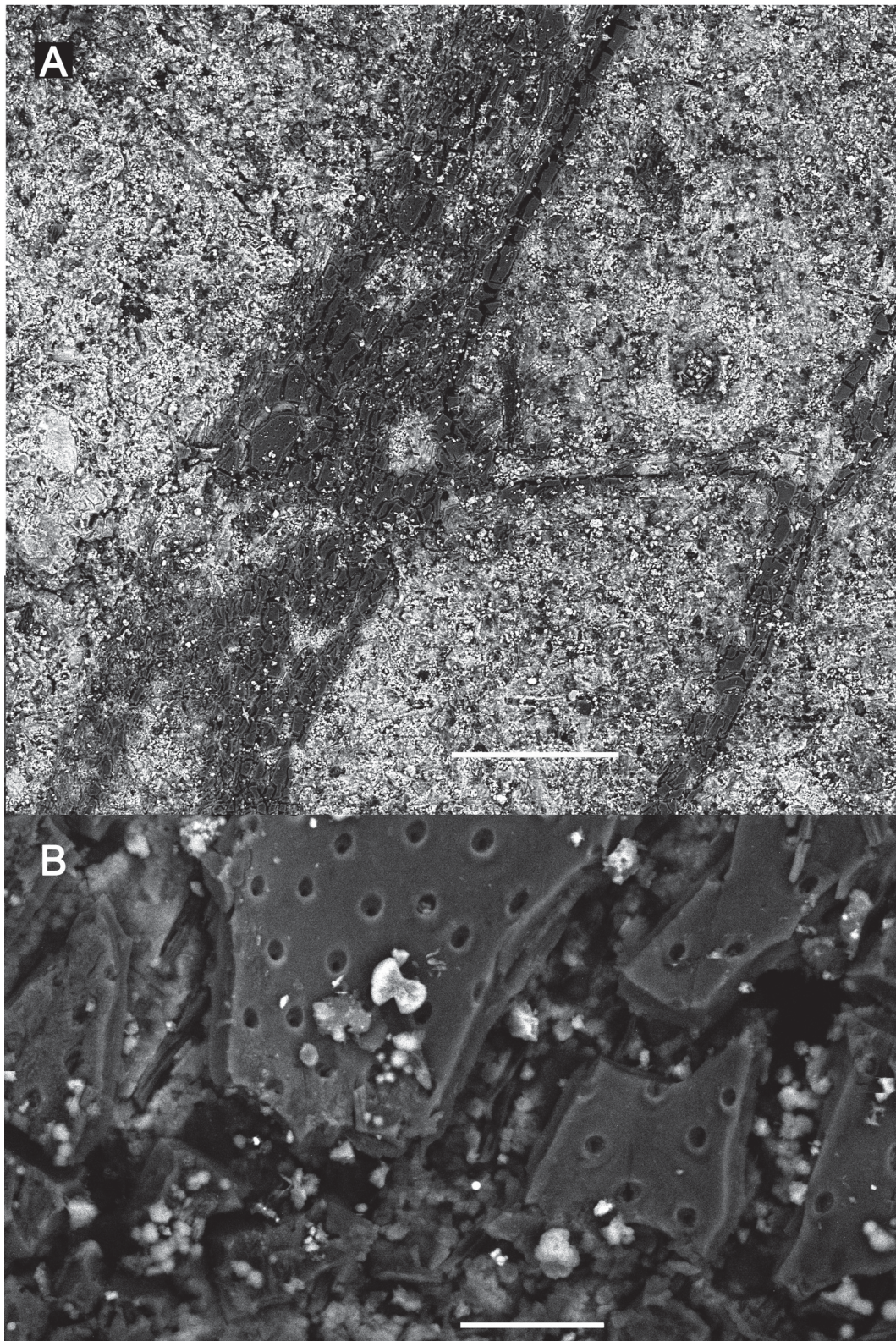
is transverse or conical in the former, and narrow tubular in the latter (Rasnitsyn 1990, 2002; Zhang *et al.* 2013). The first metasomal segment of *P. salamonei* gen. et sp. nov. seems to be narrow tubular, supporting an attribution to the Roproniidae. The Mesoserphidae are up to now only known in the Mesozoic, while the Roproniidae are recent to Mesozoic.

*Paleoropronia salamonei* gen. et sp. nov. differs from the three recent roproniid genera *Ropronia* Provancher, 1886, *Hsiufuopronia* Yang, 1997, and *Xiphiopronia* He & Chen, 1991 in the cell [1M] very narrow, much narrower than cell [2Cu] (Lin 1987; He & Chen 1991; Yang 1997). *Hsiufuopronia* and *Xiphiopronia* also differ from *P. salamonei* gen. et sp. nov. in the pterostigma distinctly more triangular.



**Fig. 3.** *Paleoropronia salamonei* gen. et sp. nov., holotype (MNHN.F.A57266). **A.** Right fore wing base. **B.** Head and thorax. Scale bars: 1 mm.





**Fig. 4.** *Paleoropronia salamonei* gen. et sp. nov., holotype (MNHN.F.A57266). **A.** Pterostigma. **B.** Detail of cuticle of the pterostigma. Scale bars: A = 200  $\mu$ m; B = 20  $\mu$ m.



In the genus *Ropronia*, some species also have a distinctly triangular pterostigma (viz. *R. brevicornis* Townes, 1948), while others have a linear one (viz. *R. insularis* Lin, 1987), more similar to that of *P. salamonei* gen. et sp. nov.

Among the Mesozoic Roproniidae, *Paraulacus sinicus* Ping, 1928 and *Mesoropronia byrka* Rasnitsyn, 1990 have a cell [1M] not very narrow, only slightly narrower than [2Cu] (Rasnitsyn 1990; Zhang *et al.* 2013). *Beipiaosirex parva* Hong, 1983 has a very different wing venation (Hong 1983). *Mesohelorus muchini* Martynov, 1925 differs from *P. salamonei* gen. et sp. nov. in the cell [1M] broader and triangular with distal side much shorter than basal one (Martynov 1925). *Mesohelorus haifanggouensis* Wang, 1987 has a fore wing venation nearly identical to that of *P. salamonei* gen. et sp. nov., with a very narrow cell [1M]. The main difference being in the relative positions of the pterostigma that has its base well distal of [1M] in *P. salamonei* gen. et sp. nov., but it is opposite of [1M] in *Mesohelorus haifanggouensis*, so that the cell [1R1] is much longer in *P. salamonei* gen. et sp. nov. than in the latter (Wang 1987). *Jeholoropronia pingi* Ren, Lu, Guo & Ji, 1995, *Liaoropronia leonina* Zhang & Zhang, 2001 and *L. regia* Zhang & Zhang, 2001 strongly differ from *P. salamonei* gen. et sp. nov. in the cell [1M] triangular (Zhang & Zhang 2001).

Among the Mesozoic Mesoserphidae, *Mesoserphus* Kozlov, 1968, *Auliserphus* Rasnitsyn, 1986, *Campturoserphus* Rasnitsyn, 1986, *Turgoserphus* Rasnitsyn, 1990, *Karataoserphus* Rasnitsyn, 1994, *Lordoserphus* Rasnitsyn, 1994, *Cretoserphus* Rasnitsyn & Delclòs, 2000, *Beipiaoserphus* Zhang & Zhang, 2000, *Sinoserphus* Shih *et al.*, 2011, *Yanliaoserphus* Shih *et al.*, 2011, and *Codoserphus* Shi *et al.*, 2013 have a cell [1M] much broader than in *P. salamonei* gen. et sp. nov. (Kozlov 1968; Rasnitsyn 1986, 1990, 1994; Rasnitsyn & Delclòs 2000; Zhang & Zhang 2000; Shih *et al.* 2011; Shi *et al.* 2013). *Oxyuroserphus* Rasnitsyn, 1994 is a very small taxon (length of fore wing 1.5 to 2.2 mm long), unlike in *P. salamonei* gen. et sp. nov. *Otia* Zhang, 1992 has a triangular cell [1M] (Zhang 1992).

Roproniidae is a Holarctic and Oriental family. These wasps live in deciduous forests. Some species are known to be parasitoids of tenthredinid sawfly larvae. Tenthredinid fossils are also present among the wasp fauna of the outcrop at Menat and it is possible that *P. salamonei* gen. et sp. nov. was also a sawfly parasitoid.

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