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New Fossil Mymarommatid Species, *Palaeomymar japonicum* sp. nov. (Hymenoptera: Mymarommatidae), Discovered in Cretaceous Amber from Japan

Victor FURSOV[1], Yasuyuki SHIROTA[2], Tomoo NOMIYA[2] and Kenzou YAMAGISHI[3]

[1]*Institute of Zoology, National Ukrainian Academy of Sciences, Bodgan Khmelnitskiy Street 15, Kiev, Ukraine*
[2]*Laboratory of Evolutional Ecology, Faculty of Agriculture and Life Sciences, Hirosaki University, Bunkyo-3, Hirosaki, 036–8224 Japan*
[3]*Entomological Laboratory, Faculty of Agriculture, Meijo University, Tempaku, Nagoya, 468–8502 Japan*

Abstract. *Palaeomymar japonicum* sp. nov. is described from Upper Cretaceous amber (about 80 million years ago) found in Japan. This new species is characterized by seven-segmented funicle, four-segmented clava, forewing with smooth, non-reticulate disk and with 38 long marginal setae, and by the first segment of the petiole being 1.77 times as long as the second segment.

Key words: *Palaeomymar*, Hymenoptera, Mymarommatidae, fossil, Cretaceous amber, Japan.

Introduction

The Mymarommatidae is an extremely rare family occupying a peculiar systematic position in the Hymenoptera. The family is characterized by bizarre (bell-like) head structure, antennae without longitudinal multiporous plate sensilla, forewings with special reticulation, and two-segmented petiole (Gibson, 1993).

The family includes more fossil species than extant ones and consists of three genera. Two of the genera are fossil (*Gallorommа* Schluter, 1978; *Archaeromma* Yoshimoto, 1975) and one genus (*Palaeomymar* Meunier, 1901) is known both as extant and as fossil. Most of the fossils were found in amber from the Oligocene and Miocene (about 25–65 million years ago) (Yoshimoto, 1975; Doutt, 1973), and also from the Mesozoic (about 100 million years ago) (Schluter, 1978).

The genus *Gallorommа* consists of one species, *G. bezonnaisensis* Schluter from French amber (Schluter, 1978). The genus *Archaeromma* with two species, *A. minutissima* Brues and *A. nearctica* Yoshimoto, was described from Canadian Cretaceous amber (Upper Cretaceous) (Brues, 1910; Yoshimoto, 1975).

The third genus *Palaeomymar* is distinguished from *Gallorommа* and *Archaeromma* by its 10- or 13-segmented antennae, widely placed mandibles, small compound eyes, shape of forewings with long marginal fringes, and reduced stalk-like hind wings.

The genus *Palaeomymar* consists of 13 species, six of which were discovered as fossils in amber. The first record of a fossil species is *P. succini* described by Meunier (1901). Kozlov and Rasnitsyn (1979) described three species, *P. agapa, P. mandibulatus*, and *P. senonicus*, from Siberian (Tajmyr) amber (early and late Cretaceous, about 78 million years ago). Schluter and Kohring (1990) described *P. duerrenfeldi* from Sicilian amber (Miocene). Rasnitsyn and Kulicka (1990) reviewed mymarommatids in late Cretaceous (about 90 million years ago) and Cenozoic amber. A unique species, *P. duisburgi* (Stein), is recorded both as an extant species and as a fossil from Baltic amber (early Oligocene) (Bakkendorf, 1948), but there are some doubts about its identity.

Besides these fossil species, eight extant species are known in the world: *P. duisburgi* (Stein, 1877), *P. goethei* Girault, 1920, *P. mira* Girault, 1931, *P. mirissimum* Girault, 1935, *P. buyckxi* Mathot, 1966, *P. insulare* Valentine, 1971, *P. cyclopterus* Fidalgo & DeSantis, 1982 and *P. chaoi* Lin, 1994.

Palaeomymar japonicum sp. nov., is described here from Upper Cretaceous amber (about 80 million years ago) discovered in Kuji, Japan. This is the first record of a fossil *Palaeomymar* and also the first record of the family Mymarommatidae in Japan.

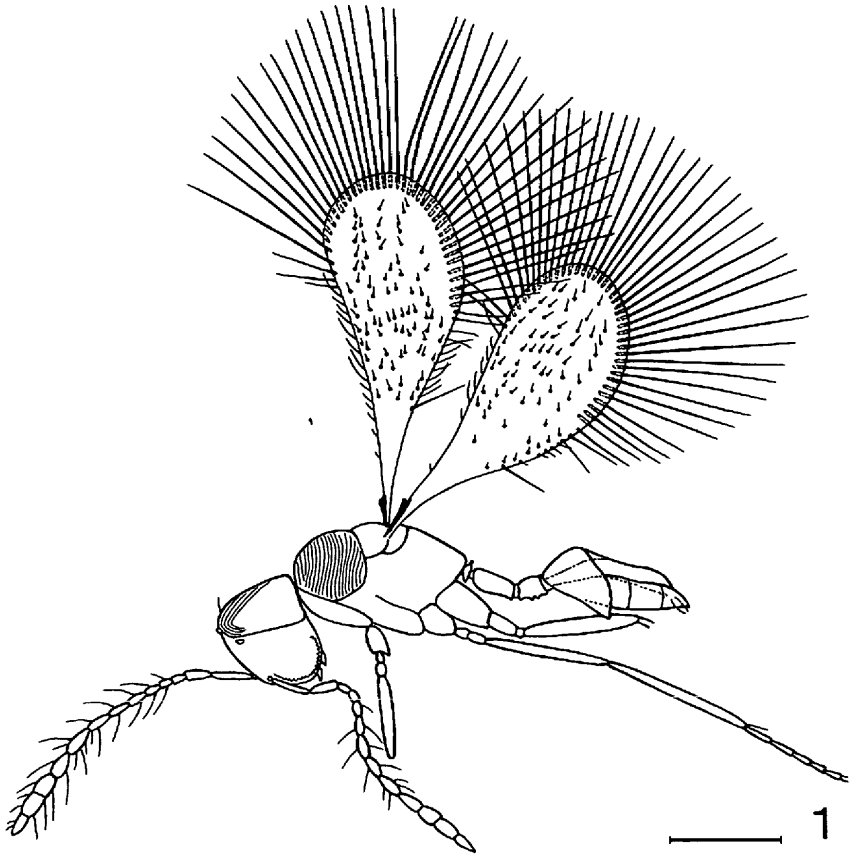

Fig. 1. *Palaeomymar japonicum* sp. nov., holotype, male (picture drawn from specimen in amber). Scale: 0.1 mm.

Description

***Palaeomymar japonicum* sp. nov.**
[Japanese name: Kuji-mukashi-hosohane-kobachi]
(Figs. 1–3)

Male. Length of body 0.43 mm, length of forewings with marginal fringe 0.43 mm, without fringe 0.31 mm.

Body dark-brown, nearly black, except dirty-yellowish petiole, all coxae and trochanters, and brown legs and sternites of gaster.

Head sub-globular, dorsal half of vertex nearly horizontal. Vertex with deep cavity and transverse linear striation. Mandibles with 2 sharp teeth. Ocelli well developed. Antennal toruli placed closely to ventral margin of face. Antennae long, with 13 segments. Funicle 7-segmented, first and second funicular segments the shortest; first segment without seta, following 6 segments of funicle with long, fine, oblique setae. Funicular segments increase in length and width towards the apex; 6th segment of funicle more expanded. Clava 4-segmented, apical 3 segments more closely joined, with long, fine, oblique setae. Ratio of lengths of antennal segments –(13 : 8) : (4 : 4 : 5 : 6 : 6.5 : 8 : 10) : (9 : 7 : 9 : 8); ratio of widths –(2.5 : 3): (1.5 : 2 : 2 : 2: 2.5 : 3 : 4) : (4.5 : 5.5 : 5 : 3).

Pronotum not reaching tegulae. Mesoscutum convex, with clearly visible transverse, striate sculpture. Scutellum and postscutellum without visible sculpture. Forewings very narrow basally, with short venation, very wide disk and long marginal fringe. Length of forewings 3.1–3.2 times as long as maximum width. Marginal vein without setae, very slender basally, with 5 dark round sensilla, widely expanded apically and tapering at the apex. Disk of forewings smooth, not reticulate, with 2 anterior, 2 median and 4 posterior setal lines. Apical setae of 2 anterior setal lines very long, about 2 times as long as basal anterior setae. Marginal fringe with 38 strong long setae, 16 thin short anterior setae, 3 anterior setae of middle size and 9 thin short posterior setae, and with thin basal separate long seta. Length of basal posterior seta 0.66 times as long as maximum width of forewing. Maximum length of marginal fringe 1.42 times as long as maximum width of forewing. Hindwings not visible. Legs long, slender. Femora slightly expanded in apical half. Fore and middle tibiae with short apical seta. Tarsi 5-segmented.

Petiole 2-segmented, with black basal collar, with

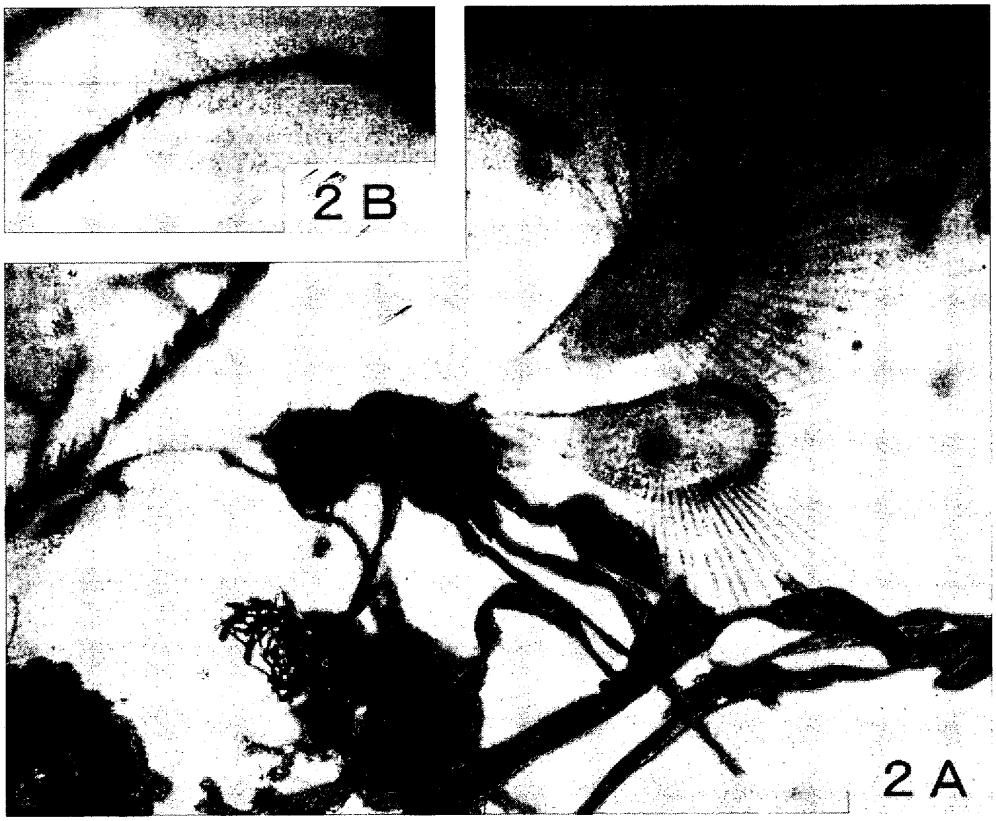

Fig. 2. *Palaeomymar japonicum* sp. nov., holotype, male (photo of specimen in amber). A: Whole aspect. B: Antenna.

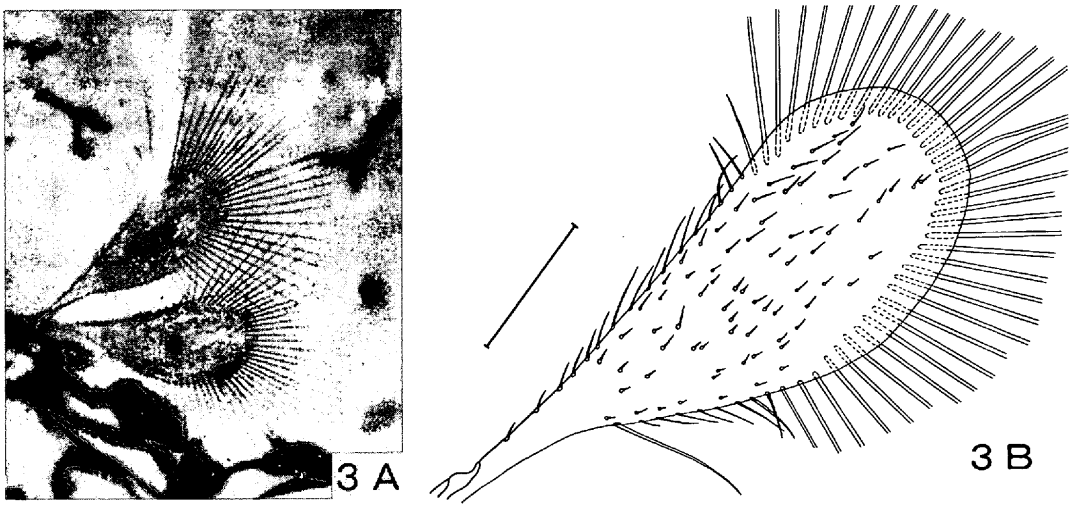

Fig. 3. *Palaeomymar japonicum* sp. nov., holotype, male, forewings. A: Photo of specimen in amber. B: Picture drawn from specimen in amber. Scale: 0.1 mm.

fine cellular sculpture, second segment with 2 very short ventral spurs. Ratio of length to width of first segment of petiole 16.0 : 6.5; second segment of petiole 9.0 : 6.5. Gaster short, smooth, semi-transparent, with black contents, flattened dorso-ventrally, apical part curved ventrally. Apex of gaster with 2 rod-shaped, curved parts of genitalia, probably digital sclerites.

Holotype. Male. Japan, Iwate, Kuji, coll. T. Nomiya & Y. Shirota, inclusion in amber (size of amber cylinder: diameter 3.0 mm, length 3.5 mm), Upper Cretaceous level, sample N 159. Deposited in Y. Shirota's collection of Laboratory of Evolutional Ecology, Faculty of Agriculture and Life Sciences, Hirosaki University (Hirosaki, Japan).

Remarks. The new species is close to *Palaeomymar chaoi* Lin (Lin, 1994), but differs from it by seven-segmented funicle, four-segmented clava, forewings with 38 long setae of marginal fringe, and first

segment of petiole 1.77 times as long as second segment.

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