

Fossil of the Genus *Eubrianax* (Coleoptera, Psephenidae) from the Upper Miocene Ningyôtôge Formation in Tottori Prefecture, Japan

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Abstract A larval fossil specimen of water penny beetle *Eubrianax* sp. was found from the Upper Miocene Tatsumitôge Member (ca. 6.5–5.5 Ma) of the Ningyôtôge Formation in Saji-chô, Tottori-shi, Tottori Prefecture, Japan. The fossil specimen is identified with *Eubrianax* sp., aff. *E. pellucidus* LEWIS based on pronotal structures.

Introduction

The genus *Eubrianax* KIESENWETTER includes 22 species worldwide (LEE *et al.*, 2001, 2003, 2005). The larvae are known as “water pennies” which dwell on stone surface in running water. In Japan, three species occur in the main islands and six species in the Ryukyu Islands (SATÔ, 1985; LEE *et al.*, 2001). However, fossil records of the Psephenidae in Japan are poorly known. FUJIYAMA (1983) reported the only record of a fossil water penny, *Mataeopsephus* sp., aff. *M. japonicus* MATSUMURA from the Early Pleistocene Kazusa Formation in Nagasaki Prefecture, Japan.

The Tatsumi-tôge (Pass) in Tottori Prefecture is one of the most famous sites of the Tertiary fossil insects in Japan (FIRGNE, 1988). For example, fossils of *Carabus* sp. (as *Apotomopterus* sp.: HIURA, 1971) and *Graptopsaltria inaba* FUJIYAMA, 1982 are described from the site. Recently, we noticed a fossil specimen from the Tatsumi-tôge, which is well-preserved water penny on siltstone. The larva is identified with the genus *Eubrianax*. In this paper, we are going to describe the fossil and to discuss its systematic position in the genus.

Systematic Palaeontology

Famiy P s e p h e n i d a e LACORDAIRE
Subfamily E u b r i a n a c i n a e JAKOBSON
Genus *Eubrianax* KIESENWETTER, 1874
Eubrianax sp., aff. *E. pellucidus* LEWIS

(Figs. 1–2)

Material. A larval exuviae of the last instar (lacking abdominal segments VII to IX) in coll. of Tottori Prefectural Museum [TRPM-EF-0000008].

Condition of fossil. The fossil is well-preserved specimen but detail structure of marginal peg setae and surface of exuviae are not preserved.

Description. Length 5.0 mm, width 5.2 mm. Body flattend, but roundly convex, with lateral tergal extensions on thorax and abdomen; form entirely oval with dense marginal peg setae [MPS]. Pronotum strongly produced anteriorly, with broadly arcuate anterior margin; middle pronotal plate lacking (Fig. 1 A); mid-pronotal longitudinal sulci absent (Fig. 1 B); pericellar sulci absent (Fig. 1 C); dividing sulci at posterior plates on prothorax absent. Meso- and metathoraces shorter than but broader than prothorax. Spiracles [SP] on mesothorax. Median longitudinal suture and costal lines [CL] present on thorax. Posterior plates on abdominal terga absent.

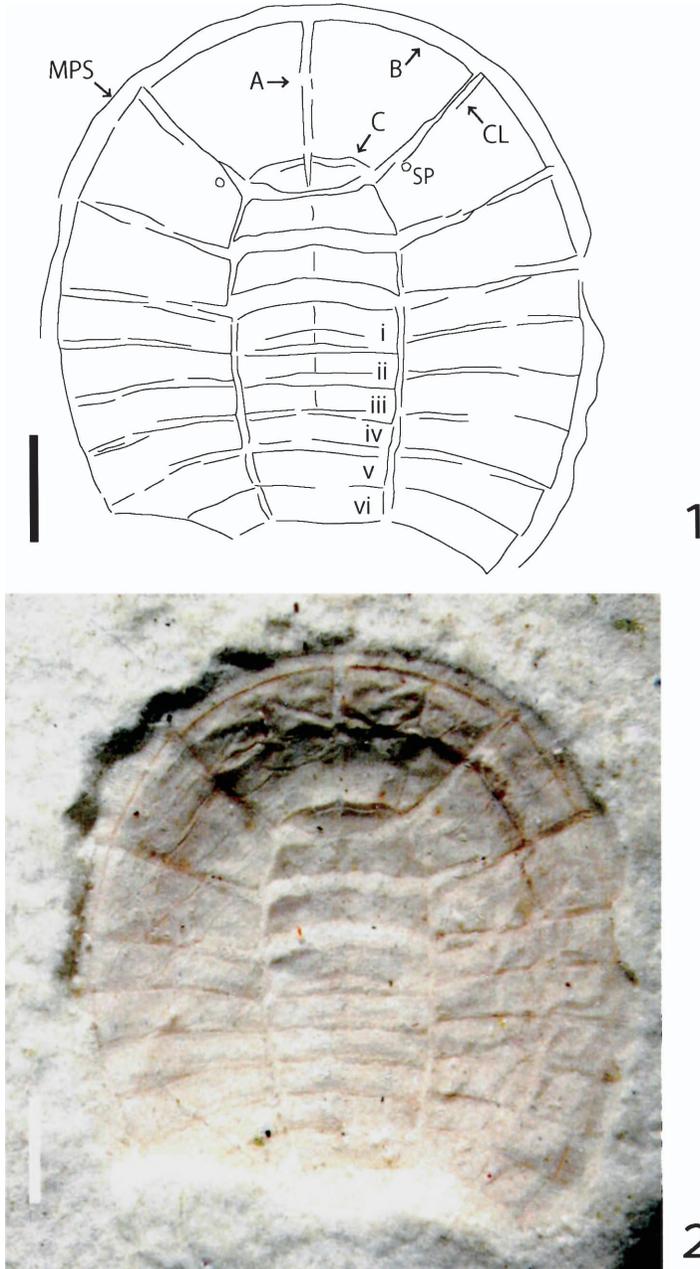
Fossil horizon and age. Tatsumitôge Member of the Ningyôtôge Formation (YAMANA, 1992, 1997). The age is estimated ca. 6.5–5.5 Ma by pollen assemblages (SAITO & ICHITANI, 2007). The fossil is the oldest fossil record of the Psephenidae in Japan.

Locality. Tatsumi-tôge (Pass), Saji-chô, Tottori-shi, Tottori Prefecture, Honshu, Japan. The fossil site is the natural monument of Tottori Prefecture, so that it is protected by the ordinance.

Discussion

LEE *et al.* (2001) recognized four species-groups, *ramicornis*, *granicollis*, *pellucidus*, *serratus* groups, from the genus *Eubrianax* based on cladistic analysis. The fossil belongs to the *E. pellucidus* species-group based on lacking middle pronotal plate in larva. The group includes four recent members: *E. pellucidus* in China and main islands of Japan (Honshu, Shikoku, Kyushu); *E. insularis* in Yaku-shima Is.; *E. amamiensis* in Amami-Ôshima and Okinawa Isls.; *E. manakikikuse* in Ishigaki, Iriomote Isls. and Taiwan (LEE *et al.*, 2001). The fossil age shows that the *E. pellucidus* species-group has existed for more than 5.5 million years.

All the members of the species-group live in mountain streams (HAYASHI, 2009). The fossil bed shows that the siltstone deposited in the area of still water (HIROTA, 1981). The fossil larval exuviae of the last instar was probably carried by running water from pupated place in the stream.



Figs. 1-2. Fossil *Eubrianax* sp., aff. *E. pellucidus*. CL, costal line; MPS, marginal peg setae; SP, spiracle. i-vi, 1st to 6th abdominal segments. A-C, see description of the fossil. Scale bar=1.0 mm.

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要 約

林 成多・川上 靖：鳥取県辰巳峠から産出した新第三紀のマルヒラタドロムシ属化石（コウチュウ目：ヒラタドロムシ科）。——鳥取県鳥取市佐治町（旧佐治村）の辰巳峠には、後期中新世の人形峠累層辰巳峠部層が分布し、泥岩層から昆虫化石が産出することが古くより知られている（現在は鳥取県の天然記念物となっており、化石採集等の行為は禁止されている）。この度、鳥取県立博物館の収蔵標本を検討した結果、ヒラタドロムシ科の幼虫（終齢幼虫の抜殻）の化石が確認され、マルヒラタドロムシ属の一種と同定された。前胸中央部に菱形の小片を欠くことにより、ヒメマルヒラタドロムシ種群 (*E. pellucidus* species-group) に属すると結論した。ヒラタドロムシ科の化石としては、国内で2例目となる発見で、国内ではもっとも古い化石記録となる。

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Xylopsocus intermedius DAMOISEAU, 1993 (Coleoptera, Bostrichidae), a New Beetle in the Taiwanese and Palearctic Fauna

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The genus *Xylopsocus* LESNE belongs to the tribe Xyloperthini and subfamily Bostrichinae of the family Bostrichidae (BOROWSKI & WĘGRZYNOWICZ, 2007). Most of the 18 described species of the genus *Xylopsocus* is distributed in the Oriental, Australian and Ethiopian Regions. In the Palearctic four species were recorded, including three Taiwanese species, *X. bicuspis* LESNE, 1901, *X. capucinus* (FABRICIUS, 1781), and *X. castanoptera* (FAIRMAIRE, 1850) (BOROWSKI, 2007; LIU, 2006).

Working on the collection of the Taiwan Agricultural Research Institute Insect Collection in Wufeng, among the unidentified material we found *Xylopsocus intermedius* DAMOISEAU in DAMOISEAU & COULON, 1993, which has not been recorded from Taiwan so far. Single specimen of this species was collected in the Shaanxi Province (labeled: Sekizan, Formosa 18 V 1935, col. Y. MIWA) (Figs. 1 & 2). Till now the *X. intermedius* was recorded from Vietnam only (DAMOISEAU & COULON, 1993; BOROWSKI & WĘGRZYNOWICZ, 2007).

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Fig. 1. *Xylopsocus intermedius* DAMOISEAU, habitus, dorsal view.

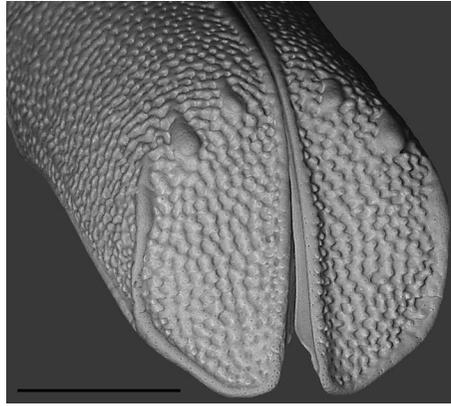


Fig. 2. *Xylopsocus intermedius* DAMOISEAU, elytral declivity, scale bar = 1 mm.

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