

Late Pliocene Donaciinae (Coleoptera, Chrysomelidae) from the Koka Formation, Kobiwako Group in Shiga Prefecture, Japan

Masakazu HAYASHI

767–45–101, Ohara, Sanda, Hyôgo, 669–1515 Japan

and

Shigehiko SHIYAKE

Osaka Museum of Natural History,
Nagai Park 1–23, Higashi-sumiyoshi-ku, Osaka, 546–0034 Japan

Abstract Three species of the donaciine fossils were obtained from the Late Pliocene Koka Formation on the riverbed of the Yasu River, Kosei-chô, Shiga Prefecture, Japan. The donaciine fossils are identified with *Plateumaris akiensis*, *Plateumaris constricticollis* and *Donacia (Donaciomima)* sp. The fossil age is ca. 2.6 Ma.

This paper deals with the donaciine fossils from the Kobiwako Group in Shiga Prefecture, Japan. The Kobiwako Group is an inland freshwater deposit that is one of the representative strata of the Plio-Pleistocene in Japan. Though many of the formations of the group include lignite beds, fossil insects from the group have poorly been known: TOMINAGA and Insect Fossil Research Group (1993) has been the only one reporting fossil insects from the Kobiwako Group, including “*Plateumaris akiensis?*” on the riverbed of the Echi River in Eigenji-chô, Shiga Prefecture. This paper is the second report on fossil insects from the group. Since several lignite beds of the Japanese Plio-Pleistocene strata yields abundant fossil beetles, such as the Uonuma Formation in Niigata Pref. and Kazusa Group in Saitama Pref., we anticipate abundant fossils from the group in the future.

Geological Setting

KAWABE (1989, 1990 and 1994) reviewed the stratigraphy of the Kobiwako Group and subdivided it into eight formations: Ueno, Iga, Aoyama, Koka, Gamo, Kusatsu, Katata and Takashima, as in the ascending order (Fig. 1). According to his paper, the geological age of the group corresponds to the Late Pliocene to Middle Pleistocene, and the accumulation age was estimated at 4.0 to 0.5 Ma (SATOGUCHI *et al.*, 1999).

The fossil locality is the riverbed of the Yasu River, Yoshinaga, Kosei-chô, Shiga

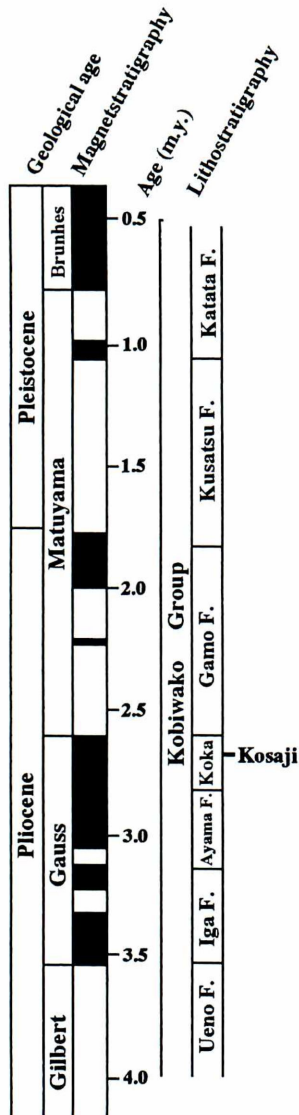


Fig. 1. Litho-, magneto-, and tephro-stratigraphy of the Kobiwako Group (modified from SATOGUCHI *et al.*, 1999).

Prefecture, Japan ($34^{\circ}59'33''\text{N}$, $136^{\circ}6'13''\text{E}$; Fig. 2). In this area, the Koka Formation is distributed along the Yasu River (Research Group for the Fossil Footprints at the River Yasu, 1998). The formation mainly contains gravel, sand and silt but also interbedded volcanic ash and lignite beds. The stratigraphical position of the lignite bed which yields the donacine fossils is by 9 m above the Kosaji volcanic ash bed, the age of which is estimated ca. 2.6 Ma (Research Group for the Fossil Footprints at the River Yasu, 1998).

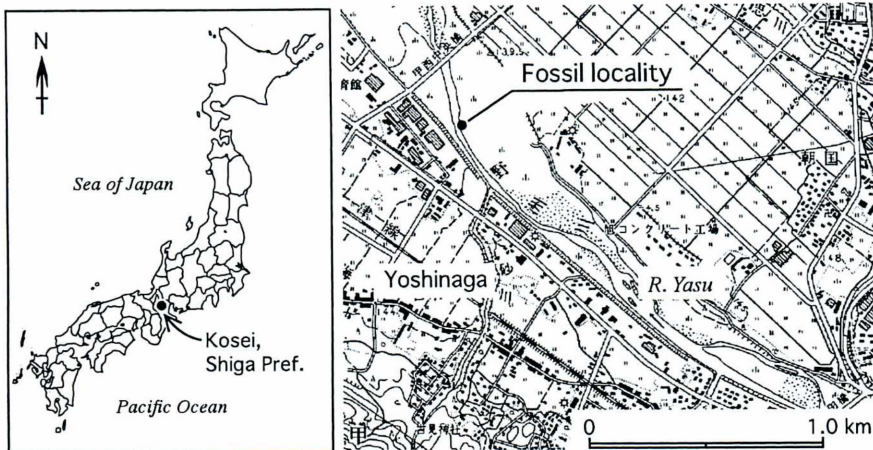


Fig. 2. Map showing the fossil locality in the Yasu River. Using the topographic maps "Mikumo", scale 1 : 25,000 by the Geographical Survey Institute, Japan.

Methods and Materials

The lignite beds of the formation are compressed and cemented peaty deposits. All fossil specimens were found by splitting them along the bedding planes and examining the resulting surfaces, and were preserved in shut cases in wet condition with ethyl alcohol. Most specimens were examined under a stereoscopic microscope (SM) and photographs were also taken by using SM. All fossil specimens reported in this paper are deposited in the Osaka Museum of Natural History (OMNH). For comparison, recent specimens from both in OMNH and in the author's collection were used.

Description of Fossils

Subfamily **Donaciinae** KIRBY

Genus **Plateumaris** THOMSON

Plateumaris akiensis TOMINAGA et KATSURA

(Figs. 3A, B, C)

Plateumaris akiensis TOMINAGA et KATSURA, 1984, Bull. Osaka Mus. nat. Hist., (37): 25.

Description. Coloration of pronotum, elytron and sterna of abdominal segment entirely metallic green. Pronotum more or less quadrate; disc densely punctate; median line indistinct, sometimes distinct; basal sulcus present but shallow, punctures coarse and sparse; callosal sulcus indistinct; anterolateral callus present. Elytral disc with ten complete punctate striae and a scutellar striole; interstriae shiny; interstitial rugae entirely distributed, radiating from strial punctures, becoming finer and denser apically;

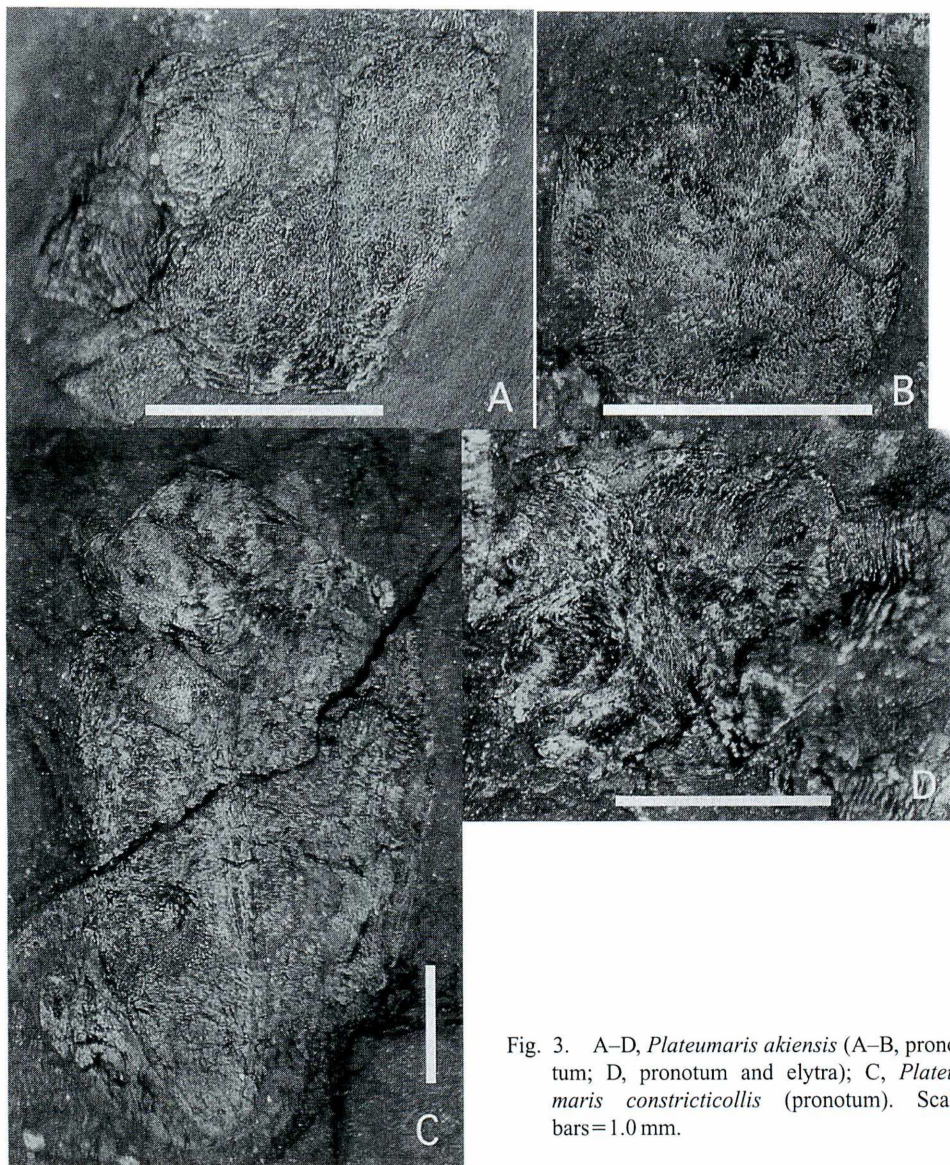


Fig. 3. A–D, *Plateumaris akiensis* (A–B, pronotum; D, pronotum and elytra); C, *Plateumaris constricticollis* (pronotum). Scale bars=1.0 mm.

sutural interval narrowed subapically, inner and outer beads convergent, and explanate sutural margin exposing; apex rounded.

Measurements. Pronotum: length, 1.4–1.5 mm (n=3). Elytron: length, 4.2 mm; width, 1.5 mm (n=1).

Remarks. This species can be recognized by dense punctures on pronotal disc (Fig. 4 A). The pronotum of *P. constricticollis* may be similar to that of *P. akiensis*, but

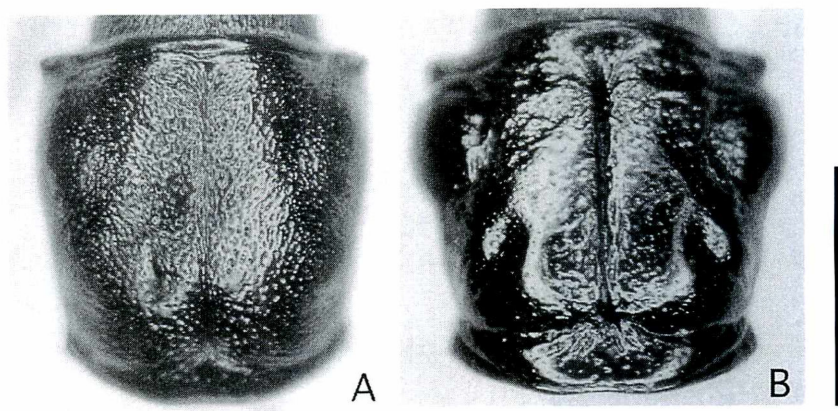


Fig. 4. Pronotum of recent *Plateumaris* spp.: A, *P. akiensis*; B, *P. constricticollis*. Scale bar=1.0 mm.

the disc of the former is smoother than that of the latter (Fig. 5 B). Recent *P. akiensis* is a very rare species in Japan; the present populations are limited to Geihoku-chô, Hiroshima Prefecture (TOMINAGA *et al.*, 1984). The fossil of this species was once reported from the Late Miocene to Pliocene Hogi Lignite Formation in Ketaka-chô, Tottori Prefecture (Fossil Insect Research Group for Nojiri-ko Excavation & AKAGI, 1986). Its discovery from the Koka Formation indicate that *P. akiensis* was distributed in Kinki region in the Late Pliocene.

Plateumaris constricticollis (JACOBY)

(Fig. 3 D)

Donacia constricticollis JACOBY, 1885, Proc. zool. Soc. Lond., **1885**: 192.

Plateumaris constricticollis: JACOBSON, 1892, Horae Soc. ent. ross., **26**: 434.

Description. Pronotum metallic purple. Pronotal outline more or less cordate; anterolateral calli prominent, callosal sulci present with rugae; disc entirely shiny, punctulated and rugose in anterior half; basal sulcus present, with scattered rugae and punctures; median line continuous.

Measurements. Pronotum: length, 1.5 mm (n=1).

Remarks. Fossil record of this species is rare in western Japan though reported from the Late Miocene to Pliocene Hogi Lignite Formation in Ketaka-chô, Tottori Prefecture (Fossil Insect Research Group for Nojiri-ko Excavation & AKAGI, 1986).

Donacia (Donaciomima) sp.

(Fig. 5)

Description. Coloration of elytron metallic green. Elytron subparallel-sided from base to middle, gradually narrowed toward apex, with ten complete punctate

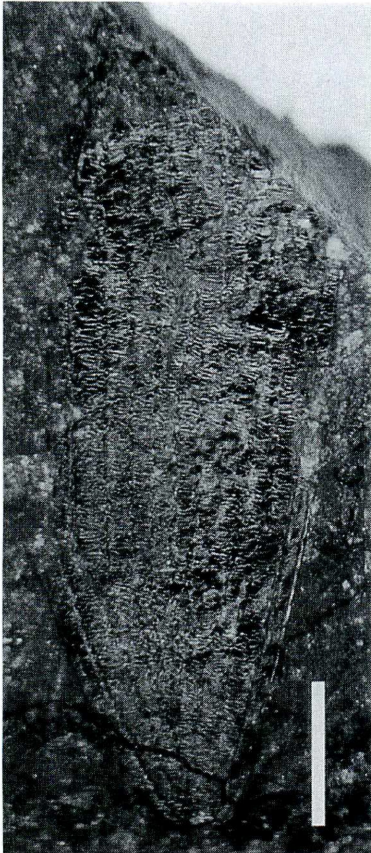


Fig. 5. Left elytron of *Donacia* (*Donaciomima*) sp. Scale bar=1.0 mm.

striae; strial punctures nearly vertical oval; all intervals shiny, rugulose, punctulate; sutural interval gradually narrowing to apex; other intervals with transverse rugae between them; apex truncate, outer and inner apical angles nearly right.

Measurements. Elytron: length, 5.8 mm+; width, 1.9 mm (n=1).

Remarks. Elytral rugosity is similar to that of *Donacia clavareau* JACOBSON and related species.

要 約

林 成多・初宿成彦：古琵琶湖層群甲賀累層から産出したネクイハムシ亜科（甲虫目ハムシ科）の化石。—— これまで古琵琶湖層群からの昆虫化石の記録は、わずか1例のみであった。筆者らは滋賀県甲西町の野洲川に分布する甲賀累層を調査した結果、亜炭層からネクイハムシ亜科の化石を得ることができた。小佐治火山灰（約260万年前）に対比されている火山灰層の上位から、3種のネクイハムシ亜科甲虫が産出し、アキミズクサハムシ *Plateumaris akiensis* TOMINAGA et KATSURA, オオミズクサハムシ *Plateumaris constricticollis* (JACOBY), フトネクイハムシ

亜属の1種 *Donacia* (*Donaciomima*) sp. と同定された。アキミズクサハムシは現在、広島県芸北町のみから知られているが、本化石記録は本種の後期鮮新世の分布を考察するうえで重要な発見である。古琵琶湖層群には多くの亜炭層が挟まれており、今後の調査で新たな化石の発見が期待される。

References

- Fossil Insect Research Group for Nojiri-ko Excavation & S. AKAGI, 1986. Late Miocene to Pliocene insect fossils from the Hogi Lignite Formation of Ketaka-cho, Tottori Prefecture, Japan (1). *Bull. Osaka Mus. nat. Hist.*, (40): 31–58, pls. 5–6. (In Japanese, with English abstract.)
- KAWABE, T., 1989. Stratigraphy of the lower part of the Kobiwako Group around the Ueno basin, Kinki district, Japan. *J. Geosci. Osaka City Univ.*, **32**: 39–52.
- 1990. The Kobiwako Group: in and around Ueno basin. *Urban Kubota*, (**29**): 30–47. (In Japanese.)
- 1990. Geohistory of Lake Biwa. In: *The Natural History of Lake Biwa*, 25–72. Yasaka Shobo Inc., Tokyo. (In Japanese.)
- SATOGUCHI, Y., Y. NAGASHI, K. KUROKAWA & S. YOSHIKAWA, 1999. Tephrostratigraphy of the Pliocene to Lower Pleistocene formations in central Honshu, Japan. *Earth Sci. (Chikyu Kagaku)*, **53**: 275–290. (In Japanese, with English abstract.)
- Research Group for the Fossil Footprints at the River Yasu, 1998. Fossil footprints at River Yasu, Asakuni, Kosei Town, Shiga Prefecture, Central Japan. 57 pp. Kosei Municipal Board of Education, Kosei. (In Japanese.)
- TOMINAGA, O., & Insect Fossil Research Group, 1993. Fossil Insects obtained from the petrified forest site in the Echi River, Shiga Prefecture. *Res. Rept. Lake Biwa Mus.*, (1): 77–79. (In Japanese.)
- , K. KATSURA, & Fossil Insect Research Group for Nojiri-ko Excavation, 1984. Studies on the Japanese Donaciinae (Coleoptera: Chrysomelidae). 2. Notes on geographical diversity of *Plateumaris constricticollis*, with descriptions of an allied new species. *Bull. Osaka Mus. nat. Hist.*, (37): 25–40, pl. 8. (In Japanese, with English descriptions.)

Elytra, Tokyo, **30** (1): 213–214, June 30, 2002

New Record of *Elodes burmensis* (Coleoptera, Scirtidae) from Vietnam and India

Hiroyuki YOSHITOMI

Bioindicator Co., Ltd., (Sapporo branch),
Kita 1, Nishi 2–11, Chûô-ku, Sapporo-shi, 060–0001 Japan

Elodes burmensis KLAUSNITZER was originally described from Myanmar, and has been