

Two Extant Species of the Genus *Onthophagus*  
(Coleoptera, Scarabaeidae) from the  
Pleistocene in Central Japan

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**Abstract** Two fossil specimens of *Onthophagus* spp. from the Pleistocene are identified with two extant species: a fossil specimen from the Uonuma Formation is *O. lenzii*, and a fossil specimen from the Bushi Formation is *O. viduus*.

The coprophagous scarabaeid beetles are well known mainly as feeders of mammalian excrements, and called dung beetles. About 110 species of dung beetles are known from Japan (MASUMOTO, 1985). Their feeding habits vary with types of mammalian dungs, herbivorous, omnivorous and carnivorous. It is an interesting problem to trace the historical changes of the dung beetle fauna of Japan, but fossil records of them are poor from the Japanese Neogene. On the other hand, many species have been reported from the Upper Pleistocene to the Holocene mainly from the archeological sites (e.g., HARUSAWA, 1994).

We have studied dung beetle fossils from the Pleistocene of Japan. The research has proved that two fossil specimens of *Onthophagus* spp. from the Pleistocene are identified with two extant species: a fossil specimen from the Uonuma Formation is *O. lenzii*, and a fossil specimen from the Bushi Formation is *O. viduus*. The latter was reported by HAYASHI (1996) as *Onthophagus* sp.

***Onthophagus lenzii* HAROLD**

(Fig. 4A)

**Material.** Head (in coll. of the Osaka Museum of Natural History).

**Description.** Head entirely metallic black; general shape oblong; outline of clypeus edged, front arched, side prominent but rounded; eye slender, and oblique

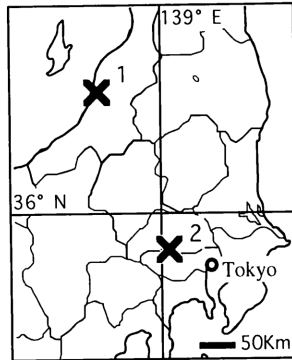


Fig. 1. Fossil localities of *Onthophagus* spp. from central Japan; 1, Kogamaya, Izumozaki-machi, Niigata Pref.; 2, Noda, Iruma City, Saitama Pref.

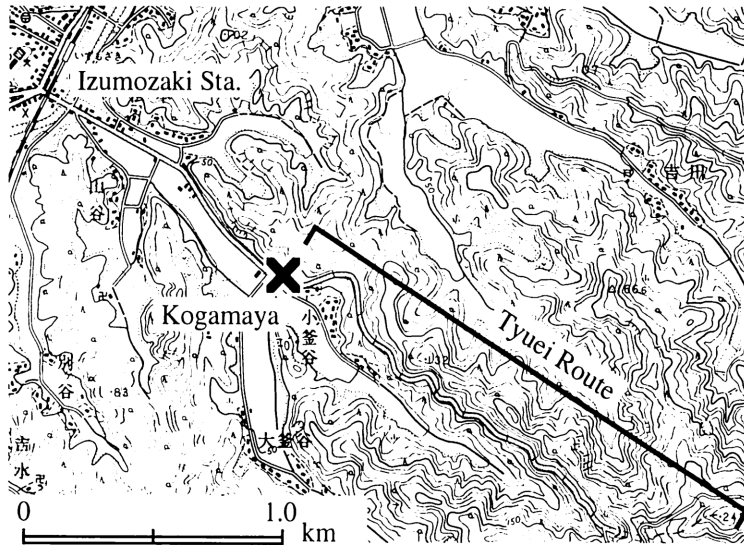


Fig. 2. Fossil locality of *O. lenzii* at Kogamaya (X). Map using the topographic map of "Izumozaki", scale 1 : 25,000 by the Geographical Survey Institute.

against median line; two oblong swelling on frons and vertex, gently arched towards the front; clypeus densely punctate, more or less rugose; frons and vertex punctate.

*Measurements.* Length 2.0 mm, width 2.7 mm.

*Locality and stratigraphic horizon.* The fossil of this species was collected from the Uonuma Formation in Izumozaki-machi, Niigata Prefecture (Figs. 1, 2). The Uonuma Formation in this area is distributed along the axis of the Izumozaki Syncline that corresponds to the upper member of the formation in the type area and conformably overlies the Haizume Formation (KOBAYASHI *et al.*, 1993). The strata of the locality gently dip since it is situated just on the axis of the syncline composed of silt and coarse to middle grained sand (Fig. 3). The fossil specimen was yielded from a

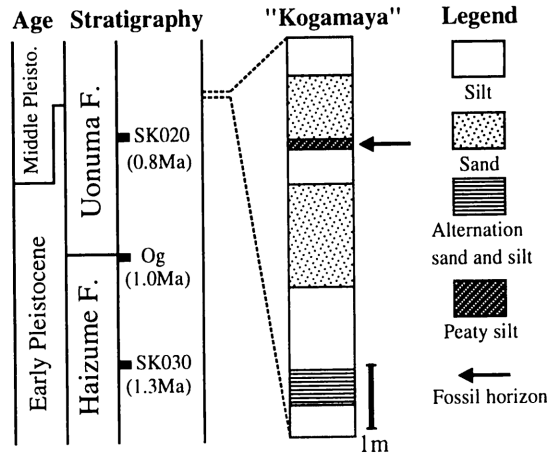


Fig. 3. Stratigraphy of the Uonuma Formation at Izumozaki district and columnar section of the fossil locality of *O. lenzii* at Kogamaya.

thin bed of peaty silt containing plant fossils of *Alnus japonica* and Cyperaceae. Several beetle fossils belonging to the Carabidae and Hydrophilidae were also yielded from the bed. A route is shown on the locality map called Tyuei Route (KOBAYASHI *et al.*, 1993; Fig. 2). On the route, we can observe stratigraphy of the Uonuma Formation and its lower formations typically and the locality is situated at the western side of the route. A characteristic volcanic ash layer, SK020 widely distributed in the area is intercalated in the formation (KOBAYASHI *et al.*, 1993). The fission track age of the ash is  $0.81 \pm 0.12$  Ma (YOSHIKOSHI, 1983). The fossil horizon is in the upper member of the formation and above the SK020. The age of the fossil is considered about 0.7 Ma based on its stratigraphic horizon and tephro- and magneto-stratigraphy of the formation (YOSHIKOSHI, 1983; MURAMATSU, 1983; MANABE & KOBAYASHI, 1988; KOBAYASHI *et al.*, 1993).

*Remarks.* This specimen agrees with recent male specimens of *O. lenzii* in the external morphology of the head.

### *Onthophagus viduus* HAROLD

(Fig. 4B)

*Materials.* Head (in coll. of the Saitama Museum of Natural History).

*Description.* Head entirely metallic black, general shape more or less oblong; outline of clypeus edged, front arched, side prominent but rounded; eye slender, and oblique against median line; frons and vertex with two oblong swellings, that on frons gently arched towards the front and that on vertex straight and lying just between eyes; clypeus sparsely punctate, more or less rugose; frons and vertex sparsely punctate.

*Measurements.* Length 1.7 mm, width 1.7 mm.

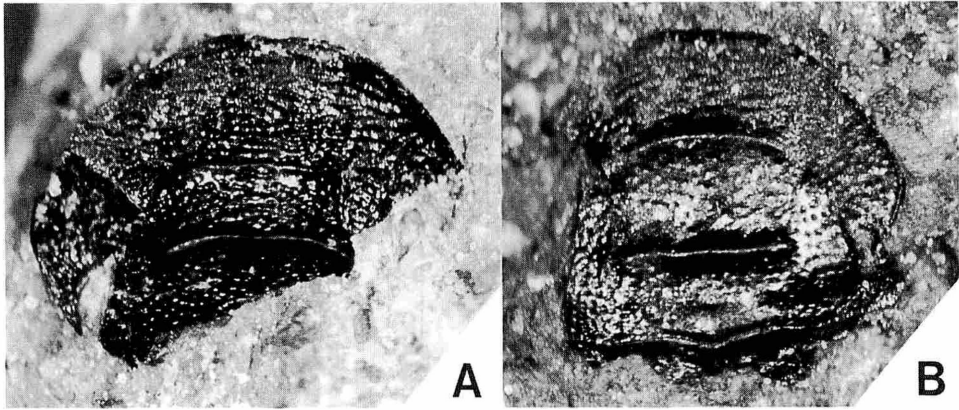


Fig. 4. A, *Onthophagus lenzii* (male), head; B, *O. viduus* (female), head.

*Locality and stratigraphic horizon.* The fossil of this species was collected from the lowest member of the Bushi Formation on the riverbed of the Iruma River at Noda, Iruma City, Saitama Prefecture (Fig. 1: see HAYASHI, 1996, 1997). HAYASHI (1996) discussed fossil beetle assemblages from the formation and their paleo-environments in detail. The Bushi Formation is assigned to the Early Pleistocene (HORIGUCHI *et al.*, 1977; Sasai Fossil Forest Research Group, 1984). The fission track age of E1 volcanic ash layer in the uppermost member is  $1.03 \pm 0.07$  Ma (TAKEGOSHI & MURAMATSU, 1994).

*Remarks.* This specimen agrees with recent female specimens of *O. viduus* in the external morphology of the head. It is also similar to the female of *Onthophagus atripennis* but differs in the oblong swelling on the vertex and punctuation of the clypeus.

## 要 約

林 成多・春沢圭太郎：本州中央部の更新統から産出した2種のエンマコガネ属甲虫類。——新潟県出雲崎町の魚沼層上部（約70万年前）から産出したカドマルエンマコガネおよび埼玉県入間市の仏子層最下部層（約160–150万年前）から産出したマルエンマコガネの化石を記録した。

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## Records of Some Species of *Diarthiger* (Coleoptera, Staphylinidae, Pselaphinae) from Shikoku, Japan

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The genus *Diarthiger* SHARP from Japan and adjacent areas was revised by NOMURA (1997), and two species, *D. fossulatus morimotoi* NOMURA and *D. kubotai* NOMURA were recorded from Shikoku. Later, NOMURA (1998) added *D. fossulatus dentipes* NOMURA et LEE firstly described from South Korea to the fauna of Shikoku. YOSHIDA (1998) reported many records of *D. fossulatus morimotoi* and *D. kubotai* from Tokushima Prefecture and suggested that both the species were collected from an ant nest. Distribution and behavior of these *Diarthiger* species in Shikoku