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ON THE GENUS ONTHOPHILUS FROM JAPAN
(COLEOPTERA: HISTERIDAE)

By Masahiro Ōhara and Takehiro Nakane

Abstract


The genus Onthophilus Leach from Japan is revised and seven species in total are recognized to occur there. Of them, O. ordinarius Lewis is newly recorded from Japan, and O. aonoi is described as new to science. Male genitalia of all the known Japanese species except kamiyai are figured and a key to the species is provided.

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Contents

Introduction .................................................. 2
Acknowledgements .............................................. 2
Terminology .................................................. 2
The Genus Onthophilus Leach .................................. 3
Key to the species ............................................. 4
Onthophilus silvae Lewis .................................... 5
Onthophilus ostreatus Lewis ................................ 5
Onthophilus niponensis Lewis .............................. 6
Onthophilus aonoi sp. nov. ................................. 6
Onthophilus ordinarius Lewis .............................. 9
Onthophilus flavicornis Lewis .............................. 9
Onthophilus kamiyai Adachi .............................. 9
References .................................................. 11
Plates ..................................................... 13
INTRODUCTION

*Onthophilus* Leach is a small genus in the family Histeridae, and has been represented by 32 species. Crowson (1974) states that the genus would be the most primitive among the extant members of the family. The Palearctic species of the genus are revised by Reichardt (1933) and the Nearctic ones by Helava (1978). Some useful terms for important costae and carinae are proposed by Helava (I.c.). In Japan Lewis (1884, 1907) recorded *ostreatus* and described *flavicornis*, *silvae* and *nipponensis* as new. Adachi (1930) studied Japanese *Onthophilus* and described *kamiyai* as new. In this paper we recognize seven species in Japan, of which one species, *ordinarius* Lewis, is recorded as new to Japan and another species, *aonoi*, is described as new to science. All of them, except *kamiyai*, are figured with emphasis on the pronotum and male genitalia. A key to the species is provided.

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TERMINOLOGY

For the terminology of the striae and other surface features, we have followed Wenzel and Dybas (1941) and Helava (1978).

Head (Fig. 1-A) with two carinae.

VFC (vertico-frontal carina or “vertico-frontal” carina in Helava). Carina located along the midline extending from the occipital carina to between the antennae; may be variously reduced.

LFC (latero-frontal carina). Carina running from the antennal pit, obliquely across the face, to, or just above, the clypeus.

Pronotum (Fig. 1-B) with one to three pairs of costae (*O. silvae* with four pairs of costae, but the costa situated between PC₁ and PC₂ is very short. In this paper this short costa is not named).

PC₁ (pronotal costa 1). Costa closest to the lateral edge.

PC₂ (pronotal costa 2). Costa running between PC₁ and PC₃.

PC₃ (pronotal costa 3). Costa nearest to the midline.
Each elytron (Fig. 1-B) with eight striae, which are named external and internal subhumeral, one to five, and sutural from outside to inside. The order of numbering in Histeridae is opposite to that in most other Coleoptera. In the case of the genus Onthophilus, moreover, there are many costae, which are more evident than striae. Major costae are named in the following lines, but minor costae are not named.

SC (sutural costa). Costa lying mesad of the sutural stria, i.e. between the stria and the suture.

EC₅ (elytral costa 5). Costa lying mesad of stria 5.
EC₃ (elytral costa 3). Costa lying mesad of stria 3.
EC₂ (elytral costa 2). Costa lying mesad of stria 2.
EC₁ (elytral costa 1). Costa lying mesad of stria 1.
ISC (internal subhumeral costa). Costa lying mesad of the internal subhumeral stria.

ESC (external subhumeral costa). Costa lying mesad of the external subhumeral stria. This costa is straight and not sinuous along the stria, so that it is separated from the stria at its front end by a semicircular area.

Propygidium (Fig. 1-C) with three carinae.

PM. Carina running along the midline.
PLC. Carina running along the lateral margin.
Pygidium (Fig. 1-C) with two carinae.

TC (transverse carina). Carina running across the pygidium near the base.
LC (longitudinal carina). Carina running along the midline.

THE GENUS ONTHOPHILUS LEACH

Onthophilus Leach, 1817: 77 [Type-species: Hister striatus Forster, 1771].

Body oval, usually black. Antennae, mouthparts and legs fuscous or fulvous. Head has one to three carinae, and with coarse punctures. Labrum has at least two setiferous punctures. Antennal scape angulate. Pronotum with two to eight discal...
costae. Elytron with eight striae and multicostate, some costae usually very strong, appearing very rough and heavily sculptured. Propygidium and pygidium with or without carinae. Prosternal lobe is present. Prosternum without carinal striae; hind margin emarginate to fit mesosternal anterior margin. Antennal cavities situated in anterolateral prothoracic angles, at least partly closed beneath by prosternal alae. Meso- and metasternum with large punctures. Protibiae slender and multidenticate. Tarsi 5-5-5. Paramera of male genitalia fused with each other except apically.

**KEY TO THE SPECIES**

1 (2) Pronotum with 8 costae. Body length* 2.50-2.65 mm. Figs. 2(A), 4(A-B), 5b(G, K), 5c(O, S). ...................................................... *O. silvae Lewis

2 (1) Pronotum with 4 or 6 costae.

3 (8) EC₃ ending just caudad of a deep transverse fossa situated within the front margin of the elytron.

4 (5) PC₃ present on apical and basal half of the pronotum, and strongly developed. Body length 3.60-4.68 mm. Figs. 2(B), 4(C-D), 5a(A), 5b(I), 5c(M, Q). .................................. *O. ostreatus Lewis

5 (4) PC₃ absent, or present only on basal half of the pronotum.

6 (7) PC₃ present. Body length 2.50-3.02 mm. Figs. 2(C), 3(A), 4(E-F), 5a(B), 5b(J), 5c(N,R). ..................................................... *O. niponensis Lewis

7 (6) PC₃ absent. Body length 3.28-3.38 mm. Figs. 2(D), 3(B, D-G), 4(G-H), 5a(C-D).

8 (3) EC₃ entire up to the front margin of the elytron.

* Body length: length from anterior angles of pronotum to apex of propygidium.
9 (10) Body longer than 2.5 mm (2.86-3.54 mm). Elytral costae sometimes interrupted. Figs. 2(E), 3(C), 4(1-J), 5a(E-F). .................................. O. ordinarius Lewis

10 (9) Body shorter than 2.5 mm. Elytral costae clear and complete.

11 (12) Propygidium with 3 costae. Body length 1.82-2.34 mm. Figs. 2(F), 4(K-L), 5b(H, L), 5c (P, T). .......................................................... O. flavicornis Lewis

12 (11) Propygidium with 1 costa. Body length 2 mm (after Adachi, 1930). .......................................................... O. kamiyai Adachi

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**Onthophilus silvae Lewis**


Specimens examined. 1♂ and 5 exs. Hokkaido—1♂ and 1 ex., Sapporo, 12/vi/?, no collector’s name. (Hokkaido Univ.); 4 exs., Moiwa, Sapporo, no date, no collector’s name. (Hokkaido Univ.). Honshu—1 ex., Daiyuzan, Hakone, Kanagawa-ken, 7/viii/1982, Y. Hirano leg.


Remarks. This species is easily distinguished from all the other Japanese species of the genus by the following characters: the presence of a costa between PC1 and PC2, the costa being very short, occurring on the basal third of the pronotum and running towards PC; the interstices between costae of elytra with a longitudinal series of transverse punctures appearing at regular intervals. These characters are not general in this genus.

Hirano (1986) reported the association of this species with *Lasius (Dendrolasius) fuliginosus* (Latreille) (Hymenoptera: Formicidae).

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**Onthophilus ostreatus Lewis**


Distribution. Japan (Honshū; Shikoku; Kyūshū); Continental China; Taiwan.

Remarks. This species is the largest among the Japanese species of *Onthophilus*. It is similar to *niponensis*, *aonoi* sp. nov. and *ordinarius*, but easily separated from them by the following characters: PC₃ divided into apical and basal halves; body larger, and the punctures of pronotum coarser. In general the adult of this species appears in autumn (Sep.-Dec.), and has been found under cow and dog dung, human feces, and decaying vegetable matter.

*Onthophilus niponensis* Lewis


Distribution. Japan (Honshū; Kyūshū).

Remarks. This species is allied to *ostreatus*, *aonoi* sp. nov. and *ordinarius*, yet is separated from them by the characters given in the key.

*Onthophilus aonoi* sp. nov.

♂. Body length 3.28 mm between anterior angles of pronotum and apex of propygidium, and 3.01 mm between anterior angles of pronotum and apices of elytra. Width 2.40 mm.

Body oval, black. Antennae, maxillae and tarsi fuscous.

Head without VFC and LFC, rather even on vertex but with a very short elevation between antennal pits; clypeus elevated, thus the head appearing feebly concave behind clypeus; edge of antennal pits also elevated. Punctures large, round, shallow and separated from each other by 0.3 times their diameter. Labrum with two distinct setiferous punctures at lateral one-fifth, and with several minor setiferous punctures. Mandibles strongly developed and with large punctures, those along the dorsal keel being setiferous, but the apical third of mandible shining and not punctate. Scape of antenna with some large setiferous and some moderate-sized unisetiferous punctures, these punctures being separated by about half their diameter (Fig. 3-D).

Pronotum 0.54 times as long as wide, and strongly convex. Sides feebly arcuate

and convergent anteriorly. Anterior angles obtuse. Anterior margin arcuate-emarginate. Disk with only 4 distinct costae, PC₂ suggested by feeble elevations on the apical and basal areas, the anterior and the posterior elevations respectively convergent and divergent caudad. PC₂ and PC₁ almost straight; PC₂ clearly elevated on basal half, but not reaching basal margin; PC₁ clearly elevated on basal third, but not reaching basal margin. Punctures on apical half except on costae large, round, shallow and dense; between PC₂ moderate-sized, shallow and sparse, round or elongate, especially elongate near PC₂; between PC₁ and PC₂ on inner half (near PC₄) elongate, large and dense, on outer half round; between PC₁ and lateral margin large, round and dense (Fig. 3-B).

Elytra wider than pronotum. All costae with two rows of punctures on sides, and depressed near apical margin. SC, EC₃, EC₂, EC₁ lower than other costae. SC feebly elevated, lower at basal fifth, then slightly elevated to middle, and abbreviated in apical fifth, with elongate or round (on base) punctures. EC₄ low, abbreviated in apical fifth, sparsely with elongate and shallow punctures. EC₄ abruptly elevated, shining on vertex. EC₃ low, suggested by a row of fine punctures, and ending at basal sixth, where it is replaced by a transverse fossa lying between EC₂ and EC₄. EC₂ elevated, shining on vertex, and interrupted at basal third to middle. EC₁ low, on basal fourth a little more elevated, from basal fourth to middle with large and round punctures, and on apical half with punctures obsolete. ISC slightly elevated, vertex shining and completed. (Fig 3-E). ESC on basal half densely with large and
round punctures. Space between costae with a clear and shining stria, which is bordered by two low carinae; strial punctures round and deep, accompanied on either side by a small tubercle, which interrupts the low carina. Area between ESC and external subhumeral stria moderately, roundly and densely punctate. Epipleura densely with large, round and shallow punctures. Scutellum shining, subparallel basally, and arcuate apically, with microscopical structures.

Propygidium with PMC, which is strong from basal margin to apical fourth, vertex densely with small punctures and shining. PLC short on apical half and low. Punctures mostly large, round, shallow, and separated by 0.3 to 0.5 times their diameter, along the anterior margin confluent, and along the lateral and posterior margins becoming smaller. All these punctures setiferous (Fig. 3-F).

Pygidium without carinae, and depressed behind anterior angles. Discal area broadly convex. Punctures round, shallow and dense, smaller than most propygidial ones (Fig. 3-G).

Prosternum flat between coxae, feebly convex anteriorly. Punctures large, round, separated by 0.5 times their diameter, but near basal angles intermixed with small punctures. Posterior margin deeply emarginate. Prosternal lobe transverse, about 0.3 times as long as prosternum. Anterior margin straight. Punctures small and dense, absent along the posterior margin.

Mesosternum transverse, anterior margin fitting to prosternal emargination. Punctures confluent, moderate and sparse.

Metasternum separated from mesosternum by clear meso-metasternal stria. Median longitudinal suture distinct. Punctures large, irregular, and confluent along the anterior margin, much larger behind the mesocoxae; along the lateral margin, large, round and sparse; before the metacoxae large and confluent; on discal area moderate ones and fine ones mixed; along the posterior margin fine and dense. Surface slightly depressed along the median longitudinal suture.

First abdominal sternum sparsely with large, round and deep punctures, which become smaller and denser towards the posterior margin.

Protibia slender, with twelve spicules, of which seven apical ones are large, each occurring on a slightly elevated base.

Male genitalia as figured (Fig. 4-G, -H).

♀. Body length 3.38 mm between anterior angles of pronotum and apex of propygidium, and 3.14 mm between anterior angles of pronotum and apices of elytra. Width 2.39 mm. In general appearance quite similar to the male except in the metasternum not depressed along the longitudinal midline.

Specimens examined. 1♂ and 1♀. Honshū—1♂ (holotype) and 1♀, Shitakura, Sōja, Okayama-ken, 7/iii/1976, T. Aono leg. (holotype in the collection of T. Nakane).

Distribution. Japan (Honshū).

Remarks. This new species is closely related to O. niponensis Lewis, 1907, from Tōkyō, but can be separated from the latter by having the following characters: body larger, labrum with several setiferous punctures, PC3 absent, pronotum more sparsely punctate, and the basal piece of male genitalia different in shape.
Onthophilus ordinarius Lewis

Onthophilus ordinarius Lewis, 1879: 79 [USSR: Irkutsk]; Reichardt, 1933: 143, fig. 1 [key; illustrated; noted]; Reichardt, 1941: 86, 88, fig. 43a; Kryzhanovsky and Reichardt, 1976: 286, 287, fig. 571 [key; illustrated; noted].

Specimens examined. 3♂♂ 1 ♀, and 1 ex. Hokkaidō—1 ex., Sapporo, 10/vi/1940, Y. Nishijima leg.; 1♂, Sapporo, 24/v/1939, H. Kōno leg. (Hokkaidō Univ.); 1♂, Maruyama, Sapporo, 24/v/1939, Y. Nishijima leg. (Hokkaidō Univ.); 1♂ and 1 ♀, Nopporo, 14 and 27/vi/1986, M. Ōhara leg.

Distribution. Japan (Hokkaidō); USSR (Vladivostok; Baikal Sea; Novosibirsk; Irkutsk; Ussuri). New to Japan.

Remarks. This species is allied to ostreatus, niponensis and aonoi sp. nov., but differs from them by the pronotum more transverse and with more elongate punctations, by PC3 posteriorly abbreviated, and by the basal piece and tegmen of male genitalia differently shaped. Posterior margin of prosternum with hairs in male. Female larger in size than male.

Onthophilus flavicornis Lewis

Onthophilus flavicornis Lewis, 1878: 69 (nee. Forster, 1771) [Japan: Tōkyō].


Distribution. Japan (Hokkaidō; Honshū; Shikoku; Kyūshū). New to Hokkaidō.

Remarks. O. flavicornis is easily distinguished from all other Japanese species of the genus by the body size, the elytral costae without interruptions, and the basal piece of male genitalia open dorsally at the base. This last character was adopted by Helava (1978) in recognizing his flohri group. This species is found in litter of forests.

Onthophilus kamiyai Adachi

Original description: "Oval, black, somewhat shining. Head densely punctured; vertex 3-costate; outer two costae oblique, contiguous with each other at their frontal ends. Scape of the antenna large, black; funicle and club brownish red. Palpi brownish red. Thorax rather densely punctured and with six costae; outer two short and near the base; intermediate four complete, slightly oblique, contiguous with one another anteriorly. Elytra with seven costae elevated alternately; the second costa elevated the highest; the fourth and sixth come next; and the remaining costae in odd number low; interstices of these costae with two longitudinal series of very short, slender costae, and between them a series of punctures. Propygidium densely punctured, with a median longitudinal carina. Underside densely punctured. Legs black. Length, 2 mm.; width, 1.5 mm."

Distribution. Japan (Honshu).

Remarks. This species was originally described on the basis of three specimens. However, those specimens, once deposited in Tōkyō Agriculture College, were burned out during World War II, and no material of this species has been available. Judging from Adachi's description and another character given in his key, this species is very similar to flavicornis, but may be distinguished from the latter by the PC₃ complete, and by the propygidium with only one carina.

References


Crowson, R.A., 1974 Observations on Histeroidea, with descriptions of an apterous larviform male and of the internal anatomy of male Sphaerites. J. Ent. (B) 42 (2): 133-140.


