



Title	The Dytiscidae of Japan Part1. (Noterinae, Laccophilinae)
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Citation	Insecta matsumurana, 7(1-2), 17-24
Issue Date	1932-12
Doc URL	http://hdl.handle.net/2115/9247
Type	bulletin (article)
File Information	7(1-2)_p17-24.pdf



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THE *DYTISCIDAE* OF JAPAN

Part I

(*NOTERINAE, LACCOPHILINAE*)

By

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(With 1 Text-figure)

This paper has a two-fold aim. Its immediate object is to give a list of the family as complete as possible. The second purpose is to facilitate the identification of the Dytiscid-species distributing through our country. Therefore I have taken considerable pains in making the keys and brief descriptions to show the important characteristics of the species.

It is a pleasant duty to express my grateful acknowledgment to Prof. Dr. S. MATSUMURA, who has kindly read through the whole of the manuscript, and whatever knowledge I have had of the subject has been acquired in the Entomological Museum of the Hokkaido Imperial University, under his continual guidance and encouragement. Also to Dr. S. KUWAYAMA, I express my sincere thanks for his kind advice and help in the course of the investigation.

Key to the Subfamilies

- 1'' Scutellum usually quite concealed.
- 2'' Front and middle tarsi with 5 joints, the 4th about the same length with the 3rd. Internal lamina of the hind coxa enormously developed and projected on to a different plane from the external lamina of the coxae so as to form a prominent platform. Metathoracic episternum does not reach to the middle coxal cavity.
- 3'' Internal lamina of the hind coxa entirely projected on to a different plane from the external lamina of the coxa. Posterior margin of the hind tarsal joints straight; terminal joint with two slender claws of nearly equal length. Prosternal process usually very large and broad. ...
... .. *Noterinae*
- Internal lamina of the hind coxa is in a same plane at the anterior part with the external lamina, but distinctly projected on to a different plane at the posterior part, presenting truncate edge at the extremity. Prosternal process much compressed, very acuminate, frequently its apex being prolonged so as to form a very long and slender spine. *Laccophilinae*
- 2' Front and middle tarsi usually pseudotetramer; the joint between the third and (true) fifth joints reduced to a mere knot. Internal lamina of the hind coxa in a same plane with the external lamina. Metathoracic episternum penetrates into the middle coxal cavity. Prosternum

- deflected or bent between the frontal coxae, so that the prosternal process placed on a quite different plane from that of the prosternum. *Hydroporinae*
- 1' Scutellum distinctly visible.
- 4'' Outline of the eye invaded in front by the free margin of the clypeus, so that it is notched or emarginate, being not circular. Anterior tarsi of the male always incrassated, but with no palettes. Prosternum usually slightly compressed. *Colymbetinae*
- 4' Outline of the eye not emarginate at the inner edge. Anterior tarsi of the male with the three basal joints dilated, with nearly a circular palettes. Prosternum usually flat, being not compressed. *Dytiscinae*

Subfamily **Noterinae**

Key to the Tribes

- 1'' Prosternal process rounded behind. Posterior femur destitute of a group of ciliae at the outer apical angle. *Noterini*
- 1' Prosternal process broad, with broad and subtruncate hind margin. Posterior femur with a conspicuous group of ciliae at the outer apical angle. *Hydrocanthini*

Tribe **Noterini**

Noterini SHARP, on Aquat. Carn. Col., p. 263, 919 (1880-82).

Genus **Noterus** CLAIRVILLE

Noterus CLAIRVILLE, Helv. Ent., II, p. 222 (1806).

Antennae stout in the female and more or less incrassate in the male. Anterior tibial angle rounded, having rather long and curved spur.

Up to present about six species are known in the world, among them we have only following one species.

1. **Noterus japonicus** SHARP

Noterus japonicus SHARP, Trans. Ent. Soc. Lond., p. 52 (1873).

Concolorously reddish brown; wing-case more or less darker; frequently the pronotum infuscated on the middle. Prosternal process of the male distinctly punctated, but in the female smooth. Antenna of the male more or less incrassated; 5th joint as broad as long; 6th joint inserted at the outer half of the 5th joint; 7th to 10th as broad as long, but each gradually tapers towards the extremity; terminal joint pointed. Length 4.0-4.3 mm. This is one of the most common species in Japan.

Habitat—Hokkaido (Sapporo), Honshu (Nagano, Tokyo), Shikoku (Koyadaira), Kiushu (after SHARP, Trans. Ent. Soc. Lond., p. 52, 1873), Formosa (Musha), Korea (after MORI, Journ. Chosen, Nat. Hist. Soc., No. 14, p. 50, 1932).

General Distribution—China, Japan, Formosa, Korea.

Japanese Name: *Chairo-keshi-gengoro*.

Tribe **Hydrocanthini**

Hydrocanthini SHARP, On Aquat. Carn. Col., p. 268, 920 (1880-82)

Genus **Canthyrus** SHARP

Canthyrus SHARP, On Aquat. Carn. Col., p. 268, 838 (1880-82).

Hydrocanthus RÉGIMBART, Ann. Soc. Ent. Franc., (5) VIII, p. 455, 464 (1878).

Suphis CROTCH, Trans. Amer. Ent. Soc., IV, p. 396 (1873).

Body much convex above, much acuminate behind, strongly polished. Antenna very short and slender. Prosternal process moderately broad, not broader than long. Hind coxal process highly developed and much prolonged behind. Hind legs rather slender, the femora and tibiae but little flattened, the former bear a well developed group of ciliae at the extremity of their hind margin; the tarsi about as long as the tibiae, their basal joint as long as, or longer than the three succeeding ones taken together.

Key to the Species

- 1'' Upper and under surface concolorously reddish brown. Long oval, narrowed posteriorly. Wing-case, abdomen and apex of the antenna more or less darker. 2.7 mm. ... *flavus* MOTSCHULSKY
- 1' Wing-case black or pitchy black, with yellowish markings.
- 2'' Pronotum black with a yellow marking at the anterior angle. Wing-case more conspicuously punctured and a brown sublateral marking at the middle. Antenna and frontal leg brown, hind leg ferruginous. 3.0 mm. *guttula* AUBÉ
- 2' Pronotum yellow; wing-case with 3 or 4 yellowish markings.
- 3'' Apex of the wing-case black. Long oval, strongly narrowed toward the extremity. Head and pronotum orange-yellow, the latter with a black band along the base and with a black marking at the middle of the anterior margin. Wing-case black, with three orange-yellow markings; two of them near the base, the rest a little behind the middle. Underside black; legs, antennae, head and the sides of the pronotum reddish brown. 3.2-3.5 *nitidulus* SHARP
- 3' Apex of the wing-case orange-yellow. Comparing with the foregoing species the body smaller, the shoulder relatively narrower and not so strongly narrowed posteriorly. Head and pronotum reddish yellow. Wing-case black with 4 reddish yellow markings; two of them along the base, a transverse broader one at a little behind the middle, and the rest at the tip. Punctures on the wing-case very fine and scarcely recognizable. 2.5-2.8 mm. *politus* SHARP

2. **Canthyrus flavus** MOTSCHULSKY

Hydrocanthus flavus MOTSCHULSKY, Etud. Ent., IV, p. 83 (1855).

Canthyrus fulvescens RÉGIMBART, Ann. Soc. Ent. Franc., (6) IX, p. 149 (1889).

This species seems to be rare in Formosa, only one specimen in the

collection of the Hokkaido Imperial University.

Hab.—Formosa (Koshun).

Gen. Distr.—Annam, China, India, Formosa, Java, Sumatra.

J. N.: *Kiuro-kotsubu-gengoro*.

3. *Canthydrus guttula* AUBÉ

Hydrocanthus guttula AUBÉ, Spec. Col. VI, p. 410 (1838).

This species not present in the collection of the Entomological Museum of the Hokkaido Imperial University, and it is unknown to me.

Hab.—Formosa (after KAMIYA, *Kagaku no Nogyo*, XIII, p. 11, 1932).

Gen. Distr.—Brasil, Formosa, Madagascar, Mascarene-Isles, Newguinea, Timor, ? Borneo.

J. N.: *Taiwan-kotsubu-gengoro*.

4. *Canthydrus nitidulus* SHARP

Canthydrus nitidulus SHARP, On Aquat. Carn. Col., p. 278 (1880-82).

The colouration of the upper surface seems to be considerably variable, a specimen caught at Taito (25/II-27/III. 1919) by S. INAMURA, J. SONAN and M. YOSHINO has the pronotum almost entirely black, leaving the reddish-brown lateral portions, and the two markings near the base of the wing-case scarcely recognizable.

Hab.—Formosa (Taito).

Gen. Distr.—Annam, China, Formosa, Tongking.

J. N.: *Tsuya-kotsubu-gengoro*.

5. *Canthydrus politus* SHARP

Hydrocanthus politus SHARP, Trans. Ent. Soc. Lond., p. 51 (1873).

Usually the wing-case of this species pitchy black or black with 4 large distinct markings, but sometimes the ground colour remarkably reduced, so that the marking near the scutellar portion connected with the transverse marking behind the middle.

Hab.—Honshu (Maiko, Takasago), Shikoku (Sasayama), Kiushu (after S. MATSUMURA, *Cat. Ins. Jap.*, II, Col. p. 52. 1916).

Gen. Distr.—China, Japan.

J. N.: *Mutsuboshi-kotsubu-gengoro*.

Subfamily **Laccophilinae**

Genus **Laccophilus** LEACH

Laccophilus LEACH, Zool. Misc., III, p. 69 (1817).

Prosternal process is remarkably small, very acuminate, much compressed, and frequently its apex prolonged so as to form a very slender, acuminate spine. Spurs of the hind tibiae emarginate at their apices.

At present about 180 species are known in the world, and the majority of them seem to inhabit in the warmer parts of the world. In the following I have dealt 6 species under the genera as occurring in our faunal region. Besides these 6 species *L. hyalinus* DE GEER (= *L. interruptus* PANZER) was recorded from Japan by S. MATSUMURA (Cat. Ins. Jap. II, Col., p. 52, 1916) and K. KAMIYA (Kagaku no Nogyo, XIII, p. 11, 1932), but the occurrence of that species seems to me quite doubtful, therefore, I have omitted it in the present paper.

Key to the Species

- 1'' Wing-case with distinct markings.
- 2'' Dark marking on the wing-case flexuous or undulated. Prosternal process elongated at the extremity.
- 3'' Wing-case with a yellow teeth-like lateral band near the base. Pronotum concolorously reddish brown, or sometimes at the middle of the anterior and posterior margins more or less infuscated. Wing-case with many undulated longitudinal lines, interrupted near the base so as to leave a pale teeth-like fascia. The space between the fascia and base nearly black, but often some longitudinal or oblique yellowish stripes may be recognizable. Pronotum with double, head and wing-case with a single-reticulation. 3.6-4.0 mm. *chinensis* BOHEMAN
- 3' Wing-case with no yellow teeth-like fascia near the base.
- 4'' Upper surface with a single reticulation. Wing-case pale yellow, dark longitudinal markings consist of continuous undulating lines, usually these lines make a pair and frequently interrupted near the base and apex. 3.5-4.3 mm. *sharpi* RÉGIMBART
- 4' Upper surface with a double reticulation. Dark markings on the wing-case fine, flexuous, and not continuous longitudinally. 4.2 mm. *formosanus* TAKIZAWA
- 2' Marking on the wing-case formed of a longitudinal straight line. Prosternal process short.
- 5'' Smaller in shape; the basal portion of the wing-case broadly infuscated. Dark brown, not shiny, head and pronotum more or less reddish. Scutellar portion of the pronotum more projected behind comparing with that of *L. lewisius*. Longitudinal markings on the wing-case not distinctly limited. Reticulation on the head and pronotum single, and more or less polyhedral, while that on the wing-case somewhat round and with very fine punctures. 3.4-3.8 mm. *kobensis* SHARP
- 5' Larger in shape; the basal portion of the wing-case not infuscated. Shiny pale yellow or yellowish brown. The longitudinal markings on the wing-case slightly darker than the ground colour, distinctly limited by brownish black outline, and these markings not reaching to the base of the wing-case. Reticulation on the upper surface simple, more or less larger and polyhedral. 3.9-4.7 mm. *lewisius* SHARP
- 1' Wing-case with no distinct marking. Pale yellow, wing-case more or less brownish, without any marking. Reticulation simple and fine. 4.3-4.9 mm. *difficilis* SHARP

6. *Laccophilus chinensis* BOHEMAN

Laccophilus chinensis BOHEMAN, Eugen. Resa, p. 21 (1858).

This species seems to be rather rare in Formosa comparing with *L. sharpi* RÉGIMBART.

Hab.—Formosa (Kotosho).

Gen. Distr.—Ceylon, China, India, Formosa.

J. N.: *Usucha-tsubu-gengoro*.

7. *Laccophilus difficilis* SHARP

Laccophilus difficilis SHARP, Trans. Ent. Soc. Lond., p. 53 (1873).

In this species the dark marking on the elytra remarkably reduced so as to render the wing-cases nearly dark brown colour except on the sides; in some specimens are seen some traces of oblique pale markings and two longitudinal yellow linear stripes.

Hab.—Hokkaido (Atsubetsu, Barato, Jozankei, Sapporo), Honshu (Gumma, Iwate, Maiko, Misaki, Nagano, Osaka, Shizuoka, Takasago, Tokyo, Yokkaichi), Shikoku (Awa), Kiushu (Kumamoto), Korea (Eitoho).

Gen. Distr.—China, Korea, Japan.

J. N.: *Tsubu-gengoro*.

8. *Laccophilus formosanus* sp. nov.

Pale yellow, head and pronotum with no marking; suture of the elytra and the base of pronotum slightly reddish brown. Linear brownish markings on



Fig. 1

Markings on the left wing-case (*L. formosanus* TAKIZAWA)

the wing-case, not touching the lateral and sutural portions; they are more or less broken up into short pieces so as to form a quite irregular polyhedral circle. The reticulation on the upper surface double and quite distinct. Prosternal process elongated at the extremity; no coxal file. Length 4.2: Width 2.4 mm.

Closely allied to *L. sharpi* and *L. chinensis*. It is rather larger and less convex than in *L. sharpi*, and differs from it by the reticulation of the upper surface which is entirely double, and also by the dark markings on the wing-case which are not continuous longitudinally. It is more allied to *L. chinensis*, but easily distinguished from it by the reticulation of the elytra, and fine, linear, flexuous dark marking of the wing-case.

Hab.—Formosa (2 ♀, 1 ♂ 1912. S. MATSUMURA).

J. N.: *Taiwan-tsubu-gengoro*.

The type specimens are preserved in the Entomological Museum of the Hokkaido Imperial University.

9. *Laccophilus kobensis* SHARP

Laccophilus kobensis SHARP, Trans. Ent. Soc. Lond., p. 53 (1873).

The male has the front and middle tarsi much incrassate.

Hab.—Honshu (Akashi, Misaki, Takasago).

Gen. Distr.—China, Japan.

J. N.: *Kobe-tsubu-gengoro*.

10. *Laccophilus lewisius* SHARP

Laccophilus Lewisius SHARP, Trans. Ent. Soc. Lond., p. 52 (1873).

The front and middle tarsi of the male much incrassate and the last ventral segment more truncated than that of the female. The reticulation on the upper surface is quite distinct.

Hab.—Honshu (Takasago, Tamagawa, Tokyo), Shikoku (Sasayama), Kiushu (Jōno).

Gen. Distr.—China, Japan.

J. N.: *Lewis-tsubu-gengoro*.

11. *Laccophilus sharpi* RÉGIMBART

Laccophilus Sharpi RÉGIMBART, Ann. Soc. Ent. Franc., (6) IX, p. 151 (1889).

Laccophilus flexuosus SHARP (nec AUBÉ), On Aquat. Carn. Col., p. 310 (1880-82).

Laccophilus sharpi var. *similis* RÉGIMBART, Ann. Soc. Ent. Franc., (6) IX, p. 150 (1889).

This species is very variable in colour and markings; in the melanistic specimen the hind coxa and abdomen frequently brownish or blackish, and the fuscous marking along the middle of the anterior margin of pronotum sometimes quite distinct. The undulating longitudinal black lines on the wing-case usually interrupted near the base and apex, but sometimes these lines quite continuous from the base to the apex. On the contrary, in the albinistic or immature specimens the upper surface frequently light yellow, and the undulated longitudinal markings on the wing-case not conspicuous, recognizable only in the posterior portion.

Hab.—Hokkaido (after MATSUMURA, Cat. Ins. Jap. II, Col., p. 53, 1916), Honshu (Hokke, Komaba, Takasago), Kiushu (Kumamoto), Shikoku (Sasayama), Formosa (Koshun, Taichu, Taihoku), Korea (after MORI, Journ. Chosen, Nat. Hist. Soc., No. 14, p. 50, 1932).

Gen. Distr.—Annam, Australia, Burma, China, Cochín-China, India, Japan, Korea, Formosa, Java, Newguinea, Philippines, Sumatra.

J. N.: *Sharp-tsubu-gengoro*.

摘 要

著者は北海道帝國大學昆蟲學教室に保管せられたる標本を基礎とし、數年來日本産龍虱科の昆蟲を研究し來れるが、今回略その完了を見たるを以て、之を今後次順本誌に發表せんとす。

第一報として、本文に扱ひたるものは *Noterinae* 及 *Laccophilinae* の二亞科に屬する十一種類なるが、其の内一は新種なり。

今之等の學名及和名を記さば次の如し。

1. <i>Noterus japonicus</i> SHARP	チャイロケシゲンゴロウ
2. <i>Canthydrus flavus</i> MOTSCHULSKY	キイロコツブゲンゴロウ
3. <i>C. guttula</i> AUBÉ	タイマンコツブゲンゴロウ (新稱)*
4. <i>C. nitidulus</i> SHARP	ツヤコツブゲンゴロウ
5. <i>C. politus</i> SHARP	ムツボシコツブゲンゴロウ
6. <i>Laccophilus chinensis</i> BOHEMAN	ウスチャツブゲンゴロウ
7. <i>L. difficilis</i> SHARP	ツブゲンゴロウ
8. <i>L. formosanus</i> TAKIZAWA (n. sp.)	タイマンツブゲンゴロウ (新種新稱)
9. <i>L. kobensis</i> SHARP	カウベツブゲンゴロウ
10. <i>L. lewisius</i> SHARP	レキスツブゲンゴロウ
11. <i>L. sharpi</i> RÉGIMBART	シャープツブゲンゴロウ

* 本種は著者には不明なるも便宜上上記の如き和名を附し置きたり。