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Volume 12, Number 22

Aquatic Coleoptera I

Arthropoda: Insecta: Coleoptera: Dytiscidae

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National Institute of Biological Resources
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Aquatic Coleoptera I

Arthropoda: Insecta: Coleoptera: Dytiscidae

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The Flora and Fauna of Korea logo was designed to represent six major target groups of the project including vertebrates, invertebrates, insects, algae, fungi, and bacteria.

PREFACE

The biological resources include all the composition of organisms and genetic resources which possess the practical and potential values essential to human live. Biological resources will be firm competition of the nation because they will be used as fundamental sources to make highly valued products such as new lines or varieties of biological organisms, new material, and drugs. As the Nagoya Protocol was adopted in 2010 and entered into force in the 12th Conference of Parties of the Convention on Biological Diversity (CBD) in 2014, it is expected that the competition to get biological resources will be much intensive under the rapidly changed circumstance on the access and benefit sharing of the genetic resources (ABS). To cope with a new international paradigm on all kinds of issues related to biological resources, the Ministry of Environment of Korea enforced a new law called ‘An act on access and benefit sharing of genetic resources’ on August 17th, 2017.

Each nation in the world is investigating and clearing information of native species within its territory in order to secure its sovereignty rights over biological resources. The National Institute of Biological Resources (NIBR) of the Ministry of Environment has published the ‘Flora and Fauna of Korea’ since 2006 to manage biological resources in comprehensive ways and to enhance national competitiveness by building up the foundation for the sovereignty over biological resources. Professional research groups consisting of professors and related experts of taxonomy examined systematically a total of 14,336 species for the past eight years to publish 173 volumes in both Korean and English versions, and two volumes of World Monograph covering 216 species of invertebrates. This year, 13 volumes of the Flora and Fauna of Korea in both Korean and English versions including 1,407 species of invertebrates, insects and vascular plants are additionally published. Flora and Fauna of Korea are the first professional records to describe all the species of the nation in a comprehensive way, and they would contribute to level up the taxonomic capacity.

The NIBR will continue to publish flora and fauna of Korea that will contribute conservation and application of biological resources for successful implementation of the ABS protocol. Finally, I would like to express my sincere appreciation to authors who spared no effort to publish *the Flora and Fauna of Korea*.

President
of the National Institute of Biological Resources

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Genus *Sandracottus* Sharp, 1882

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Nebrioporus hostilis (Sharp, 1884)

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Oreodytes kanoi Kamiya, 1938

Oreodytes natrix (Sharp, 1884)

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Hydrovatus acuminatus Motschulsky, 1859

Hydrovatus subtilis Sharp, 1882

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Genus *Hygrotus* Stephens, 1828

Hygrotus chinensis Sharp, 1882

Hygrotus impressopunctatus (Schaller, 1783)

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Genus *Allopachria* Zimmermann, 1924

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Hyphydrus japonicus vagus Brinck, 1943

Tribe Bidessini Sharp, 1882

Genus *Allodessus* Guignot, 1953

Allodessus megacephalus (Gschwendtner, 1931)

Genus *Hydroglyphus* Motschulsky, 1853

Hydroglyphus coreanus Lee and Ahn, 2016

Hydroglyphus flammulatus (Sharp, 1882)

Hydroglyphus geminus (Fabricius, 1781)

Hydroglyphus japonicus (Sharp, 1873)

Genus *Leiodytes* Guignot, 1936

Leiodytes frontalis (Sharp, 1884)

Leiodytes nicobaricus (Redtenbacher, 1867)

INTRODUCTION

Dytiscidae are one of the largest and most frequently encountered groups of aquatic insects (Alaire and Michat, 2014). This family is cosmopolitan, with distributions all around the world, from both the polar region to the equator (Galewski, 1971). However, most species are found in tropical and subtropical areas (Nilsson, 2015). Some species have a very wide distributional range, including several zoogeographic regions; others, on the contrary, have a very restricted distribution, or are endemic on islands or particular areas. Some others have a circumpolar distribution, and others even inhabit high altitudes up to 5,100 m in mountainous areas (Wilson, 1923; Balke, 2005). In general, they are found in larger numbers in lentic habitats, both permanent and temporary. In lotic habitats they are most frequently found in the wet margins, where the water current is slow or absent and there is an accumulation of sediments and organic debris. Some species are hygropetric, underground or terrestrial. They are always less abundant in waters with large populations of fish (Watts, 1978). Diving beetles live in association with the aquatic vegetation, and for that, are much more numerous in the marginal zones of the water bodies, where the water is shallow and the emergent and/or submergent vegetation is particularly abundant. They also use the terrestrial vegetation when inhabiting floodplain ponds or temporary rain pools. Both larvae and adults are active throughout the year, though they are much less numerous in the winter than in the summer (Watts, 1978). The larvae pass through three morphologically similar instars except for the size. They are predacious and generally very voracious, eating practically every prey (most commonly arthropods or annelids) of a suitable size (Balke, 2005).

Members of the Dytiscidae are characterized by the combination of the following characters: head short, compact, posteriorly retracted; prothoracic glands large, not covered by muscle tissue; metaventrite without transverse suture; metacoxa anteriorly expanded; metacoxal process with large outer lobe; concurrent hind leg movements (Balke, 2005).

The diving beetles contain more than 4,303 species in 171 genera worldwide (Nilsson, 2015) and 1,100 species in 74 genera in seven subfamilies in the Palaearctic region (Nilsson and Hájek, 2015). In Korea, 52 species in 21 genera have been recorded (Jung et al., 2011; Lee and Ahn, 2014; Lee and Ahn, 2015), 301 species in 42 genera from China, 130 species in 32 genera from Japan and 107 species in 20 genera from the Far East of Russia (Nilsson and Hájek, 2015).

It was Kolbe (1886) who recorded the first dytiscid species (*Cybister japonicus* Sharp, *Ilybius apicalis* Sharp, *Platambus pictipennis* Sharp, *Coelambus* sp.) in Korea. About 50 years later, Japanese entomologist, Mori (1932a, b) reported 25 species including a new species (*Copelatus koreanus* Mori). Cho (1969) was the first Korean beetle taxonomist who studied the Korean dytiscid fauna. Since then, a few entomologists (Kim, 1984; Kwon and Seo, 1986) studied Korean dytiscid beetles, mainly in the local fauna. Yoon and Ahn (1986; 1988a; 1988b) recorded 30 species in 16 genera including six species new to Korea with descriptions and illustrations and no taxonomic review has been performed since Park et al. (2008b). Recently, Lee and Ahn

(2008; 2014; 2015; 2016a; 2016b) added new records of seven additional species in Korea.

In this review, 58 dytiscid species are recognized in the Korean Peninsula. We treat in detail the taxonomy of the species and genera of the family Dytiscidae in Korea. We provide detailed keys for identifying the species in each genus. Habitus photographs and illustrations of diagnostic characters of dytiscid species in Korea are provided.

MATERIAL AND METHODS

We studied more than 3,000 adult specimens of Korean Dytiscidae. Most of the materials examined for this work were collected during our fieldworks of the last ten years and deposited specimens in the Chungnam National University Insect Collection (CNUIC), Daejeon, Korea. Also, S. H. Lee's personal collection during his fieldworks from 1988 to 2011 was used for this study. Many type series and voucher specimens were borrowed from the Natural History Museum (NHM), London, United Kingdom, the Hokkaido University Museum (SEHU), Sapporo, Japan and the Ehime University Museum (EUMJ), Matsuyama, Japan. Specimens are usually prepared in pinned specimens for the observation of morphological characters, and we used only part in ethanol-preserved collections.

Habitus photographs were prepared from single or multilayered photographs taken with an Olympus DP71 camera with several images amalgamated using Helicon Focus 5.3 (Helicon Soft Ltd, Kharkov, Ukraine) and edited by Adobe Photoshop CS4 (Adobe Systems, San Jose, CA, USA). Dry specimens for SEM photographs were sputter-coated with platinum (Cressington 208 auto sputter coater, Hertfordshire, UK) and examined under an SEM (S-4800, Hitachi, Tokyo, Japan).

The terms of taxonomic characters and measurements of specimens mainly followed Roughley and Larson (2001) and Balke (2005). The subdivision of China and Russia follows the standards of Löbl and Smetana (2003). We used Roman numerals for segments of tagmata and Arabic numerals for articles of appendages. Permanent microscope slides were prepared using the techniques described by Hanley and Ashe (2003).

The arrangement and concept of subfamilies, tribes and genera are those of Miller and Bergsten (2014). The listings of names of species within genera are alphabetical. Diagnoses and keys for higher taxa are based only on Korean specimens and some literature. Therefore, we provide detailed description of adults of the species although there is some redundancy of characters. When we write that species 'a' is very similar to species 'b', we mean that adults of the two species are very similar. Primary distributional entries are provided according to the names of countries where each species is found. Korea is listed first, and eastern Asian countries alphabetically, and then all other countries alphabetically as well. Secondary entries (if any) are the subunits of large countries such as China and Russia. We used the following abbreviation of provinces in Korea: PB, Pyeonganbuk-do; PN, Pyeongannam-do; GW, Gangwon-do; GG, Gyeonggi-do; CB, Chungcheongbuk-do; CN, Chungcheongnam-do; GB, Gyeongsangbuk-do; GN, Gyeongsangnam-do; JB, Jeollabuk-do; JN, Jeollanam-do; and JJ, Jeju-do.

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TAXONOMIC NOTES

Phylum Arthropoda von Siebold, 1848

Class Insecta Linnaeus, 1758

Order Coleoptera Linnaeus, 1758

Suborder Adephaga Schellenberg, 1806

Family Dytiscidae Leach, 1815

Dytiscides Leach, 1815: 84.

TYPE: *Dytiscus* Linnaeus, 1758.

SPECIES: Over 4,300 (58 in Korea).

DISTRIBUTION: Worldwide.

KOREA: PB, PN, GW, GG, CB, CN, GB, GN, JB, JN, JJ.

Key to the subfamilies of the Dytiscidae in Korea

1. Eyes not emarginate on anterior margin 2
 - Eyes emarginate on anterior margin 3
2. Metatibia about 1/2 times as long as metafemur Cybistrinae
 - Metatibia about 2/3 to 3/4 times as long as metafemur Dytiscinae
3. Prosternum and prosternal process not on same plane; pro- and mesotarsi pseudotetramerous with tarsomere 4 small Hydroporinae
 - Prosternum and prosternal process on same plane; pro- and mesotarsi distinctly pentamerous 4
4. Scutellum not visible; postero-lateral angle of metatarsomeres 1–4 strongly lobed Laccophilinae
 - Scutellum visible; postero-lateral angle of metatarsomeres 1–4 not lobed 5
5. Elytron with longitudinal striae; metacoxal line very close to medial line Copelatinae
 - Elytron without longitudinal striae; metacoxal line not close to medial line 6
6. Metafemur with group of setae on antero-ventral part Agabinae
 - Metafemur without group of setae on antero-ventral part Colymbetinae

Subfamily Agabinae Thomson, 1867

TYPE: *Agabus*.

SPECIES: over 310 (8 in Korea).

DISTRIBUTION: Worldwide.

KOREA: PB, GW, GG, CB, CN, GB, GN, JB, JN, JJ.

Tribe Agabini Thomson, 1867

DIAGNOSIS: Clypeus with marginal foveae on antero-lateral angle. Metafemur and metatibia without natatory setae on ventral margins (Larson, 1987; Nilsson, 1996; 2000).

Key to the genera of the Agabini in Korea

1. Lateral bead of prosternal process broadly inflated *Platambus*
 – Lateral bead of prosternal process narrowly inflated 2
2. Metatarsal claws unequal (Pl. 4B) in length; female ovipositor with serrated lateral ridges *Ilybius*
 – Metatarsal claws subequal (Pl. 2B) in length; female ovipositor without serrated lateral ridges ... *Agabus*

Genus *Agabus* Leach, 1817

Genus *Agabus* Leach, 1817

Agabus Leach, 1817: 68. Type species: *Dytiscus serricornis* Paykull, 1799.

DIAGNOSIS: Head with linear grooves on the clypeus. Metatarsal claws subequal in length. Female anal sternite with apex evenly rounded or truncate medially (Larson, 1987; Nilsson, 1996).

Key to the subgenera of the *Agabus* in Korea

1. Median lobe of aedeagus with ventral tooth in subapical part *Acatodes*
 – Median lobe of aedeagus without ventral tooth in subapical part *Gaurodytes*

Subgenus *Acatodes* Thomson, 1859

Key to the species of the *Acatodes* in Korea

1. Body smaller than 8.0 mm 2
- Body larger than 8.0 mm 3
2. Median lobe slightly bulbed at anterior fifth *A. (Acatodes) congener*
- Median lobe distinctly bulbed at anterior seventh *A. (Acatodes) japonicus*
3. Lateral parts of pronotum yellow *A. (Acatodes) regimbarti*
- Lateral parts of pronotum reddish brown to black *A. (Acatodes) conspicuus*

1. *Agabus (Acatodes) congener* (Thunberg, 1794)

Dytiscus congener Thunberg, 1794: 75. Type locality: Sweden: Uppland.

Agabus congener: Sharp, 1882: 454; Zimmermann, 1919: 210.

Agabus funkii Sedlitz, 1887: 92.

Agabus daisetsuzanus Kamiya, 1938a: 34; Zaitzev, 1953: 271.

Gaurodytes congener: Zaitzev, 1953: 247.

DISTRIBUTION: **Asia:** Korea, China (Jilin, Qinghai), Japan, Russia (East Siberia, Far East, West Siberia), Mongolia, and widely distributed in Palaearctic region.

REGION: Palaearctic.

KOREA: Unknown.

KOREAN RECORDS: *Agabus congener*: Kwon and Suh, 1986: 95; Kim et al., 1994: 133; Cho and Park, 2010: 95.

REMARKS: This species has been recorded in Korea by Kwon and Suh (1986), Kim et al. (1994) and Cho and Park (2010), only in their checklists without any taxonomic comments. We could not find any Korean specimens and the occurrence of this species in Korea is suspicious. However, its occurrence in Korea is probable because it is known from neighboring countries [China, Japan and Russia (Far East)]. Therefore, we cite this species here based on the previous records until we will find clear evidence.

2. *Agabus (Acatodes) conspicuus* Sharp, 1873 (Pl. 1)

Agabus conspicuus Sharp, 1873: 48; Régimbart, 1899: 277; Zimmermann, 1930: 97; Mori, 1932a: 3; Kamiya,

1938: 33; Cho, 1969: 177; Satô, 1983: 164. Type locality: Japan: Osaka, Nagasaki.

Platynectes procerus Régimbart, 1899: 281.

Agabus deplanatus Guignot, 1952: 18.

DESCRIPTION: Length 9.5–11.5 mm. Body oval, convex, with microreticulation.

Color: Head black with two reddish brown spots in posterior part; pronotum black with reddish brown band on lateral margin; elytra reddish brown to black. Ventral surface mostly black; antenna, mouthparts, hypomera, epipleura, legs reddish brown.

Head: Head (Pl. 1B) subtrapezoidal, about 1.8 times as wide as long, widest across eyes, with sparse setae on clypeal grooves and around eyes. Anterior margin of clypeus straight. Width of frons about 3.0 times as wide as eye. Antenna long and slender; antennomeres longer than wide; 1 longest, subparallel; 2–10 broad apically; 2–11 with a few setae on subapical part; 11 long oval, slightly longer than 10, widest at apical third. Labrum with long setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomeres 1–3 broad apically; 1 shortest; 2 slightly longer than 1; 3 as long as 2; 4 long oval, longest, 1.5 times as long as 3, widest at middle, apex truncate, bifid. Labial palpomeres 1–2 broad apically; 1 shortest; 2 about 3.0 times as long as 1, protruding at apical third; 3 long oval, as long as 2, apex truncate, bifid. Gula subquadrate, slightly convex; gular suture non-parallel, continuous. Mentum widest at posterior corners; antero-medial margin slightly rounded; antero-lateral part protruded; anterior corners rounded; lateral margin rounded; posterior corner rounded; posterior margin slightly rounded.

Thorax: Pronotum trapezoidal, widest at posterior corners, about 3.0 times as wide as long, 1.5 times as wide as head; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner rectangular; posterior margin bisinuate. Elytra rounded apically, widest at middle, wider than pronotum. Prosternum carinate medially and with compact setae on anterior margin. Prosternal process long and straight, carinate medially, with sparse setae on medial part; posterior part acuminate, carinate, with thin lateral bead, apex acute. Metaventrite convex, with longitudinal suture in postero-medial part. Procoxa rounded, with sparse setae. Protrochanter subtriangular, with sparse setae on ventral part. Profemur with setae on dorsal part with a row of spines on ventral margin. Protibia with a row of spines on dorsal and ventral parts. Protarsomere 1 about 3.0 times as long as 2; 2 as long as 3; 4 slightly longer than 3; 5 longest, 2.0 times as long as 4. Protarsal claws 1/2 times shorter than tarsomere 5. Mesocoxa rounded, with compact setae on medial part. Mesotrochanter subtriangular, with sparse setae on ventral part. Mesofemur with sparse setae, with a row of spines on ventral margin. Mesotibia with a row of spines on dorsal and ventral parts. Mesotarsomere 1 about 3.0 times as long as 2; 2 as long as 3; 4 slightly longer than 3; 5 longest, 2.0 times as long as 4. Mesotarsal claws 1/2 times shorter than tarsomere 5. Metacoxal process with sparse setae; postero-lateral part rounded, apex bifid. Metatrochanter semicircular. Metafemur with sparse punctures. Metatibia with a rows of spines on dorsal and ventral parts, with 3–4 anteroventral spines; metatibial largest spine slightly longer than tarsomere 1. Metatarsomere 1 longest, 2.5 times as long as 2;

2 slightly longer than 3; 3 slightly longer than 4; 4 shortest; 5 about 1.2 times as long as 4. Metatarsal claw equal, 0.5 times shorter than tarsomere 5.

Abdomen: Sternites V–VI with sparse setae on medial part; sternite VII with long setae in posterior part. Median lobe (Pl. 1C) of aedeagus long and slender, widest at base, curved at middle, with subapical spine curved ventrally, apex acute. Paramere subtriangular, with long setae on lateral margin.

TYPE MATERIAL: Syntype, 1♂ (NHM), with labels as follows: “*Agabus conspicuus*. ♂ Type D. S. Japan. G. Lewis 803., Type H.T., Japan. G. Lewis. Sharp Coll. 1905–313., *Agabus conspicuus* ♂ Type D. S. Type 803 *Agabus conspicuus* Japan”.

SPECIMENS EXAMINED: SOUTH KOREA: Gangwon Prov.: 1♀, Samcheok-si, Nogok-myeon, Maeub-stream, 19 v 1991, SH Lee, *ex stream*; Gyeongbuk Prov.: 1♂, Munkyeong, 9 viii 1978, YJ Kwon, *ex pool*; 1♀, Uljin-gun, Seo-myeon, Sogwang-ri, 22 viii 1987, SH Lee, *ex pond*; 1♀, Yeongdeok-gun, Opo-ri, 26 vii 1991, SH Lee, *ex pond*; Gyeongnam Prov.: 1♀, Yangsan-gun, Daeseok-pond, 2 x 1988, SH Lee, *ex pond*; Jeonbuk Prov.: 1♂2♀♀, Imsil-gun, Samgyeo-myeon, 14 viii 1988, SH Lee.

DISTRIBUTION: Korea, Japan, Russia (Far East).

REGION: Palaearctic.

KOREA: GW, GB, GN.

KOREAN RECORDS: *Agabus conspicuus*: Mori, 1932a: 3; Mochizuki and Tsunekawa, 1937: 78; Kamiya, 1938b: 78; Mochizuki and Matsui, 1939: 56; Cho, 1957: 199; 1969: 177; Kim and Nam, 1982: 25; Lee et al., 1985: 401; Kwon and Suh, 1986: 95; Yoon and Ahn, 1988b: 253; Kim et al., 1994: 133; Lee, 1995: 13; Nilsson, 1995: 597; 2003b: 36; 2010: 1; 2012: 1; Hua, 2002: 35; Cho and Park, 2010: 95.

3. *Agabus (Acatodes) japonicus* Sharp, 1873 (Pl. 2)

Agabus japonicus Sharp, 1873: 50; 1882: 501; Régimbart, 1899: 279; Kamiya, 1938a: 80; Feng, 1932: 27; Li, 1992: 35; Mori and Kitayama, 1993: 116; Nilsson, 1995: 51. Type locality: Japan: Hiogo, Nagasaki.

Gaurodytes japonicus: Zimmermann, 1934: 213.

Gaurodytes japonicus falkenstromi Zaitzev, 1953: 254.

DESCRIPTION: Length 6.5–7.7 mm. Body oval, convex, with microreticulation.

Color: Head black with two reddish brown spots on posterior part; pronotum black; elytron brown with yellow band on anterior parts. Ventral surface mostly black; antenna, mouthparts, hypomera, epipleura yellowish brown.

Head: Head subtrapezoidal, about 1.8 times as wide as long, widest across eyes, with sparse setae on clypeal grooves and around eyes. Anterior margin of clypeus straight. Width of frons about 5.0 times as wide

as eye. Antenna long and slender; antennomeres longer than wide; 1–10 broad apically; 2–11 with a few setae on subapical part; 1 longest; 11 long oval, 1.2 times as long as 10, widest at middle. Labrum with long setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomeres 1–3 broad apically; 1 shortest; 2 about 2.0 times as long as 1; 3 slightly longer than 2; 4 long oval, longest, 2.0 times as long as 3, widest at middle, apex truncate, bifid. Labial palpomeres 1–2 broad apically; 1 shortest; 2 about 1.5 times as long as 1, protruded at apical third; 3 long oval, as long as 2, apex truncate, bifid. Gula hexagonal, convex; gula suture non-parallel, continuous. Mentum widest at posterior corner; antero-medial margin slightly bisinuate; antero-lateral part protruded; anterior corner rounded; lateral margin rounded; posterior corner rounded; posterior margin slightly rounded.

Thorax: Pronotum trapezoidal, widest at posterior corners, about 3.5 times as wide as long, 1.85 times as wide as head; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner rectangular; posterior margin slightly rounded. Elytra rounded apically, widest at middle, wider than pronotum. Prosternum carinate medially and with compact setae on anterior margin. Prosternal process long and straight, convex medially, with sparse setae on medial part; posterior part acuminate, slightly convex, with thin lateral bead, apex acute. Metaventrite convex, with longitudinal suture on postero-medial part. Procoxa rounded, with sparse setae. Protrochanter subtriangular, with sparse setae on ventral part. Profemur with setae on dorsal part, with a row of spines on ventral margin. Protibia with a row of spines on dorsal and ventral parts. Protarsomere 1 about 3.0 times as long as 2; 2 as long as 3; 4 slightly longer than 3; 5 longest, 2.0 times as long as 4. Protarsal claws 1/2 times shorter than tarsomere 5. Mesocoxa rounded, with compact setae on medial part. Mesotrochanter subtriangular, with sparse setae on ventral part. Mesofemur with sparse setae, with a row of spines on baso-ventral margin. Mesotibia with a row of spines on dorsal and ventral parts. Mesotarsomere 1 about 3.0 times as long as 2; 2 as long as 3; 4 slightly longer than 3; 5 longest, 2.0 times as long as 4. Mesotarsal claws 1/2 times shorter than tarsomere 5. Metacoxal process with sparse setae; postero-lateral part rounded, apex bifid. Metatrochanter semicircular. Metafemur with sparse punctures. Metatibia with a row of spines on dorsal and ventral parts, with 4 anteroventral spines; metatibial largest spine slightly shorter than tarsomere 1. Metatarsomere (Pl. 2B) 1 longest, 2.5 times as long as 2; 2 slightly longer than 3; 3 slightly longer than 4; 4 shortest; 5 about 1.5 times as long as 4. Metatarsal claws equal, 1/2 times shorter than tarsomere 5.

Abdomen: Sternites V–VI with sparse setae on medial part; sternite VII with long sparse setae on posterior part. Median lobe (Pl. 2C) of aedeagus long and slender, widest at base, curved at middle, bulbed at anterior sixth, with subapical spine curved ventrally, apex acute. Paramere subtriangular, with long setae on lateral margin.

TYPE MATERIAL: Syntype, 1♂ (NHM), with labels as follows: “*Agabus japonicus*. ♂ Type D. S., *Agabus japonicus* ♂ Type D. S., Type, Type 780. *Agabus japonicus*, Sharp Coll 1905–313., Japan. Lewis.”

SPECIMENS EXAMINED: SOUTH KOREA: Chungbuk Prov.: 3♂♂3♀♀, Cheongju-si, Heungdeok-gu,

Gangseo-dong, 22 x 2005, DH Lee, *ex pond*; 3♂♂8♀♀, same data as former except for 23 x 2005; 6♂♂4♀♀, same data as former except for Hyuam-dong, 1 vi 2005; 5♂♂3♀♀, same data as former except for 7 v 2005; 6♂♂8♀♀, same data as former except for 15 x 2005; 3♂♂3♀♀, same data as former except for Jidong-dong, 16 x 2005; 2♀♀, same data as former except for Seochon-dong, 16 x 2005; 1♂, Cheongwon-gun, Doldarimot, 17 viii 1989, SH Lee, *ex pond*; 1♂, Jungwon-gun [=Chungju-si], Jisil-ri, 16 vii 1987, SH Lee, *ex pond*; 1♂2♀♀, Okcheon-gun, Yongam-pond, 29 x 1989, SH Lee; 1♀, Yeongdong-gun, Simcheon-myeon, Sinjeong2-ri, 14 vi 2004, DH Lee, JI Yeon, *ex pond*; Chungnam Prov.: 11♂♂11♀♀, Boryeong-si, Jupomyeon, 25 viii 1988, SH Lee; 1♀, Buyeo-gun, Gyuam-myeon, Gyuam-ri, 12 viii 2005, DH Lee, *ex stream pool*; 1♀, Buyeo-gun, Mt. Mansusan, 19 viii 1999, KJ Ahn, *at light*; 1♀, Daejeon-si, Seongbuk-dong, Bangdong-reservoir, 5 viii 2000, HJ Kim, *at light*; 1♂2♀♀, Daejeon-si, Yuseong-gu, Juk-dong, 22 x 2005, DH Lee, *ex pond*; 1♀, same data as former except for Gung-dong, 7 v 2007, *ex under wet leaves*; 5♂♂6♀♀, Yesan-gun, Sudeok-temple, 26 vii 1995, SH Lee; Gangwon Prov.: 1♂, Samcheok-si, Maeub-stream, 19 v 1991, SH Lee, *ex stream pool*; 1♂, Yanggu-gun, Dongsu-ri, 2 viii 1991, SH Lee, *ex pond*; Gyeongbuk Prov.: 1♂, Cheongson-gun, Budong-myeon, Sangeui-ri, Mt. Juwangsang, 14 vi 2006, DH Lee, *ex stream*; 1♂, Gyeongju-si, Pumsan-pond, 6 vi 1991, SH Lee, *ex pond*; 3♂♂, Pohang-si, Jigok-dong, 26 iv 1990, SH Lee; 1♂, Uljin-gun, Goseong-ri, 22 viii 1987, SH Lee, *ex pond*; 1♀, Ulneung-gun, 1992, SH Lee; 1♂, Yeongdeok-gun, Opo-ri, 26 vii 1991, SH Lee, *ex pond*; 1♀, Yeongil-gun [=Pohang-si], Duma-ri, 9 v 1988, SH Lee, *ex pond*; 1♀, same data as former except for Imam-ri, iv 1989; 1♀, Yeongpung-gun [=Yeongju-si], Hwayeon-pond, 2 viii 1988, SH Lee, *ex pond*; Gyeonggi Prov.: 3♂♂5♀♀, Seoul-si, Seoul National University, 4 vi 1986, DG Lee, *ex pond*; Gyeongnam Prov.: 1♂, Changnyeong-gun, Jikyo-pond, 1 ix 1988, SH Lee, *ex pond*; 1♀, Geoje-si, Geoje-pond, 28 vii 2009, SH Lee; 1♂1♀, Sancheong-gun, Matgol-pond, 7 vi 2009, SH Lee; 2♂♂1♀, Hadong-gun, Bukcheon-myeon, Jikjeon-pond, 11 vi 2010, SH Lee; 1♀, Haman-gun, Daepyeong-swamp, 22 v 1988; Jeju Prov.: 1♂, Bukjeju-gun, Gosan-pond, 23 vii 1990, SH Lee, *ex pond*; 1♂, Bukjeju-gun, Jocheon-eub, Gyora-ri, 22 v 2006, DH Lee, *ex stream* (1♂, on slide); 2♀♀, Bukjeju-gun, Jocheon-eub, Seonheul-ri, Dongbaek-garden, 2 iii 2007, DH Lee, *ex pond*; 5♂♂3♀♀, Jeju-si, Saekdal-dong, 1100goji, 12 x 2006, DH Lee, *ex mountain stream*; 4♂♂4♀♀, same data as former except for 8 xi 2006; 2♂♂1♀, same data as former except for 31 v 2007; 2♂♂4♀♀, Jeju-si, Orai-dong, Nature rest forest, 30 v 2007, DH Lee, *ex mountain stream pool*; Jeonbuk Prov.: 1♂1♀, Gochang-gun, Gochang-eub, Wolgok-ri, 22 v 2007, TK Kim, YH Kim, *ex valley margin*; 2♂♂2♀♀, Imsil-gun, Samgyeo-myeon, 14 viii 1988, SH Lee; 1♀, Jeongju-si [=Jeongeub-si], Yeonji-dong, 4 viii 1990, SH Lee, *ex pond*; 3♂♂, Muju-gun, Guchon-dong, 4 viii 1994, SH Lee; 1♂3♀♀, Namwon-si, Sandong-myeon, Yeonhwa-pond, 26 iv 2009; Jeonnam Prov.: 1♂, Gurye-gun, Cheoneun-temple, 4 vi 1983, SH Lee, *ex pond*.

DISTRIBUTION: Korea, China (Fujian, Guanxi, Heilongjiang, Hubei, Jiangsu, Jiangxi, Liaoning, Sichuan, Yunnan), Japan, Russia (Far East), Taiwan.

REGION: Palaearctic.

KOREA: GW, GG, CB, CN, JB, JN, GB, GN, JJ.

KOREAN RECORDS: *Agabus japonicus*: Mori, 1932a: 3; Kamiya, 1938b: 81; Ishii, 1940: 42; Cho, 1957: 199; Cho, 1969: 178; Kim and Nam, 1982: 25; Lee et al., 1985: 402; Kwon and Suh, 1986: 95; Yoon, 1988: 588; Yoon and Ahn, 1988b: 253; Lee et al., 1992b: 51; Kim et al., 1994: 133; Lee, 1994: 16; 1995: 13; Nilsson, 1995: 60; Hua, 2002: 35; Park et al., 2008a: 227; Cho and Park., 2010: 95. *Gaurodytes japonicus* Sharp: Kim, 1984: 205.

4. *Agabus (Acatodes) regimbarti* Zaitzev, 1906 (Pl. 3)

Agabus regimbarti Zaitzev, 1906: 174; Feng, 1932: 28. Type locality: India, China: inner part.

Gaurodytes regimbarti: Zimmermann, 1934: 212; Zaitzev, 1953: 253.

Agabus brunneus Kamiya, 1935: 8.

Agabus orientalis Kamiya, 1938a: 36.

Agabus browni: Mori and Kitayama, 1993: 115 (misidentification).

DESCRIPTION: Length 9.0–11.5 mm. Body oval, convex, with microreticulation.

Color: Head black with two reddish brown spots on posterior part; pronotum black with yellow band on lateral part; elytra black with yellow band on antero-lateral part. Ventral surface mostly black; antenna, mouthparts, legs reddish brown; hypomera, epipleura yellowish brown.

Head: Head subtrapezoidal, about 1.8 times as wide as long, widest across eyes, with sparse setae on clypeal grooves and around eyes. Anterior margin of clypeus straight. Width of frons about 3.0 times as wide as eye. Antenna long and slender; antennomeres longer than wide; 1 longest, subparallel; 2–10 broad apically; 2–11 with few a setae on subapical part; 11 long oval, slightly longer than 10, widest at apical third. Labrum with long setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomeres 1–3 broad apically; 1 shortest; 2 about 1.5 times as long as 1; 3 as long as 2; 4 long oval, longest, 2.0 times as long as 3, widest at middle, apex truncate, bifid. Labial palpomeres 1–2 broad apically; 1 shortest; 2 about 3.0 times as long as 1, protruding at apical third; 3 long oval, slightly shorter than 2, apex truncate, bifid. Gula quadrate, slightly convex; gula suture parallel, continuous. Mentum widest at posterior corner; antero-medial margin slightly rounded; antero-lateral part protruded; anterior corner rounded; lateral margin rounded; posterior corner rounded; posterior margin slightly rounded.

Thorax: Pronotum trapezoidal, widest at posterior corners, about 3.0 times as wide as long, 1.5 times as wide as head; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner rectangular; posterior margin bisinuate. Elytra rounded apically, widest at middle, wider than pronotum. Prosternum carinate medially and with compact setae on anterior margin. Prosternal process long and straight, convex medially, with sparse setae on medial part; posterior part acuminate, convex, with thin lateral bead, apex acute. Metaventricle convex, with longitudinal suture on

postero-medial part. Procoxa rounded, with sparse setae. Protrochanter subtriangular, with sparse setae on ventral part. Profemur with setae on dorsal part with a row of spines on ventral margin. Protibia with a row of spines on dorsal and ventral parts. Protarsomere 1 about 3.0 times as long as 2; 2 as long as 3; 4 slightly longer than 3; 5 longest, 2.0 times as long as 4. Protarsal claws 1/2 times shorter than tarsomere 5. Mesocoxa rounded, with compact setae on medial part. Mesotrochanter subtriangular, with sparse setae on ventral part. Mesofemur with sparse setae, with a row of spines on ventral margin. Mesotibia with a row of spines on dorsal and ventral parts. Mesotarsomere 1 about 3.0 times as long as 2; 2 as long as 3; 4 slightly longer than 3; 5 longest, 2.0 times as long as 4. Mesotarsal claws 1/2 times shorter than tarsomere 5. Metacoxal process with sparse setae; postero-lateral part rounded, apex bifid. Metatrochanter semicircular. Metafemur with sparse punctures. Metatibia with a row of spines on dorsal and ventral parts, with 2–7 anteroventral spines; metatibial largest spine slightly shorter than tarsomere 1. Metatarsomere 1 longest, 2.5 times as long as 2; 2 slightly longer than 3; 3 slightly longer than 4; 4 shortest; 5 about 1.2 times as long as 4. Metatarsal claw equal, 1/2 times shorter than tarsomere 5.

Abdomen: Sternites V–VI with sparse setae on medial part; sternite VII with long setae on posterior part. Median lobe (Pl. 3B) of aedeagus long and slender, widest at base, curved at middle, with straight subapical spine, apex acute. Paramere subtriangular, with long setae on lateral margin.

SPECIMENS EXAMINED: SOUTH KOREA: Chungbuk Prov.: 1 ♀, Cheongju-si, Heungdeok-gu, Gangseo-dong, 4 v 2005, D.-H. Lee, *ex pond*; 1 ♀, same data as former except for Hyuam-dong, 1 vi 2005; 1 ♀, Jungwong-gun [Chungju-si], Jisil-pond, 17 viii 1989, SH Lee, *ex pond*; 1 ♂, Okcheon-gun, Yongam-pond, 29 x 1989, SH Lee, *ex pond*; 5 ♂♂2 ♀♀, Yeongdong-run, Simcheon-myeon, Sinjeong2-ri, 14 vi 2004, DH Lee, JI Yeon, *ex pond*; Chungnam Prov.: 1 ♂, Daejeon-si, Sintanjin, 15 ix 1982, Kang, *ex pond*; 1 ♀, Daejeon-si, Yuseong-gu, Juk-dong, 17 v 2004, DH Lee, *ex rice field*; 1 ♂2 ♀♀, same data as former except for 18 v 2004; 1 ♂5 ♀♀, Geumsan-gun, Jewon-myeon, Daesan-ri, 18 vi 2004, DH Lee, *ex stream pool*; 1 ♀, Gongju-si, Banpo-myeon, Hakbong-ri, 10 ix 2005, DH Lee, *ex pond*; Gangwon Prov.: 1 ♂, Cheorwon-gu, Hak-pond, 15 ix 1990, SH Lee, *ex pond*; 1 ♀, Hwacheon-gun, Gulun-pond, 30 vii 1991, SH Lee, *ex pond*; 1 ♂, Samcheok-si, Maeub-stream, 19 v 1991, SH Lee, *ex stream pool*; 1 ♂, Yanggu-gun, Dongsu-ri, 2 viii 1991, SH Lee, *ex pond*; Gyeongbuk Prov.: 1 ♂, Dalseong-gun, Dalchang-pond, 8 x 1988, SH Lee, *ex pond*; 1 ♂, Gyeongju-si, Pumsan-pond, 17 vi 1990, SH Lee, *ex pond*; 1 ♀, Munkyeong, 9 viii 1978, YJ Kwon, *ex pool*; 1 ♂1 ♀, Pohang-si, Jigok-dong, 26 iv 1990, SH Lee; 1 ♂2 ♀♀, Ulneung-gun, Buk-myeon, Hyeonmu-bong, N37°31'16.12", E130°48'42.88", 206 m, 19 v 2011, DH Lee, HM Lim, *ex pond*; 1 ♀, Yeongcheon-gun, Yeongdo-dong, 8 x 1988, SH Lee, *ex pond*; 1 ♀, Yeongdeok-gun, Opo-ri, 26 vii 1991, SH Lee, *ex pond*; Gyeonggi Prov.: 1 ♂, Gwangju-si, Jungang-reservoir, 20 viii 1989, SH Lee; 1 ♂, Incheon-si, Ganghwa-gun, Hwado-myeon, Dongmak-ri, 18 vi 2005, DH Lee, *ex rice field*; Gyeongnam Prov.: 2 ♂♂2 ♀♀, Changnyeong-gun, Saji-pond, 17 vi 1990, SH Lee; 1 ♀, Geoje-si, Geoje-pond, 28 vii 2009, SH Lee; Jeju Prov.: 1 ♂, Bukjeju-eub, Jocheon-eub, Gyorae-ri, 22 v 2006, DH Lee, *ex pond*; 3 ♀♀, Bukjeju-gun, Jocheon-eub, Seonheul-ri, 12 vi 2005, DH

Lee, *ex pond*; 1♂, same data as former except for 22 v 2006; 1♀, Bukjeju-gun, Jongdal-ri, 27 vii 1990, SH Lee, *ex pond*; 1♀, Namjeju-gun, Namwon-eub, Sinrye-ri, 12 vi 2005, DH Lee, *ex mountain stream*; Jeonbuk Prov.: 1♀, Imsil-gun, Samgyeo-myeon, 14 viii 1988, SH Lee.

DISTRIBUTION: Korea, China (Beijing, Gansu, Guizhou, Hebei, Heilongjiang, Jiangxi, Liaoning, Sichuan, Shaanxi, Shandong, Shanxi, Xinjiang, Yunnan), India.

REGION: Palaearctic.

KOREA: GW, GG, CB, CN, JB, GB, GN, JJ.

KOREAN RECORDS: *Agabus regimbarti*: Park et al., 2008a: 226; Nilsson, 2012: 2 (North Korea). *Agabus amoenus*: Kwon and Suh, 1986: 95; Yoon, 1988: 587; Kim et al., 1994: 133; Cho and Park., 2010: 94 [misidentification of *A. regimbarti*]. *Agabus browni*: Cho et al., 1985: 19; Kwon and Suh, 1986: 95; Yoon, 1988: 590; Yoon and Ahn, 1988b: 254; Lee et al., 1992b: 51; Park and Kim, 1993: 110; Kim et al., 1994: 133; Lee, 1994: 16; Lee, 1995: 12; Nilsson, 2003b: 36 (North Korea) [misidentification of *A. regimbarti*].

Subgenus *Gaurodytes* Thomson, 1859

Key to the species of the *Gaurodytes* in Korea

1. Median lobe not curved at a right angle, slightly bulbed at anterior fifth *A. (Gaurodytes) adpressus*
- Median lobe curved at a right angle, distinctly bulbed at anterior fifth *A. (Gaurodytes) udege*

5. *Agabus (Gaurodytes) adpressus* Aubé, 1837

Agabus adpressus Aubé, 1837: 169; Sharp, 1882: 518; Zimmermann, 1930: 183; Kamiya, 1938a: 33; Cho, 1969: 177. Type locality: Russia: Siberia.

Agabus haeffneri Aubé, 1837: 170; Zimmermann, 1934: 47.

Colymbetes subquadratus Motschulsky, 1859: 102.

Gaurodytes angusticollis Sahlberg, 1871: 408.

Agabus sahlbergi Sharp, 1882: 517; Mori, 1932a: 4.

Agabus solus Leech, 1949: 248.

DISTRIBUTION: Asia: Korea, Kazakhstan, Mongolia, Russia (East Siberia, West Siberia), Europe: Finland, Norway, Russia (North European territory).

REGION: Nearctic, Palaearctic.

KOREA: Unknown.

KOREAN RECORDS: *Agabus adpressus*: Kamiya, 1938b: 77; 1940: 122; Cho, 1957: 199; Cho, 1969: 177; Kwon and Suh, 1986: 94; Yoon, 1988: 587; Yoon and Ahn, 1988b: 253; Kim et al., 1994: 133; Cho and Park, 2010: 94. *Agabus sahlbergi* Sharp: Mori, 1932b (Synonym of *A. adpressus*).

REMARKS: This species has been recorded in Korea by Kamiya (1938b; 1940), Kwon and Suh (1986), only in their checklists without any taxonomic comments. We could not find any Korean specimens and the occurrence of this species in Korea is suspicious. Therefore, we cite this species here based on the previous records until we will find clear evidence.

6. *Agabus (Gaurodytes) udege* Nilsson, 1994

Agabus udege Nilsson, 1994: 170. Type locality: Russia: Primorye.

DISTRIBUTION: Korea (North), China (Jilin), Russia (Far East).

REGION: Eastern Palaearctic.

KOREA: North Korea.

KOREAN RECORDS: *Agabus udege*: Nilsson, 2010: 7; 2012: 7.

REMARKS: This species has been recorded only in North Korea by Nilsson (2010). We could not find any South Korean specimen but cited this species based on the previous records.

Genus *Ilybius* Erichson, 1832

Genus *Ilybius* Erichson, 1832

Ilybius Erichson, 1832: 18; Sharp, 1882: 890; Feng, 1932: 115; Kamiya, 1938a: 39; Vazirani, 1970: 345.

Type: *Dytiscus fenestratus* Fabricius, 1781.

DIAGNOSIS: Pronotum with continuous fine line along anterior margin. Metatarsal claws unequal. Female sternite VII emarginate medially. Female ovipositor with serrate lateral ridge (Kamiya, 1940; Nilsson, 2000).

Key to the species of the *Ilybius* in Korea

1. Elytron with yellow to reddish brown band on lateral margin; anterior part of median lobe abruptly slender and parallel *I. apicalis*

- Elytron without yellowish brown band on lateral margin; anterior part of median lobe bulbed
 *I. chishimannus*

7. *Ilybius apicalis* Sharp, 1873 (Pl. 4)

Ilybius apicalis Sharp, 1873: 51; Régimbart, 1899: 289; Kamiya, 1940: 124; Feng, 1932: 29; Zaitzev, 1953: 282; Lee et al., 1992b: 51; Li, 1992: 35; Mori and Kitayama, 1993: 120. Type locality: Japan: Hiogo, Simabara.

Ilybius intermediatus Feng, 1936: 10.

DESCRIPTION: Length 8.0–9.5 mm. Body oval, convex, with microreticulation.

Color: Head dark brown with two reddish brown spots on posterior part; pronotum black with yellowish brown band on lateral margins; elytra black with yellow to reddish brown band on lateral margins. Ventral surface mostly reddish brown.

Head: Head semicircular, about 2.0 times as wide as long, widest across eyes, with sparse setae on clypeal grooves. Anterior margin of clypeus short, straight. Width of frons about 3.0 times as wide as eye. Antenna long and slender; antennomeres longer than wide; 1–10 broad apically, with a few setae on subapical part; 11 long oval, about 1.2 times as long as 10, widest at middle. Labrum with long setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomeres 1–3 broad apically; 1 shortest; 2 as long as 3; 4 subquadrate, longest, 2.5 times as long as 3, apex truncate, bifid. Labial palpomeres 1–2 broad apically; 1 shortest; 2 slightly longer than 1, with long setae on apical part; 3 subquadrate, 2.0 times as long as 2, apex truncate, bifid. Gula quadrate; gula suture parallel, continuous. Mentum widest at posterior corner; antero-medial margin bisinuate; antero-lateral part protruded and slightly curved; anterior corner rounded; lateral margin rounded; posterior corner rectangular; posterior margin straight.

Thorax: Pronotum subquadrate, widest at posterior corners, about 4.0 times as wide as long, 1.5 times as wide as head; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner obtuse; posterior margin slightly rounded. Elytra rounded apically, widest at middle, wider than pronotum. Prosternum transverse, slightly convex and with sparse setae on medial part. Prosternal process long and straight, convex medially, with sparse setae on medial part; posterior part acuminate, with lateral bead. Metaventrite with longitudinal suture on medial part. Procoxa rounded, with sparse spines. Protochanter subtriangular, with sparse spines. Profemur with a row of spines on ventral margin. Protibia with a row of spines on dorsal part. Protarsomere 1 about 2.0 times as long as 2; 2 as long as 3; 4 slightly longer than 3; 5 longest, 2.0 times as long as 4. Protarsal claws 0.5 times shorter than tarsomere 5. Mesocoxa rounded, with sparse spines. Mesotrochanter subtriangular, with sparse spines. Mesofemur with sparse spines. Mesotibia with sparse spines. Mesotarsomere 1 about 2.0 times as long as 2; 2 as long as 3; 4

slightly longer than 3; 5 longest, 2.0 times as long as 4. Mesotarsal claws 0.5 times shorter than tarsomere 5. Metacoxal process with sparse setae; postero-lateral part rounded, apex bifid. Metatrochanter semicircular. Metafemur with sparse setae. Metatibia with a rows of spines on dorsal part, with 5 posteroventral spines; metatibial largest spine longer than tarsomere 1. Metatarsomere (Pl. 4B) 1 longest, 3.0 times as long as 2; 2 slightly longer than 3; 3 slightly longer than 4; 4 shortest; 5 slightly longer than 4. Metatarsal claws slightly shorter than tarsomere 5.

Abdomen: Sternites V–VI with sparse setae; sternite VII with sparse setae on posterior part. Median lobe (Pl. 4C) of aedeagus long and slender, widest at base, curved at basal third. Paramere subtriangular, with long setae on lateral margin.

TYPE MATERIAL: Syntype, 1♂ (NHM), with labels as follows: “Type H. T., Japan. Sharp Coll. 1905–313., *Ilybius apicalis* ♂ Type D.S”.

SPECIMENS EXAMINED: SOUTH KOREA: Chungbuk Prov.: 1♀, Boeun-gun, Jisan-ri, 17 viii 1989, SH Lee, *ex pond*; 1♂1♀, Cheongju-si, Heungdeok-gu, Gangseo1-dong, 4 v 2005, DH Lee, *ex pond*; 3♂♂5♀♀, same data as former except for, Hyuam-dong, 1 vi 2005; 2♀♀, same data as former except for, 1 vi 2005; 1♀, same data as former except for Jidong-dong, 11 vi 2005; 1♂, Danyang-gun, Eoeuigok, 16 viii 1989, SH Lee, *ex pond*; 1♀, Jincheon-gun, Chopyeong-pond, 31 vii 1994, SH Lee; 1♂, Jungwon-gun [=Chungju-si], Jisil-ri, 16 vii 1987, SH Lee, *ex pond*; Chungnam Prov.: 1♀, Boryeong-si, Jupomyeon, 25 vii 1988, SH Lee; 1♀, Cheonan-si, Cheongsu-pond, 14 ix 1990, SH Lee; 1♀, Cheongyang-gun, Munmak-pond, 25 vii 1995, SH Lee; 1♂, Daejeon-si, Sintanjin, 25 vii 1988, SH Lee; 1♂, Nonsan-si, 25 vii 1995, SH Lee; 1♂, Seocheon-gun, Gunsanyeon, 5 viii 1990, SH Lee; 1♀, Taean-gun, Seungeon2-pond, 2 x 2011, SH Lee; Gangwon Prov.: 1♂, Cheorwon-gun, Hak-pond, 15 ix 1990, SH Lee; 1♀, Chuncheon-si, Chiljeon-dong, 5 viii 1988, SH Lee; 1♀, Gangneung-si, Gyeongpo-lake, 4 viii 1988, SH Lee; 1♀, Inje-gun, Eubnae-ri, 1 viii 1991, SH Lee, *ex pond*; 1♂, Yanggu-gun, Dongsu-ri, 1 viii 1991, SH Lee; Gyeongbuk Prov.: 1♂, Cheongdo-gun, Songeub-ri, 17 ix 1989, SH Lee, *ex pond*; 1♀, Daegu-si, Ganam-pond, 10 ix 1988, SH Lee; 1♀, Gumi-si, Okgye-dong, 18 vi 1990, SH Lee; 1♀, Gyeongju-si, Ijo-stream, 30 vi 1991, SH Lee; 1♂, Pohang-si, Jigok-dong, 26 iv 1992, SH Lee; 1♂, Uljin-gun, Pogang-pond, 22 viii 1987, SH Lee; 1♀, Yeongdeok-gun, Opo-ri, 26 vii 1991, SH Lee, *ex pond*; 1♀, Yecheon-gun, Wondang-pond, 6 vi 1988, SH Lee; 1♂, Yeongcheon, 5 v 1988, SH Lee; 1♀, Yeongyang-gun, Yeon-pond, 6 vi 1990, SH Lee; Gyeonggi Prov.: 1♀, Incheon-si, Ganghwa-gun, Naegapond, 16 ix 1990, SH Lee; 1♀, Incheon-si, Mansu-stream, 6 viii 1988, SH Lee; 1♂, Pocheon-si, Gangneung, Neungdae, 19 vii 1992, SH Lee; 1 ex, Suwon-si, Seoho, 14 ix 1990, SH Lee; 1♀, Yeosu-si, Hosi-pond, 19 viii 1989, SH Lee; Gyeongnam Prov.: 1♂, Changnyeong-gun, 2 iv 1985, SH Lee; 2♂♂, Haman-gun, Beomsu-myeon, Yunsan-ri, 29 v 2003, JC Son, *ex pond*; 1♀, Haman-gun, Beomsu-myeon, Daepyeong-ri, 27 vi 2006, D.-H. Lee, *ex pond*; 1♀, Hapcheon-gun, Jeongyang-pond, 3 vi 1990, SH Lee; 1♀, Sacheon-si, Sanam-pond, 13 viii 1995, SH Lee; Jeju Prov.: 1♀, Bukjeju-gun, Dumo-ri, 22 vii 1990, SH Lee; 2♀♀, Bukjeju-gun, Jocheon-eub, Seonheul-ri, 12 vi 2005, DH Lee, *ex pond*; 4♂♂5♀♀, same data as former except for 22

v 2006 (1♂, on slide); Jeonbuk Prov.: 1♂, Gimje-gun, Gunyong-pond, 6 viii 1990, SH Lee; 1♀, Iksan-si, Geumseong-reservoir, 1 viii 1990, SH Lee; Imsil-gun, Eoeun-ri, 14 viii 1989, SH Lee; 1♀, Jeonju-si, Osong-pond, 24 viii 1988, SH Lee; 1♀, Wanju-gun, 24 vii 1995, SH Lee; Jeonnam Prov.: 1♀, Gwangju-si, Deokeui-pond, 1 viii 2009, SH Lee; 1♂, Mokpo-si, Hadang-dong, 10 ix 1990, SH Lee, *ex pond*; 1♂, Naju-si, Juksan-ri, 4 viii 1990, SH Lee, *ex pond*; 1♂, Yeongam-gun, Taeman-pond, 22 vii 1988, SH Lee.

DISTRIBUTION: Korea, China (Beijing, Gansu, Heilongjiang, Hubei, Jilin, Jiangxi, Liaoning, Sichuan, Shaanxi, Shanghai, Shandong), Japan, Russia (Far East).

REGION: Eastern Palaearctic.

KOREA: GW, GG, CB, CN, JB, JN, GB, GN, JJ.

KOREAN RECORDS: *Ilybius apicalis*: Kolbe, 1886: 173; Okamoto, 1924: 167; Mori, 1932a: 4; Kamiya, 1938b: 88; Kamiya, 1940: 124; Cho, 1957: 199; 1963: 45; 1969: 178; Kim and Nam, 1982: 25; Lee et al., 1985: 402; Kwon and Suh, 1986; Kim and Chang, 1987: 103; Yoon, 1988: 592; Yoon and Ahn, 1988b: 254; Kim and Lee, 1991: 65; Lee et al., 1992b: 51; Kim et al., 1994: 133; Lee, 1994: 16; Lee, 1995: 13; Nilsson, 1995: 64; 2003b: 41; 2010: 8; 2012: 8; Hua, 2002: 38; Park et al., 2008a: 228; Cho and Park., 2010: 95. *Ilybius lateralis* (misidentification): Kim et al., 1994: 133; Cho and Park, 2010: 95.

REMARKS: Kim et al. (1994) first reported *Ilybius lateralis* (Gebler) in Korea. However, we have concluded that this was a misidentification of *I. apicalis*, based on our examination of his voucher specimens (1♂, Yeongcheon, 5 v 1988, SH Lee). This species can be distinguished from *Ilybius lateralis* (Gebler) by elytron with yellow to reddish brown band on lateral margin.

8. *Ilybius chishimannus* Kôno, 1944

Ilybius chishimannus Kôno, 1944: 80. Type locality: Russia: Kuril Island.

Ilybius weymarni Balfour-Browne, 1947: 446.

DISTRIBUTION: Korea, China (Heilongjiang, Jilin), Mongolia, Russia (East Siberia, Far East).

REGION: Eastern Palaearctic.

KOREA: Unknown.

KOREAN RECORDS: *Ilybius chishimannus*: Lee et al., 1985: 402; Kim et al., 1994: 133; Cho and Park., 2010: 95.

REMARKS: This species has been recorded in Korea by Lee et al. (1985), only in their checklists without any taxonomic comments. We could not find any Korean specimens and the occurrence of this species in Korea is suspicious. However, its occurrence in Korea is probable because it is known from neighboring countries [China and Russia (Far East)]. Therefore, we cite this species here based on the previous records until we will find clear evidence.

Genus *Platambus* Thomson, 1859

Genus *Platambus* Thomson, 1859

Platambus Thomson, 1859: 14; Sharp, 1882: 889; Feng, 1932: 8; Kamiya, 1938a: 30; Zaitzev, 1953: 271; Nakane et al., 1963: 58. Type species: *Dytiscus maculatus* Linnaeus, 1758.

DIAGNOSIS: Epipleura continuing rather broad after middle of elytra. Prosternal process in most species with lateral bead broadly inflated in posterior part of procoxae. Mesocoxae widely separated. Metatasomere 5 longer than metatarsomere 4 (Nilsson, 2000).

REMARKS: Generic concept of *Platambus* Thomson has been revised and *Platambus stygius* (Régimbart), *P. ussuriensis* (Nilsson) and *P. koreanus* (Nilsson) were transferred from *Agabus* Leach to this genus by Nilsson (2000).

Key to the species of the *Platambus* in Korea

1. Prosternal process flat and elytra with markings 2
 - Prosternal process convex and elytra without markings 3
2. Median lobe almost thick, anterior part slender in lateral view *P. fimbriatus*
 - Median lobe almost slender, slightly bulbed at anterior fifth in lateral view *P. pictipennis*
3. Median lobe with subapical constriction *P. koreanus*
 - Median lobe without subapical constriction 4
4. Median lobe with about 6 ventrodiscal spiniform setae *P. stygius*
 - Median lobe with 0–2 ventrodiscal spiniform setae *P. ussuriensis*

9. *Platambus fimbriatus* Sharp, 1884 (Pl. 5)

Platambus fimbriatus Sharp, 1884: 445; Régimbart, 1899: 280; Kamiya, 1938a: 30; Zaitzev, 1953: 273; Brancucci, 1988: 179. Type locality: Japan: Honshu.

Platambus kansouis Feng, 1936: 9.

Platambus (Agraphis) fimbriatus: Nakane et al., 1963: 58.

DESCRIPTION: Length 6.5–8.0 mm. Body oval, convex, with microreticulation.

Color: Head brown with two reddish brown spots on posterior part; pronotum brown with yellowish markings on lateral margins; elytron black with yellow band on anterior and lateral parts. Ventral surface mostly reddish brown; hypomera, epipleura yellowish brown.

Head: Head subtrapezoidal, about 2.0 times as wide as long, widest across eyes, with sparse setae on clypeal grooves and around eyes. Anterior margin of clypeus straight. Width of frons about 2.5 times as wide as eye. Antenna long and slender; antennomeres longer than wide; 1–10 broad apically; 1 longest; 2–10 with a few setae on subapical part; 11 long oval, slightly longer than 10, widest at middle. Labrum with long setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomeres 1–3 broad apically; 1 shortest; 2 about 2.0 times as long as 1; 3 slightly longer than 2; 4 long oval, longest, 2.0 times as long as 3, apex truncate, bifid. Labial palpomeres 1–2 broad apically; 1 shortest; 2 about 2.0 times as long as 2; 3 long oval, 1.5 times as long as 2, apex truncate, bifid. Gula hexagonal, convex; gula suture non-parallel, continuous. Mentum widest at posterior corner; antero-medial margin slightly bisinuate; antero-lateral part protruded; anterior corner rectangular; lateral margin rounded; posterior corner rounded; posterior margin slightly rounded.

Thorax: Pronotum trapezoidal, widest at posterior corners, about 3.0 times as wide as long, 1.25 times as wide as head; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner rectangular; posterior margin slightly rounded. Elytra rounded apically, widest at anterior three-fifth, wider than pronotum. Prosternum slightly convex medially and with a row of setae on anterior margin. Prosternal process long and straight, convex medially, with sparse setae on medial part; posterior part acuminate, slightly convex, with thin lateral bead, apex acute. Metaventrite convex, with longitudinal suture on postero-medial part. Procoxa rounded. Protrochanter subtriangular. Profemur with a row of spines on dorsal and ventral margins. Protibia with sparse spines on medial part, with a row of spines on dorsal and ventral parts. Protarsomere 1 slightly longer than 2; 2 as long as 3; 4 about slightly longer than 3; 5 longest, 3.0 times as long as 4. Protarsal claws 1/2 times shorter than tarsomere 5. Mesocoxa rounded, with compact spines. Mesotrochanter subtriangular. Mesofemur with sparse setae, with a row of spines on baso-ventral margin. Mesotibia with a row of spines on dorsal and ventral parts. Mesotarsomere 1 about 2.0 times as long as 2; 2 shortest; 3 slightly longer than 2; 4 about 1.5 times as long as 3; 5 longest, 2.0 times as long as 4. Mesotarsal claws 1/2 times shorter than tarsomere 5. Metacoxal process with sparse setae; postero-lateral part rounded, apex bifid. Metatrochanter semicircular. Metafemur with sparse punctures. Metatibia (Pl. 5C) with a rows of spines on dorsal and ventral parts, with 0–3 anteroventral spines; metatibial largest spine slightly shorter than tarsomere 1. Metatarsomere 1 longest, 2.0 times as long as 2; 2 slightly longer than 3; 3 slightly longer than 4; 4 shortest; 5 about 1.2 times as long as 4. Metatarsal claw equal, 1/2 times shorter than tarsomere 5.

Abdomen: Sternites V–VI with compact setae on medial part; VII (Pl. 5D) with sparse setae on posterior part. Median lobe (Pl. 5E) of aedeagus long and slender, widest at base, strongly curved at basal fourth, without ventrodistal spiniform setae, apex long acute. Paramere subtriangular, with long setae on lateral margin.

TYPE MATERIAS: Lectotype. 1♂ (NHM), with labels as follows: “*Platambus fimbriatus*. Type D. S. Chiuzenji.

Japan. 19. 8. 81. Lewis., Type H. T. Japan. G. Lewis. 1910–320., Sharp Coll. 1905–313., chiuzenji. 19. VIII. -24. VIII. 81., Syntype, Lectotype *Platambus fimbriatus* Sharp, des. M. Brancucci. 86.”

SPECIMENS EXAMINED: NORTH KOREA: Pyenganbuk Prov.: 7♂♂8♀♀, DPR. KOREA. Hyangsan-gun Around Chongchon-Hotel Near Chongchon-River 1 vii 2008 Changdo Han leg.; SOUTH KOREA: Chungbuk Prov.: 3♂♂2♀♀, Chungju-si, Yangseong-myeon, Jocheon-ri, N36°56'28.06", E127°54'13.99", 73 m, 19 ix 2014, DH Lee, beside stream; 2♂♂1♀, Yeongdong-gun, Simcheon-myeon, Danjeon-ri, 24 ix 2005, DH. Lee, J. I. Yeon, *ex stream*; 3♂♂, same data as former except for Gugang-ri, 15 vi 2004 (1♂, on slide); 3♂♂4♀♀, same data as former except for Sinjeong2-ri, 14 vi 2004; Chungnam Prov.: 1♀, Daejeon-si, Yuseong-gu, Wolpyeong-dong, 4 x 2005, DH. Lee, *ex stream pool*; 1♂, Geumsan-gun, Jewon-myeon, Daesan-ri, 18 vi 2004, DH. Lee, J. I. Yeon, *ex stream*; Gangwon Prov.: 2♀♀, Cheorwon-gun, Kimhwa-eub, Wasu-ri, Namdae-stream, 9 ix 2008, DH Lee, *ex beside stream*; 1♂4♀♀, Chuncheon-si, Namsan-myeon, Nami-island, 15 viii 2006, M.-J. Jeon, *ex near stream*; 1♀, Samcheok-si, Gagok-stream, 25 vi 1995, SH Lee; Gyeongbuk Prov.: 2♀♀, Cheongsong-gun, Cheongsong-eub, N36°26'00.53", E128°03'46.11", 195 m, 11 vii 2010, DH Lee, HJ Jang, at light; 1♂, Uljin-gun, Wangpi-stream, 27 vi 1995, SH Lee; 1♂, Yeongdeok-gun, Changsu-pond, 5 vi 1994, SH Lee; 1♀, Yeongju-si, Buseok-myeon, Namdae-ri, Mt. Seondalsan, 29 vi 1998, JI. Kim, *ex stream*; Jeonbuk Prov.: 2♂♂, Muju-gun, Muju-eub, Naedo-ri, 18 vi 2004, DH.Lee, JI Yeon, *ex stream*.

DISTRIBUTION: Korea, China (Jilin, Gansu, Hebei, Sichuan), Japan, Russia (Far East).

REGION: Eastern Palaearctic.

KOREA: GW, CB, CN, JB, GB, GN.

KOREAN RECORDS: *Platambus fimbriatus*: Mori, 1932a: 3; Kamiya, 1938b: 72; 1940: 122; Cho, 1957: 199; 1969: 176; Kwon and Suh, 1986: 94; Brancucci, 1988: 182; Yoon, 1988: 585; Yoon and Ahn, 1988b: 252; Kim and Lee, 1991: 65; Kim et al., 1994: 133; Lee, 1995: 13; Nilsson, 1995: 57; 2003b: 43; 2010: 10; 2012: 10; Kim et al., 1999: 129; Hua, 2002: 40; Cho and Park., 2010: 95.

10. *Platambus koreanus* (Nilsson, 1997) (Pl. 6)

Agabus koreanus Nilsson, 1997: 636. Type locality: Russia: Primorye.

Platambus koreanus: Nilsson, 2000: 34.

DESCRIPTION: Length 6.4–6.8 mm. Body oval, convex, with microreticulation.

Color: Head black with two reddish brown spots on posterior part; pronotum black; elytron black with yellow spot on lateral and subapical parts. Ventral surface mostly black; antenna, palpi, mouthparts, legs reddish brown.

Head: Head subtrapezoidal, about 2.0 times as wide as long, widest across eyes, with sparse setae on clypeal grooves and around eyes. Anterior margin of clypeus straight. Width of frons about 5.0 times as wide

as eye. Antenna long and slender; antennomeres longer than wide; 1–10 broad apically; 1 longest; 2–10 with a few setae on subapical part; 11 long oval, slightly longer than 10, widest at middle. Labrum with long setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomeres 1–3 broad apically; 1 shortest; 2 as long as 3; 4 long oval, longest, 2.0 times as long as 3, apex truncate, bifid. Labial palpomeres 1–2 broad apically; 1 shortest; 2 about 2.0 times as long as 1; 3 long oval, 1.2 times as long as 2, apex truncate, bifid. Gula hexagonal, convex; gula suture non-parallel, continuous. Mentum widest at posterior corner; antero-medial margin slightly bisinuate; antero-lateral part protruded; anterior corner rounded; lateral margin rounded; posterior corner rounded; posterior margin slightly rounded.

Thorax: Pronotum trapezoidal, widest at posterior corners, about 3.5 times as wide as long, 1.5 times as wide as head; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner rectangular; posterior margin slightly rounded. Elytra rounded apically, widest at middle, wider than pronotum. Prosternum carinate medially and with a row of setae on anterior margin. Prosternal process long and straight, convex medially, with sparse setae on medial part; posterior part ovate, slightly convex, with lateral bead, apex acute. Metaventricle convex, with longitudinal suture on postero-medial part. Procoxa rounded, with sparse spines. Protochanter subtriangular, with sparse setae on ventral part. Profemur with a row of spines on dorsal and ventral margins. Protibia with a row of spines on dorsal and ventral parts. Protarsomere 1 about 2.0 times as long as 2; 2 shortest; 3 slightly longer than 2; 4 about 1.5 times as long as 3; 5 longest, 2.0 times as long as 4. Protarsal claws 1/2 times shorter than tarsomere 5. Mesocoxa rounded, with compact spines on medial part. Mesotrochanter subtriangular, with sparse setae on ventral part. Mesofemur with sparse setae, with a row of spines on baso-ventral margin. Mesotibia with a row of spines on dorsal and ventral parts. Mesotarsomere 1 about 2.0 times as long as 2; 2 shortest; 3 slightly longer than 2; 4 about 1.5 times as long as 3; 5 longest, 2.0 times as long as 4. Mesotarsal claws 1/2 times shorter than tarsomere 5. Metacoxal process with sparse setae; postero-lateral part rounded, apex bifid. Metatrochanter semicircular. Metafemur with sparse punctures. Metatibia (Pl. 6C) with a rows of spines on dorsal and ventral parts, with 0 or 1 anteroventral spines; metatibial largest spine slightly shorter than tarsomere 1. Metatarsomere 1 longest, 2.0 times as long as 2; 2 slightly longer than 3; 3 slightly longer than 4; 4 shortest; 5 about 1.2 times as long as 4. Metatarsal claw equal, 1/2 times shorter than tarsomere 5.

Abdomen: Sternites V–VI with sparse setae; VII (Pl. 6D) with sparse setae on posterior part. Median lobe (Pl. 6E) of aedeagus long and slender, widest at base, curved at basal third, with about 10 ventrodiscal spiniform setae, apex bulbed and rounded. Paramere subtriangular, with long setae on lateral margin.

SPECIMENS EXAMINED: SOUTH KOREA: Chungnam Prov.: 3♂♂4♀♀, Daejeon-si, Yuseong-gu, Gung-dong, Chungnam National University, 7 v 2007, DH Lee, *ex* under wet leaves; 6♂♂3♀♀, same data as former except for Juk-dong, 9 x 2005, *ex* springfed pool; 6♂♂11♀♀, same data as former except for 28 x 2005 (1♂, on slide); 6♂♂6♀♀, same data as former except for 8 xi 2005; 5♀♀, same data as former except for 29 ii 2006; 2♀♀, same data as former except for 15 iv 2006; 2♀♀, Gongju-si, Banpo-myeon, Hakbong-ri,

8 iv 2006, DH. Lee, *ex* springfed pool; 1♂, same data as former except for 8 x 2005; 3♂♂3♀♀, same data as former except for 17 v 2006; 3♂♂2♀♀, same data as former except for 17 vi 2006 (2♂♂, on slides); 1♂, same data as former except for 27 vii 2006; Gyeongnam Prov.: 1♂2♀♀, Ulsan-si, Mt. Jeongnoksan, Mujechi-swamp, 23 iv 1996, YB Cho, *ex* pond; 1♂4♀♀, same data as former except for 26 iv 1997.

DISTRIBUTION: Korea, Russia (Far East).

REGION: Eastern Palaearctic.

KOREA: CN, GN.

KOREAN RECORDS: *Platambus koreanus*: Nillsson, 2003b; 43; 2015: 10. *Agabus koreanus*: Nilsson, 1996: 636 [generic recombination].

11. *Platambus pictipennis* Sharp, 1873

Platambus pictipennis Sharp, 1873: 49; Régimbart, 1899: 280; Zimmermann, 1919: 153; Kamiya, 1938a: 31; Zaitzev, 1953: 272; Brancucci, 1988: 18. Type locality: Japan: Honshu.

Platambus (Agraphis) pictipennis Nakane et al., 1963: 58.

DISTRIBUTION: Korea, Japan, Russia (Far East).

REGION: Eastern Palaearctic.

KOREA: Unknown.

KOREAN RECORDS: *Platambus pictipennis*: Kolbe, 1886: 173; Mori, 1932a: 3; Kamiya, 1938b: 20; Cho, 1957: 199; 1969: 176; Kwon and Suh, 1986: 94; Yoon, 1988: 586; Yoon and Ahn, 1988b: 253; Kim et al., 1994: 133; Hua, 2002: 40; Nilsson, 2003; 44; 2012: 10; Cho and Park, 2010: 95.

REMARKS: This species has been recorded from Korea by Kolbe (1886), only in their checklists without any taxonomic comments. Since then, many records have been repeated by several entomologists. We could not find any Korean specimens and the occurrence of this species in Korea is suspicious. However, its occurrence in Korea is probable because it is known from neighboring countries [Japan and Russia (Far East)]. Therefore, we cite this species here based on the previous records until we will find clear evidence.

12. *Platambus stygius* (Régimbart, 1899) (Pl. 7)

Agabus stygius Régimbart, 1899: 270. Type locality: China: Sichuan.

Gaurodytes stygius: Zaitzev, 1953: 240.

Platambus jilanzhui Wewalka and Brancucci, 1995: 98.

Agabus nakanei Nilsson, 1997: 631.

Platambus stygius: Nilsson, 2000: 34.

DESCRIPTION: Length 6.5–8.0 mm. Body oval, convex, with microreticulation.

Color: Head black with two reddish brown spots on posterior part; pronotum black; elytron black with yellow spot on lateral and subapical parts. Ventral surface mostly black; antenna, palpi, mouthparts, legs reddish brown.

Head: Head subtrapezoidal, about 2.0 times as wide as long, widest across eyes, with sparse setae on clypeal grooves and around eyes. Anterior margin of clypeus straight. Width of frons about 5.0 times as wide as eye. Antenna long and slender; antennomeres longer than wide; 1–10 broad apically; 1 longest; 2–10 with a few setae on subapical part; 11 long oval, slightly longer than 10, widest at middle. Labrum with long setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomeres 1–3 broad apically; 1 shortest; 2 as long as 3; 4 long oval, longest, 2.0 times as long as 3, apex truncate, bifid. Labial palpomeres 1–2 broad apically; 1 shortest; 2 about 2.0 times as long as 1; 3 long oval, 1.2 times as long as 2, apex truncate, bifid. Gula hexagonal, convex; gula suture non-parallel, continuous. Mentum widest at posterior corner; antero-medial margin slightly bisinuate; antero-lateral part protruded; anterior corner rounded; lateral margin rounded; posterior corner rounded; posterior margin slightly rounded.

Thorax: Pronotum trapezoidal, widest at posterior corners, about 3.5 times as wide as long, 1.5 times as wide as head; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner rectangular; posterior margin slightly rounded. Elytra rounded apically, widest at middle, wider than pronotum. Prosternum carinate medially and with a row of setae on anterior margin. Prosternal process long and straight, convex medially, with sparse setae on medial part; posterior part ovate, slightly convex, with lateral bead, apex acute. Metaventricle convex, with longitudinal suture on postero-medial part. Procoxa rounded, with sparse spines. Protochanter subtriangular, with sparse setae on ventral part. Profemur with a row of spines on dorsal and ventral margins. Protibia with a row of spines on dorsal and ventral parts. Protarsomere 1 about 2.0 times as long as 2; 2 shortest; 3 slightly longer than 2; 4 about 1.5 times as long as 3; 5 longest, 2.0 times as long as 4. Protarsal claws 1/2 times shorter than tarsomere 5. Mesocoxa rounded, with compact spines on medial part. Mesotrochanter subtriangular, with sparse setae on ventral part. Mesofemur with sparse setae, with a row of spines on baso-ventral margin. Mesotibia with a row of spines on dorsal and ventral parts. Mesotarsomere 1 about 2.0 times as long as 2; 2 shortest; 3 slightly longer than 2; 4 about 1.5 times as long as 3; 5 longest, 2.0 times as long as 4. Mesotarsal claws 1/2 times shorter than tarsomere 5. Metacoxal process with sparse setae; postero-lateral part rounded, apex bifid. Metatrochanter semicircular. Metafemur with sparse punctures. Metatibia (Pl. 7C) with a row of spines on dorsal and ventral parts, with 4–12 anteroventral spines; metatibial largest spine slightly shorter than tarsomere 1. Metatarsomere 1 longest, 2.0 times as long as 2; 2 slightly longer than 3; 3 slightly longer than 4; 4 shortest; 5 about 1.2 times as long as 4. Metatarsal claw equal, 1/2 times shorter than tarsomere 5.

Abdomen: Sternites V–VI with sparse setae; VII (Pl. 7D) with sparse setae on posterior part. Median lobe

(Pl. 7E) of aedeagus long and slender, widest at base, strongly curved at basal third, with about 5 ventrodistal spiniform setae, apex acute. Paramere subtriangular, with long setae on lateral margin.

SPECIMENS EXAMINED: SOUTH KOREA: Jeju Prov.: 12♂♂10♀♀, Bukjeju-gun, Aewol-eub, N33°21'40.65", E126°27'44.58", 1,097 m, 12 x 2006, SJ Park, TK Kim, YH Kim, *ex* mountain stream; 4♂♂1♀, Bukjeju-gun, Jocheon-eub, Gyorae-ri, 22 v 2006, DH Lee, *ex* stream; 1♀, same data as former except for Seongpanak, 11 vii 1985, SH Lee; 1♀, Bukjeju-gun, Suakgyo, 26 vii 1990, SH Lee, *ex* stream; 1♀, same data as former except for Witseoreum, 25 vii 1990; 2♂♂1♀, Jeju-si, Orai-dong, Eori-mok, 31 v 2007, DH Lee, *ex* small mountain stream; 4♂♂1♀, same data as former except for Nature rest forest, 30 v 2007, *ex* mountain stream pool; 9♂♂2♀♀, Jeju-si, Saekdal-dong, 1100 hill, 24 v 2006, DH Lee, *ex* mountain stream (2♂♂, on slide); 3♂♂1♀, same data as former except for 8 xi 2006; 3♂♂2♀♀, same data as former except for 31 v 2006; 3♂♂2♀♀, Namjeju-gun, Namwon-eub, Sinrye-ri, 12 vi 2005, DH Lee, *ex* mountain stream; 1♂5♀♀, same data as former except for 24 v 2006 (1♀, on slide); 1♂5♀♀, same data as former except for Dongsu-bridge, 29 v 2007; 1♀, Seogwipo-si, Yeongsil, 24 vii 1990, SH Lee, *ex* stream.

DISTRIBUTION: Korea, China (Beijing, Hebei, Jilin, Liaoning, Sichuan, Shandong, Yunnan), Japan.

REGION: Eastern Palaearctic.

KOREA: JJ.

KOREAN RECORDS: *Platambus stygius*: Lee and Ahn, 2008: 88; Cho and Park, 2010: 95; Jung et al., 2011: 42. *Agabus miyamotoi*: Lee et al., 1992a: 63 [misidentification of *P. stygius*]. *Agabus optatus*: Lee et al., 1985: 402; Lee et al., 1992b: 51 [misidentification of *P. stygius*]. *Agabus insolitus*: Lee et al., 1985: 401; Kim et al., 1994: 133; Cho and Park, 2010: 95 [misidentification of *P. stygius*].

REMARKS: *Agabus miyamotoi* Nakane was first recorded in Korea by Lee et al. (1992a). However, after examining specimens studied by them, we found that previously recorded in Korea was actually *Platambus stygius* (Régimbart).

13. *Platambus ussuriensis* (Nilsson, 1997) (Pl. 8)

Agabus ussuriensis Nilsson, 1997: 632. Type locality: Russia: Primorye.

Platambus ussuriensis: Nilsson, 2000: 34.

DESCRIPTION: Length 6.5–7.5 mm. Body oval, convex, with microreticulation.

Color: Head black with two reddish brown spots on posterior part; pronotum black; elytron black with yellow spot on lateral and subapical parts. Ventral surface mostly black; antenna, palpi, mouthparts, legs reddish brown.

Head: Head subtrapezoidal, about 2.0 times as wide as long, widest across eyes, with sparse setae on

clypeal grooves and around eyes. Anterior margin of clypeus straight. Width of frons about 5.0 times as wide as eye. Antenna long and slender; antennomeres longer than wide; 1–10 broad apically; 1 longest; 2–10 with a few setae on subapical part; 11 long oval, slightly longer than 10, widest at middle. Labrum with long setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomeres 1–3 broad apically; 1 shortest; 2 as long as 3; 4 long oval, longest, 2.0 times as long as 3, apex truncate, bifid. Labial palpomeres 1–2 broad apically; 1 shortest; 2 about 2.0 times as long as 1; 3 long oval, 1.2 times as long as 2, apex truncate, bifid. Gula hexagonal, convex; gula suture non-parallel, continuous. Mentum widest at posterior corner; antero-medial margin slightly bisinuate; antero-lateral part protruded; anterior corner rounded; lateral margin rounded; posterior corner rounded; posterior margin slightly rounded.

Thorax: Pronotum trapezoidal, widest at posterior corners, about 3.5 times as wide as long, 1.5 times as wide as head; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner rectangular; posterior margin slightly rounded. Elytra rounded apically, widest at middle, wider than pronotum. Prosternum carinate medially and with a row of setae on anterior margin. Prosternal process long and straight, convex medially, with sparse setae on medial part; posterior part ovate, slightly convex, with lateral bead, apex acute. Metaventricle convex, with longitudinal suture on postero-medial part. Procoxa rounded, with sparse spines. Protochanter subtriangular, with sparse setae on ventral part. Profemur with a row of spines on dorsal and ventral margins. Protibia with a row of spines on dorsal and ventral parts. Protarsomere 1 about 2.0 times as long as 2; 2 shortest; 3 slightly longer than 2; 4 about 1.5 times as long as 3; 5 longest, 2.0 times as long as 4. Protarsal claws 1/2 times shorter than tarsomere 5. Mesocoxa rounded, with compact spines on medial part. Mesotrochanter subtriangular, with sparse setae on ventral part. Mesofemur with sparse setae, with a row of spines on baso-ventral margin. Mesotibia with a row of spines on dorsal and ventral parts. Mesotarsomere 1 about 2.0 times as long as 2; 2 shortest; 3 slightly longer than 2; 4 about 1.5 times as long as 3; 5 longest, 2.0 times as long as 4. Mesotarsal claws 1/2 times shorter than tarsomere 5. Metacoxal process with sparse setae; postero-lateral part rounded, apex bifid. Metatrochanter semicircular. Metafemur with sparse punctures. Metatibia (Pl. 8C) with a row of spines on dorsal and ventral parts, with 5 anteroventral spines; metatibial largest spine slightly shorter than tarsomere 1. Metatarsomere 1 longest, 2.0 times as long as 2; 2 slightly longer than 3; 3 slightly longer than 4; 4 shortest; 5 about 1.2 times as long as 4. Metatarsal claw equal, 1/2 times shorter than tarsomere 5.

Abdomen: Sternites V–VI with sparse setae; VII (Pl. 8D) with sparse setae on posterior part. Median lobe (Pl. 8E) of aedeagus long and slender, widest at base, curved at basal third, with 0–2 ventrodistal spiniform setae, apex acute. Paramere subtriangular, with long setae on lateral margin.

SPECIMENS EXAMINED: SOUTH KOREA: Chungbuk Prov.: 1♂, Jecheon-si, Hansu-myeon, Songgye-ri, Mt. Wolaksan, 23 viii 2006, D.-H. Lee, ex springfed pool near stream; Chungnam Prov.: 1♂2♀♀, Gongju-si, Banpo-myeon, Hakbong-ri, Eunseon falls, 16 viii 2005, DH Lee, ex seepage (1♀, on slide); 4♂♂2♀♀, same data as former except for Sangsin-ri, 29 vii 2006, ex springfed pool (1♂, on slide); 1♂, same data as

former except for, 8 v 2007, *ex* valley margin; 1♀, Seosan-si, Haemi-myeon, Daegok-ri, Mt. Gayasan, 8 vi 2006, D.-H. Lee, *ex* stream; 1♂, Taean-gun, Sanhu-ri, Mt. Baekhwasan, 8 iii 2007, D.-H. Lee, *ex* small mountain stream; 3♂♂, Yesan-si, Sudeok-temple, 26 vii 1995, SH Lee; Gangwon Prov.: 1♀, Chuncheon-si, Dong-myeon, Gamjeong-ri, Yeonsangol, 23 vii 1992, SH Lee; 5♂♂3♀♀, Hongcheon-gun, Nae-myeon, Changchon-ri, Mt. Gyeongsan, 15 v 2007, DH Lee, *ex* spring on mountain; 2♂♂, Inje-gun, Buk-myeon, Mt. Daeamsan, Yong-wetland, 2 x 1967, JI Kim, *ex* wetland; 1♂, Inje-gun, Jindong-ri, Mt. Jeombongsan, Jindong valley, 18 iv 2007, HG Min, SM Yun, *ex* wet leaf litter; 1♀, Pyeongchang-gun, Jinbu-myeon, Mt. Odaesan, 18 v 2002, SJ Park, CW Shin, *ex* stream; 1♂, same data as former except for 8 v 2004, DH Lee; 1♀, same data as former except for 16 v 2006, *ex* springfed pool near stream (1♀, on slide); 1♀, same data as former except for 29 iii 2007, *ex* valley margin; 1♂, Taebaek-si, Sodo-dong, Mt. Taebaeksan, 3 ix 2004, TK Kim, *ex* under stone near stream; 1♂2♀♀, Yangyang-gun, Seo-myeon, Osaek-ri, N38°04'37.43", E128°27'01.59", 349 m, 27 vii 2014, DH Lee, mountain stream; Gyeongbuk Prov.: 2♂♂3♀♀, Gimcheon-si, Buhang-myeon, Daeya-ri, N36°1'24.85", E127°54'23.18", 29 viii 2011, DH Lee, SW Jung, seepage pond; 1♂, Uljin-gun, Yeongji-cave, 9 i 2004, BW Kim; 2♂♂2♀♀, Uleung-gun, Seo-myeon, Namseo2-ri, Taeharyeong, 19 v 2011, DH Lee, mountain stream; 3♀♀, Yeongju-si, Bonghyeon-myeon, Dusan-ri, Mt. Oknyebong, 21 viii 2006, D.-H. Lee *ex* springfed pool; 1♂, Yeongju-si, Sunheung-myeon, Daejeom-ri, 20 vii 2005, D.-H. Lee, *ex* seepage; Gyeonggi Prov.: 1♀, Gwacheon-si, Makgyo-dong, Mt. Cheonggyesan, 20 vi 1985, KJ Ann, *ex* stream; 1♂1♀, Gwangju-si, Jungbu-myeon, Sanseong-ri, Namhansanseong, 30 vi 1985, KJ Ahn, *ex* stream; 1♀, Namyangju-si, Byeolnae-myeon, Mt. Bulamsan, 29 x 1982, S. H. Gye, *ex* stream; 1♀, Seoul-si, Dobong-gu, Sanggye-dong, 6 vi 1985, S. Y. Cho, *ex* stream; Jeonbuk Prov.: 4♂♂2♀♀, Buan-gun, Jinseo-myeon, Seokpo-ri, Naeso-temple, N35°37'03.25", E126°35'14.11", 57 m, 17 vii 2013, YG Ban, spring; 8♂♂3♀♀, Muju-gun, Gucheon-dong, 4 viii 1994, SH Lee; 2♂♂, Namwon-si, Geumji-myeon, Taenae-ri, Naegi-maeul, 6 vi 2007, D.-H. Lee, *ex* small mountain stream; Jeonnam Prov.: 1♂1♀, Damyang-gun, Changpyeong-myeon, Oidong-ri Oidong-reservoir, 25 v 2006, D.-H. Lee, *ex* under stone near stream (1♀, on slide); 2♂♂3♀♀, Goheung-gun, Geumsan-myeon, Geogeu Island, Jeokdaebong, 25 v 2015, TK Kim, *ex* mountain stream; 1♂, Gurye-gun, Mt. Jirisan, Piagol, 24 v 2002, H.-J. Kim, M.-J. Jeon, *ex* wet leaf litter.

DISTRIBUTION: Korea, China (Fujian, Hebei, Jilin, Liaoning), Russia (Far East).

REGION: Eastern Palaearctic.

KOREA: GW, GG, CB, CN, JB, JN, GB, BN.

KOREAN RECORDS: *Platambus ussuriensis*: Nilsson, 2003b: 44; 2010: 11; 2012: 11. *Agabus ussuriensis*: Nilsson, 1996: 632; Hua, 2002: 34 [generic recombination]. *Agabus optatus*: Mori, 1932a: 4; Kamiya, 1938b: 82; Cho, 1957: 199; 1969: 178; Kim and Nam, 1982: 25; Kwon and Suh, 1986: 95; Yoon, 1988: 589; Yoon and Ahn, 1988b: 253; Kim et al., 1994: 133; Lee, 1994: 16; Kim and Kim, 1996a: 48; Cho and Park, 2010: 95 [misidentification of *P. ussuriensis*]. *Gaurodytes optatus*: Kim et al., 1974: 220 [misidentification of *P. ussuriensis*].

Subfamily Colymbetinae Thomson, 1867

TYPE: *Colymbetes*.

SPECIES: 148.

DISTRIBUTION: Worldwide.

KOREA: PN, GW, GG, CB, CN, GB, GN, JB, JN, JJ.

Tribe Colymbetini Erichson, 1837

DIAGNOSIS: Eyes emarginate anteriorly. Prosternum and prosternal process in the same plane. Apex of elytra evenly rounded. Metatarsal claws unequal in length. Gonocoxa flattened, apex rounded (Miller and Bergsten, 2014).

Genus *Rhantus* Dejean, 1833

Genus *Rhantus* Dejean, 1833

Rhantus Dejean, 1833: 54; Sharp, 1882: 899; Feng, 1932: 116; Kamiya, 1938a: 40; Vazirani, 1970: 348. Type species: *Colymbetes pulverosus* Stephens, 1828.

DIAGNOSIS: Body oval or elongated, length less than 15.0 mm. Pronotum with narrow to moderate lateral bead. Prosternal process convex, carinate medially, posterior part not acute. Metaventral wing not reach the epipleura. Metatarsomere 5 shorter than 4 (Kamiya, 1938a; Roughley and Larson, 2001).

Key to the species of the *Rhantus* in Korea

1. Body length less than 12.5 mm; pronotum with transverse black spot on medial part *R. suturalis*
- Body length more than 13.0 mm; pronotum with round black spot on medial part *R. yessoensis*

Subgenus *Rhantus* Dejean, 1833

14. *Rhantus (Rhantus) suturalis* (Macleay, 1825) (Pl. 9)

Colymbetes suturalis Macleay, 1825: 31. Type locality: Indonesia: Java.

Dytiscus punctatus Geoffroy, 1785: 70.

Colymbetes pulverosus Stephens, 1828: 69.

Colymbetes australis Aubé, 1838: 236.

Rhantus dispar Régimbart, 1899: 308.

Rhantus annamita Régimbart, 1899: 309.

Rhantus chinensis Falkenström, 1936: 228.

Rhantus bramardi Guignot, 1942: 87.

Rhantus birmanicus Vazirani, 1970: 352.

DESCRIPTION: Length 11.0–12.5 mm. Body oval, convex, with microreticulation.

Color: Head yellow, posterior part black with yellow marking; pronotum yellowish brown with transverse black marking on medial part; elytron yellowish brown with compact black spots. Ventral surface mostly black; antenna, mouthparts, hypomera, epipleura, legs yellow to yellowish brown.

Head: Head subtrapezoidal, about 2.0 times as wide as long, widest across eyes, with sparse setae on clypeal grooves and around eyes. Anterior margin of clypeus straight. Width of frons about 2.0 times as wide as eye. Antenna long and slender; antennomeres longer than wide; 1 subparallel, longest, 2.0 times as long as 2; 2–10 broad apically, with a few setae on subapical part; 11 long oval, as long as 10, widest at middle. Labrum with long setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomeres 1–3 broad apically; 1 shortest; 2 about 2.5 times as long as 1; 3 about 1.5 times as long as 2; 4 long oval, longest, slightly longer than 3, apex truncate, bifid. Labial palpomeres 1–2 broad apically; 1 shortest; 2 about 3.0 times as long as 1; 3 long oval, as long as 2, apex truncate, bifid. Gula reversed trapezoidal; gula suture non-parallel, continuous. Mentum widest at posterior corner; antero-medial margin rounded; antero-lateral part protruded; anterior corner rounded; lateral margin rounded; posterior corner rounded; posterior margin slightly rounded.

Thorax: Pronotum subtrapezoidal, widest at posterior corners, about 4.0 times as wide as long, 1.5 times as wide as head; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner rounded; posterior margin slightly rounded. Elytra widest at anterior four-seventh, wider than pronotum. Prosternum distinctly carinate medially and with a row of setae on anterior margin. Prosternal process long and straight, distinctly carinate medially, with sparse setae on medial part; posterior part ovate, distinctly carinate, with thin lateral bead, apex rounded. Metaventricle convex, with longitudinal suture on postero-medial part. Procoxa rounded, with sparse setae. Protochanter subtriangular, with sparse setae. Profemur with a row of spines on ventral margin. Protibia with a row of spines on dorsal and ventral parts. Protarsomere 1 about 2.5 times as long as 2; 2 slightly longer than 3; 3 as long as 4; 5 longest, 3.0 times as long as 4. Protarsal claws with basal tooth; inner claw longer than outer. Mesocoxa rounded, with sparse setae. Mesotrochanter subtriangular, with sparse setae on ventral part. Mesofemur with sparse setae, with a row of spines on ventral margin. Mesotibia with a row of spines on dorsal and ventral parts. Mesotarsomere 1 slightly longer than 2; 2 as long as 3; 4 slightly longer than 3; 5 longest, 2.0 times as

long as 4. Mesotarsal claws with basal tooth; inner claw longer than outer. Metacoxal process with compact small punctures; postero-lateral part rounded; postero-medial part emarginate; apex bifid. Metatrochanter semicircular. Metafemur with sparse setae on apico-medial part. Metatibia with sparse spines, with a rows of spines on dorsal and ventral parts, with 5 anteroventral spines; metatibial largest spine slightly longer than tarsomere 1. Metatarsomere 1 longest, 2.0 times as long as 2; 2 slightly longer than 3; 3 slightly longer than 4; 4 slightly longer than 5; 5 shortest. Metatarsal claws with basal tooth; inner claw 2.0 times as long as outer.

Abdomen: Sternites V–VI with sparse long setae on medial part; sternite VII with sparse setae on postero-lateral parts. Median lobe (Pl. 9B) of aedeagus long and slender, widest at base, curved at basal fifth, protruded at middle, apex acute. Paramere (Pl. 9C) subtriangular, with long setae on lateral margin.

TYPE MATERIAL: Lectotype, 1♂ (NHM), with labels as follows: “Java. Horsfield. 60–15., 62, Type, 60. 15, E.I.C. Lectotypus, Suturalis. Mac. Balke des. 1989, *Rhantus suturalis* MacLeay 1825”.

SPECIMENS EXAMINED: NORTH KOREA: Pyeonannam Prov.: 1♂2♀♀, DPR. KOREA. Pyongyang-city Around Pyongyang-Hotel Near Daedong-River 8 vii 2008 Changdo Han leg. SOUTH KOREA: Chungbuk Prov.: 4♂♂3♀♀, Cheongju-si, Heungdeok-gu, Gangseo-dong, Hanggagol-pond, N36°37'35.91", E127°24'46.85", 73 m, 22 x 2005, DH Lee, pond; 1♂, Danyang-gun, Maepo-eub, Eoeuigok-ri, 27 vii 2009, SH Lee; 4♀♀, Eumseong-gun, Gamgok-myeon, Jucheon-ri, Jucheon-reservoir, N37°04'31.37", E127°37'49.94", 98 m, 16 viii 1989, SH Lee, reservoir; 4♂♂3♀♀, Goisan-gun, Iin-pond, 18 viii 1988, SH Lee; 1♂1♀, Jecheon-si, Yangminwon, 30 vii 1994, SH Lee; 2♀♀, Jincheon-gun, Chopyeong-myeon, Hwasan-ri, Chopyeong-reservoir, N36°49'00.87", E127°30'58.96", 64 m, 31 vii 1994, SH Lee, reservoir; 2♂♂3♀♀, Okcheon-gun, Iwon-myeon, Yongbang-ri, Yongbang-reservoir, 29 x 1989, SH Lee; 1♂1♀, Yeongdong-gun, Simcheon-myeon, Danjeon-ri, 24 ix 2005, DH Lee, stream; Chungnam Prov.: 2♂♂4♀♀, Asan-si, Onyang3-dong, 31 vii 1994, SH Lee; 1♂2♀♀, Boryeong-si, Jupomyeon, Boryeong-ri, 25 vii 1988, SH Lee; 1♀, Buyeo-gun, Buyeo-eub, Yongjeong-ri, 3 x 2011, SH Lee; 2♂♂4♀♀, Cheonan-si, Dongnam-gu, Samryong-dong, Cheongsu-reservoir, N36°46'38.98", E127°10'30.67", 76 m, 14 ix 1990, SH Lee, reservoir; 2♂♂, Cheongyang-gun, Munmak-pond, 25 vii 1995, SH Lee; 1♂2♀♀, Daejeon-si, Yuseong-gu, Bangdong-reservoir, 29 ii 2006, DH Lee, beside reservoir; 1♀, Taean-gun, Nam-myeon, Hwangchon-ri, N36°51'49.23", E126°12'23.75", 7 m, 31 vii 2013, DH Lee, ex pond on abandon salt farm; 1♂2♀♀, Taean-gun, Nam-myeon, Sinon-ri, N36°35'47.11", E126°17'21.98", 10 m, 20 vii 2013, DH Lee, ex swamp; 1♀, Yesan-gun, Sinam-myeon, Bobyol-ri, Sabgyocheon, 26 vii 1995, SH Lee; Gangwon Prov.: 4♂♂4♀♀, Chuncheon-si, Dongsan-myeon, Wonchang-ri, 23 vii 1992, SH Lee; 1♂, Hwacheon-gun, Gandong-myeon, Yuchon-ri, 30 vii 1987, SH Lee; 1♀, Inje-gun, Inje-eub, 31 vii 1991, SH Lee; 1♂, Jeongseon-gun, Imgye-eub, Bancheon-ri, 19 viii 1995, SH Lee, ex reservoir; 3♂♂4♀♀, Pyeongchang-gun, Baesujang, 29 vii 1994, SH Lee; 1♀, Sokcho-si, Mt. Seoraksan, Biseonda, 19 vii 2004, SJ Park, at light; Gyeongbuk Prov.: 1♀, Cheongsong-gun, Cheongsong-eub, N36°26'00.53", E128°03'46.11", 195 m, 11 vii 2010, DH Lee, HJ Jang, at light; 1♀, Gyeongju-si, Geoncheon-eub, 6 vi 1991, SH Lee; 1♀, Gumi-si, Haepyeong-myeon, Songgok-ri, Mt. Dorisan,

5 viii 1994, SH Lee; 1♀, Pohang-si, Nam-gu, DaeJam-dong, 18 ix 1988, SH Lee; 1♂1♀, Sangju-si, Gaeundong, Gaeun-pond, 9 viii 1990, SH Lee; 2♂♂3♀♀, Yecheon-gun, Yonggung-myeon, Mui-ri, Wondang-reservoir, N36°35'43.36", E128°17'36.32", 68 m, 6 vi 1988, SH Lee, reservoir; 2♂♂1♀, Yeongcheon-si, Jayang-myeon, Chunghyo-ri, Jayang-dam, 1 ix 1990, SH Lee; 1♂3♀♀, Yeongyang-gun, Sadon-pond, 6 vi 1990, SH Lee, pond; Gyeonggi Prov.: 2♀♀, Gwangju-si, Jungdae-dong, Jungang-reservoir, N37°23'59.52", E127°13'15.81", 70 m, 20 viii 1989, SH Lee, reservoir; 1♂1♀, Icheon-si, Seolseong-myeon, 19 viii 1988, SH Lee, ex reservoir; 1♂, Incheon-si, Ganghwa-gun, Gilsang-myeon, Jangheung-ri, Gilsang-reservoir, 26 v 2012, SH Lee; 11♂♂15♀♀, Incheon-city, Ongjin-gun, Baekryeongdo, 28 vii 2011, HM Lim, at light; 3♂♂4♀♀, Namyangju-si, Jinjeob-eub, 8 viii 1988, SH Lee; 1♀, Pocheon-si, Idong-myeon, Jangam-ri, Idong-bridge, N38°01'57.66", E127°21'58.73", 147 m, 18 vii 1992, SH Lee, stream; 1♂, Suwon-si, Paldal-gu, Hwaseo-dong, Seoho-reservoir, N37°16'38.87", E126°59'17.42", 35 m, 4 ix 1990, SH Lee, reservoir; 2♀♀, Yeoncheon-si, Yeoncheon-eub, Dongmak-ri, N38°06'45.13", E127°06'45.13", 104 m, 26 ix 2014, DH Lee, SG Lee, JS Lee, ex pond; Gyeongnam Prov.: 1♂2♀♀, Busan-si, Gijang-gun, Ilgwang-myeon, Mundong-ri, 28 vii 2009, SH Lee; 2♂♂1♀, Geoje-si, Geoje-myeon, Oksan-ri, Oksan-reservoir, N34°52'19.60", E128°35'35.50", 85 m, 17 vii 2008, SH Lee, reservoir; 1♂, Sacheon-si, Gonpyeong-myeon, Yongsan-ri, Dasol-temple, 14 viii 1995, SH Lee; 5♂♂3♀♀, Sancheong-gun, Matgol-pond, 7 vi 2009, SH Lee; 1♀, Ulsan-si, Ulju-gun, Eonyang-eub, Jikdong-ri, 2 x 1988, SH Lee; 2♀♀, Yangsan-si, Habuk-myeon, Jisan-ri, Tongdo-temple, 23 vii 1999, SH Lee; JeJu Prov.: 1♂1♀, Jeju-si, Jocheon-eub, Seonheul-ri, 11 vi 2005, DH Lee, pond; 1♂, Namjeju [=Seogwipo-si], Galmae-pond, 26 vii 2005, SH Lee; Jeonbuk Prov.: 1♀, Buan-gun, 9 iv 2005, DH Lee, SM Choi, ex rice field; 1♂, Iksan-si, Hwangdeung-myeon, Hwangdeung-ri, 1 viii 1990, SH Lee; 4♂♂3♀♀, Imsil-gun, Samgye-myeon, Samgye-ri, N35°30'36.71", E127°16'17.68", 143 m, 14 viii 1989, SH Lee, reservoir; 1♂, Gunsan-si, Miryong-dong, Mije-reservoir, N35°57'06.45", E126°41'41.97", 15 m, 1 viii 2010, SH Lee, reservoir; 1♀, Muju-gun, Seolcheon-myeon, Simgok-ri, 4 viii 1994, SH Lee; 2♂♂1♀, Namwon-si, Okrim-pond, 15 viii 1989, SH Lee; 1♂, Sunchang-gun, Ingye-myeon, Tab-ri, Tabri-reservoir, N35°27'20.55", E127°08'56.13", 192 m, 1 viii 2009, SH Lee, reservoir; 1♂, Wanju-gun, 24 vii 1995, SH Lee; Jeonnam Prov.: 1♀, Gangjin-gun, Gangjin-eub, Imcheon-ri, Imcheon-reservoir, 13 vi 2010, SH Lee; 1♂4♀♀, Jangheung-gun, Jangheung-eub, Yeonsan-ri, 28 ix 2010, SH Lee; 4♀♀, Suncheon-si, Byeolyang-myeon, Bongrim-ri, Bongrim-reservoir, N34°52'39.13", E127°27'02.39", 21 m, 12 vi 2010, SH Lee, reservoir.

DISTRIBUTION: Asia: Korea, China (Beijing, Fujian, Gansu, Guandong, Guizhou, Guanxi, Hebei, Heilongjiang, Hubei, Jiangsu, Jilin, Liaoning, Macao, Nei Mongol, Qinghai, Sichuan, Shandong, Shanxi, Xinjiang, Yunnan, Zhejiang), Japan, Mongolia, Russia (East Siberia, Far East, West Siberia) and widely distributed in Palaearctic, Oriental and Australian regions.

REGION: Australian, Oriental, Pacific, Palearctic, Oriental.

KOREA: PN, GW, GG, CB, CN, JB, JN, GB, GN, JJ.

KOREAN RECORDS: *Rhantus suturalis*: Nilsson, 2003b; 47; Park et al., 2008a: 229; Nilsson, 2010: 13; Nilsson, 2012: 13. *Rhantus pulverosus*: Mori, 1932a: 4; Mochizuki and Tsunekawa, 1937: 78; Kamiya, 1938b: 93;

Mochizuki and Matsui, 1939: 56; Ishii, 1940: 42; Kamiya, 1940: 125; Cho, 1957: 199; 1969: 179; Kim et al., 1974: 220; Kim and Nam, 1982: 25; Lee et al., 1985: 402; Kwon and Suh, 1986: 95; Yoon, 1988: 593; Yoon and Ahn, 1988b: 255; Kim and Lee, 1991: 65; Lee et al., 1992b: 52; Park and Kim, 1993: 110; Kim et al., 1994: 133; Lee, 1994: 15; 1995: 13; Kim, 1995: 132; 2000: 131; Kim and Kim, 1996a: 48; 1996b: 126; Kwon et al., 1996: 474; Kim et al., 1999: 129; Han et al., 2007: 271; Han et al., 2008: 243; Cho and Park, 2010: 95 [synonym of *R. suturalis*]. *Rhantus punctatus*: Okamoto, 1924: 166; Cho, 1963: 45 [synonym of *R. suturalis*]. *Rhantus erraticus*: Han et al., 2007: 271; Han et al., 2008: 245 [misidentification of *R. suturalis*].

15. *Rhantus (Rhantus) yessoensis* Sharp, 1891 (Pl. 10)

Rhantus yessoensis Sharp, 1891: 6. Type locality: Japan: Chiuzenji, Junsai.

DESCRIPTION: Length 13.0–15.0 mm. Body oval, convex, with microreticulation.

Color: Head yellowish brown, posterior part black with yellowish brown marking; pronotum yellowish brown with rounded black marking on medial part; elytron yellowish brown with compact black spots. Ventral surface mostly black; antenna, mouthparts, hypomera, epipleura, legs yellow to yellowish brown.

Head: Head subtrapezoidal, about 2.0 times as wide as long, widest across eyes, with sparse setae on clypeal grooves and around eyes. Anterior margin of clypeus straight. Width of frons about 2.0 times as wide as eye. Antenna long and slender; antennomeres longer than wide; 1 subparallel, longest, 2.0 times as long as 2; 2–10 broad apically, with a few setae on subapical part; 11 long oval, as long as 10, widest at middle. Labrum with long setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomeres 1–3 broad apically; 1 shortest; 2 about 2.5 times as long as 1; 3 about 1.5 times as long as 2; 4 long oval, longest, 1.5 times as long as 3, apex truncate, bifid. Labial palpomeres 1–2 broad apically; 1 shortest; 2 about 3.0 times as long as 1; 3 long oval, as long as 2, apex truncate, bifid. Gula reversed trapezoidal; gula suture non-parallel, continuous. Mentum widest at posterior corner; antero-medial margin rounded; antero-lateral part protruded; anterior corner rounded; lateral margin rounded; posterior corner rounded; posterior margin slightly rounded.

Thorax: Pronotum subtrapezoidal, widest at posterior corners, about 5.0 times as wide as long, 1.5 times as wide as head; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner rounded; posterior margin slightly rounded. Elytra rounded apically, widest at anterior four-seventh, wider than pronotum. Prosternum distinctly carinate medially and with a row of setae on anterior margin. Prosternal process long and straight, distinctly carinate medially, with sparse setae on medial part; posterior part ovate, distinctly carinate, with thin lateral bead, apex rounded. Metaventricle convex, with longitudinal suture on medial part. Procoxa rounded, with sparse setae. Protrochanter subtriangular, with sparse setae. Profemur with a row of spines on ventral margin. Protibia with a row of spines on dorsal and ventral parts. Protarsomere 1 about 2.5 times as long as 2; 2 slightly longer than 3;

3 as long as 4; 5 longest, 3.0 times as long as 4. Protarsal claws with basal tooth; inner claw longer than outer. Mesocoxa rounded, with sparse setae. Mesotrochanter subtriangular, with sparse setae on ventral part. Mesofemur with sparse setae, with a row of spines on ventral margin. Mesotibia with a row of spines on dorsal and ventral parts. Mesotarsomere 1 slightly longer than 2; 2 as long as 3; 4 slightly longer than 3; 5 longest, 2.0 times as long as 4. Mesotarsal inner claw broad and longer than outer. Metacoxal process with compact small punctures; postero-lateral part rounded; postero-medial part emarginate; apex bifid. Metatrochanter semicircular. Metafemur with sparse setae on apico-medial part. Metatibia with sparse spines, with a rows of spines on dorsal and ventral parts, with 5 anteroventral spines; metatibial largest spine 1.5 times as long as tarsomere 1. Metatarsomere 1 longest, 2.0 times as long as 2; 2 slightly longer than 3; 3 slightly longer than 4; 4 slightly longer than 5; 5 shortest. Metatarsal claws with basal tooth; inner claw 2.0 times as long as outer.

Abdomen: Sternites V–VI with sparse long setae on medial part; sternite VII with sparse setae on postero-lateral parts. Median lobe (Pl. 10B) of aedeagus long and slender, widest at base, curved at basal fifth, narrowed apically, apex acute. Paramere (Pl. 10C) subtriangular, with long setae on lateral margin.

TYPE MATERIAL: Syntype, 1♂ (NHM), with labels as follows: “*Rhantus yessoensis* Type D. S., Junsai Japan. Lewis., Syntype, Type, Sharp Coll. 1905–313”.

SPECIMENS EXAMINED: SOUTH KOREA: Jeju Prov.: 1♀, Bukjeju-gun [=Jeju-si], Gyorae-ri, 13 vi 2005, DH Lee, *ex. casual water*; 1♂2♀♀, Mt. Halasan, Gwaneumsa-temple, 23 viii 2004, SW Choi, SD Na, at light; 4♂♂1♀, Mt. Halasan, 24 viii 2004, SW Choi, SD Na, at light; 1♂, Seogwipo-si, Saekdal-dong, 1100 goji, 12 x 2006, DH Lee, *ex mountain stream*.

DISTRIBUTION: Korea, China (Fujian, Hunan, Jiangxi, Liaoning), Japan.

REGION: Eastern Palearctic.

KOREA: JJ.

KOREAN RECORDS: *Rhantus yessoensis*: Kwon and Suh, 1986: 96; Lee et al., 1992b: 52; Kim et al., 1994: 133; Nilsson, 2003b: 47; Cho and Park, 2010: 95; Nilsson, 2012: 14.

Subfamily Copelatinae Branden, 1885

TYPE: *Copelatus*.

SPECIES: 691.

DISTRIBUTION: Worldwide.

KOREA: PN, GW, GG, CB, CN, GB, GN, JB, JN, JJ.

Tribe Copelatini Branden, 1885

Genus *Copelatus* Erichson, 1832

Genus *Copelatus* Erichson, 1832

Copelatus Erichson, 1832: 18. Type species: *Dytiscus posticatus* Fabricius, 1801.

DIAGNOSIS: Body elongated to oval. Clypeus with transverse discontinuous groove on antero-lateral part. Pronotum margined at lateral part. Prosternum and prosternal process on same plane. Protibia dilated apically. Elytron often with longitudinal striae. Metacoxal lines strongly convergent anterior part to metacoxal lobes. Sternite with short, curved striae (Megna and Epler, 2012).

Key to the species of the *Copelatus* in Korea

1. Antennomere 11 slightly shorter than 10; elytron with 10 dorsal striae *C. zimmermanni*
- Antennomere 11 as long as 10; elytron with 6 dorsal striae 2
2. Elytra black, without yellow band on anterior part *C. weymarni*
- Elytra brown to dark brown, with yellow band on anterior part 3
3. Median lobe of aedeagus bulbed at apical two-fifth *C. japonicus*
- Median lobe of aedeagus bulbed at middle *C. kammurensis*

16. *Copelatus japonicus* Sharp, 1844 (Pl. 11)

Copelatus japonicus Sharp, 1844: 445. Type locality: Japan: Kyushu.

Copelatus chinensis Régimbart, 1899: 298.

Copelatus collocallosus Falkenström, 1932: 192.

DESCRIPTION: Length 5.5–5.8 mm. Body long oval, with microreticulation and small punctures.

Color: Dorsal surface slightly convex, brown to dark brown. Ventral surface rugose, yellowish brown to brown.

Head: Head semicircular, about 2.0 times as wide as long, widest across eye, anterior part yellowish brown. Anterior margin of clypeus straight. Clypeal suture distinct. Eye slightly protruded. Width of frons about 3.5 times as wide as eye. Antenna long and slender. Antennomeres 1–11 longer than wide; 1 parallel, 1.5 times as long as 2; 2–10 widest at apical part, with two short setae on apical part; 11 long oval, slightly shorter than

10, widest at apical two-fifth, with many setae on apical part. Labrum with long setae on antero-medial part; anterior margin emarginate. Labium subquadrate, with long setae on anterior part. Maxillary palpomere 1 cup-shaped, shortest, with a few setae on lateral part; 2 subparallel, about 2.0 times as long as 1, widest at apical part; 3 subparallel, as long as 2, widest at apical part; 4 longest, about 1.5 times as long as 3, widest apical third, apex truncate and bifid. Labial palpomere 1 cup-shaped, smallest, with long setae on lateral part; 2 about 2.5 times as long as 1, widest at apical part, a long seta on lateral and apical parts; 3 longest, about 1.2 times as long as 2, widest apical two-fifth, apex truncate and bifid. Gular suture curved, only present in anterior part of gula. Submentum with a row of setae on anterior part and many punctures on postero-lateral parts. Mentum widest across posterior corner; antero-median margin bisinuate; antero-lateral part protruded; anterior corners rounded; lateral margins slightly rounded; posterior corners acute; posterior margin slightly rounded.

Thorax: Pronotum subtrapezoidal, widest across posterior corner, about 3.0 times as wide as long, 1.7 times as wide as head, with wrinkles on lateral two-third, with a row of setae on anterior and posterior part, with a longitudinal sulcus on medial part; lateral part yellowish brown; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner rounded; posterior margin straight. Scutellum with short setae on antero-lateral part. Elytra rounded apically, widest at middle, slightly wider than pronotum, with transverse yellow band on anterior part; with six discal striae and a submarginal stria on each elytron. Prosternum transverse, with many setae, strongly convex on medial part; anterior margin rounded, with long setae. Prosternal process long; posterior part rounded; apex acute. Hypomeron with many setae on anterior part. Metaventrite with longitudinal suture on medial part and with many short setae on antero-medial part. Procoxal cavity oval, with short spine on ventral part. Protochanter subtriangular, with short spines, and without a row of blunt spines on ventral part. Profemur subquadrate, with many short setae, with 4 or 5 blunt spines on anterior ventral margin and 3 or 4 blunt spines on postero-ventral margin, with a group of setae on apico-ventral part. Protibia with six large spines on apical part and with a row of long spine on ventral part. Protarsomere 1 slightly longer than sum of 2–3; 2 as long as 3; 4 shortest; 5 longest, as long as sum of 2–4. Mesocoxal cavity rounded, with many short spines on ventral part. Mesotrochanter triangular, with sparse short spines. Mesofemur with many setae on dorsal and medial parts, and with a row of short spines on ventral part. Mesotibia with setae on medial part, and with two rows of large spines on dorsal and ventral parts, and with seven large spines on apical margin. Mesotarsomere 1 about 2.0 times as long as 2; 2 as long as 3 and 4 combined; 5 longest, as long as sum of 1–4. Metacoxal process with sparse setae; apex rounded and bifid. Metatrochanter semicircular, with many short spines on ventral part. Metafemur with a row of spines on baso-dorsal part. Metatibia with two rows of spines on dorsal and ventral parts; metatibial largest spine shorter than metatarsomere 1. Metatarsomere 1 longest, 2.0 times as long as 2; 2 slightly longer than 3; 3 slightly longer than 4; 4 shortest; 5 as long as 3.

Abdomen: Sternites IV–VI with long setae on medial part; sternite VII with two groove and setae on medial part. Median lobe (Pl. 11B) of aedeagus elongated, widest at basal part; apical part slender, strongly curved;

bulbed at apical two-fifth. Paramere semicircular, widest at subbasal part, with long setae from apical part to middle; digitus oval, widest at apical third, apex slightly acute and with long setae.

TYPE MATERIAL: Syntype, 1♂ (NHM), with labels as follows: “*Copelatus japonicus*. Types D. S. Japan. Lewis, Type, Sharp Coll. 1905–313”.

SPECIMENS EXAMINED: SOUTH KOREA: Jeju prov.: 7♂♂4♀♀, Bukjeju-gun, Jocheon-eub, Seonheul-ri, 13 vi 2005, SI Lee, *ex* sifting (2♂♂, on slides); 1♂3♀♀, same data as former except for, DH Lee, *ex* leaf litter (1♂, on slide); 1♂, same data as former except for, 22 v 2006, *ex* pond.

DISTRIBUTION: Korea, China (Fujian, Hubei, Sichuan, Yunnan), Japan, Taiwan.

REGION: Eastern Palearctic.

KOREA: JJ.

KOREAN RECORDS: *Copelatus japonicus*: Satô, 1985: 60; Kwon and Suh, 1986: 94; Lee et al., 1992b: 50; Kim et al., 1994: 133; Nilsson, 1995: 41; Hua, 2002: 35; Nilsson, 2003b: 47; Park et al., 2008a: 222; 2008b: 75; Nilsson, 2010: 14; Cho and Park, 2010: 95; Jung et al., 2012: 45; Nilsson, 2012: 14.

17. *Copelatus kammurensis* Tamu and Tsukamoto, 1955 (Pl. 12)

Copelatus kammurensis Tamu and Tsukamoto, 1955: 73. Type locality: Japan: Kyoto prefecture.

DESCRIPTION: Length 5.5–5.8 mm. Body long oval, with microreticulation and small punctures.

Color: Dorsal surface slightly convex, brown to dark brown. Ventral surface rugose, yellowish brown to brown.

Head: Head semicircular, about 2.0 times as wide as long, widest across eye, anterior part yellowish brown. Anterior margin of clypeus straight. Clypeal suture distinct. Eye slightly protruded. Width of frons about 3.5 times as wide as eye. Antenna long and slender. Antennomeres 1–11 longer than wide; 1 parallel, 1.5 times as long as 2; 2–10 widest at apical part, with two short setae on apical part; 11 long oval, slightly shorter than 10, widest at apical two-fifth, with many setae on apical part. Labrum with long setae on antero-medial part; anterior margin emarginate. Labium subquadrate, with long setae on anterior part. Maxillary palpomere 1 cup-shaped, shortest, with a few setae on lateral part; 2 subparallel, about 2.0 times as long as 1, widest at apical part; 3 subparallel, as long as 2, widest at apical part; 4 longest, about 1.5 times as long as 3, widest apical third, apex truncate and bifid. Labial palpomere 1 cup-shaped, smallest, with long setae on lateral part; 2 about 2.5 times as long as 1, widest at apical part, a long seta on lateral and apical parts; 3 longest, about 1.2 times as long as 2, widest apical two-fifth, apex truncate and bifid. Gula suture curved, only present anterior part of gula. Submentum with a row of setae on anterior part and many punctures on postero-lateral parts. Mentum widest across posterior corner; antero-median margin bisinuate; antero-lateral part protruded; anterior corner

rounded; lateral margin slightly rounded; posterior corner acute; posterior margin slightly rounded.

Thorax: Pronotum subtrapezoidal, widest across posterior corner, about 3.0 times as wide as long, 1.7 times as wide as head, with wrinkles on lateral a fifth, with a row of setae on anterior and posterior part, with a longitudinal sulcus on medial part; lateral part yellowish brown; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner rounded; posterior margin straight. Scutellum with short setae on antero-lateral part. Elytra rounded apically, widest at middle, slightly wider than pronotum, with transverse yellow band; with six striae and a submarginal stria on each elytron. Prosternum transverse, with many setae, strongly convex on medial part; anterior margin rounded, with long setae. Prosternal process long; posterior part rounded; apex acute. Hypomeron with many setae on anterior part. Metaventricle with longitudinal suture on medial part and with many short setae on antero-medial part. Procoxal cavity oval, with short spine on ventral part. Protrochanter subtriangular, with short spines, and without a row of blunt spines on ventral part. Profemur subquadrate, with many short setae; with 4 or 5 blunt spines on anterior ventral margin and 5 blunt spines on postero-ventral margin, with a group of setae on apico-ventral part. Protibia with six large spines on apical part and with a row of long spine on ventral part. Protarsomere 1 slightly longer than sum of 2–3; 2 as long as 3; 4 shortest; 5 longest, longer than sum of 2–4. Mesocoxal cavity rounded, with many short spines on ventral part. Mesotrochanter triangular, with sparse short spines. Mesofemur with many setae on dorsal and medial parts, and with a row of short spines on ventral part. Mesotibia with setae on medial part, and with two rows of large spines on dorsal and ventral parts, and with seven large spines on apical margin. Mesotarsomere 1 about 2.0 times as long as 2; 2 as long as 3 and 4 combined; 5 longest, as long as sum of 1–4. Metacoxal process with sparse setae; apex rounded and bifid. Metatrochanter semicircular, with many short spines on ventral part. Metafemur with a row of spines on baso-dorsal part. Metatibia with two rows of spines on dorsal and ventral parts; metatibial largest spine shorter than metatarsomere 1. Metatarsomere 1 longest, 2.0 times as long as 2; 2 slightly longer than 3; 3 slightly longer than 4; 4 shortest; 5 as long as 3.

Abdomen: Sternites IV–VI with long setae on medial part; sternite VII with two grooves and setae on medial part. Median lobe (Pl. 12B) of aedeagus elongated, widest at basal part; apical part slender, curved; bulbous at middle. Paramere semicircular, widest at middle, with long setae from apical part to a fifth; digitus oval, widest at apical third, apex rounded and with long setae.

SPECIMENS EXAMINED: SOUTH KOREA: Jeonbuk Prov.: 2♂♂, Buan-gun, Byeonsan-myeon, Mt. Naebyeonsan, near Wolmyeong Temple, 29 v 2001, YB Cho, *ex* sifting (1♂, on slide).

DISTRIBUTION: Korea, Japan.

REGION: Eastern Palearctic.

KOREA: JB.

KOREAN RECORDS: *Copelatus kammurensis*: Park et al., 2008b: 74; Cho and Park, 2010: 95; Jung et al., 2012: 45.

18. *Copelatus koreanus* Mori, 1932

Copelatus koreanus Mori, 1932b: 49. Type locality: Korea: Seoul.

DISTRIBUTION: Korea.

REGION: Eastern Palearctic.

KOREA: GG.

KOREAN RECORDS: *Copelatus koreanus*: Mori, 1932b: 49; Mori, 1932a: 3; 1932b: 49; Cho, 1957: 199; Cho, 1969: 175; Kim and Nam, 1982: 25; Kim, 1984: 205; Lee et al., 1985: 402; Kwon and Suh, 1986: 94; Yoon, 1988: 584; Yoon and Ahn, 1988b: 252; Kim et al., 1994: 133; Kim, 2002b: 275; Nilsson, 2003b: 47; Park et al., 2008b: 74; Nilsson, 2010: 14; Cho and Park, 2010: 95; Jung et al., 2012: 42; Nilsson, 2012: 14.

REMARKS: According to Park et al. (2008), “Mori (1932b) described that *C. koreanus* is very similar to *C. weymarni* in morphological characters, except for the complete submarginal stria”. In the distributional study, the species was found only in Cheongryangri, Seoul in Korea (Mori 1932b). However, *C. weymarni* is common in Korea. Therefore, they doubt that the species is *C. weymarni*. According to the author’s statements, the valid species name should be *C. koreanus* Mori, 1932 rather than *C. weymarni* Balfour-Browne, 1947, judging from publication priority by year. This situation remains unresolved and further study is needed.

19. *Copelatus weymarni* Balfour-Browne, 1947 (Pl. 13)

Copelatus weymarni Balfour-Browne, 1947: 440. Type locality: Manchuria [China: Heilongjiang]: Djalantun.

DESCRIPTION: Length 5.0–6.0 mm. Body long oval, with microreticulation and small punctures.

Color: Dorsal surface slightly convex, dark brown to black. Ventral surface rugose, yellowish brown to dark brown.

Head: Head semicircular, about 2.0 times as wide as long, widest across eye, anterior part yellowish brown. Anterior margin of clypeus straight. Clypeal suture distinct. Eye slightly protruded. Width of frons about 3.5 times as wide as eye. Antenna long and slender. Antennomeres 1–11 longer than wide; 1 parallel, 1.5 times as long as 2; 2–10 widest at apical part, with two short setae on apical part; 11 long oval, as long as 10, widest at apical two-fifth, with many setae on apical part. Labrum with long setae on antero-medial part; anterior margin emarginate. Labium subquadrate, with long setae on anterior part. Maxillary palpomere 1 cup-shaped, shortest, with a few setae on lateral part; 2 subparallel, about 2.0 times as long as 1, widest at apical part; 3 subparallel, as long as 2, widest at apical part; 4 longest, about 1.2 times as long as 3, widest apical third, apex truncate and bifid. Labial palpomere 1 cup-shaped, smallest, with long setae on lateral part; 2 about 2.5

times as long as 1, widest at apical part, a long seta on lateral and apical parts; 3 longest, about 1.2 times as long as 2, widest apical two-fifth, apex truncate and bifid. Gula suture curved, only present anterior part of gula. Submentum with a row of setae on anterior part and many punctures on postero-lateral parts. Mentum widest across posterior corner; antero-median margin bisinuate; antero-lateral part protruded; anterior corner rounded; lateral margin slightly rounded; posterior corner acute; posterior margin slightly rounded.

Thorax: Pronotum subtrapezoidal, widest across posterior corner, about 3.0 times as wide as long, 1.7 times as wide as head, with wrinkles on lateral a third, with a row of setae on anterior and posterior part, with a longitudinal sulcus on medial part; lateral part yellowish brown; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner rounded; posterior margin straight. Scutellum with short setae on antero-lateral part. Elytra rounded apically, widest at middle, slightly wider than pronotum, without transverse yellow band; with six striae and a submarginal stria on each elytron. Prosternum transverse, with many setae, strongly convex in medial part; anterior margin rounded, with long setae. Prosternal process long; posterior part rounded; apex acute. Hypomeron with many setae on anterior part. Metaventricle with longitudinal suture in medial part and with many short setae on antero-medial part. Procoxal cavity oval, with short spine on ventral part. Protochanter subtriangular, with short spines, and without a row of blunt spines on ventral part. Profemur subquadrate, with many short setae; with 5 or 6 blunt spines on anterior ventral margin and 4 or 5 blunt spines on postero-ventral margin, with a group of setae on apico-ventral part. Protibia with six large spines on apical part and with a row of long spine on ventral part. Protarsomere 1 slightly longer than sum of 2–3; 2 as long as 3; 4 shortest; 5 longest, as long as sum of 2–4. Mesotrochanter triangular, with sparse short spines. Mesofemur with many setae on dorsal and medial parts, and with a row of stout spines on ventral part. Mesotibia with setae on medial part, and with two rows of large spines on dorsal and ventral parts, and with seven large spines on apical margin. Mesotarsomere 1 about 2.0 times as long as 2; 2 as long as 3 and 4 combined; 5 longest, as long as sum of 1–4. Metacoxal process with sparse setae; apex rounded and bifid. Metatrochanter semicircular, with many short spines on ventral part. Metafemur with a row of spines on baso-dorsal part. Metatibia with two rows of spines on dorsal and ventral parts; metatibial largest spine shorter than metatarsomere 1. Metatarsomere 1 longest, 2.0 times as long as 2; 2 slightly longer than 3; 3 slightly longer than 4; 4 shortest; 5 as long as 3.

Abdomen: Sternites IV–VI with long setae on medial part; sternite VII with two grooves and setae in medial part. Median lobe (Pl. 13B) of aedeagus elongated, widest at apical third; apical part slender, curved; apical third rounded and protruding. Paramere semicircular, widest at basal part, with long setae from apical part to apical third.

SPECIMENS EXAMINED: NORTH KOREA: Pyeongannam Prov.: 2♀♀, DPR. KOREA. PyongYang-city SunAn-Airport Light of Entrance 17 vii 2008 Changdo Han leg. TOKYO [JAPAN] Collection of Wildlife Research Center In Korea University; SOUTH KOREA: Chungbuk Prov.: 2♀♀, Cheongju-si, Heungdeok-gu, Jidong-dong, 3 v 2005, DH Lee, ex casual water; 1♂2♀♀, same data as former except for, Jukrim-dong,

22 vi 2005; 2♂♂2♀♀, Danyang-gun, Maepo-eub, Eoeigok-ri, 27 vii 2009, SH Lee; 1♂3♀♀, Eumseong-gun, Gangok-myeon, Jucheon-ri, 16 viii 1989, SH Lee, *ex* reservoir; Chungnam Prov.: 1♀, Choenan-si, Ipjang-myeon, 3 viii 2006, SJ Park, SI Lee, YH Kim, at light; 1♂, Daejeon-si, Yuseong-gu, Jangdae-dong, 23 vii 2005, SI Lee, at light; 2♂♂3♀♀, Daejeon-si, Yuseong-gu, Jeonmin-dong, Gabcheon, 31 x 2005, DH Lee, *ex* pool; 1♂1♀, Daejeon-si, Yuseong-gu, Juk-dong, 28 x 2005, DH Lee, *ex* springfed pool; 1♂, same data as former except for, 8 xi 2005; 1♂, same data as former except for, 7 v 2006 (1♂, on slide); 1♀, same data as former except for, 15 iv 2006; 2♀♀, Daejeon-si, Yuseong-gu, Wolpyeong-dong, Gabcheon, 31 x 2005, DH Lee, *ex* pool; 1♂3♀♀, Taean-gun, Nam-myeon, Sinon-ri, N36°35'47.11", E126°17'21.98", 10 m, 13 vii 2013, DH Lee, *ex* wetland near dune; Gyeongbuk.: 1♀, Gimcheon-si, Buhang-myeon, Daeya-ri, 27 iv 2011, DH Lee, SW Jung, *ex* seepage pond; 1♂, Uljin-gun, Seo-myeon, Wangpi-ri, Soksa-brige, 26 iv 2012, DH Lee, *ex* stream Gyeonggi Prov.: 1♂, Incheon-si, Ongjin-gun, Baekryeongdo, 28 vii 2011, HM Lim, at light (1♂, on slide); 2♂♂2♀♀, Suwon-si, NIAST, 6 viii 1997, Black light; 2♂♂2♀♀, Yeoncheon-gun, Yeoncheon-eub, Dongmak-ri, N38°06'01.50", E127°06'45.13", 104 m, 25 ix 2014, DH Lee, *ex* pond; Jeju Prov.: 2♀♀, Namjeju, Boseom, 23 vii 1990, SH Lee.

DISTRIBUTION: Korea, China (Heilongjiang, Liaoning, Shanghai), Japan, Russia (Far East).

REGION: Eastern Palearctic.

KOREA: PN, GG, CB, CN, JJ.

KOREAN RECORDS: *Copelatus weymarni*: Lee et al., 1992a: 62; Kim et al., 1994: 133; Lee, 1994: 16; Nilsson, 1995: 40; Hua, 2002: 35; Nilsson, 2003b: 48; 2010: 15; 2012: 15; Han et al., 2007: 271; Han et al., 2008: 231; Park et al., 2008a: 224; 2008b: 75; Cho and Park, 2010: 95; Jung et al., 2012: 42.

20. *Copelatus zimmermanni* Gschwendtner, 1934 (Pl. 14)

Copelatus zimmermanni Gschwendtner, 1934: 143. Type locality: China: Zhejiang.

DESCRIPTION: Length 5.0–6.8 mm. Body long oval, with microreticulation and small punctures.

Color: Dorsal surface slightly convex, dark brown to black. Ventral surface rugose, dark brown to black.

Head: Head semicircular, about 2.0 times as wide as long, widest across eye, anterior part yellowish brown. Anterior margin of clypeus straight. Clypeal suture distinct. Eye slightly protruded. Width of frons about 3.5 times as wide as eye. Antenna long and slender. Antennomeres 1–11 longer than wide; 1 parallel, 1.5 times as long as 2; 2–10 widest at apical part, with two short setae on apical part; 11 long oval, slightly shorter than 10, widest at apical two-fifth, with many setae on apical part. Labrum with long setae on antero-medial part; anterior margin emarginate. Labium subquadrate, with long setae on anterior part. Maxillary palpomere 1 cup-shaped, shortest, with a few setae on lateral part; 2 subparallel, about 2.0 times as long as 1, widest at apical part; 3 subparallel, as long as 2, widest at apical part; 4 longest, about 1.7 times as long as 3, widest

apical third, apex truncate and bifid. Labial palpomere 1 cup-shaped, smallest, with long setae on lateral part; 2 about 2.5 times as long as 1, widest at apical part, a long seta on lateral and apical parts; 3 longest, about 1.2 times as long as 2, widest apical two-fifth, apex truncate and bifid. Gula suture curved, only present anterior part of gula. Submentum with a row of setae on anterior part and many punctures on postero-lateral parts. Mentum widest across posterior corner; antero-median margin bisinuate; antero-lateral part protruded; anterior corner rounded; lateral margin slightly rounded; posterior corner acute; posterior margin slightly rounded.

Thorax: Pronotum subtrapezoidal, widest across posterior corner, about 3.0 times as wide as long, 1.7 times as wide as head, with wrinkles on lateral a third, with a row of setae on anterior and posterior part, with a longitudinal sulcus on medial part; lateral part brown; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner rounded; posterior margin straight. Scutellum with short setae on antero-lateral part. Elytra rounded apically, widest at middle, slightly wider than pronotum, with transverse yellow band; with 10 striae on each elytron. Prosternum transverse, with many setae, strongly convex on medial part; anterior margin rounded, with long setae. Prosternal process long; posterior part rounded; apex acute. Hypomerone with many setae on anterior part. Metaventre with longitudinal suture on medial part and with many short setae on antero-medial part. Procoxal cavity oval, with short spine on ventral part. Protrochanter subtriangular, with short spines, and with a row of blunt spines on ventral part. Profemur subquadrate, with many short setae; with about 15 blunt spines on anterior ventral margin and without blunt spines on postero-ventral margin, with a group of setae on apico-ventral part. Protibia with six large spines on apical part and with a row of long spine on ventral part. Protarsomere 1 slightly longer than sum of 2–3; 2 as long as 3; 4 shortest; 5 longest, as long as sum of 2–4. Mesocoxal cavity rounded, with many short spines on ventral part. Mesotrochanter triangular, with sparse short spines. Mesofemur with many setae on dorsal and medial parts, and with a row of short spines on ventral part. Mesotibia with setae on medial part, and with two rows of large spines on dorsal and ventral parts, and with seven large spines on apical margin. Mesotarsomere 1 about 2.0 times as long as 2; 2 as long as 3 and 4 combined; 5 longest, as long as sum of 1–4. Metacoxal process with sparse setae; apex rounded and bifid. Metatrochanter semicircular, with many short spines on ventral part. Metafemur with a row of spines on baso-dorsal part. Metatibia with two rows of spines on dorsal and ventral parts; metatibial largest spine shorter than metatarsomere 1. Metatarsomere 1 longest, 2.0 times as long as 2; 2 slightly longer than 3; 3 slightly longer than 4; 4 shortest; 5 as long as 3.

Abdomen: Sternites IV–VI with long setae on medial part; sternite VII with two groove and setae on medial part. Median lobe (Pl. 14B) of aedeagus stout, widest at middle; apical part acute; apical fourth and middle parts bulbed. Paramere subtriangular, widest at subbasal part, with long setae from apical part to two-third; digitus elongated, widest at middle, apex rounded and with long setae.

SPECIMENS EXAMINED: SOUTH KOREA: 1♂1♀, Jeju Prov.: Bukjeju-gun, Jocheon-eub, Gyoraeri, 22 v

2005, DH Lee, *ex pond* (1♂, on slide); 2♀♀, same data as former except for, Seonheul-ri, Dongbaek-pond, 25 ix 2008.

DISTRIBUTION: Korea, China (Zhejiang), Japan.

REGION: Eastern Palearctic.

KOREA: JJ.

KOREAN RECORDS: *Copelatus zimmermanni*: Lee et al., 1985: 402; Kim et al., 1994: 133; Han et al., 2007: 271; Han et al., 2008: 232; Park et al., 2008a: 225; 2008b: 76; Cho and Park, 2010: 95; Jung et al., 2012: 42.

Subfamily Laccophilinae Gistel, 1856

TYPE: *Laccophilus*.

SPECIES: 439.

DISTRIBUTION: Worldwide.

KOREA: PB, PN, GW, GG, CB, CN, GB, GN, JB, JN, JJ.

Tribe Laccophilini Gistel, 1856

Genus *Laccophilus* Leach, 1815

Genus *Laccophilus* Leach, 1815

Laccophilus Leach, 1815: 84. Type species: *Dytiscus minutus* Linnaeus, 1758.

DIAGNOSIS: Head short and broad. Medial part of prosternum and prosternal process on same plane. Prosternal process very small, slender and apex acute. Metatibial spines bifid apically. Pro- and mesotarsi with 5 tarsomeres. Postero-lateral angle of metatarsomere strongly lobed (Kamiya, 1938a; Roughley and Larson, 2001).

Key to the species of the *Laccophilus* in Korea

1. Body length more than 4.0 mm 2
- Body length less than 4.0 mm 3
2. Elytra with distinct brown to black vitta *L. lewisioides*
- Elytra with indistinct brown vitta *L. difficilis*

3. Ventral surface dark brown *L. vagelineatus*
 – Ventral surface yellowish brown 4
 4. Maxillary palpomere 4 with black marking on apical part; elytra without dark wavy stripes ... *L. kobensis*
 – Maxillary palpomere 4 without black marking on apical part; elytra with dark wavy stripes *L. sharpi*

21. *Laccophilus difficilis* Sharp, 1873 (Pl. 15)

Laccophilus difficilis Sharp, 1873: 53; Kamite et al., 2005: 618. Type locality: Japan: Kyushu.

DESCRIPTION: Length 5.0–5.5 mm. Body oval, reverse drop-shaped, slightly convex dorsally and flattened ventrally; widest at three-fifth, with reticulation and sparse punctures.

Color: Dorsal surface yellow to yellowish brown; ventral surface yellowish brown.

Head: Head transverse semicircular, about 6.0 times as wide as long. Clypeus transverse; anterior margin straight; antero-lateral part with a few setae. Frons about 3.0 times as wide as eye; lateral part with small punctures. Antennomeres 1–11 longer than wide; 1 parallel, 1.5 times as long as 2; 2–10 widest at apical part, with two short setae on apical part; 11 long oval, slightly shorter than 10, widest at apical two-fifth, with many setae on apical part. Labrum transverse; anterior margin rounded and antero-medial part emarginate. Maxillary palpomere 1 shortest; 2 and 3 about 2.0 times as long as 1; 4 about 3.0 times as long as 3, dark brown at apical fourth, sensilla rounded. Labial palpomere 1 shortest; 2 and 3 about 3.0 times as long as 1; 3 dark brown at apical third, sensilla rounded. Gula suture distinct. Mentum widest across posterior corner; antero-medial margin bisinuate; antero-lateral part protruded; anterior corner rounded; lateral margin slightly rounded; posterior corner acute; posterior margin slightly rounded.

Thorax: Pronotum broad trapezoidal, about 3.0 times as wide as long, widest across posterior corners, with small polygonal meshes and few setae, mostly two or three meshes connected; anterior corner acute; posterior corner rounded; posterior margin transverse V-shaped. Pronoto-elytral margin continuous. Elytra widest in middle, yellow with irregular marking and vittae, small polygonal meshes and few setae present, meshes not connected and larger than pronotum; postero-lateral margin with a row of long setae. Scutellum concealed. Prosternum with a row of setae on anterior margin and with setae on medial part. Prosternal process lanceolate, with longitudinal ridge on medial part; lateral bead broad. Protrochanter semicircular, with short setae. Profemur with a row of long spines on baso-ventral part and with a row of setae on medial part. Protibia shorter than femur, with short setae. Protarsomere 1 about 1.5 times as long as 2; 3 as long as 2; 4 slightly longer than 3; 5 about 2.0 times as long as 4. Mesotrochanter subtrapezoidal. Mesofemur with a row of long spines on baso-ventral part. Mesotibia shorter than femur, with short setae. Mesotarsomere 1 about 1.5 times as long as 2; 3 as long as 2; 4 slightly longer than 3; 5 about 2.0 times as long as 4. Metacoxal process trapezoidal, widest across posterior corner; antero-lateral part with small projection; postero-lateral

parts with rounded lateral bead. Metafemur without setae; postero-lateral angle rectangular with a few setae. Metatibia shorter than femur, with 7–9 spines on dorsal margin, largest spine as long as metatarsomere 1. Metatarsomere 1 longest, about 1.7 times as long as 2; 3, 4 and 5 as long as 2.

Abdomen: Sternite VII semicircular, with sparse setae on median and posterior parts, postero-medial part slightly convex. Median lobe of aedeagus (Pl. 15B) slender, curved; apex acute, subapical to middle expanded laterally; anterior third narrowed; basal part widest.

TYPE MATERIAL: Lectotype, 1♂ (NHM), with labels as follows: “*Laccophilus difficilis* Types D. S., Lectotype, Lectotypus, Japan., Japan. Lewis., Sharp Coll. 1905–313., *Laccophilus difficilis* Types D. S., Lectotype *Laccophilus difficilis* Sharp det. M. Brancucci”.

SPECIMENS EXAMINED: NORTH KOREA: Pyeongannam Prov.: 8♂♂12♀♀, PyeongYang-City, SunAn-Airport, Light of Entrance, 17 vii 2008, Changdo Han leg; Pyeonganbuk Prov.: 5♂♂3♀♀, Hyangsan-Gun, Around Hyangsan-Hotel, Near Chaongchon-River, 29. VI. 2009. Changdo Han leg; SOUTH KOREA: Chungbuk Prov.: 4♂♂2♀♀, Boeun-gun, Boeun-eub, Jisan-ri, 17 viii 1988, SH Lee; 5♂♂1♀, Cheongju-si, Heungdeok-gu, Gangseo-dong, Hanggagol-pond, N36°37'35.91", E127°24'46.85", 73 m, 22 x 2005, DH Lee, pond; 2♂♂1♀, Cheongwon-gun, 17 viii 1989, SH Lee; 1♀, Eumseong-gun, Gangok-myeon, Jucheon-ri, Jucheon-reservoir, N37°04'31.37", E127°37'49.94", 98 m, 16 viii 1989, SH Lee, reservoir; 3♂♂3♀♀, Goisan-gun, Iin-pond, 18 viii 1988, SH Lee; 7♂♂6♀♀, Jecheon-si, Yangminwon, 30 vii 1994, SH Lee; 10♂♂16♀♀, Jincheon-gun, Chopyeong-myeon, Hwasan-ri, Chopyeong-reservoir, N36°49'00.87", E127°30'58.96", 64 m, 31 vii 1994, SH Lee, reservoir; 2♂♂5♀♀, Okcheon-gun, 8 vii 1991, SH Lee; 3♂♂1♀, Yeongdong-gun, Simcheon-myeon, Danjeon-ri, 24 ix 2005, DH Lee, stream (1♂, on slide). Chungnam Prov.: 4♂♂4♀♀, Boryeong-si, Jupoo-myeon, Boryeong-ri, 25 vii 1988, SH Lee; 5♂♂1♀, Cheonan-si, Dongnam-gu, Samryong-dong, Cheongsu-reservoir, N36°46'38.98", E127°10'30.67", 76 m, 14 ix 1990, SH Lee, reservoir; 10♂♂6♀♀, Cheongyang-gun, Munmak-pond, 25 vii 1995, SH Lee; 2♂♂2♀♀, Daejeon-si, Yuseong-gu, Bangdong-reservoir, 29 ii 2006, DH Lee, beside reservoir (2♂♂, on slides); 2♂♂1♀, Geumsan-gun, Jewon-myeon, Cheonnae-ri, 15 vi 2004, DH Lee, JI Yeon, pond; 2♂♂1♀, Gongju-si, Banpo-myeon, Sangsin-ri, 10 vi 2004, SM Choi, rice field; 1♂, Seocheon-gun, Maseo-myeon, Deokam-ri, Yonghwasil-reservoir, N36°02'27.08", E126°43'07.66", 8 m, 5 viii 1990, SH Lee; 2♀♀, Taean-gun, Wonbuk-myeon, Sindu-ri, N36°50'34.37", E126°11'53.53", 20 m, 31 vii 2013, DH Lee, SG Lee, JS Lee, dune pond; 4♂♂9♀♀, Yesan-gun, Deoksan-myeon, Sacheon-ri, Sudeok-temple, N36°39'42.70", E126°37'20.08", 141 m, 26 vii 1995, SH Lee; 3♂♂4♀♀, Yeongi-gun, Geumnae-myeon, Daepyeong-ri, 17 ix 1997, US Hwang, MS Kim, SJ Park; Gangwon Prov.: 3♂♂2♀♀, Cheorwon-gun, Dongsong-eub, Odeok-ri, Hakji-reservoir, N38°13'56.69", E127°13'29.68", 190 m, 15 ix 1990, SH Lee, reservoir; 3♂♂2♀♀, Chuncheon-si, Chiljeondong, 5 viii 1988, SH Lee; 2♂♂, Gangneung-si, Unjeong-dong, Gyeongpo-lake, N37°47'49.59", E128°54'15.48", 1 m, 4 viii 1988, SH Lee, lagoon; 1♂1♀, Hongcheon-gun, Hwachon-myeon, Gulun-ri, 29 vii 1992, SH Lee; 1♀, Hoingseon-gun, 12 vi 1988, SH Lee; 6♂♂6♀♀, Hoingseong-gun, Hoingseong-eub,

Gaejeon-ri, 29 vii 1991, SH Lee; 2♂♂4♀♀, Inje-gun, Inje-eub, 31 vii 1991, SH Lee, beside stream; 2♂♂3♀♀, Hwacheon-gun, Gandong-myeon, Yuchon-ri, 30 vii 1987, SH Lee; 11♂♂12♀♀, Inje-gun, Nammyeon, Namjeon-ri, 1 viii 1991, SH Lee; 4♂♂4♀♀, Pyeongchang-gun, Baesujang, 29 vii 1994, SH Lee, pond; 6♂♂3♀♀, Samcheok-si, Geundeok-myeon, Hamaengbang-ri, Chodang-reservoir, N37°23'16.83", E129°12'19.24", 19 m, 7 ix 1990, SH Lee, reservoir; 7♂♂4♀♀, Sokcho-si, Joyang-dong, 21 v 1990, SH Lee; 10♂♂12♀♀, Wonju-si, Hanggu-dong, Dongmak-reservoir, N37°20'34.18", E128°00'23.27", 257 m, 3 viii 1988, SH Lee, reservoir; 1♀, Yanggu-gun, Dong-myeon, Wolun-ri, Wolun-reservoir, N38°13'22.13", E128°02'41.50", 319 m, 26 vii 2009, SH Lee, reservoir; Gyeongbuk Prov.: 7♂♂6♀♀, Andong-si, Seonggok-dong, 27 vii 1998, SH Lee, pond; 14♂♂10♀♀, Bonghwa-gun, Bonghwa-eub, Yugok-ri, Cheonma-reservoir, N36°54'39.84", E128°46'08.73", 243 m, 2 viii 1988, SH Lee, reservoir; 8♂♂6♀♀, Cheongdo-gun, Iseo-myeon, Heungseon-ri, Pungyang-reservoir, N35°40'52.68", E128°40'00.55", 111 m, SH Lee, reservoir; 1♀, Cheongsong-gun, Budong-myeon, Sangeui-ri, Mt. Juwangsan, 19 vii 1989, SH Lee; 3♂♂2♀♀, Daegu-si, Dalseong-gun, Yuga-myeon, Bonbal-ri, N35°38'26.96", E128°28'31.77", 70 m, 17 vi 1990, SH Lee, reservoir; 3♀♀, Goryeong-gun, Goryeong-eub, Junghwa-ri, 3 vi 1990, SH Lee, pond; 7♂♂5♀♀, Gumi-si, Haepyeong-myeon, Songgok-ri, Mt. Dorisan, 5 viii 1994, SH Lee, pond; 2♂♂4♀♀, Gunwi-gun, Hyoryeong-myeon, Janggi-ri, Janggi-reservoir, N36°06'57.80", E128°35'40.40", 181 m, 18 vi 1990, SH Lee, reservoir; 6♂♂8♀♀, Gyeongju-si, Cheonbuk-myeon, Seongji-ri, Sori-pond, N35°54'20.73", E129°16'50.95", 80 m, 16 ix 1989, SH Lee, pond; 1♂, Gyeongsan-si, Gyeyang-dong, Nammae-reservoir, N35°49'41.37", E128°44'40.37", 58 m, 25 vii 1986, SH Lee, reservoir; 1♂, Mungyeong-si, Seodui-pond, 13 vi 2009, SH Lee, pond; 2♂♂6♀♀, Pohang-si, Buk-gu, Gigye-myeon, Guji-ri, 3 iii 1991, SH Lee, Pond; 2♀♀, Pohang-si, Namgu, Daejam-dong, Daejam-reservoir, N36°00'55.79", E129°20'07.38", 38 m, 18 ix 1988, SH Lee, reservoir; 11♂♂15♀♀, Seongju-gun, Makgol-pond, 3 viii 1991, SH Lee, pond; 7♂♂9♀♀, Uljin-gun, Hupo-myeon, Hupo-ri, 25 ix 1994, SH Lee; 3♂♂3♀♀, Yecheon-gun, Yonggung-myeon, Mui-ri, Wondang-reservoir, N36°35'43.36", E128°17'36.32", 68 m, 6 vi 1988, SH Lee, reservoir; 9♂♂6♀♀, Yeongdeok-gun, Chuksan-myeon, 3 x 1994, SH Lee; 10♂♂16♀♀, Yeongju-si, Munsu-myeon, 2 viii 1988, SH Lee; 1♂3♀♀, Yeongyang-gun, Sadon-pond, 6 vi 1990, SH Lee, pond; Gyeonggi Prov.: 3♂♂5♀♀, Dongducheon-si, Tabdong-dong, 7 viii 1988, SH Lee; 2♀♀, Gwangju-si, Jungdae-dong, Jungang-reservoir, N37°23'59.52", E127°13'15.81", 70 m, 20 viii 1989, SH Lee, reservoir; 6♂♂6♀♀, Icheon-si, Bubal-eub, Gobaek-ri, Hoji-reservoir, N37°18'13.60", E127°31'52.38", 52 m, 17 viii 1989, SH Lee, reservoir; 2♀♀, Incheon-si, Ganghwa-gun, Naega-myeon, Gocheon-ri, Naega-reservoir, N37°44'44.62", E126°27'56.18", 34 m, 16 ix 1990, SH Lee, reservoir; 1♀, Incheon-si, Ongjin-gun, Baekryeong-myeon, 28 vii 2011, HM Lim, at light; 11♂♂14♀♀, Namyangju-si, Jinjeob-eub, 8 viii 1988, SH Lee; 7♂♂11♀♀, Pocheon-si, Idong-myeon, Jangam-ri, Idong-bridge, N38°01'57.66", E127°21'58.73", 147 m, 18 vii 1992, SH Lee, stream; 2♂♂1♀, Suwon-si, Paldal-gu, Hwaseo-dong, Seoho-reservoir, N37°16'38.87", E126°59'17.42", 35 m, 4 ix 1990, SH Lee, reservoir; 5♂♂5♀♀, Yangpyeong-si, 20 viii 1989, SH Lee, reservoir; Gyeongnam Prov.: 6♂♂3♀♀, Busan-si, Gijang-gun, Ilgwang-myeon, Mundong-ri, 28 vii 2009, SH Lee, pond; 5♂♂1♀, Changnyeong-gun,

Changnyeong-eub, Jikgyo-ri, 1 ix 1988, SH Lee, pond; 6♂♂7♀♀, Changwon-si, Seongsan-gu, Bulmosan-dong, 7 v 2009, SH Lee, pond; 3♂♂2♀♀, Geochang-gun, Gasi-pond, 10 viii 1989, SH Lee, pond; 2♂♂2♀♀, Geoje-si, Geoje-myeon, Oksan-ri, Oksan-reservoir, N34°52'19.60", E128°35'35.50", 85 m, 17 vii 2008, SH Lee, reservoir; 5♂♂1♀, Hadong-gun, Bukcheon-myeon, Jikjeon-ri, 11 vi 2006, SH Lee, pond; 1♀, Haman-gun, Beobsu-myeon, Dasong-ri, Daepyeong-swamp, N35°20'22.14", E128°20'15.08", 19 m, 22 v 1988, SH Lee, swamp; 1♂1♀, Hapcheon-gun, Yaro-myeon, Jeongdae-ri, Myeonggok-reservoir, N35°42'12.74", E128°09'58.88", 113 m, 7 v 2009, SH Lee, reservoir; 3♂♂5♀♀, Milyang-si, Bubuk-myeon, Uiyang-ri, Uiyang-reservoir, N35°32'46.60", E128°42'58.68", 71 m, 14 ix 1996, SH Lee, reservoir; 1♂1♀, Sacheon-si, Gonmyeong-myeon, Yongsan-ri, Dasol-temple, N35°04'57.68", E127°55'11.37", 155 m, 14 viii 1995, SH Lee, pond; 1♂8♀♀, Sancheong-gun, Geumseo-myeon, Maechon-ri, Sanpung-reservoir, N35°25'17.27", E127°52'00.69", 115 m, 10 viii 1989, SH Lee, reservoir; 1♂, Ulsan-si, Ulju-gun, Duseo-myeon, Hwalcheon-ri, 14 vii 1991, SH Lee, stream; Jeju Prov.: 4♂♂3♀♀, Jeju-si, Gujwa-eub, Jongdal-ri, 27 vii 1990, SH Lee, pond; 6♂♂4♀♀, Jeju-si, Hangyeong-myeon, Dumo-ri, 22 vii 1990, SH Lee, pond; 2♂♂2♀♀, Jeju-si, Jocheon-eub, Gyora-ri, 22 v 2006, DH Lee, pond (2♂♂, on slides); 2♀♀, Jeju-si, Saekdal-dong, 10 v 2012, HG Min, marsh; 4♂♂1♀, Seogwipo-si, Songsan-eub, Siheung-ri, 27 vii 1990, SH Lee, pond; Jeonbuk Prov.: 5♂♂3♀♀, Gimje-si, Gunyong-pond, 6 viii 1990, SH Lee, pond; 5♂♂3♀♀, Gunsan-si, Miryong-dong, Mije-reservoir, N35°57'06.45", E126°41'41.97", 15 m, 1 viii 2010, SH Lee, reservoir; 4♂♂4♀♀, Iksan-si, Hwangdeung-myeon, Hwangdeung-ri, 1 viii 1990, SH Lee; 5♂♂7♀♀, Imsil-gun, Samgye-myeon, Samgye-ri, N35°30'36.71", E127°16'17.68", 143 m, 14 viii 1989, SH Lee, reservoir; 2♂♂2♀♀, Jangsu-gun, Myeonggeum-reservoir, 14 viii 1988, SH Lee; 1♂, Namwon-si, Daesan-myeon, Gilgok-ri, 7 vi 2007, TK Kim, HW Kim, YH Kim; 3♂♂5♀♀, Sunchang-gun, Ingye-myeon, Tab-ri, Tabri-reservoir, N35°27'20.55", E127°08'56.13", 192 m, 1 viii 2009, SH Lee, reservoir; 1♀, Wanju-gun, Samrye-myeon, Ha-ri, 5 ix 2005, DH Lee, stream; Jeonnam Prov.: 12♂♂7♀♀, Boseong-gun, Boseong-eub, Boseong-ri, Bugok-reservoir, N34°46'33.11", E127°04'39.00", 157 m, 16 viii 1995, SH Lee, reservoir; 1♂, Gangjin-gun, Maryang-myeon, Maryang-ri, 27 vii 2004, SW Choi, at light; 1♂, Goheung-gun, Daeseo-myeon, Ondong-pond, 12 vi 2010, SH Lee, pond; 1♀, same data as former except for Supung-pond; 2♂♂1♀, Gwangju-si, Buk-gu, Deokeuidong, 1 viii 2009, SH Lee, pond; 1♂, Hwasun-gun, Dong-myeon, Jangdong-ri, 3 viii 2009, SH Lee, pond; 4♂♂5♀♀, Jangheung-gun, Jangheung-eub, Yeonsan-ri, 28 ix 2010, SH Lee, pond; 1♀, Jangseong-gun, Buki-myeon, Owol-ri, Songsan-reservoir, N35°25'13.28", E126°49'01.60", 100 m, 1 viii 2009, SH Lee, reservoir; 4♂♂3♀♀, Jindo-gun, Gunnae-myeon, Dunjeon-ri, Geumseong-pond, 28 vii 2010, SH Lee, pond; 2♂♂2♀♀, Muan-gun, Muan-eub, Seongam-ri, Seongam-reservoir, N34°58'29.68", E126°29'13.56", 64 m, 2 viii 1990, SH Lee, reservoir; 2♂♂1♀, Suncheon-si, Byeolyang-myeon, Bongrim-ri, Bongrim-reservoir, N34°52'39.13", E127°27'02.39", 21 m, 12 vi 2010, SH Lee, reservoir; 2♂♂3♀♀, Yeongam-gun, Deokjin-myeon, Jangseon-ri, 22 vii 1988, SH Lee, pond.

DISTRIBUTION: Korea, China (Beijing, Fujian, Guangdong, Guizhou, Hainan, Heilongjiang, Hebei, Hunan, Jiangsu, Jilin, Jiangxi, Liaoning, Sichuan, Shanghai, Shandong, Shanxi, Yunnan, Zhejiang), Japan, Russia (Far

East).

REGION: Eastern Palearctic.

KOREA: PB, PN, GW, GG, CB, CN, JB, JN, GB, GN, JJ.

KOREAN RECORDS: *Laccophilus difficilis*: Mori, 1932a: 2; Takizawa, 1932: 22; Kusanagi, 1936: 325; Kamiya, 1938a: 6; 1938b: 26; 1940: 116; Cho, 1957: 198 (misprint); 1969: 173; Brancucci, 1983: 279; Kwon and Suh, 1986: 92; Yoon, 1988: 570; Yoon and Ahn, 1988a: 192; Kim and Lee, 1991: 65; Lee et al., 1992: 49; Park and Kim, 1993: 110; Kim et al., 1994: 132; Lee, 1994: 17; 1995: 11; Nilsson, 1995: 69; 2003: 76; Kim and Kim, 1996b: 126; Kim and Kim, 1998: 169; Kim, 2000: 131; Han et al., 2007: 271; Han et al., 2008: 213; Park et al., 2008: 210; Cho and Park, 2010: 95; Nilsson and Hájek, 2014: 47; Lee and Ahn, 2015: 64. *Laccophilus minutus*: Kim et al., 1994: 132; Cho and Park, 2010: 95 [misidentification].

REMARKS: *Laccophilus minutus* (Linnaeus) was first recorded in Korea by Kim et al. (1994) and then by Cho and Park (2010). However, after examining specimens studied by Kim et al. (1994), we found that *L. minutus* (Linnaeus) previously recorded in Korea was actually *L. difficilis* Sharp. This species can be distinguished from *L. minutus* (Linnaeus) by apical fourth part of median lobe expanded laterally.

22. *Laccophilus kobensis* Sharp, 1873 (Pl. 16)

Laccophilus kobensis Sharp, 1873: 53; Nilsson, 1995: 69; Kamite et al., 2005: 620. Type locality: Japan: Honshu.

DESCRIPTION: Length 3.5–4.0 mm. Body oval, reverse drop-shaped, slightly convex dorsally and flattened ventrally; widest at anterior three-fifth, with reticulation and sparse punctures.

Color: Dorsal surface yellowish brown; ventral surface brown, with reticulation and sparse punctures.

Head: Head transverse semicircular, about 6 times as wide as long. Clypeus transverse; anterior margin straight; antero-lateral part with a few setae. Frons about 3.0 times as wide as eye; lateral part with small punctures. Antennomeres 1–11 longer than wide; 1 parallel, 1.5 times as long as 2; 2–10 widest at apical part, with two short setae on apical part; 11 long oval, slightly shorter than 10, widest at apical two-fifth, with many setae on apical part. Labrum transverse; anterior margin rounded and antero-medial part emarginate. Maxillary palpomere 1 shortest; 2 and 3 about 2.0 times as long as 1; 4 about 3.0 times as long as 3, dark brown at apical third, sensilla rounded. Labial palpomere 1 shortest; 2 and 3 about 3.0 times as long as 1; 3 dark brown at apical third, sensilla rounded. Gula suture distinct. Mentum widest across posterior corner; antero-median margin bisinuate; antero-lateral part protruded; anterior corner rounded; lateral margin slightly rounded; posterior corner acute; posterior margin slightly rounded.

Thorax: Pronotum broad trapezoidal, about 3.0 times as wide as long, widest across posterior corners, with small polygonal meshes and few setae, mostly two or three meshes connected; anterior corner acute; posterior

corner rounded; posterior margin transverse V-shaped. Pronoto–elytral margin continuous. Elytra yellowish brown to brown with irregular marking and indistinct vittae, small polygonal meshes and few setae present; meshes not connected and larger than pronotum; postero-lateral margin with a row of long setae. Scutellum concealed. Prosternum with a row of setae on anterior margin and with setae on medial part. Prosternal process lanceolate, with longitudinal ridge on medial part; lateral bead broad. Protochanter semicircular, with short setae. Profemur with a row of long spines on baso-ventral part and with a row of setae on medial part. Protibia shorter than femur, with short setae. Protarsomere 1 about 1.5 times as long as 2; 3 as long as 2; 4 slightly longer than 3; 5 about 2.0 times as long as 4. Mesotrochanter subtrapezoidal. Mesofemur with a row of long spines on baso-ventral part. Mesotibia shorter than femur, with short setae. Mesotarsomere 1 about 1.5 times as long as 2; 3 as long as 2; 4 slightly longer than 3; 5 about 2.0 times as long as 4. Metacoxal process trapezoidal, widest across posterior corner; antero-lateral part with small projection; postero-lateral parts with rounded lateral bead. Metafemur without setae; postero-lateral angle rectangular with a few setae. Metatibia shorter than femur, with 7–9 spines on dorsal margin largest spine slightly longer than metatarsomere 1. Metatarsomere 1 longest, about 1.5 times as long as 2; 3, 4, 5 as long as 2.

Abdomen: Sternite VII semicircular, with sparse setae on median and posterior part, postero-medial part valvular. Median lobe (Pl. 16B) of aedeagus slender, weakly curved; apex acute, subapical to middle expanded laterally; widest at middle.

TYPE MATERIAL: Lectotype, 1♂ (NHM), with labels as follows: “*Laccophilus kobensis* Types D. S., Lectotype, Japan. Lewis, Sharp Coll. 1905–313., Japan, Kobé, Japan. *L. kobensis* Type D. S., Lectotype *Laccophilus kobensis* Sharp det. M. Brancucci”.

SPECIMENS EXAMINED: SOUTH KOREA: Gyeongbuk Prov.: 1♂♂3♀♀, Pohang-si, Nam-gu, Jigok-dong, 26 iv 1992, SH Lee; Jeju Prov.: 1♂1♀, Jeju-si, Hangyeong-myeon, Yongsu-ri, 17 viii 1992, SH Lee, pond; 1♂1♀, Jeju-si, Jocheon-eub, Seonheul-ri, 11 vi 2005, DH Lee, pond; 1♂3♀♀, same data as former except for 12 vi 2005; 2♂♂1♀, same data as former except for 22 v 2006 (1♂1♀, on slide); 1♂, same data as former except for 2 iii 2007 (1♂, on slide); 2♂♂3♀♀, same data as former except for Dongbaek-park, 25 ix 2008 (1♂, on slide); 1♂, Seogwipo-si, Galmae-pond, 25 vii 2005, SH Lee, pond (1♂, on slide); 3♂♂5♀♀, Jeju-si, Saekdal-dong, 10 v 2012, HG Min, marsh; 1♀, Jeju-si, Saekdal-dong, 1100goji, N33°21'36.45", E126°47'46.42", 1,098 m, 24 v 2006, DH Lee, mountain stream; 2♂♂, same data as former except for 8 xi 2006 (1♂, on slide).

DISTRIBUTION: Korea, China (Fujian, Guanxi, Hunan, Shandong), Japan, Taiwan.

REGION: Eastern Palearctic.

KOREA: GB, JJ.

KOREAN RECORDS: *Laccophilus kobensis*: Kwon and Suh, 1986: 93; Lee et al., 1992: 61; Kim et al., 1994: 132; Han et al., 2007: 271; Han et al., 2008: 215; Park et al., 2008a: 211; Cho and Park, 2010: 95; Lee and Ahn, 2015: 66.

23. *Laccophilus lewisioides* Brancucci, 1983 (Pl. 17)

Laccophilus lewisioides Brancucci, 1983: 272. Type locality: China: Tien-Sin.

DESCRIPTION: Length 4.0–4.5 mm. Body oval, reverse drop-shaped, slightly convex dorsally and flattened ventrally; widest at anterior three-fifth; with reticulation and sparse punctures.

Color: Body mostly yellowish brown.

Head: Head transverse semicircular, about 6 times as wide as long. Clypeus transverse; anterior margin straight; antero-lateral part with a few setae. Frons about 3.0 times as wide as eye; lateral part with small punctures. Antennomeres 1–11 longer than wide; 1 parallel, 1.5 times as long as 2; 2–10 widest at apical part, with two short setae on apical part; 11 long oval, slightly shorter than 10, widest at apical two-fifth, with many setae on apical part. Labrum transverse; anterior margin rounded and antero-medial part emarginate. Maxillary palpomere 1 shortest; 2 and 3 about 2.0 times as long as 1; 4 about 3.0 times as long as 3, dark brown at apical third, sensilla rounded. Labial palpomere 1 shortest; 2 and 3 about 3.0 times as long as 1; 3 brown at apical part, sensilla rounded. Gula suture distinct. Mentum widest across posterior corner; antero-medial margin bisinuate; antero-lateral part protruded; anterior corner rounded; lateral margin slightly rounded; posterior corner acute; posterior margin slightly rounded.

Thorax: Pronotum broadly trapezoidal, about 3.0 times as wide as long, widest across posterior corners, with large irregular meshes and few setae; anterior corner acute; posterior corner rounded; posterior margin transverse V-shaped. Pronoto-elytral margin continuous. Elytra yellow with distinct dark brown vittae, large transverse meshes and few setae present; meshes larger than in pronotum; postero-lateral margin with a row of long setae. Scutellum concealed. Prosternum with a row of setae on anterior margin and with setae on medial part. Prosternal process lanceolate, with longitudinal ridge (carina) on medial part; lateral bead broad. Protochanter semicircular, with short setae. Profemur with a row of long spines on baso-ventral part and with a row of setae on medial part. Protibia shorter than femur, with short setae. Protarsomere 1 about 1.5 times as long as 2; 3 as long as 2; 4 slightly longer than 3; 5 about 2.0 times as long as 4. Mesotrochanter subtrapezoidal. Mesofemur with a row of long spines on baso-ventral part. Mesotibia shorter than femur, with short setae. Mesotarsomere 1 about 1.5 times as long as 2; 3 as long as 2; 4 slightly longer than 3; 5 about 2.0 times as long as 4. Metacoxal process trapezoidal, widest across posterior corner; antero-lateral part with small projection; postero-lateral parts with rounded lateral bead. Metafemur without setae; postero-lateral angle rectangular with a few setae. Metatibia shorter than femur, with 7–9 of spines on dorsal margin, largest spine as long as metatarsomere 1. Metatarsomere 1 longest, about 1.5 times as long as 2; 3, 4, 5 as long as 2.

Abdomen: Sternite VII semicircular, with sparse setae on median and posterior part, postero-medial part slightly convex. Median lobe (Pl. 17B) of aedeagus slender, bent and widest at middle, apex acute.

SPECIMENS EXAMINED: SOUTH KOREA: Gyeongbuk Prov.: 1♂, Euseong-gun, Dongseong-pond, 6 vi 2010,

SH Lee, pond; 1♀, same data as former except for Hwajeon-pond; 1♂1♀, Gyeongsan-si, Gyeyang-dong, Nammae-reservoir, N35°49'41.37", E128°44'40.37", 58 m, 12 ix 1984, R. Pinger, reservoir; 1♂, same data as former except for 18 iv 1985; 1♀, same data as former except for 25 iv 1985; 1♂1♀, same data as former except for 13 v 1989; 1♂1♀, Gyeongju-si, Geoncheon-eub, Sinpyeong-ri, 28 v 1993, SH Lee; 1♀, Pohang-si, Nam-gu, Daejam-dong, Daejam-reservoir, N36°00'55.79", E129°20'07.38, 38 m, 12 v 1988, SH Lee, reservoir; 1♀, same data as former except for 18 ix 1988; 4♂♂2♀, Pohang-si, Nam-gu, Yeonil-eub, Yugang-ri, 23 viii 1992, SH Lee (2♂♂1♀, on slides); Gyeongnam Prov.: 2♂♂3♀♀, Milyang-si, Bubuk-myeon, Uiyang-ri, Uiyang-reservoir, N35°32'46.60", E128°42'58.68", 71 m, 14 ix 1996, SH Lee, reservoir.

DISTRIBUTION: Korea, China (Hebei, Jiangsu, Nei Mongol, Shanghai), Russia (Far East).

REGION: Eastern Palearctic.

KOREA: GB, GN.

KOREAN RECORDS: *Laccophilus lewisoides*: Brancucci, 1983: 272; Nilsson, 1995: 69; Hua, 2002: 39; Hájek, 2003: 117; Nilsson, 2003: 46; Nilsson and Hájek, 2014: 47; Lee and Ahn, 2015: 68. *Laccophilus lewisius*: Cho et al., 1985: 19; Kwon and Suh, 1986: 93; Yoon, 1988: 570; Yoon and Ahn, 1988a: 192; Lee et al., 1992: 50; Kim et al., 1994: 132; Lee, 1994: 17; 1995: 11; Han et al., 2007: 271; Han et al., 2008: 216; Cho and Park, 2010: 95 [misidentification].

REMARKS: *Laccophilus lewisius* Sharp was first recorded in Korea by Cho et al. (1985). After that, many entomologists (Cho et al., 1985: 19; Kwon and Suh, 1986: 93; Yoon and Ahn, 1988: 192; Lee et al., 1992: 50) reported this species in Korea. However, after examining specimens studied by Cho et al. (1985), Yoon and Ahn (1988) and Lee et al. (1992), we found that *L. lewisius* Sharp previously recorded in Korea was actually *L. lewisoides* Brancucci. This species can be distinguished from *L. lewisius* Sharp by the median lobe bent at middle.

24. *Laccophilus sharpi* Régimbart, 1889

Laccophilus sharpi Régimbart, 1889: 151. Type locality: Indonesia: Java.

Laccophilus similis Régimbart, 1889: 150.

Laccophilus samosir Csiki, 1938: 125.

DISTRIBUTION: Korea, Australia, China (Anhui, Beijing, Fujian, Guangdong, Guizhou, Guanxi, Hainan, Hebei, Hong Kong, Hubei, Hunan, Jiangsu, Jilin, Jiangxi, Liaoning, Sichuan, Shandong, Yunnan, Zhejiang), Himachal Pradesh, India, Iran, Japan, Nepal, Pakistan, Philippines, Saudi Arabia, Sri Lanka, Sumatra, Taiwan, Vietnam.

REGION: Palearctic.

KOREA: Unknown.

KOREAN RECORDS: *Laccophilus sharpi*: Takizawa, 1932: 23; Kamiya, 1938a: 8; 1938b: 28; Ishii, 1940: 42;

Cho, 1957: 198; 1969: 173; Brancucci, 1983: 347; Kwon and Suh, 1986: 93; Yoon, 1988: 571; Yoon and Ahn, 1988a: 193; Kim et al., 1994: 132; Nilsson, 1995: 71; 2010: 49; Hua, 2002: 39; Cho and Park, 2010: 95; Nilsson and Hájek, 2014: 48; Lee and Ahn, 2015: 69. *Laccophilus sharpi similis*: Mori, 1932a: 2 [synonym of *L. sharpi*].

REMARKS: We could not find specimens in Korea but cited this species based on Brancucci (1983).

25. *Laccophilus vagelineatus* Zimmermann, 1922 (Pl. 18)

Laccophilus vagelineatus Zimmermann, 1922: 19; Kamite et al., 2005: 623. Type locality: Russia: Primorye.

DESCRIPTION: Length 3.5–4.0 mm. Body oval, reverse drop-shaped, slightly convex dorsally and flattened ventrally; widest at anterior three-fifth; with reticulation and sparse punctures.

Color: dorsal surface yellow to yellowish brown and ventral surface dark brown.

Head: Head transverse semicircular, about 6 times as wide as long. Clypeus transverse; anterior margin straight; antero-lateral part with a few setae. Frons about 3.0 times as wide as eye; lateral part with small punctures. Antennomeres 1–11 longer than wide; 1 parallel, 1.5 times as long as 2; 2–10 widest at apical part, with two short setae on apical part; 11 long oval, slightly shorter than 10, widest at apical two-fifth, with many setae on apical part. Labrum transverse; anterior margin rounded and antero-medial part emarginate. Maxillary palpomere 1 shortest; 2 and 3 about 2.0 times as long as 1; 4 about 3.0 times as long as 3, without dark brown marking, sensilla rounded. Labial palpomere 1 shortest; 2 and 3 about 3.0 times as long as 1; 3 without dark brown marking, sensilla rounded. Gula suture distinct. Mentum widest across posterior corner; antero-median margin bisinuate; antero-lateral part protruded; anterior corner rounded; lateral margin slightly rounded; posterior corner acute; posterior margin slightly rounded.

Thorax: Pronotum broad trapezoidal, about 3.0 times as wide as long, widest across posterior corners with small transverse meshes and few setae; anterior corner acute; posterior corner rounded; posterior margin transverse V-shaped. Pronoto–elytral margin continuous. Elytra widest a half, brown with distinct dark brown vittae; transverse yellowish brown marking present on anterior fourth; small polygonal meshes and few setae present; meshes smaller than pronotum; postero-lateral margin with a row of long setae. Scutellum concealed. Prosternum with a row of setae on anterior margin and with setae on medial part. Prosternal process lanceolate, with longitudinal ridge (carina) on medial part; lateral bead broad. Protrochanter semicircular, with short setae. Profemur with a row of long spines on baso-ventral part and with a row of setae on medial part. Protibia shorter than femur, with short setae. Protarsomere 1 about 1.5 times as long as 2; 3 as long as 2; 4 slightly longer than 3; 5 about 2.0 times as long as 4. Mesotrochanter subtrapezoidal. Mesofemur with a row of long spines on baso-ventral part. Mesotibia shorter than femur, with short setae. Mesotarsomere 1 about 1.5 times as long as 2; 3 as long as 2; 4 slightly longer than 3; 5 about 2.0 times as long as 4. Metacoxal

process trapezoidal, widest across posterior corner; antero-lateral part with small projection; postero-lateral parts with rounded lateral bead. Metafemur without setae; postero-lateral angle rectangular with a few setae. Metatibia shorter than femur, with 5–6 spines on dorsal margin largest spine slightly longer than metatarsomere 1. Metatarsomere 1 longest, about 1.7 times as long as 2; 3, 4, 5 as long as 2.

Abdomen: Sternite VII semicircular, with sparse setae on median and posterior part, postero-medial part valvular. Median lobe (Pl. 18B) of aedeagus slender, weakly curved; apex acute, anterior fifth broadly expanded laterally; basal part widest.

SPECIMENS EXAMINED: SOUTH KOREA: Gyeonggi Prov.: 4♂♂3♀♀, Suwon-si, Paldal-gu, Hwaseo-dong, Seoho-reservoir, N37°16'38.87", E126°59'17.42", 35 m, 4 ix 1990, SH Lee, reservoir (2♂♂1♀, on slides); Gyeongnam Prov.: 1♂, Busan-si, Mulam, 24 vii 1991, SH Lee.

DISTRIBUTION: Korea, China (Anhui, Fujian, Hubei, Jiangsu, Jiangxi, Yunnan, Zhejiang), Japan, Russia (Far East).

REGION: Eastern Palearctic.

KOREA: GG, GN.

KOREAN RECORDS: *Laccophilus vagelineatus*: Brancucci, 1983: 282; Lee, 1994: 17; Nilsson, 1995: 69; 2003: 46; Hua, 2002: 39; Hájek, 2003: 120; Nilsson and Hájek, 2014: 48; Lee and Ahn, 2015: 70. *Laccophilus hyalinus*: Jung et al., 2011: 42 [misidentification].

REMARKS: *Laccophilus hyalinus* (DeGeer) was first recorded in Korea by Jung et al. (2011). However, after examining specimens studied by them, we found that previously recorded in Korea was actually *L. vagelineatus* Zimmermann. This species can be distinguished from *L. hyalinus* by the elytra with transverse yellow marking.

Subfamily Cybistrinae Sharp, 1882

TYPE: *Cybister*.

SPECIES: 128.

DISTRIBUTION: Worldwide.

KOREA: GW, GG, CB, CN, GB, GN, JB, JN, JJ.

Tribe Cybistrini Sharp, 1882

DIAGNOSIS: Elytron with cluster of stiff setae on apico-ventral part. Mesotarsomere with simple adhesive setae. Metafemur and metatibia very short and broad. Metafemur with natatory setae on dorsal margin.

Metatibia inner spine acute and boarder than outer one. (Miller et al., 2007).

Genus *Cybister* Curtis, 1827

Genus *Cybister* Curtis, 1827

Cybister Curtis, 1827: pl. 151. Type species: *Dytiscus lateralis* Fabricius, 1798.

DIAGNOSIS: Mesotibia with postero-apical marginal setae in a continuous line. Mesotarsomeres of males and pro- and mesotarsomeres of females with a series of setae along the postero-ventral apical margin. Males with a single metatarsal claw. Lobes of the male sternite VII with medial margin emarginate (Miller et al., 2007).

Key to the species of the *Cybister* in Korea

1. Elytron black, without yellow band on lateral margin *C. brevis*
– Elytron dark green, with yellow band on lateral margin 2
2. Body length less than 40.0 mm; ventral surface mostly yellowish brown *C. lewisianus*
– Body length more than 40.0 mm; medial parts of metaventrite and metacoxal plate black *C. chinensis*

Subgenus *Cybister* Curtis, 1827

26. *Cybister (Cybister) chinensis* Motschulsky, 1854 (Pl. 19)

Cybister chinensis Motschulsky, 1854: 44; Nilsson and Petrov, 2007: 43. Type locality: China: Beijing.

Cybister japonicus Sharp, 1873: 45.

DESCRIPTION: Length 34.0–42.0 mm. Body oval, convex, with microreticulation.

Color: Head green to dark green, anterior part yellow; pronotum and elytra dark green with yellow band on lateral margins. Ventral surface mostly yellow; medial part of metaventrite and metacoxal plates dark brown to black.

Head: Head subtrapezoidal, about 1.5 times as wide as long, widest across eyes, with sparse setae on clypeal grooves and around eyes. Anterior margin of clypeus straight. Width of frons about 2.2 times as wide as eye. Antenna long and slender; antennomeres longer than wide, 1–10 broad apically; 1 longest; 11 slightly longer than 10, widest at subapical part. Labrum with long setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomeres 1–3 broad apically; 1 as long as 3; 2 slightly longer than 1; 4 long

oval, longest, slightly longer than 3, apex truncate, bifid. Labial palpomeres 1–2 broad apically; 1 shortest; 2 longest, 2.0 times as long as 1; 3 long oval, slightly shorter than 2, apex truncate, bifid. Gula trapezoidal, convex; gula suture non-parallel, continuous. Mentum widest at posterior corner; antero-medial margin slightly bisinuate; antero-lateral part protruded; anterior corner rectangular; lateral margin rounded; posterior corner rectangular; posterior margin slightly rounded.

Thorax: Pronotum trapezoidal, widest at posterior corners, about 3.5 times as wide as long, 1.5 times as wide as head, with longitudinal plica; anterior margin slightly rounded; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner acute; posterior margin broadly bisinuate. Elytra slightly acute apically, widest at anterior two-third, wider than pronotum. Prosternum distinctly protruded medially and with a row of setae on anterior margin. Prosternal process long and flattened, slightly convex medially; posterior part acuminate, slightly concave medially, with thin lateral bead, apex acute. Metaventricle convex, with a row of setae on anterior part, with indistinct longitudinal suture on medial part. Procoxa rounded. Protrochanter subtriangular, with sparse spines. Profemur with a row of long spines on ventral margin. Protibia with sparse spines. Protarsomeres 1–3 fused, broad, transverse, with suckers; 4 small; 5 about 2.0 times as long as 4. Protarsal inner claw as long as tarsomere 5. Mesocoxa rounded. Mesotrochanter subtriangular, with sparse spines on dorsal part. Mesofemur with short spines, with a row of long spines on baso-ventral margin. Mesotibia with sparse spines; mesotibial largest spine as long as tarsomere 1–2 combined. Mesotarsomeres 1–3 without suckers; 1 about 1.5 times as long as 2; 2 as long as 3; 4 slightly shorter than 3; 5 longest, 1.2 times as long as 4. Mesotarsal claw longer than tarsomere 5. Metacoxal process with sparse setae, with broad lateral bead; postero-lateral part rounded, apex acute. Metatrochanter trapezoidal. Metafemur broad apically. Metatibia (Pl. 19B) with sparse spines; metatibial largest spine longer than tarsomere 1, apex acute. Metatarsomere 1 about 1.5 times as long as 2; 3 slightly shorter than 2; 4 slightly shorter than 3; 5 about 1.5 times as long as 4. Metatarsal claw 1.2 times as long as tarsomere 5.

Abdomen: Sternites IV–VI with sparse setae on medial part; sternite VII with sparse setae on posterior part. Median lobe (Pl. 19C, D) of aedeagus thick, widest at base, curved at middle, apex rounded in lateral view; with 2 long carinae, narrowed at apical fifth, widest at apical three-fifth, apical part rounded in dorsal view. Paramere (Pl. 19E) subtriangular, narrowed, with long setae on lateral margin.

SPECIMENS EXAMINED: SOUTH KOREA: Chungbuk Prov.: 3♀♀, Chungju-si, Jisil-pond, 16 viii 1989, SH Lee; Chungnam Prov.: 1♂1♀, Cheonan-si, Dongnam-gu, Samryong-dong, Cheongsu-reservoir, N36°46'38.98", E127°10'30.67", 76 m, 14 ix 1990, SH Lee, reservoir; Gangwon Prov.: 1♀, Cheorwon-gun, Dongsong-eub, Odeok-ri, Hakji-reservoir, N38°13'56.69", E127°13'29.68", 190 m, 15 ix 1990, SH Lee, reservoir; Gyeongbuk Prov.: 2♂♂, Bonghwa-gun, Bonghwa-eub, Yugok-ri, Cheonma-reservoir, 2 viii 1988, SH Lee; 1♀, Gyeonsan-si, Yeongnam University, 11 vii 1982, MK Kim, at light; Gyeonggi Prov.: 1♂1♀, Yeoncheon-si, Yeoncheon-eub, Dongmak-ri, N38°06'45.13", E127°06'45.13", 104 m, 26 ix 2014, DH Lee, SG Lee, JS Lee, pond; Gyeongnam Prov.: 1♀, Changnyeong-gun, 2 iv 1985, SH Lee; Jeju Prov.: 1♂, Jeju-si,

Saekdal-dong, 10 v 2012, HG Min, ex pond; Jeonbuk Prov.: 1♂, Gochang-gun, 21~25 vii 1992, R.G.O.

DISTRIBUTION: Korea, China (Beijing, Fujian, Guandong, Hainan, Hebei, Heilongjiang, Jilin, Liaoning, Ningxia, Sichuan, Shaanxi, Shandong, Shanxi, Tianjin) Japan, Russia (Far East), Taiwan.

REGION: Eastern Palaearctic.

KOREA: GW, GG, CB, CN, GB, GN, JB, JJ.

KOREAN RECORDS: *Cybister chinensis*: Nilsson, 2015: 18. *Cybister japonicus*: Kolbe, 1886: 173; Wilke, 1920: 264; Okamoto, 1924: 165; Mori, 1932a: 5; Kusanagi, 1936: 324; Mochizuki and Tsunekawa, 1937: 77; Kamiya, 1938b: 121; Mochizuki and Matsui, 1939: 55; Kamiya, 1940: 129; Cho, 1957: 200; Cho, 1963: 45; Cho, 1969: 184; Kim et al., 1974: 220; Kim and Nam, 1982: 25; Lee et al., 1985: 402; Kwon and Suh, 1986: 97; Yoon, 1988: 608; Yoon and Ahn, 1988b: 259; Kim and Lee, 1991: 65; Park and Kim, 1993: 110; Kim et al., 1994: 134; Lee, 1994: 15; Hua, 2002: 36; Nilsson, 2003b: 51; Han et al., 2007: 271; Han et al., 2008: 255; Park et al., 2008: 239; Cho and Park, 2010: 95 [synonym of *C. chinensis*].

27. *Cybister (Cybister) lewisianus* Sharp, 1873 (Pl. 20)

Cybister lewisianus Sharp, 1873: 46. Type locality: Japan: Osaka.

DESCRIPTION: Length 21.0–26.0 mm. Body oval, convex, with microreticulation.

Color: Head green to dark green, anterior part yellow; pronotum and elytra dark green with yellow band on lateral margins. Ventral surface mostly brown; antenna, palpus, front and middle legs, hypomera, epipleura yellow to yellowish brown.

Head: Head subtrapezoidal, about 1.5 times as wide as long, widest across eyes, with sparse setae on clypeal grooves and around eyes. Anterior margin of clypeus straight. Width of frons about 2.2 times as wide as eye. Antenna long and slender; antennomeres longer than wide, 1–10 broad apically; 1 longest; 11 slightly longer than 10, widest at subapical part. Labrum with long setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomeres 1–3 broad apically; 1 as long as 3; 2 slightly longer than 1; 4 long oval, longest, slightly longer than 3, apex truncate, bifid. Labial palpomeres 1–2 broad apically; 1 shortest; 2 longest, slightly longer than 1; 3 long oval, as long as 2, apex truncate, bifid. Gula trapezoidal, convex; gula suture non-parallel, continuous. Mentum widest at posterior corner; antero-medial margin slightly bisinuate; antero-lateral part protruded; anterior corner rectangular; lateral margin rounded; posterior corner rectangular; posterior margin slightly rounded.

Thorax: Pronotum trapezoidal, widest at posterior corners, about 4.0 times as wide as long, 1.5 times as wide as head, with longitudinal plica; anterior margin slightly rounded; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner acute; posterior margin broadly bisinuate. Elytra rounded apically, widest at anterior three-fifth, wider than pronotum. Prosternum distinctly protruded

medially and with a row of setae on anterior margin. Prosternal process long and flattened, slightly convex medially; posterior part acuminate, slightly convex, with thin lateral bead, apex acute. Metaventrite convex, with a row of setae on anterior part, with indistinct longitudinal suture on medial part. Procoxa rounded. Protrochanter subtriangular, with sparse spines. Profemur with a row of long spines on ventral margin. Protibia with sparse spines. Protarsomeres 1–3 fused, broad, transverse, with suckers; 4 small; 5 about 2.0 times as long as 4. Protarsal inner claw as long as tarsomere 5. Mesocoxa rounded. Mesotrochanter subtriangular, with sparse spines on dorsal part. Mesofemur with short spines, with a row of long spines on baso-ventral margin. Mesotibia with sparse spines; mesotibial largest spine as long as tarsomere 1–2 combined. Mesotarsomeres 1–3 without suckers; 1 about 1.5 times as long as 2; 2 as long as 3; 4 slightly shorter than 3; 5 longest, 1.2 times as long as 4. Mesotarsal claw as long as tarsomere 5. Metacoxal process with sparse setae, with broad lateral bead; postero-lateral part rounded, apex acute. Metatrochanter trapezoidal. Metafemur broad apically. Metatibia with sparse spines; metatibial largest spine longer than tarsomere 1–2 combined, apex acute. Metatarsomere 1 about 1.5 times as long as 2; 3 slightly shorter than 2; 4 slightly shorter than 3; 5 about 1.5 times as long as 4. Metatarsal claw 1/3 times as long as tarsomere 5.

Abdomen: Sternites IV–VI with sparse setae on medial part; sternite VII with sparse setae on posterior part. Median lobe (Pl. 20B, C) of aedeagus long and slender, widest at middle, curved at subbasal part, apex acute in lateral view; narrowed at basal third, apical part protruded and rounded in dorsal view. Paramere (Pl. 20D) subtriangular, rugose, with long setae on lateral margin.

TYPE MATERIAL: Syntype, 1♂ (NHM), with labels as follows: “Type, Japan. G Lewis. 1910–320., *Cybister lewisianus* ♂, type DS”.

SPECIMENS EXAMINED: SOUTH KOREA: Chungbuk Prov.: 2♂♂2♀♀, Eumseong-gun, Samseong-myeon, Samgok-ri, Seongeun-pond, 9 x 2011 SH Lee, ex pond; Chungnam Prov.: 1♂, Taean-gun, Anmyoen-eub, Seungeon-ri, Seungeon2-reservoir, 2 x 2011, SH Lee; Gyeongbuk Prov.: 1♂, Gyeongsan-si, Gyeongyang-dong, Nammae-reservoir, N35°49'41.37", E128°44'40.37", 58 m, 25 vii 1986, SH Lee, reservoir; 2♀♀, Gyeongsan-si, Yeongnam University, 11 vii 1982, MK Kim, at light; Jeonnam Prov.: 1♂, Hwasun-gun, Hwasun-reservoir, 15 viii 1995, SH Lee.

DISTRIBUTION: Korea, China (Anhui, Beijing, Hebei, Jiangsu, Jiangxi, Liaoning, Shanghai, Zhejiang), Japan.

REGION: Eastern Palaearctic.

KOREA: CB, CN, JN, GB.

KOREAN RECORDS: *Cybister lewisianus*: Mori, 1932a: 5; Kwon and Suh, 1986: 98; Kim et al., 1994: 134; Park et al., 2008a: 241; Cho and Park, 2010: 95. *Cybister tripunctatus*: Okamoto, 1924: 165; Mori, 1932a: 5; Kusanagi, 1936: 324; Ishii, 1940: 42 [misidentification of *C. lewisianus*]. *Cybister tripunctatus orientalis*: Kamiya, 1938b: 125; Cho, 1957: 201; 1963: 45; 1969: 184; Kim and Nam, 1982: 25; Lee et al., 1985: 402; Kwon and Suh, 1986: 98; Yoon, 1988: 610; Yoon and Ahn, 1988b: 259; Kim and Lee, 1991: 65; Kim et al., 1994: 134; Hua, 2002: 34; Cho and Park, 2010: 95 [misidentification of *C. lewisianus*].

Subgenus *Melanectes* Brinck, 1945

28. *Cybister (Melanectes) brevis* Aubé, 1838 (Pl. 21)

Cybister brevis Aubé, 1838: 98. Type locality: Japan.

DESCRIPTION: Length 20.0–25.0 mm. Body oval, convex, with microreticulation.

Color: Head dark green to black, anterior part yellowish brown; pronotum dark green to black; elytron black with yellowish brown spots on posterior part. Ventral surface mostly black; antenna, mouthparts, legs, hypomera, epipleura yellowish brown to dark brown.

Head: Head subtrapezoidal, about 1.8 times as wide as long, widest across eyes, with punctures on medial and posterior parts, with sparse setae on clypeal grooves. Anterior margin of clypeus straight. Width of frons about 2.2 times as wide as eye. Antenna long and slender; antennomeres longer than wide; 1–10 broad apically; 3 longest; 11 slightly shorter than 10, widest at middle. Labrum with long setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomeres 1–3 broad apically; 1 as long as 3; 2 slightly longer than 1; 3 as long as 1; 4 long oval, longest, 2.0 times as long as 3, apex truncate, bifid. Labial palpomeres 1–2 broad apically; 1 shortest; 2 about 1.5 times as long as 1; 3 long oval, longest, 1.5 times as long as 2, apex truncate, bifid. Gula trapezoidal, convex; gula suture non-parallel, continuous. Mentum widest at posterior corner; antero-medial margin slightly bisinuate; antero-lateral part protruded; anterior corner rounded; lateral margin rounded; posterior corner rectangular; posterior margin slightly rounded.

Thorax: Pronotum trapezoidal, widest at posterior corners, about 4.0 times as wide as long, 2.0 times as wide as head, with longitudinal plica on medial part; anterior margin slightly rounded; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner acute; posterior margin broadly bisinuate. Elytra rounded apically, widest at anterior three-fifth, wider than pronotum. Prosternum distinctly protruded medially and with a row of setae on anterior margin. Prosternal process long and flattened, slightly convex medially; posterior part acuminate, slightly convex, with thin lateral bead, apex acute. Metaventricle convex, with indistinct longitudinal suture on medial part. Procoxa rounded. Protrochanter subtriangular, with sparse spines. Profemur with group of long spines on baso-ventral margin. Protibia with a row of long spines on dorsal margin. Protarsomeres 1–3 fused, broad, transverse with suckers; 4 small; 5 about 2.0 times as long as 4. Protarsal claws unequal, inner claw $\frac{2}{3}$ times as long as tarsomere 5 and longer than outer claw. Mesocoxa rounded. Mesotrochanter subtriangular, with sparse spines. Mesofemur with a group of spines on baso-ventral margin. Mesotibia with sparse spines; mesotibial largest spine as long as tarsomere 1–2 combined. Mesotarsomeres 1–3 without suckers; 1 about 1.5 times as long as 2; 2 as long as 3; 4 slightly shorter than 3; 5 longest, 1.2 times as long as 4. Mesotarsal claw as long as tarsomere 5. Metacoxal process with sparse setae, with broad lateral bead; postero-lateral part rounded, apex bifid. Metatrochanter trapezoidal. Metafemur broad apically. Metatibia (Pl. 21B) with sparse spines; metatibial largest spine as

long as tarsomere 1–2 combined, apex acute. Metatarsomere 1 about 1.5 times as long as 2; 3 slightly shorter than 2; 4 slightly shorter than 3; 5 about 1.5 times as long as 4. Metatarsal claw (Pl. 21C) 1/3 times as long as tarsomere 5.

Abdomen: Sternites IV–VII with sparse setae on medial part. Median lobe (Pl. 21D) of aedeagus robust, widest at base, curved at middle, apex acute in lateral view. Paramere (Pl. 21E) semicircular, with long setae on lateral margin.

SPECIMENS EXAMINED: SOUTH KOREA: Chungbuk Prov.: 1♀, Boeun-gun, Boeun-eub, Jisan-ri, 17 viii 1988, SH Lee; 1♀, Jincheon-gun, Chopyeong-myeon, Hwasan-ri, Chopyeong-reservoir, N36°49'00.87", E127°30'58.96", 64 m, 31 vii 1994, SH Lee, reservoir; 1♂, Yeongdong-gun, Hwanggan-myeon, Sintan-ri, Sintan-pond, 9 v 2009, SH Lee; Chungnam Prov.: 1♀, Daejeon-si, Yuseong-gu, Juk-dong, 18 v 2004, DH Lee, *ex* rice field; Gangwon Prov.: 1♂1♀, Hongcheon-gun, Nam-myeon, Myeongdong-ri, 29 iv 2003, JG Kim, *ex* ditch; 1♂, Wonju-si, Haenggu-dong, Dongmak-pond, 3 viii 1988, SH Lee; Gyeongbuk Prov.: 1♂, Cheongdo-gun, Unmun-myeon, Sinwon-ri, Unmun-temple, 15 ix 1996, SH Lee; 1♂, Mungyeong-si, Seodui-pond, 13 vi 2009, SH Lee; 4♂♂3♀♀, Pohang-si, Nam-gu, Jigok-dong, 26 iv 2010, SH Lee; Gyeonggi Prov.: 3♂♂2♀♀, Yeoncheon-si, Yeoncheon-eub, Dongmak-ri, N38°06'45.13", E127°06'45.13", 104 m, 26 ix 2014, DH Lee, SG Lee, JS Lee, pond; Gyeongnam Prov.: 3♂♂1♀, Yangsan-si, Sangbuk-myeon, Daeseok-ri, Daeseok-pond, 22 x 1988, SH Lee; Jeju Prov.: 1♂2♀♀, Bukjeju-gun [=Jeju-si], Jocheon-eub, Seonheul-ri, 11 vi 2005, DH Lee, *ex* pond.

DISTRIBUTION: Korea, China (Liaoning, Sichuan Taiwan), Japan.

REGION: Eastern Palearctic.

KOREA: GW, GG, CB, CN, GB, GN, JJ.

KOREAN RECORDS: *Cybister brevis*: Mori, 1932a: 5; Yoshino, 1935: 16; Mochizuki and Tsunekawa, 1937: 77; Kamiya, 1938b: 121; Mochizuki and Matsui, 1939: 55; Cho, 1957: 200; Cho, 1969: 183; Kwon and Suh, 1986: 97; Yoon, 1988: 608; Yoon and Ahn, 1988b: 259; Kim et al., 1994: 134; Lee, 1994: 15; 1995: 13; Nillson, 2003b: 51; Han et al., 2007: 271; Han et al., 2008: 257; Park et al., 2008: 243; Cho and Park, 2010: 95.

Subfamily Dytiscinae Leach, 1815

DIAGNOSIS: Eye not emarginate along antero-lateral margin. Prosternum and prosternal process in same plane. Apical part of male protarsal adhesive setae circular sucker-disc. Aedeagus symmetrical bilaterally. Gonocoxae fused dorsally (Miller and Bergsten, 2014).

TYPE: *Dytiscus*.

SPECIES: over 247.

DISTRIBUTION: Worldwide.

KOREA: GW, GG, CB, CN, GB, GN, JB, JN, JJ.

Key to the tribes of the Dytiscinae in Korea

1. Metatibial spines bifid apically Aciliini
 - Metatibial spines acute apically 2
2. Apex of prosternal process sharply pointed; elytron laterally with compact and short spines Eretini
 - Apex of prosternal process rounded; elytron laterally without compact and short spines 3
3. Meso- and metatarsomeres without compact short setae on apical margin; metatarsal claws equal in length Dytiscini
 - Meso- and metatarsomeres with compact short setae on apical margin; metatarsal claws not equal in length Hydaticini

Tribe Dytiscini Leach, 1815

DIAGNOSIS: Meso- and metatarsomeres without short and adpressed setae on apical margin. Metatarsal claws equal in length (Miller and Bergsten, 2014).

Genus *Dytiscus* Linnaeus, 1758

Genus *Dytiscus* Linnaeus, 1758

Dytiscus Linnaeus, 1758: 411. Type species: *Dytiscus marginalis* Linnaeus, 1758.

DIAGNOSIS: Length from 22.6–40.0 mm. Clypeal-frontal suture entire. Prosternum slightly convex anteriorly. Male mesotarsus with 700 to 1,000 palettes. Metatibia slender. Metatibial inner spine shorter than outer spine. Apical portion of median lobe triangular in cross-section (Roughley, 1990; Roughley and Larson, 2000).

Key to the species of the *Dytiscus* in Korea

1. Apex of metacoxal process obtusely angulate *D. marginalis czerskii*
 - Apex of metacoxal process acuminate *D. dauricus dauricus*

29. *Dytiscus dauricus dauricus* Gebler, 1832

Dytiscus dauricus Gebler, 1832: 39. Type locality: Russia: Siberia.

Dytiscus franklinii Kirby, 1837: 77.

Dytiscus frontalis Motschulsky, 1859: 101.

Dytiscus strigifrons Motschulsky, 1859: 101.

Dytiscus vexanus Sharp, 1882: 643.

Dytiscus obscures Gschwendtner, 1922: 93.

Dytiscus ammurensis Balfour-Browne, 1944b: 356.

DISTRIBUTION: Korea, China (Heilongjiang, Jilin, Xinjiang), Japan, Mongolia, Russia (East Siberia, Far East).

REGION: Eastern Palaearctic.

KOREA: Unknown.

KOREAN RECORDS: *Dytiscus dauricus*: Kwon and Suh, 1986: 97; Kim et al., 1994: 134; Cho and Park, 2010: 95.

REMARKS: This species has been recorded in Korea by Kwon and Suh (1986), Kim et al. (1994) and Cho and Park (2010), only in their checklists without any taxonomic comments. We could not find any Korean specimens and the occurrence of this species in Korea is suspicious. However, its occurrence in Korea is probable because it is known from neighboring countries [China, Japan and Russia (Far East)]. Therefore, we cite this species here based on the previous records until we will find clear evidence.

30. *Dytiscus marginalis czerskii* Zaitzev, 1953 (Pl. 22)

Dytiscus marginalis czerskii Zaitzev, 1953: 328. Type locality: Russia: Primorye.

DESCRIPTION: Length 31.0–36.0 mm. Body oval, convex, with microreticulation.

Color: Head dark green to black with M-shaped yellowish brown marking, clypeus and labrum yellow; pronotum dark green to black with yellow bands on margins; elytron dark green to black with yellow bands on lateral margins. Ventral surface yellowish brown to dark brown.

Head: Head subtrapezoidal, about 2.0 times as wide as long, widest across eyes, with sparse punctures around eyes. Anterior margin of clypeus straight. Width of frons about 2.2 times as wide as eye diameter. Antenna long and slender; antennomeres longer than wide, with a few setae on subapical part; 1 longest; 2–10 broad apically; 2 shortest; 11 slightly shorter than 10, widest at subapical part. Labrum with long setae on antero-medial part, emarginate at anterior margin. Maxillary palpomeres 1–3 broad apically; 1 shortest; 2 as long as 3; 4 long oval, slightly longer than 3, apex truncate, bifid. Labial palpomeres 1–2 broad apically; 1

shortest; 2 longest, about 2.0 times as long as 1; 3 long oval, slightly shorter than 2, apex truncate, bifid. Gula trapezoidal, convex; gula suture non-parallel, continuous. Mentum widest at posterior corner; antero-medial margin slightly bisinuate; antero-lateral part protruded; anterior corner rounded; lateral margin rounded; posterior corner rectangular; posterior margin slightly rounded.

Thorax: Pronotum trapezoidal, widest at posterior corners, about 3.0 times as wide as long, 1.5 times as wide as head, with longitudinal groove on medial part; anterior margin slightly rounded; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner rounded; posterior margin slightly rounded. Elytra rounded apically, widest at anterior three-fifth, wider than pronotum. Prosternum convex medially and with a row of setae on anterior margin. Prosternal process long and vent, slightly convex medially, with sparse setae on medial part; posterior part ovate, slightly convex, with thin lateral bead, apex rounded. Metaventricle convex, with longitudinal suture on medial part. Procoxa oval, rugose. Protrochanter subtriangular, with sparse short spines. Profemur with group of long spines on baso-ventral margin, with a row of long spines on ventral margin. Protibia with a row of long spines on dorsal margin. Protarsomeres 1–3 fused, broad, rounded with round suckers; 4 small; 5 about 2.0 times as long as 4. Protarsal claws 2/3 times as long as tarsomere 5. Mesocoxa rounded. Mesotrochanter trapezoidal, with sparse spines on dorsal part. Mesofemur with a row of long spines on ventral margin. Mesotibia with sparse spines; mesotibial longest spine as long as tarsomeres 1–2 combined. Mesotarsomeres 1–3 expanded laterally, with suckers on ventral parts; 1 slightly longer than 2; 2 slightly longer than 3; 3 as long as 4; 5 about 1.5 times as long as 4. Mesotarsal claws 1/3 times as long as tarsomere 5. Metacoxal process with sparse setae, with lateral bead; postero-lateral part rounded, apex bifid and acute. Metatrochanter semicircular. Metafemur broad apically. Metatibia with sparse spines; metatibial largest spine slightly longer than tarsomere 1, apex acute. Metatarsomere 1 about 2.0 times as long as 2; 2 slightly longer than 3; 3 slightly longer than 4; 4 shortest; 5 slightly longer than 4. Metatarsal inner claw 1/3 times as long as tarsomere 5.

Abdomen: Sternites IV–VI with sparse setae on medial part; sternite VII with sparse setae on postero-lateral part, posterior margin emarginate. Median lobe (Pl. 22B) of aedeagus long and slender, widest at middle, curved at basal fifth, apex rounded, with setae on anterior part in lateral view. Paramere (Pl. 22C) long and slender, with long setae on lateral margin, apical part rounded.

SPECIMENS EXAMINED: SOUTH KOREA: Gangwon Prov.: 1♂1♀, Inje-gun, Seohwa-myoen, Seoheung-ri, Mt. Daeamsan, Yong-swamp, 20 vi 2011, SW Jeong; Gyeonggi Prov.: 1♂2♀♀, Yeoncheon-si, Yeoncheon-eub, Dongmak-ri, N38°06'45.13", E127°06'45.13", 104 m, 26 ix 2014, DH Lee, SG Lee, JS Lee, pond.

DISTRIBUTION: Korea, China (Hebei, Heilongjiang, Henan), Japan, Russia (Far East, East Siberia).

REGION: Eastern Palaearctic.

KOREA: GW, GG.

KOREAN RECORDS: *Dytiscus marginalis czerskii*: Roughley, 1990: 469; Nillson, 2003b: 52; Nilsson, 2012: 20 (North Korea). *Dytiscus czerskii*: Kwon and Suh, 1986: 97; Kim et al., 1994: 134; Cho and Park, 2010: 95;

Dytiscus marginalis: Kamiya, 1938b: 116; Kamiya, 1940: 129; Cho, 1957: 200; Cho, 1969: 183; Yoon, 1988: 606; Yoon and Ahn, 1988b: 258.

Tribe Hydaticini Sharp, 1882

DIAGNOSIS: Anterior margin of metaventral wing straight or slightly concave. Male with a stridulatory apparatus (Larson and Pritchard, 1974; Miller, 2013).

Genus *Hydaticus* Leach, 1817

Genus *Hydaticus* Leach, 1817

Hydaticus Leach, 1817: 69. Type species: *Dytiscus transversalis* Pontoppidan, 1763.

DIAGNOSIS: Metafemur and metatibia with fine punctuation on anterior part. Basal brush of setae on male mesotarsomere 1 large, forming a broad brush. Gonocoxae of female apically sharply acute, knifelike (Miller et al., 2009).

Key to the species of the *Hydaticus* in Korea

1. Elytron with yellow round marking on antero-basal part *H. bowringii*
- Elytron without yellow round marking on antero-basal part 2
2. Elytron with longitudinal yellow bands on lateral part 3
- Elytron without longitudinal yellow bands on lateral part 4
3. Elytral yellow bands separated at anterior two-third *H. satoi satoi*
- Elytral yellow bands separated at anterior third *H. vittatus vittatus*
4. Elytron with yellow sinuate marking on anterior part *H. conspersus*
- Elytron without yellow sinuate marking on anterior part 5
5. Elytron yellow with transverse rectangle marking *H. thermonectoides*
- Elytron yellow without transverse rectangular marking 6
6. Elytron yellow with black vittae *H. grammicus*
- Elytron yellow without black vittae *H. rhantoides*

Subgenus *Prodaticus* Sharp, 1882

31. *Hydaticus (Prodaticus) bowringii* Clark, 1864 (Pl. 23)

Hydaticus bowringii Clark, 1864: 214. Type locality: Australia: Moreton Bay [mislabelled] and coastal China.

DESCRIPTION: Length 12.0–14.0 mm. Body oval, convex, with microreticulation.

Color: Head black, anterior part yellowish brown; pronotum yellowish brown with black band antero-medial and postero-medial parts; elytron black with yellow spot on antero-basal part and two yellow vittae on lateral part. Ventral surface mostly reddish brown; antenna, palpi, prosternum, front legs, mesofemur, hypomera, and anterior part of epipleura yellowish brown.

Head: Head semicircular, about 2.0 times as wide as long, widest across eyes. Anterior margin of clypeus slightly emarginate. Width of frons about 2.2 times as wide as eye. Antenna long and slender; antennomeres longer than wide, with a few setae on subapical part; 1–10 broad apically; 1 longest, 2.0 times as long as 2; 2 shortest; 11 as long as 10, widest at middle. Labrum with setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomeres 1–3 broad apically; 1 shortest; 2 about 2.0 times as long as 1; 3 slightly longer than 2; 4 as long as 3, apex truncate, bifid. Labial palpomeres 1–2 broad apically; 1 shortest; 2 about 3.0 times as long as 1; 3 as long as 2, apex truncate, bifid. Gula reverse trapezoidal, slightly convex; gula suture non-parallel, continuous. Mentum widest at middle; antero-medial margin straight; antero-lateral part protruded; anterior corner rounded; lateral margin rounded; posterior corner rounded.

Thorax: Pronotum broad trapezoidal, widest at posterior corners, about 4.5 times as wide as long, 1.3 times as wide as head; anterior margin slightly bisinuate; antero-lateral part protruded; anterior corner rounded; lateral margin slightly rounded; posterior corner rounded; posterior margin slightly bisinuate. Elytra acute apically, widest at anterior two-third, wider than pronotum. Prosternum distinctly convex medially and with setae except medial part. Prosternal process long and slightly vent, convex medially; posterior part ovate, slightly convex, with thin lateral bead, apex rounded. Metaventrite convex, with longitudinal suture on medial part. Procoxa oval. Protochanter subtriangular, with sparse spines. Profemur with a row of spines on ventral margins. Protibia with spines. Protarsomeres 1–3 fused, broad with round suckers; 4 small; 5 about 2.0 times as long as 4. Protarsal claws 1/2 times as long as tarsomere 5. Mesocoxa rounded. Mesotrochanter subtriangular, with sparse spines on dorsal part. Mesofemur with a row of long spines on baso-ventral margin. Mesotibia with sparse spines; mesotibial largest spine longer than tarsomere 1. Mesotarsomeres 1–3 with two long setae on subapical part; 1 as long as 3; 2 slightly shorter than 1; 4 slightly longer than 3; 5 longest, 1.5 times as long as 4. Mesotarsal claws 2/3 times as long as tarsomere 5. Metacoxal process with sparse setae, without lateral bead; postero-lateral part rounded, apex acute. Metatrochanter semicircular. Metafemur broad apically. Metatibia with sparse spines; metatibial largest spine as long as tarsomeres 1–2 combined, apex acute. Metatarsomere 1 about 2.0 times as long as 2; 2 as long as 3; 4 slightly shorter than 3; 5 slightly longer

than 4. Metatarsal claw unequal, inner claw 2.5 times as long as outer claw.

Abdomen: Sternites V–VI with sparse setae on medial parts; sternite VII with a row of setae on postero-lateral part. Median lobe (Pl. 23B) of aedeagus long and slender, widest at base, curved at subbasal part, protruded at middle, apex slightly acute in lateral view. Paramere (Pl. 23C) long and slender, curved at basal third, with short spines on anterior part.

TYPE MATERIAL: Syntype, 1♂ (NHM), with labels as follows: “Type H. T. Ly 889, *Bowringii* Clark MS”.

SPECIMENS EXAMINED: SOUTH KOREA: Chungbuk Prov.: 1♂, Boeun-gun, Jisan-ri, 17 viii 1989, SH Lee; Chungnam Prov.: 1♂, Nonsan-si, Noseong-myoen, 1 viii 1990, SH Lee; Gangwon Prov.: 1♀, Chuncheon-si, Chiljeon-dong, 5 viii 1988, SH Lee; 1♂2♀♀, Hoingsong-gun, 12 vi 1988, SH Lee; 1♂, Hwacheon-gun, Gandong-myeon, Yuchon-ri, 30 vii 1987, SH Lee; 1♂, Inje-gun, Nam-myeon, Namjeon-ri, 1 viii 1991, SH Lee; 6♂♂13♀♀, Wonju-si, Haenggu-dong, Dongmak-pond, 3 viii 1988, SH Lee; Gyeongbuk Prov.: 1♂, Yeonpung-gun [=Goisan-gun], Hwayeonji, 2 viii 1988, SH Lee, *ex pond*; Gyeongnam Prov.: 1♀, Changwon-si, Yongdong, 1986; 1♀, Sancheong-gun, Geumseo-myeon, Maechon-ri, Sinpung-pond, 10 viii 1989, SH Lee; Jeju Prov.: 1♂, Bukjeju-gun [=Jeju-si], Jocheon-eub, Seonheul-ri, 11 v 2005, DH Lee, *ex pond*; 1♀, same data as former except 22 v 2005; 1♀, Namjeju [=Seogwipo-si], Siheung-ri, 27 vii 1990, SH Lee; Jeonnam Prov.: 1♂, Hwasun-gun, Hwasun-pond, 15 viii 1995, SH Lee.

DISTRIBUTION: Korea, China (Anhui, Beijing, Hebei, Hubei, Jiangsu, Jiangxi, Liaoning, Sichuan, Shaanxi, Shandong, Yunnan, Zhejiang), Japan, Taiwan.

REGION: Eastern Palaearctic.

KOREA: GW, CB, GB, GN, JN, JJ.

KOREAN RECORDS: *Hydaticus bowringii*: Okamoto, 1924: 166; Mori, 1932a: 4; Yoshino, 1935: 16; Mochizuki and Tsunekawa, 1937: 77; Kamiya, 1938b: 101; Mochizuki and Matsui, 1939: 55; Ishii, 1940: 42; Kamiya, 1940: 127; Cho, 1957: 200; 1963: 45; 1969: 180; Kim and Nam, 1982: 25; Lee et al., 1985: 402; Kwon and Suh, 1986: 96; Yoon, 1988: 600; Yoon and Ahn, 1988b: 257; Kim and Lee, 1991: 65; Lee et al., 1992b: 53; Park and Kim, 1993: 110; Kim et al., 1994: 133; Hua, 2002: 36; Nillson, 2003b: 53; 2012: 22; Park et al., 2008a: 233; Cho and Park, 2010: 95.

32. *Hydaticus (Prodaticus) conspersus* Régimbart, 1899 (Pl. 24)

Hydaticus conspersus Régimbart, 1899: 315. Type locality: Japan.

DESCRIPTION: Length 14.0–15.0 mm. Body oval, convex, with microreticulation.

Color: Head yellowish brown with black band on posterior margin; pronotum yellowish brown with black marking on antero-medial part, with black band on postero-medial part; elytron black with yellow marking on

anterior part, with yellow band on lateral margin. Ventral surface brown to dark brown; antenna, palpi, front and middle legs, hypomera, epipleura yellowish brown.

Head: Head semicircular, about 2.0 times as wide as long, widest across eyes, with sparse punctures around eyes. Anterior margin of clypeus straight. Width of frons about 2.2 times as wide as eye. Antenna long and slender; antennomeres longer than wide, with a few setae on subapical part; 1–10 broad apically; 1 longest, 2.0 times as long as 2; 11 as long as 10, widest at middle. Labrum with long setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomeres 1–3 broad apically; 1 shortest; 2 about 1.5 times as long as 1; 3 longest, 1.2 times as long as 2; 4 long oval, slightly shorter than 3, apex truncate, bifid. Labial palpomeres 1–2 broad apically; 1 shortest; 2 longest, about 3.0 times as long as 1; 3 long oval, 2/3 times as long as 2, apex truncate, bifid. Gula trapezoidal, concave; gula suture non-parallel, continuous. Mentum widest at posterior corner; antero-medial margin slightly bisinuate; antero-lateral part protruded; anterior corner rectangular; lateral margin rounded; posterior corner rectangular; posterior margin slightly rounded.

Thorax: Pronotum trapezoidal, widest at posterior corners, about 4.0 times as wide as long, 2.2 times as wide as head; anterior margin slightly rounded; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner acute; posterior margin bisinuate. Elytra rounded apically, widest at anterior three-fifth, wider than pronotum. Prosternum distinctly convex medially, with compact setae, with a row of setae on anterior margin. Prosternal process long and vent, slightly convex medially; posterior part ovate, slightly convex, with thin lateral bead, apex acute. Metaventrite convex, with longitudinal suture on medial part. Procoxa oval. Protrochanter subtriangular, with sparse spines. Profemur with compact long spines on baso-ventral part, with a row of spines on ventral margin. Protibia with sparse spines. Protarsomeres 1–3 fused, broad, rounded with round suckers; 4 small; 5 about 3.0 times as long as 4. Protarsal claws 1/2 times as long as tarsomere 5. Mesocoxa rounded. Mesotrochanter subtriangular, with sparse spines. Mesofemur with a row of long spines on ventral margin. Mesotibia with sparse spines; mesotibial largest spine longer than tarsomere 1. Mesotarsomeres 1–3 fused, broad, rounded with round suckers; 1 about 3.0 times as long as 2; 2 as long as 3; 4 about 1.5 times as long as 3; 5 longest, 1.5 times as long as 4. Mesotarsal claws 1/2 times as long as tarsomere 5. Metacoxal process with sparse setae, with broad lateral bead; postero-lateral part rounded, apex bifid. Metatrochanter semicircular. Metafemur broad apically, with a few setae on apical part. Metatibia with sparse spines; metatibial largest spine as long as tarsomeres 1–2 combined, apex acute. Metatarsomere 1 as long as 2 and 3; 4 slightly shorter than 3; 5 slightly longer than 4. Metatarsal claw unequal, inner claw 2.0 times as long as outer claw.

Abdomen: Sternites V–VI with sparse setae on posterior part; sternite VII with compact setae on postero-lateral part. Median lobe (Pl. 24B, C) of aedeagus long and slender, distinctly thick at subapical part, curved at basal fifth, apex subquadrate in lateral view; anterior part trifid, apical fifth part protruded laterally in ventral view. Paramere (Pl. 24D) long and slender, curved at middle, anterior part serrate.

SPECIMENS EXAMINED: SOUTH KOREA: Jeju Prov.: 3♂♂2♀♀, Bukjeju-gun, Jocheon-eub, Gyorae-ri,

Dongsu-bridge, 13 x 2006, SJ Park, TK Kim, YH Kim, *ex* stream pool; 1♂, Bukjeju-gun [=Jeju-si], Jocheon-eub, Seonheul-ri, Dongbaek-ro, N33°31'01.31", E126°42'30.34", 87 m, 15 vi 2011, DH Lee, *ex* pond; 2♂♂1♀, Jeju-si, Mt. Hallasan, 1100 goji, 25 viii 2004, SW Choi, SD Na, at light.

DISTRIBUTION: Korea, Japan.

REGION: Eastern Palaearctic.

KOREA: JJ.

KOREAN RECORDS: *Hydaticus conspersus*: Nillson, 2003b: 53; 2012: 22; Park et al., 2008: 231. *Hydaticus pacificus*: Lee et al., 1985: 402; Lee et al., 1992b: 53; Kim et al., 1994: 133 [misidentification of *H. conspersus*].

33. *Hydaticus (Prodaticus) grammicus* (Germar, 1827) (Pl. 25)

Dytiscus grammicus Germar, 1827: pl. 1. Type locality: Germany: Odenbach.

Dytiscus lineolatus Ménétriés, 1832: 140.

Hydaticus nigrovittatus Clark, 1864: 221.

DESCRIPTION: Length 8.0–11.0 mm. Body oval, convex, with microreticulation.

Color: Head yellowish brown with black band on posterior margin; pronotum yellowish brown with black dots anterior and postero-medial parts; elytron yellowish brown with black vittae and compact dots. Ventral surface mostly yellowish brown.

Head: Head semicircular, about 1.8 times as wide as long, widest across eyes, with sparse punctures around eyes and posterior part. Anterior margin of clypeus straight. Width of frons about 3.0 times as wide as eye. Antenna long and slender; antennomeres longer than wide, with a few setae on subapical part; 1–10 broad apically; 1 longest, 2.0 times as long as 2; 2 shortest; 11 as long as 10, widest at middle. Labrum with setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomeres 1–3 broad apically; 1 shortest; 2 about 2.0 times as long as 1; 3 slightly longer than 2; 4 as long as 3, apex truncate, bifid. Labial palpomeres 1–2 broad apically; 1 shortest; 2 about 2.5 times as long as 1; 3 about 1.2 times as long as 2, apex truncate, bifid. Gula quadrate, slightly convex; gula suture non-parallel, continuous. Mentum widest at middle; antero-medial margin straight; antero-lateral part protruded; anterior corner rounded; lateral margin rounded; posterior corner rounded.

Thorax: Pronotum trapezoidal, widest at posterior corners, about 4.0 times as wide as long, 1.8 times as wide as head; anterior margin slightly bisinuate; antero-lateral part protruded; anterior corner rounded; lateral margin slightly rounded; posterior corner rectangular; posterior margin slightly bisinuate. Elytra acute apically, widest at anterior two-third, wider than pronotum. Prosternum distinctly convex medially and with setae except medial part. Prosternal process long and slightly vent, convex medially; posterior

part ovate, convex, with thin lateral bead, apex rounded. Metaventrite convex, with longitudinal suture on medial part. Procoxa oval. Protrochanter subtriangular, with sparse spines. Profemur with a row of spines on ventral margins. Protibia with spines. Protarsomeres 1–3 fused, broad, rounded with round suckers; 4 small; 5 about 2.0 times as long as 4. Protarsal claws 1/2 times as long as protarsomere 5. Mesocoxa rounded. Mesotrochanter subtriangular, with sparse spines on dorsal part. Mesofemur with a row of long spines on baso-ventral margin. Mesotibia with sparse spines. Mesotarsomeres 1–3 with two long setae on subapical part; 1 as long as 3; 2 slightly shorter than 1; 4 slightly longer than 3; 5 longest, 1.5 times as long as 4. Mesotarsal claws 2/3 times as long as tarsomere 5. Metacoxal process with sparse setae, without lateral bead; postero-lateral part rounded, apex acute. Metatrochanter

semicircular. Metafemur broad apically. Metatibia with sparse spines; metatibial largest spine longer than tarsomeres 1–2 combined, apex acute. Metatarsomere 1 about 2.0 times as long as 2; 2 as long as 3; 4 slightly shorter than 3; 5 slightly longer than 4. Metatarsal claw unequal, inner claw 2.5 times as long as outer claw.

Abdomen: Sternites V–VI with sparse long setae on medial parts; sternite VII with sparse long setae on postero-lateral part. Median lobe (Pl. 25B) of aedeagus long and slender, curved at basal fifth, apical part vented ventrally. Paramere (Pl. 25C) long and slender curved at basal third, protruded at apical third, anterior part granulate, apex rounded.

SPECIMENS EXAMINED: SOUTH KOREA: Chungbuk Prov.: 1♂1♀, Chungju-si, Jisil-pond, 16 viii 1989, SH Lee; 1♀, Eumseong-gun, Gamgok-myeon, Jucheon-ri, Jucheon-reservoir, N37°04'31.37", E127°37'49.94", 98 m, 16 viii 1989, SH Lee, reservoir; 9♂♂7♀♀, Goisan-gun, Iwon-pond, 18 viii 1989, SH Lee; 1♂, Jecheon-si, Yangminwon, 30 vii 1994, SH Lee; 2♀♀, Jincheon-gun, Chopyeong-eub, Hwasan-ri, Chopyeong-reservoir, 31 vii 1994, SH Lee, reservoir; 2♂♂, Okcheon-gun, Iwon-myeon, Yongbang-ri, 29 x 1989, SH Lee; Chungnam Prov.: 1♀, Boryeong-si, Jupomyeon, Boryeong-ri, Boryeong-reservoir, N36°24'44.94", E126°35'47.58", 83 m, 2 x 2011, SH Lee, reservoir; 2♂♂, Buyeo-gun, Buyeo-eub, Yongjeong-ri, 3 x 2011, SH Lee; 1♂, Cheongyang-gun, Mumak-pond, 25 vii 1995, SH Lee; 1♂1♀, Nonsan-si, 25 vii 1995, SH Lee; 1♂, Taean-gun, Nam-myeon, Hwangchon-ri, N36°51'49.23", E126°12'23.75", 7 m, 31 vii 2013, DH Lee, pond on abandon salt farm; 2♂♂1♀, Taean-gun, Nam-myeon, Sinon-ri, N36°51'49.23" E126°12'23.75" 7 m, 30 vii 2013, DH Lee, pond on abandon salt farm; Gangwon Prov.: 1♂2♀♀, Chuncheon-si, Dongsan-myeon, Wonchang-ri, 23 vii 1992, SH Lee; 1♀, Gangneung-si, Unjeong-dong, Gyeongpo-lake, 4 viii 1988, SH Lee, ex lagoon; 3♂♂3♀♀, Hoingsong-gun, 12 vi 1988, SH Lee; 2♂♂4♀♀, Hwacheon-gun, Gandong-myeon, Yuchon-ri, 30 vii 1987, SH Lee; 1♂, Inje-gun, Nam-myeon, Namjeon-ri, 1 viii 1991, SH Lee; 1♂1♀, Pyeongchang-gun, Baesujang, 29 vii 1994, SH Lee; 1♀, Samcheok-si, Geundeok-myeon, Hamaengbang-ri, Chodang-reservoir, 7 ix 1990, SH Lee; 1♂2♀♀, Wonju-si, Haenggu-dong, Dongmak-pond, 3 viii 1988, SH Lee; Gyeongbuk Prov.: 1♀, Cheongsong-gun, Cheongsong-eub, N36°26'00.53", E128°03'46.11", 195 m, 11 vii 2010, DH Lee, HJ Jang, at light; 2♂♂3♀♀, Gyeongju-si, Geoncheon-eub, 6 vi 1991, SH Lee; 1♂2♀♀, Pohang-si, Nam-gu, Daejam-dong, 18 ix 1988, SH Lee; 1♂2♀♀, Sangju-si, Gaeun-dong, Gaeun-pond, 9

viii 1990, SH Lee; 1♂2♀♀, Yecheon-gun, Yonggung-myeon, Mui-ri, Wondang-reservoir, N36°35'43.36", E128°17'36.32", 68 m, 6 vi 1988, SH Lee, reservoir; 2♂♂, Yeongcheon-si, Jayang-myeon, Chunghyo-ri, Jayang-dam, 1 ix 1990, SH Lee; Gyeonggi Prov.: 2♂♂1♀, Gwangju-si, Jungdae-dong, Jungang-reservoir, 20 viii 1989, SH Lee; 1♂, Icheon-si, Seolseong-myeon, 19 viii 1988, SH Lee; 2♂♂1♀, Incheon-si, Ganghwa-gun, Naega-pond, 16 ix 1990, SH Lee; 5♂♂5♀♀, Incheon-si, Ongjin-gun, Baekryeong-myeon, 28 vii 2011, HM Lim, at light; 3♂♂2♀♀, Namyangju-si, Jinjeon-eub, 8 viii 1088, SH Lee; 3♂♂3♀♀, Suwon-si, Paldal-gu, Hwaseo-dong, Seoho-reservoir, 4 ix 1990, SH Lee; Gyeongnam Prov.: 1♂, Sacheon-si, Gonpyeong-myeon, Yongsan-ri, Dasol-temple, 14 viii 1995, SH Lee; 5♂♂3♀♀, Sancheong-gun, Matgol-pond, 7 vi 2009, SH Lee; 1♀, Ulsan-si, Ulju-gun, Eonyang-eub, Jikdong-ri, 2 x 1988, SH Lee; 2♀♀, Yangsan-si, Habuk-myeon, Jisan-ri, Tongdo-temple, 23 vii 1999, SH Lee; Jeju Prov.: 1♂♂3♀♀, Jeju-si, Gujwa-eub, Jongdal-ri, 27 vii 1990, SH Lee, pond; 1♂1♀, Jeju-si, Hangyeong-myeon, Dumo-ri, 22 vii 1990, SH Lee, pond; 1♂2♀♀, Jeju-si, Jocheon-eub, Gyora-ri, 22 v 2006, DH Lee, pond; 1♂1♀, Seogwipo-si, Songsan-eub, Siheung-ri, 27 vii 1990, SH Lee, pond; Jeonbuk Prov.: ; 1♂, Gimje-si, Gunyong-pond, 6 viii 1990, SH Lee; 2♂♂3♀♀, Gunsan-si, Miryong-dong, Mije-reservoir, 1 viii 2010, SH Lee; 4♂♂1♀, Imsil-gun, Samgye-myeon, Samgye-ri, 14 viii 1989, SH Lee; 3♂♂3♀♀, Jangsu-gun, Myeonggeum-pond, 14 viii 1989, SH Lee; 1♂, Namwon-si, Okrim-pond, 15 viii 1989, SH Lee; 1♂, Wangju-gun, 24 vii 1995, SH Lee; Jeonnam Prov.: 1♀, Gokseong-gun, Seokgok-myeon, Juksan-ri, 1 viii 2009, SH Lee; 1♀, Jangheung-gun, Jangheung-eub, Yeonsan-ri, 28 ix 2010, SH Lee; 1♂, Yeosu-si, Sora-myeon, Sora-stream, 11 vi 2010, SH Lee.

DISTRIBUTION: Asia: Korea, China (Beijing, Hainan, Hebei, Heilongjiang, Hubei, Jiangsu, Jilin, Liaoning, Sichuan, Yunnan), Japan, and widely distributed in Palearctic region.

REGION: Palearctic.

KOREA: GW, GG, CB, CN, JB, JN, GB, GN, JJ.

KOREAN RECORDS: *Hydaticus grammicus*: Okamoto, 1924: 166; Kusanagi, 1936: 324; Kamiya, 1938b: 104; Kamiya, 1940: 128; Cho, 1957: 200; 1963: 45; 1969: 181; Kim and Kim, 1971: 155; Kim and Nam, 1982: 25; Lee et al., 1985: 402; Kwon and Suh, 1986: 96; Yoon, 1988: 601; Yoon and Ahn, 1988b: 257; Kim and Lee, 1991: 65; Lee et al., 1992b: 53; Park and Kim, 1993: 110; Kim et al., 1994: 133; Lee, 1994: 16; Lee, 1995: 13; Kim and Kim, 1996b: 126; Kim and Kim, 1998: 169; Kim et al., 1999: 129; Kim, 2000: 131; Hua, 2002: 37; Nillson, 2003b: 53; 2012: 22 (North Korea); Kim et al., 2004: 116; Han et al., 2007: 271; Han et al., 2008: 249; Park et al., 2008a: 234; Cho and Park, 2010: 95. *Hydaticus grammicus nigrovittatus*: Mori, 1932a: 4; Yoshino, 1935: 16; Mochizuki and Tsunekawa, 1937: 77; Mochizuki and Matsui, 1939: 55; Ishii, 1940: 42 [synonym of *H. grammicus*].

34. *Hydaticus (Prodaticus) rhantoides* Sharp, 1882

Hydaticus rhantoides Sharp, 1882: 664. Type locality: Japan.

Hydaticus fengi Falkenström, 1936: 236.

TYPE MATERIAL: Lectotype, 1♂ (NHM), with labels as follows: “LECTOTYPE, China lov., 1009, Sharp Coll. 1905–313., *Hydaticus rhantoides* det. Wewalka, Lectotypus *Hydaticus rhantoides* SHARP Wewalka 1975”.

DISTRIBUTION: Korea, China (Fujian, Guandong, Guizhou, Hainan, Heilongjiang, Hubei, Hong Kong, Hunan, Jiangsu, Sichuan, Shanghai, Yunnan, Zhejiang) Japan, Taiwan.

REGION: Eastern Palaearctic.

KOREA: Unknown.

KOREAN RECORDS: *Hydaticus rhantoides*: Kwon and Suh, 1986: 96; Kim et al., 1994: 133; Cho and Park, 2010: 95.

REMARKS: This species has been recorded in Korea by Kwon and Suh (1986), Kim et al. (1994) and Cho and Park (2010), only in their checklists without any taxonomic comments. We could not find any Korean specimens and the occurrence of this species in Korea is suspicious. However, its occurrence in Korea is probable because it is known from neighboring countries (China and Japan). Therefore, we cite this species here based on the previous records until we will find clear evidence.

35. *Hydaticus (Prodaticus) satoi satoi* Wewalka, 1975

Hydaticus satoi Wewalka, 1975: 91. Type locality: Japan: Kyushu.

DISTRIBUTION: Korea, Bhutan, China (Fujian, Hebei, Liaoning, Sichuan), Japan, Sikkim, Taiwan. India, Laos, Thailand, Myanmar, Philippines, Borneo.

REGION: Oriental, Palaearctic.

KOREA: Unknown.

KOREAN RECORDS: *Hydaticus satoi*: Kwon and Suh, 1986: 96; Kim et al., 1994: 134; Hua, 2002: 34; Cho and Park, 2010: 95.

REMARKS: We could not find any Korean specimen but cited this species based on the previous records.

36. *Hydaticus (Prodaticus) thermonectoides* Sharp, 1884 (Pl. 26)

Hydaticus thermonectoides Sharp, 1884: 447. Type locality: Japan: Nagano.

DESCRIPTION: Length 10.5 mm. Body oval, convex, with microreticulation.

Color: Head yellowish brown; pronotum yellowish brown with a row of black dots on anterior part; elytron yellowish brown with black markings on middle and anterior two-third. Ventral surface mostly yellowish brown.

Head: Head subtrapezoidal, about 2.0 times as wide as long, widest across eyes. Anterior margin of clypeus straight. Width of frons about 3.0 times as wide as eye. Antenna long and slender; antennomeres longer than wide, with a few setae on subapical part; 1–10 broad apically; 1 longest; 11 slightly longer than 10, widest at subapical part. Labrum with long setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomeres 1–3 broad apically; 1 shortest; 2 about 2.0 times as long as 1; 3 slightly longer than 2; 4 long oval, longest, slightly longer than 3, apex truncate, bifid. Labial palpomeres 1–2 broad apically; 1 shortest; 2 about 3.0 times as long as 1; 3 long oval, as long as 2, apex truncate, bifid. Gula trapezoidal, convex; gula suture non-parallel, continuous. Mentum widest at posterior corner; antero-medial margin slightly bisinuate; antero-lateral part protruded; anterior corner rectangular; lateral margin rounded; posterior corner rectangular; posterior margin slightly rounded.

Thorax: Pronotum trapezoidal, widest at posterior corners, about 4.0 times as wide as long, 1.8 times as wide as head; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner rectangular; posterior margin slightly rounded. Elytra rounded apically, widest at anterior three-fifth, wider than pronotum. Prosternum convex medially and with a row of setae on anterior margin. Prosternal process long and vent, slightly convex medially, with sparse setae on medial part; posterior part ovate, convex, with thin lateral bead, apex rounded. Metaventrite convex, with longitudinal suture on medial part. Procoxa rounded. Protrochanter subtriangular, with sparse spines. Profemur with a row of long spines on ventral margin. Protibia with sparse spines. Protarsomere 1 about 1.2 times as long as 2; 2 shortest; 3 slightly longer than 2; 4 slightly longer than 3; 5 longest, 1.2 times as long as 4. Protarsal claws 2/3 times as long as tarsomere 5. Mesocoxa rounded. Mesotrochanter subtriangular, with sparse spines on dorsal part. Mesofemur with a row of long spines on baso-ventral margin. Mesotibia with sparse spines. Mesotarsomeres 1 about 1.2 times as long as 2; 2 shortest; 3 slightly longer than 2; 4 slightly longer than 3; 5 longest, 1.2 times as long as 4. Mesotarsal claws as long as tarsomere 5. Metacoxal process with sparse setae, with broad lateral bead; postero-lateral part rounded, apex bifid. Metatrochanter semicircular, with a few setae on ventral margin. Metafemur broad apically. Metatibia with sparse spines; metatibial largest spine longer than tarsomeres 1–2 combined, apex acute. Metatarsomere 1 as long as 2 and 3; 4 slightly shorter than 3; 5 about 1.2 times as long as 4. Metatarsal claw unequal, inner claw 2.0 times as long as outer claw.

Abdomen: Sternites V–VI with sparse setae; sternite VII with sparse setae on postero-lateral part.

TYPE MATERIAL: Syntype, 1♀ (NHM), with labels as follows: “*Hydaticus thermonectoides* Type H. T., nakaseuda 1881., Japan. G. Lewis 1910–320.”

SPECIMENS EXAMINED: SOUTH KOREA: Gyeonggi Prov.: 1♀, Namyangju-si, Hwado-eub, Mt. Cheonmasan, 6 vii 1958, JN Kang.

DISTRIBUTION: Korea, China (Jiangsu, Yunnan, Zhejiang), Japan.

REGION: Eastern Palaearctic.

KOREA: GG.

KOREAN RECORDS: *Hydaticus thermonectoides*: Mori, 1932a: 4; Kamiya, 1938b: 106; 1957: 200; 1969: 181; Kwon and Suh, 1986: 96 Yoon, 1988: Yoon and Ahn, 1988b: 258; 603; Kim et al., 1994: 133; Hua, 2002: 37; Nilsson, 2003b: 54; 2010: 23; 2012: 23; Han et al., 2007: 271; Han et al., 2008: 247; Cho and Park, 2010: 95.

37. *Hydaticus (Prodatiscus) vittatus vittatus* (Fabricius, 1775)

Dytiscus vittatus Fabricius, 1775: 825. Type locality: India.

Hydaticus sesquivittatus Fairmaire, 1880: 164.

Graphoderus lenzi Schönfeldt, 1890: 170.

Hydaticus nepalensis Satô, 1961a: 60.

DISTRIBUTION: Korea, China (Fujian, Guandong, Hainan, Hong Kong, Hubei, Jiangsu, Jiangxi, Macao, Sichuan, Shandong, Shanxi, Zhejiang) Himachal Pradesh, India, Japan, Nepal, Sikkim, Taiwan, Uttar Pradesh. India, Indonesia.

REGION: Oriental, Palaearctic.

KOREA: Unknown.

KOREAN RECORDS: *Hydaticus vittatus*: Okamoto, 1924: 166; Mori, 1932a: 5; Kamiya, 1938b: 20; Cho, 1957: 200; 1963: 45; 1969: 181; Satô, 1961a: 55; Lee et al., 1985: 402; Yoon and Ahn, 1988b: 253.

REMARKS: This species has been recorded in Korea by Okamoto (1924) and Mori (1932a), only in their checklists without any taxonomic comments. We could not find any Korean specimens and the occurrence of this species in Korea is suspicious. However, its occurrence in Korea is probable because it is known from neighboring countries (China and Japan). Therefore, we cite this species here based on the previous records until we will find clear evidence.

Tribe Eretini Crotch, 1873

Genus *Eretes* Laporte, 1833

Genus *Eretes* Laporte, 1833

Eretes Laporte, 1833: 397. Type species: *Dytiscus griseus* Fabricius, 1781.

DIAGNOSIS: Dorsal surface yellow with small to extensive black markings. Epipharyngeal processes very large, oval and flattened. Pronotum with narrow lateral bead. Prosternal process narrow apically and sharp. Surfaces of meso- and metatarsomeres with compact and flattened setae. Elytra very thin and flattened, relatively lightly sclerotized overall, with each puncture bearing a black spot. Postero-lateral margin of elytron (Pl. 27B) with a row of short and curved spines (Miller, 2002).

38. *Eretes griseus* (Fabricius, 1781) (Pl. 27)

Dytiscus griseus Fabricius, 1781: 293. Type locality: India.

Eunectes plicipennis Motschulsky, 1845: 29.

DESCRIPTION: Length 10.0–16.0 mm. Body oval, convex, with microreticulation.

Color: Head yellowish brown with black spot on postero-medial part, with black marking on posterior margin; pronotum yellowish brown with a row of black spots on anterior part, with two black bands on medial part, with sparse black spots on posterior part; elytron yellowish brown with black spots and sparse black markings. Ventral surface pale yellow to yellowish brown.

Head: Head subquadrate, about 2.0 times as wide as long, widest across eyes, with sparse setae on clypeal groove and around eyes. Anterior margin of clypeus slightly emarginate. Width of frons about 1.5 times as wide as eye. Antenna long and slender; antennomeres longer than wide, with a few setae on subapical part; 1–10 broad apically; 1 longest; 2 shortest, 1/4 times as long as 1; 11 slightly longer than 10, widest at middle. Labrum with long setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomeres 1–3 broad apically; 1 as long as 3; 2 slightly longer than 1; 4 longest, 3.0 times as long as 3, apex truncate, bifid. Labial palpomeres 1–2 broad apically; 1 shortest; 2 about 2.5 times as long as 1; 3 longest, 2.0 times as long as 2, apex truncate, bifid. Gula trapezoidal, slightly convex; gula suture non-parallel, continuous. Mentum widest at middle; antero-medial margin straight; antero-lateral part protruded; anterior corner rounded; lateral margin rounded; posterior corner rounded.

Thorax: Pronotum trapezoidal, widest at posterior corners, about 4.0 times as wide as long, 1.3 times as wide as head; anterior margin slightly bisinuate; antero-lateral part protruded; anterior corner acute; lateral

margin slightly rounded; posterior corner acute; posterior margin straight. Elytra (Pl. 27B) acute apically, widest at anterior two-third, wider than pronotum. Prosternum convex medially and with a row of setae on anterior margin. Prosternal process long and vent, very convex medially, with sparse spines on medial part; posterior part lanceolate, slightly convex, with thin lateral bead, apex acute. Metaventricle convex, with longitudinal suture on medial part. Procoxa rounded, with sparse spines. Protrochanter subtriangular, with sparse spines, with long spines on apical margin. Profemur with a row of long setae on dorsal and ventral margins. Protibia with a row of short spines on ventral margin. Protarsomeres 1–3 fused, broad, rounded with round suckers; 4 small; 5 about 3.0 times as long as 4. Protarsal claws 1/2 times as long as tarsomere 5. Mesocoxa rounded, with sparse spines. Mesotrochanter subtriangular, with sparse spines on dorsal part. Mesofemur with sparse short spines, with few long spines on baso-ventral margin, with long setae on ventral margin. Mesotibia with sparse spines, with long setae on ventral margin. Mesotarsomeres 1–3 with two long setae on subapical part; 1 slightly longer than 2; 2 shortest; 3 as long as 1 and 4; 5 longest, 3.0 times as long as 4. Mesotarsal claws as long as tarsomere 5. Metacoxal process with sparse setae, with thin lateral bead; postero-lateral part rounded, apex acute. Metatrochanter semicircular. Metafemur broad apically. Metatibia with sparse spines; metatibial largest spine slightly longer than tarsomere 1, apex bifid. Metatarsomere 1 about 2.0 times as long as 2; 2 as long as 3; 4 slightly shorter than 3; 5 about 1.5 times as long as 4. Metatarsal claw unequal, inner claw slightly longer than outer claw.

Abdomen: Sternites V–VI with sparse setae; sternite VII with sparse setae on postero-lateral part, posterior margin slightly bisinuate. Median lobe (Pl. 27C) of aedeagus long, slender, trifid widest at middle, apex rounded in lateral view. Paramere (Pl. 27D) subtriangular, with short spines on anterior part, apical part with 4 large spines.

SPECIMENS EXAMINED: SOUTH KOREA: Chungnam Prov.: 1♀, Gongju-si, Gyeryong-myeon, Jungjang-ri, Gab-temple, 29 vii 1979, Moon; Gangwon Prov.: 1♂, Inje-gun, 31 vii 1991, SH Lee; Gyeongbuk Prov.: 1♂, Bonghwa-gun, 1 viii 1988, JH Kim; 1♂1♀, Sangju-si, Gaeun-pond, 9 viii 1990, SH Lee; 1♀, Uljin-gun, Giseong-myeon, Sadong-ri, 19 vii 1994, SH Lee; Gyeonggi Prov.: 1♂2♀, Incheon-si, Ongjin-gun, Deokjeok-myeon, 7 vii 1981, Kim; 1♀, Seoul-si, Suyu-ri, 15 v 1934, Cho; Gyeongnam Prov.: 1♂, Sancheong-gun, Sanjang-myeon, Mt. Jirisan, 18 vii 1994, KI Lee; Jeju Prov.: 1♂, Bukjeju-gun, Ban-pond, 26 vii 2005, SH Lee; 1♀, Jeju-si, Ara-dong, Gwaneum-bridge, 19 viii 1994, SH Lee; Jeonnam Prov.: 1♂, Wando-gun, Wando-eub, 21 viii 1982, Jang.

DISTRIBUTION: Asia: Korea, China (Beijing, Fujian, Hainan, Hebei, Heilongjiang, Hubei, Jiangsu, Liaoning, Macao, Sichuan, Shaanxi, Shanghai, Shandong, Shanxi, Xizang, Yunnan, Zhejiang), Japan, Nepal, Russia (Far East), Taiwan, and widely distributed in Palaearctic region.

REGION: Oriental, Palaearctic.

KOREA: GW, GG, CN, JN, GB, GN, JJ.

KOREAN RECORDS: *Eretes griseus*: Nilsson, 2010: 21; 2015: 21. *Eretes sticticus*: Okamoto, 1924: 165; Mori,

1932a: 4; Yoshino, 1935: 16; Kusanagi, 1936: 324; Mochizuki and Tsunekawa, 1937: 77; Kamiya, 1938b: 99; Kamiya, 1940: 126; Cho, 1957: 200; 1963: 45; 1969: 179; Kim and Nam, 1982: 25; Lee et al., 1985: 402; Kwon and Suh, 1986: 97; Yoon, 1988: 597; Yoon and Ahn, 1988b: 256; Kim and Lee, 1991: 65; Kim et al., 1994: 134; Kim, 1995: 132; Lee, 1995: 13; Kwon et al., 1996: 474; Hua, 2002: 36; Han et al., 2007: 271; Han et al., 2008: 251; Park et al., 2008: 236; Cho and Park, 2010: 95 [misidentification of *E. griseus*].

Tribe Aciliini Thomson, 1867

DIAGNOSIS: Metatibial spines bifid apically (Miller and Bergsten, 2014).

Key to the genera of the Aciliini in Korea

1. Elytron yellowish brown with retiform black pattern; metatibial outer spine (Pl. 28B) 1.5 times as long as inner spine *Graphoderus*
- Elytron yellow with transverse black markings; metatibial outer spine 2.0 times as long as inner spine *Sandracottus*

Genus *Graphoderus* Dejean, 1833

Genus *Graphoderus* Dejean, 1833

Graphoderus Dejean, 1833: 54. Type species: *Dytiscus cinereus* Linnaeus, 1758.

DIAGNOSIS: Body oval. Prosternal process short and broad, rounded apically. Mesofemur with setae of posterior margin shorter than width of femur. Apical setae of mesotarsomeres shorter than length of tarsomeres. Metacoxa large. Metaventral wing mostly slender, apical part broad. Female elytron with slight grooves and elongated punctures (Kamiya, 1938a; Roughly and Larson, 2000).

39. *Graphoderus adamsii* (Clark, 1864) (Pl. 28)

Hydaticus adamsii Clark, 1864: 211. Type locality: China.

Hydaticus japonicus Sharp, 1873: 48.

DESCRIPTION: Length 12.0–14.5 mm. Body oval, convex, with microreticulation.

Color: Head yellowish brown with V-shaped black marking on postero-medial part, with black band on posterior margin; pronotum yellowish brown with black bands on anterior and posterior margins; elytron yellowish brown with retiform black pattern. Ventral surface mostly dark brown; antenna, mouthparts, gula, fore and middle legs, hypomera, and epipleura yellowish brown.

Head: Head subtrapezoidal, about 2.0 times as wide as long, widest across eyes, with sparse punctures around eyes. Anterior margin of clypeus straight. Width of frons about 2.2 times as wide as eye. Antenna long and slender; antennomeres longer than wide, with a few setae on subapical part; 1–10 broad apically; 1 longest; 11 slightly longer than 10, widest at subapical part. Labrum with long setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomeres 1–3 broad apically; 1 shortest; 2 as long as 3; 4 long oval, longest, slightly longer than 3, apex truncate, bifid. Labial palpomeres 1 and 2 broad apically; 1 shortest; 2 longest, about 2.5 times as long as 1; 3 long oval, slightly shorter than 2, apex truncate, bifid. Gula trapezoidal, convex; gula suture non-parallel, continuous. Mentum widest at posterior corner; antero-medial margin slightly bisinuate; antero-lateral part protruded; anterior corner rectangular; lateral margin rounded; posterior corner rectangular; posterior margin slightly rounded.

Thorax: Pronotum trapezoidal, widest at posterior corners, about 4.0 times as wide as long, 2.0 times as wide as head, with longitudinal groove; anterior margin slightly rounded; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner rectangular; posterior margin slightly rounded. Elytra rounded apically, widest at anterior three-fifth, wider than pronotum. Prosternum convex medially and with a row of setae on anterior margin. Prosternal process long and vent, slightly convex medially, with sparse setae on medial part; posterior part ovate, slightly convex, with thin lateral bead, apex rounded. Metaventrite convex, with longitudinal suture on medial part. Procoxa rounded. Protrochanter subtriangular, with sparse spines. Profemur with a row of long spines on ventral margin. Protibia with sparse spines. Protarsomeres 1–3 fused, broad, rounded with round suckers; 4 small; 5 about 4.0 times as long as 4. Protarsal claws 2/3 times as long as tarsomere 5. Mesocoxa rounded. Mesotrochanter subtriangular, with sparse spines on dorsal part. Mesofemur with a row of long spines on baso-ventral margin. Mesotibia with sparse spines. Mesotarsomeres 1–3 with suckers; 1 as long as 2 and 3; 4 about slightly longer than 3; 5 longest, 1.2 times as long as 4. Mesotarsal claws as long as tarsomere 5. Metacoxal process with sparse setae, with broad lateral bead; postero-lateral part rounded, apex bifid. Metatrochanter semicircular, with a few setae on ventral margin. Metafemur broad apically. Metatibia (Pl. 28B) with sparse spines; metatibial largest spine slightly longer than tarsomere 1, apex bifid. Metatarsomere 1 as long as 2 and 3; 4 slightly shorter than 3; 5 about 1.2 times as long as 4. Metatarsal claw unequal, inner claw 2.0 times as long as outer claw.

Abdomen: Sternites V–VI with sparse setae; sternite VII with sparse setae on postero-lateral part, lateral part rugose. Median lobe (Pl. 28C) of aedeagus trifid, widest at middle, narrowed at basal part, apex rounded in dorsal view. Paramere (Pl. 28D) slightly broad, with short setae on anterior part, apex rounded.

TYPE MATERIAL: Syntype, 1♂ (NHM), with labels as follows: “Type, H.T., 67 56, China, *adamsii* Clark.”

SPECIMENS EXAMINED: SOUTH KOREA: Chungnam Prov.: 1♀, Taean-gun, Mageompo, 30 vii 2013, DH Lee, *ex pond*; Gangwon Prov.: 1♂, Gangneung-si, Gyeongpo-lake, 4 viii 1988, SH Lee; Gyeongbuk Prov.: 1♀, Pohang-si, Jigok-myeon, 26 iv 1992, SH Lee; 1♀, Yeongju-si, Munsu-myeon, 2 viii 1988, SH Lee; Gyeonggi Prov.: 1♂, Seoul-si, Suyu-ri, 15 v 1934, Cho; 1♂, Yongin-si, Baekam-myeon, Jangpyeong-ri, 31 x 2001, YB Lee; Gyeongnam Prov.: 1♀, Changwon-si, Yong-dong, 1986; Jeju Prov.: 1♂2♀♀, Bukjeju-gun, Jocheon-eub, Seonheul-ri, 11 vi 2005, DH Lee, *ex pond*; 1♀, same as former except for 12 vi 2005; 1♀, same as former except for 25 ix 2008, Dongbaek-pond; 1♀, Namjeju-gun, Opo-pond, 24 vii 1990, SH Lee; Jeonbuk Prov.: 1♂, Muju-gun, 6~10 vii 1993, R. G. O.

DISTRIBUTION: Korea, China (Beijing, Hebei, Heilongjiang, Hubei, Jiangsu, Jilin, Liaoning, Shanxi, Zhejiang), Japan, Russia (Far East).

REGION: Eastern Palaearctic.

KOREA: GW, GG, CN, JB, GB, GN, JJ.

KOREAN RECORDS: *Graphoderus adamsii*: Okamoto, 1924: 166; Mori, 1932a: 5; Kamiya, 1938b: 110; Mochizuki and Matsui, 1939: 55; Ishii, 1940: 42; Cho, 1957: 200; 1963: 45; 1969: 182; Kim and Nam, 1982: 25; Lee et al., 1985: 402; Kwon and Suh, 1986: 97; Yoon, 1988: 604; Yoon and Ahn, 1988b: 258; Lee et al., 1992b: 53; Kim et al., 1994: 134; Lee, 1994: 15; Nilsson, 1995: 76; 2003b: 49; 2010: 16; 2012: 16; Hua, 2002: 36; Han et al., 2007: 271; Han et al., 2008: 253; Park et al., 2008a: 237; Cho and Park, 2010: 95.

Genus *Sandracottus* Sharp, 1882

Genus *Sandracottus* Sharp, 1882

Sandracottus Sharp, 1882: 672. Type species: *Dytiscus fasciatus* Fabricius, 1775.

DIAGNOSIS: Labial palpomere 2 with many setae. Elytron yellow with black markings. Mesofemur with a few long spines on ventral margin (Vazirani, 1969).

40. *Sandracottus mixtus* (Blanchard, 1843) (Pl. 29)

Dytiscus fasciatus Fabricius, 1775: 825 [Homonym].

Hydaticus mixtus Blanchard, 1843: pl. 4. Type locality: Indonesia: Timor.

Hydaticus hunteri Crotch, 1872: 205 [Replacement name].

Sandracottus crucialis Régimbart, 1899: 333.

Sandracottus mixtus: Balfour-Browne, 1944b: 355; Vazirani, 1969: 275; Nilsson, 1995: 76; 2003b: 49.

DESCRIPTION: Length 13.0–15.0 mm. Body oval, convex, with microreticulation.

Color: Head yellow with black band on posterior margin; pronotum yellow with black marking on medial part; elytron (Pl. 29D) yellow with black bands and dots. Ventral surface mostly brown; antenna, palps, front and middle legs, hypomera, and epipleura yellowish brown.

Head: Head subtrapezoidal, about 2.2 times as wide as long, widest across eyes, with sparse setae on clypeal grooves and around eyes. Anterior margin of clypeus emarginate. Width of frons about 1.8 times as wide as eye. Antenna long and slender; antennomeres longer than wide, with a few setae on subapical part; 1–10 broad apically; 1 longest; 11 slightly shorter than 10, widest at apical third. Labrum with long setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomeres 1–3 broad apically; 1 shortest; 2 as long as 3; 4 long oval, longest, 1.5 times as long as 3, with compact punctures on subapical part, apex truncate, bifid. Labial palpomeres 1–2 broad apically; 1 shortest; 2 longest, about 3.0 times as long as 1; 3 long oval, slightly shorter than 2, apex truncate, bifid. Gula trapezoidal, convex; gula suture non-parallel, continuous. Mentum widest at posterior corner; antero-medial margin slightly bisinuate; antero-lateral part protruded; anterior corner acute; lateral margin rounded; posterior corner rounded; posterior margin slightly rounded.

Thorax: Pronotum trapezoidal, widest at posterior corners, about 4.5 times as wide as long, 1.8 times as wide as head, with longitudinal plicae on medial part, with many setae on lateral parts; anterior margin slightly rounded; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner rectangular; posterior margin slightly bisinuate. Elytra rounded apically, widest at anterior two-third, wider than pronotum. Prosternum convex medially and with a row of long setae on anterior margin. Prosternal process long and slightly vent, distinctly convex medially, with long setae; posterior part ovate, slightly convex, with thin lateral bead and sparse setae, apex rounded. Hypomera with many setae on anterior part. Metaventrite convex, with longitudinal suture on medial part, with sparse setae on anterior part. Procoxa oval. Protochanter subtriangular, with sparse spines. Profemur with compact long spines on baso-ventral part, with a row of long spines on ventral margin. Protibia with short spines on dorsal and ventral parts. Protarsomeres 1–3 fused, broad, rounded with round suckers; 3 with two long spines on subapical part; 4 small; 5 about 2.5 times as long as 4. Protarsal claws 2/3 times as long as tarsomere 5. Mesocoxa rounded. Mesotrochanter subtriangular, with sparse spines on dorsal part. Mesofemur with a row of long spines on ventral margin. Mesotibia with sparse spines; mesotibial largest spine longer than tarsomeres 1–3 combined. Mesotarsomeres 1–4 with long setae on ventral margin; 1–3 with suckers; 1 slightly longer than 2; 2 shortest; 3 about 1.5 times as long as 2; 4 as long as 3; 5 longest, 1.5 times as long as 4. Mesotarsal claws 2/3 times as long as tarsomere 5. Metacoxal process with sparse setae, with thin lateral bead, with two grooves on posterior part; postero-lateral part rounded, apex bifid. Metatrochanter semicircular, with sparse punctures. Metafemur broad apically. Metatibia with sparse spines; metatibial largest spine as long as tarsomeres 1–2 combined, apex bifid. Metatarsomere 1 as long as 2 and 3; 4 slightly shorter than 3; 5 slightly longer than 4. Metatarsal claw unequal, inner claw slightly longer than outer claw.

Abdomen: Sternites IV–VII rugous laterally; sternites IV–VI with sparse setae; sternite VII with sparse setae on postero-lateral part. Median lobe (Pl. 29B) of aedeagus nearly parallel-sided, widest at anterior fifth and distinctly bifid apical part in dorsal view. Paramere (Pl. 29C) slightly longer than median lobe and acute on apical part.

SPECIMENS EXAMINED: SOUTH KOREA: Jeju Prov.: 1♀, Jeju-do, 18 vii 1966, KS Park; 1♀, Jeju-si, Ara-dong, Gwaneum-temple, 2 viii 1955, PS Cho; 6♂♂10♀♀, Jeju-si, Ara 1-dong, 19 viii 1994, SH Lee, *ex stream* (1♂: on slide, CNUIC); 1♀, Bukjeju-gun, Jocheon-eub, Gyorae-ri, 12 vi 2005, DH Lee; 1♂1♀, 22 v 2006; 1♂, Awol-eub, Gwangryeong-ri, 21 xi 1982, JO Byon; 1♀, Awol-eub, Yusuam-ri, 17 vii 1990, GD Han; 4♂♂1♀, Aewol-eub, Yusuam-ri, Goimuloreum, 9 ix 2011, SW Jung, *ex pond* (1♂: on slide, CNUIC).

DISTRIBUTION: Korea, China, Japan, India, Indonesia, Myanmar.

REGION: Oriental, Eastern Palaearctic.

KOREA: JJ.

KOREAN RECORDS: *Sandracottus mixtus*: Lee and Ahn, 2014: 36. *Hydaticus pacificus*: Yoon and Ahn, 1988b: 257 [misidentification of *S. mixtus*].

REMARKS: Yoon and Ahn (1988) firstly reported *Hydaticus pacificus* Aube in Korea but it was an incorrect identification of *S. mixtus*. We had an opportunity to examine the specimens (1♀, Jeju-si, Ara-dong, Gwaneum-temple, 2 viii 1955, PS Cho; 1♂, Awol-eub, Gwangryeong-ri, 21 xi 1982, JO Byon) used in their studies. This species can be distinguished from *S. dejeanii* (Aubé) and *S. festivus* (Illiger) by the pattern of black marking on elytra and nearly parallel-sided median lobe.

Subfamily Hydroporinae Aubé, 1836

DIAGNOSIS: Antero-medial part of prosternum and prosternal process in distinctly different plane. Pro– and mesotarsi pseudotetramerous. Scutellum concealed with the elytra closed (Miller and Bergsten, 2014).

TYPE: *Hydroporus*.

SPECIES: Over 2,300.

DISTRIBUTION: Worldwide.

KOREA: PN, GW, GG, CB, CN, GB, GN, JB, JN, JJ.

Key to the tribes of the Hydroporinae in Korea

1. Elytra with sublateral plicae Bidessini
- Elytra without sublateral plicae 2

- 2. Metatarsal claws unequal Hyphdrini
- Metatarsal claws equal 3
- 3. Epipleura with transverse carina at humeral angle Hygrotini
- Epipleura without transverse carina at humeral angle 4
- 4. Elytra with acute apex Hydrovatini
- Elytra without acute apex Hydroporini

Tribe Hydroporini Aubé, 1836

DIAGNOSIS: Prosternal process extended to metaventricle between mesocoxae. Metanepisternum extended to metacoxal cavities. Apex of elytra and sternite VII not pointed. Medial part of metacoxa and base of abdomen in different plane. Metacoxal process prominent. Metatarsal claw subequal in length. Paramere with a single segment (Miller and Bergsten, 2014).

Key to the genera of the Hydroporini in Korea

- 1. Elytra with subapical tooth (Pl. 30B) *Nebrioporus*
- Elytra without subapical tooth *Oreodytes*

Genus *Nebrioporus* Régimbart, 1906

Genus *Nebrioporus* Régimbart, 1906

Nebrioporus Régimbart, 1906: 237. Type species: *Hydroporus kilimandjarensis* Régimbart, 1906.

DIAGNOSIS: Elytra (Pl. 30B) with subapical tooth. Anterior part of metatibia with a row of setigerous punctures. Metaventricle and metacoxal plate with fine and dense punctures. Paramere (Pl. 30E) with hook-like sclerotization on apical part (Toledo, 2009).

Key to the species of the *Nebrioporus* in Korea

- 1. Body outline continuous between pronotum and elytra *N. simplicipes*
- Body outline discontinuous between pronotum and elytra *N. hostilis*

41. *Nebrioporus hostilis* (Sharp, 1884) (Pl. 30)

Deronectes hostilis Sharp, 1884: 448; Kamiya, 1938: 22. Type locality: Japan: Kyushu.

Nebrioporus hostilis: Nilsson and Angus, 1992: 287; Nilsson et al., 1995: 364.

DESCRIPTION: Length 4.5–4.7 mm. Body long oval and slightly convex, with small microreticulation (Pl. 30F) and punctures.

Color: Head yellowish brown with two black interocular spots; pronotum yellowish brown with black marking on medial part; elytron yellow with black vitta and markings; ventral surface mostly black, with compact punctures.

Head: Head semicircular, about 2.0 times as wide as long, widest across eyes; anterior part with linear impression, sparse setae present around eyes, clypeal groove with compact setae. Anterior margin of clypeus slightly emarginate. Width of frons about 2.5 times as wide as eye. Antenna long and slender; antennomeres longer than wide; 1 longest, widest at middle; 2–10 broad apically, with a few setae on subapical part; 11 long oval, widest at middle. Labrum with long setae on antero-medial part, emarginate at anterior margin. Maxillary palpomere 1 broad apically, as long as 2; 2 broad apically, with a few setae on apical part; 3 broad apically, slightly longer than 2; 4 longest, 1.5 times as long as 3, widest at middle, apex bifid. Labial palpomere 1 shortest; 2 broad apically, slightly longer than 1, with a few setae on apical part; 3 oval, 1.5 times as long as 2, widest at middle, apex bifid. Gula quadrate; gula suture parallel, continuous. Mentum widest across at middle; antero-medial margin bisinuate; antero-lateral part protruded; anterior corner acute; lateral margin rounded; posterior corner obtuse; posterior margin straight.

Thorax: Pronotum reverse-pentagonal, widest at middle, about 2.0 times as wide as long, 1.5 times as wide as head, with large punctures on lateral part; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin rounded; posterior corner rounded; posterior margin transverse V-shaped. Elytra (Pl. 30B) slightly acute apically, widest at middle, slightly wider than pronotum, with compact short setae. Prosternum transverse, convex and with long setae on medial part. Prosternal process long and vented, convex medially, with long setae on medial part; posterior part oval, convex medially, with long setae. Metaventricle with glabrous part and longitudinal suture on medial part. Procoxa subtriangular, with spines. Protochanter subtriangular, with long seta on ventral part. Profemur with short setae on baso-medial part. Protibia with short spines, with a row of setae on dorsal part. Protarsomere 1 as long as 3; 2 slightly shorter than 1; 5 longest. Protarsal claws long and thick, 2.0 times shorter than tarsomere 5; inner claw with rounded expansion on basal part. Mesocoxa rounded, with short spines on ventral part. Mesotrochanter triangular, with short spines, with few long setae on ventral part. Mesofemur with long setae, with a row of setae on medial part. Mesotibia with long setae. Mesotarsomere 1 as long as 3; 2 slightly shorter than 1; 5 longest. Mesotarsal claws shorter than tarsomere 5. Metacoxal plate with large punctures. Metacoxal process with sparse setae; apex reversed V-shaped. Metatrochanter semicircular, with sparse setae. Metafemur with long and short setae.

Metatibia with two rows of spines on dorsal and ventral parts; metatibial largest spine 1/3 times shorter than tarsomere 1. Metatarsomere 1 longest, 2.5 times as long as 2; 2 as long as 3; 4 slightly shorter than 3; 5 about 1.5 times shorter than 4. Metatarsal claw 1/3 times as long as tarsomere 5.

Abdomen: Sternites V–VI with long setae on medial part, with a row of setae on posterior part; sternite VII with compact setae on posterior part. Median lobe (Pl. 30C, D) of aedeagus slender, curved at subapical part, widest at basal part; apex acute (in lateral view). Paramere (Pl. 30E) subtriangular, elongated, widest subbasal part; apex acute, curved, with long setae.

TYPE MATERIAL: Lectotype, 1♂ (NHM), with labels as follows: “Holotype, Japan. G. Lewis. 1910–320., *Deronectes hostilis*. Type D. S. Japan. Lewis, Lectotype *Nebrioporus hostilis* (Sharp, 1884) des. Toledo 2009”.

SPECIMENS EXAMINED: SOUTH KOREA: Chungbuk Prov.: 1♀, Cheongju-si, Heungdeok-gu, Gangseo1-dong, 4 v 2005, DH Lee, *ex pond*; 6 *ex*, Chungju-si, Yangseong-myeon, Jocheon-ri, Namhan-river, N37°08'48.70", E127°46'59.85", 52 m, 19 ix 2014, DH Lee, beside stream; 1 *ex*, Jecheon-si, Chagol-pond, 19 iv 2009, SH Lee; 7♂♂2♀♀, Yeongdong-gun, Simcheon-myeon, Gugang-ri, 15 vi 2004, DH Lee, JI Yeon, *ex stream* (1♂, on slide); 3♂♂3♀♀, Yeongdong-gun, Simcheon-myeon, Danjeon-ri, 24 vi 2005, D.-H. Lee, *ex stream*; Chungnam Prov.: 3♂♂3♀♀, Daejeon-si, Yuseong-gu, Wolpyeong-dong, 3 xi 2005, DH Lee, *ex stream pool*; 7♂♂3♀♀, same data as former except for 4 xi 2005 (3♂♂, on slide); 2♂♂6♀♀, same data as former except for 15 viii 2005; 3♂♂1♀♀, same data as former except for 27 ii 2006; 13♂♂14♀♀, Geumsan-gun, Jewon-myeon, Daesan-ri, 18 vi 2004, D.-H. Lee, *ex stream pool*; 1♂, Gongju-si, Geum-river, 3 v 1998, K.-J. Ahn, *ex stream*; 2♂♂3♀♀, Yeongi-gun, Geumnam-myeon, 17 ix 1997, US Hwang, MS Kim, SJ Park, *ex stream*; 1♂, same data as former except for Seokgoyo-ri; 3♀♀, same data as former except for Seokdeok-ri; Gangwon Prov.: 7 *exx*, Chuncheon-si, Dong-myeon, Yeonsangol, 25 vii 1992, SH Lee; 1 *ex*, Gangneung-si, Geumjin-ri, Okgye-beach, N37°37'37.2", E129°03'04.8", 7 m, 4 ix 2013, KJ Ahn, IS Yoo, JH Song, debris on sandy beach; 1 *ex*, Jeongseon-gun, Yegok-bridge, 25 vii 2009, SH Lee; 1 *ex*, Pyeongchang-gun, Baesujang, 25 vii 1994, SH Lee; Gyeongbuk Prov.: 1 *ex*, Uljin-gun, Bugu-ri, 13 x 1994, SH Lee; Gyeonggi Prov.: 2 *exx*, Yeoncheon-gun, Yeoncheon-eub, Dongmak-ri, N38°05'25.76", E127°06'35.11", 70 m, 26 ix 2014, DH Lee, under stone beside stream; Gyeongnam Prov.: 4 *exx*, Geochang-gun, Mari-stream, 7 vi 2009, SH Lee; Jeju Prov.: 1♂, Bukjeju-gun, Jongdal-ri, 27 vii 1990, SH Lee, *ex pond*. 1♂, Namjeju-gun, Boseong-ri, 9 vii 1985, YB Cho, *ex pond*; Jeonnam Prov.: 1♀, Gwangju-si, Mt. Taehwasan, 5 viii 1998, JB Jeon, at light; 1 *ex*, Yeosu-si, Sinbok-pond, 26 x 2010, SH Lee.

DISTRIBUTION: Korea, China (Jilin, Liaoning, Sichuan), Japan, Russia (Far East), Taiwan.

REGION: Eastern Palaearctic.

KOREA: GW, GG, CB, CN, JN, GB, GN, JJ.

KOREAN RECORDS: *Nebrioporus hostilis*: Toledo, 1998: 80; Park et al., 2008a: 219; Toledo, 2009: 33; Nilsson, 2010: 36; 2012: 36. *Potamonectes hostilis*: Kwon and Suh, 1986: 94; Yoon and Ahn, 1986: 147;

Yoon, 1988: 579; Lee et al., 1992b: 48; Kim et al., 1994: 133; Lee, 1995: 12; Kwon et al., 1996: 474; Nilsson, 2003b: 66; Cho and Park., 2007: 271; Cho and Park., 2010: 95.

REMARKS: We report the discovery of the first melanistic form of *N. hostilis*, which was discovered in Jeju island and Ulneung island. The remarkable difference is the much dark coloration of pronotum and elytra.

42. *Nebrioporus simplicipes* (Sharp, 1884)

Deronectes simplicipes Sharp, 1884: 442; Régimbart, 1899: 197; Kamiya, 1938: 22. Type locality: Japan: Hokkaido.

Potamonectes simplicipes: Zimmermann, 1933: 20; Zaitzev, 1953: 58.

Nebrioporus simplicipes: Nilsson and Angus, 1992: 288.

TYPE MATERIAS: Lectotype, 1♂ (NHM), with labels as follows: “♂ Lectotype, Japan. Lewis., Sharp Coll. 1905–313., LECTOTYPE *Nebrioporus simplicipes* (Sharp, 1884) des. Toledo 2009, ♂.”. Paralectotype. 1♀ (NHM), with labels as follows: “♀ PARALECTOTYPE, Japan. Lewis., Sharp Coll. 1905–313., LECTOTYPE *Nebrioporus simplicipes* (Sharp, 1884) des. Toledo 2009, ♀.”

DISTRIBUTION: Korea, Japan, Russia (Far East).

REGION: Eastern Palaearctic.

KOREA: Unknown.

KOREAN RECORDS: *Nebrioporus simplicipes*: Toledo, 2009: 93; Nilsson, 2012: 37. *Deronectes simplicipes*: Mori, 1932a: 3; Takizawa, 1933: 178; Kamiya, 1938b: 58; Cho, 1957: 198; 1969: 175 [generic recombination]. *Potamonectes simplicipes*: Kwon and Suh, 1986: 94; Yoon and Ahn, 1986: 147; Yoon, 1988: 579; Kim et al., 1994: 133; Cho and Park, 2010: 95. [generic recombination].

REMARKS: We could not find any Korean specimen but cited this species based on the previous records.

Genus *Oreodytes* Seidlitz, 1887

Genus *Oreodytes* Seidlitz, 1887

Oreodytes Seidlitz, 1887: 57. Type species: *Hyphydrus borealis* Gyllenhal, 1826.

DIAGNOSIS: Pronotum with distinct postero-lateral plicae. Prosternal process flattened, not rugose. Metacoxal plate with many punctures. Metafemur with a row of punctures on ventral surface (Zimmerman, 1985).

Key to the species of the *Oreodytes* in Korea

1. Body long oval, elytra yellowish brown with black vittae *O. kanoi*
 – Body oval, elytra black with yellow markings *O. natrix*

43. *Oreodytes kanoi* Kamiya, 1938

Deronectes kanoi Kamiya, 1938: 223. Type locality: Japan, Honshu.

Oreodytes kanoi: Nilsson, 2001: 178.

DISTRIBUTION: Korea, Japan.

REGION: Eastern Palaearctic.

KOREA: Unknown.

KOREAN RECORDS: *Oreodytes kanoi*: Lee et al., 1985: 402; Kim et al., 1994: 133; Cho and Park, 2010: 95.

REMARKS: This species has been recorded in Korea by Lee et al. (1985), Kim et al. (1994) and Cho and Park (2010), only in their checklists without any taxonomic comments. We could not find any Korean specimens and the occurrence of this species in Korea is suspicious. However, its occurrence in Korea is probable because it is known from neighboring country (Japan). Therefore, we cite this species here based on the previous records until we will find clear evidence.

44. *Oreodytes natrix* (Sharp, 1884) (Pl. 31)

Hydroporus natrix Sharp, 1884: 443. Type locality: Japan: Chuzenji lake.

Graptodytes natrix: Takizawa, 1933: 175; Kamiya, 1938: 20.

Neonectes natrix: Zaitzev, 1953: 205; Li, 1992: 35; Mori and Kitayama, 1993: 91.

Oreodytes natrix: Nilsson, 2001: 179.

DESCRIPTION: Length 2.5–3.5 mm. Body fusiform and slightly convex dorsally, with small microreticulation and punctures.

Color: Head black with yellow marking on medial part; pronotum black with yellow M-shaped marking on medial part; elytron black with seven yellow markings; ventral surface mostly reddish brown.

Head: Head semicircular, about 2.0 times as wide as long, widest across eyes; anterior part with linear impression, setae present around eyes, clypeal grooves with compact setae. Anterior margin of clypeus round. Width of frons about 3.0 times as wide as eye. Antennae long and slender; antennomere 1 broad apically,

as long as 2; 2–10 broad apically, with a few setae on subapical part; 11 long oval, widest at apical third. Labrum with long setae on antero-medial part, emarginate at anterior margin. Maxillary palpomere 1 broad apically, as long as 2; 2 broad apically, with a few setae on apical part; 3 broad apically, slightly longer than 2; 4 longest, 2.0 times as long as 3, apex bifid. Labial palpomere 1 shortest; 2 broad apically, slightly longer than 1, with a few setae on apical part; 3 oval, 2.0 times as long as 2, widest at middle, apex bifid. Gula subquadrate; gula suture subparallel, continuous. Mentum widest across posterior part; antero-medial margin bisinuate; antero-lateral part protruded; anterior corner rectangular; lateral margin straight; posterior corner obtuse; posterior margin straight.

Thorax: Pronotum reverse-pentagonal, widest across posterior corner, about 3.0 times as wide as long, 1.5 times as wide as head, with large punctures on lateral part; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin straight; posterior corner acute; posterior margin bisinuate. Elytra acute apically, widest at anterior third, slightly wider than pronotum. Prosternum transverse, convex and with long setae on medial part. Prosternal process long and vented, convex medially; posterior part rounded, with convex lateral bead. Metaventricle with large punctures and longitudinal suture present on medial part. Procoxa subtriangular, with a few setae. Protochanter subtriangular, with long seta on ventral part. Profemur with a row of spines on dorsal part. Protibia with a row of spines on medial part; apical margin sinuate. Protarsomere 1 as long as 3; 2 slightly shorter than 3; 5 longest. Protarsal claws shorter than tarsomere 5. Mesocoxa rounded. Mesotrochanter triangular, with sparse setae on ventral part. Mesofemur with a row of setae on medial part. Mesotarsomere 1 as long as 3; 2 slightly shorter than 3; 5 longest. Mesotarsal claws shorter than tarsomere 5. Metacoxal plate with large punctures. Metacoxal process with sparse setae; apex reversed V-shaped. Metafemur with setae on apico-medial part, with a row of setae on ventral part. Metatibia with two rows of spines on dorsal and ventral parts; metatibial largest spine 0.5 times shorter than tarsomere 1. Metatarsomere 1 longest, 2.0 times as long as 2; 2 as long as 3; 4 shortest; 5 about 1.5 times shorter than 4. Metatarsal claw 0.25 times shorter than tarsomere 5.

Abdomen: Sternites II–III with large punctures; sternites V–VI with long setae on medial part, with a row of setae on posterior part; sternite VII (Pl. 31B) with compact setae on posterior part. Median lobe (Pl. 31C) of aedeagus slender, curved at subapical part, widest at basal fourth; apex acute (in lateral view). Paramere curved, with long setae; apex acute (in lateral view).

TYPE MATERIAS: Syntypes, 4 exx. (NHM), with labels as follows: “*Hydroporus natrix*. Types D. S. Chiugengi. Japan. 23. 8. 81 Lewis, Holo Type, Sharp Coll. 1905–313.”

SPECIMENS EXAMINED: SOUTH KOREA: Chungbuk Prov.: 6♂♂2♀♀, Danyang-gun, Sunheung-myeon, Baejeom-ri, 20 vii 2005, DH Lee, ex stream; 4♂♂3♀♀, Danyang-gun, Yeongcheon-myeon, Namcheon-ri, 21 vii 2005, DH Lee, ex stream; 1 ex, Yeongdong-gun, Mulhan-valley, 22 vii 1995, SH Lee; Chungnam Prov.: 1♀, Daejeon-si, Yuseong-gu, Wolpyeong-dong, 27 ii 2006, D.-H. Lee, ex stream pool; 2♂♂3♀♀, Geumsan-gun, Jewon-myeon, Cheonnae-ri, 18 vi 2004, DH Lee, ex stream; 2♂♂, Geumsan-gun, Jewon-

myeon, Daesan-ri, 18 vi 2004, DH Lee, *ex* stream; 1♀, Gongju-si, Geumsubong, Mt. Gyeryongsan, 23 vi 2000, HJ Kim, *ex* stream; 1 ex, Nonsan-si, Beolgok-myeon, Sajeong-ri, 24 v 2014, DH Lee, *ex* under stone beside stream; Gangwon Prov.: 1 ex, Cheoncheon-si, Mt. Yonghwasan, 26 vii 2009, SH Lee; 1 ex, Donghae-si, Mureung-valley, 26 vii 1994, SH Lee; 1♀, Hongcheon-gun, Hongcheongang, 29 vii 1991, SH Lee, *ex* stream; 2 exx, Inje-gun, Buk-myeon, Yongdae-ri, 12Seonyeo-bridge, 5 vii 2013, DH Lee, *ex* under stone beside stream; 1 ex, Jeonseon-gun, Bancehon-pond, 19 viii 1995, SH Lee; 2♀♀, Pyeongchang-gun, Jinbumeon, Sangjinbu-ri, 16 2006, DH Lee, *ex* stream; 1 ex, Samcheok-si, Gagok-stream, 25 vi 1995, SH Lee; 1 ex, Tabaek-si, Miin-fall, 10 iv 1994, SH Lee; Gyeongbuk Prov.: 1 ex, Bonghwa-gun, Mt. Cheongmusan, 9 iv 1994, SH Lee; 7♂♂4♀♀, Cheongsong-gun, Sangeui-ri, Budong-myeon, Mt. Juwangsan, 13 vi 2006, D.-H. Lee, *ex* stream (1♂, on slide); 2♂♂2♀♀, same data as former except for, 14 vi 2006; 1♀, Gyeongju-si, Ijocheon, 30 vi 1991, SH Lee, *ex* beside stream; 1 ex, Seongju-gun, Pocheon-valley, 7 v 2009, SH Lee; 1 ex, Uljin-gun, Seo-myeon, Wangpi-ri, Soksa-bridge, 26 iv 2012, DH Lee, *ex* beside stream; 1 ex., Yeongdeok-gun, Okgye-myeon, 9 vii 1995, SH Lee; Gyeonggi Prov.: 6 exx, Pocheon-si, Gwangneung, Neungdae, 7 vii 1992, SH Lee; 2 exx, Yeoncheon-gun, Yeoncheon-eub, Dongmak-ri, N38°05'25.76", E127°06'35.11", 70 m, 26 ix 2014, DH Lee, *ex* under stone beside stream; Gyeongnam Prov.: 1 ex, Euiryeong-gun, Deokam-pond, 8 v 2009, SH Lee; 2 exx, Geoje-si, Soryang-ri, 17 vii 2008, SH Lee; 1 ex, Milyang-si, Cheongdo, Yogocheon, 23 vii 2010, SH Lee; 1 ex, Sancheong-gun, Maetgol-pond, 7 vi 2009, SH Lee; 1♂, Ulsan-si, Bokancheon, 14 vii 1991, SH Lee, *ex* stream; Jeju Prov.: 1♂, Bukjeju-gun, Jongdal-ri, Korea, 27 vii 1990, SH Lee, *ex* pond; 1♂, Namjeju-gun, Boseong-ri, 9 vii 1985, YB Cho, *ex* pond; Jeonbuk Prov.: 1 ex, Jangsu-gun, Tookdong-valley, 9 v 2009, SH Lee; 1♂2♀♀, Muju-gun, Muju-eub, Naedo-ri, 18 vi 2004, D.-H. Lee, J. I. Yeon, *ex* stream (2♀♀, on slide); 1 ex, Wanju-gun, Mt. Daedunsan, 24 vii 1991, SH Lee; Jeonnam Prov.: 1 ex, Jangseong-gun, Baekyang-temple, 1 viii 2009, SH Lee; 2 exx, Jindo-gun, Daeya-pond, 5 viii 2009, SH Lee; 1 ex, Suncheon-si, Jibon-ri, Wonjibon-bridge, N35°00'23", E127°30'22", 51 m, 5 vi 2014, DH Lee, *ex* under stone beside stream.

DISTRIBUTION: Korea, China (Jilin, Liaoning), Japan, Russia (Far East).

REGION: Eastern Palaearctic.

KOREA: GW, GG, CB, CN, JB, JN, GB, GN, JJ.

KOREAN RECORDS: *Oreodytes natrix*: Park et al., 2008a: 218. *Neonectes natrix*: Kwon and Suh, 1986: 94; Yoon and Ahn, 1986: 146; Yoon, 1988: 581; Kim et al., 1994: 132; Lee, 1994: 18; 1995: 12; Nilsson, 1995: 53; Hua, 2002: 40; Cho and Park., 2007: 271; Cho and Park., 2010: 95.

Tribe Hydrovatini Sharp, 1882

DIAGNOSIS: Apex of prosternal process broad and triangular, margined laterally. Epipleuron with an oblique carina at humeral angle. Metatarsal claws equal in length (Miller and Bergsten, 2012).

Genus *Hydrovatus* Motschulsky, 1853

Genus *Hydrovatus* Motschulsky, 1853

Hydrovatus Motschulsky, 1853: 4. Type species: *Hyphydrus cuspidatus* Kunze, 1818.

DIAGNOSIS: Apex of elytra and sternite VII acute. Metacoxal process elongated and slender; apical incision deep and narrow (Miller and Bergsten, 2014).

Key to the species of the *Hydrovatus* in Korea

1. Antennomeres 7–10 slightly broad apically; apex of median lobe protruded, acute laterally
 *H. acuminatus*
 – Antennomeres 7–10 distinctly broad apically; apex of median lobe rounded *H. subtilis*

45. *Hydrovatus acuminatus* Motschulsky, 1859 (Pl. 32)

Hydrovatus acuminatus Motschulsky, 1859: 42. Type locality: South East Asia.

Hydrovatus obscurus Motschulsky, 1859: 43.

Hydroporus badius Clark, 1863: 424.

Hydroporus malaccaae Clark, 1863: 425.

Hydrovatus onsanguineus Régimbart, 1880: 212.

Hydrovatus humilis Sharp, 1882: 327.

Hydrovatus sordidus Sharp, 1882: 327.

Hydrovatus obscurus Régimbart, 1895: 108.

Hydrovatus ferrugineus Zimmermann, 1919: 127.

Hydrovatus furvus Guignot, 1950: 25.

DESCRIPTION: Length 2.4–2.6 mm. Body rounded oval and more or less convex dorsally, with microreticulation and small punctures.

Color: Head yellowish brown; pronotum yellowish brown with a row of dark brown dots on anterior part; elytra brown with black subsutural line; ventral surface yellowish brown to brown.

Head: Head semicircular, about 1.5 times as wide as long, widest across eyes; clypeal groove with a few setae. Anterior margin of clypeus rounded. Width of frons about 3.0 times as wide as eye. Antennomere 1 slender, longer than 2; 2–10 broad apically, slightly longer than wide, 3–6 broad subapically (in male); 11 long oval, widest at middle. Labrum with long setae on antero-medial part, emarginate at anterior margin.

Maxillary palpomere 1 broad apically, as long as 3; 2 broad apically, slightly longer than 1; 3 broad apically, curved; 4 oval, longest, as long as 1–3 combined, widest at basal third, apex truncate. Labial palpomere 1 broad apically, shortest; 2 broad apically, slightly longer than 1, with long setae on medial part; 3 oval, widest at basal third, about 2.0 times as long as 2, apex truncate. Gula trapezoidal; gula suture non-parallel, continuous. Mentum widest across posterior part; antero-medial margin bisinuate; antero-lateral part protruded, with compact setae; anterior corner rounded; lateral margin rounded; posterior corner slightly obtuse; posterior margin straight.

Thorax: Pronotum reverse-pentagonal, widest across posterior corner, about 3.5 times as wide as long, 1.2 times as wide as head; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner acute; posterior margin bisinuate. Elytra widest at middle, slightly wider than pronotum. Prosternum transverse, with long setae on medial part. Prosternal process slender and vented; posterior part flattened, apex rounded. Metaventricle with longitudinal suture on medial part. Procoxa subtriangular, with short spines on ventral part. Protrochanter subtriangular, with a row of long setae on ventral part. Profemur with two long spines on ventral part. Protibia with long spines, with a row of spines on ventral part. Protarsomere 1 about 1.2 times as long as 2; 2 slightly shorter than 3; 3 slightly shorter than 1; 5 slender and longest. Protarsal claws 2.5 times shorter than tarsomere 5. Mesocoxa rounded, with sparse short spines. Mesotrochanter triangular, with a row of long setae on ventral part. Mesofemur with sparse long spines. Mesotarsomere 1 about 1.2 times as long as 2; 2 slightly shorter than 3; 3 slightly shorter than 1; 5 slender and longest. Mesotarsal claws 2.5 times shorter than tarsomere 5. Metacoxal process with sparse setae; apex trifid. Metatrochanter semicircular, with sparse short setae. Metafemur with sparse few setae. Metatibia with two rows of spines on dorsal and ventral parts; metatibial largest spine about 0.5 times shorter than tarsomere 1. Metatarsomere 1 longest, 1.2 times as long as 2; 2 slightly longer than 3; 3 about 2.0 times as long as 4; 4 shortest; 5 as long as 2. Metatarsal claw 3.0 times shorter than 5.

Abdomen: Sternites IV–VII with sparse setae; sternite VII with a row of long setae on lateral and posterior parts. Median lobe (Pl. 32B, C) of aedeagus broad, subparallel; apex protruded, acute laterally in dorsal view; slender, slightly curved, apex acute in lateral view. Paramere (Pl. 32D) semicircular, widest at base; apex rounded in lateral view.

SPECIMENS EXAMINED: SOUTH KOREA: Chungnam Prov.: 2♂♂, Tae'an-gun, Iwon-myeon, Gwan-ri, Iwon-seawall, N36°53'902", E126°16'219", 3 m, 5 viii 2015, DH Lee, SG Lee, at light near reclaimed land; ∴ 2♂♂2♀♀, Tae'an-gun, Wonbuk-myeon, Hwangchon-ri, N36°51'855", E126°11'973", 13 m, 17 vii 2015, DH Lee, at light near abandon salt farm.

DISTRIBUTION: **Asia:** Korea, China (Fujian, Guandong, Guangxi, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Xinjiang, Yunnan), Iran Iraq, Israel, Japan, Nepal, Oman, Pakistan, Saudi Arabia, Syria, Taiwan, Turkey, Yemen (Socotra), **North Africa:** Egypt, Libya.

REGION: Afrotropical, Palaearctic.

KOREA: CN.

KOREAN RECORD: Lee and Ahn, 2016b: 344.

46. *Hydrovatus subtilis* Sharp, 1882 (Pl. 33)

Hydrovatus subtilis Sharp, 1882: 329; Lee et al., 1992b: 47; Nilsson et al., 1995: 361. Type locality: Thailand.

Hydrovatus adachii Kamiya, 1932: 4; Takizawa, 1933: 165.

DESCRIPTION: Length 2.4–2.8 mm. Body rounded oval and more or less convex dorsally, with microreticulation and small punctures.

Color: Head yellowish brown; pronotum yellowish brown with a row of dark brown dots in anterior part; elytra brown with black subsutural line; ventral surface yellowish brown to brown.

Head: Head semicircular, about 1.5 times as wide as long, widest across eyes; clypeal groove with a few setae. Anterior margin of clypeus rounded. Width of frons about 3.0 times as wide as eye. Antennomere 1 slender, longer than 2; 2–10 broad apically, slightly longer than wide (in male); 11 long oval, widest at middle. Labrum with long setae on antero-medial part, emarginate at anterior margin. Maxillary palpomere 1 broad apically, as long as 3; 2 broad apically, slightly longer than 1; 3 broad apically, curved 2; 4 oval, longest, as long as sum 1–3, widest at basal third, apex truncated. Labial palpomere 1 broad apically, shortest; 2 broad apically, slightly longer than 1, with long setae on medial part; 3 oval, widest at basal third, about 2.0 times as long as 2, apex truncate. Gula trapezoidal; gula suture non-parallel, continuous. Mentum widest across posterior part; antero-medial margin bisinuate; antero-lateral part protruded, with compact setae; anterior corner rounded; lateral margin rounded; posterior corner slightly obtuse; posterior margin straight.

Thorax: Pronotum reverse-pentagonal, widest across posterior corner, about 3.5 times as wide as long, 1.2 times as wide as head; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner acute; posterior margin bisinuate. Elytra widest at middle, slightly wider than pronotum. Prosternum transverse, with long setae on medial part. Prosternal process slender and vented; posterior part flattened, apex rounded. Metaventrite with longitudinal suture on medial part. Procoxa subtriangular, with short spines on ventral part. Protochanter subtriangular, with a row of long setae on ventral part. Profemur with two long spines on ventral part. Protibia with long spines, with a row of spines on ventral part. Protarsomere 1 about 1.2 times as long as 2; 2 slightly shorter than 3; 3 slightly shorter than 1; 5 slender and longest. Protarsal claws 2.5 times shorter than tarsomere 5. Mesocoxa rounded, with sparse short spines. Mesotrochanter triangular, with a row of long setae on ventral part. Mesofemur with sparse long spines. Mesotarsomere 1 about 1.2 times as long as 2; 2 slightly shorter than 3; 3 slightly shorter than 1; 5 slender and longest. Mesotarsal claws 2.5 times shorter than tarsomere 5. Metacoxal process with sparse setae; apex trifid. Metatrochanter semicircular, with sparse short setae. Metafemur with sparse few setae.

Metatibia with two rows of spines on dorsal and ventral parts; metatibial largest spine about 0.5 times shorter than tarsomere 1. Metatarsomere 1 longest, 1.2 times as long as 2; 2 slightly longer than 3; 3 about 2.0 times as long as 4; 4 shortest; 5 as long as 2. Metatarsal claw 3.0 times shorter than 5.

Abdomen: Sternites IV–VII with sparse setae; sternite VII with a row of long setae on lateral and posterior part. Median lobe (Pl. 33B, C) of aedeagus narrowed apically, widest at basal fourth, apical margin slightly rounded in dorsal view; slender, slightly curved, apex vented and acute in lateral view. Paramere (Pl. 33D) semicircular, widest at basal fifth; apex acute in lateral view.

TYPE MATERIAL: Lectotype, 1♂ (NHM), with labels as follows: “Type, Siam, Sharp Coll 1905-313, Type ♂, *Hydrovatus subtilis* n. sp. *Hydrovatus subtilis* Sharp Des. O. Biström, 1989, Lectotype”.

SPECIMENS EXAMINED: SOUTH KOREA: Chungbuk Prov.: 2♂♂, Cheongju-si, Heungdeok-gu, Hyuam-dong, 7 v 2005, D.-H. Lee, *ex pond*; 1♀, same data as former except for 1 vi 2005; 1♂, same data as former except for 15 x 2005; 2♂♂8♀♀, same data as former except for 5 v 2006 (2♂♂3♀♀, on slide); Gyeonggi Prov.: 1♀, Suwon-si, Seoho-pond, 14 ix 1990, SH Lee, *ex pond*; Gyeongnam Prov.: 1 ex, Sancheong-gun, Maetgol-pond, 7 vi 2009, SH Lee; Jeju Prov.: 1♀, Bukjeju-gun, Jongdal-ri, 27 vii 1990, SH Lee, *ex pond*; 1♂, Namjeju-gun, Siheung-ri, 26 vii 1990, SH Lee, *ex pond*; Jeonnam Prov.: 1 ex, Jangseong-gun, Songsan-pond, 1 viii 2009, SH Lee; 1♂, Yeongam-gun, Taeganji, 22 vii 1989, SH Lee, *ex pond*.

DISTRIBUTION: Korea, China (Macao), India, Indonesia, Japan, Laos, Malaysia, Taiwan, Thailand.

REGION: Oriental, Eastern Palaearctic.

KOREA: GG, CB, GB, JN, JJ.

KOREAN RECORDS: *Hydrovatus subtilis*: Lee et al., 1992b: 48; Kim et al., 1994: 133; Nilsson, 2003b: 71; 2010: 41; 2012: 41; Park et al., 2008a: 220; Lee and Ahn, 2016b: 344.

Tribe Hygrotini Portevin, 1929

DIAGNOSIS: Epipleuron with oblique carina at humeral angle. Metacoxal lobe rounded and covered base of metatrochanter. Metatarsal claws equal in length. Apex of elytra and sternite VII not acute (Nilsson and Holmen, 1995).

Genus *Hygrotus* Stephens, 1828

Genus *Hygrotus* Stephens, 1828

Hygrotus Stephens, 1828: 38. Type species: *Dytiscus inaequalis* Fabricius, 1777.

DIAGNOSIS: Medium-sized. Dorsal surface with contrasting color pattern. Pronotum and elytra without baso-medial striae (Nilsson and Holmen, 1995).

Key to the species of the *Hygrotus* in Korea

1. Punctures of dorsal surface less coarse and slightly impressed; median lobe (Pl. 34C) with long setae on ventral side *H. chinensis*
- Punctures of dorsal surface coarse and distinctly impressed; median lobe without long setae on ventral side *H. impressopunctatus*

47. *Hygrotus chinensis* Sharp, 1882 (Pl. 34)

Hygrotus chinensis Sharp, 1882: 398; Régimbart, 1899: 200; Zimmermann, 1930: 100. Type locality: China: Jiangxi.

Coelambus vittatus Sharp, 1884: 441; Zaitzev, 1953: 136.

DESCRIPTION: Length 4.3–5.0 mm. Body long oval, slightly convex dorsally, with punctures. Outline slightly discontinuous between pronotum and elytra.

Color: Dorsal surface brown to reddish brown, head with interocular black marking, elytron with black punctures and four dark vittae. Ventral surface mostly dark brown and antenna, palpi, hypomera, epipleura, and legs yellowish brown to brown.

Head: Head semicircular, about 2.0 times as wide as long, widest across eyes; clypeal groove with a few setae. Anterior margin of clypeus slightly emarginate. Width of frons about 2.5 times as wide as eye. Antennomere 1 slender, longer than 2; 2–10 broad apically; 11 long oval, widest at apical fourth. Labrum with long setae on antero-medial part, emarginate at anterior margin. Maxillary palpomere 1 broad apically, shortest; 2 broad apically, slightly longer than 1; 3 broad apically, slightly longer than 2; 4 longest, 2.5 times as long as 3, widest at middle, apex bifid. Labial palpomere 1 broad apically, shortest; 2 broad apically, slightly longer than 1, with few a setae on apical part; 3 oval, widest at middle, about 1.5 times as long as 2, apex bifid. Gula subquadrate; gula suture subparallel, continuous. Mentum widest across posterior part; antero-medial margin bisinuate; antero-lateral part protruded, with compact setae; anterior corner rounded; lateral margin rounded; posterior corner slightly obtuse; posterior margin straight.

Thorax: Pronotum reverse-pentagonal, widest across posterior corner, about 3.0 times as wide as long, 1.5 times as wide as head, with long setae on anterior and lateral parts; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin straight; posterior corner obtuse; posterior margin bisinuate. Elytra rounded apically, widest at middle, slightly wider than pronotum. Prosternum transverse, with compact

setae; medial part concave. Prosternal process slender and vented; posterior part expanded, with longitudinal carina; apex acute. Metaventricle with longitudinal suture on medial part. Procoxa subtriangular, with short spines on ventral part. Protrochanter subtriangular, with a row of long setae on ventral part. Profemur with sparse setae on basal part, with a row of spines on ventral part. Protibia with a row of spines on dorsal and ventral parts. Protarsomere 1 as long as 2; 2 slightly shorter than 3; 5 longest, about 3.0 times as long as 3. Protarsal claws (Pl. 34B) shorter than tarsomere 5 (inner claw short, thick, rounded apically in male). Mesocoxa rounded, with sparse short spines on ventral part. Mesotrochanter triangular, with a row of long setae on ventral part. Mesofemur with two rows of spines on medial part, with a row of spines on ventral part. Mesotarsomere 1 longest; 2 about 2.0 times shorter than 3; 3 about 2.5 times as long as 5. Mesotarsal claws shorter than tarsomere 5. Metacoxal process with sparse setae; apex bisinuate. Metatrochanter semicircular, with sparse short setae. Metafemur with a row of long spines on apico-medial part, with a row of short spines on dorsal and ventral parts. Metatibia with two rows of spines on dorsal and ventral parts; metatibial largest spine about 0.5 times shorter than tarsomere 1. Metatarsomere 1 longest, 1.5 times as long as 2; 2 as long as 3; 4 slightly shorter than 3; 5 about 1.2 times shorter than 4. Metatarsal claw shorter than 5.

Abdomen: Sternites IV–VI with long setae on medial part; sternite VII with rows of long setae on posterior part. Median lobe (Pl. 34C) of aedeagus slender, widest at base, with long setae on lateral part; apex acute (in lateral view). Paramere curved, with long setae; apex acute (in lateral view).

TYPE MATERIAL: Lectotype, 1♂ (NHM), with labels as follows: “Type, China Kiu Kiang, Type 206, Sharp Coll 1905-313, *Coelambus chinensis* n. sp. Kiu Kiang, LECTOTYPE *Coelambus chienesis* Sharp. Des Fery 1990”.

SPECIMENS EXAMINED: SOUTH KOREA: Chungbuk Prov.: 1♀, Jecheon-si, Yangmanjeon, 30 vii 1994, SH Lee; Chungnam Prov.: 8♂♂7♀♀, Taean-gun, Wonbuk-myeon, Hwangchon-ri, N36°51'855", E126°11'973", 13 m, 17 vii 2015, DH Lee, at light near abandon salt farm; Gyeongbuk Prov.: 1♂, Cheongsong-gun, Unwiji, Korea, 23 ix 1989, SH. Lee, ex pond; 1♀, Gimcheon-si, Buhang-myeon, Daeya-ri, 27 iv 2011, SH Lee, SW Jung, ex seepage pool; 1♂, Yeongdeok-gun, Ganggu-myeon, Chuksan-ri, 3 x 1994, SH Lee, ex pond; 1♀, Yeongdeok-gun, Ganggu-myeon, Myogok-ri, 6 vi 1994, SH. Lee, ex reservoir; Gyeonggi Prov.: 1♂, Icheon-si, Janghowon-eub, Seoneub-ri, Mt. Seoseongsan, 19 viii 1989, SH. Lee, ex pond.; 1♀, Icheon-gun, Seonghoji, 19 viii 1989, SH. Lee, ex pond; 1♀, Incheon-si, Ganghwa-gun, Gyodong-myeon, 6 x 2009, HM Lim, at light; 2♂♂2♀♀, Suwon-si, Gwangseo-gu, Seodun-dong, 9 viii 1997 at light; 1♀, Suwon-si, Seohoji, 14 ix 1990, SH Lee, ex pond; Jeju Prov.: 1♂, Namjeju-gun, Ojo-ri, 17 vii 1990, SH Lee, ex pond; Jeonbuk Prov.: Gunsan-si, Gijeok-pond, 3 x 2011, SH Lee.

DISTRIBUTION: Korea, China (Beijing, Hebei, Heilongjiang, Jilin, Jiangxi, Liaoning, Nei Mongol, Sichuan, Xizang, Zhejiang), Japan, Mongolia, Russia (Far East).

REGION: Eastern Palaearctic.

KOREA: GG, CB, CN, GB, JJ.

KOREAN RECORDS: *Hygrotus chinensis*: Fery, 2003: 148; Nilsson, 2003b; 71; 2010: 42; 2012: 42; Park et al., 2008a: 216; *Coelambus chinensis*: Kwon and Suh, 1986: 93; Yoon and Ahn, 1986: 146; Yoon, 1988: 578; Lee et al., 1992b: 48; Kim et al., 1994: 132; Nilsson, 1995: 45; Hua, 2002: 38; Cho and Park., 2007: 271; Cho and Park., 2010: 95 [generic recombination].

48. *Hygrotus impressopunctatus* (Schaller, 1783)

Dytiscus impressopunctatus Schaller, 1783: 312. Type locality: Germany: Halle.

Coelambus impressopunctatus: Feng, 1932a: 325; Kamiya, 1938a: 17; Zaitzev, 1953: 135.

Hygrotus impressopunctatus: Balfour-Browne, 1947: 438.

Coelambus impressopunctatus roborovskii Zaitzev, 1953: 135.

Coelambus impressopunctatus hiurai Satô, 1972: 54.

DISTRIBUTION: Asia: Korea, China (Hebei, Heilongjiang, Liaoning, Nei Mongol, Qinghai, Sichuan, Shaanxi, Xinjiang), Japan, Mongolia, Russia (East Siberia, Far East, West Siberia), and widely distributed in Palaearctic region. North America.

REGION: Nearctic, Palaearctic.

KOREA: Unknown.

KOREAN RECORDS: *Coelambus impressopunctatus*: Kim et al., 1994: 132; Cho and Park, 2010: 95 [generic recombination].

REMARKS: This species has been recorded in Korea by Kim et al. (1994) and Cho and Park (2010), only in their checklists without any taxonomic comments. We could not find any Korean specimens and the occurrence of this species in Korea is suspicious. However, its occurrence in Korea is probable because it is known from neighboring countries [China, Japan and Russia (Far East)]. Therefore, we cite this species here based on the previous records until we will find clear evidence.

Tribe Hyphydrini Sharp, 1882

DIAGNOSIS: Apex of prosternal process narrow and pointed. Epipleuron with oblique carina at the humeral angle. Medial part of metaventral wing narrow. Medial part of metacoxa at the same level as the abdomen. Metacoxal process absent or very small and semicircular. Metatarsal inner claw shorter than outer (Miller and Bergsten, 2014).

Key to the genera of the Hyphydrini in Korea

1. Anterior margin of head without plicae *Allopachria*
 – Anterior margin of head with plicae *Hyphydrus*

Genus *Allopachria* Zimmermann, 1924

Genus *Allopachria* Zimmermann, 1924

Allopachria Zimmermann, 1924: 194. Type species: *Allopachria quadripustulata* Zimmermann, 1924.

DIAGNOSIS: Body oblong oval to rounded, moderately convex dorsoventrally. Posterior angles of pronotum not distinctly extended backward. Prosternal process not dentate. Base of metatrochanter covered by small lobe of metacoxal process (Wewalka, 2000).

49. *Allopachria flavomaculata* (Kamiya, 1938) (Pl. 35)

Hyphydrus flavomaculata Kamiya, 1938a: 12; Zaitzev, 1953: 110. Type locality: Japan: Honshu.

Nipponhydrus flavomaculata Satô, 1981: 68.

Allopachria flavomaculata: Biström et al., 1997: 76.

DESCRIPTION: Length 2.3–2.6 mm. Body almost round, convex, with small punctures.

Color: Head yellow, pronotum black, elytra black with yellow markings, ventral surface reddish brown.

Head: Head semicircular, about 2.0 times as wide as long, widest across eyes; compact punctures and setae present around eyes, clypeal groove with a few setae. Anterior margin of clypeus more or less straight. Width of frons about 3.5 times as wide as eye. Antennomere (Pl. 35B) 1 slender, longer than 2; 2–10 broad apically; 5–9 distinctly expanded at apical part; 11 long oval widest at middle. Labrum with long setae on antero-medial part, emarginate at anterior margin. Maxillary palpomere 1 broad apically, shortest; 2 broad apically, slightly longer than 1; 3 broad apically, slightly longer than 2; 4 longest, 2.0 times as long as 3, widest apical third, apex bifid. Labial palpomere 1 broad apically, shortest; 2 broad apically, as long as 3, with stout setae on apical part; 3 oval, widest at middle, with short setae on subapical part, apex bifid. Gula subquadrate; gula suture subparallel, continuous. Mentum widest across posterior part; antero-medial margin bisinuate; antero-lateral part protruded, with compact setae; anterior corner rounded; lateral margin rounded; posterior corner slightly obtuse; posterior margin straight.

Thorax: Pronotum reverse-pentagonal, widest across posterior corner, about 3.0 times as wide as long, 1.5 times as wide as head, with a row of setae on anterior part; anterior margin straight; antero-lateral part

protruded; anterior corner acute; lateral margin straight; posterior corner obtuse; posterior margin V-shaped. Elytra rounded apically, widest at anterior third, 1.3 times as wide as pronotum. Prosternum transverse, with longitudinal carina on medial part. Prosternal process long and vented; posterior part expanded, apex acute. Metaventricle with longitudinal suture on posterior part. Procoxa subtriangular, with short spines on ventral part. Protochanter subtriangular, with a row of setae on ventral part. Profemur with a row of spines on ventral part. Protibia with a row of spines on medial part, with a row of setae on dorsal part. Protarsomere 1 as long as 2; 2 slightly shorter than 3; 3 longest, about 3.0 times as long as 5. Protarsal claws shorter than tarsomere 5. Mesocoxa rounded, with sparse short spines on ventral part. Mesotrochanter triangular, with sparse short setae. Mesofemur with a row of spines on ventral part. Mesotarsomere 1 longest; 2 about 2.0 times shorter than 3; 3 about 2.5 times as long as 5. Mesotarsal claws shorter than tarsomere 5. Metacoxal process with sparse setae; apex protruded laterally. Metatrochanter semicircular, with sparse short setae on ventral part. Metafemur with sparse spines. Metatibia with two rows of spines on dorsal and ventral parts; metatibial largest spine about 0.5 times shorter than tarsomere 1. Metatarsomere 1 longest, 1.5 times as long as 2; 2 as long as 3; 4 slightly shorter than 3; 5 about 1.5 times shorter than 4. Metatarsal claws unequal.

Abdomen: Sternites V–VI with long setae on medial part; sternite VII (Pl. 35C) with rows of setae on posterior part. Median lobe of aedeagus (Pl. 35D) trident, widest at base, subapical part slender; apex acute (in dorsal view). Paramere (Pl. 35D) elongated, subparallel-sided, curved at anterior fourth; apex rounded (in dorsal view).

SPECIMENS EXAMINED: SOUTH KOREA: Gangwon Prov.: 1♀, Donghae-si, Mureung-valley, 26 vii 1994, SH Lee, *ex valley*; Gyeongbuk Prov.: 3♂♂8♀♀, Cheongsong-gun, Budong-myeon, Sangeui-ri, Mt. Juwangsang, 14 vi 2006, DH. Lee, *ex mountain stream* (2♂♂2♀♀, on slide); 1♀, Uljin-gun, Mt. Eumbongsan, 24 vi 1995, SH Lee, *ex stream*; Gyeongnam Prov.: 1♂, Sacheon-si, Gonmyeon-myeon, Yongsan-ri, 14 viii 1995, SH Lee, *ex stream*; Jeonbuk Prov.: 1♂, Muju-gun, Gucheon-dong, 4 viii 1994, SH Lee, *ex stream*.

DISTRIBUTION: Korea, China (Guanxi), Japan.

REGION: Eastern Palaearctic.

KOREA: GW, GB, GN, JB.

KOREA RECORDS: *Allopachria flavomaculata*: Jung et al., 2011: 42. *Nipponhydrus flavomaculatus*: Lee, 1995: 12.

Genus *Hyphyrus* Illiger, 1802

Genus *Hyphyrus* Illiger, 1802

Hyphyrus Illiger, 1802: 299. Type species: *Dytiscus gibbus* Fabricius, 1777.

DIAGNOSIS: Body strongly convex dorsoventrally. Anterior margin of head with plicae. Base of metatrochanter totally exposed. Metatibia (Pl. 37B) with a long spine on apical part. Spermatheca well-sclerotized (Biström, 1982).

Key to the species of the *Hyphydrus* in Korea

1. Protarsomere 1 longest; median lobe of aedeagus elongated and slender, widest at basal part *H. falkenstromi*
- Protarsomere 3 longest; median lobe of aedeagus elongated and broad, widest at middle *H. japonicus vagus*

50. *Hyphydrus falkenstromi* Gschwendtner, 1939 (Pl. 36)

Hyphydrus falkenstromi Gschwendtner, 1939: 25; Brinck, 1943: 9; Balfour-Browne, 1944a: 129; Biström, 1982: 42; Nilsson, 2003: 74. Type locality: China: Beijing.

Hyphydrus brincki Guignot, 1946: 72.

DESCRIPTION: Length 3.5–4.5 mm Body almost round and convex, with small punctures.

Color: Head and pronotum mostly reddish brown; interocular spot and posterior margin of pronotum black; elytra yellow to orange with black markings, apical part brown; ventral surface reddish brown.

Head: Head semicircular, about 2.0 times as wide as long, widest across eyes; compact punctures and setae present around eyes, clypeal groove with a few setae. Anterior margin of clypeus rounded. Width of frons about 3.5 times as wide as eye. Antennae long and slender, antennomere 4 shortest, 11 longest. Labrum with long setae on antero-medial part, emarginate at anterior margin. Maxillary palpomere 1 broad apically, shortest; 2 broad apically, about 1.5 times as long as 1; 3 broad apically, as long as 2; with a long seta on apical part; 4 longest, 2.0 times as long as 3, apex bifid. Labial palpomere 1 broad apically, shortest; 2 broad apically, longest, with many spines on apical part; 3 oval, slightly shorter than 2, widest apical two-fifth, apex bifid. Gula subquadrate; gula suture subparallel, continuous. Mentum widest across anterior corner; antero-medial margin bisinuate; antero-lateral part protruded, with compact setae; anterior corner slightly acute; lateral margin rounded; posterior corner rounded; posterior margin straight.

Thorax: Pronotum reverse-pentagonal, widest across posterior corner, about 3.0 times as wide as long, 1.5 times as wide as head, with a row of setae on anterior part; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin straight; posterior corner obtuse; posterior margin V-shaped. Elytra rounded apically, widest at anterior third, 1.3 times as wide as pronotum. Prosternum transverse, concave on medial part; anterior margin slightly rounded. Prosternal process long and slender; posterior

part broad, with linear-form carina. Metaventricle with longitudinal suture on medial part, with sparse short setae. Procoxa subtriangular, with short spines on ventral part. Protrochanter subtriangular, with short setae. Profemur with a row of spines on ventral part, with a row of setae on baso-medial part. Protibia with a row of spines on medial part; apical margin sinuate. Protarsomere 1 slightly shorter than 3; 2 about 2.0 times shorter than 1; 3 longest; 5 about 3.0 times shorter than 2. Protarsal claws longer than tarsomere 5. Mesocoxa rounded, with many short spines on ventral part. Mesotrochanter triangular, with sparse short setae. Mesofemur with a row of spines on ventral part. Mesotarsomere 1 longest; 2 about 2.5 times shorter than 3; 3 slightly shorter than 1; 5 about 1.3 times shorter than 2. Mesotarsal claws as long as tarsomere 5. Metacoxal process with sparse setae; apex reversed V-shaped. Metafemur with coarse setae on medial part, with a row of spines on ventral part. Metatibia with two rows of spines on dorsal and ventral parts; metatibial largest spine as long as tarsomere 1. Metatarsomere 1 longest, 1.5 times as long as 2; 2 as long as 3; 4 slightly shorter than 3; 5 about 2.0 times shorter than 4. Metatarsal claw slightly shorter than tarsomere 5.

Abdomen: Sternites V–VI with long setae on medial part; sternite VII with rows of setae on posterior part. Median lobe of aedeagus (Pl. 36B) elongated and slender, widest at basal part, subapical part protruded and rounded; apex slightly acute (in dorsal view). Paramere (Pl. 36B) elongated, expanded at anterior fourth, narrowest at posterior fourth, with many long setae on apical part (in dorsal view).

SPECIMENS EXAMINED: SOUTH KOREA: Jeju Prov.: 1♀, Bukjeju-gun, Seobu-pond, 23 vii 1990, SH Lee; 1♂1♀, Seoguipo-si, Seoho-dong, 23 vii 1990, SH Lee, *ex pond* (1♂ on slide, CNUIC); 3♂♂, Seoguipo-si, Seongsan-eub, Ojo-ri, 24 vii 1990 (1♂ on slide, CNUIC); 1♀, Jeju-si, Hankyeong-myeon, Yongsu-ri, 20 viii 1994; 1♂, Aewol-eub, Yongheung-ri, Eomuksaemi-pond, 31 vii 2005.

DISTRIBUTION: Korea, China (Beijing, Fujian, Heilongjiang, Jiangsu, Jilin, Liaoning, Nei Mongol Shandong, Tianjin), Russia (Far East).

REGION: Eastern Palaearctic.

KOREA: JJ.

KOREAN RECORD: *Hyphydrus falkenstromi*: Lee and Ahn, 2014: 35.

51. *Hyphydrus japonicus vagus* Brinck, 1943 (Pl. 37)

Hyphydrus japonicus Sharp, 1873: 54. Type locality: Japan: Kyushu.

Hyphydrus frontalis Sharp, 1882: 381.

Hyphydrus paromoeus Guignot, 1954: 40.

DESCRIPTION: Length 3.8–5.0 mm. Body almost round and convex, with small punctures.

Color: Head and pronotum mostly reddish brown; interocular spot and posterior margin of pronotum black;

elytra yellow to orange with black markings; ventral surface reddish brown.

Head: Head semicircular, about 2.0 times as wide as long, widest across eyes; anterior part with a linear impression, compact punctures and setae present on around eyes, clypeal groove with a few setae. Anterior margin of clypeus rounded. Width of frons about 3.5 times as wide as eye. Antennae long and slender, antennomere 4 shortest, 11 longest. Labrum with long setae on antero-medial part, emarginate at anterior margin. Maxillary palpomere 1 broad apically, shortest; 2 broad apically, about 1.5 times as long as 1; 3 broad apically, as long as 2; with a long seta on apical part; 4 longest, 2.0 times as long as 3, apex bifid. Labial palpomere 1 broad apically, shortest; 2 broad apically, longest, with many spines on apical part; 3 oval, slightly shorter than 2, widest in apical two-fifths, apex bifid. Gula subquadrate; gula suture subparallel, continuous. Mentum widest across posterior part; antero-medial margin bisinuate; antero-lateral part protruded, with compact setae; anterior corner slightly acute; lateral margin rounded; posterior corner rounded; posterior margin straight.

Thorax: Pronotum reverse-pentagonal, widest across posterior corner, about 3.0 times as wide as long, 1.5 times as wide as head, with a row of setae on anterior part; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin straight; posterior corner obtuse; posterior margin V-shaped. Elytra rounded apically, widest at anterior third, 1.3 times as wide as pronotum. Prosternum transverse, concave on medial part; anterior margin slightly rounded. Prosternal process long and slender; posterior part broad, with linear-form carina. Metaventricle with longitudinal suture on medial part, with sparse short setae. Procoxa subtriangular, with short spines on ventral part. Protochanter subtriangular, with short setae. Profemur with a row of spines on ventral part, with a row of setae on baso-medial part. Protibia with a row of spines on medial part; apical margin sinuate. Protarsomere 1 longest; 2 about 2.0 times shorter than 3; 3 about 1.3 times as long as 1; 5 about 2.0 times shorter than 2. Protarsal claws shorter than tarsomere 5. Mesocoxa rounded, with many short spines on ventral part. Mesotrochanter triangular, with sparse short setae. Mesofemur with a row of spines on ventral part. Mesotarsomere 1 longest; 2 about 2.0 times shorter than 3; 3 about 1.3 times as long as 1; 5 about 2.0 times shorter than 2. Mesotarsal claws shorter than tarsomere 5. Metacoxal process with sparse setae; apex reversed V-shaped. Metafemur with a row of spines on ventral part. Metatibia (Pl. 37B) with two rows of spines on dorsal and ventral parts; metatibial largest spine as long as tarsomere 1. Metatarsomere 1 longest, 1.5 times as long as 2; 2 as long as 3; 4 slightly shorter than 3; 5 about 2.0 times shorter than 4. Metatarsal claw slightly shorter than tarsomere 5.

Abdomen: Sternites V–VI with long setae on medial part; sternite VII with rows of setae on posterior part. Median lobe (Pl. 37C) of aedeagus elongated and broad, widest at middle, subapical part protruded; apex rounded (in dorsal view). Paramere (Pl. 37D) elongated, subparallel-side, apex rounded, with compact setae on apical part (in dorsal view).

TYPE MATERIAL: Lectotype, 1♂ (NHM), with labels as follows: “*Hyphydrus japonicus*. ♂ Type D. S. Japan. Lewis, Lecto Type, Japan. Lewis., Sharp Coll. 1905–313., *Hyphydrus japonicus* ♂, *Hyphydrus japonicus* Lectotypus”.

SPECIMENS EXAMINED: NORTH KOREA: Pyeonannam Prov.: 20 exx. DPR. KOREA. PyongYang-city Around PyongYang-Hotel Near Daedong-River 8 vii 2008 Changdo Han leg; 10 exx. DPR. KOREA. PyongYang-city Around Mt. RyongAck-San Near Suna-River 3 vii 2009. Changdo Han leg; SOUTH KOREA: Chungbuk Prov.: 3♂♂5♀♀, Cheongju-si, Heungdeok-gu, Hyuam-dong, 1 vi 2005, D.-H. Lee, *ex pond*; 5♂♂3♀♀, same data as former except for, 7 v 2005; 26♂♂20♀♀, same data as former except for, 15 x 2005 (1♂, on slide); 4♂♂2♀♀, same data as former except for Jidong-dong, 16 x 2005; 2♀♀, same data as former except for Seochon-dong, 16 x 2005; 4♂♂1♀, same data as former except for Gangseo-dong, 22 x 2005, D.-H. Lee, *ex pond*; 15♂♂11♀♀, same data as former except for 23 x 2005, D.-H. Lee, *ex pond*; 1♂, Cheongwon-gun, Muneui-myeon, 21 vii 1988, YB Cho, *ex pond*; 1♀, Eumseong-gun, Seonju-pond, 18 viii 1989, SH Lee, *ex pond*; 4 ex, Jecheon-si, Yangminwon, 30 vii 1994, SH Lee; 1♂, Jungwon-gun [=Chungju-si], Jisil-pond, 17 viii 1989, SH Lee, *ex pond*; 1♀, Okcheon-gun, Yongam-pond, 29 x 1989, SH Lee, *ex pond*; 1♀, Yeongdong-gun, Bonghwang-pond, 31 vii 1990, SH Lee, *ex pond*; 2♀♀, Yeongdong-gun, Simcheon-myeon, Sinjeong2-ri, 14 vi 2004, DH. Lee, JI Yeon, *ex pond*; 1♀, Yeonpung-gun [=Goisan-gun], Hwayeonji, 2 viii 1988, SH Lee, *ex pond*; Chungnam Prov.: 1♀, Buyeo-gun, Mt. Mansusan, 19 viii 1999, K.-J. Ahn, at light; 1♂, Buyeo-gun, Gyuam-myeon, Gyuam-ri, 12 viii 2005, D.-H. Lee, *ex stream pool*; 1♀, Daejeon-si, Daedek-gu, Sungjeon [=Hannam] University, 1 ix 1982, YB Cho, *ex pond*; 1♀, Daejeon-si, Seongbuk-dong, Bangdong reservoir, 5 viii 2000, HJ Kim, at light; 2♂♂1♀, Daejeon-si, Yuseong-gu, Juk-dong, 22 x 2005, DH Lee, *ex pond*; 1 ex, Geumsan-gun, Sungamji, 31 vii 1990, SH Lee, *ex pond*; 1♀, Taean-gun, Wonbuk-myeon, Sindu-ri, N36°50'34.37" E126°11'53.53" 20 m, 31 vii 2013, DH Lee, *ex pond on dune*; Gangwon Prov.: 4 exx, Gangneung-si, Gyeongpolake, 4 viii 1988, SH Lee; 1♂, Hwacheon-gun, Gulun-pond, 30 vii 1991, SH Lee, *ex pond*; 11 exx, Hoingsong-gun, Gaejeon-ri, 29 vii 1991, SH Lee; 1♂, Inje-gun, Namjeon-ri, 2 vii 1991, SH Lee, *ex pond*; 1♂, Myeongju-gun [=Gangneung-si], Hasi-ri, 4 viii 1988, SH Lee, *ex pond*; 1♀, Wonseon-gun [=Wonju-si], Gwanggyeok-pond, 3 viii 1988, SH Lee, *ex pond*; 1♂, Wonseon-gun [=Wonju-si], Chiljeon-dong, 5 viii 1988, SH Lee, *ex pond*; Gyeongbuk Prov.: 1♂, Andong-si, Woiha-ri, 19 vi 1988, SH Lee, *ex pond*; 1♂, Chilgok-gun, Yakmok-myeon, 22 iv 1985, Y. B. Cho, *ex pond*; 1♀, Daegu-si, Ganam-pond, 10 ix 1988, SH Lee, *ex pond*; 1 ex, Daegu-si, Gyeongbuk university, 15 viii 1974, YJ Kwon, *ex pond*; 1♀, same data as former except for 22 viii 1974; 1♀, Gimcheon-si, Ain-pond, 10 viii 1988, SH Lee, *ex pond*; 1♀, Gyeongsan-si, Nammae-pond, 25 vii 1986, YB Cho, *ex pond*; 1♂, Gunwi-gun, Jangki-ri, 18 vi 1990, SH Lee, *ex pond*; 1♀, Gyeongju-si, Pumsanji, 6 vi 1991, SH Lee, *ex pond*; 1♀, Pohang-si, Hyeongsan river, 23 vi 1990, SH Lee, *ex pond*; 1 ex, Uljin-gun, Goseong-ri, 22 viii 1987, SH Lee, *ex pond*; 1♂, Yeongil-gun [=Pohang-si], Duma-ri, 9 v 1988, SH Lee, *ex pond*; 1♀, Yecheon-gun, Eubbu-ri, 6 vi 1988, SH Lee, *ex pond*; 1♀, Yeongcheon-gun, Yeongcheondam, 1 vii 1990, SH Lee, *ex pond*; Gyeonggi Prov.: 1♀, Gwangju-si, Hongjung-pond, 20 viii 1989, SH Lee, *ex pond*; 1♂, Icheon-si, Seonghoji, 19 viii 1989, SH Lee, *ex pond*; 1♂3♀♀, Incheon-si, Ongjin-gun, Baekryeong-gun, 28 vii 2011, HM Lim, at light; 1♀, Pocheon-si, Gwangreung, 8 viii 1988, SH Lee, *ex pond*; 1♀, Suwon-si, Sehoji, 14 ix 1990, SH Lee, *ex pond*; 1♂, Yangpyeong-si, Gungae-pond, 20 viii 1989, SH Lee, *ex pond*; 1♀, Yeosu-si, Hyoji, 19 viii 1989, SH Lee, *ex pond*; 1♂, Yeoncheon-gun, Hwangji, 7 viii 1988, SH Lee, *ex pond*; Gyeongnam Prov.:

1♀, Hadong-gun, Sanggye-temple, 29 v 1996, SH Lee, *ex pond*; 1♂, Sacheon-si, Seotaek-pond, 11 viii 1989, SH Lee, *ex pond*; 1♂, Sacheon-gun, Maechon-ri, 10 viii 1989, SH Lee, *ex pond*; 1♀, Ulsan-si, Sinheung-ri, 2 x 1988, SH Lee, *ex pond*; 1♂, Yangsan-gun, Daeseok-pond, 2 x 1988, SH Lee, *ex pond*; Jeju Prov.: 4 exx, Jeju-si, Hanrim-eub, Opo [= Ongpo-ri], 24 vii 1990, SH Lee; 1♀, Namjeju-gun, Siheung-ri, 27 vii 1990, SH Lee; Jeonbuk Prov.: 6 exx, Imsil-gun, Samgye-dong, 14 viii 1989, SH Lee; 1♀, Jangsu-gun, Myeonggeum-pond, 14 viii 1989, SH Lee, *ex pond*; 1♂, Jeongju-si [=Jeongeub-si], Yeonji-dong, 4 viii 1990, SH Lee, *ex pond*; 1♀, Namwon-si, Okrim-pond, 13 viii 1989, SH Lee, *ex pond*; Jeonnam Prov.: 1♀, Yeongam-gun, Taegan-pond, 22 viii 1989, SH Lee, *ex pond*; 1 ex, Yeongam-gun, Geumho-pond, 22 vii 1988, SH Lee.

DISTRIBUTION: Korea, Japan, Russia (Far East).

REGION: Eastern Palaearctic.

KOREA: GW, GG, CB, CN, GB, GN, JB, JN, JJ.

KOREAN RECORDS: *Hyphydrus japonicus*: Mori, 1932a: 3; Mochizuki and Tsunekawa, 1937: 77; Kamiya, 1938b: 36; Ishii, 1940: 42; Kamiya, 1940: 116; Cho, 1957: 198; Cho, 1969: 174; Biström, 1982: 43; Kwon and Suh, 1986: 93; Yoon and Ahn, 1986: 146; Yoon, 1988: 574; Kim and Lee, 1991: 65; Lee et al., 1992b: 48; Kim et al., 1994: 132; Lee, 1994: 18; Lee, 1995: 12; Nilsson, 1995: 48; 2003b: 74; Hua, 2002: 38; Park et al., 2008a: 212.

Tribe Bidessini Sharp, 1882

DIAGNOSIS: Metacoxa fused to the first visible sternite. Metatibia basally slender and apically gradually expanded. Paramere with two or three segments. Spermatheca with spine (Biström, 1988; Miller and Bergsten, 2014).

Key to the genera of the Bidessini in Korea

1. Head without occipital line *Hydroglyphus*
- Head with occipital line 2
2. Prosternal process with carina on postero-medial part; elytra without large setose punctures ... *Allodessus*
- Prosternal process with carina on lateral part; elytra with large setose punctures *Leiodytes*

Genus *Allodessus* Guignot, 1953

Genus *Allodessus* Guignot, 1953

Allodessus Guignot, 1953:110. Type species: *Hydroporus bistrigatus* Clark, 1862.

DIAGNOSIS: Head with occipital line. Pronotum and elytra with plica. Elytra without sutural line. Epipleuron without basal cavity and carina (Balke and Ribera, 2004).

52. *Allodessus megacephalus* (Gschwendtner, 1931) (Pl. 38)

Bidessus megacephalus Gschwendtner, 1931a: 21. Type locality: China: Taiwan.

Bidessus maculosus Gschwendtner, 1931b: 462; Zaitzev, 1953: 122.

Bidessus tokunagai Kamiya, 1932: 5.

Liodessus megacephalus: Nilsson, 1995: 51.

Allodessus megacephalus: Balke and Libera, 2004: 122.

DESCRIPTION: Length 3.2 mm. Body long oval, slightly convex, with microreticulation and small punctures.

Color: Head yellow with black band on posterior margin; pronotum yellow with black band on postero-medial part; elytra yellow with black marking on medial part. Ventral surface mostly black, and antennae, mouthparts, prosternum, hypomeron, epipleura and legs yellow.

Head: Head semicircular, about 1.8 times as wide as long, widest across eyes, with compact setae around eyes and clypeal grooves. Anterior margin of clypeus more or less straight. Width of frons about 2.5 times as wide as eye. Antenna long and slender; antennomeres longer than wide; 1 longest, widest at middle; 2–10 broad apically, with a few setae on subapical part; 11 long oval, about 2.0 times as long as 10, widest at middle. Labrum with long setae on antero-medial part, emarginate at anterior margin. Maxillary palpomere 1 broad apically, slightly longer than 2; 2 broad apically, shortest; 3 broad apically, 2.0 times as long as 2; 4 longest, 3.0 times as long as 3, widest at basal third, apex bifid. Labial palpomere 1 broad apically, shortest; 2 broad apically, slightly longer than 1, with long setae on apical part; 3 oval, 2.0 times as long as 2, widest at middle, apex bifid. Gula quadrate; gula suture parallel, discontinuous. Mentum widest at middle; antero-medial margin bisinuate; antero-lateral part protruded; anterior corner acute; lateral margin rounded; posterior corner obtuse; posterior margin straight.

Thorax: Pronotum subquadrate, widest at middle, about 2.5 times as wide as long, slightly wider than head, with coarse setae, with long setae on lateral parts; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin rounded; posterior corner obtuse; posterior margin transversely bisinuate. Elytra acute apically, widest at middle, slightly wider than pronotum, with compact short setae. Prosternum transverse, convex and with long setae on medial part. Prosternal process long and vented, convex medially, with long setae on medial part; posterior part reversed triangular, with carina postero-medial part. Metaventrite with glabrous part and longitudinal suture on medial part. Procoxa subtriangular, with sparse setae. Protochanter subtriangular, with setae on ventral part. Profemur with short spines on baso-medial

part, with a row of setae on dorso-ventral parts. Protibia with short spines, with a row of setae on dorsal part. Protarsomere 1 slightly longer than 2; 2 as long as 3; 5 elongated, longest, 2.0 times as long as 3. Protarsal claws shorter than tarsomere 5. Mesocoxa rounded, with setae. Mesotrochanter triangular, with sparse setae. Mesofemur with sparse spines. Mesotibia with sparse spines. Mesotarsomere 1 slightly longer than 2; 2 as long as 3; 5 elongated, longest, 2.0 times as long as 3. Mesotarsal claws shorter than tarsomere 5. Metacoxal plate with large punctures. Metacoxal process with sparse setae; apex bifid. Metatrochanter semicircular, with sparse setae. Metafemur with sparse setae. Metatibia with a rows of spines on dorsal and medial parts; metatibial largest spine 0.3 times shorter than tarsomere 1. Metatarsomere 1 longest, 1.5 times as long as 2; 2 slightly longer than 3; 4 shortest; 5 about 1.5 times as long as 4. Metatarsal claw 0.3 times shorter than tarsomere 5.

Abdomen: Sternites V–VI with long setae on medial part, with sparse setae; sternite VII with sparse setae on medial part and with a row of setae on posterior margin.

SPECIMENS EXAMINED: SOUTH KOREA: Jeonnam Prov.: 1 ♀, Sinan-gun, Jeungdo-myeon, Ujeon-beach, N34°59'22.4", E126°08'1.6", 18 m, 13 v 2011, KJ Ahn, YH Kim, IS Yoo, JH Song, under debris on sandy beach.

DISTRIBUTION: Korea, China (Fujian), Japan, Taiwan.

REGION: Eastern Palaearctic.

KOREA: JN.

KOREAN RECORDS: *Leiodessus megacephalus*: Kim, 1982: 82; Kwon and Suh, 1986: 93; Kim et al., 1994: 132; Cho and Park, 2010: 95. [generic recombination]. *Bidessus tokumagai*: Kim, 1984: 205; Lee et al., 1985: 402 [synonym of *A. megacephalus*].

Genus *Hydroglyphus* Motschulsky, 1853

Genus *Hydroglyphus* Motschulsky, 1853

Hydroglyphus Motschulsky, 1853: 5. Type species: *Dytiscus geminus* Fabricius, 1792.

DIAGNOSIS: Head without transverse cervical line. Prosternal process reaching metaventrite. Elytra with distinct sutural line (Biström, 1986).

Key to the species of the *Hydroglyphus* in Korea

- 1. Elytra with plica on antero-medial part 2
- Elytra without plica on antero-medial part 3

2. Anterior part of head yellowish brown; lateral margin of pronotum round *H. japonicus*
 – Head brown; lateral margin of pronotum straight *H. geminus*
 3. Elytra with large subquadrate marking on medial part *H. flammulatus*
 – Elytra with four bands *H. coreanus*

53. *Hydroglyphus coreanus* Lee and Ahn, 2016 (Pl. 39)

Hydroglyphus coreanus Lee and Ahn, 2016: 290. Type locality: Korea: Gyeonggi Prov., Ansan-si, Danwongu, Daebudo-dong.

DESCRIPTION: Length 1.8–2.0 mm. Body long oval, slightly convex, dorsal surface with reticulation.

Color: Head mostly yellowish brown, around eyes and posterior margin dark brown. Pronotum mostly yellowish brown, postero-medial part with dark-brown marking. Elytra pale yellow with four dark brown band, subsutural striae dark brown. Ventral surface mostly dark brown, and antenna, mouth parts, gena, gula, prosternum, hypomera, epipleura yellowish brown, and legs brown.

Head: Head semicircular, about 2.0 times as wide as long, with sparse punctures. Clypeus transverse; antero-medial part slightly emarginate. Width of frons about 2.0 times as wide as eye. Antennomeres 1–3 longer than wide; 4 shortest, as long as wide; 5–10 longer than wide, broad apically; 10 as long as 9; 11 slender, about 2.0 times as long as 10, apical part acute. Labrum transverse; anterior margin rounded but antero-medial part emarginate. Maxillary palpomere 1 as long as 2 and broad apically; 4 about 3.0 times as long as 3. Labial palpomere 1 as long as 2; 3 about 2.5 times as long as 2. Mentum with sparse setae on antero-lateral parts, widest at middle; antero-medial margin bisinuate; antero-lateral part protruded; anterior corner acute; lateral margin rounded; posterior corner obtuse; posterior margin straight.

Thorax: Pronotum subquadrate, about 3.0 times as wide as long, widest at middle, with compact setae; anterior margin nearly straight; anterior corner acute; lateral margin slightly rounded; posterior corner obtuse; posterior margin transverse V-shaped; pronotal plicae present on posterior part. Pronoto-elytral angle present. Prosternum with compact setae on medial part. Elytra widest at middle, with compact setae, posterior margin with sparsely long setae. Elytral plicae absent. Epipleura with setae on lateral part. Prosternal process long and vented, convex medially, with long setae on medial part; posterior part reversed triangular, with carina postero-medial part. Procoxa subtriangular, with sparse setae. Protrochanter subtriangular, with setae on ventral part. Profemur with short spines on baso-medial part, with a row of setae on dorso-ventral parts. Protibia with short spines, with a row of setae on dorsal part. Protarsomere 1 slightly longer than 2; 2 as long as 3; 5 elongated, longest, 2.0 times as long as 3. Protarsal claws shorter than tarsomere 5. Mesocoxa rounded, with setae. Mesotrochanter triangular, with sparse setae. Mesofemur with sparse spines. Mesotibia with sparse spines. Mesotarsomere 1 slightly longer than 2; 2 as long as 3; 5 elongated, longest, 2.0 times as

long as 3. Mesotarsal claws shorter than tarsomere 5. Metaventrite with sparse setae. Metacoxal plate with large punctures. Metacoxal process flattened with sparse setae. Metatrochanter semicircular, with sparse setae. Metafemur with sparse setae. Metatibia with a rows of spines on dorsal and medial parts; metatibial largest spine 0.3 times shorter than tarsomere 1. Metatarsomere 1 about 1.5 times as long as 2; 2 as long as 3; 3 about 1.2 times as long as 4; 4 shortest; 5 as long as 3.

Abdomen: Sternite IV with sparse setae; sternites V–VI with a rows of setae on medial parts; sternite VII with sparse setae on posterior and lateral parts. Median lobe (Pl. 39B) of aedeagus slender, bent, strongly protruded at apical forth; apical part protruded in lateral view. Paramere (Pl. 39C) with three segments; apical segment expanded, with compact bump in lateral view.

TYPE MATERIAS: Holotype, ♂, labeled as follows: “KOREA: Gyeonggi Prov.: Ansan-si, Danwon-gu, Daebudo-dong, Dongju-salt farm, N37°14'05.60" E126°36'19.55" 4 m, 7 xi 2013, DH Lee, IS Yoo, SG Lee, saline pond near salt farm”. Holotype, *Hydroglyphus coreanus* Lee and Ahn, Desig. D.-H. Lee and K.-J. Ahn 2014. Paratype, 3♂1♀ (1♂ on slide), same data as holotype; 6♂8♀, same data as holotype except for 3 ix 2014, DH Lee, SG Lee.

DISTRIBUTION: Korea.

REGION: Eastern Palaearctic.

KOREA: GG.

KOREAN RECORD: *Hydroglyphus coreanus*: Lee and Ahn, 2016a: 290.

REMARKS: This species is similar to *H. japonicus* (Sharp), and *H. signatellus* (Klug) but can be distinguished by the median lobe of aedeagus strongly protruded at apical forth and apical segment of paramere expanded, with compact bump.

54. *Hydroglyphus flammulatus* (Sharp, 1882) (Pl. 40)

Bidessus flammulatus Sharp, 1882: 359; Vazirani, 1969: 315. Type locality: China: Jiangxi.

Bidessus antennatus Régimbart, 1892: 118.

Hydroglyphus flammulatus: Biström, 1988: 12.

DESCRIPTION: Length 2.2–2.4 mm. Body long oval, slightly convex, dorsal surface with reticulation.

Color: Head mostly yellowish brown, with transverse dark brown band on posterior margin. Pronotum mostly yellowish brown, with dark-brown marking on postero-medial part. Elytra pale yellow, with transverse dark brown marking on anterior part, with large subquadrate dark brown marking on medial part, subsutural striae dark brown. Ventral surface mostly dark brown, and antenna, mouth parts, gena, gula, prosternum, hypomera, epipleura, legs yellowish brown.

Head: Head semicircular, about 2.0 times as wide as long. Clypeus transverse; antero-medial part slightly emarginate. Width of frons about 2.0 times as wide as eye. Antennomeres 1–3 longer than wide; 4 shortest, as long as wide; 5–10 longer than wide, broad apically; 11 slender, apical part acute. Labrum transverse; anterior margin rounded but antero-medial part emarginate. Maxillary palpomere 1 as long as 2 and 3, and broad apically; 4 about 3.0 times as long as 3. Labial palpomere 1 as long as 2; 3 about 2.5 times as long as 2. Mentum with sparse setae on antero-lateral parts, widest at middle; antero-medial margin bisinuate; antero-lateral part protruded; anterior corner acute; lateral margin rounded; posterior corner obtuse; posterior margin straight.

Thorax: Pronotum subquadrate, about 3.0 times as wide as long, widest at middle, with compact setae; anterior margin nearly straight; anterior corner acute; lateral margin slightly rounded; posterior corner obtuse; posterior margin transverse V-shaped; pronotal plicae present on posterior part. Pronoto-elytral angle present. Prosternum with compact setae on medial part. Elytra widest at middle, with compact setae, with sparsely long setae on posterior margin. Elytral plicae absent. Epipleura with sparse setae. Prosternal process long and vented, convex medially, with long setae on medial part; posterior part reversed triangular, with carina postero-medial part. Procoxa subtriangular, with sparse setae. Protrochanter subtriangular, with setae on ventral part. Profemur with short spines on baso-medial part, with a row of setae on dorso-ventral parts. Protibia with short spines, with a row of setae on dorsal part. Protarsomere 1 slightly longer than 2; 2 as long as 3; 5 elongated, longest, 2.0 times as long as 3. Protarsal claws shorter than tarsomere 5. Mesocoxa rounded, with setae. Mesotrochanter triangular, with sparse setae. Mesofemur with sparse spines. Mesotibia with sparse spines. Mesotarsomere 1 slightly longer than 2; 2 as long as 3; 5 elongated, longest, 2.0 times as long as 3. Mesotarsal claws shorter than tarsomere 5. Metaventrite with sparse setae. Metacoxal plate with large punctures. Metacoxal process flattened with sparse setae. Metatrochanter semicircular, with sparse setae. Metafemur with sparse setae. Metatibia with a rows of spines on dorsal and medial parts; metatibial largest spine 0.3 times shorter than tarsomere 1. Metatarsomere 1 about 1.5 times as long as 2; 2 as long as 3; 3 about 1.2 times as long as 4; 4 shortest; 5 as long as 3.

Abdomen: Sternite IV with sparse setae; V–VI with two rows of setae on medial parts; sternite VII with compact setae. Median lobe (Pl. 40B) of aedeagus slender, protruded at apical two-thirds; apical part slightly bulbed and acute in lateral view. Paramere (Pl. 40C) slender, with two segments; basal segment widest at middle; apical segment with long setae in anterior third, with thick spine on apical part in lateral view.

TYPE MATERIAS: Syntype, 1 ex. (NHM), with labels as follows: “Types, China., Sharp Coll. 1905–313., n. sp. Kiu Kiang, *Bidessus flammulatus*, Type 108”. Cotype, 1 ex. (NHM), with labels as follows, “Cotype, China, Sharp Coll 1905–303, 103. *Bidessus flammulatus* jud. Typ. D.S.”.

SPECIMENS EXAMINED: SOUTH KOREA: Chungnam Prov.: 1♀, Daejeon-si, Yuseong-gu, Gunseo-dong, National Science Museum, Changuinaraegwan, 24 vii 2013, YM Ryu; 1♂, Taean-gun, Nam-myeon, Sinon-ri, N36°51'49.23", E126°12'23.75", 7 m, 30 vii 2013, DH Lee, pond on abandon salt farm.

DISTRIBUTION: Japan, China (Jiangxi, Sichuan, Taiwan), India, Iran, Nepal, Pakistan.

REGION: Oriental, Eastern Palaearctic.

KOREA: CN.

KOREAN RECORD: *Hydroglyphus flammulatus*: Lee and Ahn, 2016a: 291.

55. *Hydroglyphus geminus* (Fabricius, 1781) (Pl. 41)

Dytiscus pusillus Fabricius, 1781: 291 [Homonym].

Dytiscus geminus Fabricius, 1792: 199. Type locality: Germany: Halle.

Hydroporus monaculatus Drapiez, 1820: 270.

Bidessus obscurus Sahlberg, 1903: 16.

Bidessus nitens Falkenström, 1939: 7.

Hydroglyphus pusillus: Biström, 1986:7; 1988:14; Nilsson, 1995: 50.

Hydroglyphus geminus: Nilsson, 2003: 56.

DESCRIPTION: Length 1.8–2.2 mm. Body long oval, slightly convex, dorsal surface with reticulation.

Color: Head dark brown. Pronotum mostly yellowish brown, with dark-brown marking on postero-medial part. Elytra mostly yellowish brown, with transverse dark brown marking on anterior part, two dark brown marking on postero-medial part, subsutural striae dark brown. Ventral surface mostly brown to dark brown, and antenna, mouth parts, gena, gula, prosternum, hypomera, epipleura, legs yellow to yellowish brown.

Head: Head semicircular, about 2.0 times as wide as long, with compact punctures. Clypeus transverse; antero-medial part slightly emarginate. Width of frons about 2.0 times as wide eye. Antennomere 1–3 as long as wide; 4 shortest, as long as wide; 5–10 wider than long, broadened apically; 10 as long as 9; 11 slender, about 2.0 times as long as 10, apical part acute. Labrum transverse; anterior margin rounded but antero-medial part emarginate. Maxillary palpomere 1 as long as 2 and 3, and broad apically; 4 about 3.0 times as long as 3. Labial palpomere 1 as long as 2; 3 about 2.5 times as long as 2. Mentum with sparse setae on antero-lateral parts, widest at middle; antero-medial margin bisinuate; antero-lateral part protruded; anterior corner acute; lateral margin rounded; posterior corner obtuse; posterior margin straight.

Thorax: Pronotum subquadrate, about 3.0 times as wide as long, widest at middle, with compact setae; anterior margin nearly straight; anterior corner acute; lateral margin nearly straight; posterior corner obtuse; posterior margin transverse V-shaped; pronotal plicae present on posterior part. Pronoto-elytral angle present. Prosternum with compact setae on medial part. Elytra widest at middle, with compact setae, with sparsely long setae on posterior margin. Elytral plicae present. Epipleura with sparse setae. Prosternal process long and vented, convex medially, with long setae on medial part; posterior part reversed triangular, with carina postero-medial part. Procoxa subtriangular, with sparse setae. Protochanter subtriangular, with setae on

ventral part. Profemur with short spines on baso-medial part, with a row of setae on dorso-ventral parts. Protibia with short spines, with a row of setae on dorsal part. Protarsomere 1 slightly longer than 2; 2 as long as 3; 5 elongated, longest, 2.0 times as long as 3. Protarsal claws shorter than tarsomere 5. Mesocoxa rounded, with setae. Mesotrochanter triangular, with sparse setae. Mesofemur with sparse spines. Mesotibia with sparse spines. Mesotarsomere 1 slightly longer than 2; 2 as long as 3; 5 elongated, longest, 2.0 times as long as 3. Mesotarsal claws shorter than tarsomere 5. Metaventrite with sparse setae. Metacoxal process flattened with sparse setae. Metatrochanter semicircular, with sparse setae. Metafemur with sparse setae. Metatibia with a rows of spines on dorsal and medial parts; metatibial largest spine 0.3 times shorter than tarsomere 1. Metatarsomere 1 about 1.5 times as long as 2; 2 as long as 3; 3 about 1.2 times as long as 4; 4 shortest; 5 as long as 3.

Abdomen: Sternite IV with sparse setae; V–VI with a rows of setae on medial parts; sternite VII with compact setae. Median lobe (Pl. 41B) of aedeagus slender, protruded at apical two-thirds; apical part rectangular in lateral view. Paramere (Pl. 41C) slender, with three segments; basal segment widest at middle; middle segment narrow at anterior two third, with long setae on apical part; apical segment small, triangular in lateral view.

SPECIMENS EXAMINED: SOUTH KOREA: Chungbuk Prov.: 1 ex, Cheongju-si, Heungdek-gu, Hyuam-dong, N36°37'14.08", E127°23'51.75", 62 m, 7 v 2005, DH Lee, pond; 3 ex, as same data as former except for 15 x 2005; 2 ex, as same data as former except for 23 x 2005; 2 ex, as same data as former except for 5 v 2006; 2 ex, Danyang-gun, Gagok-myeon, Eoeuigok-ri, 28 vii 1991, SH Lee; 1 ex, Yeongdong-gun, Sangchon-myeon, Mulhan-ri, Mulhan-valley, 22 vii 1995, SH Lee, valley; Chungnam Prov.: 1 ex, Buyeo-gun, Mt. Mansusan, 19 vii 1999, KJ Ahn, at light; Gangwon Prov.: 8 ex, Chuncheon-si, Dongsan-myeon, Wonchang-ri, Gangwon National University research forest, 21 vii 1992, SH Lee; 1 ex, Hwacheon-gun, Gandong-myeon, Yuchon-ri, 30 vii 1987, SH Lee; 1 ex, Pyeongchang-gun, Baesujang, 29 vii 1994, SH Lee, pond; 1 ex, Yanggu-gun, Yanggu-eub, Dongsu-ri, 1 viii 1991, SH Lee; 1 ex, Yeongwol-gun, Hanbando-myeon, Seo-river, 29 vii 1994, SH Lee, river; Gyeongbuk Prov.: 2 ex, Andong-si, Yongsan-dong, Andong-dam, N36°34'57.28", E128°46'04.70", 106 m, 2 viii 1996, SH Lee, stream; 1 ex, Gyeongsan-si, Gyeyang-dong, Nammae-reservoir, N35°49'41.37", E128°44'40.37", 58 m, 12 ix 1984, R. Pinger, reservoir; 24 ex, Gumi-si, Mt. Geumosan, 19 vii 2001, KJ Ahn, SJ Park, CW Shin, at light; 2 ex, Seongju-gun, Seongju-eub, Seongsan-ri, Chadongol, 3 viii 1991, SH Lee; 1 ex, Yeongdeok-gun, Yongchugol, 10 ix 1994, SH Lee; Gyeonggi Prov.: 1 ex, Pocheon-si, Soheul-myeon, Neungdae, 7 vii 1992, SH Lee; Gyeongnam Prov.: 3 ex, Sancheong-gun, Maetgol-pond, 7 vi 2009, SH Lee, pond; Jeonbuk Prov.: 1 ex, Imsil-gun, Samgye-myeon, Samgye-ri, N35°30'36.71", E127°16'17.68", 143 m, 14 viii 1989, SH Lee, reservoir.

DISTRIBUTION: Asia: Korea, China (Guizhou, Guanxi, Heilongjiang, Henan, Jilin Liaoning, Sichuan, Yunnan), Japan, Mongolia, Russia (East Siberia, West Siberia), and widely distributed in Palaearctic region.

REGION: Palaearctic.

KOREA: GW, GG, CB, CN, GB, GN, JB.

KOREAN RECORDS: *Hydroglyphus geminus*: Nilsson, 2003; 56 (North Korea); Nilsson and Hájek, 2015: 24 (North Korea); Lee and Ahn, 2016a:292.

56. *Hydroglyphus japonicus* (Sharp, 1873) (Pl. 42)

Hydroporus japonicus Sharp, 1873: 54. Type locality: Japan, Kyushu.

Bidessus yoshimurai Kamiya, 1932: 4.

Hydroglyphus japonicus: Biström, 1988: 14.

DESCRIPTION: Length 1.8–2.0 mm. Body long oval, slightly convex, dorsal surface with reticulation.

Color: Head mostly yellowish brown, around eyes and posterior part dark brown. Pronotum mostly yellowish brown, with dark-brown marking on postero-medial part. Elytra yellowish brown, with transverse dark brown marking on anterior part, with two dark brown vittae on medial part, subsutural striae dark brown. Ventral surface mostly brown to dark brown, and antenna, mouth parts, gena, gula, prosternum, hypomera, epipleura, legs yellow to yellowish brown.

Head: Head semicircular, about 2.0 times as wide as long. Clypeus transverse; antero-medial part slightly emarginate. Width of frons about 2.0 times as wide as eye. Antennomeres 1–3 longer than wide; 4 shortest, as long as wide; 5–10 wider than long, slightly broad apically; 10 as long as 9; 11 slender, about 2.0 times as long as 10, apical part acute. Labrum transverse; anterior margin rounded but antero-medial part emarginate. Maxillary palpomere 1 as long as 2 and 3, and broad apically; 4 about 3.0 times as long as 3, apical part with two sensorium. Labial palpomere 1 as long as 2; 3 about 2.5 times as long as 2. Mentum with sparse setae on antero-lateral parts, widest at middle; antero-medial margin bisinuate; antero-lateral part protruded; anterior corner acute; lateral margin rounded; posterior corner obtuse; posterior margin straight.

Thorax: Pronotum subquadrate, about 3.0 times as wide as long, widest at middle, with compact setae; anterior margin nearly straight; anterior corner acute; lateral margin slightly rounded; posterior corner obtuse; posterior margin transverse V-shaped; pronotal plicae present on posterior part. Pronoto-elytral angle present. Prosternum with compact setae on medial part. Elytra widest at middle, with compact setae, with sparse long setae on posterior margin. Elytral plicae present. Epipleura with sparse setae. Prosternal process long and vented, convex medially, with long setae on medial part; posterior part reversed triangular, with carina postero-medial part. Procoxa subtriangular, with sparse setae. Protochanter subtriangular, with setae on ventral part. Profemur with short spines on baso-medial part, with a row of setae on dorso-ventral parts. Protibia with short spines, with a row of setae on dorsal part. Protarsomere 1 slightly longer than 2; 2 as long as 3; 5 elongated, longest, 2.0 times as long as 3. Protarsal claws shorter than tarsomere 5. Mesocoxa rounded, with setae. Mesotrochanter triangular, with sparse setae. Mesofemur with sparse spines. Mesotibia

with sparse spines. Mesotarsomere 1 slightly longer than 2; 2 as long as 3; 5 elongated, longest, 2.0 times as long as 3. Mesotarsal claws shorter than tarsomere 5. Metaventrite with sparse setae. Metacoxal plate with large punctures. Metacoxal process flattened with sparse setae. Metatrochanter semicircular, with sparse setae. Metafemur with sparse setae. Metatibia with a rows of spines on dorsal and medial parts; metatibial largest spine 0.3 times shorter than tarsomere 1. Metatarsomere 1 about 1.5 times as long as 2; 2 as long as 3; 3 about 1.2 times as long as 4; 4 shortest; 5 as long as 3.

Abdomen: Sternite IV with sparse setae; V–VI with a rows of setae on medial parts; sternite VII with sparse setae. Median lobe (Pl. 42B) of aedeagus slender, widest two-third; dorsal margin round; apical part rounded in lateral view; Paramere (Pl. 42C) slender, with three segments; basal segment widest at anterior part; middle segment widest at posterior part, with long setae on apical part; apical segment triangular, with acute process on posterior part in lateral view.

TYPE MATERIAL: Syntype, 1 ex (NHM), with labels as follows: “*Hydroporus japonicus* Types D. S., Japan, Type, Japan. Lewis., Sharp Coll. 1905–313., *Hydroporus japonicus* Types D. S., Type 65 *Hydroporus japonicus* Japan”.

SPECIMENS EXAMINED: NORTH KOREA: Pyeonannam Prov.: 3♂♂5♀♀, Pyongyang-city, Around Pyongyang-Hotel, Near Daedong-River, 20 vi 2008, Changdo Han; SOUTH KOREA: Chungbuk Prov.: 2 ex, Cheongju-si, Heungdeok-gu, Gangseo1-dong, 25 iv 2005, DH Lee, pond; 1 ex, as same data as former except for 4 v 2005; 2 ex, as same data as former except for 17 vi 2005; 4 ex, Cheongju-si, Heungdek-gu, Hyuam-dong, N36°37'14.08", E127°23'51.75", 62 m, 15 x 2005; 2 ex, as same data as former except for 23 x 2005; 2 ex, Cheongju-si, Heungdeok-gu, Jidong-dong, 3 v 2005, DH Lee, pond; 2 ex, as same data as former except for 16 x 2005; 1 ex, as same data as former except for Jukrim-dong, 22 vi 2005; 4 ex, as same data as former except for Seochon-dong, 16 x 2005; 3 ex, Eumseong-gun, Gamgok-myeon, Jucheon-ri, Jucheon-reservoir, N37°04'31.37", E127°37'49.94", 98 m, 16 viii 1989, SH Lee, reservoir; 2 ex, Danyang-gun, Gagok-myeon, Bobal-ri, 22 vii 2005, DH Lee, rice field; 6 ex, Goisan-gun, Iin-pond, 18 viii 1988, SH Lee; 1 ex, Jecheon-si, Yangminwon, 30 vii 1994, SH Lee; 2 ex, Okcheon-gun, 8 vii 1991, SH Lee; 1 ex, Yeongdong-gun, Simcheon-myeon, Sinjeong-ri, 15 vi 2004, DH Lee, pond; Chungnam Prov.: 9 ex, Asan-si, Onyang3-dong, 31 vii 1994, SH Lee; 10 ex, Boryeong-si, Jupoo-myeon, Boryeong-ri, Boryeong-reservoir, N36°24'44.94", E126°35'47.58", 83 m, 2 x 2011, SH Lee, reservoir; 13 ex, Buyeo-gun, Buyeo-eub, Yongjeong-ri, 3 x 2011, SH Lee, pond; 7 ex, Buyeo-gun, Gyuam-myeon, Gyuam-ri, 12 viii 2005, DH Lee, stream; 1 ex, Buyeo-gun, Mt. Mansusan, 19 vii 1999, KJ Ahn, at light; 2 ex, Daejeon-si, Yuseong-gu, Juk-dong, 15 iv 2006, DH Lee, pond; 1 ex, Daejeon-si, Yuseong-gu, Wolpyeong-dong, 15 viii 2005, DH Lee, stream; 3 ex, Gongju-si, Banpo-myeon, Sangsin-ri, 10 vi 2004, SM Choi, rice field; 3 ex, Gongju-si, Okryong-dong, 15 ix 2005, DH Lee, stream; 1 ex, Gongju-si, Sagok-myeon, Namgye-ri, 22 vii 2008, DH Lee, YH Kim, JH Song, YG Ban, at light near stream; 1 ex, Nonsan-si, Noseong-myeon, 1 viii 1990, SH Lee; 1 ex, Taean-gun, Anmyeon-eub, Seungeon-ri, 27 vii 1995, SH Lee; 1 ex, Taean-gun, Nam-myeon, Hwangchon-ri, N36°51'49.23", E126°12'23.75", 7 m, 31 vii 2013, DH

Lee, pond on abandon salt farm; 1 ex, Taean-gun, Nam-myeon, Sinon-ri, Mageompo-beach, N36°35'47.11", E126°17'21.98", 10 m, 30 vii 2013, DH Lee, pond; 3 ex, Taean-gun, Wonbuk-myeon, Sindu-ri, N36°50'40.36", E126°11'45.08", 8 m, 31 vii 2013, DH Lee, pool on dune; 3 ex, Yesan-gun, Sinam-myeon, Bobyeol-ri, Sabgyocheon, 26 vii 1995, SH Lee; Gangwon Prov.: 1 ex, Chuncheon-si, Dong-myeon, Gamjeong-ri, Yeonsangol, N37°53'35.34" E127°47'28.31", 154 m, 23 vii 1992, SH Lee; 5 ex, Chuncheon-si, Dongsan-myeon, Wonchang-ri, Gangwon National University research forest, 21 vii 1992, SH Lee; 1 ex, Chuncheon-si, Nam-myeon, Baekam-ri, 24 viii 2005, DH Lee, pond; 2 ex, Hwacheon-gun, Gandong-myeon, Yuchon-ri, 30 vii 1987, SH Lee; 1 ex, Inje-gun, Nam-myeon, Namjeon-ri, 1 viii 1991, SH Lee; 6 ex, Pyeongchang-gun, Jinbu-myeon, Mt. Odaesan, 28 vii 1994, SH Lee; 4 ex, Yeongwol-gun, Yeongwol-eub, Samok-ri, Dong-river, 29 vii 1994, SH Lee; Gyeongbuk Prov.: 6 ex, Andong-si, Yongsan-dong, Andong-dam, N36°34'57.28", E128°46'04.70", 106 m, 2 viii 1996, SH Lee, stream; 1 ex, Bonghwa-gun, Bonghwa-eub, Yugok-ri, Cheonma-reservoir, N36°54'39.84", E128°46'08.73", 243 m, 2 viii 1988, SH Lee, reservoir; 3 ex, Gumi-si, Mt. Geumosan, 19 vii 2001, KJ Ahn, SJ Park, CW Shin, at light; 1 ex, Gyeongju-si, Geoncheon-eub, Sinpyeong-ri, 28 v 1993, SH Lee; 10 ex, Gyeongju-si, Hyeongok-myeon, 24 v 1995, SH Lee; 1 ex, Gyeongju-si, Jeonhyeondong, Bulguk-temple, N35°47'20.78", E129°19'55.02", 238 m, 23 vi 1991, SH Lee; 1 ex, Gyeongju-si, Naenam-myeon, Yongjang-ri, Hwagok-pond, N35°46'29.10", E129°10'47.58", 82 m, 25 iv 1993, SH Lee, pond; 2 ex, Gyeongsan-si, Jinnyang-eub, 11 viii 1989, SH Lee, pond; 5 ex, Pohang-si, Buk-gu, Gigye-myeon, Gigye-stream, 22 viii 1992, SH Lee; 4 ex, Pohang-si, Buk-gu, Gigye-myeon, Guji-ri, 3 iii 1991, SH Lee, Pond; 11 ex, Pohang-si, Nam-gu, Jigok-dong, 26 iv 1992, SH Lee; 3 ex, Sangju-si, Gaeun-dong, 9 viii 1990, SH Lee, pond; 1 ex, Seongju-gun, Gacheon-myeon, Hwajuk-ri, Pocheon-valley, 7 v 2009, mountain stream; 1 ex, Uljin-gun, Wonnam-myeon, Maehwa-ri, Maehwa-stream, 30 ix 1995, SH Lee, stream; 3 ex, Yeongcheon-si, Jayang-myeon, Chunghyo-ri, Jayang-dam, N36°06'19.32", E128°04'06.86", 164 m, 1 ix 1990, SH Lee, stream; 3 ex, Yeongchoen-si, Cheongdo-gun, 9 x 1988, SH Lee; 2 ex, Yeongdeok-gun, Chuksan-myeon, 3 x 1994, SH Lee; Gyeonggi Prov.: 3 ex, Icheon-si, Seolseong-myeon, 19 viii 1988, SH Lee, pond; 1 ex, Incheon-si, Ganghwa-gun, Gilsang-myeon, Jaheung-ri, Gilsang-reservoir, N37°37'26.80", E126°30'04.82", 15 m, 26 v 2012, SH Lee, reservoir; 12 ex, Incheon-si, Ganghwa-gun, Hwado-myeon, Sagi-ri, Buno-reservoir, N35°35'53.77", E126°27'55.52", 0 m, 26 v 2012, SH Lee, reservoir; 4 ex, Incheon-si, Ongjin-gun, Baekryeong-myeon, 28 vii 2011, HM Lim, at light; 5 ex, Namyangju-si, Jeonjin-eub, 8 viii 1988, SH Lee; 1 ex, Pocheon-si, Idong-myeon, Jangam-ri, Idong-bridge, N38°01'57.66", E127°21'58.73", 147 m, 18 vii 1992, SH Lee, stream; 42 ex, Pocheon-si, Soheul-myeon, Gomun-pond, 17 vii 1988, SH Lee, at light near pond; 9 ex, Pocheon-si, Soheul-myeon, Neungdae, 7 vii 1992, SH Lee; Gyeongnam Prov.: 1 ex, Changnyeong-gun, Changnyeong-eub, Jikgyo-ri, 1 ix 1988, SH Lee, pond; 2 ex, Changwon-si, Seongsan-gu, Bulmosan-dong, 7 v 2009, SH Lee, pond; 5 ex, Geoje-si, Geoje-myeon, Oksan-ri, Oksan-reservoir, N34°52'19.60", E128°35'35.50", 85 m, 17 vii 2008, SH Lee, reservoir; 2 ex, Geoje-si, Geoje-myeon, Soryang-ri, 17 vii 2008, SH Lee, pond; 1 ex, Hapcheon-gun, Yaro-myeon, Jeongdae-ri, Myeonggok-reservoir, N35°42'12.74", E128°09'58.88", 113 m, 7 v 2009, SH Lee, reservoir; 4 ex, Jinju-si, Panam-dong, 21 vii 2005, SI Lee, at light; 1 ex, Sacheon-si, Gonmyeong-myeon,

Yongsan-ri, Dasol-temple, N35°04'57.68", E127°55'11.37", 155 m, 14 viii 1995, SH Lee, pond; 2 ex, Sacheon-si, Yonghyeon-myeon, Onjeong-ri, Seotaek-reservoir, N35°01'57.73", E128°03'08.50", 4 m, 11 viii 1989, SH Lee, reservoir; 4 ex, Sancheong-gun, Geumseo-myeon, Maechon-ri, Sanpung-reservoir, N35°25'17.27", E127°52'00.69", 115 m, 10 viii 1989, SH Lee, reservoir; 5 ex, Sancheong-gun, Maetgol-pond, 7 vi 2009, SH Lee, pond; 7 ex, Ulsan-si, Ulju-gun, Duseo-myeon, Hwalcheon-ri, 14 vii 1991, SH Lee, stream; Jeju Prov.: 1 ex, Bukjeju-gun, Jocheon-eub, Gyorae-ri, 23 v 2006, DH Lee, stream; 4 ex, as same data as former except for Dongsugyo, 29 v 2007, stream pool; 1 ex, Bukjeju-gun, Jocheon-eub, Seonheul-ri, 12 vi 2005, DH Lee, pond; 1 ex, as same data as former except for 22 v 2006; 1 ex, as same data as former except for Dongbaek garden pond, 2 iii 2007; 5 ex, Jeju-si, Hangyeong-myeon, Yongsu-ri, 23 vii 1990, SH Lee; 8 ex, Jeju-si, Saekdaldong, 10 v 2012, HG Min, marsh; 6 ex, Jeju-si, Samdo2-dong, 23 vii 1990, pond; 4 ex, Namjeju-gun, Andeok-myeon, Sagye-ri, 25 v 2006, DH Lee, pond; Jeonbuk Prov.: 18 ex, Gimje-si, Gunyong-pond, 6 viii 1990, SH Lee, pond; 2 ex, Gunsan-si, Miryong-dong, Mije-reservoir, N35°57'06.45", E126°41'41.97", 15 m, 1 viii 2010, SH Lee, reservoir; 11 ex, Gunsan-si, Naeheung-dong, Naeheung-reservoir, N36°00'13.78", E126°45'47.53", 13 m, 3 x 2011, SH Lee, reservoir; 1 ex, Gusan-si, Seosu-myeon, Maryong-ri, 25 iv 2009, SH Lee, pond; 2 ex, Iksan-si, Samgi-myeon, Yeondong-ri, 26 iv 2009, SH Lee, pond; ; 2 ex, Namwon-si, Orikrim-pond, 15 viii 1989, SH Lee, pond; 1 ex, Wanju-gun, Samrye-eub, Ha-ri, 3 x 2005, DH Lee, pond; Jeonnam Prov.: 1 ex, Boseong-gun, Hoichun-myeon, Dongryul-ri, Yulpo-beach, KJ Ahn, HJ Kim, MJ Jeon, under dry seaweed; 11 ex, Gangjin-gun, Maryang-myeon, Maryang-ri, 27 viii 2004, SW Choi, at light; 2 ex, Gangjin-gun, Maryang-myeon, Suin-ri, 17 iv 2004, DH Lee, pond; 21 ex, Jangheung-gun, Jangheung-eub, Yeonsan-ri, 28 ix 2010, SH Lee, pond; 1 ex, Mokpo-si, Hadang-dong, 10 x 1990, SH Lee, pond.

DISTRIBUTION: Korea, China (Beijing, Fujian, Guandong, Heilongjiang, Hubei, Jiangsu, Jilin, Jiangxi, Liaoning, Zhejiang), Japan, Russia (Far East).

REGION: Eastern Palaearctic.

KOREA: GW, GG, CB, CN, GB, GN, JB, JN, JJ.

KOREAN RECORDS: *Hydroglyphus japonicus*: Nillson, 2003: 56; Park et al., 2008a: 214; Nilsson and Hájek, 2014: 24; Lee and Ahn, 2016a: 293. *Bidessus japonicus*: Mori, 1932a: 3; Takizawa, 1933: 170; Kusanagi, 1936: 325; Kamiya, 1938: 42; 1940: 117; Cho, 1957: 198; 1969: 174 [generic recombination]. *Guignotus japonicus*: Kwon and Suh, 1986: 93; Yoon and Ahn, 1986: 146; Yoon, 1988: 576; Lee et al., 1992; Kim et al., 1994: 132; Lee, 1994: 16; 1995: 12; Kim and Kim, 1996b: 126; Cho and Park, 2010: 95 [generic recombination].

Genus *Leiodytes* Guignot, 1936

Genus *Leiodytes* Guignot, 1936

Leiodytes Guignot, 1936: 20. Type species: *Hydroporus evanescens* Boheman, 1848.

DIAGNOSIS: Body glossy. Head with occipital line. Palpi slender, bifid apically. Pronotum and elytra with plicae. Elytra without subsutural lines. Paramere with two segments (Biström, 1988).

Key to the species of the *Leiodytes* in Korea

1. Body more or less broadly oval; ventral surface brown *L. frontalis*
- Body oval; ventral surface yellowish brown *L. nicobaricus*

57. *Leiodytes frontalis* (Sharp, 1884) (Pl. 43)

Bidessus frontalis Sharp, 1884: 440. Type locality: Japan: Yokohama, Osaka.

Leiodytes frontalis: Biström, 1988: 27.

DESCRIPTION: Length 1.8–2.0 mm. Body broadly oval, slightly convex, with small setose punctures.

Color: Head yellowish brown; pronotum yellowish brown with two dark brown markings on postero-medial part; elytra brown with dark brown markings. Ventral surface mostly brown, mouthparts and legs yellow, lateral part of sternites III–VI dark brown to black.

Head: Head semicircular, about 2.0 times as wide as long, widest across eyes, with microreticulation. Anterior margin of clypeus rounded. Width of frons about 2.2 times as wide as eye. Antenna long and slender; antennomeres longer than wide; 1 broad apically; 2 oval, widest at middle; 3–10 broad apically, with a seta on subapical part; 4 shortest; 11 long oval, about 2.0 times as long as 10, widest at middle. Labrum with long setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomere 1 broad apically, as long as 2; 3 broad apically, slightly longer than 2; 4 longest, 4.0 times as long as 3, widest at basal third, apex bifid. Labial palpomere 1 broad apically, as long as 2; 3 oval, 4.0 times as long as 2, widest at basal third, apex bifid. Gula trapezoidal; gula suture non-parallel, discontinuous. Mentum widest at posterior corner; antero-medial margin bisinuate; antero-lateral part protruded and slightly curved; anterior corner rounded; lateral margin rounded; posterior corner rectangular; posterior margin straight.

Thorax: Pronotum reverse pentagonal, widest at posterior corners, about 4.0 times as wide as long, 1.5 times as wide as head, with long setae on lateral parts; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner obtuse; posterior margin transversely bisinuate. Elytra acute apically, widest at middle, wider than pronotum. Prosternum transverse, slightly convex and with sparse setae on medial part. Prosternal process long and vented, convex medially, with long setae on medial part; posterior part long hexagonal, with carina laterally. Metaventricle with large setose punctures, with longitudinal suture on medial part. Procoxa subtriangular, with sparse setae. Protrochanter subtriangular, with sparse setae. Profemur with sparse setae. Protibia with short spines, with

a row of setae on dorsal part. Protarsomere 1 slightly longer than 3; 3 1.5 times as long as 2; 5 elongated, longest, slightly longer than 1. Protarsal claws 1/2 times shorter than tarsomere 5. Mesocoxa subtriangular, with sparse setae. Mesotrochanter subtriangular, with sparse setae. Mesofemur with sparse setae. Mesotibia with short spines, with a row of setae on dorsal part. Mesotarsomere 1 slightly longer than 3; 3 1.5 times as long as 2; 5 elongated, longest, slightly longer than 1. Mesotarsal claws 1/2 times shorter than tarsomere 5. Metacoxal plate with large setose punctures. Metacoxal process with sparse setae; apex reversed V-shaped. Metatrochanter semicircular, with sparse setae. Metafemur with sparse setae. Metatibia with a row of spines on dorsal and medial parts; metatibial largest spine 1/4 times shorter than tarsomere 1. Metatarsomere 1 longest, 1.5 times as long as 2; 2 slightly longer than 3; 3 about 1.5 times as long as 4; 4 shortest; 5 about 2.0 times as long as 4. Metatarsal claw 1/5 times shorter than tarsomere 5.

Abdomen: Sternites V–VI with long setae on medial part, with sparse setae; sternite VII with sparse setae. Median lobe (Pl. 43B) of aedeagus long and slender, widest at base, narrowed apically, apex slender and rounded in lateral view. Paramere (Pl. 43C) elongated and subtriangular, widest at middle, with long setae from subapical part and apical third; apex vented and rounded in lateral view.

TYPE MATERIAL: Syntype, 1♂ (NHM), with labels as follows: “*Bidessus frontalis*. Type D. S. Yokohama Lewis, Type, Sharp Coll. 1905–313.”

SPECIMENS EXAMINED: SOUTH KOREA: Gyeongbuk Prov.: 1♀, Gyeongju-si, Geoncheon-eub, Seo-myeon, Simpyeong-ri, 28 V 1993, SH Lee, *ex pond*; 1♂, Uljin-gun, Onjeong-myeon, Daeamsil, 8 V 1994, SH Lee; Jeju Prov.: 1♂, Namjeju-gun, Boseong-ri, 9 VII 1985, Y. B. Cho, *ex pond*.

DISTRIBUTION: Korea, Japan.

REGION: Eastern Palaearctic.

KOREA: GB, JJ.

KOREAN RECORDS: *Leiodytes frontalis*: Nillson, 2003b; 56; 2010: 25; 2012: 25. *Clypeodytes frontalis*: Lee et al., 1992b: 48; Kim et al., 1994: 132; Lee, 1994: 16; Cho and Park, 2010: 95 [generic recombination].

58. *Leiodytes nicobaricus* (Redtenbacher, 1867) (Pl. 44)

Hydroporus nicobaricus Redtenbacher, 1867: 21. Type locality: India: Nicobar Islands.

Leiodytes nicobaricus: Biström, 1988: 25.

Leiodytes orissaensis: Mori and Kitayama, 1993: 71 (misidentification).

DESCRIPTION: Length 1.8–2.0 mm. Body long oval, slightly convex, with small setose punctures.

Color: Head yellow; pronotum yellow with two black markings on postero-medial part; elytra yellowish brown with brown markings. Ventral surface mostly yellow and legs yellowish brown.

Head: Head semicircular, about 2.0 times as wide as long, widest across eyes. Anterior margin of clypeus rounded. Width of frons about 2.2 times as wide as eye. Antenna long and slender; antennomeres longer than wide except 4 quadrate; 1 broad apically; 2 oval, widest at basal third; 3–10 broad apically, with a seta on subapical part; 4 shortest; 11 long oval, about 1.5 times as long as 10, widest at middle. Labrum with long setae on antero-medial part, deeply emarginate at anterior margin. Maxillary palpomere 1 broad apically, as long as 2; 3 broad apically, slightly longer than 2; 4 longest, 4.0 times as long as 3, widest at basal two third, apex bifid. Labial palpomere 1 broad apically, as long as 2; 3 oval, 4.0 times as long as 2, widest at basal two third, apex bifid. Gula trapezoidal; gula suture non-parallel, discontinuous. Mentum widest at posterior corner; antero-medial margin bisinuate; antero-lateral part protruded; anterior corner rounded; lateral margin rounded; posterior corner rectangular; posterior margin straight.

Thorax: Pronotum reverse pentagonal, widest at posterior corners, about 3.5 times as wide as long, wider than head, with long setae on lateral parts; anterior margin straight; antero-lateral part protruded; anterior corner acute; lateral margin slightly rounded; posterior corner obtuse; posterior margin transverse bisinuate. Elytra acute apically, widest at middle, wider than pronotum, with compact setose large and small punctures. Prosternum transverse, slightly convex and with sparse setae on medial part. Prosternal process long and vented, convex medially, with long setae on medial part; posterior part long hexagonal, with carina lateral part. Metaventrite with longitudinal suture on medial part. Procoxa subtriangular, with sparse setae. Protochanter subtriangular, with sparse setae. Profemur with sparse setae. Protibia with short spines, with a row of setae on dorsal part. Protarsomere 1 slightly longer than 3; 3 1.5 times as long as 2; 5 elongated, longest, slightly longer than 1. Protarsal claws 1/2 times shorter than tarsomere 5. Mesocoxa subtriangular, with sparse setae. Mesotrochanter subtriangular, with sparse setae. Mesofemur with sparse setae. Mesotibia with short spines, with a row of setae on dorsal part. Mesotarsomere 1 slightly longer than 3; 3 1.5 times as long as 2; 5 elongated, longest, slightly longer than 1. Mesotarsal claws 1/2 times shorter than tarsomere 5. Metacoxal plate with sparse large punctures. Metacoxal process with sparse setae; apex reversed V-shaped. Metatrochanter semicircular, with sparse setae. Metafemur with sparse setae. Metatibia with a row of spines on dorsal and medial parts; metatibial largest spine 1/4 times shorter than tarsomere 1. Metatarsomere 1 longest, 1.2 times as long as 2; 2 slightly longer than 3; 3 about 1.5 times as long as 4; 4 shortest; 5 about 2.0 times as long as 4. Metatarsal claw 1/5 times shorter than tarsomere 5.

Abdomen: Sternites V–VI with long setae on medial part, with sparse setae; sternite VII with sparse setae, with deep groove on posterior part, with a row of setae on posterior margin. Median lobe (Pl. 44B) of aedeagus crown-shaped, widest at apex, narrowest at basal third in lateral view. Paramere (Pl. 44C) elongated, vented at middle; apex rounded, with compact setae in lateral view.

SPECIMENS EXAMINED: SOUTH KOREA: Chungbuk Prov.: 1♀, Cheongju-si, Heungdeok-gu, Gangseo1-dong, 4 V 2005, DH. Lee, *ex pond* (1♀, on slide); Gyeongbuk Prov.: 1♀, Gyeongju-si, Hyeongok, 24 V 1992, SH Lee; Jeju Prov.: 1♂, Bukjeju-gun, Jocheon-eub, Seonheul-ri, 11 VI 2005, DH. Lee, *ex pond*; 2♂♂4♀♀,

same data as former except for, 22 V 2006 (1♂3♀♀, on slide); 1♂, Bukjeju-gun, Dongbaek-garden, 28 VII 2005, SH Lee, *ex pond*; 1♀, Bukjeju-gun, Molsuni-pond, 27 VII 2005, SH Lee, *ex pond*; 1♀, Namjeju-gun, Boseong-ri, 23 VII 1990, SH Lee, *ex pond*; 1♀, Namjeju-gun, Galmae-pond, 26 VII 2005, SH Lee, *ex pond*; Jeonnam Prov.: 1♀, Suncheon-si, Sanseong-pond, 5 VI 2009, SH Lee.

DISTRIBUTION: Korea, China (Macao), India, Japan, Malaysia.

REGION: Oriental, Eastern Palaearctic.

KOREA: CB, GB, JJ.

KOREAN RECORDS: *Leiodytes nicobaricus*: Lee and Ahn, 2008: 87; Jung et al., 2012: 42.

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PLATES

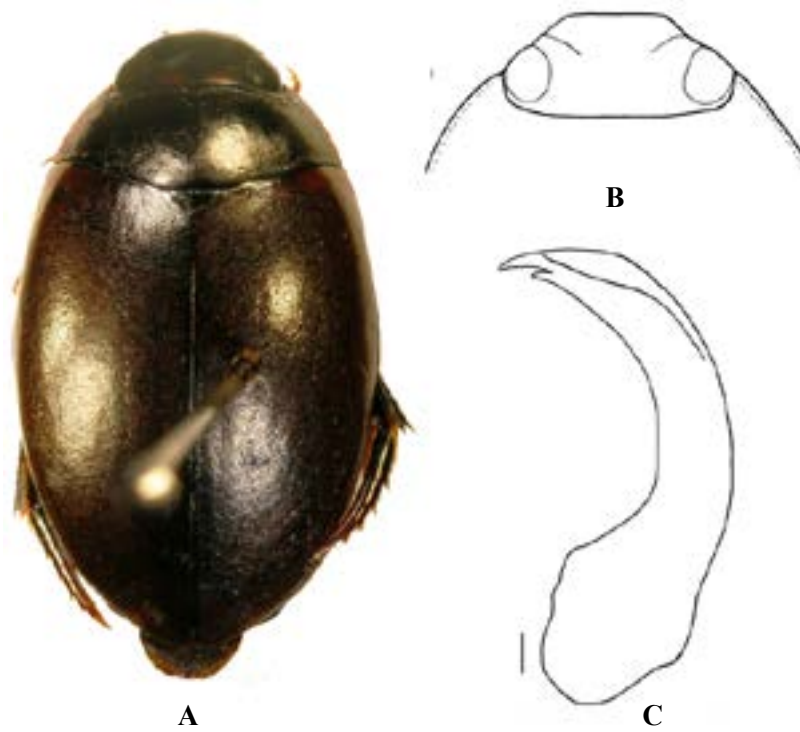


Plate 1. *Agabus conspicuus*. A: habitus, 10.0 mm, B: head (dorsal aspect), C: median lobe (lateral aspect). Scales = 0.1 mm.

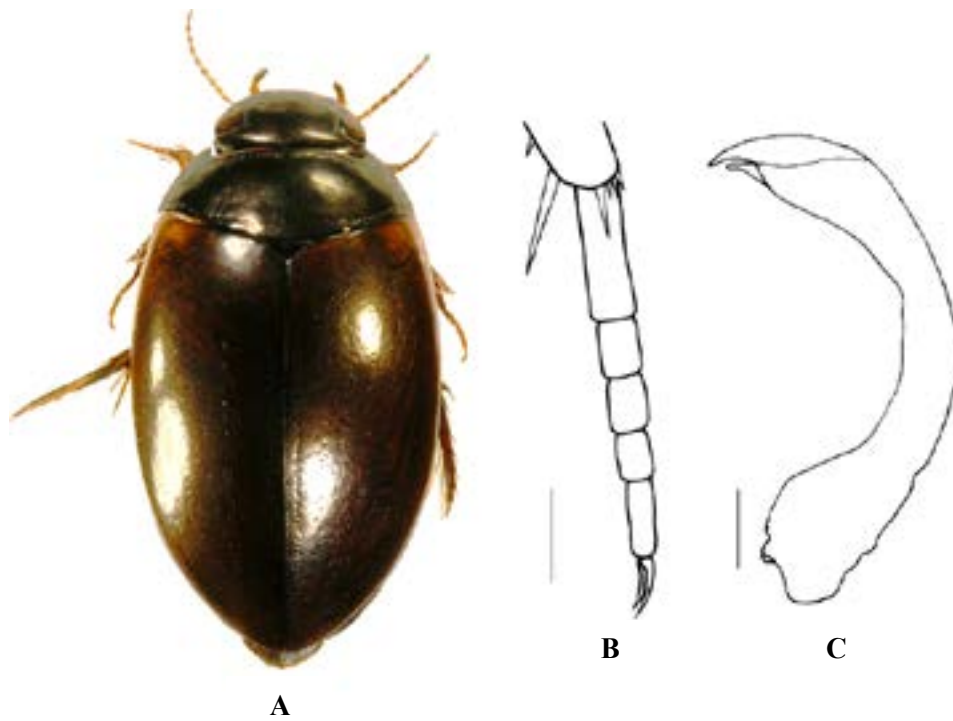


Plate 2. *Agabus japonicus*. A: habitus, 7.5 mm, B: metatarsus (lateral aspect), C: median lobe (lateral aspect). Scales = 0.1 mm.

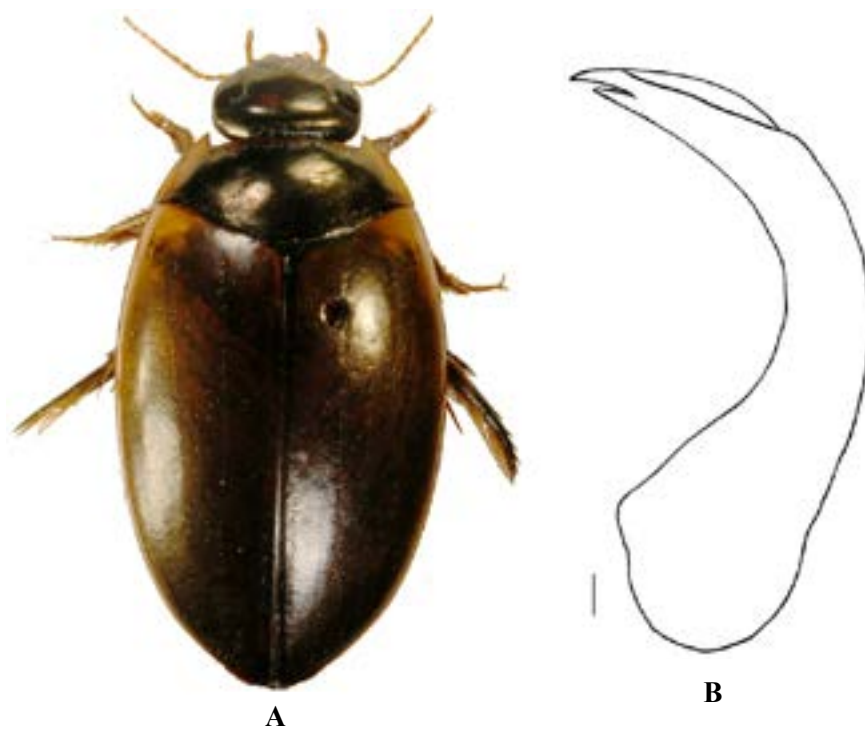


Plate 3. *Agabus regimbarti*. A: habitus, 9.5 mm, B: median lobe (lateral aspect). Scale = 0.1 mm.

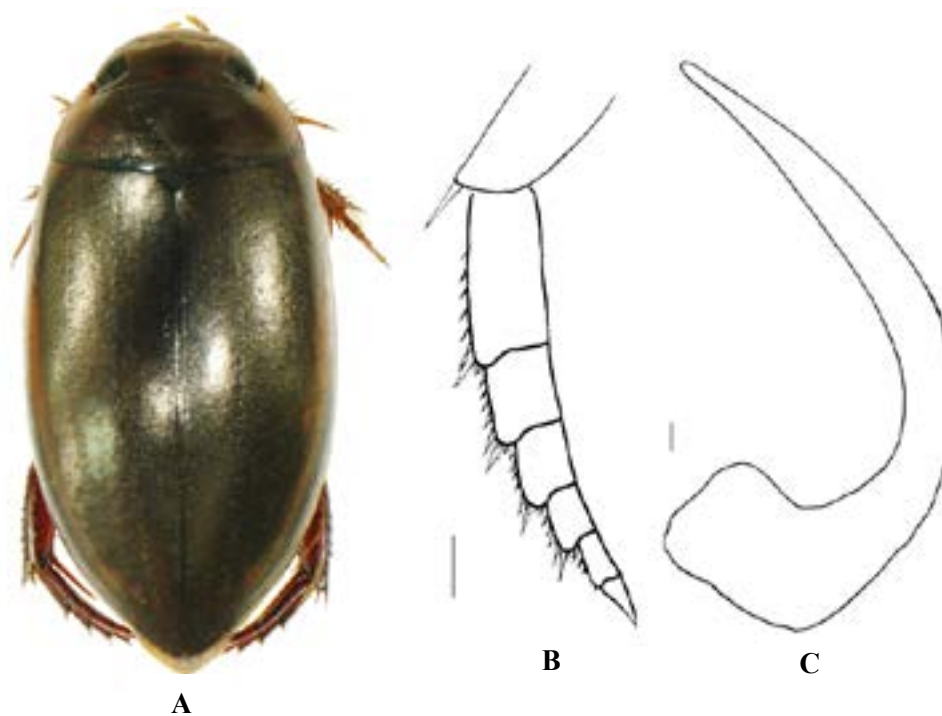


Plate 4. *Ilybius apicalis*. A: habitus, 8.5 mm, B: metatarsus (lateral aspect), C: median lobe (lateral aspect). Scales = 0.1 mm.

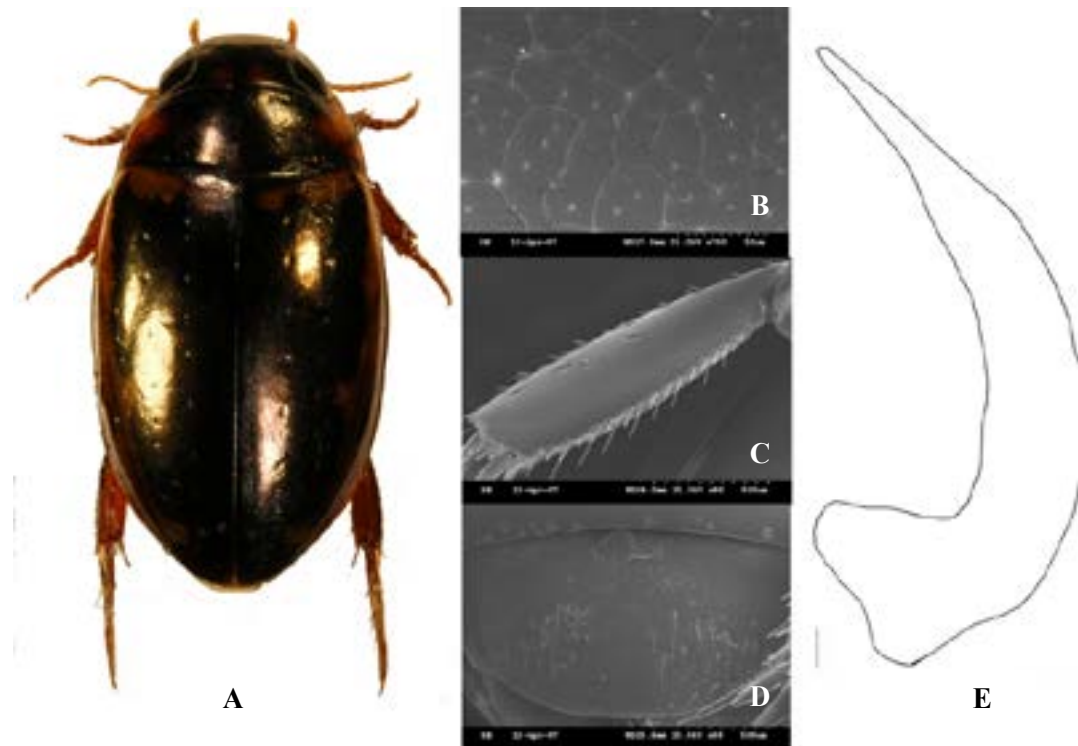


Plate 5. *Platambus fimbriatus*. A: habitus, 7.5 mm, B: reticulation of elytra (dorsal aspect), C: metatibia (lateral aspect), D: sternite VII (ventral aspect), E: median lobe (lateral aspect). Scale = 0.1 mm.

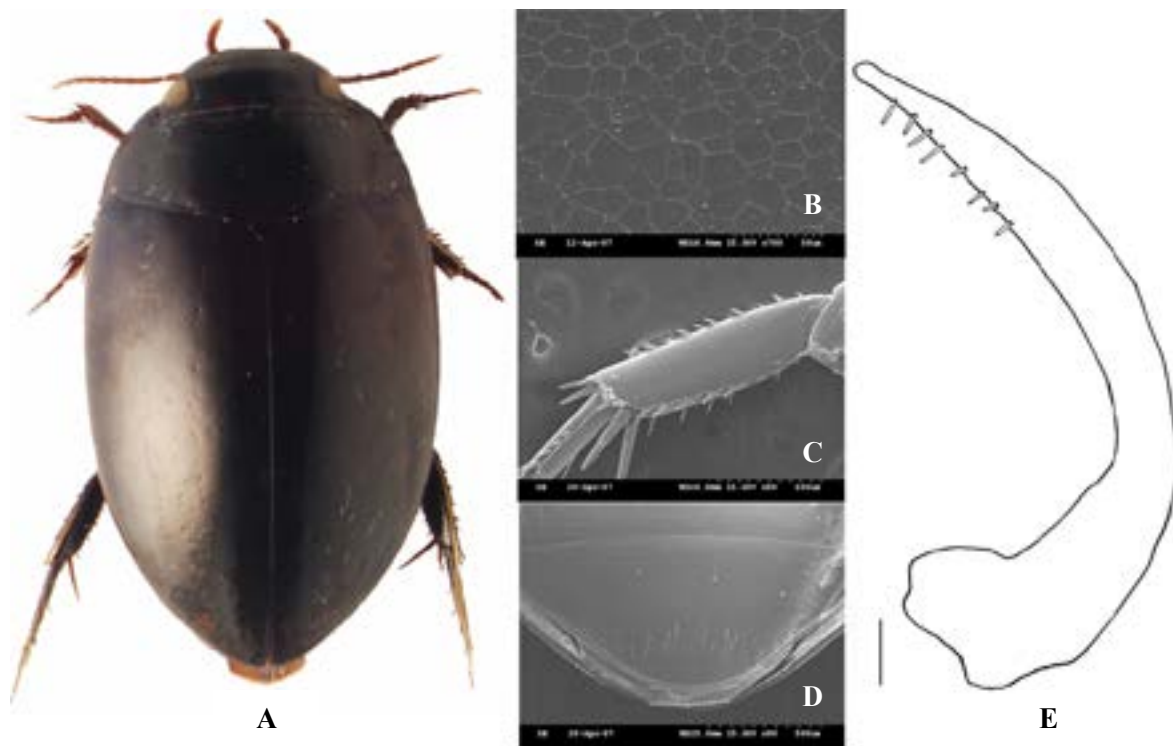


Plate 6. *Platambus koreanus*. A: habitus, 6.5 mm, B: reticulation of elytra (dorsal aspect), C: metatibia (lateral aspect), D: sternite VII (ventral aspect), E: median lobe (lateral aspect). Scale = 0.1 mm.

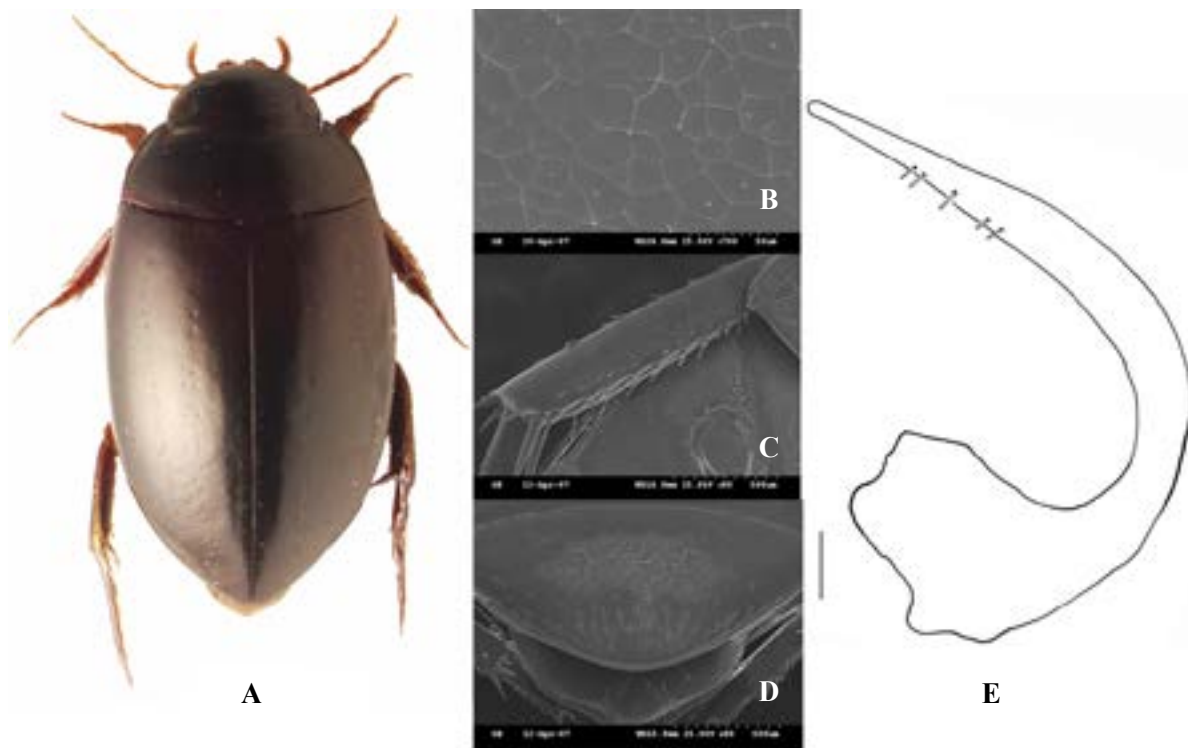


Plate 7. *Platambus stygius*. A: habitus, 7.0 mm, B: reticulation of elytra (dorsal aspect), C: metatibia (lateral aspect), D: sternite VII (ventral aspect), E: median lobe (lateral aspect). Scale = 0.1 mm.

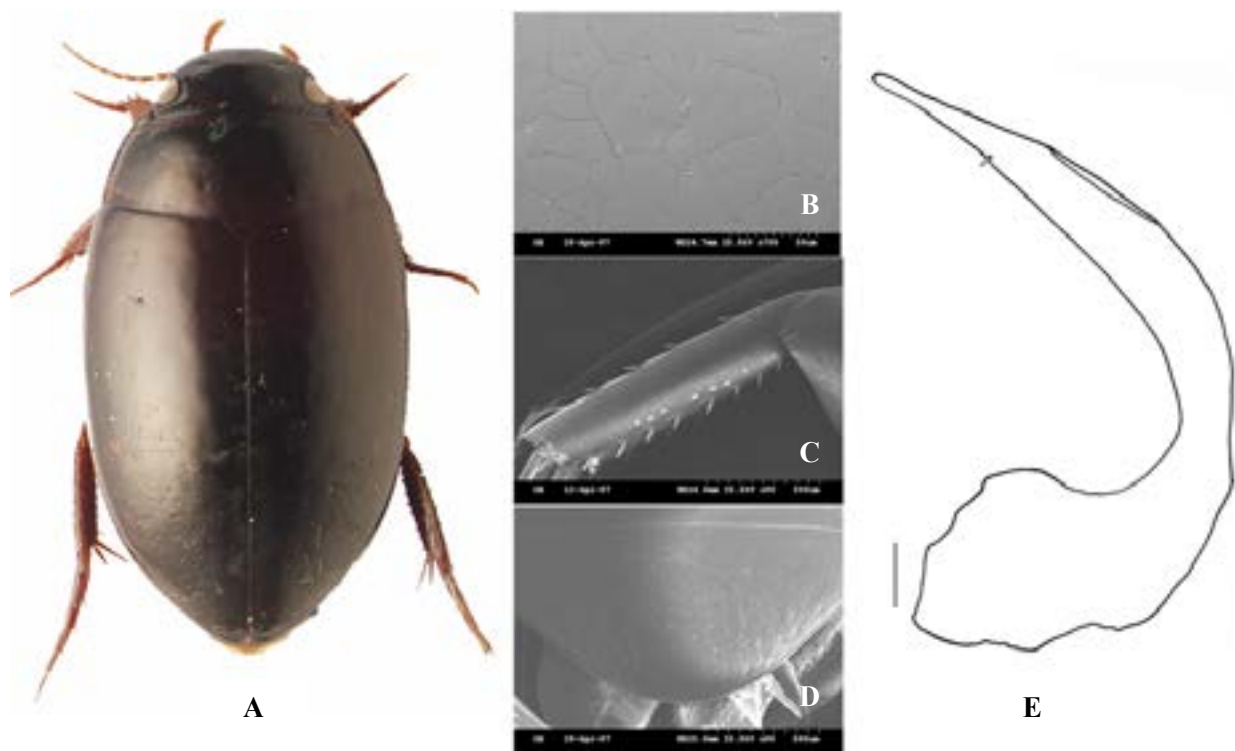


Plate 8. *Platambus ussuriensis*. A: habitus, 6.8 mm, B: reticulation of elytra (dorsal aspect), C: metatibia (lateral aspect), D: sternite VII (ventral aspect), E: median lobe (lateral aspect). Scale = 0.1 mm.

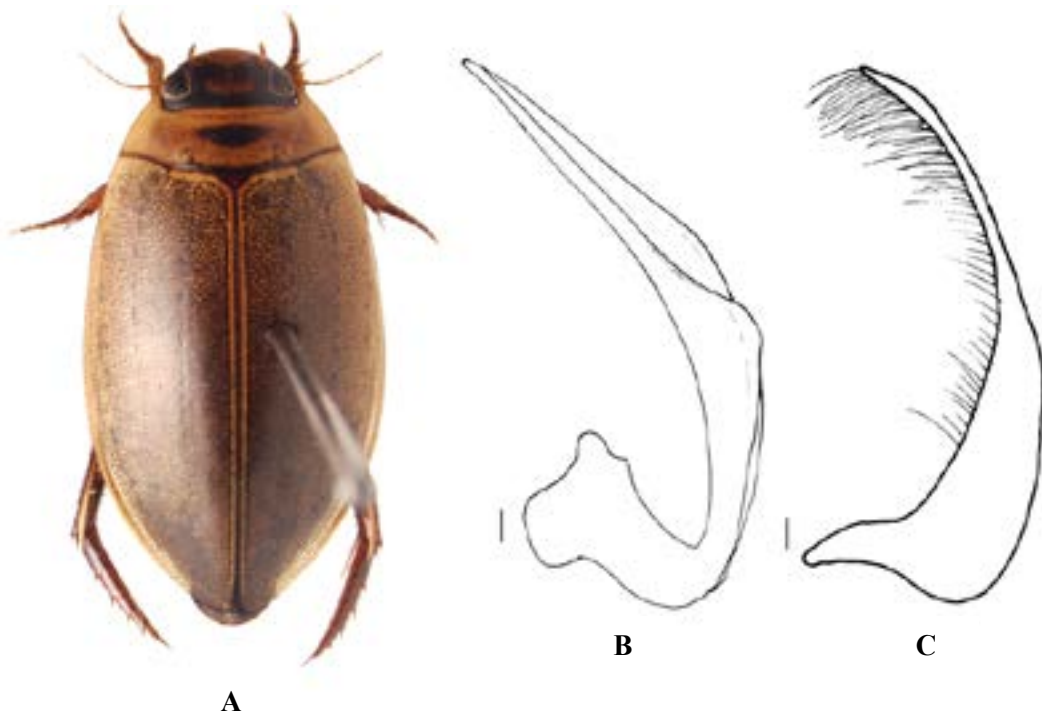


Plate 9. *Rhantus suturalis*. A: habitus, 9.5 mm, B: median lobe (lateral aspect), C: paramere (lateral aspect). Scales = 0.1 mm.

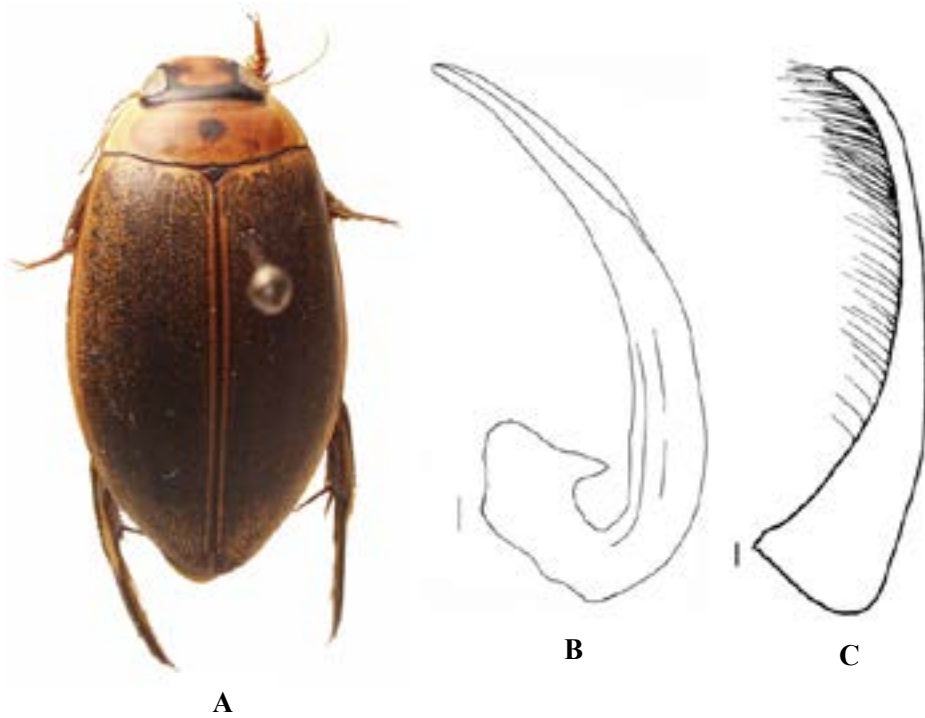


Plate 10. *Rhantus yessoensis*. A: habitus, 11.0 mm, B: median lobe (lateral aspect), C: paramere (lateral aspect). Scales = 0.1 mm.

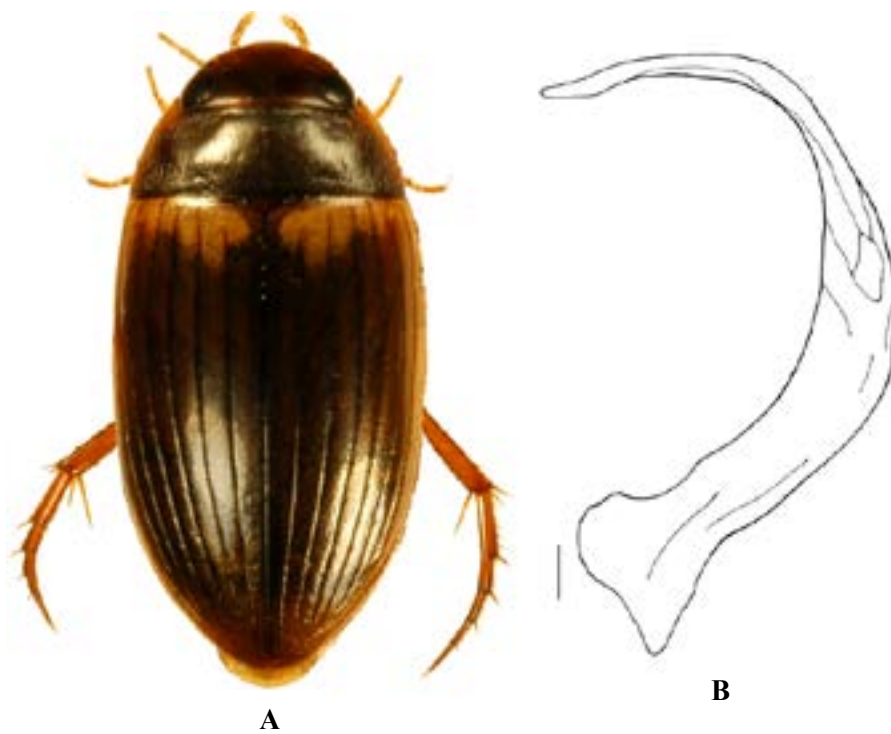


Plate 11. *Copelatus japonicus*. A: habitus, 5.6 mm, B: median lobe (lateral aspect). Scale = 0.1 mm.

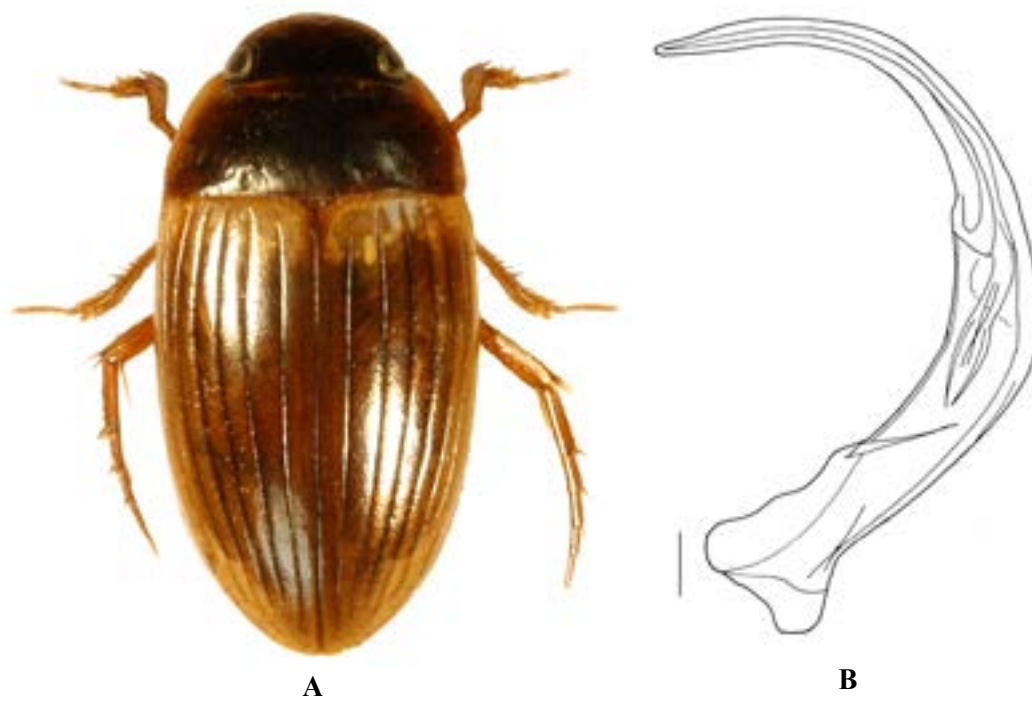


Plate 12. *Copelatus kammurensis*. A: habitus, 5.7 mm, B: median lobe (lateral aspect). Scale = 0.1 mm.

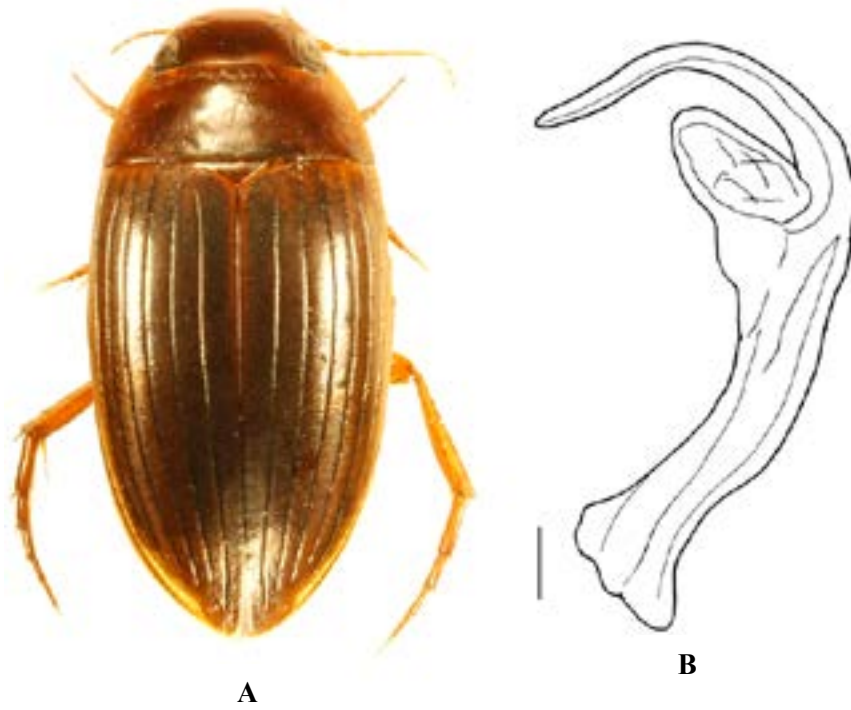


Plate 13. *Copelatus weymarni*. A: habitus, 5.6 mm, B: median lobe (lateral aspect). Scale = 0.1 mm.

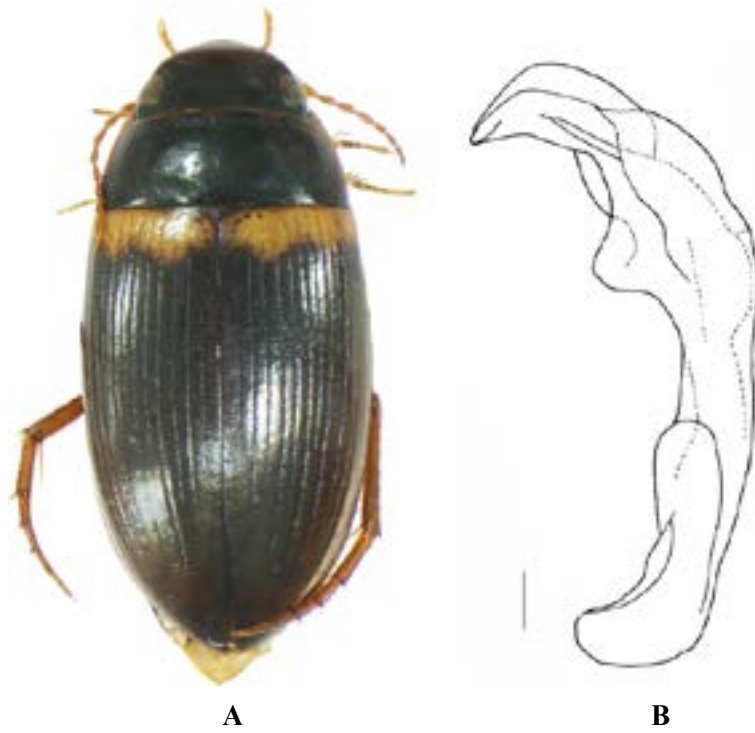


Plate 14. *Copelatus zimmermanni*. A: habitus, 5.5 mm, B: median lobe (lateral aspect). Scale = 0.1 mm.

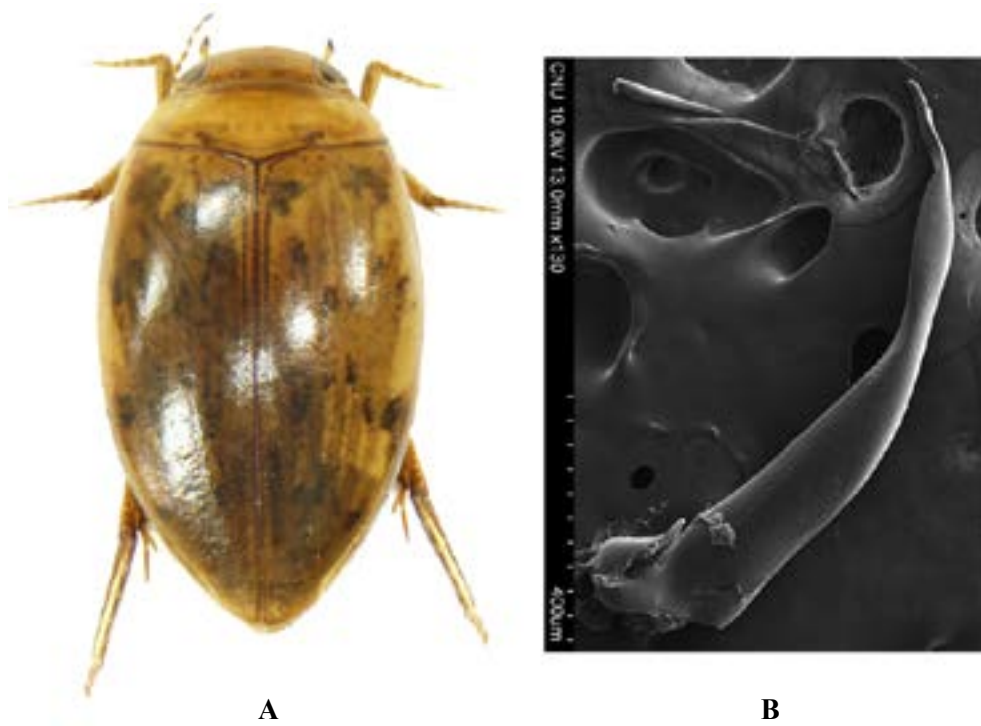


Plate 15. *Laccophilus difficilis*. A: habitus, 5.2 mm, B: median lobe (lateral aspect).

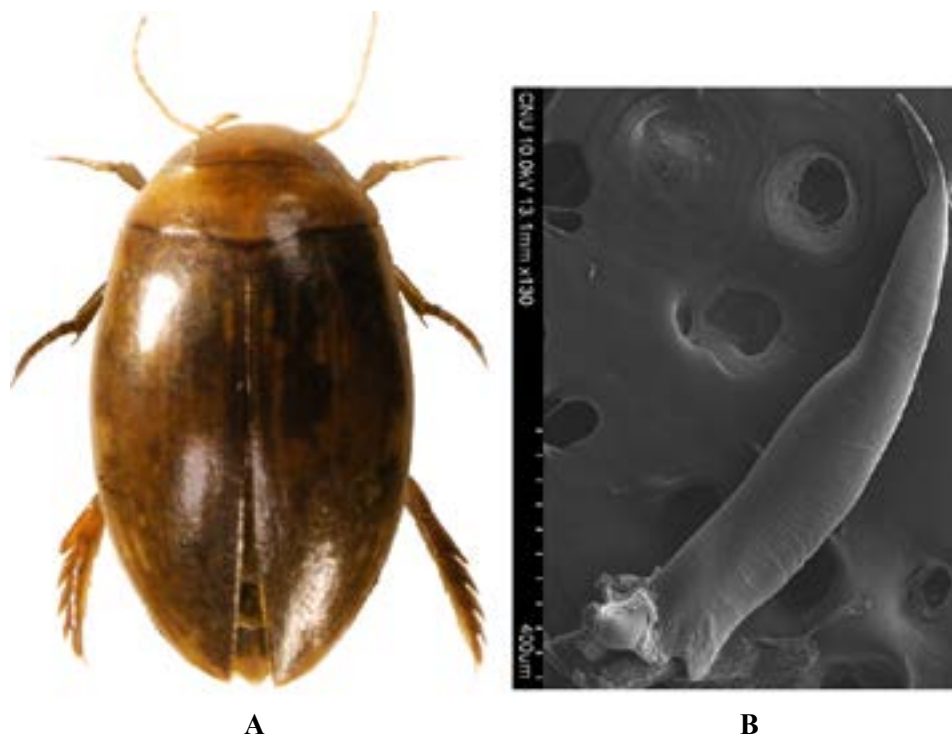


Plate 16. *Laccophilus kobensis*. A: habitus, 3.8 mm, B: median lobe (lateral aspect).



A



B

Plate 17. *Laccophilus lewisiodes*. A: habitus, 4.2 mm, B: median lobe (lateral aspect).



A



B

Plate 18. *Laccophilus vagelineatus*. A: habitus, 3.6 mm, B: median lobe (lateral aspect).

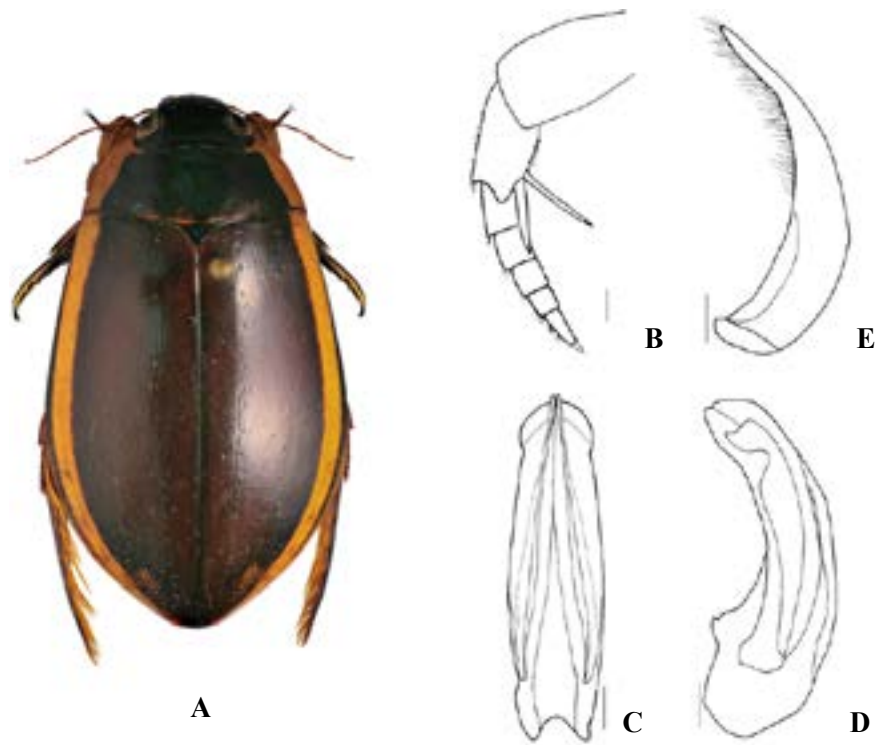


Plate 19. *Cybister chinensis*. A: habitus, 40.0 mm, B: hind leg (lateral aspect), C: median lobe (dorsal aspect), D: median lobe (lateral aspect), E: paramere (lateral aspect). Scales = 1.0 mm.

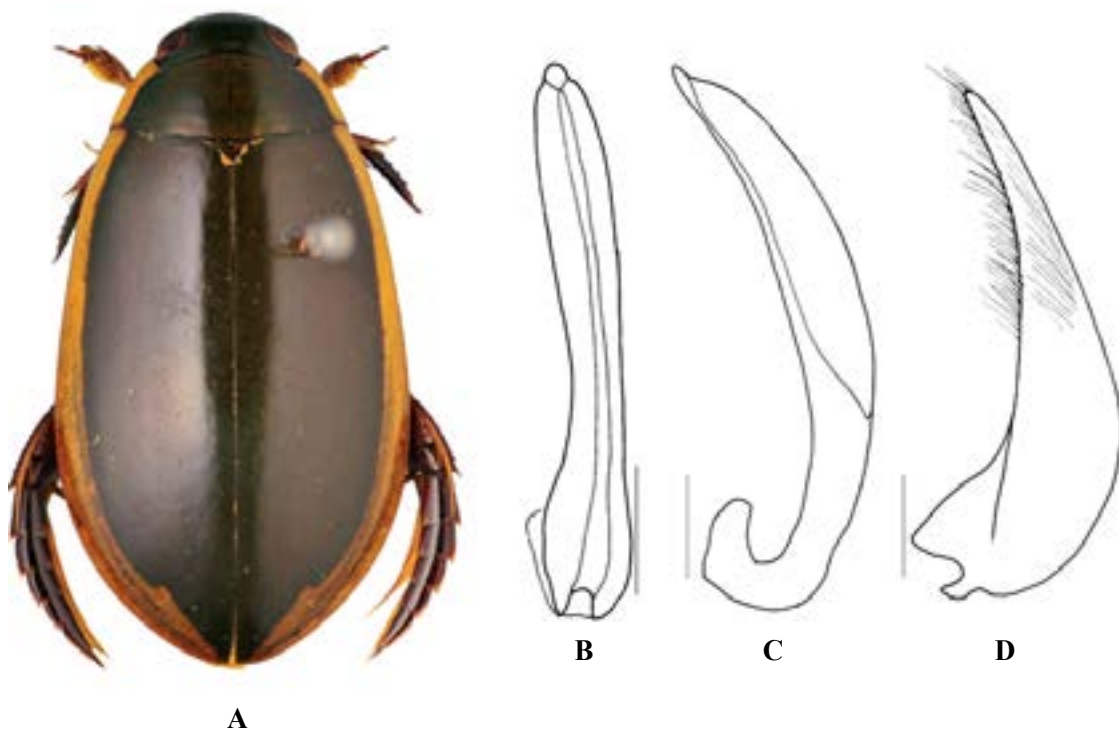


Plate 20. *Cybister lewisianus*. A: habitus, 23.0 mm, B: median lobe (dorsal aspect), C: median lobe (lateral aspect), D: paramere (lateral aspect). Scales = 1.0 mm.

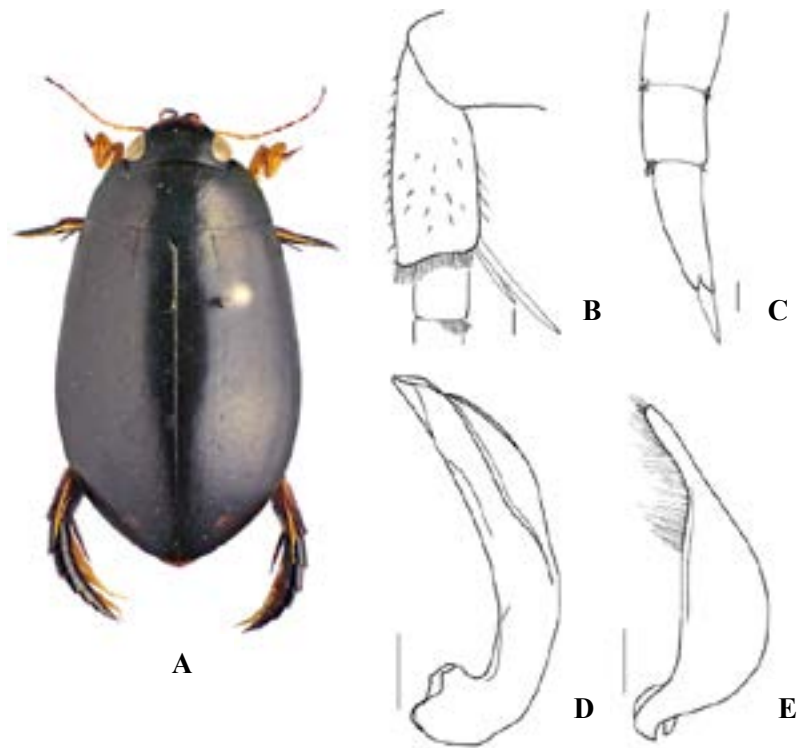


Plate 21. *Cybister brevis*. A: habitus, 36.0 mm, B: metatibia (lateral aspect), C: metatarsus (lateral aspect), D: median lobe (lateral aspect), E: paramere (lateral aspect). Scales = 1.0 mm.

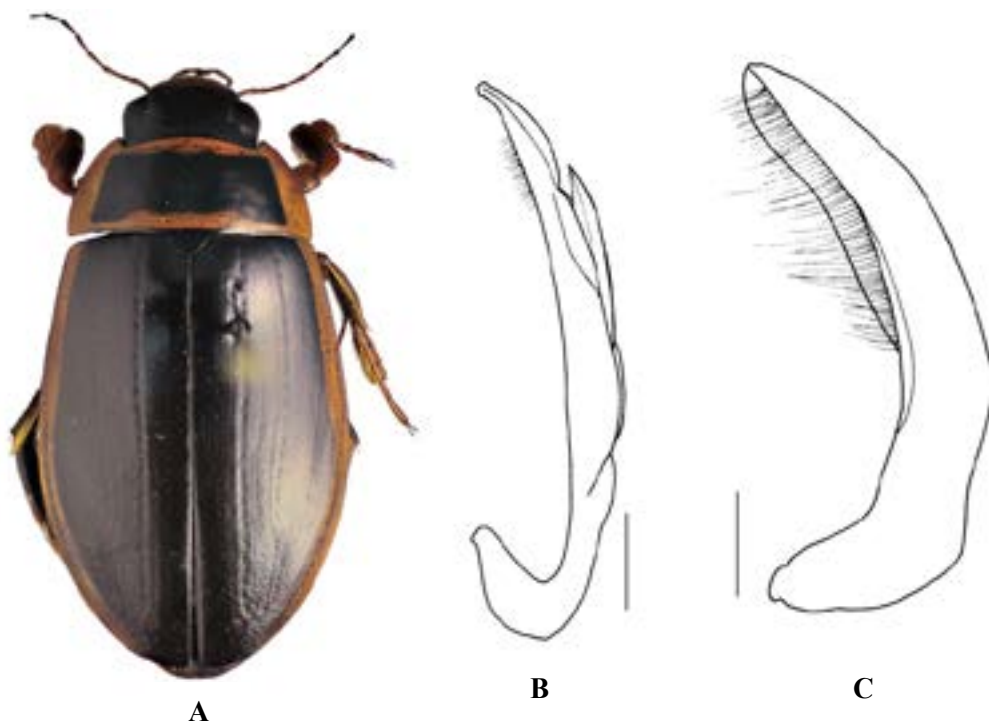


Plate 22. *Dytiscus marginalis czerskii*. A: habitus, 36.0 mm, B: median lobe (lateral aspect), C: paramere (lateral aspect). Scales = 1.0 mm.

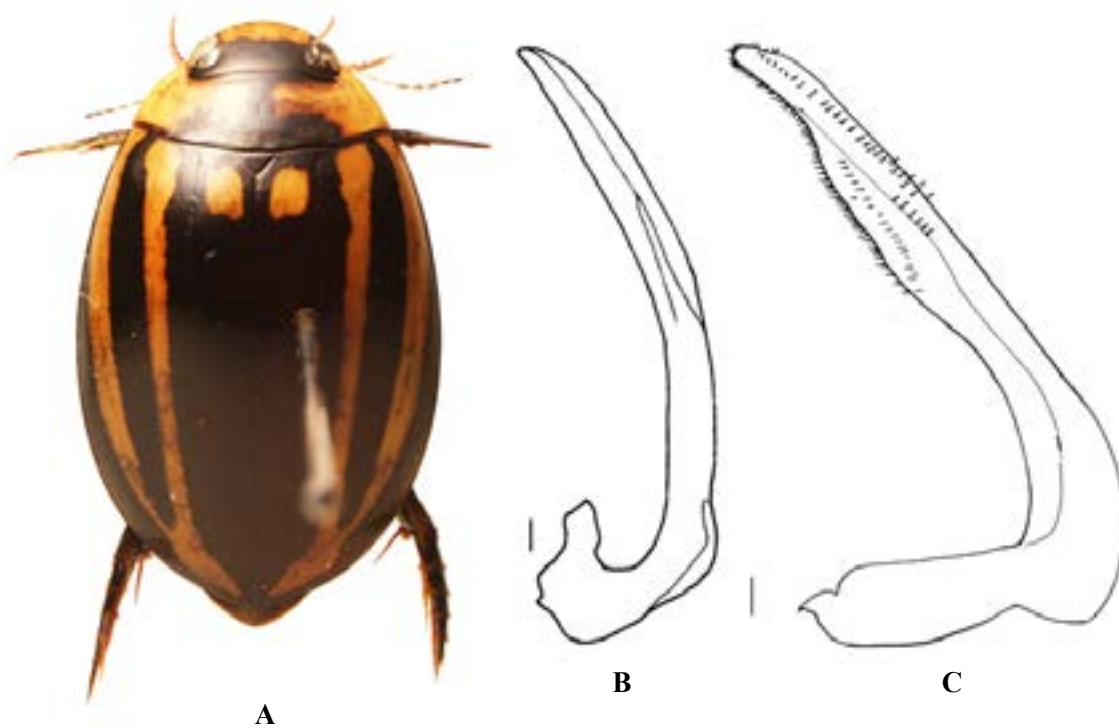


Plate 23. *Hydaticus bowringii*. A: habitus, 13.0 mm, B: median lobe (lateral aspect), C: paramere (lateral aspect). Scales = 0.1 mm.

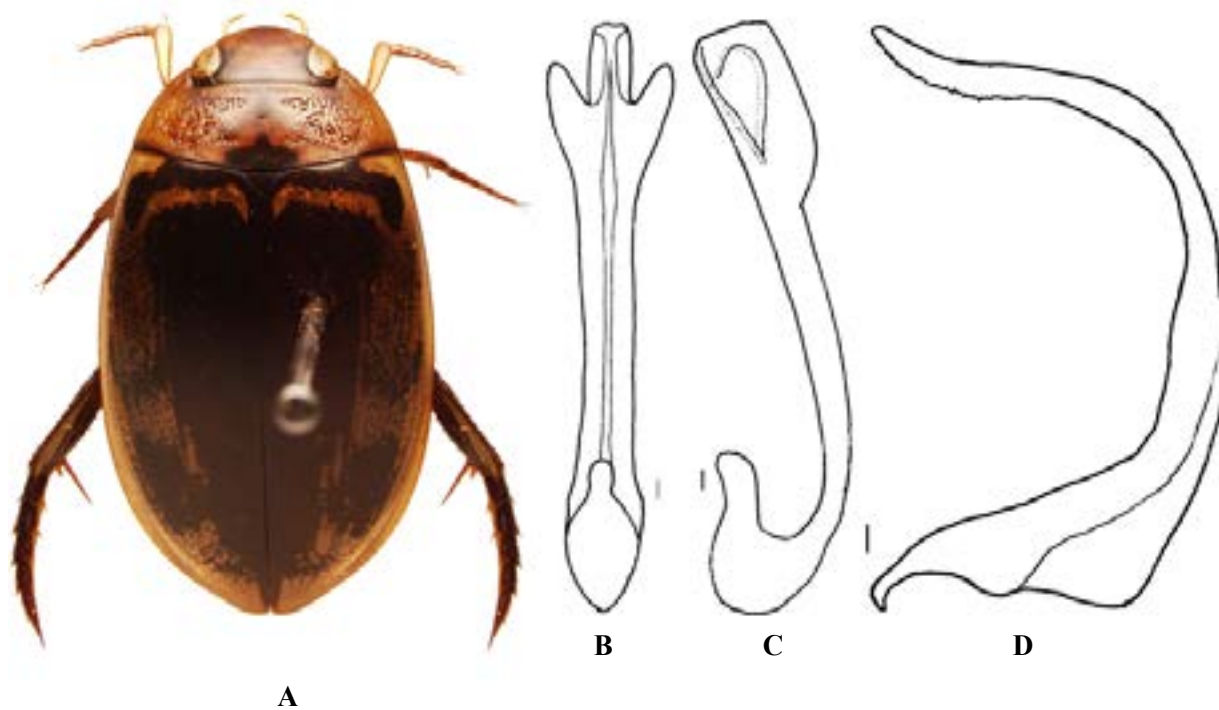


Plate 24. *Hydaticus conspersus*. A: habitus, 17.5 mm, B: median lobe (ventral aspect), C: median lobe (lateral aspect), D: paramere (lateral aspect). Scales = 0.1 mm.

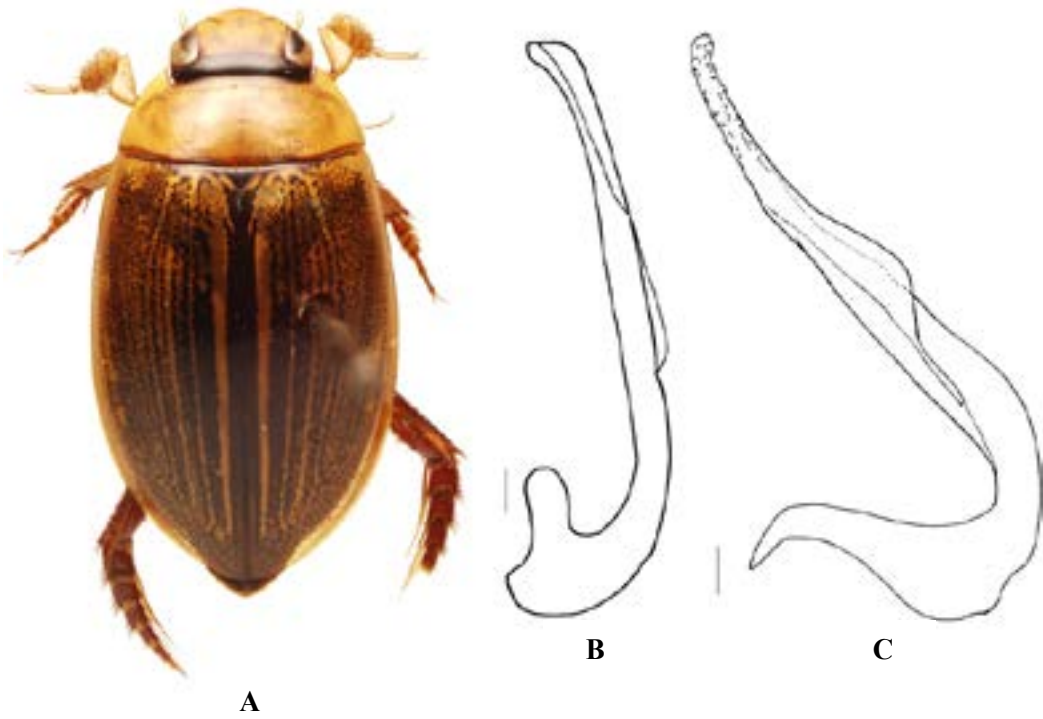


Plate 25. *Hydaticus grammicus*. A: habitus, 10.0 mm, B: median lobe (lateral aspect), C: paramere (lateral aspect). Scales = 0.1 mm.



Plate 26. Habitus of *Hydaticus thermonectoides*, 9.0 mm.

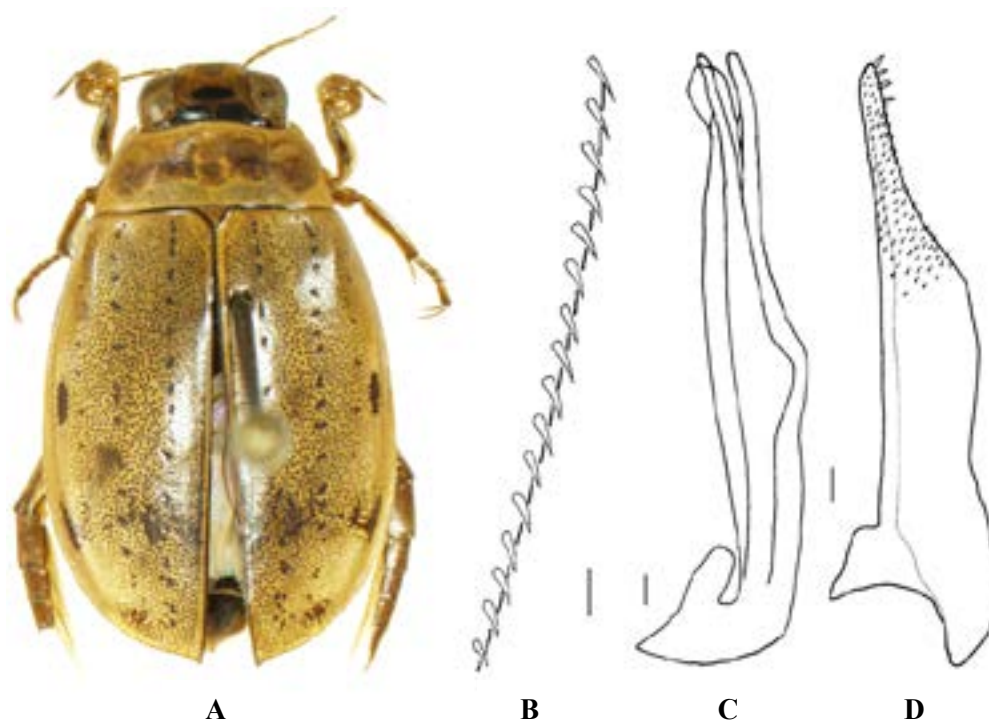


Plate 27. *Eretes griceus*. A: habitus, 14.0 mm, B: lateral margin of elytra (dorsal aspect), C: median lobe (lateral aspect), D: paramere (lateral aspect). Scales = 0.1 mm.

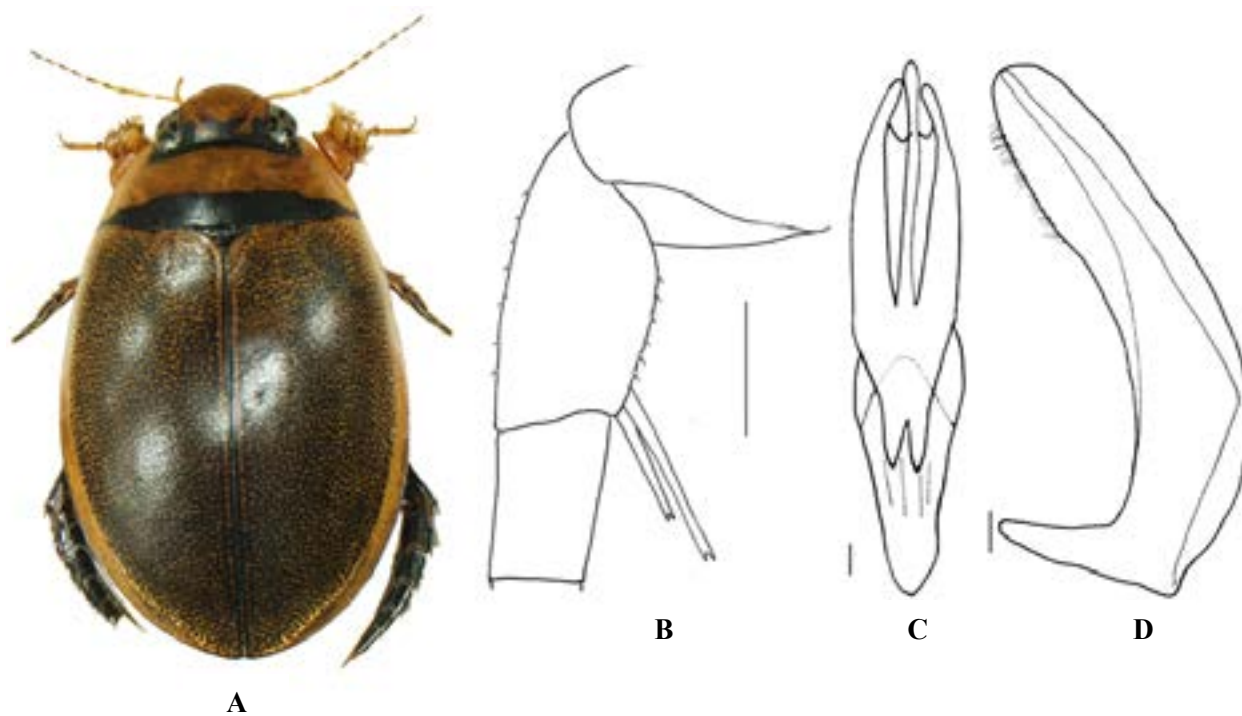


Plate 28. *Graphoderus adamsii*. A: habitus, 10.5 mm, B: metatibia (lateral aspect), C: median lobe (dorsal aspect), D: paramere (lateral aspect). Scales: B = 1.0 mm, C, D = 0.1 mm.

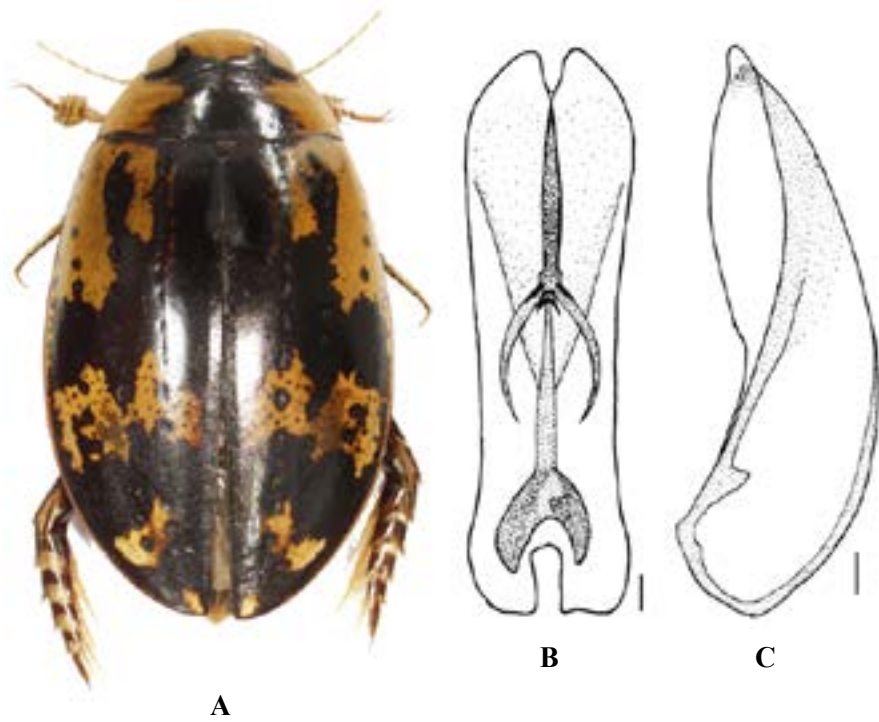


Plate 29. *Sandracottus mixtus*. A: habitus, 13.5 mm, B: median lobe (dorsal aspect), C: paramere (lateral aspect). Scales = 0.1 mm.



Plate 30. *Nebrioporus hostilis*. A: habitus, 4.5 mm, B: posterior part of elytra, C: median lobe (dorsal aspect), D: median lobe (lateral aspect), E: paramere (lateral aspect).

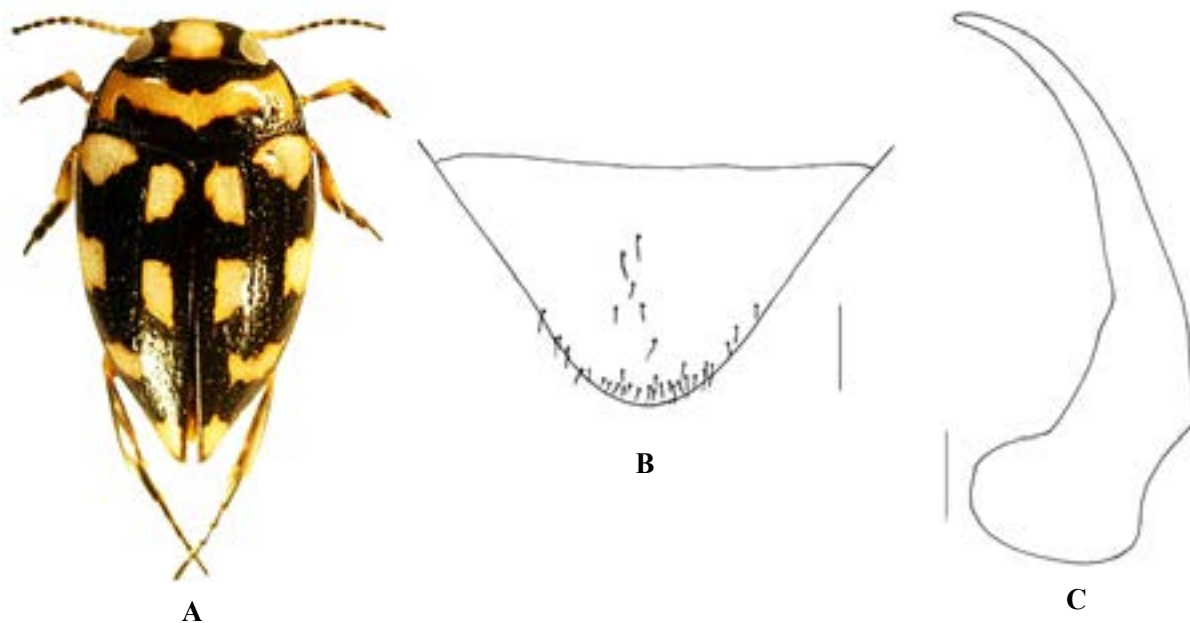


Plate 31. *Oreodytes natrix*. A: habitus, 3.0 mm, B: sternite VII (ventral aspect), C: median lobe (lateral aspect). Scales = 0.1 mm.

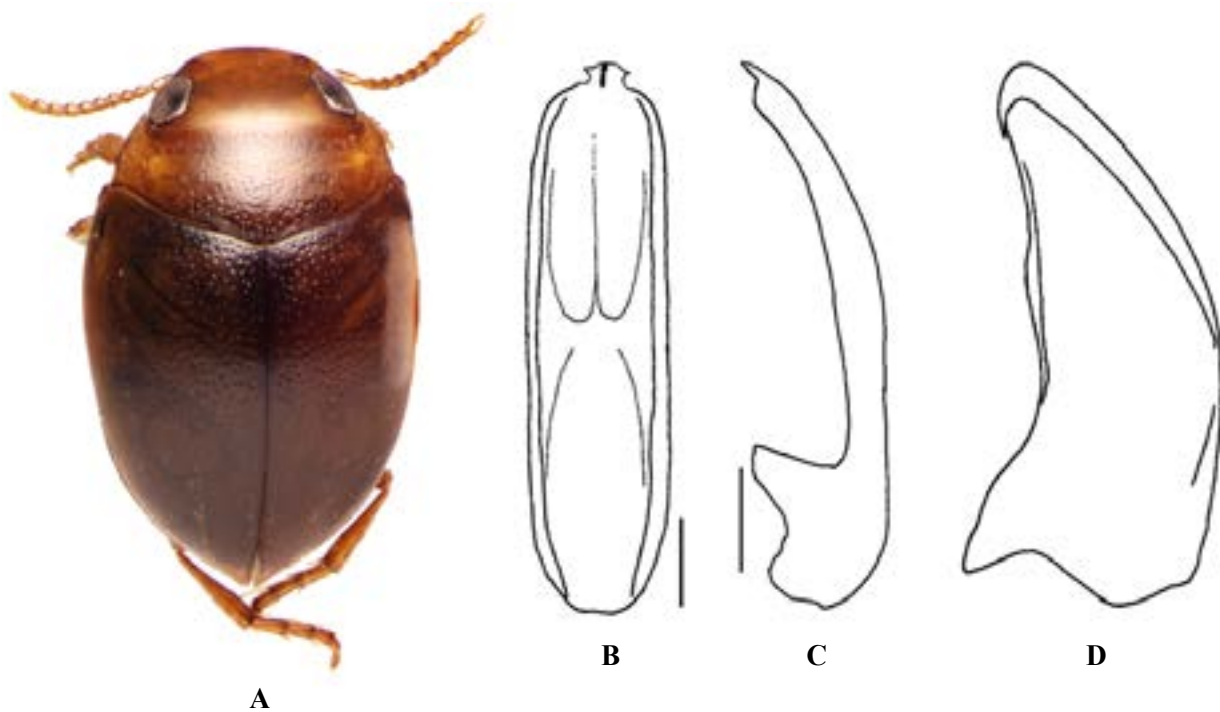


Plate 32. *Hydrovatus acuminatus*. A: habitus, 2.4 mm, B: median lobe (dorsal aspect), C: median lobe (lateral aspect), D: paramere (lateral aspect). Scales = 0.1 mm.

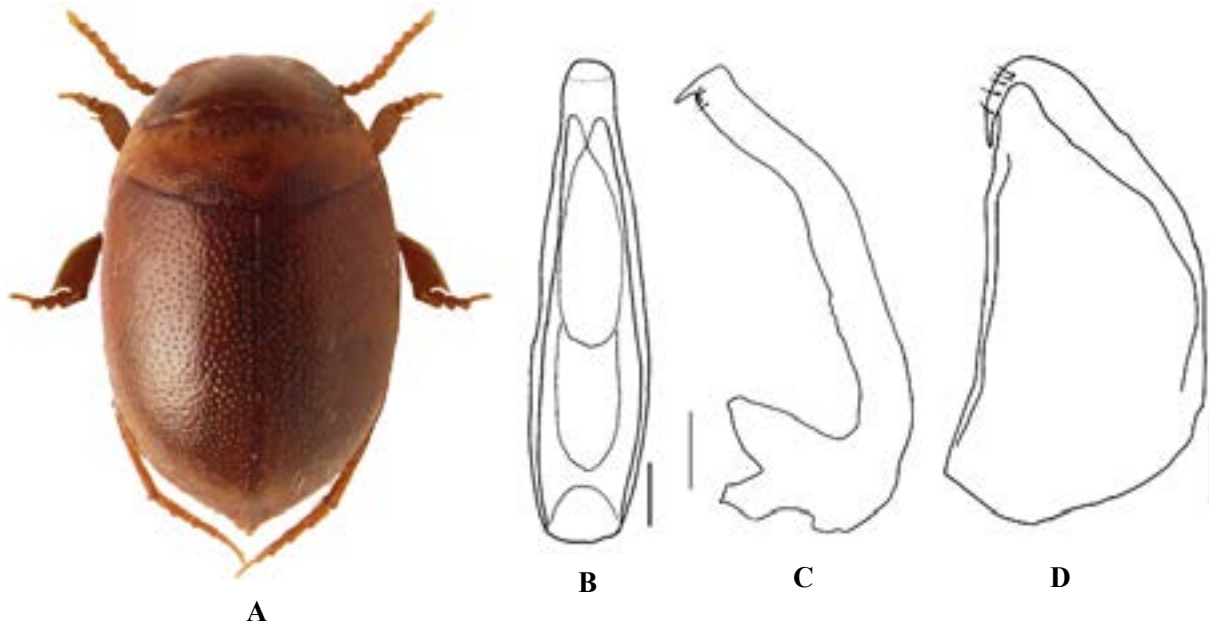


Plate 33. *Hydrovatus acuminatus*. A: habitus, 2.6 mm, B: median lobe (dorsal aspect), C: median lobe (lateral aspect), D: paramere (lateral aspect). Scales = 0.1 mm.

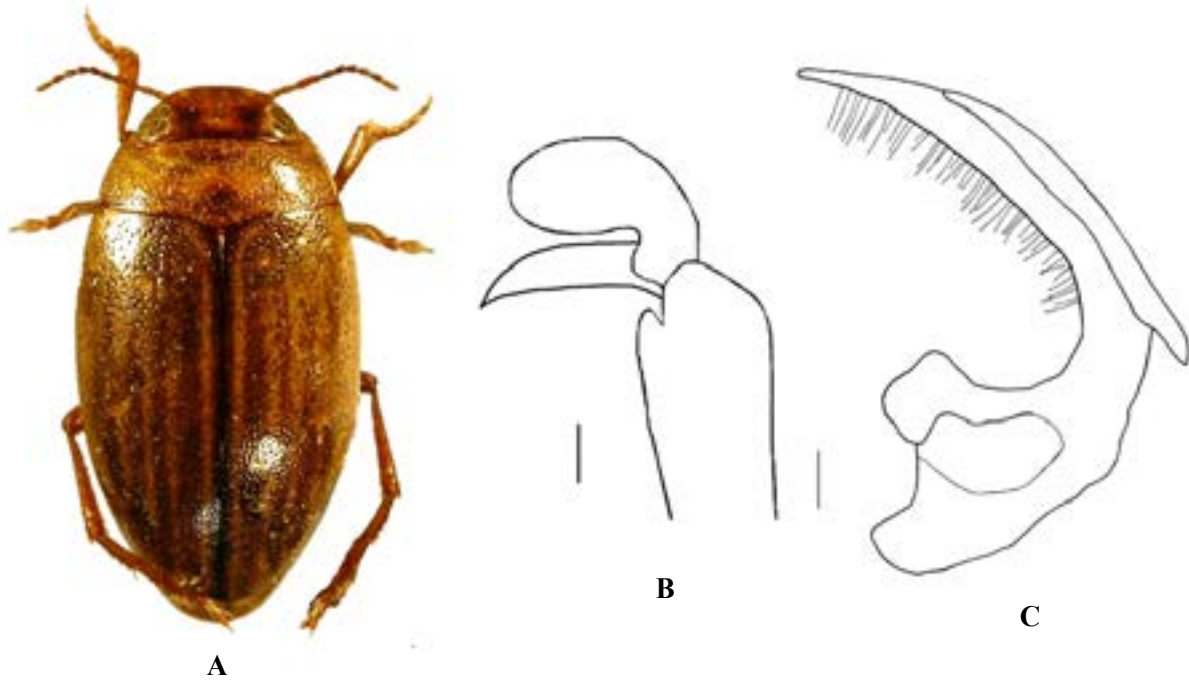


Plate 34. *Hygrotus chinensis*. A: habitus, 4.5 mm, B: protarsal claws (lateral aspect), C: median lobe (lateral aspect). Scales = 0.1 mm.

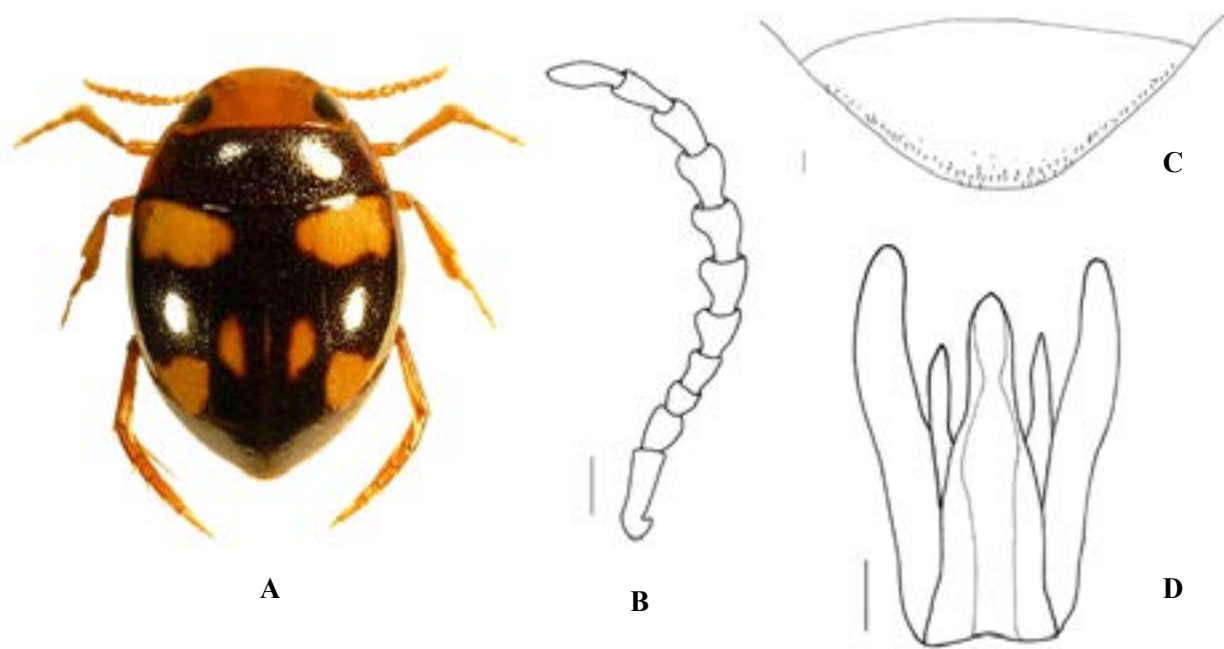


Plate 35. *Allopachria flavomaculata*. A: habitus, 2.5 mm, B: antennae (lateral aspect), C: sternite VII (ventral aspect), D: aedeagus (dorsal aspect). Scales = 0.1 mm.

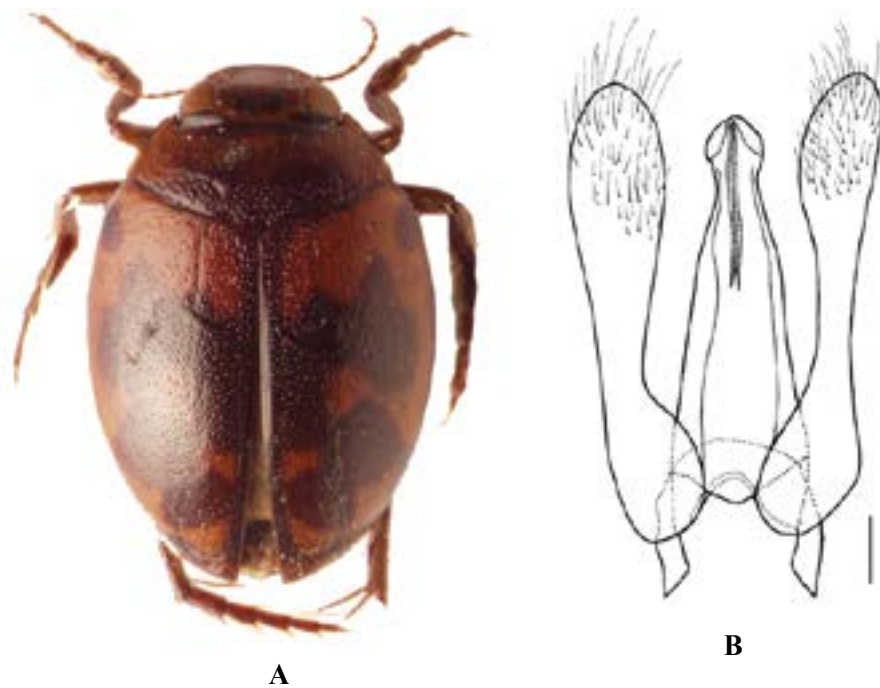


Plate 36. *Hyphydrus falkenstromi*. A: habitus, 4.6 mm, B: aedeagus (dorsal aspect). Scale = 0.1 mm.

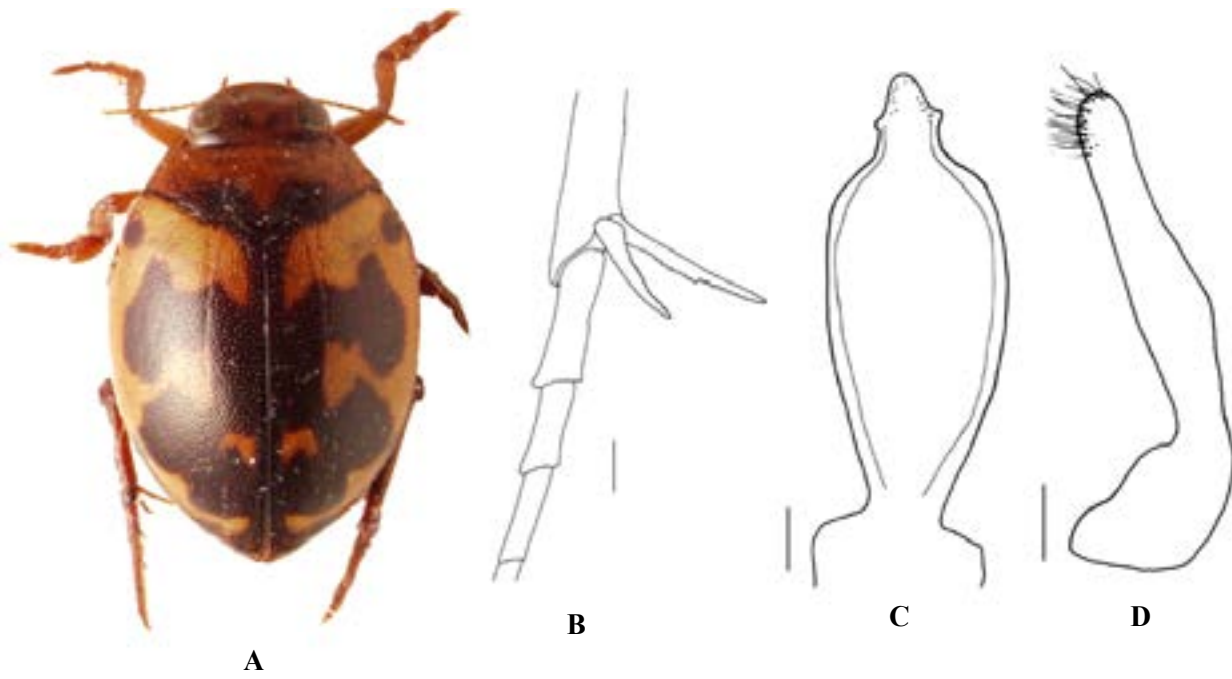


Plate 37. *Hyphydrus japonicus*. A: habitus, 4.5 mm, B: metatibia (lateral aspect), C: median lobe (dorsal aspect), D: paramere (lateral aspect). Scales = 0.1 mm.



Plate 38. Habitus of *Allodesus megacephalus*, 3.2 mm.

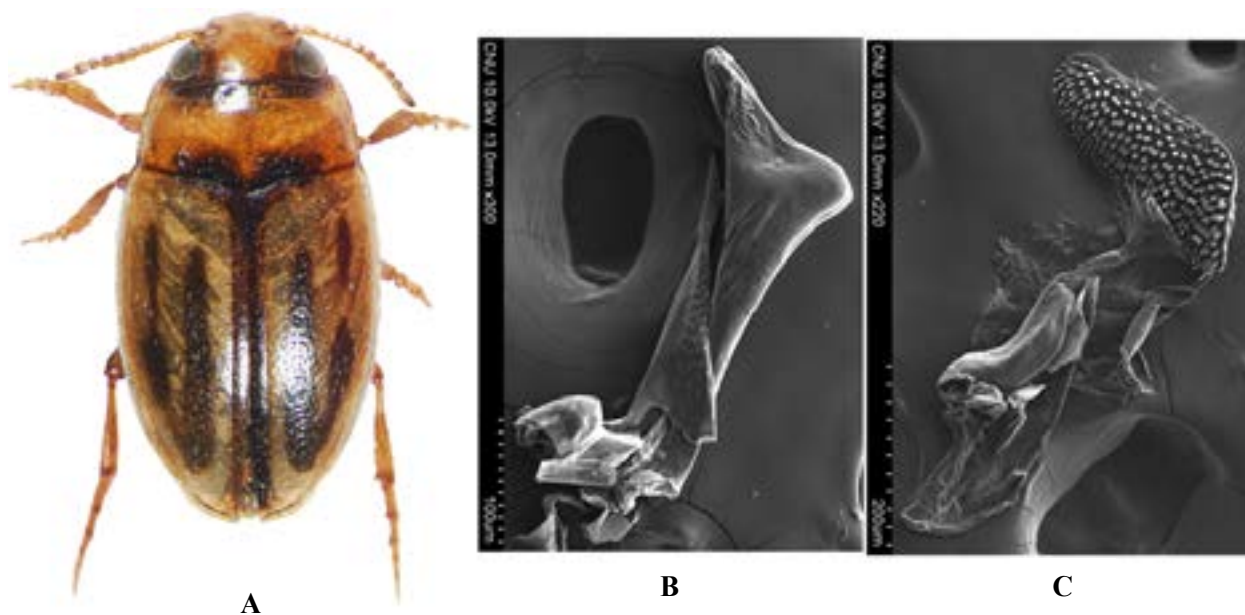


Plate 39. *Hydroglyphus coreanus*. A: habitus, 2.0 mm, B: median lobe (lateral aspect), C: paramere (lateral aspect).

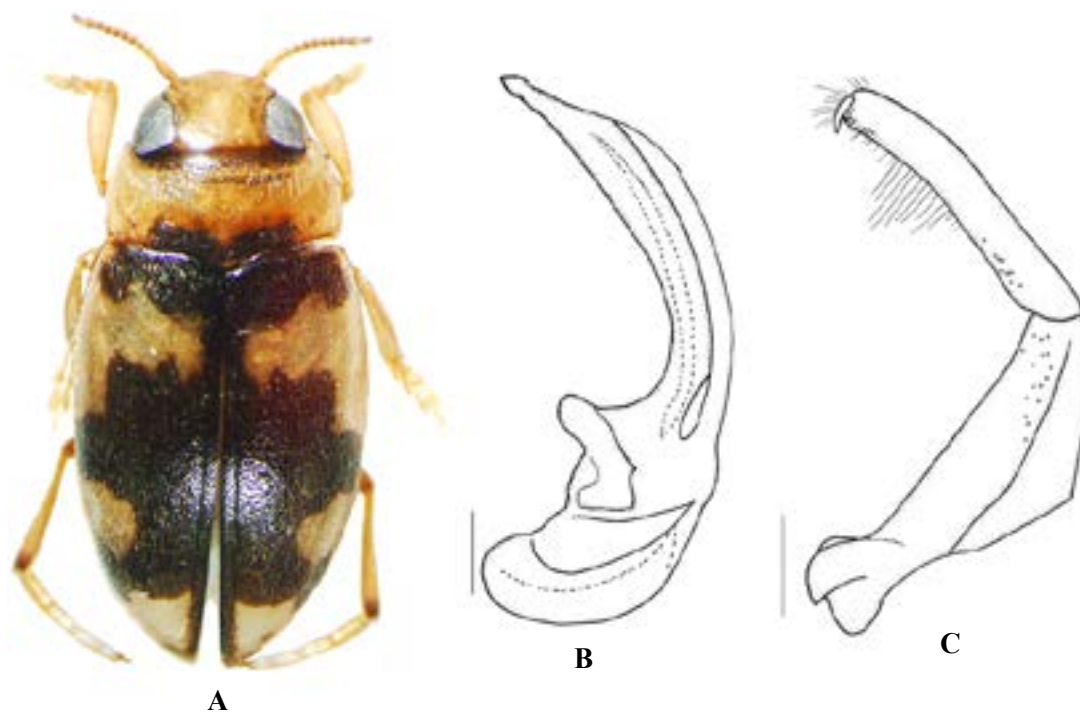


Plate 40. *Hydroglyphus flammulatus*. A: habitus, 2.2 mm, B: median lobe (lateral aspect), C: paramere (lateral aspect). Scales = 0.1 mm.

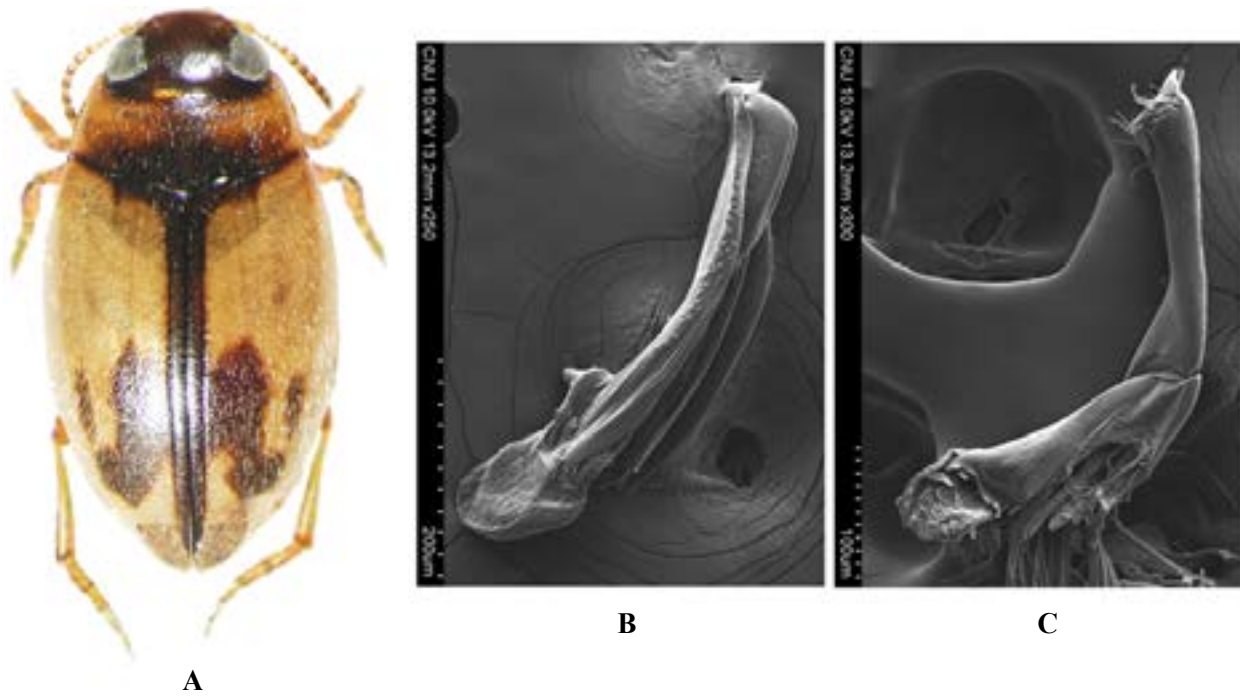


Plate 41. *Hydroglyphus geminus*. A: habitus, 2.2 mm, B: median lobe (lateral aspect), C: paramere (lateral aspect).

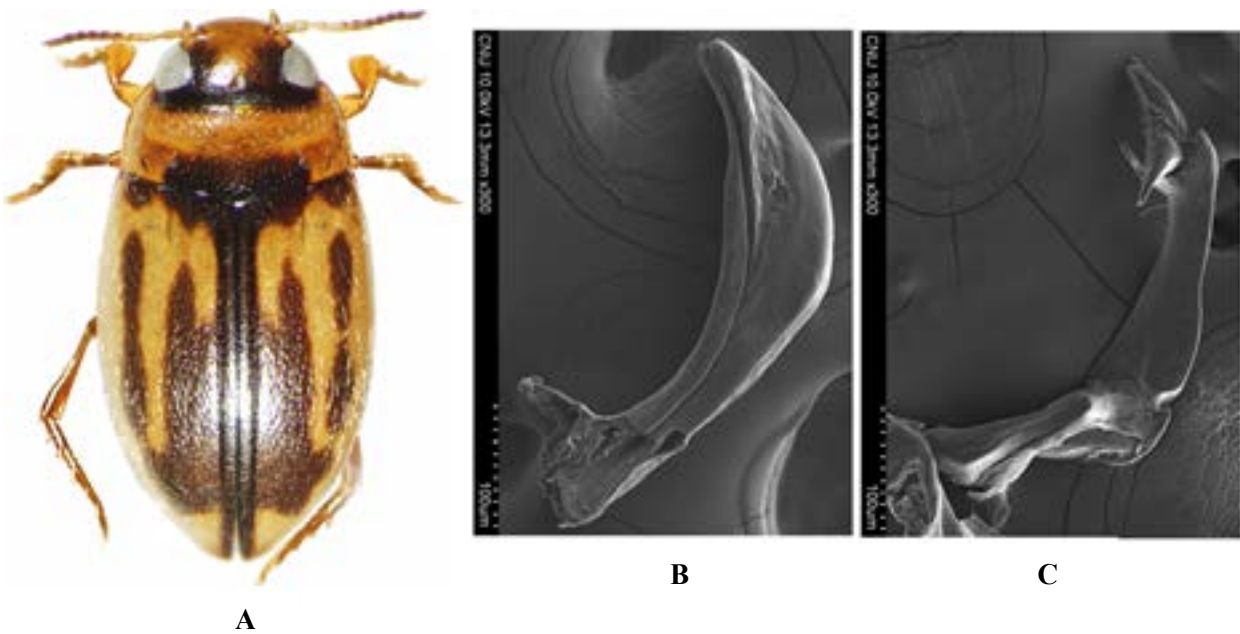


Plate 42. *Hydroglyphus japonicus*. A: habitus, 2.0 mm, B: median lobe (lateral aspect), C: paramere (lateral aspect).

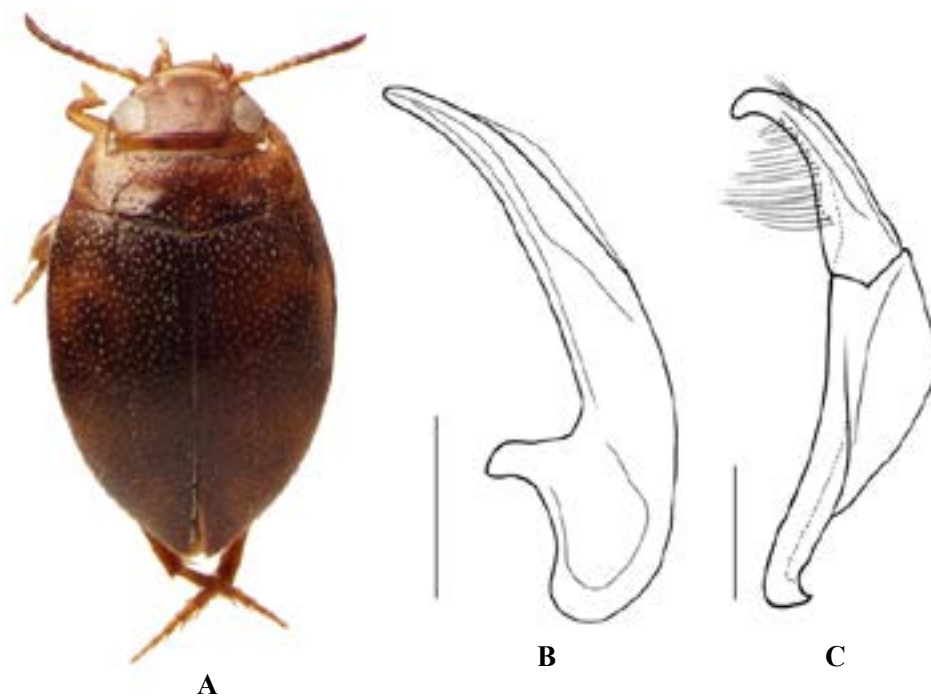


Plate 43. *Leiodytes frontalis*. A: habitus, 1.8 mm, B: median lobe (lateral aspect), C: paramere (lateral aspect). Scales = 0.1 mm.

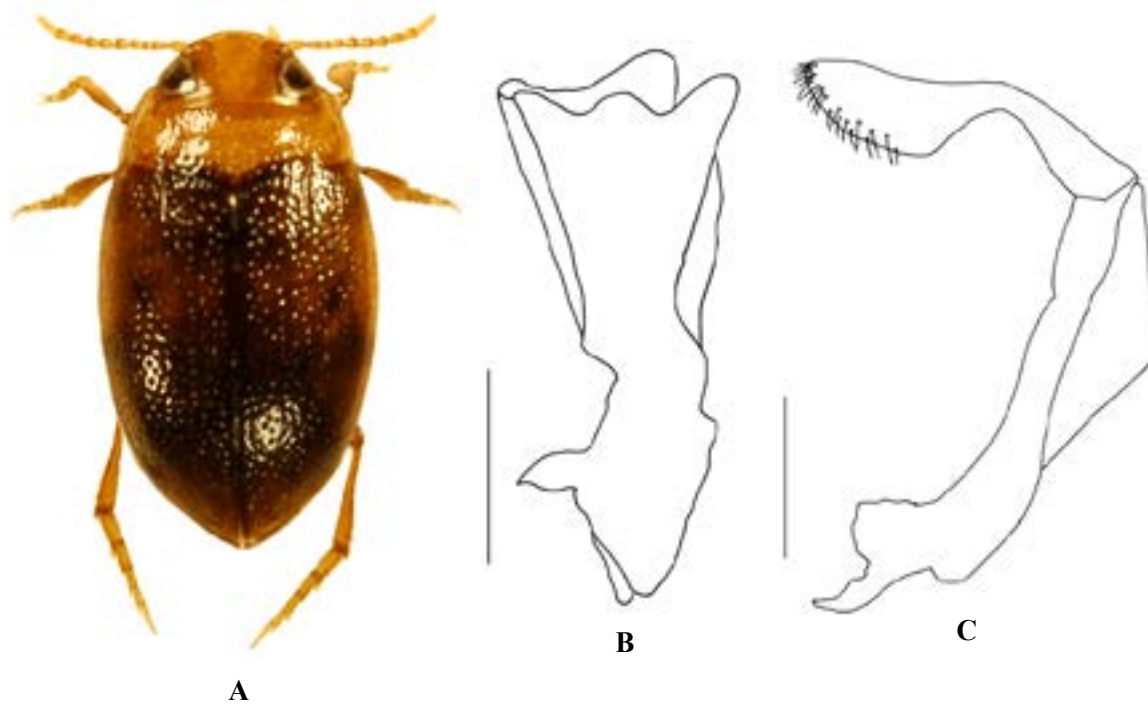


Plate 44. *Leiodytes nicobaricus*. A: habitus, 1.8 mm, B: median lobe (lateral aspect), C: paramere (lateral aspect). Scales = 0.1 mm.

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