Insect Fauna of Korea

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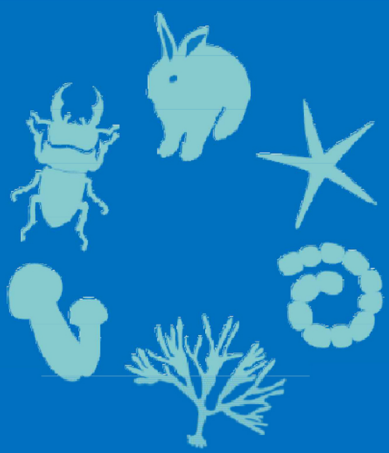

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A Korean translation of this issue is simultaneously published for Korean speaking readers. This English version therefore should be regarded as an original publication that has nomenclatural priority.

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. The book cover and the logo were designed by Jee-Yeon Koo.

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Introduction

Amongst the Korean Scarabaeoidea, the Pleurosticti and Laparosticti have been taxonomically treated by Kim (2011) and Kim (2012), respectively, in the earlier volumes of this series. However, as the families Lucanidae and Passalidae still remain to be reviewed, here we present a complete review of the Korean Lucanidae and Passalidae.

The family Lucanidae in Korea are generally large and flat beetles, measuring 4–80 mm (mostly 10–50 mm). Approximately 1,200 species have been described worldwide (Didier and Séguy, 1953; Benesh, 1960; Maes 1992; Mizunumz and Nagai 1994; Krajcik 2001), mostly from the tropics and subtropics of the Oriental region. Following Parry's (1864) report of *Cyclorasis jekelii* Parry, 1864 (=*Prismognathus dauricus* Motschulsky, 1860b) as the first lucanid species from Korea, 43 different names of species, subspecies, varieties, and synonyms have been reported from about 100 publications. In the 19th century, only four species were reported by Parry (1864) and Heyden (1887), and even in the early 20th century, only two and one additional species were recorded by van Roon (1910) and Kôno (1926), respectively. In the 1940's, many taxonomic studies on the Korean lucanids started to appear, as Nagel (1941) described one new species from Jeju-do (Is.) and Masui (1942) listed 12 species, two of which were new records. Recently, Imura and Choe (1989) and Bomans (1989) each described one new species from Korea. Kim and Kim (1998a) reviewed 27 nominal species, seven of which were synonyms and six misidentifications, and incorporated two new record species, thereby concluding the total number of the Korean lucanids to be 14 species in 10 genera. In the 21st century, Kim (2000) published a monograph of the entire fauna of Korean lucanids, and very recently, Jang and Kawai (2008) and Kim and Kim (2010) each described one new species from South Korea. Nevertheless, while the species described by Jang and Kawai (2008) (i.e., *Dorcus koreanus*) was later downgraded as a subspecies of *Dorcus carinulatus* Nagel, 1941 from Taiwan (Han et al., 2010), Kim and Kim (2010) comprehensively reviewed most of the literature related to the Korean lucanids and concluded the total number to be 17 species in eight genera.

The family Passalidae likewise are large and flat beetles, measuring 18–80 mm (mostly 25–40 mm). Approximately 500 species of 30 genera have been described worldwide, mostly found as subsocial groups in rotting logs of the tropical and subtropical forests. In Asia and Australia, only a few species of the subfamily Aulacocyclinae had been reported (Howden, 1963; Reys-Castillo, 1970; Ratcliffe, 1991; Reys-Castillo and Halffter. 1984). Meanwhile, Browne's (1993) phylogenetic study revealed the basal placement of this group and therefore considered this family as one of the basal groups of the Scarabaeoidea, together with the families Lucanidae, Trogidae, Geotrupidae, and Bolboceratinae. In Korea, only one species (*Leptaulax koreanus*) was reported as a new species in 1993.

Nevertheless, based on a phylogenetic study using morphological characters, Browne (1993) suggested that the Lucanidae and Passalidae, together with Trogidae and Bolboceratinae, are the basal groups of the Scarabaeoidea. Moreover, although the Lucanidae and Passalidae have often been viewed as the sister taxa (Howden, 1982), recent phylogenetic studies based on DNA sequence data indicated that the Diphyllostomatidae is the sister group of the Lucanidae, which, along with the Trogidae and Glaresidae, constitute the basal lineages of the Scarabaeoidea (McKenna et al., 2014).

Materials and Methods

Classification System and Taxon Sampling

This study broadly follows the classification system of Holloway (1968, 1997), Howden and Lawrence (1974), Maes (1992), and Mizunuma and Nagai (1994). A total of approximately 2,900 specimens were examined, including about 700 specimens collected by Kim[1], Jin-Ill, over the past 30 years (mostly deposited in SWU), 500 by Kim[2], Sang Il, collected over the past 10 years, and the remaining 1,700 housed in 9 major institutions. However, because some ubiquitous species tend to have myriad specimens from similar localities, we decided not to include every single record in the *Material examined* section. Here we have recorded 2,330 specimens of the Korean lucanids, which includes 3 specimens housed in BMNH, in addition to those housed in 9 major institutions, and 4 specimens of the Korean passalids. The acronyms of depositories and the number of examined specimens from each institution are summarized in Table 1.

In addition, abbreviations of the Korean toponyms used in the distributional data are as follows: [NK] North Korea; [SK] South Korea; [HB] Hamgyeongbuk-do; [HN] Hamgyeongnam-do; [YG] Yanggang-do; [CG] Chagang-do; [PB] Pyeonganbuk-do; [PN] Pyeongannam-do; [HWB] Hanghaebuk-do; [HWN] Hanghaenam-do; [GW] Gangwon-do; [GG] Gyeonggi-do; [SE] Seoul; [SG] Seoul and Gyeonggi-do; [CB] Chungcheongbuk-do; [CN] Chungcheongnam-do; [JB] Jeollabuk-do; [JN] Jeollanam-do; [JJ] Jeju-do.

Morphological Characters

Specimens were examined under a stereoscope at 7–30x magnification with fiber optic illumination. The following conventions were used in keys and descriptions. Length was measured from

Table 1. Names of depositories and their acronyms with the number of examined species and specimens of the Korean Lucanidae and Passalidae (2013).

Depository Names	Acronym	Examined	
		Spp.	Indv.
Zoological Collection, Korea University, Seoul, Korea	KU	9	591
National Institute of Agricultural Science and Technology, Suwon, Korea	NIAST	9	343
College of Agriculture and Life Sciences, Seoul National University, Suwon, Korea	SNU	11	424
Natural History Museum, Sungshin Women's University, Seoul, Korea	SWU	15/1*	671/4*
Natural History Museum, London, United Kingdom	BMNH	2	3
Jeju Folklore & Natural History Museum, Jeju, Korea	JFNM	5	33
National Institute of Biological Resources, Incheon, Korea	NIBR	9	116
Zoological Collection, Hanseo University, Seosan, Korea	HSU	3	101
Hungarian Natural History Museum, Budapest, Hungary	HNHM	8	48
Total	9 dep.	17/1*	2,330/4*

*Numbers with slash represent the number of Lucanidae/the number of Passalidae.

the apex of the mandibles to the apex of the elytra. Width was measured at the widest point of the elytra. Color was determined under fiber optic illumination. Mandibles were described as either long or short; long mandibles were longer than the length of the head while short mandibles were less than or equal to that length. For species exhibiting a high degree of polymorphism in males, mandibles were separately described for major and minor individuals. Canthi were categorized as long (dividing more than $1/2$ of each eye), medium (dividing $1/2$ of each eye) or short (dividing less than $1/2$ of each eye). Punctures were described as strong (pits >0.05 mm in diameter), moderate (pits 0.02–0.05 mm in diameter) or fine (pits <0.02 mm in diameter). For those species with punctures, puncture density was described as either dense or sparse. Dense punctures are defined as those separated by less than three puncture diameters. Sparse punctures were defined as those separated by more than three puncture diameters. The acronyms used in morphological descriptions and synonymic histories are as follows: Body length/width (BL/BW); mandible length (ML); type genus/species/locality (TG/TS/TL); synonym (Syn); the Entomological Society of Korea and Korean Society of Applied Entomology (ESK and KSAE); and the Zoological Society of Korea (KZS).

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We express our gratitude to Professor Brian D. Farrell (Harvard University, USA) for reviewing the English volume of this work, and Dr. Gary D. Alpert (Harvard University, USA) for allowing us to use his auto-montage imaging system. We also thank Dr. Maxwell V.L. Barclay (Natural History Museum, UK) for permitting us to review invaluable type specimens at the museum; Dr. Ottó Merkl (Hungarian Natural History Museum, Hungary) for loaning us important North Korean materials; Dr. Sang-wook Park (Forest Insect Diversity Research Institute, Korea) for providing us with passalid specimens; and Dr. Young Bok Cho (Hannam University, Korea) for reviewing the Korean volume of this work.

Taxonomic Notes

Coleoptera: Scarabaeoidea Latreille, 1802

Lucanidae and Passalidae

Key to the Higher Taxa of Scarabaeoidea in Korea

1. Body stout; antennomeres flat, capable of being tightly closed together at antennal club ····· ····· Pleurosticti and Laparosticti
− Body elongate, depressed; antennomeres usually stout, incapable of being tightly closed together at antennal club ····· 2
2. Antennae geniculate with distinctly long scape; mentum simple ····· Lucanidae
− Antennae slightly curved overall with relatively short scape, mentum markedly emarginate at anterior ····· Passalidae

Family Lucanidae Latreille, 1804

Lucanides Latreille, 1804: 234 (TG: *Lucanus* Scopoli, 1763).

The family Lucanidae is composed of four subfamilies Aesalinae, Lampriminae, Syndesinae, and Lucaninae, but the first three include only a small number of species with extremely restricted distribution. Burmeister (1847) once treated Figulinae (or Fignulidae) as a separate subfamily, but it is now considered as a tribe within the Lucaninae. In fact, a recent molecular phylogenetic study on world stag beetles conducted by Kim[2], Sang Il, corroborates this view that most subfamilies proposed to date, including Figulinae, belong to the Lucaninae, and found the Syndesinae as a polyphyletic group, thereby necessitating major revisions of the current classification system even at the level of subfamily (Kim and Farrell, 2015). Since the Lucaninae is the only subfamily present in Korea, the other three are not discussed any further in this work.

Key to the Tribes of Lucanidae in Korea

1. Body color metallic green to bronze; eyes not divided by canthi ····· Platycerini
− Body color orange to black; eyes partially or completely divided by canthi ····· 2
2. Elytra elongate with nine strong striations; antennal club three segmented; adults with a low degree of sexual dimorphism ····· 3
− Elytra oval without nine strong striations; antennal club four segmented; adults with a high degree of sexual dimorphism ····· 4
3. Mandibles without vertical appendage ····· Figulini

– Mandibles with one vertical appendage ····· Nigidiini
4. Body brown to black; male head without projected anterior vertices; female head with two protuberances juxtaposed in center or elytra with distinct striation ····· 5
– Body orange to dark brown; male head with distinctly projected anterior vertices; female head without two protuberances in center and elytra without striation ····· 6
5. Mesotibiae with single distinct spine ····· Dorcini
– Mesotibiae with two distinct spines ····· Aegini
6. Body not covered with hair; head with simple posterior margin; mesotibia with one or two spines and metatibia with none to two spines ····· Cladognathini
– Body covered with yellowish hairs; head significantly developed with crowned posterior margin due to two well-developed protrusions in males; mesotibia with three or more spines and metatibia with two or more spines ····· Lucanini

Tribe Platycerini Mulsant, 1842

Platycérares Mulsant, 1842: 593 (TG: *Figulus* MacLeay, 189: 109).

Genus *Platycerus* Geoffroy, 1762

Platycerus Geoffroy, 1762: 59 (TS: *Scarabaeus caraboides* Linnaeus, 1758).
Systenocerus Weise, In Heyden et al., 1883: 93 (TS: *Scarabaeus caraboides* Linnaeus, 1758).
Systenus Sharp and Muir, 1912: 573 (TS: *Scarabaeus caraboides* Linnaeus, 1758).

1-1. *Platycerus hongwonpyoi hongwonpyoi* Imura and Choe, 1989 (Fig. 1)

Platycerus hongwonpyoi Imura and Choe, 1989: 20 (TL: Mt. Jirisan); Kim, 1993: 64, 2000: 20; Park and Kim, 1993: 112; ESK & KSAE, 1994: 146; Kim and Kim, 1998: 22; Krajcik, 2001: 3.
Platycerus delicatulus (misidentification and citation): Mochizuki and Tsunekawa, 1937: 90 (first record from Korea); Masui, 1942: 71; Cho, 1995: 208, 1957: 116, 1969: 613; KZS, 1968: 133; Kim and Kim, 1972a: 83; Kim, 1993: 68; ESK & KSAE, 1994: 146 (nec Lewis, 1883).
Platycerus acuticollis (misidentification and citation): Kurosawa, 1976: 2, 1985: 332; Kim, 1978: 314; ESK & KSAE, 1994: 146 (nec Kurosawa, 1969).
Platycerus sp.: Watanabe, 1989: 29.
Platycerus hongwonpyoi hongwonpyoi: Mizunuma and Nagai, 1994: 210; Bartolozzi and Sprecher-Uebersax, 2006: 67; Kim and Kim, 2010: 57.

Type depository: 1♂ holotype - Department of Agricultural Biology, College of Agriculture, Chungnam National University; 5♂♂ paratypes - K. Masumoto, Tokokhama, and Y. Imura's collections.

Description: ♂. Body metallic bluish green dorsally and lustrous black ventrally; mandibles short, very sharp at apex, strongly punctured with long yellowish sparse hair, and slightly arcuate with one bluntly bilobed internal tooth near base and one flattened internal tooth near apex; head strongly punctured entirely with long sparse hair behind compound eyes, and narrower than pronotum; clypeus shortly projected; canthus absent; pronotum wider than elytra, widest at middle, entirely rounded with bumpy lateral margins and long sparse hair, anterior angles roundly projected and posterior angles sharply edged; elytra moderately punctured, weakly convex, and ovally elon-gate; legs generally black to dark brown except for yellowish brown femora with no lateral spine on both mesotibia and metatibia.

♀. Body brassy dorsally and lustrous brown ventrally; mandibles short, and very sharp at apex with one flattened internal tooth; head strongly puncturedd, and narrower than pronotum; clypeus imperceptibly projected; canthus absent; pronotum rounded with bumpy lateral margins and short sparse hairs; elytra moderately puncturedd, weakly convex, and longitudinally shorter than those of males; legs generally reddish brown except for dark brown knees with no lateral spine on either mesotibia or metatibia. BL: ♂ 7.8–10.5 mm; ♀ 8.5–11.0 mm.

1-2. *Platycerus hongwonpyoi merkli* Imura and Choe, 1989 (Pl. 5 Figs. 1, 2)

Platycerus hongwonpyoi merkli Imura and Choe, 1989: 21 (TL: Mt. Manmulsan in Mt. Geumgangsan); Kim, 1993: 61; Kim, 2000: 20; Kim and Kim, 1998: 23; Mizunuma and Nagai, 1994: 210; Bartolozzi and Sprecher-Uebersax, 2006: 67; Kim and Kim, 2010: 57.

Type depository: 1♂ holotype & 1♀ allotype - Hungarian Natural History Museum, Budapest, Hungary.

Description: This subspecies is morphologically almost identical with its nominal subspecies but can be distinguished by the larger body size, males dorsally darkish blue in color with weak purplish luster, inevidently arcuate mandible and narrower elytra (Imura and Choe 1989). BL: ♂ 10.5 mm; ♀ 11.0 mm.

Korean record: ⟨*P. h. hongwonpyoi*⟩ GW- Mt. Seolaksan, Mt. Gyebangsan, Mt. Chiaksan, GG- Mt. Godaesan, Mt. Soyosan, Mt. Chukryeongsan, Gwangleung, Mt. Cheonmasan, Namyangju, Mt. Dobongsan, Mt. Cheonggyesan, Mt. Yongmunsan, Gwacheon, Gwangju, CB- Mt. Soknisan, CN- Mt. Gyeryongsan, GB- Mt. Sobaeksan, Mt. palgongsan, Mt. Gayasan, GN- Mt. Jirisan, (Type specimen), Mt. Gajisan, Mt. Wonhyosan, JB- Gochang, Muju, Mt. Deogyusan, Mt. Moaksan, JN- Mt. Jirisan, Mt. jogyesan; ⟨*P. h. merkli*⟩ GW- Mt. Geumgangsan (Mt, Manmulsan, Guryong-chon).

Material examined (34ex): [SWU] ⟨*P. h. hongwonpyoi*⟩ Hongcheon Mt. Gyebangsan (1♀, 14. vi.1995); GG- Mt. Chukryeongsan (1ex, 5.vi.1999), Gwangleung (2ex, 19.v; 2.vi.1994), Namyangju (1♀, 23.v.1996), Gwangju (1♀, 7.v.1999), Gwacheon (1♂, 1.v.1993); CN- Mt. Gyeryongsan (1♀, 6.vi. 1981; 1♂, 24.iv.1983; 3ex, 28.v.1999); GB- Mt. Sobaeksan (2♂♂1♀, 28.v.1999); JB- Mt. Deogyusan (2♂♂, 20.v.1983; 4♂♂5♀♀, 25.v.1993), Gochang (1♀, 23.v.1999); [SNU] GN- Mt. Jirisan (1♂, 15.v. 1990); [KU] GW- Hongcheon Sambong-Yaksu (1ex, 10.vi.1995); GG- Mt. Dobongsan (1ex, 25.v.1925), Mt. Cheonmasan & Mt. Cheonggyesan (2ex, vi.1987; 1991); ⟨*P. h. merkli*⟩ [HNHM] NK, GW- Mt. Geumgangsan (Holotype, Mt. Manmulsan, 30.v.1970, S. Mahunka and H. Steinmann; 1♀, Paratype, Guryong-chon, 1.vi.1970, S. Mahunka and H. Steinmann).

Distribution: China, Korea.
Korea: Central, South.
Host plants: Deciduous broadleaf trees. Females oviposit on dead branches with diameters around 100–150 mm (Watanabe, 1989).
Biology: Adults of both sexes are found on the sprouts of various *Quercus* species. This species is the only lucanid species that is diurnal in Korea, and adults are active flyers. Watanabe (1989) noted that males fly around the deciduous forest beginning in April. Although no adult has been observed ovipositing directly on a dry branch, both adults and larvae appear highly resistant to desiccation. Under favorable conditions, up to 100 oviposition marks have been found on a single branch of the diameter 3 cm and the length 80 cm. In addition, this species was found above 300 m in northern regions, 800 m in southern regions of South Korea, but has never been observed in Jeju-do.

Tribe 2. Figulini Burmeister, 1819

Figulidae Burmeister, 1873: 428 (TG: *Figulus* MacLeay, 189: 109).

Genus 2. *Figulus* MacLeay, 1819

Figulus MacLeay, 1819: 109 (TS: *Lucanus* striatus Olivier, 1789).
Eudora de Castelnau, 1840: 174 (TS: *Eudora midas* de Castelnae, 1840).

Key to the species of *Figulus* in Korea

1. Mandibles with sharply monofid apex; pronotum strongly and densely punctured ..... *F. punctatus*
– Mandibles with bluntly bifid apex; pronotum sparsely punctured 2
2. Mandibles flattened; anterior margin of pronotum rounded; lateral margins of pronotum slightly angulated at a little behind of middle; metatibiae with one lateral spine ..... *F. venustus*
– Mandibles cylindrical; anterior margin and lateral margins of pronotum parellel; metatibiae with two lateral spines ..... *F. binodulus*

2. *Figulus punctatus* Waterhouse, 1873 (Fig. 2)

Figulus punctatus Waterhouse, 1873: 278 (TL: S. Japan); Koh, 2003: 68 (first record from Korea); Kim and Kim, 2010: 58.
Type depository: 1 holotype - Natural History Museum, London, UK.

Description: Body reddish black to black with strong luster; mandibles short with one internal tooth only; head anteriorly concave and strongly punctured; clypeus broad and slightly bisinuate; canthi thickly broadened, forming obtuse angles both anteriorly and posteriorly, and long, dividing compound eyes completely; pronotum broader than head, wider longitudinally than horizontally, strongly punctured at sides while smoothly punctured in center where furrowing occurs with strong and dense puncture, and lateral margins near posterior end dentate; elytra elongate, as wide as pronotum, with nine striations, central five deep and others becoming shallower toward margins on each elytron; legs black to brownish black with three lateral spines on each mesotibia and two lateral spines on each metatibia. BL: 8.0−12.0 mm.

Korean record: JN- Is. Gageodo, JJ- Seogwipo.
Material examined (1ex): [NIBR] JJ- Gamsan-ri, Andeok-myeon, Seogwipo-si (1ex, 8.iii.2009, S.I. Kim).
Distribution: Taiwan, Korea (Jejudo Is.), Japan.
Korea: Central, South.
Host plants: This species is mostly found on *Celtis sinensis* Persson, but sometimes can also be found on various *Quercus* species, such as *Quercus variabilis* Blume. In Japan, Kurusowa (1985) reported *Castanopsis* and evergreen *Quercus* species of the family Fagaceae as host plants, and Yoshida (1996) added that this species could be easily found inside thin branches of broadleaf trees fell on the ground.
Biology: Both adults and larvae are often observed together in humid coastal lowland, burrowing in rotten wood. Adults are carnivorous feeding on tiny insects or other creatures. In Japan, Kurosawa (1985) reported that this species can be found throughout the year, and Yoshida (1996) added this species to be univoltine.

3. *Figulus venustus* Bomans, 1989 (Fig. 3)

Figulus venustus Bomans, 1989: 16 (TL: Environ de Séoul, Corée) (first record from Korea); Krajcik, 2001: 13; Bartolozzi and Sprecher-Uebersax, 2006: 69; Kim and Kim, 2010: 58.
Figulus binodulus (misidentification): Kim and Kim, 1998: 22; Kim, 2000: 20.
Type depository: 1 holotype & 1 paratype - Natural History Museum, London, UK (The original description indicated two additional paratypes to be in J,P. Lacroix's Collection, but the current depository of these specimens could not be confirmed).

Description: Body brownish black with strong luster; mandibles short and thickly flattened with two internal teeth on left mandible, one internal tooth on right mandible and bluntly bifid apex; head slightly depressed anteriorly, strongly and densely punctured around eyes and sparsely punctured overall; clypeus obtusely bidentate with sparse golden hair; canthi thickly flattened, forming obtuse angles both anteriorly and posteriorly, anterior angle rather rounded, and long, dividing compound eyes completely; pronotum flat, slightly broader than head, broadest at a little behind of middle where lateral margins slightly angulated, wider horizontally than longitudinally, finely punctured entirely with some irregular strong puncture, slightly furrowed in with dense puncture in center and lateral margins near posterior angles smooth; elytra elongate, as wide as pronotum, with nine striations, central six deep and others becoming shallower toward margins on each elytron;

legs brownish black with four dents on each protibia, three lateral spines on each mesotibia and one lateral spine on each metatibia. BL: 13.0 mm.

Material examined (2ex): [BMNH] SE- Environ de Séoul (1 holotype and 1 paratype, 1913).
Distribution: Korea.
Korea: Central.
Host plants and biology: No specimen other than the type specimens is known, and this no ecological information could have been confirmed.

4. *Figulus binodulus* Waterhouse, 1873 (Fig. 4)

Figulus binodulus Waterhouse, 1873: 277 (TL: S. Japan); Mizunuma and Nagai, 1994: 299 (first record from Korea); An, 1999: 43; Bartolozzi and Sprecher-Uebersax, 2006: 69; Kim and Kim, 2010: 59.
Type depository: 1 holotype & 2 syntypes - Natural History Museum, London, UK.

Description: Body generally black with strong luster; mandibles short and thick with two internal teeth on left mandible, one internal tooth on right mandible and bluntly bifid apex; head slightly concave anteriorly and sparsely punctured; clypeus obtusely bidentate with sparse golden hair; canthi thickly broadened, forming obtuse angles both anteriorly and posteriorly, and long, dividing compound eyes completely; pronotum almost rectangular shape, slightly broader than head, wider horizontally than longitudinally, finely punctured entirely with some irregular strong puncture, vaguely furrowed with dense punctures in center and posterior angles smoothly rounded without dentation; elytra elongate, as wide as pronotum, with nine striations, central six deep and others becoming shallower toward margins on each elytron; legs black to brownish black with three lateral spines on each mesotibia and two lateral spines on each metatibia. BL: 9.0−16.0 mm.

Korean record: GN- Temple Ssanggyesa Hadong, JN- Is. Hongdo Sinan.
Material examined (3ex): [SWU] GN- Temple Ssanggyesa (1♀, 5.vi.1971, S.J. Jeong); JN- Is. Hongdo (1♀, 2.xii.2007, H.G. Jang); [NIBR] JN- Is. Hongdo (1♀, 2.xii.2007, H.G. Jang).
Distribution: Vietnam, China, Taiwan, Korea, Japan.
Korea: South.
Host plants: This species is mostly found on *Celtis sinensis* Persson. In Japan, Kurosawa (1985) reported this species to be found in rotting logs of various deciduous trees, and Yoshida (1996) noted this species to be abundant in slender branches of deciduous trees, often fallen on the ground.
Biology: The population found in Hongdo (Is.) was observed burrowing in the rotting *C. sinensis* Persson in the deciduous forest slightly distant from the coast. This species is mostly univoltine, laying eggs in the spring, and the adults emerge around September to October, spending winter as a group. Adults are carnivorous feeding on tiny insects or other creatures.

Tribe Nigidiini Jakobson, 1911

Nigidiini Jakobson, 1911: 142 (TG: *Nigidius* MacLeay, 1819: 108).

Genus *Nigidius* MacLeay, 1819

Nigidius MacLeay, 1819: 108 (TS: *Nigidius cornutus* MacLeay, 1819).
Eudora de Castelnau, 1840: 174 (TS: *Eudora midas* de Castelnau, 1840).
Hadronigidius Kraatz, 1896: 65 (TS: *Hadronigidius bennigsenii* Kraatz, 1896).

5. *Nigidius miwai* Nagel, 1941 (Fig. 5)

Nigidius miwai Nagel, 1941: 66 (TL: Insula Quelpart=Is. Jejudo; first record from Korea); Didier and Séguy, 1953: 178; Benesh, 1960: 34; Maes, 1992: 46; Krajcik, 2001: 17; Koh, 2003: 67; Kim and Kim, 2010: 59.

Type depository: The original description indicated one male holotype to be in Yushiro Miwa's Collection, but the current depository of this specimen could not be confirmed.

Description: Body generally black to reddish black with strong luster; mandibles short with one distinct lateral appendage, two internal teeth on left mandible, and one internal tooth on right mandible; head flat, irregularly punctured, and slightly concave in center; clypeus broad and vaguely bidentate; canthi very thick and long, dividing compound eyes completely; pronotum wider than head, and furrowed in with dense puncture in center; elytra elongate with nine deep striations on each elytron; legs black to brownish black with three lateral spines on each mesotibia and two lateral spines on each metatibia. BL: 14.5–16.5 mm.

Korean record: JJ- Andeok.
Material examined (1ex): [NIBR] JJ, Gamsan-ri, Andeok, Seogwipo (1♂, 21.xii.2007, S.I. Kim).
Distribution: Korea.
Korea: Jejudo.
Host plants: *Celtis sinensis* Persson.
Biology: Similar to *Figulus punctatus*, this species is found in the humid coastal lowland, burrowing in rotten wood. It also has similar life cycle as *F. binodulus*. Females lay eggs in the spring, and the adults emerge around September to October, spending winter inside the wood in a subsocial group. Adults are carnivorous feeding on tiny insects or other creatures.

Tribe Dorcini Parry, 1864

Dorcidae Parry, 1864: 86 (TG: *Dorcus* MacLeay, 1819: 111).

Genus *Dorcus* MacLeay, 1819

Dorcus MacLeay, 1819: 111 (TS: *Scarabaeus parallelipipedus* Linnaeus, 1758).
Serrognathus Motschulsky, 1861: 11 (TS: *Serrognathus castanicolor* Motschulsky, 1861).
Serrognathus (*Lasiodorcus*) Didier, 1931: 196 (TS: *Lucanus gypaetus* de Castelnau, 1840).
Serrognathus (*Brontodorcus*) Didier, 1931: 205 (TS: *Eurytrachelus alcides* Snellen van vollenhoven, 1865).
Macrodorcas Motschulsky, 1861: 15 (TS: *Psalidostomus rectus* Motschulsky, [1858]).
Macrodorcus [sic] Felsche, 1898: 48 (TS: *Psalidostomus rectus* Motschulsky, [1858]).
Macrodorcas (*Miwanus*) Maes, 1990: 12 (TS: *Leptinopterus formosanus* Miwa, 1929b).
Hemisodorcus Thomson, 1862: 397, 421 (TS: *Lucanus nepalensis* Hope, 1831).
Hemisodorcus (*Paradorcus*) Maes, 1990: 14 (TS: *Macrodorcus montivagus* Lewis, 1883).
Eurytrachelus Thomson, 1862: 398, 421 [TS: *Dorcus tityus* (Hope, 1842c)].
Ditomoderus Parry, 1864: 45 (TS: *Ditomoderus mirabilis* Parry, 1864).
Aulacostethus Waterhouse, 1869: 13 (TS: *Aulacostethus archeri* Waterhouse, 1869).
Falcicornis Planet, 1894: 44 (TS: *Falcicornis groulti* Planet, 1894).
Digonophorus Waterhouse, 1895: 157 (TS: *Digonophorus atkinsoni* Waterhouse, 1895).
Aegomorphus Houlbert, 1914: 344 (TS: *Aegomorphus ruditemporalis* Houlbert, 1914).
Pelecognathus Houlbert, 1915a: 52 [TS: *Pelecognathus prosopocoeloides* (Houlbert, 1915a)].
Durelius Houlbert, 1915b: 92 (TS: *Dorcus derelicticus* Parry, 1862).
Eurytrachellelus Didier, 1931: 185 [TS: *Dorcus tityus* (Hope, 1842c)].
Eurytrachellelus (*Eurydorcus*) Didier, 1931: 196 [TS: *Dorcus reichei* (Hope, 1842c)].
Eurytrachellelus (*Telodorcus*) Didier, 1931: 196 (TS: *Lucanus saiga* Olivier, 1789).
Eurytrachellelus (*Goniodorcus*) Didier, 1931: 196 (TS: *Eurytrachelus coranus* Gestro, 1881).
Dorcus (*Dynodorcus*) Didier, 1931: 195 [TS: *Dorcus antaeus* (Hope, 1842c)].
Pogonodorcus Séguy, 1954: 189 (TS: *Prosopocoilus elegantulus* Albers, 1891).
Epidorcus Séguy, 1954: 192 (TS: *Cladognathus piceipennis* Westwood, 1855).
Nipponodorcus Nomura and Kurosawa, In Nomura, 1960: 41 (TS: *Eurytrachelus rubrofemoratus* Snellen van Vollenhoven, 1865).
Velutinodorcus Maes, 1992: 95 (TS: *Dorcus velutinus* Thomson, 1862).

As many genera have recently been synonymized under *Dorcus*, the Korean species of the corresponding genera are all treated as the species of *Dorcus* in this publication.

Key to the species of *Dorcus* in Korea

1. Body black in color without setae on elytra ····· 2
− Body brown to black in color with yellowish to dark brown setae which form five longitudinal rows on each elytron ····· 6
2. Femora and metasternum dark red in color; mandibles with three to four internal teeth near apex

..... *D. rubrofemoratus rubrofemoratus*

– Femora and metasternum black; mandibles with one major internal tooth in middle or near base 3

3. Mandibles with one major internal tooth near base and multiple blunt teeth up to near apex ··· 4
– Mandibles with one major internal tooth in middle without multiple blunt teeth ····· 5
4. Male clypeus slightly concave in middle; last abdominal sternite of males slightly projected at apex; strong puncture on entire elytra of females, extended closely to elytral suture; protibiae slightly arcuate inward in females ····· *D. consentaneus consentaneus*
– Male clypeus distinctly bilobed; last abdominal sternite of males flat throughout; moderate puncture on entire elytra of females, extended distantly from elytral suture; protibiae straight in female ····· *D. titanus castanicolor*
5. Mandibles relatively thick and gently arcuate inward with one sharp internal tooth in middle; clypeus broad with roundly concave anterior margin in males; elytra striated in small males and females ····· *D. hopei binodulosus*
– Mandibles slender, straight throughout and curved inward near apex with one major internal tooth at one third portion from apex; clypeus broad rectangular in shape, both ends of anterior margin slightly projected and convex in center of anterior margin in males; elytra not striated ··· ..... *D. rectus rectus*
6. Body reddish to dark brown in color with tenuous dark brown setae; clypeus broad rectangular shape in males and trapezoid shape in females; protibiae thickly broadened, broadest apically, and slightly curved inward ····· *D. tenuihirsutus*
– Body brown in color with thick yellowish to brown setae; clypeus trapezoid shape in males and triangular and slightly curved outward in females ····· *D. carinulatus koreanus*

6. ***Dorcus rubrofemoratus rubrofemoratus*** (Snellen van vollenhoven, 1865) (Fig. 6)

Eurytrachelus rubrofemoratus Snellen van Vollenhoven, 1865: 152 (TL: Japan); van Roon, 1910: 35 (first record from Korea); Kôno, 1926: 88 (*rufofemoratus* [sic]); Miwa, 1927: 29; Cho, 1931: 59; 1947: 65; 1955: 208; Miwa, 1933: 360; Nakatomi, 1934: 655; Kôno, 1935: 162.

Macrodorcus rubrofemoratus: Mochizuki and Tsunekawa, 1937: 90; Mori and Cho, 1938: 36; Masui, 1942: 69; Kim, 1960: 26; Cho, 1969: 612.

Eurytrachellelus rubrofemoratus: Didier and Séguy, 1953: 139.

Macrodorcas rubrofemoratus: Miwa et al., 1936: 5; Mochizuki, 1937: 90; Miwa, 1942: 69; Cho, 1957: 115; 1965: 39; Kim, 1958: 91; 1960: 26; Benesh, 1960: 79; Cho, 1967: 197; Hyun and Woo, 1969: 192; Kim et al., 1984b: 326; Park and Cho, 1986: 127.

Nipponodorcus rubrofemoratus: Nomura, 1960: 41; 1963: 106; KZS, 1968: 133; Cho, 1969: 612; Kurosawa, 1976: 8; Kim, 1978: 308 (Nippondorcus [sic]); Lee and Kwon, 1981: 154; Nam and Kim, 1982: 128; Kurosawa, 1985: 339; Yoon et al., 1990: 110; Kim, 1993: 61; Park et al., 1993: 177; ESK & KSAE, 1994: 145; Kim and Kim, 1998: 27; 1998b: 169; Kim, 2000: 27.

Eurytrachellelus haitschunus: Didier and Séguy, 1952: 227 (TL: Fokien, China); 1953: 138; Benesh, 1960: 78 (*Macrodorcas*); Maes, 1992: 85 (*Hemisodorcus* [*Nipponodorcus*]).

Nipponodorcus rubrofemoratus rubrofemoratus: Kurosawa, 1976: 8.

Hemisodorcus (*Nipponodorcus*) *rubrofemoratus rubrofemoratus*: Maes, 1992: 86.
Dorcus rubrofemoratus: Mizunuma and Nagai, 1994: 264.
Dorcus rubrofemoratus rubrofemoratus: Kim and Kim, 2010: 61.

Type depository: 1♂ lectotype - Rijksmuseum van Natuurlijke Historie (=National Museum of Natural History), Leiden, the Netherlands. This museum is now incorporated into Naturalis Biodiversity Center.

Description: ♂. Body generally black with weak luster; mandibles slender and slightly arcuate inward with three to four oblique internal teeth near apex, innermost tooth largest and rest smaller, length varies depending on size and small individuals may lack minor teeth; head as large as pronotum and concave in center; clypeus broad rectangular shape, four times as broad as long; canthi thick and medium, dividing about a half of compound eyes; pronotum convex with lateral margins angling inward in anterior fifth and posterior third; elytra slightly convex and moderately punctured with rough surface; legs generally black, except for dark red femora, with one lateral spine on each mesotibia and no lateral spine on metatibia.

♀. Body dark brown to black without luster; mandibles short and slightly arcuate with one major internal tooth pointing inside and one vague overlapping tooth pointing upward in middle; head broad and finely punctured with two distinct protuberances juxtaposed in center; clypeus prominently projected and concave at apex; canthi medium, dividing about a half of compound eyes; pronotum rounded with lateral margins angling inward in posterior third; elytra convex, moderately punctured in center with rough surface and finely punctured at sides; legs generally black except for dark red femora with one lateral spine on each mesotibia and none or one tiny lateral spine on each metatibia. BL: ♂ 18–58.5 mm; ♀ 19–38 mm; ML: 3–14 mm.

Korean record: NK, HN- Songheung, Mt. Bujeonryeong, Temple Seokwangsa, PB- Mt. Myohyangsan, GW- Mt. Geumgangsan, Mt. Bogaesan, SK, GW- Goseong, Yangyang, Mt. Geonbongsan, Mt. Hyangnobong, Mt. Gachilbong, Mt. Seolaksan, Gangneung, Samcheok, Mt. Sogeumgang, Mt. Odaesan, Mt. Gyebangsan, Mt. Bangdaesan, Pyeongchang, Jeongseon, Imgye, Hongcheon, Mt. Chiaksan, Wonju, Mt. Taebaeksan, Mt. Hambaeksan, Chuncheon, Samcheok, GG- Iss. Deokjeokgundo, Mt. Bogaesan, Mt. Myeongjisan, Gapyeong, Mt. Yongmunsan, Yangpyeong, Gwangneung, Mt. Soyosan, Mt. Baekunsan, Mt. Chuknyeongsan, Mt. Cheonmasan, Mt. Dobongsan, Suwon, CB- Goesan, Mt. Wolaksan, Mt. Soknisan, GB- Is. Ulneungdo, Mt. Seondalsan, Yeongju, Mt. Sobaeksan, Mt. Baekamsan, Bonghwa, Uljin, Andong, Mt. Juwangsan, Mt. Gayasan, GN- Jirisan, JB- Mt. Deogyusan, Muju, Mt. Naejangsan, JN- Mt. Baekyangsan, Mt. Jirisan, Gwangyang, Mt. Baekunsan, Dapgok, JJ- Jeju-do.

Material examined (158ex): [SWU] NK, HN- Mt. Bujeonryeong (1ex, 27.vii.1933); Mt. Hyangnobong, Mt. Odaesan, Mt. Bangdaesan, Mt. Chiaksan, Mt. Taebaeksan, Mt. Hambaeksan (15ex, vi–viii.1985–1999), Mt. Odaesan (2♀♀, 10, 11.viii.1997), Mt. Sogeumgang (1♂, 18.viii.2001); GG- Mt. Yongmunsan (4♀♀, 25.viii.1998; 1♂, 28.vii.2000), Mt. Chuknyeongsan, Mt. Cheonmasan (2ex, viii, x.1984), Gwangneung (2ex, viii.1991; ix.1988); GB- Mt. Seondalsan, Yeongju (3♂♂, 29.vi.1998), Mt. Sobaeksan (2♀♀, 2.viii.1994), Uljin (2♀♀, 31.vii.1999), Uljin Sogwang-ri (5ex, vii, viii.1999); GN- Sancheong Jungsan-ri (5ex, 30.viii.1981); JB- Mt. Deogyusan (2ex, vii.1990; viii.1993); JN- Gwangyang (2ex, vii, viii.1993, 1994), Mt. Baekunsan (2♀♀, 12.viii.1994; 10.viii.1993); JJ- Jeju (1♂, 4.viii.1997); [NIBR] GW- Goseong (1♀, 25.viii.2002), Yangyang (1♀, 26.viii.2002), Gangneung (1♀, 27.viii.2002), Pyeongchang (1♀, 23.vii.1998), Jeongseon (1♀, 22.vii.1998), Wonju (1♀, 19.viii.2006); GG- Gapyeong (1♀, 25.vi.2006), Yangpyeong (1♀, 25.viii.1998); [HNHM] NK, PB- Mt. Myohyang-

san (2ex, 17.viii.1956; 1♂2♀ ♀, 14, 16.vii.1982; 1♀, 6.vii.1991); GW- Mt. Geumgangsan (1♀, 24.vii. 1982); SK, GW- Gangneung (1♂, 7.viii.2003); [JFNM] JJ- Jeju (1♀, 14.vii.1994); [NIAST] NK, HN- Temple Seokwangsa (2ex, 10.viii.1921; 22.vii.1922); GW- Mt. Geumgangsan (1ex, 25. vii.1924), SK, GW- Hongcheon (2ex, 29.vii.1989), Mt. Chiaksa (1ex, 14.viii.1999), Samcheok (1ex, 3.vii.1993); CB- Goesan (1ex, 29.vii.1992); GB- Mt. Baekamsan (1ex, 13.viii.1999), Bonghwa (1ex, 16.vii.1992), Andong (1ex, 20.viii.1988); JB- Muju (2ex, 13.viii.1975); JN- Mt. Baekyangsan, Mt. Baekunsan (5ex, vii, viii. 1993, 1994); [SNU] GW- Mt. Odaesan (1ex, 21.vii.1974); GG- Mt. Myeongjisan (1ex, 5.v.1991), Suwon (1ex, 1.v.1997); CB- Mt. Wolaksan (2ex, 20.vi.1992; 12.vii.1983); JN- Piagol (3ex, 15.vii.1968; 20.viii. 1970), Dapgok (9ex, vi, viii.1993; 1995), Mt. Baekunsan (4ex, vi.1991,2); [KU] NK, GW- Mt. Geumgangsan (2ex, vii, viii.1930, 1934); SK, GW- Mt. Geonbongsan, Mt. Seolaksan, Mt. Gachilbong, Mt. Gyebangsan (6ex, vii, viii.1979; 1981; 1992), Jeongseon (1ex, 4.viii.1977); SG- Mt. Bogaesan, Mt. Baekunsan, Mt. Dobongsan (3ex, vii, viii.1933; 1943; 1984); CB- Mt. Soknisan (2ex, 11.viii.1930; 29.vii. 1957); GB- Is. Ulneungdo (31ex, vii, viii.1928; 1ex, 10.viii.1971), Mt. Juwangsan (1ex, 4.vi.1989), Mt. Gayasan (1ex, 13.vii.1967).

Distribution: China, NE Russia, Korea, Japan.

Korea: North, Central, South, Jejudo, Is. Ulneungdo.

Host plants: This species is mostly found on *Quercus* species. In Japan, Yoshida (1996) recorded this species as inhabiting rotten stumps or the roots of semi-withered trees in humid regions.

Biology: Kim (2000) reported that adults are nocturnal from July to August, gathering around the flowing sap of *Quercus acutissima* Carruther. We further observed the adults to appear in June, active through September. This species is an active flyer, attracted to lights between 8 and 10 PM. In Japan, Kurosawa (1985) and Yoshida (1996) noted that the adults are prevalent from July to August, and active until October in deciduous forests, especially above 900 m in altitude, filled with *Salix* species. In lowlands, this species appears completely nocturnal, but diurnal activity has been reported in highlands. This species is generally univoltine, though some major males and individuals in highlands often exhibit semivoltinism, in which case, adults spend one winter hibernating in rotten wood.

7. *Dorcus consentaneus consentaneus* (Albers, 1886) (Fig. 7)

Eurytrachelus consentaneus Albers, 1886: 28 [TL: Peking (=Beijing), China].

Eurytrachelus titanus fasolt Kriesche, 1921: 118 [TL: Pjöng-jang (= Pyeongyang), N. Korea] (first record from Korea).

Eurytrachellelus titanus var. *fasolt*: Didier and Séguy, 1953: 142.

Dorcus (*Serrognathus*) *fasolt*: Nomura, 1962: 35.

Serrognathus consentaneus: Kurosawa, 1976: 8; Kim, 1978: 310 (*consetaneus* [sic]); Nam and Kim, 1982: 128; Kim et al., 1984b: 328; 1985: 105 (*consetaneus* [sic]); Kurosawa, 1985: 344; Yoon and Nam, 1986: 157; Kim and Yoo, 1987: 505; Kim and Lee, 1989: 176, Nomura and Lee, 1992: 91; ESK & KSAE, 1994: 146; Kim, 1995b: 139; 2000: 31; Kim and Kim, 1998: 29.

Eurytrachellelus consentaneus: Maes, 1981: 3.

Serrognathus (*Serrognathus*) *consentaneus*: Maes, 1992: 87.

Dorcus consentaneus: Mizunuma and Nagai, 1994: 269; Bartolozzi, 2006: 71.

Dorcus consentaneus consentaneus: Kim and Kim, 2010: 62.

Type depository: Unknown.

Description: ♂. Body generally black to reddish black with weak luster on head and pronotum, and strong luster on elytra; mandibles long, thick, and slightly arcuate overall with one major internal tooth near base and many blunt minor teeth up to near bifid apex; however, small males may lack minor internal teeth; head broad, as wide as pronotum; clypeus broad rectangular shape, both ends of anterior margin projected, and slightly concave in center of anterior margin; canthi very thin and long, dividing about three fourths of compound eyes; pronotum broad with one small protuberance on one-third portions of each lateral margins from anterior end; elytra elongate-oval shape and impunctured; last abdominal sternite slightly projected at apex legs generally black with one lateral spine on each mesotibia and usually no spine on metatibia; however, one lateral spine rarely appears on metatibiae of some enormous males.

♀. Body reddish black to black with luster; mandibles short with one big internal tooth pointing apex in middle and one vague tooth pointing inside near base; head strongly punctured entirely and narrower than pronotum; clypeus isosceles trapezoid shape; canthi thick and long, dividing about three-fourths of compound eyes; pronotum rounded, widest at middle, and strongly punctured near anterior angles; elytra elongate and weakly lustrous due to strong puncture (puncture size about 0.05 mm in diameter), extended closely to elytral suture; legs reddish black to black, protibiae arcuate inward, and mesotibiae and metatibiae with one distinct lateral spine. BL: ♂ 19–39 mm; ♀ 18–29 mm; ML: 4–14 mm.

Korean record: NK, GW- Mt. Geumgangsan, SK, GW- Mt. Jeombongsan, Gangneung, Wonju, SG- Is. Deojeokdo, Is. Boleumdo, Is. Ganghwado, Mt. Yongmunsan, Yangpyeong, Icheon, Pocheon, Gwangneung, Maseok, Mt. Cheonmasan, Namyangju, Deokso, Dongguneung, Seoul (Wui-dong, Anam-dong, Mt. Cheonggyesan), Mt. Gwanaksan, Gwangju, Yeoju, Yanggi, Mt. Yeogisan, Ilyeong, Incheon, Anyang ↔ Suwon ↔ Hwaseong, Pyeongtaek, CB- Cheongju, Jincheon, Yeongdong, Mt. Soknisan, CN- Seosan, Mt. Gyeryongsan, GB- Uljin, Mt. Juwangsan, GN- Mt. Jirisan, Taejongdae, JB- Naebyeonsan, Gochang, Jeonju, Mt. Moaksan, JN- Mt. Baekyangsan, Mt. Jirisan, Mt. Daedunsan, Gwangyang, Mt. Baekunsan, Mt. Jogyesan, JJ- Jeju-do.

Material examined (161ex): [SWU] SG- Is. Deojeokdo, Is. Boleumdo (2ex, vii.1981; viii.1987), Pocheon (2♂♂, 8.vii.1981), Gwangju (1♂, 22.v.1994), Icheon (2♂♂, vii, viii.1984), Namyangju (1♂, 17.vii.1981; 1♀, 23.viii.1987), Seoul (1♂, 15.vii.1991; 4 sites 8ex), Incheon (1♂, 10.vii.1977), Is. Ganghwado (1♂, 18.viii.1987), Hwaseong (1♀, 3.vii.1992), other 4 sites (5ex, 1977–1996); CB- Cheongju (1ex, 26.viii.1994); [HNHM] NK, GW- Mt. Geumgangsan (1♂, 10.vii.1977); [JFNM] JJ- (12♂, 11–31. viii.; 3♂♂, 2–25.ix.1993); [NIAST] SG- Mt. Cheonggyesan, Mt. Gwanaksan (2ex, vi, viii.1975, 1976), Mt. Yeogisan (1ex, 24.vi.1993), Suwon (4ex, 29.vi.1925; 2ex, vii.1971; 1976); CB- Yeongdong (1ex, 3.viii.1993); CN- Seosan (1ex, 3.viii.1932); JN- Gwangyang (2ex, 5.viii.1994), JJ- (3ex, 16.ix.1993); [SNU] GW- Gangwon-do (1ex, vi.1983); GG- Gwangneung, Maseok (2ex, viii, ix.1984; 1990), Mt. Gwanaksan ↔ Anyang ↔ Suwon (32ex, v–vii.1952–1996), Yeoju, Yanggi (2ex, vii.1955, 1956); CB- Jincheon (2ex, vi.1983); GB- Mt. Seondalsan (1ex, 20.viii.1990); GN- Taejongdae (1ex, 26.vi.1991); JN- Mt. Jirisan (3ex, 1969; 1988; 1990), Mt. Baekunsan (1ex, 23.vi.1995), Gwangyang (2ex, ?); JJ- (5ex, 30.vii.1971), [KU] GW- Wonju (1ex, 30.v.1959); SG- Gwangneung (1ex, 25.vii.1931), Mt. Cheonmasan (4ex, v, vi. 1960; 1961; 1982), Mt. Yongmunsan, Yangpyeong (7ex, v, vi.1982), Icheon (3ex, vii, ix.1937; 1957), Seoul and around (11 sites, 18ex), Pyeongtaek (2ex, 17.vi.1975); CB- Mt. Soknisan (2ex, viii.1930; vii.1957); CN- Mt. Gyeryongsan (2ex, 4.viii.1973); GB- Uljin (1ex, 27.vi.1990); JN- Mt. Jirisan (1ex), Mt. Daedunsan, Mt. Baekunsan, Mt. Jogyesan (4ex, viii.1972–6); JJ- (4ex, vii, viii.1972, 1973).

Distribution: China, Korea, Japan (restricted to Tsushima Is.).

Korea: Central, South, Jejudo.

Host plants: This species is mostly found on *Quercus* species throughout the country.

Biology: Adults gather around the flowing sap of various *Quercus* species, such as *Quercus acutissima* Carruther (Kim, 2000). This species has a life history similar to *D. titanus castanicolor*: The adults emerge in June, and are active through October. This species is nocturnal, attracted to lights between 8 and 11 P.M. During the day, the adults hide under the bark or inside cavities of *Quercus* species, and at night, they gather around the flowing sap, fruits, or lights. The adults normally survive more than 1 year, hibernating inside rotten wood during the winter.

8. *Dorcus titanus castanicolor* (Motschulsky, 1861) (Fig. 8)

Platyprosapus platymelus Saunders, 1854: 50 (TL: China)

Serrognathus castanicolor Motschulsky, 1861: 12 [TL: Tsouzima (=Is. Tsushima), Japan].

Eurytrachelus platymelus: Heyden, 1887: 250 (first record from Korea); Okamoto, 1924: 169 (*platymerus* [sic]); Miwa, 1927: 29; Cho, 1931: 58; 1947: 65; 1956: 77; 1957: 166; 1963: 216; 1969: 610; Kamijo, 1931: 20; Miwa, 1933: 356; Haku, 1935: 58; 1936: 121; Mochizuki, 1936: 211; Masaki, 1936: 261; Miwa et al., 1936: 6; Mochizuki and Tsunekawa, 1937: 89; Mori and Cho, 1938: 36; Masui, 1942: 69 (*Eurytrachellelus* [sic] *platymerus* [sic]); Kim, 1956: 342; Ku, 1963: 27; 1966: 26; KZS, 1968: 133; Cho, 1968: 263, 379; Hyun and Woo, 1969: 192; Kim and Kim, 1974: 107 (Eurytrachellus [sic]); Shin, 1978: 143; Lee and Ko, 1988: 220; Kim, 1993: 61 (nec Saunders, 1854).

Macrodorcus platymelus: Morita, 1936: 862.

Dorcus titanus Boisduval, 1832: Kim and Kim, 1973b: 196; Shin and Park, 1980: 131.

Eurytrachellelus titanus platymelus: Didier and Séguy, 1953: 141.

Serrognathus titanus Boisduval, 1835: 237 (TL: Celebes); Benesh, 1960: 86.

Serrognathus titanus platymelus: Benesh, 1960: 87.

Dorcus titanus castanicolor: Nomura, 1960: 42; Mizunuma and Nagai, 1994: 269; Kim and Kim, 2010: 63.

Serrognathus platymelus: Kurosawa, 1976: 9; Kim and Chang, 1982: 145; Kim, 1993b: 61 (nec Saunders, 1854), Kim and Nam, 1982a: 145; Kim and Yoo, 1987: 505; Kim and Lee, 1989: 176; Kim, 1993: 64; 1994a: 147.

Serrognathus platymelus castanicolor: Kurosawa, 1976: 9; 1985: 343; Nomura and Lee, 1992: 90; Kim and Park, 1991: 134; Kim, 1994b: 110; ESK & KSAE, 1994: 146; Kim, 214; 1995b: 139; Kim and Kim, 1998: 28; An, 1999: 43; Kim, 2000: 30.

Serrognathus titanus castanicolor: Kim, 1978: 309; Yoon et al., 1979: 148; 1990: 110; Lee and Kwon, 1981: 154; Kim and Nam, 1981: 125; Park and Cho, 1986: 127; Nomura and Lee, 1992: 90; Park and Kim, 1993: 177; Bartolozzi, 2006: 77.

Serrognathus (*Serrognathus*) *platymelus platymelus*: Maes, 1992: 88 (nec Saunders, 1854).

Type depository: Unknown. Motschulsky's collection is dispersed among the Moscow State University, the Zoological Museum of Saint Petersburg, the Humboldt Museum, and the German Entomological Institute. Although the type specimen of *D. titanus castanicolor* should presumably be in one of these collections, the current depository could not be confirmed for the present study.

Description: ♂. Body generally black to reddish black with weak luster on head and pronotum, and strong luster on elytra; mandibles long, thick, and slightly arcuate overall with one major internal tooth near base and many blunt minor teeth up to near bifid apex; however, small males

may lack minor internal teeth; head broad, as wide as pronotum; clypeus broad rectangular shape, both ends of anterior margin projected, and slightly concave in center of anterior margin; canthi very thin and long, dividing about three fourths of compound eyes; pronotum broad with one small protuberance on one-third portions of each lateral margins from anterior end; elytra elongate-oval shape and impunctured; last abdominal sternite slightly projected at apex; legs generally black with one lateral spine on each mesotibia and usually no spine on metatibia; however, one lateral spine rarely appears on metatibiae of some enormous males.

♀. Body reddish black to black with luster; mandibles short with one big internal tooth pointing apex in middle and one vague tooth pointing inside near base; head strongly punctured entirely and narrower than pronotum; clypeus isosceles trapezoid shape; canthi thick and long, dividing about three-fourths of compound eyes; pronotum rounded, widest at middle, and strongly punctured near anterior angles; elytra elongate and weakly lustrous due to strong puncture (puncture size about 0.05 mm in diameter), extended closely to elytral suture; legs reddish black to black, protibiae arcuate inward, and mesotibiae and metatibiae with one distinct lateral spine. BL: ♂ 20–84 mm; ♀ 20–42 mm; ML: 4–23 mm.

Korean record: NK, HN- Songheung, PN- Pyeongyang, HWN- Haeju, GW- Mt. Geumgangsan, GG- Mt. Bogaesan, Gaeseong, SK, All areas including Is. Jejudo, Is. Hongdo and Is. Ulneungdo.

Material examined (754ex): [SWU] GW- Mt. Seolaksan (4ex, vii, viii.1974; 1977; 1990; 1997), Gangneung, Samcheok, Pyeongchang, Jeongseon (4ex, vii, viii.1985; 1990; 1991; 1998); SG- Seoul (1♂, 12.vi.1993), Iss. Deokjeokgundo, Is. Ijakdo, Is. Gyodongdo (11ex, vii, viii.1981–1997), Mt. Cheonmasan (1♂, 22.v.1976), Cheongpyeong, Daeseong-ri, Yangju, Paju, Yangpyeong, Yeoju, Yongin, Hwaseong, Anseong, Pyeongtaek (14ex, vi–viii.1985–1996); Goyang, Gwacheon (2♂♂, 10.vii.1998), Incheon (1♂, 17.viii.1987); CB- Mt. Wolaksan (1ex, 10.vii.1991), Chungju (1ex, 4.vi.1985), Boeun (1♀, 15.viii.1991); CN- Mt. Gwangdeoksan, Mt. Cheongyansan (3ex, vi, viii.1984; 1994), Is. Anmyeondo (1ex, 24.vii.1981), Boryeong (1♂, 11.vi.1999), Seocheon (1♀, 23.v.1998), Asan (1♂, 3.viii.1987; 1♀, 25.vii.1992), Onyang, Gongju (6ex, viii.1982–1992), Buyeo (1♂, 19.vii.1990); GB- Bonghwa (1♂, 1.viii.1998), Sangju (1♂, 8.viii.1996; 1♀, 2.vii.1980), Gyeongsan, Eui (2♂♂, vii.1992); GN- Sancheong (1♂, 12.vii.1995), Ulsan (2♂♂, 20.v.1991; viii.1990), Milyang (1♂, 7.viii.1990), Geochang, Changryeong, Is. Geojedo (5ex, viii–x.1985–1989); JB- Gimje, Namwon (3ex, vi, vii.1981), Mt. Naejangsan (2ex, 8.viii.1989); JN- Hampyeong, Muan (2ex, v, vii.1995; 1998), Yeonggwang, Yeosu (2♂♂, viii.1989; 1993), Is. Song-ido, Is. Geumodo, Is. Hongdo (5ex, viii.1966; 1989; 1993); inland of all S. Korea 42 sites (95ex, 1981–1996); JJ- (4ex, vii, viii.1986; 1993, 1994); [NIBR] GW- Gangneung (1♀, 24.vi.1998), Donghae (1♂, 13.vi.1997), Chuncheon (2♀♀, 26.viii.2003); CB- Jincheon (1♂, 7.vii.1998); GB- Euiseong (1♂, 24.?.1995); Mt. Gabjangsan (1♂, 2.ix.2003); GN- Ulju (1♀, 24.vii.2001), Hamyang (1♂, 30.v.1997), Milyang (1♀, 21.vi.2003), Goseong (1♂, 11.ix.1999); JN- Hwasun (1♀, 6.ix.2003), Mt. Baekunsan (1♂1♀, 19.viii.1992); Sinan (1♂, 23.viii.2006), Is. Wando (1♂1♀, 16.vii.2003); JJ- Jeju (2♂♂, 25.vii.2001), Mt. Hallasan (2♀♀, 23.viii.1992); [HNHM] NK, PN- Pyeongyang (2♂♂, 19, 20.ix.1979); GW- Mt. Geumgangsan (2ex, 24.vii.1982; 1♂, 5.ix.1989; 1♂2♀♀, 10, 13.vi.1991; lake Soheungho 1ex, 5.ix.1956; Onjeong-ri 3ex, 10.vii.1977); [JFNM] JJ- Jeju (2♀♀, viii.1993; 1994); [NIAST] NK, HN- Temple Seokwangsa (3ex, 22.vii.1922); SK, GW- Hongcheon (3ex, vi, vii.1986, 1987), Chuncheon, Yeongweol (2ex, viii.1982; 1991); GG- Gwangneung (3ex, 9.viii.1910; 24.vii.1922), Geumgok, Mt. Gwanaksan, Is. Ganghwado (54ex, vi.1974–1978), Yong-in, Mt. Yeogisan (4ex, vi–viii.1992), other 23 sites (70ex); CB- Yeongdong (2ex, 18.vii.1993), Goesan (3ex, 10.ix.1992); CN- Temple Sudeoksa (1ex, 3.viii.1990); JB- Jeongeup, Gochang (2ex, vi.1991); JN- Mt. Baekyangsan (2ex, 26.vi.1922), Mt. Jirisan (1ex, 19.vii.1981), Yeongam, Goheung, Gwangyang (6ex, vi–viii.1991–3); JJ- (6ex, vi–ix.1975; 1984; 1993), [SNU] GW-

Chuncheon, Mt. Chiaksan (2ex, vi.1986; 1998), Wonju (1ex, 26.viii.1996); GG- Gwacheon (2ex, 3.vi. 1989), Hwaseong-gun (Gwangkyo, Suwon, Mt. Chilbosan 8ex, v–viii.1983–1995); CB- Cheongju, Cheongwon, Jincheon (3ex, vi.1983; 1988; 1992); CN- Daejeon (1ex, 25.v.1986); JB- Jeonju, Jinan, Imsil (5ex, v–vii.1985, 1986; 1994); JN- Mt. Baekunsan, Dapgok (15ex, vi, viii.1991–95), Mt. Jirisan (4ex, 1969; 1979; 1981; 1997), Seungju (1ex, 15.viii.1994); JJ- (2ex, vii, viii.1971; 1995); others all S. Korea (146ex); [KU] NK, HWN- Gaeseong (1ex, 31.viii.1944), Mt. Songaksan (2ex, v, vi.1931), haeju (2ex, 14.viii.1925); SK, GW- Goseong (3ex, vi, ix.1978, 1979), Mt. Geonbongsan (3ex, 24.viii.1992), Yangyang, Cheowon (2ex, vii, viii.1931; 1934); SG- Seoul (22 sites, 45ex, 1960–1995), Seoul Cheongryang-ri, Incheon, Is. Ganghwado (7ex, vi–viii.1930–1937); JN- Mt. Daedunsan (1ex, 15.viii.1972); JJ- (7 sites, 13ex); others all S. Korea (17 sites, 50ex); [HSU] CN- Deoksan (57ex, v, vi.1994–97).

Distribution: N. China, Korea, Japan (Is. Tsushima).

Korea: Central, South, Jejudo, Is. Ulneungdo.

Host plants: This species mostly feeds on *Quercus* species in the central Korea, but in the southern provinces, it is also observed in various broadleaf trees, such as *Celtis sinensis* Persson, and *Prunus yedoensis* Matsumura. In Japan, Yoshida (1996) reported *Quercus acutissima* Carruther, and riparian *Salix* species as host plants for this species.

Biology: Adults hide under the bark or inside the *Quercus* species during the day, and gather around the flowing sap, or fruits at night (Kim, 2000). The life history of this species is highly similar to that of *D. consentanus consentaneus*, and adult hibernation has also been confirmed. In Japan, Yoshida (1996) described this species to be most abundant in July, feeding on the flowing sap of various trees, such as *Q. acutissima* Carruther and *Mallotus japonicus* (Linnaeus f.) Müller Argoviensis. The adults are nocturnal, often attracted to fruits as well.

9. *Dorcus hopei binodulosus* Waterhouse, 1874 (Fig. 9)

Platyprosapus hopei Saunders, 1854: 46 (TL: China).
Dorcus binodulosus Waterhouse, 1874: 6 (TL: Japan).
Dorcus hopei: Miwa, 1927: 29 (first record from Korea); 1933: 362; Cho, 1931: 59; 1947: 65; 1956: 61; 1957: 116; 1969: 612; Nakatomi, 1934: 654; Miwa and Chujo, 1936: 7; Mochizuki et al., 1936: 211; 1937: 90; Masui, 1942: 70; Benesh, 1960: 91; Yang and Yoon, 1962: 11; KZS, 1968: 133; Kurosawa, 1976: 9; Kurosawa, 1985: 344; Kim, 1993b: 61; 2000: 29; ESK & KSAE, 1994: 145; Kim and Kim, 1998: 28; 1998b: 169.
Dorcus hopei binodulosus: Mizunuma, 2000: 33; Kim and Kim, 2010: 63.
Dorcus formosanus Miwa, 1929: 351 (TL: Taiwan): Doi, 1935: 60 (nec Miwa, 1929b); Cho, 1947: 65.
Dorcus curvidens: Kim and Kim, 1974: 107; Kim, 1978: 307 (nec Hope, 1842b).
Dorcus curvidens hopei: Nomura, 1960: 42; Nomura, 1963: 107.
Serrognathus (*Dynodorcus*) *curvidens hopei*: Maes, 1992: 93.
Dorcus curvidens binodulus [sic]: Mizunuma and Nagai, 1994: 266.
Nipponodorcus montivagus: Kurosawa, 1994: 338; ESK & KSAE, 1994: 145.

Type depository: 1♂ holotype - Natural History Museum, London, UK.

Description: ♂. Body reddish black to black with weak luster; however, strong luster appears on small individuals; mandibles long, strongly developed, gently arcuate inward with one prominent and sharp internal tooth toward apex in middle, and slightly broadened near apex; however,

internal tooth forms a right angle with mandible and broadened apex not present in small individuals; head broad, flat and wider anteriorly; clypeus extremely wide with roundly concave anterior margin; canthi thin and long, dividing about three-fourths of compound eyes; pronotum short and broad with sharp lateral margins which form curly bracket shape; elytra slightly convex with moderate puncture which forms vague striations; however, small individuals feature distinct striations with strong puncture; legs reddish black to black with one lateral spine on each mesotibia and none or one tiny lateral spine on each metatibia.

♀. Body generally reddish black to black with strong luster; mandibles short with one major internal tooth toward apex in middle and one vague overlapping tooth pointing inside; head strongly punctured with two distinct protuberances juxtaposed in center; clypeus roundly projected and concave in center of anterior margin; canthi thick and long, dividing about three-fourths of compound eyes; pronotum slightly convex, generally rounded with strong puncture at sides, impunctured and lustrous in center; elytra broad, flat and strongly punctured with distinct striations; legs reddish black to black with one lateral spine on each of both mesotibia and metatibia. BL: ♂ 27–76 mm; ♀ 25–45 mm; ML: ♂ 4–20 mm; ♀ 5–17 mm.

Korean record: NK, PN- Suncheon, Pyeongyang, HWN- Haeju, GW- Mt. Geumgangsan, GG- Gaeseong, Mt. Bogaesan, SK, GW- Mt. Odaesan, Mt. Chiaksan, GG- Pocheon, Gwangneung, Mt. Cheonmasan, CN- Asan, GB- Is. Ulneungdo, Mt. Baekamsan, Daegu, JN- Mt. Baekyangsan.

Material examined (32ex): [SWU] GG- Gwangneung (3ex, vii-x.1975; 1991; 1994), Pocheon (2♂♂, 20.vii.1975; 12.viii.1991); Asan (1♂, 25.vii.1992); GB- Mt. Baekamsan (1♀, 10.viii.1999); JN- Mt. Baekyangsan (1♂, 4.viii.1974; 1ex, v.1994), Suncheon (1♀, 3.vii.1988); [HNHM] NK, GW- Mt. Geumgangsan (Onjeong-ri 1ex, 10.vii.1977; 1♀, 12.vii.1991); [NIAST] NK, GW- Mt. Geumgangsan (1♀, 25. vii.1921); SK, GB- Mt. Baekamsan (1ex, 13.viii.1999); JN- Mt. Baekyangsan (1♀, 10.viii.1921); ?- Hekishoji (1♀, 5.viii.1924); [SNU] Anseong (1♂, 30.v.1997); [KU] NK, PN- Pyeongyang (1ex, vii.1936), GW- Mt. Geumgangsan (1ex, 13.viii.1934), SK, GW- Mt. Odaesan (1ex, 24.vi.1994); GG- Gwangneung (2ex, viii.1958; ix.1975), Mt. Cheonmasan (1ex, 1.ix.1958); JN- Mt. Baekyangsan (6ex, 4.viii.1974); ?- Teien Keigen (1ex, viii.1934), Mt. Hogaizan (2ex, viii.1938, 1939).

Distribution: Korea, Japan.

Korea: Central, South, Is. Ulneungdo.

Host plants: Kim (2000) reported *Prunus serrulata* Lindley as a host plant, but both adults and larvae have additionally been observed in various *Quercus* species. In Japan, Yoshida (1996) reported *D. curvidens hopei* (=*D. hopei biondulosus*) to be found in rotten wood penetrated by the wood-decay fungus.

Biology: Adults are nocturnal (Kim, 2000), emerging in June, active from July to September. Adults are rarely attracted to light, as they are not active flyers. Moreover, adults usually hide under the bark or inside old *Quercus* trees, including *Q. acutissima* Carruther, during the day, and gather around the flowing sap of these trees at night. Adults often survive about 2–3 years, hibernating inside rotten wood. In Japan, a dubious record indicates this species to emerge every 4 years, but Yoshida (1996) reported *D. curvidens hopei* to emerge in mid May, most abundant in July, and often found in lowlands (300–700 m in altitude) filled with old *Q. acutissima* Carruthe that are rich in flowing sap. Moreover, these nocturnal adults mostly die in the fall, and only few surviving individuals seem to hibernate.

10. *Dorcus rectus rectus* (Motschulsky, [1858]) (Fig. 10)

Psalidostomus rectus Motschulsky, 1858: 29 (TL: Japon=Japan).
Macrodorcas montivagus: Heyden, 1887: 251 (first record from Korea); Kim and Park, 1991: 154; Park et al., 1993: 177; Kwon et al., 1996: 240; Kim and Kim, 1998: 25.
Eurytrachelus rectus: van Roon, 1910: 35; Kôno, 1926: 88; Miwa, 1927: 29; 1933: 358; Cho, 1931: 58.
Dorcus rectus: Miwa, 1933: 363; Masui, 1942: 70; Benesh, 1960: 92.
Macrodorcas rectus: Heyden, 1887: 251; Benesh, 1960: 78; Nomura, 1960: 42; 1963: 109; Kurosawa, 1976: 7; 1985: 339.
Macrodorcas recta: Kim and Kim, 1998: 25; Kim, 2000: 26; Bartolozzi, 2006: 73.
Macrodorcas rectus rectus: ESK & KSAE, 1994: 145.
Macrodorcas (*Macrodorcas*) *rectus rectus*: Maes, 1992: 84.
Macrodorcus rectus: Koôno, 1926: 91; Haku, 1936: 121; Morita, 1936: 862; Miwa and Chûjô, 1936: 5; Mochizuki and Tsunekawa, 1937: 89; Mori and Cho, 1938: 36; 1955: 208 (*Maerodorcus* [sic]); 1957: 115; 1965: 39; 1969: 611; Masui, 1942: 68; KZS, 1968: 133; Nomura, 1969: 82; Kim and Kim, 1973b: 196; 1978: 313; Yoon and Nam, 1979: 148; Kim and Nam, 1981: 125; 1984b: 328; Kim, 1986: 157; Park and Cho, 1986: 127; Kim and Chang, 1982: 145; Kim and Yoo, 1987: 505; 1993: 68; Kim and Lee, 1989: 178.
Macrodorcus rectus rectus: Nomura, 1969: 77; Nomura and Lee, 1992: 89.
Nipponodorcus rectus: Nomura, 1963: 106; 1969: 76, 82; Kurosawa, 1976: 8; 1985: 338.
Dorcus rectus rectus: Mizunuma and Nagai, 1994: 262; Kim and Kim, 2010: 65.
Dorcus montivagus montivagus: Mizunuma and Nagai, 1994: 264 (nec Lewis, 1883).
Eurytrachellelus rectus: Didier and Séguy, 1953: 139.
Macrodorcas striatipennis: Kim, 1993: 61 (nec Motschulsky, 1861).

Type depository: Unknown. In the same situation as *D. titanus castanicolor*. However, the male lectotype of *Dorcus niponensis* Vollenhoven, 1861, a synonym of *D. rectus rectus*, is housed in Rijksmuseum van Natuurlijke Historie, Leiden, the Netherlands.

Description: ♂. Body dark brown to black without luster; mandibles long, slenderly developed with one major internal tooth at one third point from apex, and curved inward with one minor internal tooth near apex; however, small individuals may lack minor tooth; head flat and wider anteriorly; clypeus broad rectangular in shape, both ends of anterior margin slightly projected, and convex in center of anterior margin; canthi thin and medium, dividing about a half of compound eyes; pronotum slightly convex with lateral margins slightly angling inward in posterior third; elytra slightly convex and ovally elongate with moderate puncture; legs generally black with one lateral spine on each mesotibia and no lateral spine on metatibiae.

♀. Body dark brown to black with weak luster; mandibles slightly arcuate with one major internal tooth pointing upward in middle; head strongly punctured entirely and narrower than pronotum; clypeus roundly projected with concave vertex; canthi thick and medium, dividing about a half of each compound eye; pronotum strongly punctured at sides and widest at a little behind of middle; elytra convex and strongly punctured; legs generally black with one large lateral spine on each mesotibia and one tiny lateral spine on each metatibia. BL: ♂ 17–53.5 mm; ♀ 12–29.9 mm; ML: 3–13 mm.

Korean record: NK, HB- Musan, Nanam, Yeongpung, HN- Songheung, Yeongheung, HWN- Sinmak, GG- Gaeseong, Mt. Bogaesan, GW- Mt. Geumgangsan, SK, GW- Sokcho, Mt. Seolaksan, Mt.

Odaesan, Mt. Gyebangsan, Mt. Bangdaesan, Hongcheon, Pyeongchang, Wonju, Sinmak, old & new Cheolwon, Hwachron, Chuncheon, Gangchon, Mt. Taebaeksan, SG- Mt. Hwaaksan, Mt. Myeongjisan, Mt. Soyosan, Gapyeong, Cheongpyeong, Maseok, Mt. Cheonmasan, Pocheon, Gwangneung, Euijeongbu, Mt. Yongmunsan, Goyang, Dongguneung, Mt. Dobongsan, Mt. Bukhansan, Seoul, Incheon, Gimpo, Is. Ganghwado, Anyang, Suwon, Icheon, Janghowon, CB- Mt. Wolaksan, Danyang, Goesan, Mt. Soknisan, CN- Mt. Gwangdeoksan, Deoksan, Mt. Gyeryongsan, Taean, Is. Anmyeondo, Geumsan, GB- Is. Ulneungdo, Mt. Seondalsan, Mt. Sobaeksan, Mt. Baekamsan, Hwasan, Mungyeong, Bonghwa, Uljin, Andong, Mt. Juwangsan, Mt. Cheongryangsan, Daegu, Geochang, JB- Muju, Jinyang, Mt. Daedunsan, Mt. Deogyusan, Mt. Naejangsan, Minlyeong, Gusan, JN- Mt. Jirisan, Mt. Jogyesan, Haenam Mt. Daedunsan, JJ- Jeju-do.

Material examined (248ex): [SWU] GW- Sokcho (2ex, vii.1996, 1997), Mt. Bangdaesan (1ex, 15. viii.1995), Pyeongchang (2♀ ♀, 21.vii.1985), Mt. Taebaeksan (2♀ ♀, 23.vii.1986), Wonju (3♀ ♀, 4–29.vii.1987; 1996; 1997), Myeonseongsan Cheowon (3ex, 12.viii.1999), Chuncheon (1♂, 16.viii.1988); SG- Is. Deojeokdo (3ex, 7.vii.1981), Is. Ganghwado (6ex, vi, vii.1987–1996), Mt. Soyosan (1♀, 9.vii. 1987), Pocheon (1♂, 23.vii.1994), Mt. Chuknyeongsan (2ex, 5.vi.1999), Cheongpyeong (1ex, 16.viii. 1988), Mt. Cheonmasan (1♀, 13.vi.1981), Goyang (2♀, 20.viii.1987), Mt. Bukhansan (1♂, 26.x.1991), Seoul [12 sites (-dong), 17ex, 1981–1991], Icheon (1♂, 3.vi.1984), Janghowon (2ex, 10.iii.1990), Gimpo (1♂, 20.ix.1988), Incheon (1♂, 27.ix.1991), other 6 sites (10ex, 1983–1996); CN- Mt. Gwangdeoksan (4ex, vi, vii.1994), Is. Anmyeondo (1ex, 24.vii.1981), Taean (1♂, 24.vii.1981); GB- Mt. Seondalsan (1♂, 29.vi.1998), Mt. Baekamsan (1♂, 10.viii.1999), Uljin Sogwang-ri (2ex, vii.1999), Mt. Juwangsan (1♂, 24.vi.1986); [NIBR] GW- Chuncheon (1♀, 26.viii.2003); Donghae (1♂1♀, 13.vi.1997); CB- Cheongju (1♂, 25.vii.2006); GN- Hamyang (1♀, 7.vi.2002), Ulsan (1♂1♀, 21.vi.2003); [HNHM] NK, GW- Mt. Geumgangsan (1♂, 6.viii.1975); [NIAST] NK, GW- Mt. Geumgangsan (2ex, 5.viii.1924); SK, GW- Mt. Seolaksan (1ex, 17.x.1974); GG- Gwangneung (2ex, 1924; 19.vi.1982), Suwon (2ex, 29.vi.1925; 16. v.1977); CB- Danyang (1ex, 18.viii.1993), Goesan (1ex, 8.vii.1992); GB- Mt. Baekamsan (2ex, 13.viii. 1999), Bonghwa (2ex, 6.vii.1992; 27.viii.1993), Geochang (3ex, vii.1992); JB- Muju (3ex, 13.viii.1975; vii.1992), Jinyang (1ex, 28.viii.1992); JJ- (7ex, v–x.1922; 1983–1992); [SNU] GW- Wonju (1ex, 20.vii. 1997); GG- Mt. Myeongjisan (1ex, 17.v.1992), Gapteong (2ex, 28.viii.1997), Mt. Dobongsan (1ex, 23. vi.1992), Anyang (2ex, 26.vi.1989), Suwon (2ex, vi.1955; 1988); CB- Mt. Wolaksan (1ex, 19.vi.1996), Mt. Soknisan (1ex, 24.viii.1960); CN- Geumsan (1ex, 27.vii.1994); JN- Mt. Jirisan (1ex, 26.viii.1970), Dapgok (2ex, vi, viii.1993, 1994); [KU] NK, HN- Nanam, Yeonpung (2ex, viii.1929; 1931), GG- Gaeseong (1ex, vii.1934); Mt. Bogaesan (1ex, 23.vii.1943); SK, GW- Mt. Odaesan (10ex, vii.1927; 1958), Mt. Gyebangsan, Hwachoen (3ex vi, viii.1992), Hongcheon, Sinmak (2ex, vii.1931), Cheolwon (2ex, 10, 14.vii.1934); GS- Mt. Soyosan (6ex v–x.1928–1938; 1981), Mt. Yongmunsan (1ex, 19.vi.1966), Euijeongbu (1ex, 10.viii.1970), other 15 sites icluding Seoul (39ex, 1956–1982), Incheon (3ex, ix.1957); CN- Mt. Gyeryongsan (2ex, 5.viii.1973; 29.vii.1979); GB- Is. Ulneungdo (11ex, 1928; 1963; 1977; 1984), Mt. Sobaeksan, Mt. Cheongryangsan (2ex, vi.1981; 1996), Andong (1ex, 17.viii.1931); JB- Mt. Naejangsan (1ex, 3.vii.1985), JN- Mt. Jogyesan, Mt. Daedunsan (3ex, viii.1970; 1972; 1976); JJ- 3ex, (vii. 1966; 1973; 1978); [HSU] CN- Deoksan (25ex, v, vi.1994–1997).

Distribution: China, Korea, Japan.

Korea: North, Central, South, Jejudo, Is. Ulneungdo.

Host plants: This species is found on various *Quercus* species, such as *Q. acutissima* Carruther. In Japan, Yoshida (1996) noted that this species could be easily found in fallen trunks or branches of broad-leaf trees.

Biology: Adults are attracted to lights at night in the summer, and hibernate under rocks in the winter (Kim, 2000). Similarly in Japan, Kurosawa (1985) and Yoshida (1996) reported adults to emer-

ge in mid-May, active through October, but most abundant from July to August. In addition, this species is generally univoltine, but major males often show semivoltism, hibernating as pre-emerged adults inside the log.

11. *Dorcus tenuihirsutus* Kim and Kim, 2010 (Fig. 11)

Dorcus tenuihirsutus Kim and Kim, 2010: 66 [TL: Yangyang (GW), Mt. Baeyangsan (JN), Korea].
Dorcus velutinus Thomson, 1862: 426 (TL: India Bor.).
Gnaphaloryx velutinus: Masui, 1942: 70 (first record from Korea) (nec Thomson, 1862).
Aegus laevicollis Saunders, 1854: 54 (TL: China).
Aegus laevicollis laevicollis: Kim and Kim, 1974: 107; ESK & KSAE, 1994: 145.
Dorcus taiwanicus Nakane and Makino, 1985: 22 (TL: Taiwan): Kim and Kim, 1998: 28; Kim, 2000: 29.

Type depository: 1♂ holotype & 2♀♀ paratypes - National Institute of Biological Resources, Incheon Korea; 1♀ allotype, 1♂ paratype - Sungshin Women's University, Natural History Museum; 1♂ paratype - National Arboretum Korea; 1♀ paratype - Yale Peabody Museum; 1♀ paratype - Natural History Museum, London, UK.

Description: ♂. Body dark brown to black, opaque; mandibles short, as long as head, strongly arched inward entirely, slightly broadened internally from middle to constriction just before basal expansion, with external margin weakly angulated, slightly projected upward at base, clearly armed internally, forming longitudinal angulation, with one distinct, truncate upper tooth near roundly elongate apex; head flat between eyes, anterior median part triangularly depressed, sloping down to apex; transverse, 6 times as wide as long, anterior margin clearly sinuate in middle, surface sparsely punctured; canthi rounded, flattened, dividing about ten-elevenths of compound eyes; pronotum parallel-sided, fimbriate with short setae, surface densely punctured except longitudinal median line, punctures irregular, large, with short tufts of setae; elytra with lateral margins fimbriate with short setae, surface with five longitudinal rows of dusky brown tufts continuous on anterior half, long, erect, and each interval with three rows of hoof-shaped, ocellate punctures alternating with two rows of minute, erect setae; protibia thickly broadened apically, slightly curved inward with two rows of golden setae, lateral margin dentate with eleven teeth, apical four strongly developed, basal three obscure; mesotibiae, metatibia with one distinct lateral spine.

♀. Body dark brown to black, opaque; mandibles short, rather thick, edged longitudinally, irregularly punctured near base, with one internal tooth in middle, slightly closer to apex; head narrower than pronotum, strongly punctured, slightly convex at center with a pair of tubercles; clypeus trapezoidal with strong puncture; canthi rounded, angulated at posterior, dividing three-fourths of compound eyes; pronotum fimbriate with short setae, surface same as males; elytra and legs same as males, protibiae with lateral margin dentate with 15 teeth, including few obscure teeth alternating with major teeth. BL: ♂ 16.9–18.8 mm; ♀ 13.9–17 mm; BW: ♂ 6.3–6.9 mm; ♀ 6.1–6.7 mm.

Korean record: GW- Seo-myeon, Yangyang, Girin-myeon, Inje, JN- Mt. Baekyangsan Jangseong.

Material examined (8ex): [NIBR] Holotype: Hwang-i-ri Seo-myoun Yangyang (GW) (16.vii.2007, S.I. Kim); Paratype 1♀: Same above; [SWU] Allotype & Paratype 1♂: Mt. Baekyangsan Jangseong (JN) (4.viii.1974, J.I. Kim); [BMHN] Paratype 1♂: 5.viii.1974, J.I. Kim; [Others] Paratype 2♀♀: Girin-myeon Inje (GW) (16.vii.2007, M.Y. Kang: deposited in Korea National Arboretum); 1♀: Mt. Bae-

kyangsan Jangseong (JN) (4.viii.1974, J.I. Kim: deposited in Yale Peabody National History Museum).

Distribution: Korea only.

Korea: Central, South.

Host plants: This species is found in various *Quercus* species, such as *Q. acutissima* Carruther.

Biology: Adults are passive, mostly found inside rotting wood. In addition, adults are nocturnal, often observed around the flowing sap, and rarely attracted to lights.

Remarks: This species is morphologically similar to *Dorcus velutinus* (Thomson, 1862) and *Dorcus taiwanicus* Nakane and Makino, 1985 and has often been identified as these two species in Korea. However, this species can be distinguished from *D. velutinus* by the following characters: body narrow entirely; protibiae thick and slightly curved inward; metatibiae with one lateral spine at middle; elytra with sparse setae; mandibles cylindrical without flattened portion near base in males. This species can also be distinguished from *D. taiwanicus* by the following characters: protibiae thick and slightly curved inward; elytra with sparse setae; mandibles cylindrical without flattened portion near base in males; head with two distinct protrusions juxtaposed in center in females.

12. *Dorcus carinulatus koreanus* (Jang and Kawai, 2008) (Fig. 12)

Dorcus carinulatus Nagel, 1941: 56 (TL: Horisha Formosa=Taiwan).
Dorcus koreanus Jang and Kawai, 2008: 103 [TL: Haenam (JN), Korea]; Kim and Kim, 2010: 68.
Dorcus taiwanicus: Kim and Kim, 1998: 28; Kim, 2000: 29 (nec Nakane and Makino, 1985).
Dorcus carinulatus koreanus: Han et al., 2010: 366.

Type depository: Jang's collection (holotype - To be deposited in the National Institute of Biological Resources, Incheon, Korea).

Description: ♂. Body brown in color with thick yellowish to brown setae; mandibles black, short, gently curved, densely punctured, and broadened near base for a half of mandible; head broad, four times as broad as long, irregularly punctured with yellowish setae; clypeus trapezoid shape, broadest at base; canthi thick and long, dividing ten-elevenths of compound eyes; pronotum two thirds as broad as long, broadest posteriorly, and irregularly punctured with yellowish setae; elytra oval, and strongly punctured with five consecutive rows of thick setae; legs black to brownish black with one lateral spine on each mesotibia and metatibia.

♀. Body yellowish brown to dark brown without luster; mandibles black, short, and straight with one small internal tooth; head flat, and irregularly punctured with yellowish setae; clypeus black with strong puncture, triangular shape, and broadest at base; canthi thick and long, dividing two-thirds of compound eyes; pronotum broadest at posterior end, and irregularly punctured with yellowish setae; elytra oval and strongly punctured with five consecutive rows of thick setae; legs black to brownish black with one lateral spine on each mesotibia and metatibia, and protibiae slightly curved outward. BL: ♂ 15.6–22.1 mm; ♀ 13.9–19.0 mm.

Korean record: JN- Haenam (Temple Daeheungsa).

Material examined (1ex): [SWU] JN- Temple Daeheungsa, Haenam (1♀, 5.viii.1986, J.C. Paik).

Distribution: *D. c. carinulatus*- Taiwan; *D. c. koreanus*- Korea.

Korea: South.

Host plants: This species is found on *Celtis sinensis* Persson and *Prunus yedoensis* Matsumura.
Biology: Adults are passive, often found inside the rotten parts of *P. yedoensis* Matsumura or even inside the trunks of semi-withered Salix species. In addition, adults are nocturnal, and very rarely attracted to lights.

Tribe Aegini MacLeay, 1819

Aegini MacLeay, 1819: 112 (TG: *Aegus* MacLeay, 1819).

Genus *Aegus* MacLeay, 1819

Aegus MacLeay, 1819: 112 (TS: *Aegus chelifer* MacLeay, 1819).
Alcimus Fairmaire, 1849: 416 (TS: *Alcimus dilatatus* Waterhouse, 1874).
Aegotypus Parry, 1874: 371 (TS: *Aegus trilobatus* Parry, 1862).
Paraegus Gahan, 1888: 539 (TS: *Paraegus listeri* Gahan, 1888).
Xenostomus Boileau, 1898: 264 (TS: *Xenostomus ritsemae* Boileau, 1898).
Pseudaegus Heller, 1900: 7 (TS: *Pseudaegus leptodon* Heller, 1900).
Eubussea Zacher, 1913: 93 (TS: *Alcimus upoluensis* Arrow, 1927).
Elsion Kriesche, [1921]: 103 (TS: *Elsion sepicanum* Kriesche, [1921]).
Malietoa Kriesche, [1921]: 104 (TS: *Malietoa hindenburgi* Kriesche, [1921]).
Torynognathus Arrow, 1935: 116 (TS: *Torynognathus oberthuri* Arrow, 1935).
Tumidaegus Bomans, 1988: 8 (TS: *Tumidaegus variolosus* Bomans, 1988.
Cherasphorus Bomans, 1988: 13 (TS: *Cherasphorus inflatus* Bomans, 1988).
Aegus (*Gnaphaegus*) Maes, 1992: 97 (TS: *Lucanus squalidus* Hope and Westwood, 1845).
Aegus (*Micraegus*) Maes, 1992: 105 (TS: *Aegus adelphus* Thomson, 1862).

13. *Aegus laevicollis subnitidus* Waterhouse, 1873 (Fig. 13)

Aegus laevicollis Saunders, 1854: 54 (TL: China): Kim and Kim, 1998: 22 (first record from Korea); An, 1999: 43; Kim, 2000: 20; Bartolozzi, 2006: 70.
Aegus subnitidus Waterhouse, 1873: 277 (TL: Japan).
Eurytrachelus striatipennis Motschulsky, 1861: 17; Cho, 1931: 59; 1969: 611.
Aegus laevicollis subnitidus: Nomura, 1960: 43; Kim and Kim, 2010: 69.
Type depository: 1♂ holotype & 1♂ syntype - Natural History Museum, London, UK.

Description: ♂. Body black with luster slightly diminished by strong puncture; mandibles slender and arcuate inward with one major internal tooth and one overlapping minor tooth near base; however, small individuals may lack minor tooth; head flat and slightly concave anteriorly, extending smoothly to clypeus; clypeus wide with roundly concave anterior margin; canthi relatively thick

and very long, dividing compound eyes almost completely; pronotum broad, lustrous in center and strongly punctured at sides with dentate lateral margins; elytra elongate-oval shape with strong puncture which forms eight deep striations on each elytron; legs black to brownish black with two lateral spines on each mesotibia and one lateral spine on each metatibia.

♀. Body black to brownish black with weak luster; mandibles short and sharp at apex with one broad triangular internal tooth; head strongly punctured and narrower than pronotum; clypeus rectangular in shape with angulately concave anterior margin; canthi very thick and long, dividing compound eyes almost completely; pronotum strongly punctured entirely with dentate lateral margins; elytra weakly lustrous and strongly punctured with eight deep striations on each elytron; legs black to brownish black with two lateral spines on each mesotibia and one lateral spine on each metatibia. BL: ♂ 11–22 mm; ♀ 12–17 mm; ML: 2–6 mm.

Korean record: GW- Hongcheon, JN- Is. Soheuksando, Is. Hongdo, JJ- Jejudo.

Material examined (2ex): [SWU] GW- Hongcheon (1♂, 3.viii.1931, P.S. Cho); JN- Is. Soheuksando (Is. Gageodo) Sinan-gun (1♀, 8.viii.1970, Y.T. Noh).

Distribution: *A. laevicollis laevicollis*- China, Japan; *A. laevicollis subnitidus*- Korea.

Korea: Central, South, Jejudo, Is. Hongdo.

Host plants: This species is sapro-xylophagous on *Pinus* species, but is also rarely observed inside the completely rotten, soil-like wood of broad-leaf trees.

Biology: Larvae feed on completely rotten, soil-like wood. Like in many *Cetonia* species (Scarabaeidae: Cetoniinae), the larvae pupate inside oval cocoons that they build with soil-like wood. Adults are nocturnal and attracted to lights from early June to August.

Tribe Cladognathini Parry, 1870

Cladognathidae Parry, 1870: 75 (TG: *Cladognathus* Burmeister, 1848).

Key to Genera of Cladognathini in Korea

1. Canthus medium, dividing about a half of compound eye; male mandible curved inward without an appendage or tooth pointing upward, with multiple distinct internal teeth; pronotum almost rounded in females without distinct angulation ····· *Prosopocoilus*
– Canthus short, dividing about a third of compound eye; male mandible with an appendage or tooth pointing upward, almost straight, slightly curved upward near apex with multiple blunted internal teeth; pronotum with distinct angulation in females ····· *Prismognathus*

Genus *Prosopocoilus* Hope and Westwood, 1845

Lucanus (*Prosopocoilus*) Hope and Westwood, 1845: 4 (TS: *Lucanus cavifrons* Hope and Westwood, 1845).

Lucanus (*Metopodontus*) Hope and Westwood, 1845: 4, 30 (TS: *Lucanus downesii* Hope, 1835).

Lucanus (*Macrognathus*) Hope and Westwood, 1845: 5, 31 (TS: *Lucanus girafa* Olivier, 1789).
Cladognathus Burmeister, 1847: 364 (TS: *Lucanus girafa* Olivier, 1789).
Psalidognathus Motschulsky, 1857: 29 (TS: *Lucanus inclinatus* Motschulsky, [1858]).
Psalidoremus Motschulsky, 1861: 13 (TS: *Lucanus inclinatus* Motschulsky, [1858]).
Hoplitocranum Jakowlew, 1896: 172 (TS: *Lucanus jenkinsi* Westwood, 1848).
Prosopocoelus [sic] Parry, 1875: 5 (TS: *Lucanus cavifrons* Hope and Westwood, 1845).
Metopotropus Oberthür and Houlbert, 1913a: 416 (TS: *Prosopocoilus mohnikei* Parry, 1873).
Cyclotropus Oberthür and Houlbert, 1913b: 449 (TS: *Lucanus occipitalis* Hope and Westwood, 1845).
Homoderinus Kriesche, 1926: 384 (TS: *Homoderus variegates* Boileau, 1904).
Eulucanus Didier, 1927: 87 (TS: *Eulucanus spectabilis* Didier, 1927).
Dorcus Arrow, 1935: 109. (nec MacLeay, 1819)
Cladognathinus Didier and Séguy, 1952: 225 (TS: *Cladognathus decipiens* Parry, 1864).
Prosopocoilus (*Pseudodontolabis*) Maes, 1990: 5 (TS: *Prosopocoilus lumawigi* DeLisle, 1977).
Prosopocoilus (*Prosopocoilinus*) Maes, 1990: 6 (TS: *Lucanus curvipes* Hope and Westwood, 1845).
Prosopocoilus (*Macrodorcinus*) Maes, 1990: 6 (TS: *Lucanus passaloides* Hope and Westwood, 1845).

Key to Species of *Prosopocoilus* in Korea

1. Body reddish brown to dark brown in color; male clypeus long, narrow, and slanted downward with arrow head shape apex; pronotum without speck ····· *P. inclinatus inclinatus*
– Body orange to reddish brown in color; male clypeus narrow rectangular shape, both ends of anterior margin projected, and center of anterior margin slightly concave; pronotum with a dark spot on each side ····· *P. astacoides blanchardi*

14. *Prosopocoilus inclinatus inclinatus* (Motschulsky, [1858]) (Fig. 14)

Lucanus inclinatus Motschulsky, 1858: 29 (TL: Japan).
Psalidoremus inflexus von Harold, 1875: 288 (TL: Japan).
Psalidoremus inclinatus var. *inflexus*: Cho, 1931: 58.
Psalidoremus inclinatus: Kôno, 1926: 88 (first record from Korea); Miwa, 1927: 28; 1929a: 74; Cho, 1931: 57; 1947: 65; 1955: 208; 1956: 77; 1957: 115; 1965: 216; 1969: 608; Kamijo, 1932: 20; Doi, 1932: 4; Nakatomi, 1934: 655; Haku, 1935: 58; Mochizuki, 1936: 211; Miwa and Chûjô, 1936: 4; Mochizuki and Tsunekawa, 1937: 89; Mori and Cho, 1938: 35; Masui, 1942: 67; Didier and Séguy, 1953: 104; Benesh, 1960: 77; Ku, 1963: 27; 1966: 26; KZS, 1968: 133; Hyun and Woo, 1969: 192; Kim and Kim, 1973b: 196; Yoon and Nam, 1979: 148; Bartolozzi and Sprecher-Uebersax, 2006: 76.
Prosopocoilus inclinatus: Nomura, 1960: 40; 1969: 82; Kim and Kim, 1974: 107; 1976: 102; Kim and Nam, 1977: 130; Kurosawa, 1976: 5; 1985: 337; Kim and Nam, 1977: 104; Kim, 1980e: 345; 1981: 125; 1993: 64; 1995a: 173; Lee and Kwon, 1981: 154; Kim and Yoo, 1987: 505; 1992: 153; Kim and Lee, 1989: 178; Kim and Park, 1991: 134; 1991c: 191; Nomura and Lee, 1992: 89; Park et al., 1993: 177; Mizunuma and Nagai, 1994: 254; Kim and Kim, 1998: 25; Kim, 2000: 24.
Prosopocoilus inclinatus inclinatus: Nomura, 1963: 106; Nomura, 1969: 76; Kurosawa, 1976: 5; Nomura and Lee, 1992: 89; Kim, 1993: 61; ESK & KSAE, 1994: 146; Kim and Kim, 2010: 71.
Metopodontus inclinatus: Kim, 1978: 314; Kim and Chang, 1987: 105; Yoon et al., 1990: 110.
Prosopocoilus (*Psalidoremus*) *inclinatus*: Maes, 1992: 69.

Type depository: Unknown. (refer to the depository of *Dorcus titanus castanicolor*).

Description: ♂. Body reddish brown to dark brown with low luster; mandibles strongly developed and curved downward with many internal teeth; however, mandibles of small males not curved downward; head developed with sharply projected anterior angles; clypeus long, narrow and slanted downward with arrow head shape apex; canthi thin and medium, dividing about a half of compound eyes; pronotum rectangular in shape and shorter than head with lateral margins angling inward in posterior fifth; elytra convex and moderately punctured; legs reddish brown to dark brown with one lateral spine on each mesotibia and one tiny lateral spine on each metatibia.

♀. Body reddish brown to dark brown with low luster; mandibles short with one big internal tooth in middle; head strongly punctured entirely, and narrower than pronotum; clypeus crescent shape; canthi thick and medium, dividing about a half of compound eyes; pronotum narrower apically, widest at two thirds portion from front, strongly punctured with lateral margins angling inward in posterior third; elytra convex and almost lusterless due to strong puncture; legs reddish brown to dark brown with one lateral spine on each mesotibia and metatibia. BL: ♂ 22–74.7 mm; ♀ 23–37.6 mm; ML: 6–34 mm.

Korean record: NK, HB- Gyeonseong, Zueul, HWN- Sinmak, GW- Mt. Geumgangsan, SK, all S. Korea from Goseong-gun (GW) to Jejudo and island Ulneungdo (GB). in the case of Seoul: Chang-dong, Wu-i-dong, Junggye-dong, Taeneung, Gupabal, Bulgwang-dong, Nogbeon-dong, Jeongneung, Cheongryangni-dong, Gwangjang-dong, Hoehwa-dong, Sajik-dong, Sinchon, Yongsan etc.

Material examined (343ex): [SWU] GW- Goseong-gun (1♂, 6.vii.1985; 2ex, vii.1984; 1990) (*-gun: several sites in that province), Mt. Seolaksan (1ex, 17.viii.1974), Gangneung (1♀, 31.vii.1986), Mt. Sogeumgang (2ex, vii.1985, 1986), Chuncheon (1♂, 27.viii.1989), Gangchon (3ex, viii.1989; 1995); SG- Munsan, Daeseongdong, (5ex, vi, viii.1978; 1987; 1993), Mt. Mugabsan (1ex, viii.1991), Gapyeong (1♀, 20.vii.1987), Pocheon, Namyangju-gun Yangsu-ri, Yeoju (17ex, 1988–1996), Seoul (1♂, 29.vii.1984; Cheongye-cheon 1♀, 14.viii.1983), Is. Ganghwado (2ex, viii.1991), Icheon (1♂, 2.vii.1984); CB- Chungju (1♂, 10.viii.1987; Mt. Namsan, 1♀, 24.viii.2000); CN- Mt. Gwangdeoksan (3ex, vi, vii.1994), Seosan (2♂♂, 20.vii.1992), Geumga-myeon (1ex, 10.vii.1987); GB- Is. Ulneungdo (1ex, viii.1928), Munkyeong (5♂♂6♀♀, 18, 19.vii.; 4♀♀, 18.ix.1986), Uljin Sogwang-ri (5ex, vii, viii.1999); GN- Sancheong Jungsan-ri (1♂2♀♀, 31.vii.1981), Mt. Undalsan (1♀, 5.viii.1997); JB- Gochang (1ex, 25.vi.1991), Mt. Naejangsan (1♂, 30.vii.1995); JN- Mt. Baekunsan (1♀, 10.viii.1993); JJ- Ora-dong (1♂, 28.ix.1996); others all S. Korea (19 sites, 26ex); [NIBR] GG, Gapyeong (1♀, 24.viii.1998); CB- Chungju (1♂2♀♀, 25.vii.2006); GN- Is. Geojedo (1♂, 31.vii.1997); JN- Hwasun (1♀, 6.ix.2003), Is. Wando (2♂♂3♀♀, 15.vii.2003); [HNHM] NK, GW- Mt. Geumgangsan (lake Soheungho, 2ex, 5.ix.1956; 1♂1♀, 5.ix.1989; 2♂, 10, 13.vi.1991; 1ex, 3.viii.1991); SK, GW- Mt. Seolaksan (1♀, 17.viii.1992), Chuncheon (1♂, 26.viii.2003); GB- Sangju (1♂, 30.ix.2003); GN- Is. Geojedo (1♂, 5.v.1991); [NIAST] NK, GW- Mt. Geumgangsan (2ex, 5.viii.1924; Onsu-ri, 1ex, 25.vii.1924); SK, GW- Hongcheon (5ex, 25.vi.1986; 1ex, 26.vii.1991), Chuncheon (1ex, 11.viii.1982), Gangneung (1ex 15.vi.1980), Samcheok (1ex, 15.viii.1993); SG- Gwangneung (1ex, 10.viii.1910; 2ex, 10.iv.1923), Mt. Chuknyeongsan (1ex, 10.viii.1999), Seoul Mt. Cheongye san (2ex, 19.viii.1976), Suwon (3ex, vi, vii.1931; 1976; 1994), Anseong (1ex, 15.vi.1993), Mt. Taehwasan (1ex, 14.vii.1991); CB- Goesan (1ex, 8.viii.1992), Yeongdong (1ex, 23.vii.1993); GB- Bonghwa (2ex, viii.1991; 1993); GN- Mt. Jirisan (3ex, 1.viii.1924), Gimhae (1ex, 27.vii.1994), Hadong (5ex, vii, viii.1982; 1992); JB- Gochang (1ex, 23.vii.1993); JN- Mt. Baekyangsan (2ex, 26.vi.1922), Gwangyang (1ex, 20.viii.1992), Mt. Baekunsan (11ex, vi, viii.1991; 1994), JJ- (1ex, 5.vii.1986); [SNU] GW- Mt. Odaesan (1ex, 25.viii.1994), Chusan (2ex, vi.1991; 1994), Wonju (2ex, 26.viii.1996),

Gangwondo (1ex, 20.vii.1997), GG- Gapyeong (3ex, viii, ix.1993; 1997), Sudong (1ex, 28.vii.1995), Anyang, Mt. Gwangkyosan (13ex, vi–ix.1954; 1989; 1991; 1997), Eijeongbu, Yangpyeong, Yong-in, Gwangju-gun (6ex, v–ix.1989–1993); CB- Mt. Wolaksan (1ex, 12.vii.1983); CN- Mt. Gyeryongsan (1ex, 11.vii.1995); GB- Is. Ulneungdo (1ex, 29.vii.1997), Andong (1ex, 23.ix.1994); GN- Temple SSanggyesa Hadong (1ex, 14.vii.1969); JB- Jinan (1ex, 15.vii.1994); JN- Dapgok (2ex, 25.vi.1986); all Korea (8 sites, 14 ex), [KU] NK, HWN- Mt. Songaksan (2ex, 21.v.1931), GG- Gaeseong (1ex, 2.vii.1929), SK, GW- Mt. Geonbongsan (2ex, 24.viii.1992), Mt. Odaesan (1ex, 22.vi.1989), Sinmak (1ex, 25.vii.1931), Soyanggang (1ex, 5.viii.1975); SG- Mt. Soyosan (1ex, 4.viii.1933), Mt. Myeongjisan, Is. Nam-i-seom, Mt. Cheonmasan, Mt. Yongmunsan (8ex, vii.1958; 1961; 1976–8), Byeokje (10ex, vi–ix.1970–1976); Seoul (11 -dong, 14ex), Icheon (1ex, viii.1931); CB- Mt. Soknisan (2ex, 11.viii.1930; 25.vii.1990), GB- Is. Ulneungdo (18ex, viii.1934; 3ex, vii.1971; 1976), GB- Uljin Sogwang-ri (2ex, vii, viii.1999), Mt. Palgongsan (1ex, 27.vii.1932); GN- Mt. Gayasan (1ex, 5.viii.1960); JN- Mt. Jirisan, Mt. Jogyesan, Mt. Daedunsan (9ex, viii.1972; 1976; 1982); others all Korea (6 sites, 16ex, 1931–1979); [HSU] CN- Deoksan (19ex, v, vi.1995–1997)

Distribution: Taiwan, Korea, Japan.

Korea: North, Central, South, Jejudo, Is. Ulneungdo.

Host plants: This species is found on various *Quercus* species. In Japan, Kurosawa (1985) noted this species to be found in rotten logs, regardless of the degree, and Yoshida (1996) added that larvae could be found in rotten stump, roots, and fallen trunks.

Biology: Adults are active from June to September, and attracted nocturnally to the flowing sap of various *Quercus* species. This species is also active flyers, easily attracted to lights at night between 8 P.M. and 1 A.M. Similarly in Japan, Yoshida (1996) added this species to emerge in late May, most adundant in July, often attracted to the flowing sap of *Quercus acutissima* Carruther, *Q. serrata* Thunberg ex Murray, and *Salix* species. Adults are completely nocturnal, hiding under the leaves or near the roots during the day. In addition, this species is generally univoltine, but male majors often show semivoltism. Larvae typically leave the log they feed on before pupation, and make cocoons in the soil nearby.

15. *Prosopocoilus astacoides blanchardi* (Parry, 1873) (Fig. 15)

Metopodontus blanchardi Parry, 1873: 337 (TL: Mongolia); Cho, 1969: 607 (first record from Korea); ESK & KSAE, 1994: 145.

Prosopocoilus blanchardi: Nomura and Lee, 1992: 88; Kim and Kim, 1998: 25; Kim, 2000: 24.

Prosopocoilus astacoides blanchardi Parry, 1873: 337; Mizunuma and Nagai, 1994: 254; Bartolozzi and Sprecher-Uebersax, 2006: 74; Kim and Kim, 2010: 71.

Type depository: 1♂ (unverified type status) - Natural History Museum, London, UK.

Description: ♂. Body orange to reddish brown in its anterior part, including mandibles, head and pronotum, and light yellowish brown to orange in its posterior part, including elytra; mandibles strongly developed and slightly arcuate inward with one major internal tooth near base and four to five minor internal teeth up to apex; however, small individuals may lack major internal tooth which rather forms flattened mandibles; head concave anteriorly with two protrusions which form a valley in middle; clypeus narrow and rectangular, both ends of anterior margin projected and center of anterior margin slightly concave; canthi very thin and medium, dividing about a half of com-

pound eyes; pronotum broad rectangular with a dark spot on each side with lateral margins slightly angling inward in posterior fourth; elytra convex and finely punctured; elytral suture dark brown to black; legs yellowish brown to reddish brown except for black knees and each of both mesotibia and metatibia with one lateral spine.

♀. Body orange to reddish brown in its anterior part, including mandibles, head and pronotum, and light yellowish brown to orange in its posterior part, including elytra; mandibles short and slightly arcuate inward with one blunted internal tooth in middle; head strongly punctured and narrower than pronotum; clypeus isosceles trapezoid shape with slightly concave anterior margin; canthi thick and medium, dividing about a half of compound eyes; pronotum narrower apically with a dark spot on each side with lateral margins slightly angling inward in posterior third; elytra convex and moderately punctured; elytral suture dark brown to black; legs generally reddish brown expect for black knees, and each of both mesotibia and metatibia with one lateral spine. BL: ♂ 26.2–66.7 mm; ♀ 24.2–31.2 mm.

Korean record: Jejudo.

Material examined (14ex): [SWU] JJ- Temple Gwaneumsa (1ex, 28.vi.1968; 1ex, 1.viii.1992), Jejudo (1ex, ix.1965; 1ex, no data); [JFNM] JJ- Jeju (1ex, 3.vii.1990; 1ex, 4.viii.2007), Seoguipo (1ex, 15.vii.2002; 2ex, 13.vii.2003; 1ex, 25.viii.2007); [NIAST] JJ- (1♀, 10.viii.1985; 2♀♀, no data); [SNU] JJ- (1♀, no data).

Distribution: Mongolia, Taiwan, Korea.

Korea: Jejudo only.

Host plants: This species is often observed at the flowing sap of *Quercus* acutissima Carruther, or on the young branches.

Biology: Adults are active from June to September, and are active flyers. Although adults are completely nocturnal, attracted to lights and flowing sap at night, they are sometimes observed feeding on flowing sap during the day.

Remarks: This species was listed by the Ministry of Environment under the Endangered Wild Species - Grade II on May 31, 2012, and is currently the only lucanid species under legal protection in Korea.

Genus *Prismognathus* Motschulsky, 1860

Prismognathus Motschulsky, 1860b: 138 [TS: *Prismognathus subaeneus* (Motschulsky, 1860b) (=Cladognathus dauricus Motschulsky, 1860b)].
Cyclorasis Thomson, 1862: 397, 421 [TS: *Lucanus platycephalus* (Hope, 1842c)].

16. *Prismognathus dauricus* (Motschulsky 1860) (Fig. 16)

Metopodontus dauricus Motschulsky, 1860: 138 (TL: environ du fort Mariinsk, Daourie).
Prismognathus subaeneus Motschulsky, 1860: 138 (TL: bords du fleuve Amour); Miwa, 1927: 28; 1932: 130; Cho, 1931: 58; 1947: 65; 1956: 78; 1957: 115; 1963: 216; 1969: 608; Nakatomi, 1934: 654; Mochi-

zuki, 1936: 211; Miwa and Chûjô, 1936: 5; Mochizuki and Tsunekawa, 1937: 89; Mori and Cho, 1938: 35; Masui, 1942: 68; Cho, 1968: 264; Yoon and Nam, 1979: 148; Nam and Kim, 1982: 128.

Cyclorasis jekelii Parry, 1864: 41 [TL: Chowsan Corea=Chosan (JG) Korea] (first record from Korea); Didier and Séguy, 1953: 127 (*Prismognathus jekeli* [sic]).

Prismognathus dauricus: Heyden, 1887: 250; Benesh, 1960: 56; KZS, 1968: 133; Kurosawa, 1976: 4; Kim, 1978: 311; Kim and Nam, 1984: 327; Kurosawa, 1985: 331; Kim and Lee, 1989; 178; Yoon et al., 1990: 110; Kim and Park, 1991: 191; Nomura and Lee, 1992: 88; Maes, 1992: 67; Kim, 1993: 61 (*Prismognathous* [sic]); 1995a: 164; 1995b: 139; 1996: 173; 2000: 22; ESK & KSAE, 1994: 146; Mizunuma and Nagai, 1994: 238; Kim and Kim, 1998: 23; 1998b: 169; Krajcik, 2001: 30; Bartolozzi and Sprecher-Uebersax, 2006: 74; Kim and Kim, 2010: 72.

Prismognathus angularis Waterhouse, 1874: 6; Nagaoka, 1938: 25; Kim, 1960: 26.

Prismognathus angularis angularis: ESK & KSAE, 1994: 146 (nec Waterhouse, 1874).

Neolucanus saundersii Parry, 1864: 20; Kim et al., 1993: 20 (*sandersi* [sic]).

Type depository: Unknown (refer to the depository of *Dorcus titanus castanicolor*).

Description: ♂. Body reddish brown to dark brown; mandibles almost straight, and slightly curved upward at one fourth of mandible from apex with one major tooth and one distinct minor tooth near base, twelve to sixteen blunted internal teeth up to near apex, and one appendage pointing upward near apex; head flat with sharply projected anterior angles; clypeus rectangular, three times as broad as long; canthi thick and short, dividing about one-third of compound eyes; pronotum widest at a little behind of middle with lateral margins angling inward in posterior third; elytra moderately punctured; legs generally reddish brown to dark brown with one or two lateral spines on each mesotibia and none to two lateral spines on each metatibia.

♀. Body reddish brown to dark brown with luster; mandibles short and sharp at apex with one major internal tooth pointing inward in middle and one appendage pointing upward; head punctured entirely, and narrower than pronotum; clypeus semicircular; canthi thick and short, dividing about one-third of compound eyes; pronotum narrower in anteriorly and widest at a little behind of middle with lateral margins angling inward in posterior third; elytra finely punctured; legs generally reddish brown to dark brown with two lateral spines on each mesotibia and one lateral spine on each metatibia. BL: ♂ 11–37.5 mm; ♀ 12–23.3 mm; ML: 2–6 mm.

Korean record: NK, HB- Hoeryeong, zueul, Musan, Cheongjin, HN- Mt. Huchiryeong, Mt. Bujeonryeong, Songheung, Sambang, Gabsan, Mt. Unsuryong, Anbyeon Sepo-ri, JG- Chosan, PB- Mt. Myohyangsan, Daeyudong, Huchang, GW- Mt. Geumgangsan, GG- Mt. Bogaesan, SK, GW- Goseong, Yangyang, Gangneung, Donghae, Samcheok, Mt. Gachilbong, Mt. Geonbongsan, Mt. Seolaksan, Mt. Odaesan, Mt. Bangdaesan, Hongcheon, Inje, Sinnam, Hwacheon, Chuncheon, Mt. Chiaksan, Imgye, Mt. Daegwallyeong, Mt. Taebaeksan, Mt. Hambaeksan, Cheolwon Mt. Myeongseongsan, GG- Mt. Hwaaksan, Gapyeong, Mt. Soyosan, Mt. Baekunsan, Yangpyeong, Mt. Chuknyeongsan, Gwangneung, Namyangju, Mt. Baekunsan, Seoul, Mt. Cheonggyesan, Seongnam, Yongin, CB- Danyang, Mt. Soknisan, CN- Chungu, Seosan, Deoksan, Mt. Gyeryongsan, Mt. Malloesan, GB- Mt. Sobaeksan, Mt. Baekamsan, Uljin, Mt. Gayasan, Gyeongju, GN- Yangsan, Mt. Jirisan, Mt. Jangboksan, Masan, Hadong, JB- Gochang, Naebyeonsan, Muju, JN- Mt. Jirisan, Gurye, Mt. Baekunsan, JJ- Jejudo.

Material examined (406ex): [SWU] NK, HN- Mt. Huchiryeong (1♀, 9.viii.1933), Sambang (1♀, 3.viii.1918), Mt. Bujeonryeong (1♀, 9.viii.1933); GG- Mt. Bogaesan (1♀, 17.viii.1939); SK, GW- Mt. Odaesan (17ex, 11.viii.1997), Mt. Gachilbong (1♂, 24.vii.1984), Mt. Bangdaesan (3ex, 16.vii.1995), Inje

(1♂, 24.viii.2000), Gangneung (2♂♂, 18.viii.2001), Cheolwon Mt. Myeongseongsan (1ex, 12.viii.1999), Mt. Taebaeksan, Mt. Hambaeksan (17ex, 13.viii.1999); GG- Mt. Hwaaksan (1♂, 16.viii.2000), Mt. Baekunsan (1♂, 14.viii.1994), Mt. Chuknyeongsan (5ex, viii.1996; 1999), Namyangju (1♂, 10.viii.1999), Seongnam (1♂, 21.vii.1993), Yong-in (1ex, 15.ix.1995); CB- Danyang (2♂♂, 2.viii.1994; 13.viii.1999); CN- Chungu Mt. Namsan (1♀, 24.viii.2000), Seosan (1♂, 20.vii.1992), Mt. Malloesan (1♀, 5.ix.1993); GB- Mt. Sobaeksan (12ex, viii, ix.1993; 4♀♀, 3.viii.1994), Uljin Sogwang-ri (5ex, vii, viii.1999); GN- Mt. Jangboksan (4ex, 10.viii.1988), Mt. Jirisan (1♂1♀, vii.1981); JN- Mt. Jirisan (1♂, 29.vii.1998); Mt. Baekunsan (1♂, 14.viii.1994); [NIBR] GW- Goseong (3♂♂6♀♀, 25.viii.2002), Yangyang (3♂♂20♀♀, 26.viii.2002; 1♂, 3.viii.2004), Gangneung (1♂1♀, 27.viii.2002), Donghae (1♂2♀♀, 25.viii.1997), Samcheok (2♀♀, 12.viii.; 2♂♂, 29.viii.2002), Chuncheon (1♂, 25.vii.2003); GG- Gapyeong (1♂2♀♀, 24, 25.viii.1998; 2♀♀, 15.viii.2006), Yangpyeong (1♂5♀♀, 24, 25.viii.1998); GB- Gyeongju (2♂♂, 18.viii.2001); GN- Yangsan (1♂1♀, 7.ix.2002), Hadong (3♂♂1♀, 26, 28.viii.2002); JN- Gurye (1♀, 13.viii.2002); [HNHM] NK, PB- Mt. Myohyangsan (1ex, 17.viii.1956; 1♂2♀♀, 12, 17.ix.1980; 1♂, 17.vii.1982; 1♂2♀♀, 17.viii.1989); ?- Chon-Bon-San (1♂, 3.ix.1956); GW- Mt. Geumgangsan (2♂♂, 22, 24.vii.1982); SK, GW- Hwacheon (1♀, 30.viii.2003), Chuncheon (5♂♂2♀♀, 26.viii.2003); JN- Mt. Baekunsan (1♂7♀♀, 19, 20.viii.1992); JJ- Mt. Hallasan (4♂♂2♀♀, 23.viii.1992); [NIAST] NK, HB- Musan (5ex, 21.viii.1922); GW- Mt. Geumgangsan (3ex, 3.viii.1924); SK, GW- Hongcheon (3ex, vii–ix.1993, 1994), Mt. Chiaksan (1ex, 14.viii.1999), Mt. Daegwallyeong (1♀, viii.1987), Mt. Taebaeksan (7ex, 12.viii.1999), Samcheok (2♂, 11.viii.1993), Mt. Myeongseongsan (2ex, 17.viii.1999); GB- Mt. Sobaeksan (23ex, 13.viii.1999), Mt. Sobaeksan (12ex, 13.viii.1999); GN- Hadong (1♂, 4.vii.1992); JB- Gochang (2♂♂, 27.ix.1991); JN- Mt. Baekyangsan (1♀, 25.vi.1922); JJ- Seoguipo (7ex, 3.vii.1984); [SNU] GW- Mt. Chiaksan (1♂, 20.viii.1994); SG- Gapyeong (2ex, 29.viii.1997), Seoul Geoyeo-dong (1♀, 4.viii.1984), Gwangkyo, Anyang (2ex, ix.1995, 1997); CB- Mt. Wolaksan (1♀, 7.viii.1958); CN- Mt. Gyeryongsan (1♀, 10.vii.1995); JN- Mt. Jirisan, Mt. Baekunsan (49ex, 1970–1993), [KU] NK, Hoeryeong, Gabsan, Cheongjin (HB), Mt. Bujeonryeong (HN), Daeyudong (PB) (7ex, vii, viii.1930, 1931), Mt. Bujeonryeong (1ex, 26.vii.1935); SK, GW- Mt. Geonbongsan (21ex, 24.vii.1992), Inje (1ex, 1.x.1995); SG- Gwangneung (1ex, 12.ix.1956), Mt. Cheonggyesan (1ex, 17.iv.1993), Hangang (2ex, 22.vii.1932); CN- Mt. Gyeryongsan (4ex, viii, ix.1973–1978); GB- Mt. Gayasan (1ex, 5.viii.1960), Masan, (1ex, 31.vii.1981); JB- Muju (1ex, 16.viii.1970); JN- Mt. Jirisan (1ex, 19.viii.1982); JJ- (4ex, 1955; 1973; 1974; 1990); others all Korea (7 sites, 28ex); [JFNM] JJ- Bukjeju (1♂, 26.vii.1993; 2♂♂, 25–28.viii.1993; 3♂♂1♀, 14–16.vii.1994), Seoguipo (1♂, 30.vii.; 2♂♂, 29, 30.viii.1993).

Distribution: Mongolia, NE China, E Siberia, Is. Tsushima (Japan).

Korea: North, Central, South, Jejudo.

Host plants: Larvae feed on rotten logs of various deciduous trees, including *Quercus* species. In Japan, Yoshida (1996) noted that this species is abundant in humid, deciduous forests with many thin, fallen branches.

Biology: Adults emarge in late July, and are active through September. This species is generally mountainous, and are active flyers, and attracted to flowing sap and lights at night. Adults survive only about a month. Similarly in Japan, Yoshida (1996) noted that adults emerge in late July, most abundant in early and mid-August. This alpine species is an active flyer that flies around the forest during the day when the temperature is high. Adults only survive about 2–4 weeks. In addition, this species is generally univoltine and no adult hibernation has been observed (Kurosawa, 1985).

Tribe Lucanini Latreille, 1804

Lucanides Latreille, 1804: 234 (TG: *Lucanus* Scopoli, 1763).
Platycerinae Mulsant, 1842 (TG: *Platycerus* Geoffroy, 1762).
Chiasognathinae Burmeister, 1847 (TG: *Chiasognathus* Stephens, 1831).
Figulinae Burmeister, 1847 (TG: *Figulus* MacLeay, 1819).
Dorcinae Parry, 1864 (TG: *Dorcus* MacLeay, 1819).
Cladognathinae Parry, 1870 (TG: *Cladognathus* Burmeister, 1847).
Odontolabinae Parry, 1870 (TG: *Odontolabis* Hope, 1842).
Rhaetulinae Miwa, 1931 (TG: *Rhaetulus* Parry, 1871).
Systenocerinae Portevin, 1931 (TG: *Systenocerus* Weise, 1883).
Penichrolucaninae Arrow, 1950 (TG: *Penichrolucanus* Deyrolle, 1863).
Dendeziinae Benesh, 1955 (TG: *Dendezia* Basilewsky, 1952).
Lissotinae Benesh, 1955 (TG: *Lissotes* Westwood, 1855).
Sclerostominae Benesh, 1955 (TG: *Sclerostomus* Burmeister, 1847).
Scortizinae Benesh, 1955 (TG: *Scortizus* Westwood, 1834).
Pholidotinae Kikuta, 1986 (TG: *Pholidotus* MacLeay, 1819).
Brasilucaninae Nikolajev, 1999 (TG: *Brasilucanus* Vulcano and Pereira, 1961).

Genus *Lucanus* Scopoli, 1763

Lucanus Scopoli, 1763: 1 (TS: *Scarabaeus cervus* Linnaeus, 1758).
Hexaphyllus Mulsant, 1839: 119 (TS: *Hexaphyllus pontbrianti* Mulsant, 1839).
Lucanus (*Pseudolucanus*) Hope and Westwood, 1845: 30 (TS: *Scarabaeus capreolus* Linnaeus, 1763).
Eolucanus Kurosawa, 1970: 159 (TS: *Lucanus gracilis* Albers, 1889).

17. *Lucanus maculifemoratus dybowskyi* Parry, 1873 (Fig. 17)

Lucanus maculifemoratus Motschulsky, 1861: 9 (TL: Japon=Japan); Heyden, 1887: 250 (first record from Korea); Miwa, 1927: 28; 1929a: 73; Cho, 1931: 57; 1947: 65; 1956: 77; 1957: 115; 1969: 605; Doi, 1932: 78; Kamijo, 1932: 20; Nakatomi, 1934: 655; Kôno, 1935: 162; Miwa and Chuûjô, 1936: 1; Mochizuki, 1936: 211; Mori and Cho, 1938: 34; Nagaoka, 1938: 25; Masui, 1942: 66; Benesh, 1960: 143; Ku, 1963: 27; Nomura, 1963: 103; 1969: 82; KZS, 1968: 133; Kim and Kim, 1972: 159; 1974: 107; 1976: 102; Kim and Nam, 1984: 328; Kim and Chang, 1987: 104; Kim and Park, 1991: 191; Kim, 1994a: 147; Kim, 1993: 61 (*maculifemoratua* [sic]); Park et al., 1993: 177.
Lucanus dybowskyi Parry, 1873: 335 (TL: Amur River Dauria); Didier and Séguy, 1953: 80; Kim, 1978: 312; Yoon et al., 1990: 110; Kim and Yoo, 1987: 505; 1992: 153; Kim and Lee, 1989: 178.
Lucanus taiwanus Miwa, 1936: 2 (TL: Formosa=Taiwan); Masui, 1942: 67.
Lucanus maculifemoratus dybowskyi: Maes, 1992: 18; ESK & KSAE, 1994: 145; Mizunuma and Nagai, 1994: 215; Kim, 1995a: 163; 1995b: 139; 1996: 173; Kim and Kim, 1998: 23; Kim, 2000: 21; Bartolozzi and Sprecher-Uebersax, 2006: 65; Kim and Kim, 2010: 77.

Type depository: Unknown.

Description: ♂. Body reddish brown to dark brown, and covered with yellowish hair, dense on ventral side; mandibles long, strongly developed with four to five internal teeth and bifid apex; head significantly developed with crowned posterior margin due to two well-developed protrusions; clypeus tongue shape, slanted downward, and sharp at apex; canthi slender and short, dividing about one third of compound eyes; pronotum widest at a little behind of middle; elytra convex, wider than pronotum, and moderately punctured with much yellowish hair; legs generally reddish brown to dark brown with yellowish brown color in most portion of femora, mesotibiae with three to five lateral spines, and metatibiae with two to three lateral spines.

♀. Body reddish brown to dark brown with weak luster, and slightly covered with yellowish hair; mandibles short with one major internal tooth pointing inward and one minor overlapping tooth pointing upward in middle; head strongly punctured and narrower than pronotum; clypeus triangular shape and broadest at base; canthi thick and short, dividing about a quarter of compound eyes; pronotum widest at middle with lateral margins angling inward in posterior third; elytra convex and finely punctured; legs generally reddish brown to dark brown with yellowish brown color in most portions of femora and both mesotibia and metatibia with three or more lateral spines. BL: ♂ 27–68 mm; ♀ 23–40 mm; ML: 7–23 mm.

Korean record: NK, HN- Songheung, Sambang, Mt. Bujeonryeong, PB- Mt. Myohyangsan, Huchang, Daeyudong, HWN- Seoheung, Haeju, GW- Mt. Geumgangsan, GG- Mt. Bogaesan, SK, GW- Goseong, Sokcho, Yangyang, Mt. Seolaksan, Temple Naksansa, Mt. Gachilbong, Mt. Odaesan, Mt. Gyebangsan, Mt. Bangdaesan, Hongcheon, Mt. Sogeumgang, Inje, Pyeongchang, Mt. Taebaeksan, Samcheok, Mt. Chiaksan, Wonju, Hwacheon, Chuncheon, Gangchon, GG- Mt. Myeongjisan, Gapyeong, Mt. Soyosan, Idong, Byeokje, Jangheung, Yangju, Is. Nam-i-seom, Pocheon, Gwangneung, Mt. Yongmunsan, Mt. Cheonggyesan, Suwon, CB- Danyang, Jecheon, Mt. Soknisan, Yeongdong, CN- Taean, GB- Munkyeong, Mt. Sobaeksan, Mt. Baekamsan, Bonghwa, Uljin, Mt. Palgongsan, Mt. Gayasan, GN- Mt. Jirisan, Gimhae, JB- Mt. Deogyusan, Naebyeonsan, Muju, Mt. Naejangsan, JN- Mt. Jirisan, Gurye, Jinan, Mt. Baekunsan, Gwangyang, JJ- Jejudo.

Material examined (164ex): [SWU] GW- Mt. Odaesan (1♂, 29.vi.; 2♀♀, 11.viii.1997), Mt. Bangdaesan (2♂♂, 23.vi.1996), Mt. Gyebangsan (1♀, 16.vi.1993), Mt. Sogeumgang (1♂, 24.vi.1998), Inje (6ex, 16.viii.1995), Mt. Gyebangsan, Mt. Chiaksan, Samcheok, Gangchon (4ex, vi,viii.1980–1993), Wonju (1♀, 14.viii.1999); GG- Mt. Myeongjisan, Mt. Myeongjisan, Mt. Yongmunsan (2♀♀, ix.1980; 1989; 1♀, 28.vii.2000), Goyang (1♂, 24.vii.1994), Pocheon (1♀, 27.v.1995), Yangju (1♀, 20.vii.1996), Jangheung, Gwangneung (2♀♀ v, vi.1995, 1996), Seoul Cheongge-cheon (1♀, 27.vi.1991); CB- Danyang (3♀♀, 21.vii.1981), Jecheon (1♀, 10.viii.1988); CN- Taean (1♀, 26.v.1974); GB- Mt. Sobaeksan (1♀, 3.viii.1994), Munkyeong (1♀, 18.ix.1986), Bonghwa (1♂, 25.vii.1986), Uljin Sogwang-ri (17ex, vii, viii.1999); JN- Mt. Jirisan (4♀♀, vii, viii.1981; 1984; 1998), Mt. Baekunsan (1♀, 10.viii.1993); JJ- (10 sites, 18ex); [NIBR] GW- Goseong (1♀, 20.vi.1998), Sokcho (1♂, 26.viii.2002), Yangyang (1♂, 26.viii.2002), Pyeongchang (1♀, 23.vii.1998), Chuncheon (1♂, 25.vii.2003); GG- Gapyeong (1♀, 4.viii.2006); JN- Gurye (1♂2♀♀, 13.viii.2002); [HNHM] NK, PB- Mt. Myohyangsan (1♂, 7.vii.1991); GW- Mt. Geumgangsan (3♀♀, 9.vii.1977; 23.vii.1982; 5.viii.1975); [NIAST] NK,GW- Mt. Geumgangsan (4♀♀, 5.viii.1921; 2♀♀, 25.vii.1924); SK, GW- Mt. Odaesan (2♂♂, 8.vii.1923), Hongcheon (6ex, vii–ix.1989–1993), Pyeongchang, Chuncheon (2♀♀, vii.1982; 1993), Mt. Taebaeksan (1ex, 12.viii.1999), Mt. Chiaksan (1ex, 14.viii.1999); GG- Suwon (1♀, 25.vii.1992); CB- Yeongdong (1♀, 26.viii.1993); GB- Mt. Sobaeksan (1ex, 13.viii.1999), Mt. Baekamsan (3ex, 13.viii.1999); GN- Mt. Jirisan (1♀, 1.viii.1924),

Gimhae (1♀, 27.vii.1994); JB- Muju (1♀, 13.viii.1975); JN- Gwangyang (1♀, 20.viii.1992), Mt. Baekunsan (3ex, 5.viii.1994); [SNU] GG- Is. Nam-i-seom (1♂, 12.viii.1985), Suwon (1♀, 22.vi.no data); GN, JN- Mt. Jirisan (5♀♀, vii, viii.1969; 1970; 1981); JN- Mt. Baekunsan (1♀, 26.vi.1994), Jinan (1♀, 15.vii.1994); [KU] NK, HN- Sambang (1ex, 3.viii.1943), Mt. Bujeonryeong (1ex, 27.vii.1933); GW- Mt. Geumgangsan (2ex, viii.1931; 1934); GG- Mt. Bogaesan (1ex, 23.vii.1943); SK, GW- Goseong (4ex, 24. viii.1992), Mt. Seolaksan (3ex, vii, viii.1971; 1984), Mt. Gachilbong (1ex, 24.vii.1981), Mt. Chiaksan (1ex, 29.vii.1975), Hwacheon (1ex, 15.vi.1988); GG- Mt. Soyosan (10ex, vi–viii.1932–1935; 1ex, 9.ix. 1962); CB- Mt. Soknisan (1ex, 5.viii.1938); GB- Gyeongbug (2ex, vii.1935, 1936), Mt. Sobaeksan, Mt. Gayasan (4ex, no data).

Distribution: N China, FE Russia (Amur), Korea, Japan.

Korea: North, Central, South, Jejudo.

Host plants: This species is often found on old *Fagus japonica* var. *multinervis* (Nakai) Y. Lee ex Govaerts and Frodin, as well as on various *Quercus* species.

Biology: Adults emerge in June and survive about 2–3 months without hibernating as adults. This is also an alpine species, an active flyer, and is attracted to flowing sap and to lights at night.

Family Passalidae Leach, 1815

Passalida Leach, 1815: 100 (TG: *Passalus* Fabricius, 1792).

Adults of the Passalidae form subsocial groups with their larvae in the rotten logs or stumps, so these beetles are often observed at various life stages. Both adults and larvae have the ability to stridulate, with fourteen different ways of communication reported (Reyes-Castillo and Halffter 1984; Schuster 1975, 1983; Schuster and Schuster 1997).

The Passalidae is largely divided into the subfamilies Aulacocyclinae Kaup, 1868 and Passalinae Leach, 1815, where the former is further divided into only two tribes and the latter into five, with complex synonymic histories (Smith, 2006). As indicated in the introduction, only few species of the subfamily Aulacocyclinae are known in Asia and Australia, to which the only species of Japan (*Cylindrocaulus* sp.) belongs. Nevertheless, with the discovery of the Korean species, which belongs to the subfamily Passalinae, the previous opinions regarding the distributional range of these subfamilies have largely been contradicted.

Genus *Leptaulax* Kaup, 1868

Leptaulax Kaup, 1868: 11 (TS: *Passalus dentatus* Fabricius, 1792).
Leptaulacides Zang, 1905: 106 (TS: *Passalus bicolor* Fabricius, 1801).

1. *Leptaulax koreanus* Nomura, Kon, Johki and Lee, 1993 (Fig. 18).

Leptaulax koreanus Nomura, Kon, Johki and Lee, 1993: 51 (TL: Gwangneung GG, Korea): Kim, 2000: 33.

Type depository: Kyushu University, Japan.

Description: Body black with luster; mandibles short, markedly broad, thick, arched inward entirely, curved upward near apex, with one internal tooth, vertically bifid; labrum twice as wide as long, anterior margin concave, dorsal surface densely, and strongly punctured with long, yellowish hair; head twice as wide as long, frons with a pair of supraorbital ridges converging to posterior, frontal ridges at center merging into longitudinal ridge on vertex, with horizontal ridge on parietal region, anterior margin with four major teeth and one minor tooth at middle, surface between ridges with two to three rows of weak, oculate punctures; antennae 10-segmented, antennal club with three antennomeres, wide, subequal in length with antennomeres 5 to 7; compound eyes strongly protruded on each side; canthi very thick and short, dividing one-third of compound eyes; pronotum markedly wider than head, slightly wider at posterior, surface smooth, with thin longitudinal median line, and 2 to 3 rows of sparse, strong punctures at sides, anterior margin straight, lateral margins only slightly rounded, posterior margin nearly straight on disc, with slightly expanded margin; elytra as wide as pronotum, slightly wider at posterior, widest at posterior fourths, roundly expanded near apex, striations prominent, central four with slender, oval punctures all merged, almost furrow-like, lateral six with round, independent punctures; tibiae generally thick, protibiae markedly thick with 4 to 6 lateral teeth, mesotibiae with two major lateral spines near tip and one minor spine at middle. BL: 18.7–21.0 mm; BW: 8.7–9.2 mm.

Korean record: GG- Gwangneung.

Material examined (4ex): [SWU] GG- Gwangneung (4ex, 17.v.1992, S.W. Park) (n.b., the collection data of the examined specimens are identical with those of the holotype and 100 paratypes recorded in the original description).

Distribution: Korea.

Korea: Central.

Literature Cited

Albers G (1886) Ein neuer Lucanide, *Eurytrachelus consentaneus* von Peking und *Odontolabis inaequalis* Kaup. *Deutsche Entomologische Zeitschrift*, 30: 27–28.

An SL (1999) Insect fauna of the Dadohae Haesang National Park in Korea. *The Report of the National Science Museum*, 26: 27–65.

Andrew BTS (2006) A Review of the Family-group names of the Superfamily Scarabaeoidea (Coleoptera) with Corrections to Nomenclature and a Current Classification. *Coleopterists Society Monograph*, 5: 144–104.

Arrow GJ (1927) Coleoptera. Clavicornia and Lamellicornia. *Insects of Samoa and other Samoan terrestrial arthropods*, 4: 35–66.

Arrow GJ (1935) A contribution to the classification of the coleopterous family Lucanidae. *Transactions of the Royal Entomological Society of London*, 83(1): 105–125.

Arrow GJ (1937) Dimorphism in the males of stag-beetles (Coleoptera, Lucanidae). *Transactions of the Royal Entomological Society of London*, 86(13): 239–246.

Arrow GJ (1943) On the genera and nomenclature of the lucanid Coleoptera, and descriptions of a few new species. *Proceedings of the Royal Entomological Society of London (B)*, 12(9–10): 133–143.

Arrow GJ (1950) *The Fauna of India including Pakistan, Ceylon, Burma and Malaya. Coleoptera Lamellicornia; Lucanidae and Passalidae*, Vol 4. Taylor and Francis, London.

Bartolozzi L, Sprecher-Uebersax E (2006) Lucanidae. In: Löbl I, Smetana A (eds) *Catalogue of Palaearctic Coleoptera*, 3: 63–76. Apollo Books, Stenstrup.

Benesh B (1955) Some notes on Neotropical stagbeetles (Coleoptera: Lucanidae). *Entomological News*, 66: 97–104.

Benesh B (1960) *Coleopterorum Catalogus Supplementa edita a W. D. Hincks*, 8 (2nd ed.) itio Lucanidae. Uitgeverij Dr. W. Junk, Hague.

Boileau MH (1898) Description d'un Lucanide nouveau (Col.). *Bulletin de la Société Entomologique de France*, 47: 264–268.

Boisduval JBA (1835) *Voyage de découvertes l'Astrolabe exécuté par ordre du Roi, pendant les années 1826-1827-1828-1829, sous le commandement de M.J. Dumont d'Urville, faune entomologique de l'Océan Pacifique, avec l'illustration des insectes nouveaux recueillis pendant le voyage, 2éme partie*, Coléoptères et autres ordres. J. Tastu, Paris.

Bomans HE (1988) Inventaire d'une collection de Lucanidae récoltés en Nouvelle-Guinée et descriptions d'espèces nouvelles (Coleoptera) (1). *Nouvelle Revue d'Entomologie*, 5(1): 5–16.

Bomans HE (1989) 5èm contribution à l'étude des Coléoptères Lucanides. Nouvelles notes sur le genre *Figulus* MacLeay et descriptions d'espèces nouvelles. *Bulletin de la Société Sciences Naturelle*, 63: 13–19.

Branco T (2007) Scarabaeoidea (Coleoptera) of Portugal: genus-group names and their type species. *Zootaxa*, 1453: 1–31.

Browne DJ (1993) Phylogenetic significance of the hind wing basal articulation of the Scarabaeoidea (Coleoptera). *Ph. D. Thesis, University of Pretoria*, Pretoria, South Africa.

Burmeister HCC (1847) *Handbuch Der Entomologie - Coleoptera Lamellicornia, Xylophila Et Pectinicornia*. Fünfter Band. Theod. Ehr. Fr. Enslin, Berlin.

de Castelnau FL (1840) *Histoire Naturelle des Insectes Coléoptères*. Tome Deuxième. P. Duménil, Paris.

Cho FS (1931) Alist of Lucanidae from Korea. *Journal of Chosen Natural History Society*, (12): 56–60, pl. 3 (In Japanese).

Cho PS (1947) The fauna of the Mt. Diamond in Korea. *Bulletin of the Zooolgical Section, The Natural Science*

Museum of Korea, 2(3): 43–100 (In Japanese).

Cho PS (1955) The fauna of Dagelet Island (Ulnung-do). *Bulletin of Sungkyunkwan University*, 2: 179–266 (In Korean).

Cho PS (1956) Sexual dimorphism of Korean insects (1). *Korean Journal of Biology, Korea University*, 1(1): 76–78 (In Korean).

Cho PS (1957) A Systematic Catalogue of Korean Coleoptera. *Human and Science, Korea University*, 2: 19–303 (In Korean).

Cho PS (1963) Insect of Quelpart Island. *Human and Science, Korea University*, 6: 159–242, 294 (In Korean).

Cho PS (1965) Beiträge zur Kentnnis der Insekten-Fauna Insel Dagelet. *Commemoratory of These 60th Anniversary of the Natural Science*, Korea University: 196 (In Korean).

Cho PS (1967) *Natural conservatory area Sul Ak San*. Ministry of Education: 197–298 (In Korean).

Cho PS (1968) *Natural conservatory area Han La San and Hong do*. Ministry of Culture: 264–265 (In Korean).

Cho PS (1969) *Illustrated encyclopedia of fauna & flora of Korea*, Vol. 10, Insecta (II), Samhwa Publ. Co. Ltd., Seoul (In Korean).

Deyrolle H (1863) Nouveau genre de Lucanide. *Annals de la Société Entomologique de France*, 4(3): 485–487.

Didier R (1927) Description d'un genre nouveau et d'une nouvelle espèce de Lucanides. *Coleopteriste Bulletin de la Société Entomologique de France*, 1927: 87–90.

Didier R (1931) Introduction à l'étude de l'évolution des dorcides et essai de classification. In: Didier R (ed.) *Études sur les coléoptères lucanides du globe*. fasc., 8: 175–204.

Didier R, Séguy E (1952) Notes sur quelques espèces de lucanides et descriptions de formes nouvelles. *Revue Française d'Entomologie*, 19: 220–233.

Didier R, Séguy E (1953) Catalogue illustré des lucanides du globe, texte. *Encyclopédie Entomologique*, série A, 27. Paul Lechevalier, Paris.

Doi H (1932) Insects of Mt. Soyo. *Journal of Chosen Natural History Society*, 14: 78.

Doi H (1935) Miscellaneous notes on insects (6). *Journal of Chosen Natural History Society*, 20: 54–61.

ESK & KSAE (Entom. Soc. Kor. & Kor. Soc. Appl. Entom.) (1994) *Check List of Insects from Korea*. Kon-Kuk University Press, Seoul.

Fabricius JC (1792) *Entomologiae Systematicae Emendatae et Auctae*. Volume 1, part 1. C. G. Proft, Copenhagen, Denmark.

Fabricius JC (1801) *Systema Elutheratorum Secundum Ordines, Genera, Species: Adietis Synonymis, Locis, Observationibus, Descriptionibus*. Volume 2. Impensis Bibliopolii Academici Novi, Kiel, Germany.

Fairmaire L (1849) Essai sur les Coléoptères de la Polynésie. *Revue et Magasin de Zoologie*, (2)1: 410–422.

Felsche C (1898) *Verzeichniss der Lucaniden, welche bis jetzt bescrieben sind*. Ernst Heyne, Leipzig.

Gahan CJ (1888) On the coleoptera of Christmas Island. *Proceedings of the Zoological Society of London*, 1888(37): 538–541.

Geoffroy EL (1762) *Histoire Abrégée des insectes qui se trouvent aux environs de Paris; dans laquelle ces animaux sont rangés suivant un ordre méthodique, admiranda tibi levium spectacular rerum*. virg. Georg. Iv, Tome 1. Chez Durand, Paris.

Haku K (1935) Obtained insects by light collection. *Entomological World of Japan*, 3(1):57.

Haku K (1937) A list of insects collected from North Keisho-do, Korea (I). *Journal Chosen Natural History Society*, 21: 121.

Han TM, Jeong JC, Kang TH, Lee YB, Park HC (2010) Phylogenetic Relationships of *Dorcus koreanus* Jang and Kawai, 2008 (Coleoptera, Lucanidae): Species or Subspecies? *Zoological Science of Japan*, 27: 362–368.

von Harold E (1875) Verzeichniss der von Herrn T. Lenz in Japan gesammelten coleopteren. *Abhandlungen*

Naturwissenschaftlicher Vereins, Bremen, 4: 283–296.

Heller KM (1900) *Neue Käfer von Celebes* IV. Abhandlungen und Berichte des Königlichen Zoologischen und Anthropologisch-Ethnographischen Museums zu Dresden, 9: 1–46.

Heyden L, Reitter E, Weise J (1883) *Catalogus Coleopterorum Europae Et Caucasi*. Libraria Nicolai, Berolini, Edw. Janson, Londini and Luc. Baquet, Paris.

Heyden L (1887) Verzeichniss der von Herrn Otto Herz auf der chinesischen Halbinsel Korea gesammelten Coleopteren. *Horae Societatis Entomologicae Rossicae*, 21: 243–273.

Holloway BA (1960) Taxonomy and phylogeny in the Lucanidae (Insecta: Coleoptera). *Records of the Dominion Museum*, 3(4): 321–365.

Holloway BA (1968) The relationships of *Syndesus* MacLeay and *Sinodendron* Schneider (Coleoptera: Lucanidae). *New Zealand Journal of Science*, 11(2): 264–269.

Holloway BA (1997) Elytral surface structures as indicators of relatinoships in stag beetles, with special reference to the New Zealand species (Coleoptera: Lucanidae). *New Zealand Journal of Science*, 24(1): 47–64.

Hope FW (1831) Synopsis of the new species of Nepaul Insects in the collection of Major General Hardwicke. In: Gray JE (ed.) *The zoological miscellany, to be continued occasionally*, 1: 21–32. Treuttel, Wurtz and Co., London.

Hope FW (1835) Characters and descriptions of several new genera and species of coleopterous insects. *The Transactions of the Zoological Society of London*, 1(2): 91–112.

Hope FW (1840) Descriptions of some new insects collected in Assam, by William Griffith, Esq., Assistant surgeon in the Madras Medical Establishment. *Annals and Magazine of Natural History*, (1)6: 299–301.

Hope FW (1842a) On some rare and beautiful coleopterous insects from Silhet, the major part belonging to the collection of Frederic Parry, Esq., of Cheltenham. *Proceedings of the Linnean Society of London*, 1: 127–128.

Hope FW (1842b) Descriptions of some nondescript insects from Assam, chiefly collected by William Griffith, Esq., F.L.S., Assistant-Surgeon in the Madras Medical Service, and attached to the late Scientific Mission to Assam. *The Transactions of the Linnean Society of London*, 18: 587–600, pl. 40.

Hope FW (1842c) Descriptions of some new coleopterous insects from the Kasya Hills, near the boundary of Assam. *The Proceedings of the Entomological Society of London*, 1842: 82–84.

Hope FW, Westwood JO (1845) *A catalogue of the lucanoid Coleoptera, in the collection of the Rev*. FW Hope, MA, FRS, and C, President of the Entomological Society of London, together with descriptions of the new species therein contained. JC Bridgewater, London.

Houlbert C (1914) Description d'un nouveau genre et d'une espèce nouvelle de la Tribu des Dorcinae (Col. Lucanidae). Insecta - Revue Illustrée d'Entomologie 4: 344–346.

Houlbert C (1915a) Description de quelques lucanides nouveaux de la tribu des Cladognathinae. *Insecta - Revue Illustrée d'Entomologie*, 5: 48–54.

Houlbert C (1915b) Note sur le *Dorcus derelictus* Parry, comme type d'un nouveau genre (Durelius) de la tribu des Cladognathinae. *Insecta - Revue Illustrée d'Entomologie*, 5: 89–98.

Howden HF (1963) Passalidae. *The Beetles of the United States*, 29: 391–393.

Howden HF (1982) Larval and adult characters of *Frickius* Fermain, its relationship to the Geotrupini, and a phylogeny of some major taxa in the Scarabaeoidea (Insecta: Coleoptera). *Canadian Journal of Zoology*, 60: 2713–2724.

Howden HF, Lawrence JF (1974) The New World Aesalinae, with notes on the North American luca-nid subfamilies (Coleoptera, Lucanidae). *Canadian Journal of Zoology*, 52: 1505–1510.

Hyun JS, Woo KS (1969; 1970) Insect Fauna of Mt. Jiri (I) (II). *Bulletin, Seoul National University, Forest*, 6: 152–202; 7: 80.

Imura Y, Choe KR (1989) A new species and its subspecies of the genus Platycerus from Korea (Coleoptera,

Lucanidae). *The Korean Journal of Entomology*, 19: 19–24.

Jakobson GG (1911) Kritiko-bibliograficheskiy otdyel'. Revue critico-bibliographique. *Revue Russe D'Entomologie*, 11(1): 139–146.

Jakowlew BE (1896) Lucanides nouveaux ou peu connus. *Horae Societatis Entomologicae Rossicae*, 30: 171–174.

Jang YC, Kawai S (2008) A new species of the *Dorcus velutinus* group (Coleoptera, Lucanidae) from Korea. *Kogane*, 9: 103–106.

Kamijo N (1932) On a collection of Insect from North Keisho-Do, Korea. *Journal of Chosen Natural History Society*, 13: 20 (In Japanese).

Kaup J (1868) Prodromus zu einer Monographie der Passaliden. In: von Harold E (eds) *Coleopterologische Hefte*., 3: 4–32. Carl Merhoff's Verlag, München.

Kikuta T (1986) On the higher taxa of the stag beetle family Lucanidae (pp. 131–138). In: *Papers on Entomology Presented to Professor Takeshiko Nakane in commenmoration of his retirement*. Japanese Society of Coleopterology, Tokyo, Japan.

Kim BJ, Kim KK, Lee YJ (1993) Insect fauna of Mt. Togyu. *Wonkwang University Theses Collection*, 27: 49–80 (In Korean).

Kim CW (1978) *Distribution Atlas of Insects of Korea, Series 2, Coleoptera*. Korean Entomological Institute, Seoul.

Kim CW, Kim JI (1971) Insect fauna of Mt. Sogumgang and Mt. Odae. *Report of the Korean Association for Conservation of Nature*, 4: 139–173 (In Korean with English abstract).

Kim CW, Kim JI (1973a) Insect fauna of Gucheondong, Muju-kun. *Report of the Korean Association for Conservation of Nature*, 5: 65–101 (In Korean with English abstract).

Kim CW, Kim JI (1973b) Insect fauna of Mt. Daedunsan, Haenam-Gun. *Report of the Korean Association for Conservation of Nature*, 6: 189–200 (In Korean with English abstract).

Kim CW, Kim JI (1974) Insect fauna of National Park, Mt. Naejangsan in summer season. *Report of the Korean Association for Conservation of Nature*, 8: 95–126 (In Korean with English abstract).

Kim CW, Kim JI (1976) Land animals from Mt. Chiaksan area. *Report of the Korean Association for Conservation of Nature*, 9: 83–113.

Kim CW, Nam SH (1977) Insect Fauna of Mt. Jogyesan in summer season. *Report of the Korean Association for Conservation of Nature*, 11: 119–140.

Kim CW, Nam SH (1981) Insect Fauna in the areas of Mts. Gyebang, Sogyebang and Gachilbong in summer season. *Report of the Korean Association for Conservation of Nature*, 20: 119–137.

Kim CW, Nam SH (1982) Insect Fauna of Seoul City area. *Korea University Science and Technology*, 23: 154 (In Korean).

Kim CW, Nam SH (1984) On the relation between the insect fauna and the vegetation in Mt. Sŏrak. *Rep. Acad. Surv. Mt. Sŏrak*: 303–352.

Kim CW, Lee CE, Park HC, Nam SH, Kwon YJ (1985) Insect fauna of Mt. Chuwang in summer season. *Report of the Korean Association for Conservation of Nature*, 23: 93-110 (In Korean with English abstract).

Kim HK (1956) Insect fauna of Deogjeokdo, Korea I. *The 70th Anniversary, Ewha University*: 335–348.

Kim HK (1958) Insect fauna of Deogjeokdo, Korea II. *Journal Applied Zoological Society of Korea*, 1(1): 87–102.

Kim HK (1960) A list of insects from Mt, Solak. *Journal Applied Zoological Society of Korea*, 3(1): 21–29 (In Korean with English summary).

Kim JI (1981) The faunistic study on the insects from Sudong-myeon, Namyangju-kun, Gyeonggi-do, Korea. *Bulletin of Korean Association for Conservation of Nature*, 3: 344–345 (In Korean with English summary).

Kim JI (1993) Specimen List of North Korean Scarabaeoidea conserved in Hungarian Natural History Museum (II). *The Journal of Basic Science, Sungshin University*, 11: 59–70 (In Korean with English summary).

Kim JI (1994a) Coleoptera and Diptera from Mt. Sobaek. *Report of the Korean Association for Conservation of*

Nature, 33: 157–179 (In Korean with English summary).

Kim JI (1994b) Fauna of Coleoptera and Diptera from Pyonsan Peninsula National Park. *Report of the Korean Association for Conservation of Nature*, 34: 139–140 (In Korean with English summary).

Kim JI (1995) Insect Fauna of Coleoptera and Diptera from Mt. Pangtae in summer season. *Report of the Korean Association for Conservation of Nature*, 35: 173–174 (In Korean with English summary).

Kim JI (2000) Coleoptera (Scarabaeoidea). Economic Insects of Korea, 4. *National Institute of Agricultural Science and Technology, Suwon*, pp. 17–33 (In Korean with English summary).

Kim JI (2003) *Manuscript left by Dr. Cho Bokseong* (*Kwanjeong*). Jeonghaengsa Publ., pp. 83–119 (In Korean).

Kim JI (2011) *Insect Fauna of Korea: Pleurosticti*, volume 12, number 1. National Institute of Biological Researches, Ministry of Environment, Incheon.

Kim JI (2012) *Insect Fauna of Korea: Laparosticti*, volume 12, number 3. National Institute of Biological Researches, Ministry of Environment, Incheon.

Kim JI, Chang KS (1982) On the summer seasonal insect from the Deogjeog Archipelago. *Report on the Survey of Natural Environment in Korea*, 1: 131–164 (In Korean with English abstract).

Kim JI, Chang KS (1987) Insect fauna of the Mt. T'aebaek in Korea. *Report of the Korean Association for Conservation of Nature*, 25: 91–120 (In Korean with English summary).

Kim JI, Kim SY (1996) Insect fauna of Coleoptera and Diptera from Mt. Bangtae in summer season. *Report of the Korean Association for Conservation of Nature*, 35: 163–180 (In Korean with English summary).

Kim JI, Kim SY (1998) Taxonomic Review of Korean Lucanidae (Coleoptera: Scarabaeoidea). *The Korean Journal of Systematic Zoology*, 14: 21–33.

Kim JI, Lee OJ (1989) Insect fauna from the group islands Anma. *Report on the Survey of Natural Environment in Korea*, 9: 163–187 (In Korean with English summary).

Kim JI, Park HC (1991) The survey on the entomofanua at Mt. Myungji and Mt. Mugap under the resting-year scheme in the province Kyonggi. *Report of the Survey of Mt. Myungji Ecosystem*, 139: 192–193 (In Korean with English summary).

Kim JI, Yoo HJ (1987) Study on the insect fauna and its change from near the DMZ of the province Kyŏnggi-do, Korea. *Rep. DMZ Korea, Kyŏnggido*, pp. 489–528 (In Korean with English summary).

Kim SI, Farrell BD (2015) Phylogeny of world stag beetles (Coleoptera: Lucanidae) reveals a Gondwanan origin of Darwin's stag beetle. *Molecular Phylogenetics and Evolution.*

Kim SI, Kim JI (2010) Review of family Lucanidae (Insecta: Coleoptera) in Korea with the description of one new species. *Entomological Research*, 40(1): 55–81.

Koh SK (2003) Rediscovery of *Nigidius miwai*. *Gekkan-Mushi*, 390: 66–68.

Kôno H (1926) Einige Coleopteren aus Korea, mit Beschreibung auf eine neue Art. *Transactions of the Natural History Society of Formosa*, 16(84): 87–91 (In Japanese).

Kôno H (1935) Die Lamellicornien aus den Kurilen (vierter Beitrag zur Kenntnis der Käferfauna der Kurilen). *Insecta Matsumurana*, 9: 162–165.

Kraatz G (1896) Hadronigidius nov. genus Lucanidarum aus Ostafrika. *Deutsche Entomologische Zeitschrift*, 1: 65–66.

Krajcik M (2001) *Lucanidae of the World Catalogue*. Part 1, Checklist of the Stag Beetles of the World (Coleoptera: Lucanidae). M. Krajcik, Most, Czech Republic.

Kriesche R (1921) Über *Eurytrachelus titanus* Boisd. und seine Rassen (Coleopt. Lucanidae). *Archiv für Naturgeschichte, Abteilung A*, Berlin, 86(8): 114–119.

Kriesche R (1926) Neue Lucaniden. *Stettiner entomologische Zeitung*, 87: 382–385.

Ku K (1963; 1966) Insects of Mt. Myungji (I) (II). *Korean Journal of Zoology*, 6(1): 25–28; 9(2): 85–87. (In Korean with English summary).

Kurosawa Y (1969) A revision of the genus *Platycerus* Geoffroy in Japan (Coleoptera, Lucanidae). *Bulletin of the National Science Museum, Tokyo*, 12(3): 475–484, pl. 1.

Kurosawa Y (1970) The stag-beetles collected by the Lepidopterological Research Expedition to Nepal Himalaya in 1963. *Special Bulletin of the Lepidopterological Society of Japan*, 4: 159–167.

Kurosawa Y (1976) Family Lucanidae. Check-list of Coleoptera of Japan. *The Coleopterist's Association of Japan*, Tokyo, 1: 1–9.

Kurosawa Y (1985) Lucanidae. In: Uéno SI, Kurosawa Y, Satô M (eds) *The Coleoptera of Japan in Color*. 2: 328–346. Hoikusha Publishing Co., Osaka (In Japanese).

KZS (The Zoological Society of Korea), 1968. *Nomina Animalium Koreanorum* (2) Insecta, pp. 133.

Kwon YJ, Suh SJ, Huh EY (1996) Insect diversity of Pogil Island in Korea. *Report of Survey of Natural Environment of Korea*, 11: 213–261.

Latreille PA (1802) *Histoire Naturelle, Genérale et Particulière, des Crustacées et des Insectes*, Vol. 3. F. Dufart, Paris, France.

Latreille PA (1804) *Histoire Naturelle, Genérale et Particulière, des Crustacées et des Insectes*, Vol. 10. F. Dufart, Paris, France.

Leach WE (1815) *Entomology* (pp. 57–172). In: *Edinburgh Encyclopedia*, volume 9, part 1 Brewster (ed.), Edinburgh, Scotland.

Lee CE, Kwon YJ (1981) On the insect fauna of Ulreung Is. and Dogdo Is. in Korea. *Report of the Korean Association for Conservation of Nature*, 19: 154 (In Korean with English summary).

Lee HP Ko GS (1988) Insect fauna in the Oeyŏn Islands in summer. *Report of Survey of Natural Environment of Korea*, 8: 197–220 (In Korean with English summary).

Lewis G (1883) On the Lucanidae of Japan. *The Transactions of the Entomological Society of London*, 1883: 333–342, pl. 14.

Linnaeus C (1758) *Systema Naturae per Regna Tria Naturae, Secundum Classes, Ordines, Genera, Spedies, cum Characteribus, Differentiis, Synonymis, Locis*, edition 10, volume 1. Laurentii Salvii, Stockholm, Sweden.

MacLeay WS (1819) *Horae Entomologicae*: *Or, Essays on the Annulose Animals*. I (1), S. Bagster, London.

Maes JM (1990) Notas diversas sobre la taxonomia de los Lucanidae (Coleoptera). *Revista Nicaraguense de Entomologia*, 11: 1–34.

Maes JM (1992) Lista de los Lucanidae (Coleoptera) del mundo. *Revista Nicaragüense de Entomología*, 22A, B: 1–121.

Masaki J (1936) On the insect fauna of various islands of Korea (1). *Kontyû*, 10(5): 261 (In Japanese).

Masui M (1942) Lucaniden aus Korea. *Journal of Chosen Natural History Society*, 9(35): 66–72 (In Japanese).

McKenna DD, Farrell BD, Caterino MS, Farnum CW, Hawks DC, Maddison DR, Seago A, Short AEZ, Newton AF, Thayer MK (2014) Phylogeny and evolution of Staphyliniformia and Scarabaeiformia: Litter as a stepping stone for diversification of non-phytophagous beetles. *Systematic Entomology*.

Miwa Y (1927) A list of Japanese Lucanidae, with the description of one new species. *Insecta Matsumurana*, 2: 25–31.

Miwa Y (1929a) An addition to the list of lucanid-species from the Japanese empire. *Insecta Matsumurana*, 3: 72–76 (In Japanese).

Miwa Y (1929b) A new stag-beetle belonging to the genus *Dorcus* from Formosa. *Transactions of the Natural History Society of Formosa*, 19: 351–354.

Miwa Y (1932a) A study on the lucanid Coleoptera from the Japanese empire 1. *Transactions of the Natural History Society of Formosa*, 21: 315–325.

Miwa Y (1932b) A study on the lucanid Coleoptera from the Japanese empire 3. *Transactions of the Natural History Society of Formosa*, 22: 123–132.

Miwa Y (1933) A study on the lucanid Coleoptera from the Japanese empire 4. *Transactions of the Natural History Society of Formosa*, 23: 353–371, pls. 1–3.

Miwa Y (1936) Family Lucanidae. In: Miwa Y, Chûjö M (eds) *Catalogus Coleopterorum Japonicorum*, 2: 1–11. Noda-syobo, Taihoku.

Miwa Y, Chûjô M (1939) *Catalogus Coleopterorom Japonicorum*. parse, 5: 1–94.

Mizunuma T (2000) Stag Beetles, 2: 2–56. *Endless Science Information*, Tokyo.

Mizunuma T, Nagai S (1994) *The Lucanid Beetles of the World*, pp. 47–202. Mushi-sha, Tokyo.

Mochizuki M (1935) Beetles on Fusen Plateau. *Rinsei, Kannan Ringyokai*, 2(4): 30–33 (In Japanese).

Mochizuki M (1936) A list of Coleoptera on Mt. Kongo in Chosen. *Kontyû*, Japan, 10(4): 207–213 (In Japanese).

Mochizuki M, Tsunekawa K (1937) A list of Coleoptera from middle-Korea. *Journal of Chosen Natural History Society*, 22: 75–93 (In Japanese).

Mori T, Cho FS (1938) A list of Manchokuo's Lucanidae. *The Zoological Magazine*, 50: 34–38 (In Japanese).

Morita C (1936) A list on Coleoptera from Gunzan, Chosen. *The Entomological World*, Tokyo, 4: 852–862 (In Japanese).

Motschulsky V (1858) Entomologie spéciale, Insectes du Japon. *Études Entomologiques*, 6: 25–41.

Motschulsky V (1860a) Entomologie spéciale, Insectes du Japon. *Études Entomologiques*, 9: 4–41.

Motschulsky V (1860b) *Coléoptères de la Sibérie orientale et en particulier des rives de l'Amour* (rapportes par Schrenk, Maack, Ditmar, Voznessenski. In: Schrenk L (ed.) Reisen Und Forschungen Im Amurlande in Den Jahren 1854–1856. Bd., 2: 77–257. K. Akademie der Wissenschaften, St. Petersburg.

Motschulsky V (1861) Insectes du Japon (continuation). *Études Entomologiques*, 10: 3–24.

Mulsant E (1839) Description d'un genre nouveau dans la tribu des Lucanides. *Annales des Science, Physiques et Nautrelles d'Agriculture et d'lndustrie, Lyon*, 2: 119–121.

Mulsant E (1842) *Histoire Naturelle des Coleoptères de France*, Tome II, Lamellicornnes. Paris, pp. 155–209, 623.

Nagaoka N (1938) Insect-fauna of Mt. Myōkō in western Korea. *The Entomological World*, Tokyo, 5: 22–29 (In Japanese).

Nakatomi K (1934) Miscellaneous notes of beetles collection. *The Entomological World*, 2(12): 654–656 (In Japanese).

Nagel P (1941) Neues über Hirschkäfer (Col. Lucanidae). *Deutsche Entomologische Zeitschrift*, 1/2: 54–75.

Nakane T, Makino S (1985) On the stag beetles belonging to *Dorcus velutinus* group from Japan and Taiwan (Coleoptera, Lucanidae). *Gekkan-Mushi*, 169: 18–25 (In Japanese with English abstract and descriptions).

Nam SH, Kim MR (1982) On the relation between the insects and the forest-types of Piagol valley in Mt. Jiri. *Report of the Korean Association for Conservation of Nature*, 21: 123–136 (In Korean with English summary).

Nomura S (1960) List of the Japanese Scarabaeoidea (Coleoptera) - Notes on the Japanese Scarabaeoidea II. *Tôhô Gakuhô*, 10: 39–79.

Nomura S (1962) Some new and remarkable species of the Coleoptera from Japan and its adjacent regions. *Tôhô Gakuhô*, 12: 35–51.

Nomura S (1963) Lucanidae. In: Nakane T, Ohbayashi K, Nomura S, Kurosawa Y (eds) *Iconographia Insectorum Japonicorum, Colore Naturali Edita*, 2 (Coleoptera): 103–110, pls. 52–55. Hokuryukan, Tokyo (In Japanese).

Nomura S (1969) Zoogeographical study of the Scarabaeoidea of the Izu Islands, with descriptions of some new subspecies. *The Entomological Review of Japan*, 21(2): 71–94, pl. 8 (In Japanese with English résumé).

Nomura S, Lee CE (1992) Taxonomic notes on the stag-beetles known from Chejudo Island, Korea. *Esakia*, 32: 87–92.

Oberthür R Houlbert C (1913a) Lucanides de Java. Insecta - *Revue Illustrée d'Entomologie*, 3: 416–420.

Oberthür R Houlbert C (1913b) Lucanides de Java. Insecta - *Revue Illustrée d'Entomologie*, 3: 449–454.

Okamoto H (1924) The insect fauna of Quelpart Island (Saishiuto). *Bulletin of the Agricultural Experiment Station, Government-General of Chosen*, 1(2): 47–233.

Olivier GA (1789) No. 7 Hexadon (pp. 4). In: Entomologie, ou Histoire Naturelle des Insectes, avec Leurs Caractères Génériques et Spécifiques, leur Description, leur Synonymie, et leur Figure Enluminée. Coléoptères. Tome Premier. Baudouin, Paris.

Park CS Cho HW (1986) Insect fauna in the areas of Mt. Paekun, Mt. Kipaeg, Mt. Hwangsŏk in summer season. *Report of the Korean Association for Conservation of Nature*, 24: 128 (In Korean with English summary).

Park CS, Ku DS, Han KD (1993) Faunistic study on the Insect from Hamyang-gun and Paemsagol area of Mt. Chiri. *Report of the Korean Association for Conservation of Nature*, 31: 177–178 (In Korean with English summary).

Park JM, Kim JI (1993) Changes of insect fauna in modern times from Korea. *Bulltin of the Korean Association for Conservation of Nature*, 12: 107–134 (In Korean with English summary).

Parry FJS (1864) A catalogue of lucanoid Coleoptera; with illustrations and descriptions of various new and interesting species. *The Transactions of the Entomological Society of London*, (3)2: 1–113, pls. 1–10.

Parry FJS (1870) A revised catalogue of the lucanoid Coleoptera; with remarks on the nomenclature, and descripton of new species. *The Transactions of the Entomological Society of London*, 1870: 53–188.

Parry FJS (1873) Characters of seven nondescript lucanoid Coleoptera, and remarks upon the genera *Lissotes*, *Nigidius* and *Figulus*. *The Transactions of the Entomological Society of London*, 1873: 335–345, pl. 5.

Parry FJS (1874) Further descriptions of Lucanoid Coleoptera. *The Transactions of the Royal Entomological Society of London*, 1874(3): 365–372.

Parry FJS (1875) *Catalogus Coleopterorum Lucanoidum*. Editio Tertia. E.W. Janson, London.

Planet L (1894) Description d'une nouvelle espèce de Lucanidae: Le *Falcicornis* Groulti. *Le Naturaliste*, (2)8: 44–45.

Ratcliffe BC (1991) The Lucanidae and Passalidae (Insecta: Coleoptera) of Nebraska. *Great Plains Research* 1: 249–282.

Reys-Castillo P (1970) Coleoptera. Passalidae: Morfologia y division en grandes grupos; generos Americanos. *Folia Entomologica Mexicana*, 20–22: 1–240.

Reys-Castillo P, Halffter G (1984) La estructura social de los Passalidae (Coleoptera: Lamellicornia). *Folia Entomologica Mexicana*, 61: 49-72.

van Roon G (1910) Lucanidae. In: Schenkling S (ed.) *Coleopterorum Catalogus, Auspiciis Et Auxilio*, 19(8): 1–70. W. Junk, Berlin.

Saunders WW (1854) Characters of undescribed Lucanidae, collected in China, by R. Fortune, Esq. *The Transactions of the Entomological Society of London*, (1)3(2): 45–55, pls. 3–4.

Schuster JC (1975) Comparative behavior, acoustical signals and ecology of New World Passalidae (Coleoptera). *Ph. D. Thesis. University of Florida*, pp. 127.

Schuster JC (1983. Acoustical signals of passalid beetles: complex repertoires. *Florida Entomologist*, 66: 486–496.

Schuster JC Schuster LB (1997) The evolution of social behavior in Passalidae, p. 260–269. In Choe, J. and Crespi, B. (eds.), The Evolution of Social Behavior in Insects and Arachnids. Cambridge University Press, Cambridge.

Scopoli JA (1763) *Entomologia carniolica exhibens insecta carnioliae indigena et distributa in ordines, genera, species, varietates. methodo Linnaeana*. Trattner, vindobonae.

Seok JM (1970) *Insects Fauna of Jejudo*. Jejudo Book Series, 5: 35–46, Bojinje.

Séguy E (1954) La reserve naturelle integrale du Mont Nimba, fascicule II. Coleoptérès Lucanides. *Mémoires de l'Institut Français d'Afrique Noire Dakar*, 40: 209-211.

Sharp D, Muir F (1912) The comparative anatomy of the male genital tube in Coleoptera. *The Transactions of the*

Royal Entomological Society of London, 1912(3): 477–642.

Shin YH (1978) Insects Fauna of Mts. Wolak and Juheul in summer. *Report of the Korean Association for Conersvation of Nature*, 15: 143 (In Korean with English summary).

Shin YH Park KT (1980) On the summer insect fauna of the Gogunsan Islands and Bian Island western coast of Korea. *Report of the Korean Association for Conservation of Nature*, 18: 12–141.

Smith ABT, Hawks DC, Heraty JM (2006) On overview of the classification and evolution of the major scarab beetle clades (Coleoptera: Scarabaeoidea) based on preliminary molecular analysis. *Coleopterists Society Monograph*, 5: 35–46.

Snellen van Vollenhoven SC (1865) Sur quelques Lucanides du Muséum Royal d'Histoire Naturelle a Leide. *Tijdschrift voor Entomologie*, 8: 137–156.

Stephen JF (1931) Description of Chiasognathus grantii, a new lucnideous insect forming the type of an undescribed genus, together with some brief remarks upon its structure and affinities. *Transactions of the Cambridge Philosophical Society*, 4: 209–217.

Thomson J (1862) Catalogue des Lucanides de la collection de M. James Thomson suivi d'un appendix renfermant la description des coupes génériques et spécifiques nouvelles. *Annales de la Société entomologique de France*, (4)2: 389–436.

Vulcano MA Pereira FS (1961) A subfamilia Penichrolucaninae (Col. Lucanidae) representada em América. *Studia Entomologica*, 4: 471–480.

Watanabe T (1989) The *Platycerus* sp. of Korea. *Nature and Insect*, Tokyo, 24(8): 29–32 (In Japanese).

Waterhouse CO (1869) On a new genus and some new species of Coleoptera, belonging to the family Lucanidae. *The Transactions of the Entomological Society of London*, 1869: 13–20.

Waterhouse CO (1873) On the pectinicorn Coleoptera of Japan, with descriptions of three new species. *The Entomologist's Monthly Magazine*, 9: 277–278.

Waterhouse CO (1874) Descriptions of five new lucanoid Coleoptera. *The Entomologist's Monthly Magazine*, 11: 6–8.

Waterhouse CO (1895) Descriptions of new Coleoptera in the British Museum. *The Annals and Magazine of Natural History*, 6(16): 157–160.

Westwood JO (1834) Descripto generum nonnullorum novorum e familiâ lucanidarum, cum tabulâ synapticâ familiae notulis illustratâ. *Annals de Sciences Naturelles. Zoologie et Biologie Animale*, (2)1: 112–122, pl. 7.

Westwood JO (1855) Descriptions of some new species of exotic Lucanidae. *Transactions of the Entomological Society of London*, 2: 197–221.

Yang SY, Yoon IB (1962) The fauna of Kur-moon Island, Korea. *Zoologica, Seoul National University*, 1: 11 (In Korean).

Yoon IB Nam SH (1979) Insect fauna of Mt. Chilgap and Mt. Gyeryong area. *Report of the Korean Association for Conservation of Nature*, 17: 129–158.

Yoon IB Nam SH (1986) Insect fauna of Ch'uja Island. *Report on the Survey of Natural Environment in Korea*, 5: 157–160 (In Korean with English summary).

Yoon IB, Han KD, Kim CS (1990) A faunistic study of terrestrial insects in the Kayasan National Park. *Report of the Korean Association for Conservation of Nature*, 28: 99–128.

Yoshida K (1996) *The Lucanid Beetles of Japan*, pp. 329–346, pls. 58–63. Pub. Chu-Ken (In japanese).

Zacher F (1913) Die Schädlinge der Kokospalmen auf den Süseeinseln. *Arbeiten aus der Biologischen Kaisernanstalt für Landund Fortwirtschaft*, 9(1): 73–107.

Zang R (1905) Bemerkenswerte Passaliden aus der Sammlung des Zoologischen Instituts in Strassburg. *Deutsche Entomologische Zeitschrift*, 1905(1): 105–112.

Plates

Plates 1–2: Dorsal habitus
Plate 3: Male aedeagus (ventral view)
Plate 4: Female aedeagus (ventral view)
Plate 5: Type speicmens of the Korean Lucanidae

Plate 1

1. *Platycerus hongwonpyoi hongwonpyoi* Imura and Choe, 1989
2. *Figulus punctatus* Waterhouse, 1873
3. *Figulus venustus* Bomans, 1989
4. *Figulus binodulus* Waterhouse, 1873
5. *Nigidius miwai* Nagel, 1941
6. *Dorcus rubrofemoratus rubrofemoratus* (Snellen van Vollenhoven, 1865)
7. *Dorcus consentaneus consentaneus* (Albers, 1886)
8. *Dorcus titanus castanicolor* (Motschulsky, 1861)
9. *Dorcus hopei binodulosus* Waterhouse, 1874
10. *Dorcus rectus rectus* (Motschulsky, [1858])
11. *Dorcus tenuihirsutus* Kim and Kim, 2010

Plate 2

12. *Dorcus carinulatus koreanus* (Jang and Kawai, 2008)
13. *Aegus laevicollis subnitidus* Waterhouse, 1873
14. *Prosopocoilus inclinatus inclinatus* (Motschulsky, [1858])
15. *Prosopocoilus astacoides blanchardi* (Parry, 1873)
16. *Prismognathus dauricus* (Motschulsky, 1860)
17. *Lucanus maculifemoratus dybowskyi* Parry, 1873
18. *Leptaulax koreanus* Nomura, Kon, Johki and Lee, 1993

Plate 3

18. *Leptaulax koreanus* Nomura, Kon, Johki and Lee, 1993
1. *Platycerus hongwonpyoi hongwonpyoi* Imura and Choe, 1989
2. *Figulus punctatus* Waterhouse, 1873
4. *Figulus binodulus* Waterhouse, 1873
5. *Nigidius miwai* Nagel, 1941
6. *Dorcus rubrofemoratus rubrofemoratus* (Snellen van Vollenhoven, 1865)
7. *Dorcus consentaneus consentaneus* (Albers, 1886)
8. *Dorcus titanus castanicolor* (Motschulsky, 1861)
9. *Dorcus hopei binodulosus* Waterhouse, 1874
10. *Dorcus rectus rectus* (Motschulsky, [1858])
11. *Dorcus tenuihirsutus* Kim and Kim, 2010
12. *Dorcus carinulatus koreanus* (Jang and Kawai, 2008)
13. *Aegus laevicollis subnitidus* Waterhouse, 1873
14. *Prosopocoilus inclinatus inclinatus* (Motschulsky, [1858])

15. *Prosopocoilus astacoides blanchardi* (Parry, 1873)
16. *Prismognathus dauricus* (Motschulsky, 1860)
17. *Lucanus maculifemoratus dybowskyi* Parry, 1873

Plate 4

18. *Leptaulax koreanus* Nomura, Kon, Johki and Lee, 1993
1. *Platycerus hongwonpyoi hongwonpyoi* Imura and Choe, 1989
2. *Figulus punctatus* Waterhouse, 1873
4. *Figulus binodulus* Waterhouse, 1873
5. *Nigidius miwai* Nagel, 1941
6. *Dorcus rubrofemoratus rubrofemoratus* (Snellen van Vollenhoven, 1865)
7. *Dorcus consentaneus consentaneus* (Albers, 1886)
8. *Dorcus titanus castanicolor* (Motschulsky, 1861)
9. *Dorcus hopei binodulosus* Waterhouse, 1874
10. *Dorcus rectus rectus* (Motschulsky, [1858])
11. *Dorcus tenuihirsutus* Kim and Kim, 2010
12. *Dorcus carinulatus koreanus* (Jang and Kawai, 2008)
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16. *Prismognathus dauricus* (Motschulsky, 1860)
17. *Lucanus maculifemoratus dybowskyi* Parry, 1873

Plate 5

1. *Platycerus hongwonpyoi merkli* holotype
2. *Platycerus hongwonpyoi merkli* paratype
3. *Figulus punctatus* holotype
4. *Figulus venustus* holotype
5. *Figulus venustus* paratype
6. *Figulus binodulus* holotype/syntype
7. *Figulus binodulus* syntype
8. *Figulus binodulus* syntype
9. *Dorcus binodulosus* (= *Dorcus hopei binodulosus*) holotype
10. *Platyprosapus hopei* (= *Dorcus hopei hopei*) holotype
11. *Platyprosapus hopei* (= *Dorcus hopei hopei*) cotype
12. *Aegus subnitidus* (= *Aegus laevicollis subnitidus*) holotype/syntype
13. *Aegus subnitidus* (= *Aegus laevicollis subnitidus*) syntype
14. *Aegus laevicollis laevicollis* syntype
15. *Aegus laevicollis laevicollis* syntype
16. *Metopodontus blanchardi* (= *Prosopocoilus astacoides blanchardi*) (unverified type status)

Plate 1

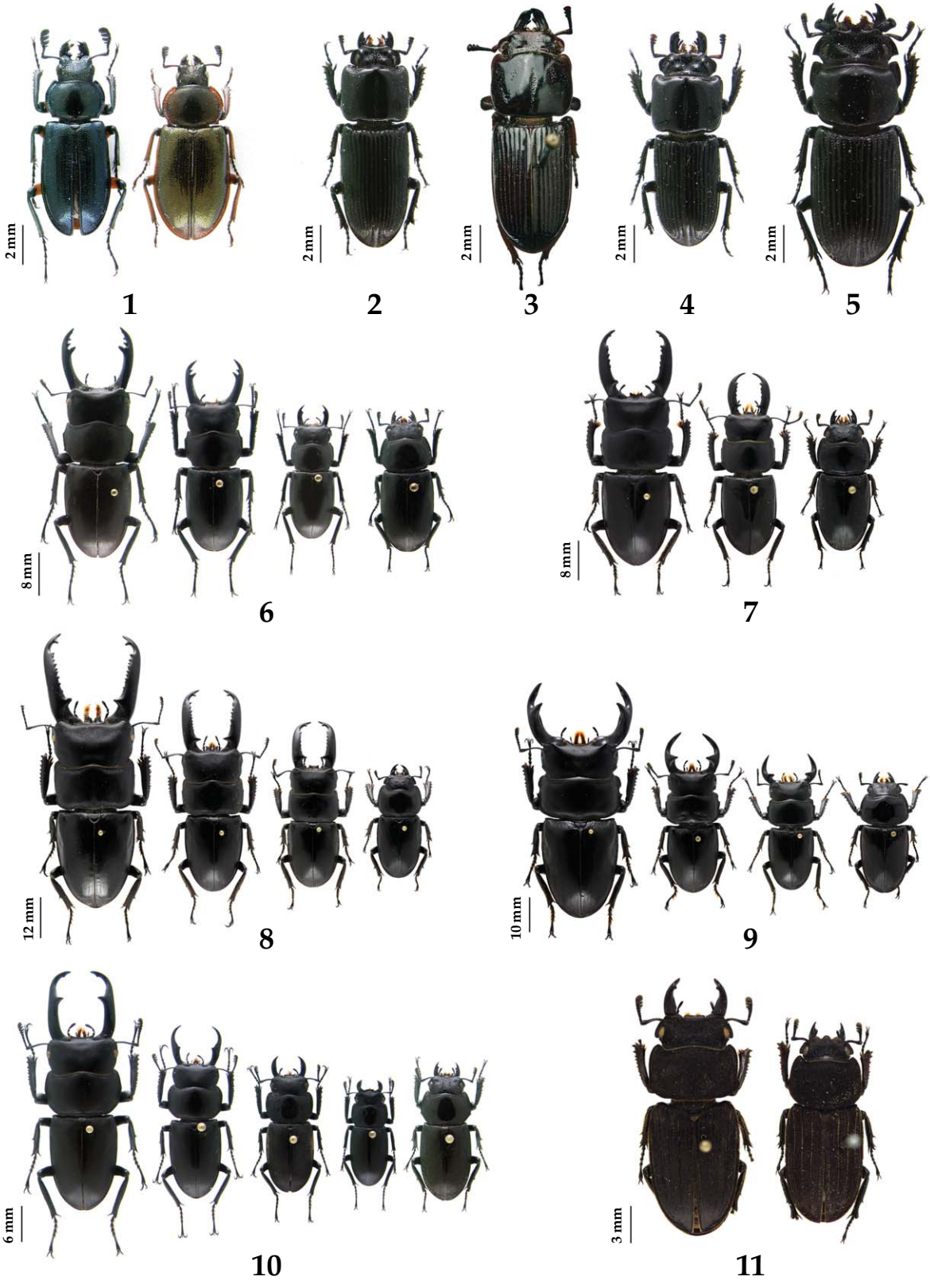

Plate 2

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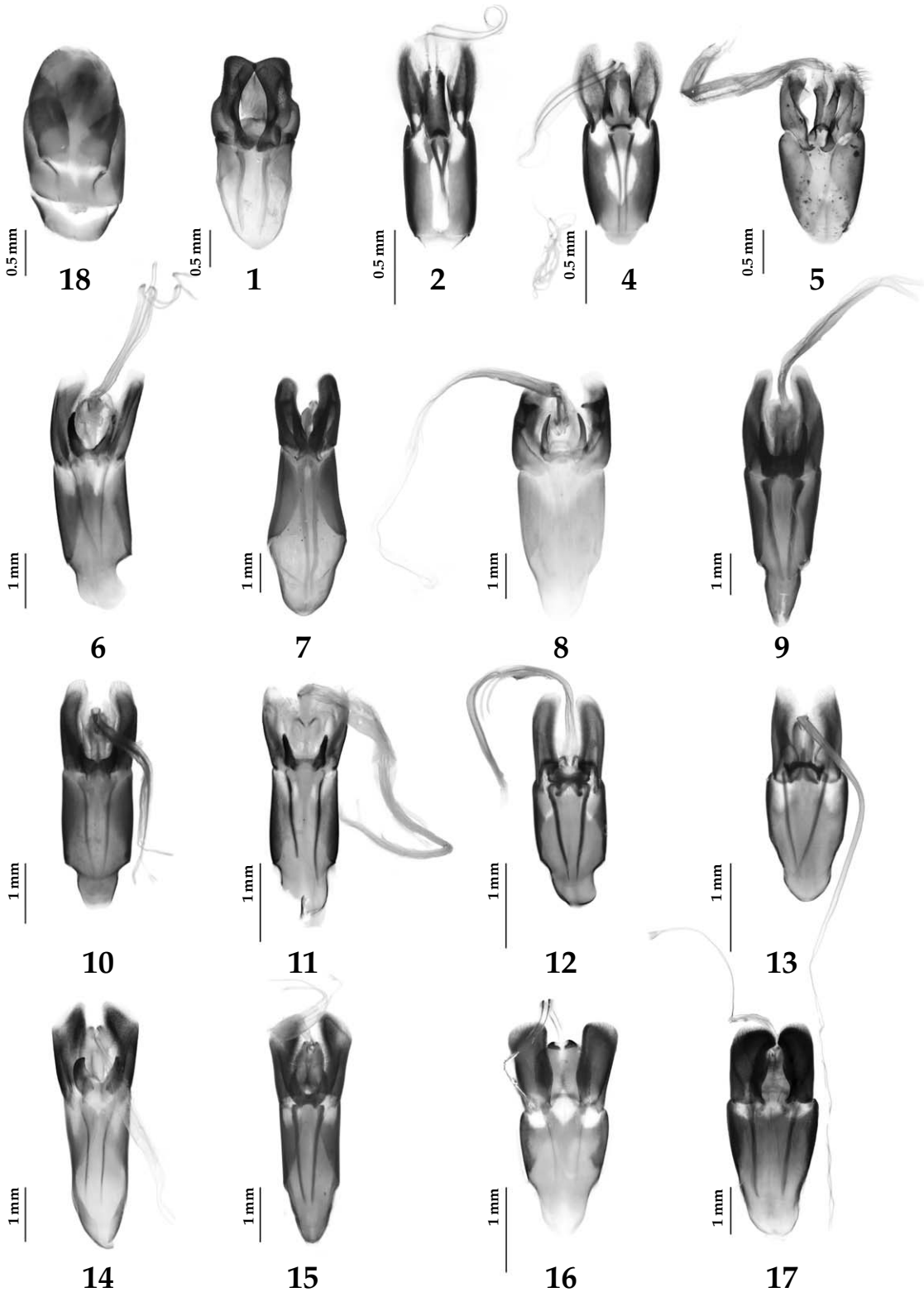
Plate 3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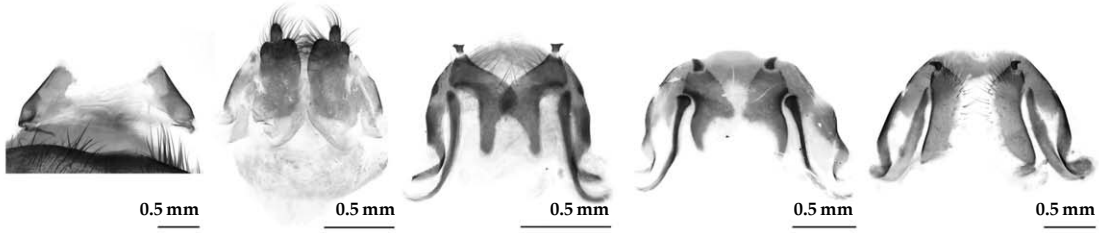

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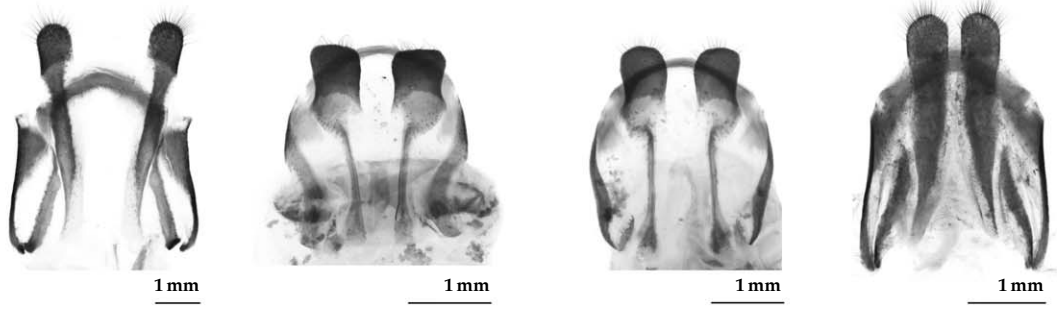

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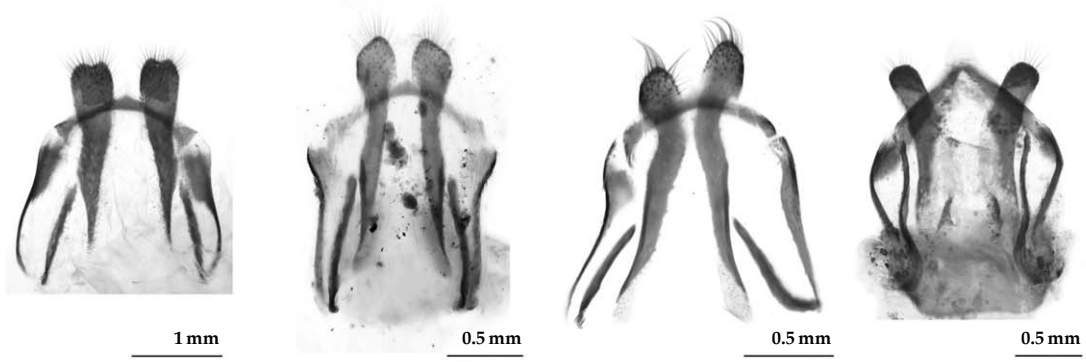

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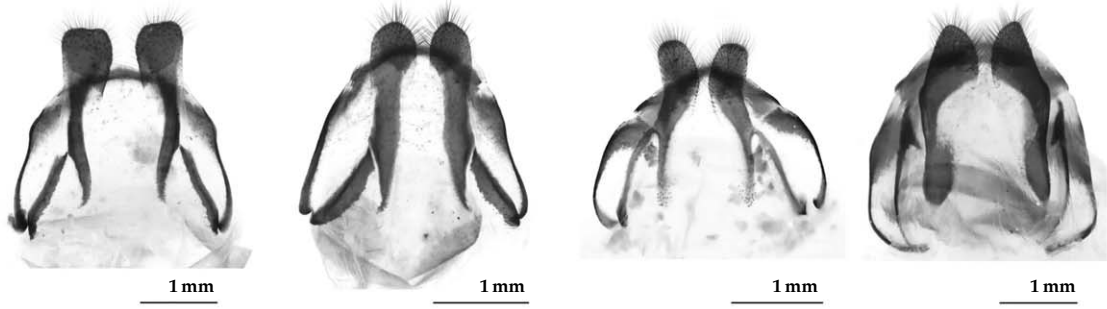

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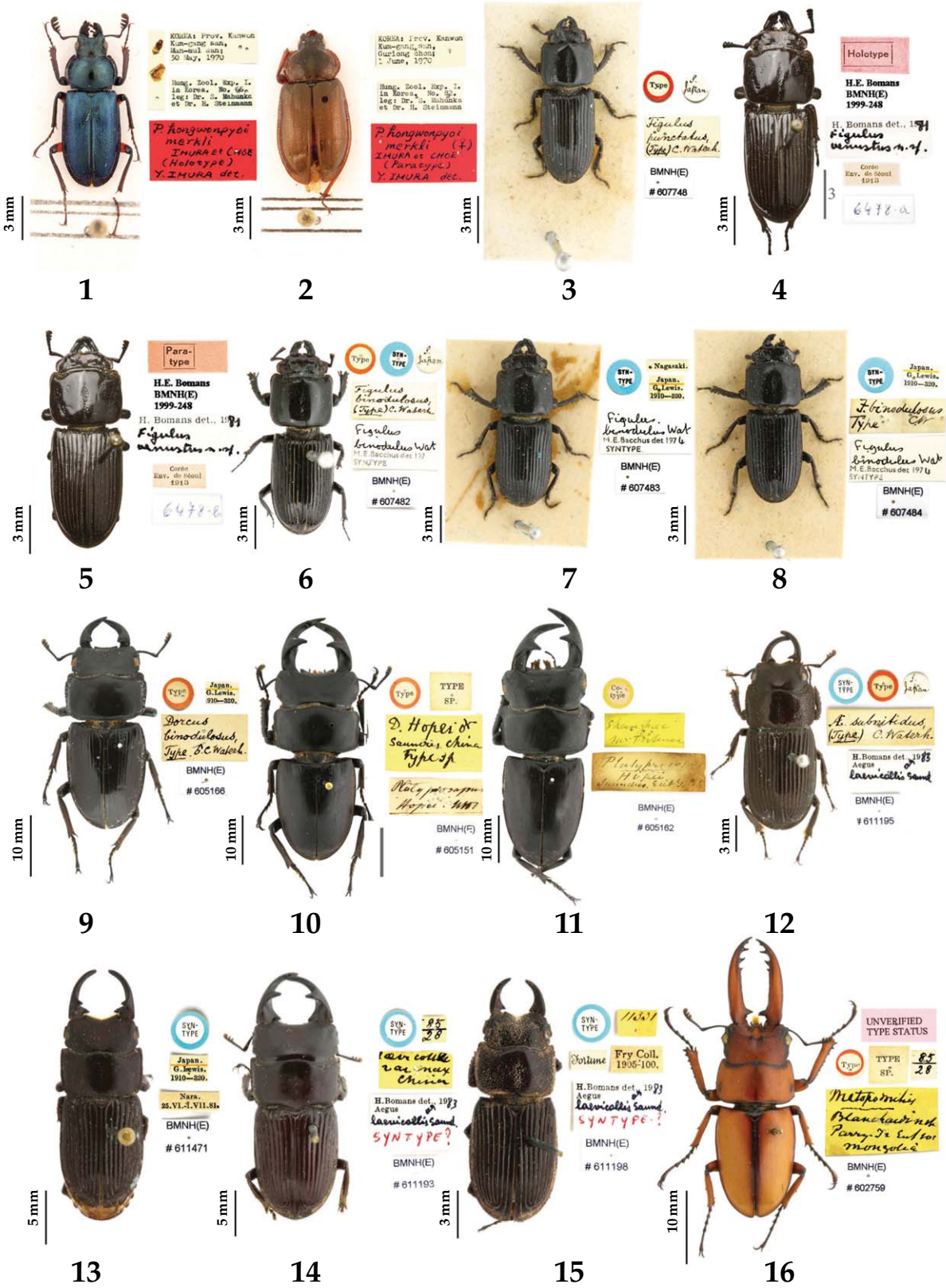
Plate 5



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