



Original Article

Taxonomic revision of the genus *Oberea* Dejean, 1835 (Coleoptera: Cerambycidae: Lamiinae) from KoreaKyungmi Kim^a, Jinyoung Park^b, Eun Young Choi^a, Jong Kyun Park^{a,*}^a Department of Ecological Science, College of Ecology and Environmental Science, Kyungpook National University, Sangju City, Republic of Korea^b Department of Nature Survey, National Institute of Ecology, Seocheon, Republic of Korea

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ABSTRACT

All the known Korean species of the genus *Oberea* Dejean, 1835 are revised by confirmation of specimen. The recorded species of Korea were very confused and cited sequentially because of lacking confirmation, among them, *O. fuscipennis*, *O. inclusa*, and *O. pupillata* were misidentified as *O. atropunctata*, *O. vittata*, and *O. heyrovskyi*, respectively. And, *O. simplex* was synonym of *O. atropunctata* already. Totally, 12 species of the genus *Oberea* were recognized from Korea. Diagnoses, illustrations of habitus male genitalia, host plants, distribution for each species, and a key for Korean *Oberea* species are provided.

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Introduction

The coleopteran species are found worldwide, particularly palearctic region is the most popular habitat (Choi et al 2016a,b). Since the first study of Okamoto (1927), the genus *Oberea* of Korea was studied mostly by foreign scientists (Danilevsky 1988, 1992a,b, 1997, 2010; Gressitt 1942; Kurihara 2009; Ohbayashi et al 1992), and studied sporadically by Korean researchers (Cho 1941, 1946, 1961, 1962; Lee 1979, 1980, 1981a,b, 1982a,b, 1983; Newman, 1942).

The genus *Oberea* Dejean, 1835 is defined by the following combination of characteristics: body elongate and cylindrical; legs very short, apex of hind femur not reaching beyond abdominal second sternite (Cherepanov 1991).

The genus *Oberea* contains about 270 species around the world (Ohbayashi and Niisato 2007). In the Palearctic region, 14 species in Korea (Hwang 2015), six species in Europe (Danilevsky 2011a), 15 species in Russia (Danilevsky 2011b), 49 species in China (Hua 2002), and 15 species in Japan (Ohbayashi and Niisato 2007).

Recently, studies of cerambycid species from Korea were intellectually active; however, there were some confusion in the genus

Oberea (Lobl and Smetana 2010; Kim 2011; Hong and Lee 2014; Hwang 2015; Jang et al 2015).

For these reasons, this study reviewed the previous taxonomic studies on Korean *Oberea* to solve the existing taxonomic problems and to provide the improved classification. In addition, photos of habitus (Figures 1–11 and 12–23), genitalia (Figures 22–32), and pictorial key (Figure 33) were provided in here. *Oberea formosana* was excluded from this study because Korean occurrence of this species is questionable based on our comprehensive survey although there are records in Korea (Lobl and Smetana 2010; Hong and Lee 2014; Hwang 2015; Jang et al 2015).

Materials and methods

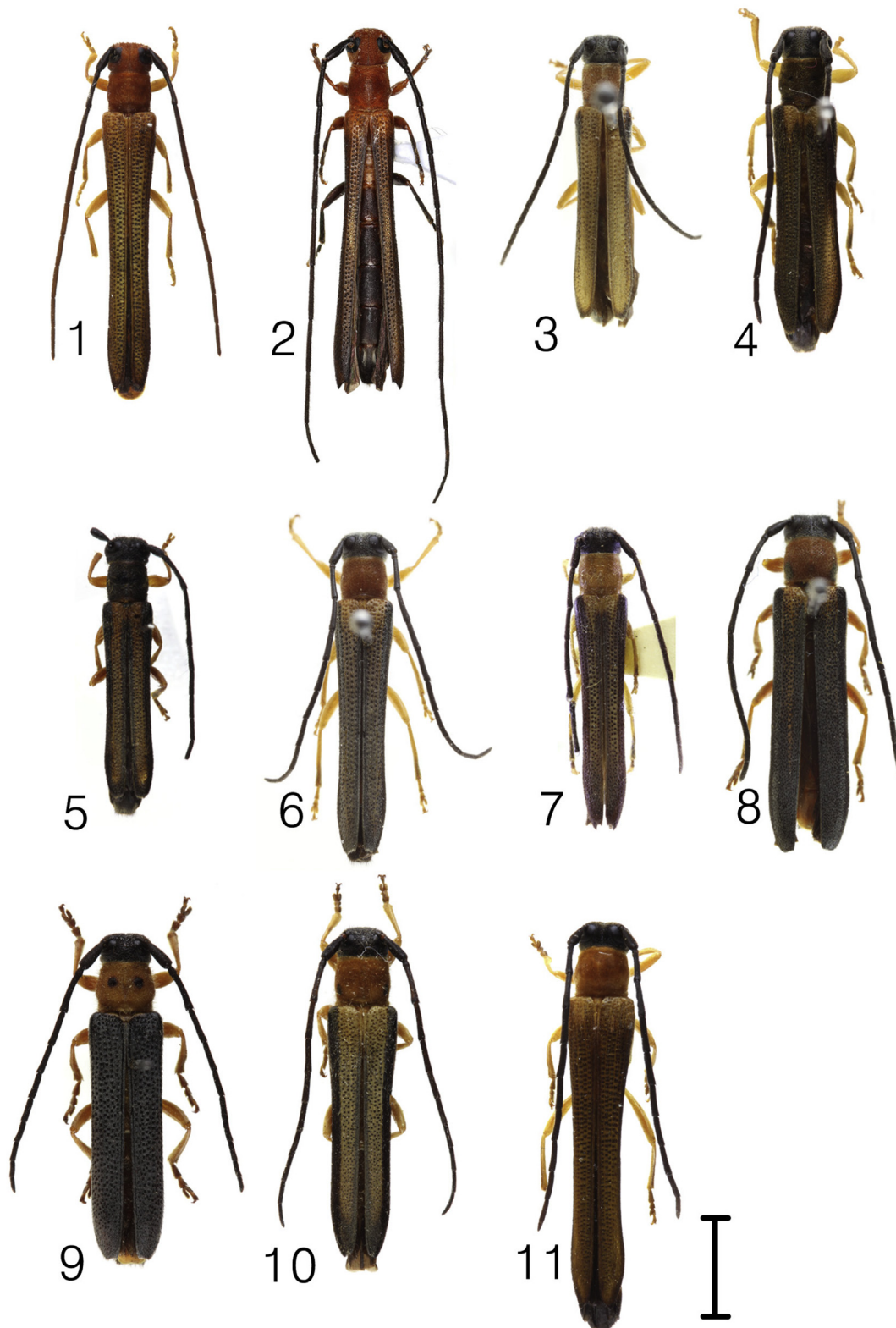
To observe morphological and anatomical characteristics, stereoscopic microscopes (Olympus SZ61, Japan) were used. To examine male genitalia, abdomens of specimen were separated from the thorax. Then, separated abdomen and 15% KOH solution were added in beaker, and heated in boiling water for 10 minutes. For further dissection, softened abdomen was moved to a hole-glass in distilled water. Male genitalia were taken out of the abdomen.

The morphological characters of the specimen and the male genitalia were imaged using Canon EOS 500D and Carl Zeiss Axio Imager A1 with Axio Cam MRc5, respectively.

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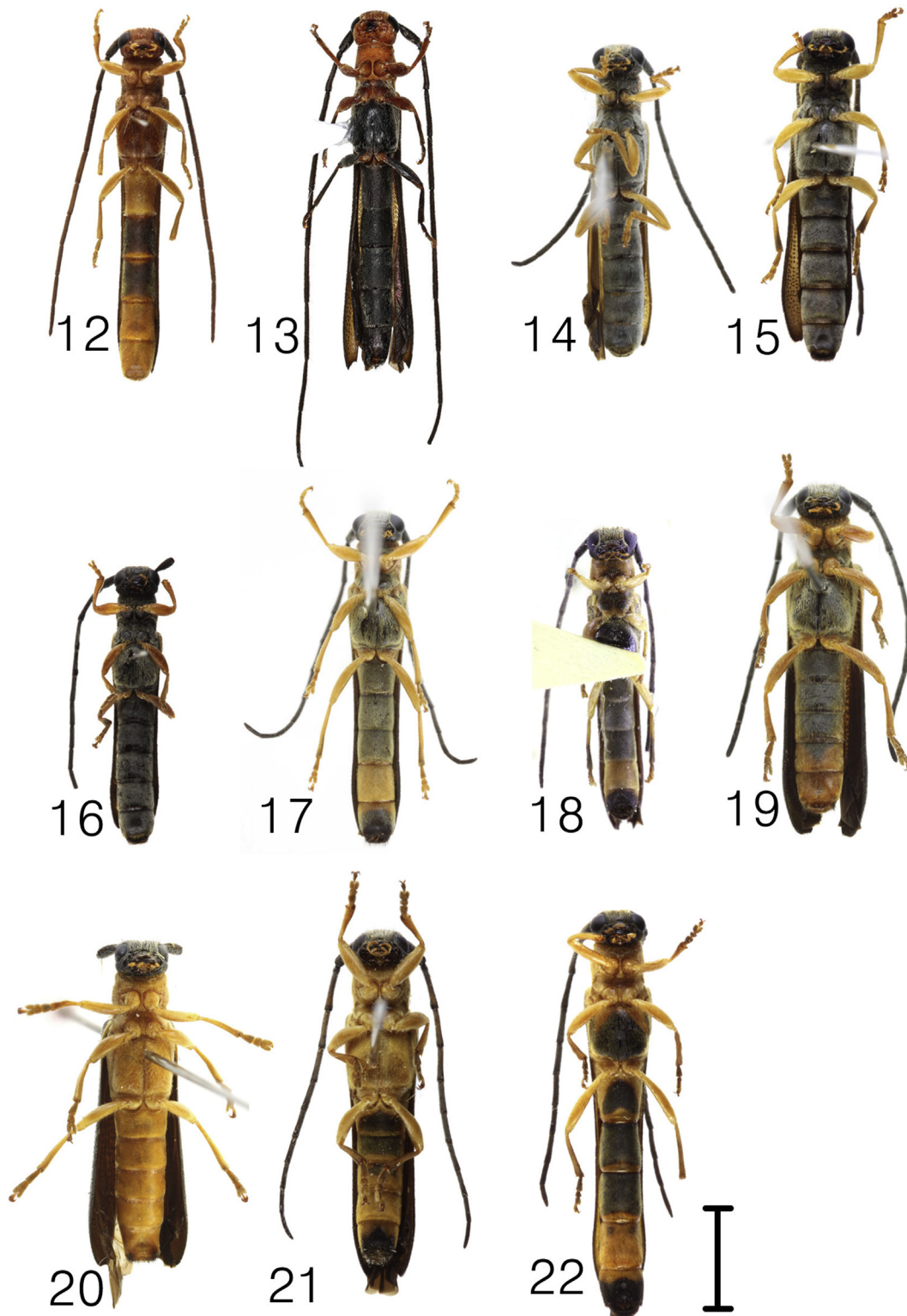
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Figures 1–11. Habitus of *Oberea* spp. (dorsal view): 1, *O. atropunctata* Pic; 2, *O. nigriventris* Bates; 3, *O. herzi* Ganglbauer; 4, *O. coreana* Pic; 5, *O. morio* Kraatz; 6, *O. vittata* Blessig; 7, *O. infranigrescens* Breuning; 8, *O. depressa* Gebler; 9, *O. oculata* (Linnaeus); 10, *O. heyrovskyi* Pic; and 11. *O. tsuyukii* Takashi & Nobuo. <scale bar = 5 mm>.

The abbreviations are as follows: KNA, Korea National Arboretum (Pocheon-si); HII, Hampyeong Insect Institute (Hampyeong-gun); NIAST, National Institute of Agricultural Science and Technology (Wanju-gun); KFRI, Korea Forest Research Institute (Seoul-

si); KNUL, Kangwon National University (Wonju-si); UI, University of Incheon (Incheon-si); SNU, Seoul National University (Seoul-si); NSM, National Science Museum (Daejeon-si); GW, Gangwon-do; GG, Gyeonggi-do; CB, Chungcheongbuk-do; CN, Chungcheongnam-



Figures 12–22. Habitus of *Oberea* spp. (ventral view): 12, *O. atropunctata* Pic; 13, *O. nigriventris* Bates; 14, *O. herzi* Ganglbauer; 15, *O. coreana* Pic; 16, *O. morio* Kraatz; 17, *O. vittata* Blessig; 18, *O. infranigrescens* Breuning; 19, *O. depressa* Gebler; 20, *O. oculata* (Linnaeus); 21, *O. heyrovskyi* Pic; and 22, *O. tsuyukii* Takashi & Nobuo. <scale bar = 5 mm>.

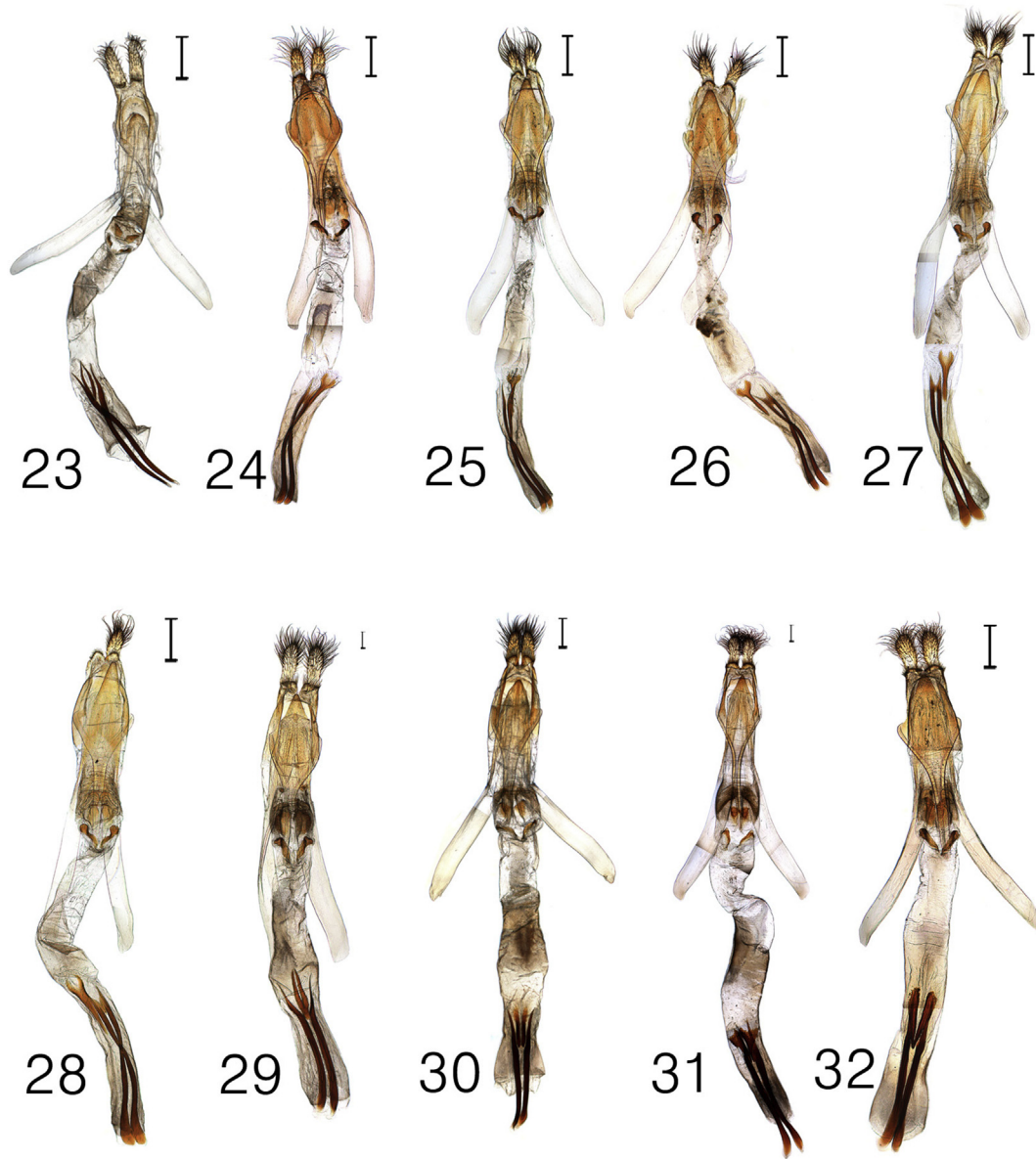
do; JB, Jeollabuk-do; JN, Jeollanam-do; GB, Gyeongsangbuk-do; GN, Gyeongsangnam-do; JJ, Jeju-do. For convenience of classification, metropolitan cities put under the provinces such as Seoul and Incheon in Gyeonggi-do, Daejeon in Chungcheongbuk-do, Daegu in Gyeongsangbuk-do, Ulsan and Busan in Gyeongsangnam-do, and Gwangju in Jeollanam-do.

Systematic accounts

Genus *Oberea* Dejean, 1835

Oberea Dejean, 1835: 351. Type species: *Cerambyx oculatus* Linnaeus, 1758.

Isosceles Newman, 1842: 318.



Figures 23–32. Male genitalia of *Oberea* spp.: 23, *O. atropunctata* Pic; 24, *O. herzi* Ganglbauer; 25, *O. coreana* Pic; 26, *O. morio* Kraatz; 27, *O. vittata* Blessig; 28, *O. infranigrescens* Breuning; 29, *O. depressa* Gebler; 30, *O. oculata* (Linnaeus); 31, *O. heyrovskyi* Pic; and 32, *O. tsuyukii* Takashi & Nobuo. <scale bar = 5 mm>.

Amaurostoma Müller, 1906: 222. Type species: *Cerambyx erythrocephalus*

Key to the species of the genus *Oberea* from Korea*

- 1. Head yellowish brown or reddish.....2
 - Head black.....3
- 2. Outside of first antennal segment without carina.....*O. atropunctata* Pic
 - Outside of first antennal segment with longitudinalcarina *O. nigriventris* Bates
- 3. Pronotum black or partly black.....4
 - Pronotum yellowish brown or reddish.....5
- 4. Elytra entirely black basally with an extensive yellow pattern.....*O. coreana* Pic
 - Elytra yellow with a black with lateral longitudinal band.....*O. morio* Kraatz

- 5. Metasternum yellowish.....6
 - Metasternum black or partly black.....7
- 6. Last sternite yellow with apically black hairs.....
 - Last sternite largely black..... *O. oculata* (Linnaeus)
 - *O. heyrovskyi* Pic
- 7. Mesosternum yellowish.....*O. tsuyukii* Takashi & Nobuo
 - Mesosternum black or partly black.....8
- 8. Scutellum black.....*O. depressa* Gebler
 - Scutellum yellowish.....9
- 9. Sternites IV grayish.....*O. herzi* Ganglbauer
 - Sternites IV yellowish.....10
- 10. Elytra apically obtuse.....*O. vittata* Blessig
 - Elytra apically deep curved and pointed.....
 -*O. infranigrescens* Breuning

* *O. formosana* not included here, because of no available specimen.

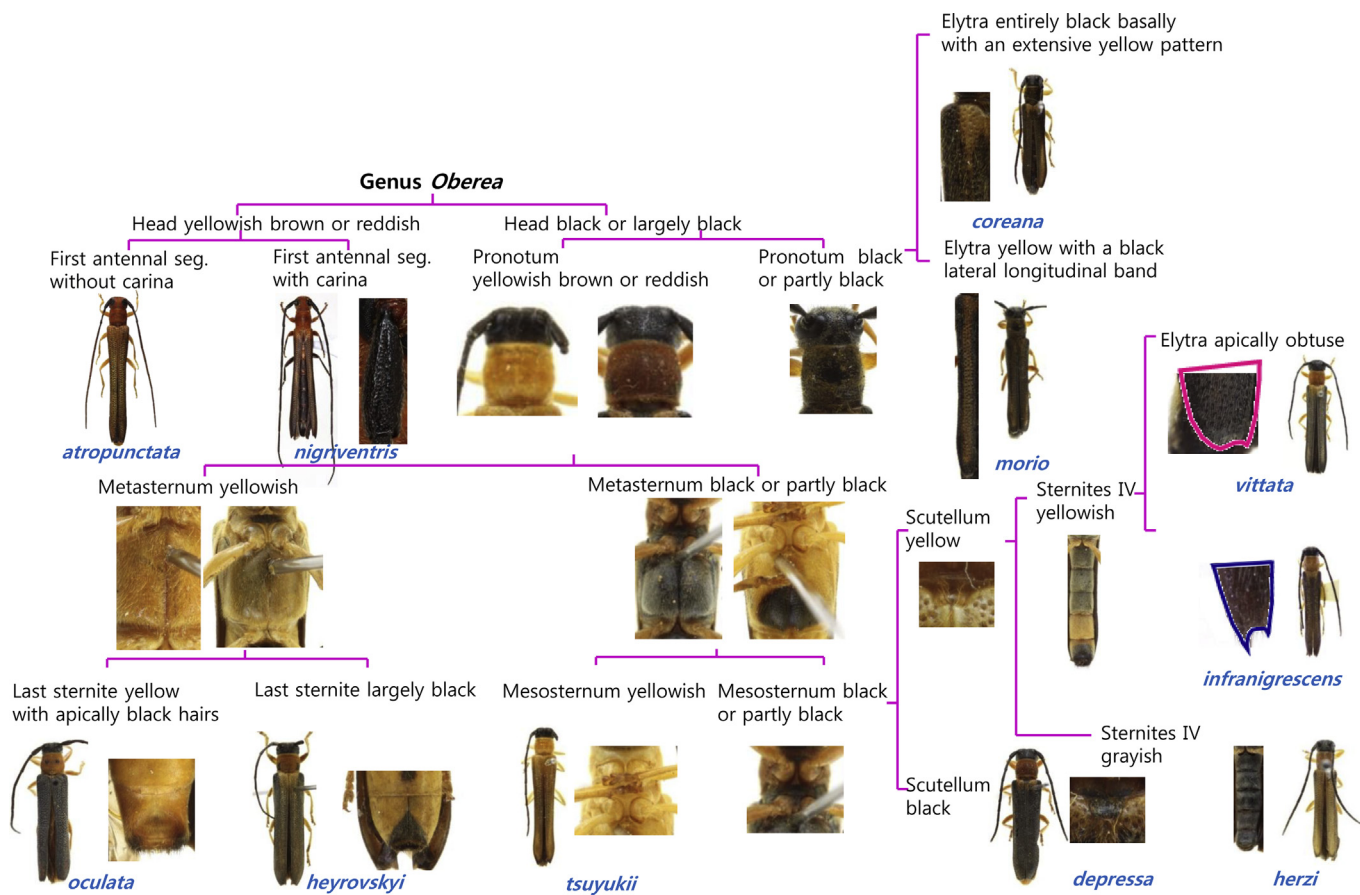


Figure 33. Pictorial key of the genus *Oberea* from Korea.

1. *Oberea atropunctata* Pic, 1916

Oberea atropunctata Pic, 1916: 17. Type locality: Yunnan, China.

Oberea atropunctata coreensis Breuning, 1947: 58. (Korea).

Oberea atropunctata coreensis Gressitt, 1951: 633.

Oberea simplex Gressitt, 1942: 79.

Diagnosis. Body length ♂ 16–19 mm, ♀ 15.5–19 mm. Head yellowish brown or reddish, from anterior frons to posterior margin of occiput with narrow longitudinal groove. Antennae almost up to apex of elytra, basally black to reddish brown. Pronotum yellowish brown or reddish. Elytra yellowish brown with deep and large dark brownish punctures, minute adherent dark brownish pubescence, apically slightly incised. Legs yellow and inner side of tibia and claw reddish-brown. Body ventrally with minute compact adherent pubescence, pro-, meso-, metasternum reddish brown. Abdomen reddish brown with black markings on the second and the third, the fifth sternite medially with narrow longitudinal groove in female. Male genitalia tegmen with lateral lobes elongate, inner side straight, and outer side slightly bent to apex; rod-like sclerites and flagellum-like sclerites relatively very long and slender baculiform, of which flagellum-like sclerites 3.45 times as long as the length of rod-like sclerites.

Materials examined. CB: 1♀, Cheongju-si, 10 vi 1992 (JK Noh, leg.)-coll. SNU; 1♀, Mt. Worak, Hansu-myeon, Jecheon-si, 20 vi 1992 (KSJ, leg.)-coll. KNA; GB: 1ex, Yongyeonsa, Bansong-ri, Okpo-myeon, Dalseong-gun, Daegu, 6 vi 1970 (SM Lee, leg.)-coll. HII; GG: 1♀, Agricultural College, Seoul University, Suwon-si, v 1968 (TS Chon, leg.)-coll. SNU; 1♀, ditto, 16 vi 1992 (NEH, leg.)-coll. SNU; 1♀, Anyang-si, 29 vi 1991 (NSD, leg.)-coll. SNU; 1♂,

Gwanggyo, 10 vi 1990 (KJH, leg.)-coll. SNU; 1♂, ditto, 28 vi 1991 (H Han, leg.)-coll. SNU; 1♀, Gwangreung, Jinjeop-up, Namyangju-si, 29 v 1983 (OJ Im, leg.)-coll. NIAST; 1♀, ditto, 15 vi 1995 (GJ Weon, leg.)-coll. KNA; 1♂, ditto, 23 vi 1997 (GJ Weon, leg.)-coll. KNA; 1♀, ditto, 10 vii 1997 (GJ Weon, leg.)-coll. KNA; 1♂, ditto, 11 vii 1997 (GJ Weon, leg.)-coll. KNA; 1♂, ditto, 11 vi 1998 (GJ Weon, leg.)-coll. KNA; 1♀, Icheonsi, 20 vi 1992 (SJH, leg.)-coll. SNU; 1♀, Mangu-dong, Jungnang-gu, Seoul, 5 vi 1993 (NR Kim, leg.)-coll. NIAST; 1ex, Mt. Cheonma, Hwado-up, Namyangju-si, 30 v 1970 (SM Lee, leg.)-coll. HII; 1♀, Mt. Gwanak, Seoul, 10 vi 1988 (JH Shin, leg.)-coll. SNU; 1ex, Mt. Myeongji, Baekdun-ri, Buk-myeon, Gapyeong-gun, 29 v 1982 (SM Lee, leg.)-coll. HII; 1ex, Namhansanseung, Seongnam-si, 6 vi 1985 (SM Lee, leg.)-coll. HII; 1♀, Singal-dong, Yongin-si, 12 vi 1992 (SS Kang, leg.)-coll. KNA; 1♂, ditto, 24 vi 1992 (CDJ, leg.)-coll. SNU; 1♂, Suwon-si, 13 vi 1995 (JA Kim, leg.)-coll. SNU; 1♂, ditto, 10 vi 1997 coll. NIAST; GN: 1♂, Geoje-recreational forests, Dongbu-myeon, Geoje-si, 2 vii 2009 (SH Kang, leg.)-coll. KNA; GW: 1♂, Chunseong, Chuncheon-si, 6 vi 1988 (JS Han & JO Weon, leg.)-coll. KNU; 1♀, ditto, 17 vi 1989 (NH Her, leg.)-coll. KNU; 1♀, Hongcheon-gun, 27 v 1988 (IH Chor, leg.)-coll. KNU; 1♂, ditto, 12 vi 1992 (JE Yun & SH Ji, leg.)-coll. KNU; 1ex, Mt. Taebaek, Taebaek-si, 19 vi 1983 (SM Lee, leg.)-coll. HII; JB: 1♀, Namwon-si, 24 vii 1990 (DG Park, leg.)-coll. SNU; JJ: 2exs, Seoguipo-si, 21 vi 1976 (SM Lee, leg.)-coll. HII; 1♀, Seongpan-ak, Gyrae-ri, Jocheon-eup, Jeju-si, 30 vii 2007 (SW Park, leg.)-coll. SNU; 1♂, 30 v 1991 (KBH, leg.)-coll. SNU.

Host plants. *Salix* spp., *Populus* spp. (Hua 2002; Bense 1995).

Distribution. Palearctic (Korea, China), Oriental (Nepal).

Remarks. Based on examine of voucher specimens, this species has been misidentified as *O. fuscipennis* (Chevrolat).

2. *Oberea nigriventris* Bates, 1873

Oberea nigriventris Bates, 1873: 389. Type locality: Japan.

Oberea nigriventris Lee, 1981a: 53. (Korea).

Diagnosis. Body length 12–16 mm. Head reddish, from anterior frons to posterior margin of occiput with narrow longitudinal groove. Antennae black, longer than body, outside of first antennomere provided with longitudinal carina. Pronotum reddish. Elytra with deep dark brown punctures, minute adherent dark brown pubescence, apically slightly incised. Legs almost black, and fore leg and mid femur reddish brown. Body ventrally with minute compact adherent pubescence, metasternum black. Abdomen black, the fifth sternite with small triangular depression in male, here with dense bristles.

Materials examined. GW: 1♂, Jinae-ri, Dong-myeon, Chuncheon-si, 16–30 vii 2009 (SJ Jang, leg.)-coll. KFRI.

Host plants. *Pyrus pyrifolia* var. *culta* (Makino) Nakai, *Anodendron affine* (Hook. & Arn.) Druce., *Cynanchum wilfordii* (Maxim.) Hemsl., *Cynanchum grandifolium* Hemsley, *Marsdenia tomentosa* Morren & Decne., *Vincetoxicum* spp. (Hua, 2002; Ohbayashi & Niisato, 2007; Kojima & Nakamura, 2011).

Distribution. Palearctic (Korea, China, Japan), Oriental (Vietnam, Laos, Taiwan, Indochina, Malaysia).

3. *Oberea herzi* Ganglbauer, 1887

Oberea herzi Ganglbauer, 1887: 23. Type locality: Peking, China.

Diagnosis. Body length ♂ 11.5–14.5 mm, ♀ 13–17 mm. Head black, medially from vertex to posterior margin of occiput with narrow longitudinal groove, with yellow adherent pubescence and a few of long setiform erect black hairs. Antennae barely short of reaching apex of elytra, inner side of antennae first and third to fourth yellow, the others dark brown to black. Pronotum light reddish brown with yellow hairs. Elytra yellow with yellow adherent pubescence, with large round punctures. Legs brown, femur with a little adherent yellow pubescence, tibia with numerous yellow pubescence, tarsus with light yellow and black pubescence. Body ventrally black with minute compact adherent grayish pubescence. Abdomen black with grayish pubescence, the fifth sternite with triangular depression in male, medially with narrow longitudinal groove in female. Male genitalia tegmen with lateral lobes straight, the apex rounded, relatively separated to each other; rod-like sclerites almost fused, separated widely by forming membrane at 1/3 point from apex; flagellum-like sclerites relatively very long and slender baculiform, fused at nearby apex, of which flagellum-like sclerites 2.94 times as long as the length of rod-like sclerites.

Materials examined. CB: 1♀♂, Suanbo-myeon, Chungju-si, 13 v 2008 (KH Kim, leg.)-coll. KNA; GB: 1♂, Cheonjeon-ri, Imha-myeon, Andong-si, 9 v 2010 (SH Kang, leg.)-coll. KNA; 2♂, Gojan-ri, Giran-myeon, Andong-si, 29 v 1993 (DS Ku, leg.)-coll. KNA; 1♀♂, Guryongpo-eup, Nam-gu, Pohang-si, 27 viii 2009 (JY Park, leg.)-coll. KNA; 3♀, Jungdong-myeon, Sangju-si, 6 ix 2008 (JR Lim, leg.)-coll. KNA; 1♂, Namyang-ri, Maejeon-myeon, Cheongdo-gun, 7 vi 2010 (BS Kim, leg.)-coll. KNA; GG: 1♀, Seodun-dong, Suwon-si, 14 vi 1969 (CS Kim, leg.)-coll. SNU; 1♂, Singal-dong, Yongin-si, 18 vi 1992 (DHL, leg.)-coll. SNU; GW: 1♀, Balsan2-ri, Sinbuk-eup, Chuncheon-si, 28 v 1998 (HC Park, leg.)-coll. NIAST; 1♀, Chunseong, Chuncheon-si, 26 v 1989 (HM Kim & HS Sin, leg.)-coll. KNU; 2♀, Jinbu-myeon, Pyeongchang-gun, 8 vii 2008 (SH Kim, leg.)-coll. KNA.

Host plants. Unknown.

Distribution. Palearctic [Korea, China, Russia (Siberia)].

4. *Oberea coreana* Pic, 1912

Oberea coreana Pic, 1912: 21. Type locality: Korea.

Diagnosis. Body length ♂ 14 mm, ♀ 9 mm. Head black, medially from vertex to posterior margin of occiput with narrow longitudinal groove, with large deep punctuation. Antennae black, shorter than body, numerous short black hairs like spine and some long hairs. Pronotum black with densely yellow hairs. Elytra entirely black basally with an extensive yellow pattern. Legs yellow. Body ventrally black with minute compact adherent yellow pubescence. Abdomen the fifth sternite with triangular depression in male, medially with narrow longitudinal groove in female.

Male genitalia. Tegumen with lateral lobes straight, the apex rounded, relatively more long hairs than *O. herzi* Ganglbauer; rod-like sclerites almost fused, separated widely by forming heart-shaped membrane at 1/5 point from apex; flagellum-like sclerites relatively very long and slender baculiform, of which flagellum-like sclerites 2.82 times as long as the length of rod-like sclerites.

Materials examined. CB: 1♂, Mt. Daemi, Chungju-si, 19 v 1997 (HC Park, leg.)-coll. NIAST; GG: 1♀, Agricultural College, Seoul University, Suwon-si, 6 v 1990 (SJ Kim, leg.)-coll. SNU.

Distribution. Palearctic [Korea, China, Russia (Siberia)].

Remarks. Lee (1987) synonymized *O. coreana* Pic as *O. morio* Kraatz. Based on the pictures of syntype specimen, *O. coreana* Pic must be an endemic of Korea because it has densely pubescence on pronotum, and relatively shorter than *O. morio* Kraatz.

5. *Oberea morio* Kraatz, 1879

Oberea morio Kraatz, 1879: 117. Type locality: East Siberia.

Oberea linearis Saito, 1932: 444 (Korea).

Diagnosis. Body length ♂ 11.8 mm. Head black with gray adherent pubescence and a few of long setiform erect black hairs, with medially from vertex to posterior margin of occiput with narrow longitudinal groove, with large deep punctuation. Antennae black, shorter than body, numerous short black hairs like spine and some long hairs. Pronotum dark black with some golden hairs. Elytra apically obtuse, basally reddish brown to yellow, along suture except for basal portion and laterally black, with large round punctures forming longitudinal rows. Legs reddish brown, with yellowish pubescence. Body ventrally black with minute compact adherent yellow pubescence. Abdomen black with grayish pubescence, the fifth sternite with largely tetragonal depression in male, medially with narrow longitudinal groove in female.

Male genitalia. Tegumen with lateral lobes rounded apex, relatively more dark and thick hairs than *O. herzi* Ganglbauer; rod-like sclerites almost fused, separated widely at 2/7 point from apex; flagellum-like sclerites relatively very long and slender baculiform, fused at nearby apex, of which flagellum-like sclerites 2.89 times as long as the length of rod-like sclerites.

Distribution. Palearctic [Korea, China, Russia (Siberia)].

Materials examined. GB: 1♂, Mt. Bohyeon, Cheongsong-gun, 13 vi 2008 (SH Kim, leg.)-coll. KNA.

Host plants. Unknown.

Distribution. Palearctic [Korea, China, Russia (Siberia)].

6. *Oberea vittata* Blessig, 1873

Oberea vittata Blessig, 1873: 221. Type locality: Amur, Russia.

Oberea vittata Ganglbauer, 1887: 132 (Korea).

Oberea inclusa Lee, 1987: 285.

Diagnosis. Body length ♂ 12.5–17 mm, ♀ 15–18.5 mm. Head black with white adherent pubescence, with deep punctuation. Antennae barely reaching apex of elytra in male or definitely not reaching in female, with basally black to apically brown (dorsally) and gray (ventrally) fine pubescence. Pronotum reddish brown with numerous thin erect hairs, with dense punctuation. Elytra with large round black punctures forming uniform longitudinal rows, fine compact adherent yellow pubescence. Legs yellow, hind tibia apically with brownish tinge. Body ventrally with short adherent grayish pubescence. Abdomen the first to the third sternites black, the fourth sternite and sides of the first to the third sternites yellow in female or only fourth sternite yellow in male, tip of abdomen black.

Male genitalia. Tegumen with lateral lobes rounded apex, relatively darker and longer hairs, slightly bent to outer side; rod-like sclerites almost fused, separated widely at 2/7 point from apex, outer side slightly bent to apex; flagellum-like sclerites relatively very long and slender baculiform, fused at nearby apex, of which flagellum-like sclerites 3.21 times as long as the length of rod-like sclerites.

Materials examined. CB: 1♀, Cheongju-si, 10 vi 1992 (JK Noh, leg.)-coll. KNA; 1♀, Cheongwon-gun, 24 vi 1992 (CDS, leg.)-coll. KNA; 1♀, Mt. Minjooji, Yeungdong-gun, 4 vi 2000 (JH Choi, leg.)-coll. KNA; 1♀, Mt. Worak, Hansu-myeon, Jecheon-si, 22 vi 1992 (CM Park, leg.)-coll. KNA; GB: 1♂, Cheonjeon-ri, Imha-myeon, Andong-si, 9 v 2010 (SH Kang, leg.)-coll. KNA; 1♀1♂, Mt. Cheongryang, Myeongho-myeon, Bonghwa-gun, 8 viii 2009 (JY Park, leg.)-coll. KNA; 1♀, Mt. Sobaek-recreational forests, Yeongju-si, 22 v 2007 (HM Kwon, leg.)-coll. KNA; 2♀1♂, Naechil-ri, Sannae-myeon, Gyeongju-si, 11 vi 2010 (HM Kwon, leg.)-coll. KNA; 1♀1♂, Namyang-ri, Maejeon-myeon, Cheongdo-gun, 7 vi 2010 (BS Kim, leg.)-coll. KNA; 2♀1♂, Seokdong-dong, Andong-si, 1 ix 2009 (JR Lim, leg.)-coll. KNA; GG: 1♀, Anyang-si, 25 vi 1989 (SH Chae, leg.)-coll. KNA; 1♀, Baran-ri, Hyangnam-eup, Hwaseong-si, 27 v 1993 (JS Her leg.)-coll. KNA; 1♀, Bupyeong-gu, Incheon, 5 viii 1996 (SW Park, leg.)-coll. KNA; 1♀, Gwanggyo, 23 vi 1992 (HK, leg.)-coll. KNA; 1ex, Gwan-greung, Jinjeop-up, Namyangju-si, 17 vi 1976 (SM Lee, leg.)-coll. HII; 4exs, ditto, 29 v 1978 (SM Lee, leg.)-coll. HII; 1♀, ditto, 2 vi 1990 (KH Kim, leg.)-coll. KNA; 1♀, ditto, 17 vi 1992 (GJ Weon, leg.)-coll. KNA; 1♂, Hwaseong-si, 12 vi 1992 (SW Park, leg.)-coll. KNA; 1ex, Jeondeungsa, Is. Ganghwa, 30 vi 1977 (SM Lee, leg.)-coll. HII; 1ex, Mt. Cheonma, Hwado-up, Namyangju-si, 4 vi 1968 (SM Lee, leg.)-coll. HII; 1♂, ditto, 24 v 1973 (SM Lee, leg.)-coll. HII; 1ex, ditto, 25 v 1973 (SM Lee, leg.)-coll. HII; 2exs, ditto, 27 v 1982 (SM Lee, leg.)-coll. HII; 2exs, Mt. Deogam, 25 v 1978 (SM Lee, leg.)-coll. HII; 1ex, Mt. Myeongji, Baekdum-ri, Buk-myeon, Gapyeong-gun, 22 v 1983 (SM Lee, leg.)-coll. HII; 3exs, ditto, 26 vi 1983 (SM Lee, leg.)-coll. HII; 1ex, Mt. Myeongseong, Youngbuk-myeon, Pocheon-si, 16 v 1982 (SM Lee, leg.)-coll. HII; 1ex, Mt. Wangbang, Tapdong-dong, Dongducheon-si, 20 vi 1976 (SM Lee, leg.)-coll. HII; 1♂, Seodun-dong, Suwon-si, 21 v 2001 (TW Kim, leg.)-coll. NIAST; 1♂, Sihwa green-belt, Siheung-si, 11 v 2003 (JC Son, leg.)-coll. NIAST; 1♀, Singal-dong, Yongin-si, 25 vi 1992 (YJK, leg.)-coll. KNA; GN: 1ex, Mt. Jiri, Sicheon-myeon, Sancheong-gun, 28 v 1982 (SM Lee, leg.)-coll. HII; 1ex, ditto, 25 vi 1982 (SM Lee, leg.)-coll. HII; GW: 1♂, Bongmyung-ri, Dongsan-myeon, Chuncheon-si, 5 vi 1995 (SS Lee & HT Kim, leg.)-coll. KNU; 1ex, Chuncheon-si, 29 v 1972 (SM Lee, leg.)-coll. HII; 1♂, ditto, 16 v 1987 (JS Jung, leg.)-coll. KNU; 1♂, ditto, 20 vi 1992 (RSK, leg.)-coll. SNU; 1♂, Dutayeon, Yanggu-gun, 24 vii 1996 (GJ Weon, leg.)-coll. KNA; 1♀, Gajeong-ri, Nam-myeon, Chuncheon-si, 17 vii 2006 (HU Cho, leg.)-coll. KNA; 1ex, Geumdae-ri, Panbu-myeon, Weonju-si, 30 v 1982 (SM Lee, leg.)-coll. HII; 1♂, Hangbong-ri, Gonggeun-myeon, Hoengseong-gun, 26 vi 2009 (SW Park, leg.)-coll. KNA; 1♂, Jinbu-

myeon, Pyeongchang-gun, 8 vii 2008 (SH Kim, leg.)-coll. KNA; 1ex, Mt. Chiak, Wonju-si, 7 vii 1996 (SM Lee, leg.)-coll. HII; 1♀, Mt. Gariwang, Jeongseon-gun, 23 v 2001 (GJ Weon, leg.)-coll. KNA; 1♂, ditto, 26 vi 2001 (GJ Weon, leg.)-coll. KNA; 1♀, Mt. Maebong, Nam-myeon, Inje-gun, 17 vi 2010 (SY Park, JS Lim, & BK Byun, leg.)-coll. KNA; 1ex, Mt. Odae, Jinbu-myeon, Pyeongchang-gun, 1 viii 1976 (SM Lee, leg.)-coll. HII; 1ex, Mt. Seorak, buk-myeon, Inje-gun, 17 vi 1978 (SM Lee, leg.)-coll. HII; 1ex, ditto, 24 vi 1978 (SM Lee, leg.)-coll. HII; 1ex, ditto, 21 vi 1980 (SM Lee, leg.)-coll. HII; 1♀, Mt. Unbongsan, Toseong-myeon, Goseong-gun, 11 vi 2010 (BK Byun, SY Park, & JS Lim, leg.)-coll. KNA; 1♀, Myeongjumogi, Mt. Sangweol, Imgye-myeon, Jeungsun-gun, 25 viii 1997 (HC Park, leg.)-coll. NIAST; 1♂, Shinnam, 28 v 1991 (JS Kim & JS Hwang, leg.)-coll. KNU; 2exs, Weolha-ri, Cheolweon-gun, 15 v 1983 (SM Lee, leg.)-coll. HII; 1ex, Yongdae-ri, Inje-gun, 25 vii 1982 (SM Lee, leg.)-coll. HII; JN: 1ex, Mt. Jogye, 5 vi 1983 (SM Lee, leg.)-coll. HII; 1♂, Nogodan, Mt. Jiri, Gurye-gun, 29 vii 1999 (JS Ahn, leg.)-coll. KNA.

Host plants. *Lespedeza* ssp., *Wistaria brachybotrys* Sieb. & Zucc. (Akira & Akamatsu, 1957, Ohbayashi & Niisato, 2007).

Distribution. Palearctic [Korea, China, Japan, Russia (Amur)].

Remarks. *O. inclusa* Pascoe has been recorded as the misidentification of *O. vittata* Blessig.

7. *Oberea infranigrescens* Breuning, 1947

Oberea japonica m. *infranigrescens* Breuning, 1947: 58. Type locality: Japan.

Oberea inclusa infranigrescens Breuning: Kojima & Hayashi, 1969: 161 (Korea).

Diagnosis. Body length ♂ 13.5 mm. Head black with yellow adherent pubescence, with deep punctuation. Antennae barely reaching apex of elytra, with basally black to apically brown (dorsally) and gray (ventrally) fine pubescence. Pronotum yellowish brown with numerous thin erect hairs, with dense punctuation. Elytra with large round black punctures forming uniform longitudinal rows, fine compact adherent yellow pubescence, apically deep curved, and pointed. Legs yellow, hind tibia apically with brownish tinge. Body ventrally with short adherent yellowish pubescence. Abdomen black except for the fourth sternite in male, the fifth sternite with triangular depression in male, medially with narrow longitudinal groove in female.

Male genitalia. Tegumen with lateral lobes rounded apex, relatively darker and longer hairs, slightly bent to outer side; rod-like sclerites almost fused, separated and pointed slenderly at 1/4 point from apex, outer side bent to apex, pointed at base; flagellum-like sclerites relatively very long and slender baculiform, fused at nearby apex, of which flagellum-like sclerites 2.43 times as long as the length of rod-like sclerites.

Materials examined. JN: 1♂, Is. Jindo, Jindo-gun, 19 vii 1984 (SM Lee, leg.)-coll. NIAST.

Host plants. Unknown.

Distribution. Palearctic (Korea, China, Japan).

Remarks. A specimen deposited in HII and labeled as *O. inclusa* Pascoe, but mistaken of *O. infranigrescens* Breuning.

8. *Oberea depressa* Gebler, 1825

Oberea depressa Gebler, 1825: 51. Type locality: Siberia.

Oberea depressa: Ganglbauer, 1887: 132 (Korea).

Diagnosis. Body length ♂ 15–17 mm, ♀ 16–19 mm. Head black, with large deep punctuation. Antennae almost up to apex of elytra in male or not in female, with adherent gray hairs on lower side,

dark brown on upper side. Pronotum reddish brown. Elytra with deep black punctures, bright grayish pubescence, apically obtuse. Legs yellow with long yellow erect hairs. Body ventrally with minute compact adherent pubescence. Abdomen largely black except for the fifth sternite, the last sternite with triangular depression in male, medially with narrow longitudinal groove in female.

Male genitalia. Tegumen with lateral lobes straight, rounded apex, relatively separated to each other; rod-like sclerites fused from base to 2/9 point; flagellum-like sclerites relatively very long and slender baculiform, tapered at the apex, of which flagellum-like sclerites 2.68 times as long as the length of rod-like sclerites.

Materials examined. CB: 1♂, Mt. Songni, Boeun-gun, 26 v 2002 (JC Son, leg.)-coll. NIAST; GB: 1♂, Cheonjeon-ri, Imha-myeon, Andong-si, 9 v 2010 (SH Kang, leg.)-coll. KNA; 11exs, Jeungsan-myeon, Gimcheon-si, 1 vi 1979 (SM Lee, leg.)-coll. HII; 1♀, Mt. Euhak, Dongmyeong-myeon, Chilgok-gun, 18 vi 2008 (MJ Lee, leg.)-coll. KNA; GG: 1♀, Agricultural College, Seoul University, Suwon-si, 13 viii 2008 (RK Kim, leg.)-coll. KNA; 1♀, Botonggol, Namhansanseung, Seongnam-si, 5 vi 2000 (HC Park, leg.)-coll. NIAST; 1♀, Cheongpyeong-myeon, Gapyeong-gun, 10 vi 1987 (YK Chang, leg.)-coll. SNU; 1♀, Gugokpokpo, Gangchon, 29 v 1999 (JC Son, leg.)-coll. NIAST; 1♂, Gwanggyo, 6 vi 1972 (YJD, leg.)-coll. SNU; 1♂, ditto, 30 v 1987 (CKS, leg.)-coll. SNU; 1♀, ditto, 21 vi 1989 (SH Lim, leg.)-coll. SNU; 1♂, ditto, 29 v 1990 (ZL, leg.)-coll. SNU; 1♂, ditto, 2 vi 1990 (JH Seo, leg.)-coll. SNU; 1♀, ditto, 4 vi 1990 (SJ Kim, leg.)-coll. SNU; 1♂, Gwangreung, Jinjeop-up, Namyangju-si, 6 vi 1970 (B, leg.)-coll. SNU; 1♀, Hagwanggyo-dong, Suwon-si, 19 v 1998 (KM Kim, leg.)-coll. NIAST; 1♂, Jogaegol, Yongmun-myeon, Yangpyeong-gun, 31 v 1986 (YS Kim, leg.)-coll. NIAST; 1♂, Mt. Cheonggye, Gwacheon-si, 24 v 1986 (MS Jung, leg.)-coll. KNU; 1ex, Mt. Cheonma, Hwado-up, Namyangju-si, 5 v 1968 (SM Lee, leg.)-coll. HII; 1♂, ditto, 22 v 1968 (SM Lee, leg.)-coll. HII; 1♀, ditto, 24 v 1974 (SM Lee, leg.)-coll. HII; 1ex, ditto, 28 v 1976 (SM Lee, leg.)-coll. HII; 3exs, ditto, 27 v 1982 (SM Lee, leg.)-coll. HII; 1ex, Mt. Godae, Yeoncheon-gun, 27 v 2000 (Bae, Lee, Lee, & Oh, leg.)-coll. IU; 1♀1♂, Mt. Goryeo, Is. Ganghwa, 8 vi 2009 (SY Park & JS Lim, leg.)-coll. KNA; 1♂, Mt. Gwanak, Seoul, 22 v 1999 (KO Joo, leg.)-coll. SNU; 1♀, ditto, 8 vi 2009 (CO Lee, leg.)-coll. SNU; 1♂, Mt. Gwanggyo, Suwon-si, 23 v 2003 (HJ Kim, leg.)-coll. SNU; 1ex, Mt. Hwaya, Namyangju-si, 28 v 1999 (Kim, leg.)-coll. IU; 1♀, Mt. Jeongbal, Ilsandong-gu, Goyang-si, 13 vi 2000 (DH Song, leg.)-coll. KNA; 1♀, Mt. Taehwa, Docheog-myeon, Gwangju-si, 14–27 vi 2008 (JO Lim, leg.)-coll. SNU; 1ex, Neungnae-ri, 23 vi 1968 (SM Lee, leg.)-coll. HII; 1♂, Paldang-dam, Yangpyeong-gun, 11 vi 1994 (SH Lee, leg.)-coll. NIAST; 1♂, Pocheon-si, 10 vi 1988 (JH Lee, leg.)-coll. SNU; 1♂, Singal-dong, Yongin-si, 24 vi 1992 (JI Kang, leg.)-coll. SNU; 1♀, Seoul University Gwanak-arboretum, Anyang-si, 12 v 1995 (JW Kim, leg.)-coll. SNU; 1♂, ditto, 26 v 1996 (AY Kim, leg.)-coll. SNU; 1♀, ditto, 7 v 2005 (S Lee, H Kim, J Lim, C Kin, & W Lee, leg.)-coll. SNU; 1♂, Yangseo-myeon, Yangpyeong-gun, 26 v 2007 (SW Park, leg.)-coll. KNA; GW: 1♂, Changchon-ri, Namsan-myeon, Chuncheon-si, 29 v 1992 (JB Pyo & YK Kim, leg.)-coll. KNU; 1♂, Hongcheon-gun, 12 vi 1992 (KS Han & OS Park, leg.)-coll. KNU; 2exs, Mt. Chiak, Wonju-si, 15 vi 1984 (SM Lee, leg.)-coll. HII; 1♂, Mt. Dapgok, Musa-ri, Miro-myeon, Samcheok-si, 22 vi 1988 (CM Park, leg.)-coll. SNU; 1♂, Mt. Jeombong, Girin-myeon, Inje-gun, 30 vi 2010 (BW Lee, JS Lim, & KM Kim, leg.)-coll. KNA; 1ex, Mt. Seorak, buk-myeon, Inje-gun, 20 vi 1980 (SM Lee, leg.)-coll. HII; 1ex, ditto, 2 vii 1984 (SM Lee, leg.)-coll. HII; 1ex, Seongsan, Myeongji-gun, 24 vi 1980 (SM Lee, leg.)-coll. HII; 2exs, Wonha-ri, Cheolweon-gun, 15 v 1983 (SM Lee, leg.)-coll. HII; 1ex, Wonju-si, 30 v 1982 (TC Son, leg.)-coll. HII; 1♀, JB: Gaok-ri, Jeoksang-myeon, Muju-gun, 29 v 2000 (SJ Jang, leg.)-coll. NIAST.

Host plants. Unknown.

Distribution. Palearctic [Korea, China, Russia (Siberia), Central Asia].

9. *Oberea oculata* (Linnaeus, 1758)

Cerambyx oculatus Linnaeus, 1758: 394. Type locality: Europe.
Oberea oculata Ganglbauer, 1887: 132 (Korea).

Diagnosis. Body length ♂ 16–18.5 mm, ♀ 17–18 mm. Head with fine gray compact adherent pubescence. Antennae black, shorter than body. Pronotum yellowish brown or reddish with a pair of round black spots, basally with barely perceptible transverse groove, with comparatively compact punctation. Elytra black with densely gray pubescence, with black round punctures. Legs yellow. Body ventrally yellow. Abdomen the fifth sternite with deep broad depression in male, medially with narrow longitudinal groove in female.

Male genitalia. Tegumen with lateral lobes straight, rounded apex; rod-like sclerites and flagellum-like sclerites relatively very long and slender baculiform, rod-like sclerites slightly expanded by forming membrane at apex, flagellum-like sclerites tapered at the apex, of which flagellum-like sclerites 2.83 times as long as the length of rod-like sclerites.

Materials examined. GG: 1♂, Anyang-si, 21 vi 1992 (OSB, leg.)-coll. SNU; 1ex, Byeongje-ri, 9 vi 1980, (SM Lee, leg.)-coll. HII; 1ex, Gwangreung, Jinjeop-up, Namyangju-si, 29 v 1970 (SM Lee, leg.)-coll. HII; 1♂, ditto, 20 vi 1982 (G Jung, leg.)-coll. KNA; 1♂, Mt. Cheonma, Hwado-up, Namyangju-si, 21 v 1974 (SM Lee, leg.)-coll. HII; 1♂, Mt. Jugeum, Sang-myeon, Gapyeong-gun, 27 vi 1984 (GJ Weon, leg.)-coll. KNA; 1♂, Suwon-si, 9 vii 1969-coll. HII; GW: 1♀, Chuncheon-si, 21 vi 1983 (SY Lee, leg.)-coll. KNU; 1♀, Chunseong, Chuncheon-si, 3 vi 1982 (YC Byun, leg.)-coll. KNU; 1♂, ditto, 18 vi 1983 (GS Jang, leg.)-coll. KNU; 1♀, ditto, 5 vi 1988 (HY Choi, leg.)-coll. KNU; 1ex, Hongcheon-gun, 4 vi 1981 (SM Lee, leg.)-coll. HII; 1ex, Janghak-ri, Dong-myeon, Chuncheon-gun, 5 vi 1982 (SM Lee, leg.)-coll. HII; 1♂, Sachang-ri, Sanae-myeon, Hwacheon-gun, 28 v 1992 (YM Lee & CI Kweon, leg.)-coll. KNU; JN: 1♂, Dapgok, Gwangyang-si, Suncheon-si, 23 vi 1995 (CP Choe, leg.)-coll. SNU.

Host plants. *Salix* spp., *Populus* spp. (Bense, 1995, Hua, 2002, Sama, 2002).

Distribution. Palearctic [Korea, China, Russia (Siberia), Europe, Morocco, Caucasus, Iran, Iraq].

10. *Oberea heyrovskyi* Pic, 1927

Oberea heyrovskyi Pic, 1927: 9–11.

Oberea pupillata Lee, 1987: 287.

Oberea heyrovskyi Pic Danilevsky, 1988: 35–39 (Korea).

Diagnosis. Body length ♂ 17 mm, ♀ 17.5–18 mm. Head black with densely punctures. Antennae barely reaching apex of elytra in male or definitely not reaching in female. Pronotum yellowish brown with laterally a pair of black spots. Body ventrally yellowish brown with most area of sternites black. Abdomen the first to the second sternites in male or the first to the third sternites in female almost black, the fifth sternite with black mark, the last sternite medially with narrow longitudinal groove in female.

Male genitalia. Tegumen with lateral lobes straight, the apex rounded, numerous darker and longer hairs; rod-like sclerites forming the largely expanded membrane at middle to apex, pointed at base, flagellum-like sclerites relatively very long and slender baculiform, of which flagellum-like sclerites 3.77 times as long as the length of rod-like sclerites.

Materials examined. CB: 1♀, Mansu vally, Mt. Songni, Boeun-gun, 27 vii 2002 (MA Kim, leg.)-coll. NIAST; CN: 1♂, Mt. Kwangduk,

Cheonan-si, 22 vii 1994 (SS Kim, leg.)-coll. NIAST; GW: 1♀, Mt. Gariwang, Jeongseon-gun, 30 vi 1997 (JC Shon, leg.)-coll. KNU; 1♂, Mt. Taebaek, Taebaek-si, 19 vi 1983 (SM Lee, leg.)-coll. HII.

Host plants. Unknown.

Distribution. Palearctic (Korea, Russia).

Remarks. *O. pupillata* (Gyllenhal) was misidentification of *O. heyrovskyi* Pic.

11. *Oberea tsuyukii* Kurihara & Ohbayashi, 2007

Oberea tsuyukii Kurihara & Ohbayashi, 2007: 193–219. Type locality: Taiwan.

Diagnosis. Body length ♂ 17–19 mm, ♀ 19 mm. Head black in male, except for brownish base in female, from anterior frons to posterior margin of occiput with narrow longitudinal groove. Pronotum yellowish brown or reddish. Elytra yellowish brown and slightly darkened at the apex, with deep and large punctures. Body ventrally yellowish brown with most area of metasternum black. Abdomen sternites partly black, the first sternite a largely heart-shaped mark in male or a pair of black spots in female, the second and the third mostly black except for apical margin and lateral sides, the fifth sternite mainly black except for basal margin. Male genitalia tegmen with lateral lobes straight, the apex rounded; rod-like sclerites gradually wide and apart from each other toward the apex, pointed at base, flagellum-like sclerites relatively very long and slender baculiform, tapered at the apex, of which flagellum-like sclerites 2.67 times as long as the length of rod-like sclerites.

Materials examined. CB: 1♂, Mt. Daemi, Chungju-si, 19 v 1997 (HC Park, leg.)-coll. NIAST; GG: 1♂, Seungchunsa, Mt. Myeongji, Baekdun-ri, Buk-myeon, Gapyeong-gun, 28 v 2001 (HA Lee, leg.)-coll. NIAST; GW: 1♀, Chuncheon Dam, Sinbuk-eup, Chuncheon-si, 20 v 1991 (HJ Yu & SK Min, leg.)-coll. KNU; 1♀, Mt. Chiak, Wonju-si, 29 vi 2000 (HB Kim, leg.)-coll. NIAST; 1♀, Ssangyong-ri, Hanbando-myeon, Yeongwol-gun, 21 v 1999 (MA Kim, leg.)-coll. NIAST.

Host plants. Unknown.

Distribution. Palearctic (Korea), Oriental (Taiwan).

12. *Oberea formosana* Pic, 1911

Oberea formosana Pic, 1911: 20.

Oberea holoxantha Saito, 1932: 458.

Oberea ruficornis Breuning, 1956: 235.

Oberea clarior Breuning, 1960: 43.

Oberea spinpennis Breuning, 1960: 43.

Remarks. This species recorded and cited from Korea sequentially (Lee, 1987; ESK.KSAE, 1994; Lobl and Smetana, 2010; Hong and Lee, 2014; Jang et al, 2015; Hwang, 2015). However, Korean occurrence of this species is questionable based on our comprehensive survey.

Conflicts of interest

The authors declare that there is no conflicts of interest.

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