

Taxonomy of the Korean Oxyporinae (Insecta, Coleoptera, Staphylinidae)

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ABSTRACT

A taxonomic study of the Oxyporinae including a single genus *Oxyporus* Fabricius in Korea is presented. Members of the genus are known to be obligate inhabitants on fleshy mushrooms. They are characterized by crescent-shaped last labial palpomere. Nine species are recognized, five of which are reported for the first time in Korea (*Oxyporus basicornis* Cameron, *O. basiventris* Jarrige, *O. crocatus* Fauvel, *O. niger* Sharp, *O. triangulum* Sharp). The illustrations, descriptions, and key to the Korean species of the Oxyporinae are presented.

Key words: taxonomy, Staphylinidae, Oxyporinae, *Oxyporus*, fungivorous, Korea

INTRODUCTION

The subfamily Oxyporinae including a single genus *Oxyporus* Fabricius is associated with fungus. Adults and larvae of the genus have been observed feeding on fleshy mushrooms (Campbell, 1969; Newton, 1984; Leschen and Allen, 1988; Hanley and Goodrich, 1995). The short life cycle of these beetles is an important adaptation to the ephemeral nature of their host fungi, and females construct and protect egg-hatching chambers (Hanley and Goodrich, 1995). Members of the *Oxyporus* are characterized by the crescent-shaped large last labial palpomere (Fig. 8), prominent mandibles, widely separated middle coxae, and 5-5-5 tarsal formula.

Nakane and Sawada (1956) described another genus *Pseudoxyporus* based on the structural differences in male genitalia and more cylindrical antennomeres. However, Campbell (1969) mentioned that these differences be not sufficient to separate as a genus, and treated it as a subgenus of *Oxyporus*. Since the Oxyporinae was first recognized as a distinct group of staphylinids by Thomp-

son in 1861, about 90 species are known from the Oriental region, Central America, and mainly from the Holarctic region. In East Asia, thirty eight species have been recorded (Kirschenblatt, 1938; Nakane and Sawada, 1956; Shibata, 1976; Zheng, 1992) but only four species have been reported so far in Korea (Yuh *et al.*, 1985; Kim *et al.*, 1994).

In this paper, we report five additional Korean species (*Oxyporus basicornis* Cameron, *O. basi-ventris* Jarrige, *O. crocatus* Fauvel, *O. niger* Sharp, *O. triangulum* Sharp) and present a key and diagnoses with line drawings.

MATERIALS AND METHODS

Materials for this study are deposited in the Chungnam National University Insect Collection, Daejeon City, Korea (CNUIC). We used pinned, glycerin-dissected, and slide-mounted adult specimens to study characters in detail. The techniques for slide preparation described by Ahn and Ashe (1996) were used.

RESULTS

Genus *Oxyporus* Fabricius, 1775

Oxyporus Fabricius, 1775, p.267; Erichson, 1840, p.555; Sharp, 1887, p.676; Bernhauer and Schubert, 1911, p.148; Scheerpeltz, 1933, p.1139; Campbell, 1969, p.225.

Type-species: *Staphylinus rufus* Linnaeus

Diagnosis. Length 7.0-13.0 mm. Body black and yellow to reddish-yellow. Surface usually smooth and very shining. Antennae inserted at sides of the head near compound eyes. Antennomeres 6-10 (Fig. 2A-B) moderately to strongly transverse, compressed dorsoventrally, entirely glabrous along midline and wider than long. Mandibles (Fig. 2D) prominent, generally as long as head and the left mandible with small tooth at outer ventral margin to receive right mandible, when crossed. Clypeus short, separated from frons by fine, transverse, impressed line. Maxillary palpomere 4 (Fig. 2E) filiform; palpomere 2 subequal in length to palpomere 3 and 4 combined. Labial palpomere 3 (Fig. 2F) large and crescent-shaped. Elytra (Fig. 1A-B) distinctly longer than wide. Middle coxae widely separated. Legs moderately slender; tibiae having dense, spiniform setae; tarsal formula 5-5-5. Abdomen with 6 visible segments.

Key to the species of *Oxyporus* in Korea

1. Antennae (Fig. 2A) pubescent; antennomeres 6-10 about 1.0 to 1.5 times wider than long; parameres long, almost reaching to apex of median lobe
 Subgenus *Pseudoxyporus* *Oxyporus (Pseudoxyporus) longipes* Sharp
- Antennae (Fig. 2B) entirely glabrous along midline; antennomeres 6-10 about 2.0 times wider than long; parameres very short, not reaching to middle of median lobe
 subgenus *Oxyporus* 2
2. Body black; male genitalia as in Fig. 6A-F *Oxyporus niger* Sharp

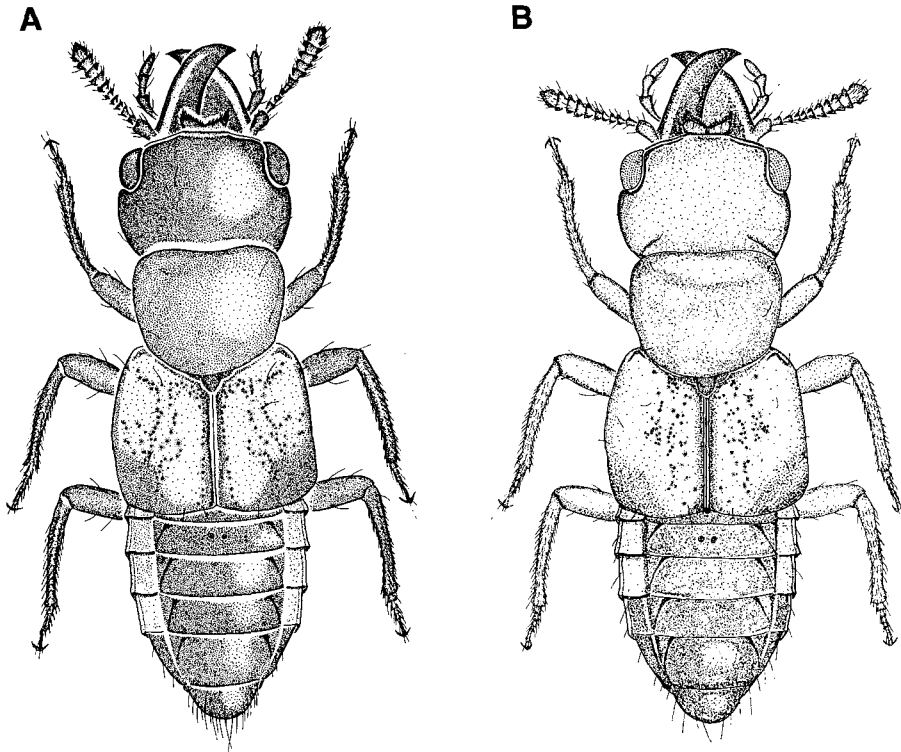


Fig. 1. Habitus. A, *O. germanus*. Body length 9.0 mm; B, *O. basicornis*. Body length 9.5 mm.

- Body bicolor or reddish brown 3
- 3. Head, pronotum, and abdomen reddish brown; male genitalia as in Fig. 4G-I
..... *Oxyporus crocatus* Fauvel
- Head, pronotum, and abdomen at least bicolor or black 4
- 4. Abdomen black 5
- Abdomen bicolor 6
- 5. Legs brown; male genitalia as in Fig. 5D-F *Oxyporus japonicus* Sharp
- Legs black; male genitalia as in Fig. 6D-F *Oxyporus triangulum* Sharp
- 6. Pronotum reddish yellow *Oxyporus rufus osawai* Nakane and Sawada
- Pronotum black 7
- 7. Abdominal segments III-VI reddish brown; male genitalia as in Fig. 4D-F
..... *Oxyporus basiventris* Jarrige
- Abdominal segments III-VI black 8
- 8. Abdominal paratergites III-V reddish yellow; male genitalia as in Fig. 4A-C
..... *Oxyporus basicornis* Cameron
- Abdominal paratergites III-VI reddish yellow; male genitalia as in Fig. 5A-F
..... *Oxyporus germanus* Sharp

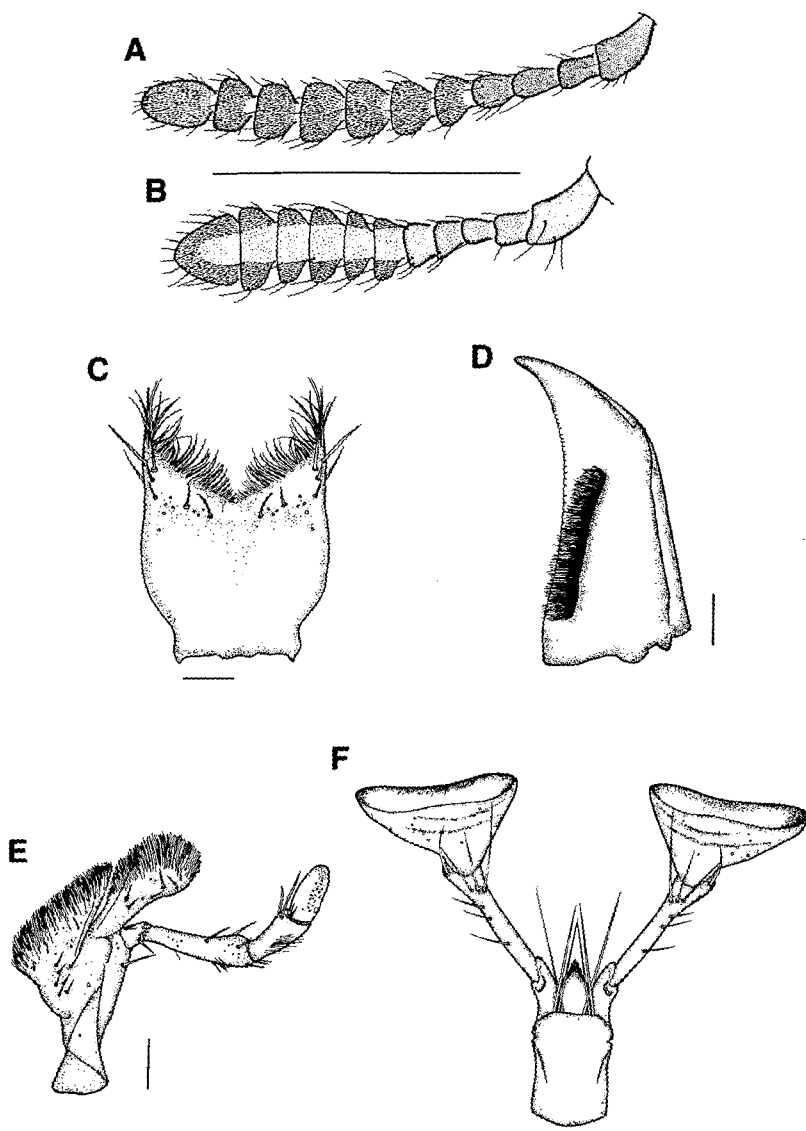


Fig. 2. Antennae and mouthparts. A, Antennae of *O. longipes*; B-F, *O. germanus*: B, Antennae; C, Labrum; D, Mandible; E, Maxilla; F, Labium. Scale bars: 0.5 mm.

1. *Oxyporus (Oxyporus) basicornis* Cameron 여린무늬입치레반날개 (신칭)
(Figs. 1B, 4A-C)

Oxyporus lewisi var. *basicornis* Cameron, 1930, p.184; Scheerpeltz, 1933, p.129; Adachi, 1957, p.193.

Oxyporus basicornis Nakane and Sawada, 1956, p.67; Shibata, 1976, p.171.

Material examined. 4♂♂, 3♀♀, Kangwon-do, Injae-gun, Mt. Jumbongsan, 23-30 Aug. 1999, U. S. Hwnag; 1♂, 1♀, Pyeongchang-gun, Mt. Odaesan, 22 Aug. 2000, K. J. Ahn and J.

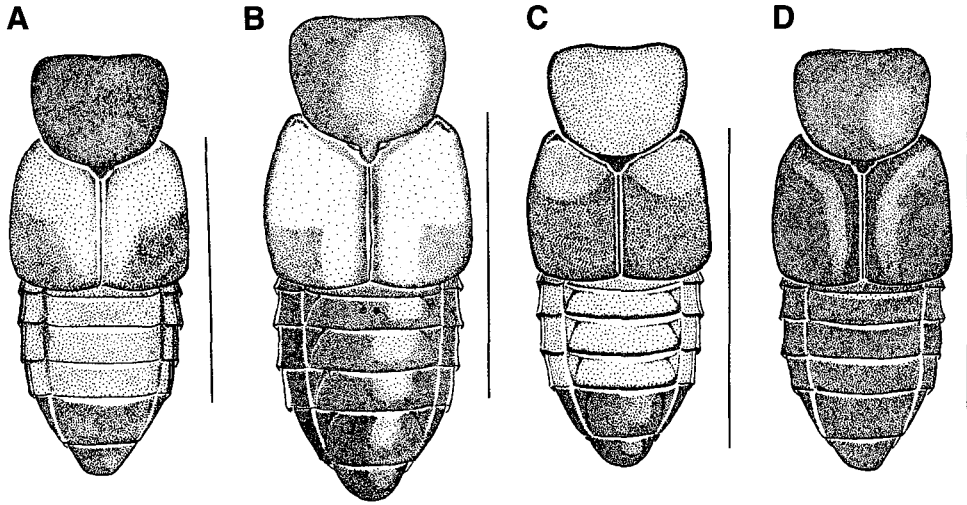


Fig. 3. Dorsal habitus. A, *O. basiventris*; B, *O. japonicus*; C, *O. rufus osawai*; D, *O. triangulum*. Scale bars: 5 cm.

H. Ahn.

Diagnosis. Body length 9.5–10.5 mm. Head and pronotum black; elytra reddish-yellow with black outer latero-apical margin; abdomen black with paratergites III–V reddish yellow; antennae black with each pubescent area yellowish brown; labrum, maxillary palpi, and labial palpi black; legs reddish brown except the posterior coxa black.

Male. Head broader than pronotum; mandibles longer than head. Male genitalia as in Fig. 4A–C. Female: Head narrower than pronotum; mandibles shorter than head.

Distribution. Korea, Japan.

2. *Oxyporus (Oxyporus) basiventris* Jarrige 주황띠입치레반날개 (신칭) (**Figs. 3A, 4D–F**)

Oxyporus basiventris Jarrige, 1948, p.40; Nakane and Sawada, 1956, p.67; Adachi, 1957, p.193; Shibata, 1976, p.172.

Material examined. 1♂, 2♀♀, Kangwon-do, Injae-gun, Mt. Jumbongsan, 23–30 Aug. 1999, W. S. Hwang.

Diagnosis. Body length 9.0–11.0 mm. Head and pronotum black; elytra reddish-yellow with black outer latero-apical margin; abdominal segments III–VI reddish brown and other segments black; antennae black with the each pubescent area yellowish brown; labrum brown, labial palpi dark brown, and maxillary palpi black; legs reddish brown except the posterior coxa black. Male genitalia as in Figs. 4D–F.

Distribution. Korea, Japan.

3. *Oxyporus (Oxyporus) crocatus* Fauvel 황토입치레반날개 (신칭) (**Fig. 4G–I**)

Oxyporus crocatus Fauvel, 1901, p.2; Nakane and Sawada, 1956, p.68; Adachi, 1956, p.193; Shibata 1976, p.172.

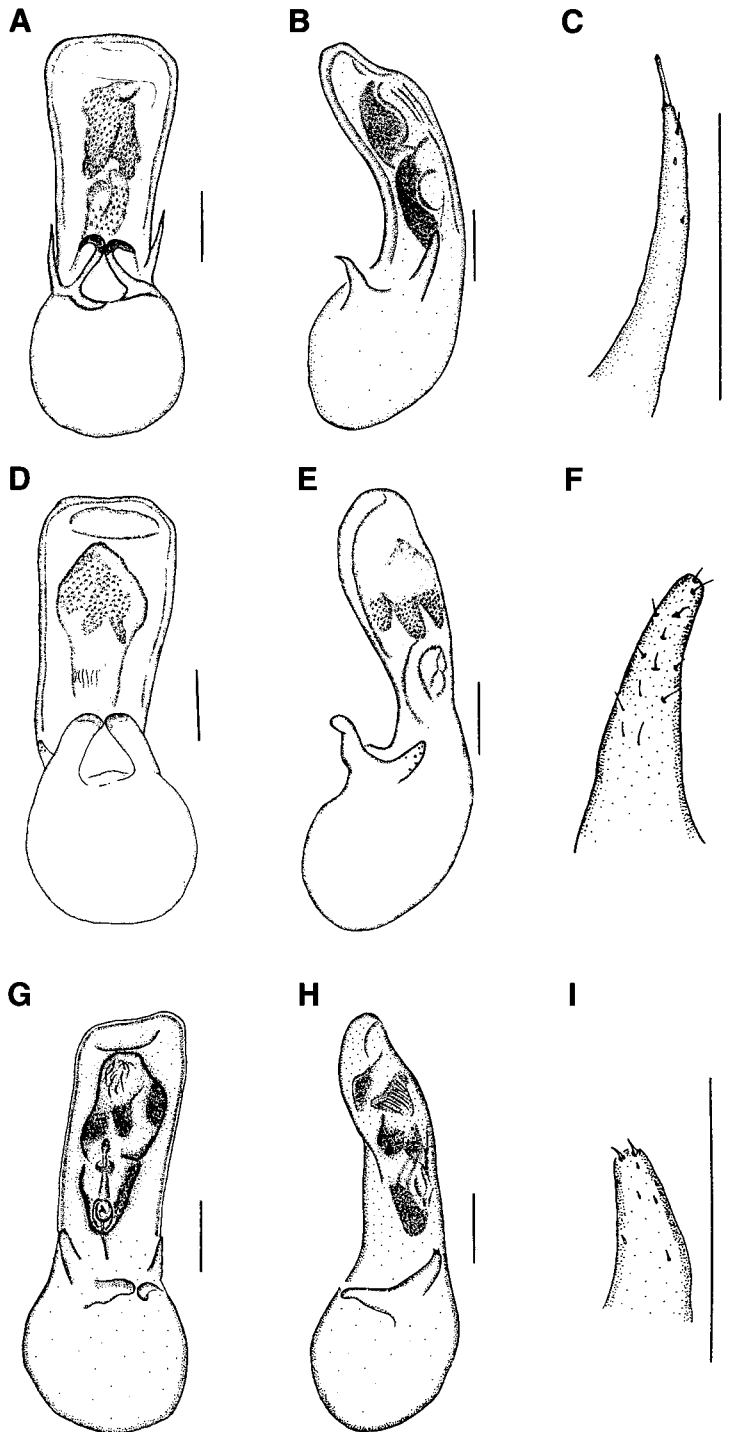


Fig. 4. Aedeagus. A-C, *O. basicornis*: A, ventral view; B, lateral view; C, Apex of paramere; D-F, *O. basiventris*: D, ventral view; E, lateral view; F, Apex of paramere; G-I, *O. crocatus*: G, ventral view; H, lateral view; I, Apex of paramere. Scale bars: 0.2 mm.

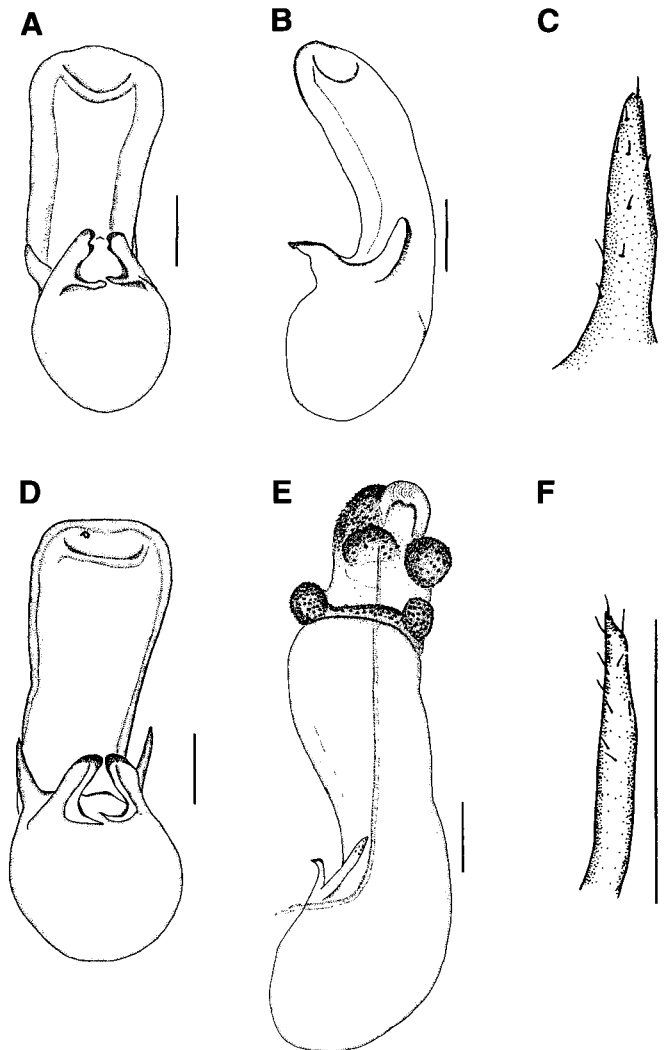


Fig. 5. Aedeagus. A-C, *O. germanus*: A, ventral view; B, lateral view; C, Apex of paramere; D-F, *O. japonicus*: D, ventral view; E, lateral view; F, Apex of paramere. Scale bars: 0.2 mm.

Material examined. 1 ♀, Kangwon-do, Pyeongchang-gun, Mt. Odaesan, 22 Aug. 2000, M. H. Kim; 1 ♂, 1 ♀, 23 Aug. 2000, J. H. Ahn; 2 ♂♂, 2 ♀♀, Temple bukdaesa, 23 Aug. 2000, W. S. Hwang; 1 ♀, Tombstone Area, 22 Aug. 2000, M. H. Kim; 1 ♀, Jeongsun-gun, Mt. Kariwangsan, 12-14 Aug. 1998, K. L. You, H. J. Kim, and K. J. Ahn; 2 ♀♀, Injae-gun, Mt. Jumbongsan, 31 Aug. 1999, W. S. Hwang; 1 ♂, Gyeonggi-do, Namyangju, Sudong-myon, Mt. Chukryongsan, 11-13 Sep. 1999, W. S. Hwang; 1 ♂, Kwangnung, 14 Sep. 1991, J. Y. Choi; 1 ♀, Chungcheongnam-do, Daejeon, Chungnam National Univ. Area, 11 Sep. 1999, C. W. Shin.

Diagnosis. Body length 7.0-8.0 mm. Head, pronotum, and abdomen reddish brown; anterior margin of frons, basal margin of thorax and often abdominal tergites, especially VII-VIII dark brown; elytra reddish-yellow with reddish brown outer latero-apical margin. Male genitalia as in

Fig. 4G-I.

Distribution. Korea, Japan.

4. *Oxyporus (Oxyporus) germanus* Sharp 극동입치레반날개 (Figs. 1A, 2B-F, 5A-C)

Oxyporus germanus Sharp, 1889, p.409; Nakane and Sawada, 1956, p.67; Shibata, 1976, p.173; Yuh *et al.*, 1985, p.229; Kim *et al.*, 1994, p.140.

Material examined. 2♂♂, 11♀♀, Kangwon-do, Hwachun-gun, Mt. Hwaaksan, 11-12 Sep. 1998, K. L. You, H. J. Kim, and K. J. Ahn; 1♂, 1♀, Chungil-myon, Mt. Balgyosan, 9-10 Sep. 1998, K. L. You, and K. J. Ahn; 1♀, Jeongsun-gun, Mt. Kariwangsan, 5-7 July 1998, H. J. Lim and K. L. You; 1♂, 12-14 Aug. 1998, K. L. You, H. J. Kim, and K. J. Ahn; 6♂♂, 3♀♀, Pochon-gun, Mt. Myeongsungsan, 5 Sep. 1999, W. S. Hwang; 1♀, Hongsung-gun, Unduryeng, 9-10 Sep. 1998, K. J. Ahn; 10♀♀, Hongcheon-gun, Mt. Gyebangsan, 18 Aug. 2000, W. S. Hwang; 5♀♀, Pyeongchang-gun, Mt. Odaesan, 28-30 Aug. 1998, K. L. You and K. J. Ahn; 2♂♂, 7♀♀, 22 Aug. 2000, M. H. Kim; 4♂♂, 31♀♀, Temple bukdaesa Area, 23 Aug. 2000, W. S. Hwang; 3♂♂, 2♀♀, Wonju, Mt. Chiaksan, Temple Sangwonsa Area, 14 Aug. 2000, W. S. Hwang; 1♂, 2♀♀, Taebaek, Mt. Taebaeksan, 16 July 1999, H. J. Kim; 86♂♂, 255♀♀, Gyeonggi-do, Namyangju, Sudong-myon, Mt. Chukryongsan, 11-14 Sep. 1999, W. S. Hwang; 7♂♂, 11♀♀, Injae-gun, Mt. Jumbongsan, 23-30 Aug. 1999, W. S. Hwang; Mt. Bangtaesan, 18 Aug. 2000, M. H. Kim; 5♂♂, 16♀♀, Kwangnung, 14 Sep. 1991, J. Y. Choi; 1♂, Chungcheongnam-do, Nonsan, Kangkeung-gun, Hwangsan-bridge Area, 15 May 1999, M. S. Kim; 3♂♂, 7♀♀, Daejeon, Chungnam National Univ. Area, 11 Sep. 1999, C. W. Shin; 2♂♂, 8♀♀, 1 Sep. 2000, C. W. Shin; 1♀, Gongju-gun, Mt. Gyeryongsan, Temple Gapsa Area, 6 Aug. 1999, W. S. Hwang; 2♀♀, Chungcheongbuk-do, Jaecheon-gun, 31 Aug. 1991, J. Y. Choi; 1♂, 1♀, Gyeongsangbuk-do, Koje, Dongbu-myon, 30 July 1999, W. S. Hwang, H. J. Kim, and C. W. Shin; 1♂, 2♀♀, Bonghwa-gun, 30 Aug. 1999, J. Y. Choi.

Diagnosis. Body length 7.0-10.5 mm. Head and pronotum black; elytra reddish brown with black outer latero-apical margin; abdomen black and abdominal paratergites III-VI reddish brown; antennae, labial palpi, maxillary palpi pale brown; coxa, femur, and tibia reddish brown. Male: Head broader than pronotum. Mandibles large, longer than head; male genitalia as in Figs. 5A-C. Female: Head narrower than pronotum. Mandibles smaller, shorter than head.

Distribution. Korea, Japan.

5. *Oxyporus (Oxyporus) japonicus* Sharp 입치레반날개 (Figs. 3B, 5D-F)

Oxyporus japonicus Sharp, 1889, p.407; Nakane and Sawada, 1956, p.66; Shibata, 1976, p.174; Yuh *et al.*, 1985, p.229; Kim *et al.*, 1994, p.140.

Material examined. 3♂♂, 13♀♀, Kangwon-do, Injae-gun, Mt. Jumbongsan, 23-30 Aug. 1999, U. S. Hwnag; 2♂♂, 2♀♀, Pyeongchang-gun, Mt. Odaesan, 7 July, 1998, K. J. Ahn; 1♀, Jin-ridge, 23 Aug. 2000, M. J. Jeon; 2♂♂, 2♀♀, Temple bukdaesa 23 Aug. 2000, W. S. Hwang; 2♂♂, 5♀♀, Wonju, Mt. Chiaksan, 14 Aug. 2000, W. S. Hwang; 1♀, Gyeonggi-do, Yangpyong-gun, June 1999, M. H. Kim.

Diagnosis. Body length 8.0-13.0 mm. Head, pronotum, abdomen black; elytra reddish-yellow with black outer latero-apical margin; antennae black with each pubescent area yellowish brown;

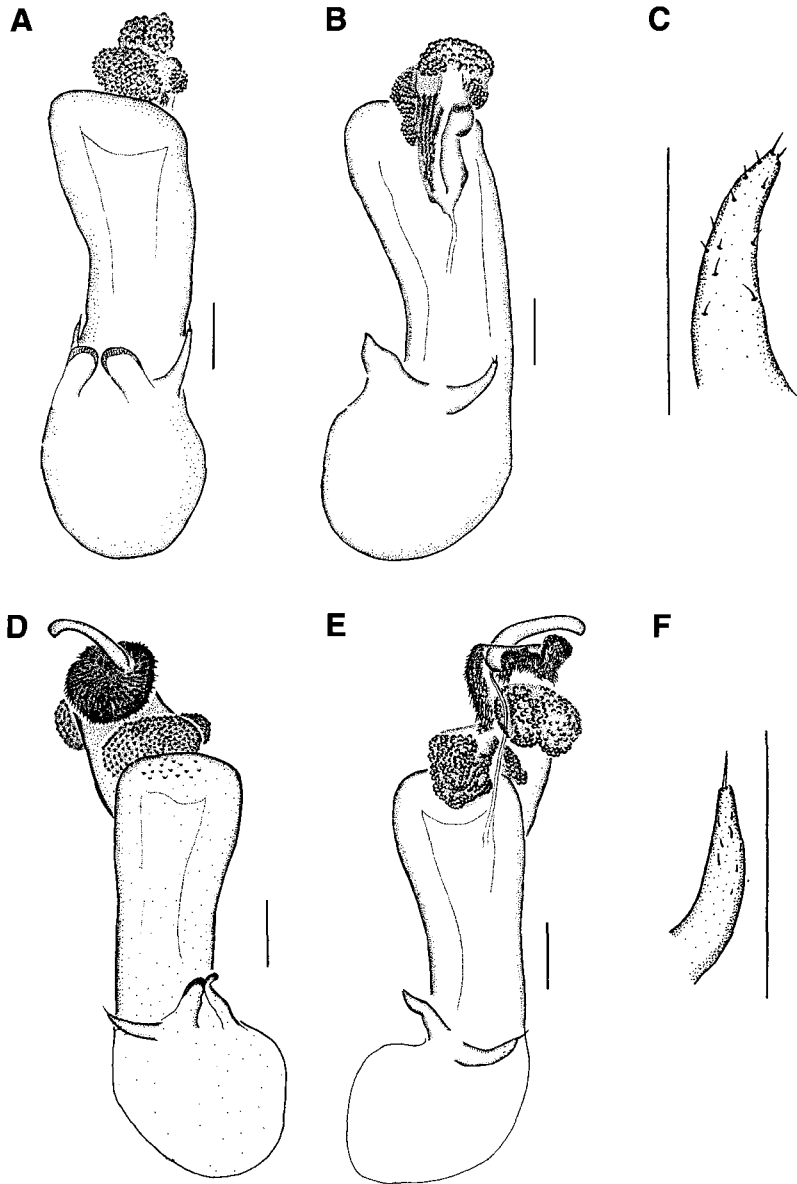


Fig. 6. Aedeagus. A-C, *O. niger*: A, ventral view; B, lateral view; C, Apex of paramere; D-F, *O. triangulum*: D, ventral view; E, lateral view; F, Apex of paramere. Scale bars: 0.2 mm.

labrum, maxillary palpi black, and labial palpi black except half of palpomere 3 pale brown; legs brown except basal half of femora.

Male: Head broader than pronotum; mandibles longer than head. Male genitalia as in Fig. 5D-F.

Female: Head narrower than pronotum; mandibles smaller, shorter than head.

Distribution. Korea, Japan.

6. *Oxyporus (Oxyporus) niger* Sharp 검둥입치레반날개 (신칭) (Fig. 6A-C)

Oxyporus niger Sharp, 1889, p.407; Nakane and Sawada, 1956, p.66; Adachi, 1957, p.192; Shibata 1976, p.176.

Diagnosis. Body length 10.0-11.0 mm. Head, pronotum, elytra and abdomen black; antennae black with each pubescent area yellowish brown; labrum black except apical half brown, labial palpi and maxillary palpi black; legs black except the tarsi reddish brown. Male genitalia as in Fig. 6A-C.

Material examined. 2 ♀♀, Kangwon-do, Pyeongchang-gun, Mt. Odaesan, 7 July 1998, K. J. Ahn; 1 ♂, Temple Sangwonsa, 22 Aug. 2000, K. J. Ahn.

Distribution. Korea, Japan.

7. *Oxyporus (Oxyporus) rufus osawai* Nakane and Sawada 적갈색입치레반날개 (Fig. 3C)

Staphylinus rufus Linne, 1758, p.422.

Oxyporus rufus osawai Nakane and Sawada, 1956, p.68; Adachi, 1957, p.192; Shibata, 1976, p.177; Kim *et al.*, 1994, p.140.

Diagnosis. Body length 7.0-9.0 mm. Head black; antennae yellow, slightly darkened towards apex; labrum, maxillary palpi, and labial palpi reddish brown; pronotum reddish brown; elytra yellowish red with black apical half; abdominal segment III-VI reddish brown and other segments black (Fig. 3C); legs clear yellow except the posterior coxa black.

Material examined. 1 ♀, Kangwon-do, Injae-gun, Mt. Jumbongsan, 23-30 Aug. 1999, U. S. Hwnag; 1 ♂, Wonju, Mt. Chiaksan, 22 July 2000, W. S. Hwang.

Distribution. Korea, Japan.

8. *Oxyporus (Oxyporus) triangulum* Sharp 짙은점무늬입치레반날개 (신칭) (Fig. 3D, 6D-F)

Oxyporus triangulum Sharp, 1889, p.407; Nakane and Sawada, 1956, p.66; Shibata, 1976, p.179.

Material examined. 2 ♂♂, Kangwon-do, Pyeongchang-gun, Mt. Odaesan, Temple Sangwonsa, 22 Aug. 2000, K. J. Ahn.

Diagnosis. Body length 9.0-11.0 mm. Head, pronotum, and abdomen black; elytra black with brown humeral and sutural margins; antennae black with each pubescent area yellowish brown; labrum brown, maxillary palpi, and labial palpi distinctly black; legs black except the tarsi and claw dark brown. Male genitalia as in Fig. 6D-F.

Distribution. Korea, Japan.

9. *Oxyporus (Pseudoxyporus) longipes* Sharp 버섯입치레반날개

Oxyporus longipes Sharp, 1889, p.409.

Pseudoxyporus Nakane and Sawada, 1956, p.70; Shibata, 1976, p.183.

Material examined. 1 ♀, Kangwon-do, Hongcheon-gun, Mt. Gyeongbongsan, 14 July 1995, H. C. Park.

Diagnosis. Body length 9.0-10.0 mm. Antennae, labrum, maxillary palpi, and labial palpi reddish brown; legs pale red with black femur; head black; pronotum pale red; abdomen III-V pale red, VI-

VIII black; elytra black with reddish brown humeral margins.

Distribution. Korea, Japan.

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한국산 입치레반날개아과 (곤충강, 딱정벌레목, 반날개과)의 분류

황 욱 선 · 안 기 정
(충남대학교 자연과학대학 생물학과)

요 약

한국산 입치레반날개아과의 분류학적 연구를 수행하였다. 조사결과 5종의 미기록종이 밝혀졌다 (*Oxyporus basicornis* Cameron, *O. basiventris* Jarrige, *O. crocatus* Fauvel, *O. niger* Sharp, *O. triangulum* Sharp). 한국산 입치레반날개아과는 총 9종이 되며, 각 종의 외부 형태적 형질과 수컷 생식기 형질을 그림과 함께 보고한다.