

Review of the genus *Eopompilus* Gussakovskij, 1932 (Hymenoptera: Pompilidae) in South Korea

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Species of the genus *Eopompilus* Gussakovskij, 1932 from South Korea are reviewed. Three species are confirmed: *E. internalis*, *E. luteus*, and *E. minor*. *Eopompilus luteus* is recorded for the first time in Korea, and is easily separated from its congeners by markedly extensive coloration and comparatively large body size in both sexes. Females are characterized by yellowish wing, light brown stigma and veins, lacking of subapical or apical dark fascia on forewing. Males are characterized by serrate antenna formed by submesal convex on each flagellomeres 2–11, symmetrical claws of fore tarsus, hypopygium widened basally and forming a rhomboid plate, lacking of dark fasciae in forewing. The specimen identified as *Cryptocheilus nicevilli* Bingham from Korea by Kim (1970) is examined and is reclassified as conspecific with *E. luteus*. A key is presented of the three species complemented by digital images and diagnosis.

Keywords: *Eopompilus luteus*, new record, Pepsinae, Spider wasps, taxonomy

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INTRODUCTION

The genus *Eopompilus* Gussakovskij, 1932 is a small group of the subfamily Pepsinae (Hymenoptera: Pompilidae). Only six species are known from the Eastern Palearctic (i.e. eastern central to northeast China, Russian Far East, Korea, and Japan proper) and Oriental regions (southern China, Taiwan, Laos, Indonesia and India) (Loktionov *et al.*, 2017; Wahis *et al.*, 2018). Korean fauna of the genus has been represented by two species, *E. internalis* and *E. minor* on the basis of just four specimens (Kim, 1970; Lelej *et al.*, 1994).

With more plentiful material, the Korean fauna of this genus is reviewed. Occurrences of these two species are reconfirmed and augmented with detailed localities, and *E. luteus* is recorded from South Korea for the first time. A key is provided of the three species complemented by digital images and diagnosis.

MATERIALS AND METHODS

Terminology of external morphology follows Loktionov *et al.* (2017). Synonym list just includes taxonomic information of original description and related primary synonyms and justifiable records for occurrences in South

Korea. Full historical reviews of all the known species are available in Loktionov and Lelej (2014), Loktionov *et al.* (2017), and Wahis *et al.* (2018).

Specimens used in this study are housed in the author's private collection, and some voucher specimens will be deposited in National Institute of Biological Resources, South Korea.

Provincial names of South Korea abbreviated as follows: GW - Gangwon-do, SL - Seoul, GG - Gyeonggi-do, IMC - Incheon Metropolitan City, CB - Chungcheongbuk-do, CN - Chungcheongnam-do, JB - Jeonlabuk-do, JN - Jeonlanam-do, DMC - Daegu Metropolitan City, GB - Gyeongsangbuk-do, UMC - Ulsan Metropolitan City, GN - Gyeongsangnam-do. Body part abbreviations are as follows: F - flagellomere, T - metasomal tergum, S - metasomal sternum.

SYSTEMATIC ACCOUNTS

Genus *Eopompilus* Gussakovskij, 1932

Eopompilus Gussakovskij, 1932: 34.

Salius Matsumura, 1911: 136. Subsequent misspelling of *Salius* Fabricius, 1804. Unavailable name according to Article 33.3 of the Code (ICZN 1999).

Salius: Matsumura 1912: 188.

Type species. *Eopompilus orientalis* Gussakovskij, 1932

= *Sialus* (!) *internalis* Matsumura, 1911, by original designation.

Diagnosis. Females are easily separated from all the other genera of subfamily Pepsinae by the following combination of characteristics. Hind tibia with a smooth full length furrow along upper margin of brush (Fig. 1A) and covered with short spines somewhat regularly set, some basomedian spines attaching on small scale-like teeth; transverse furrow on S2 weak, often obsolete in its middle; antennae long, F1 5.0–6.3 times as long as broad at apex; claws with a submesal perpendicular additional small tooth; vein 1cu-a of forewing located distally of Media, apart ca. half-length of Media (Fig. 1B); body markings much various, largely black to extensively yellow to brown, but face along inner orbit always with yellow or creamy white stripe.

Males are easily separated from all the other genera of subfamily Pepsinae by having apical margin of S6 with a row of dense short bristles equal in length (Figs. 1C, 2E, 3E) and antennae serrate, each segment of F2–11 strongly convex beneath (Figs. 1F, 2C, 3D). F1 2.3–4.2 times as long as broad; vein 1cu-a of forewing as in female; hind tibia with a smooth furrow as in female (but scale-like tooth absent); tarsal claws usually without additional tooth, but sometimes bifid, with additional inner small tooth; body black to extensively yellow and brown as in females.

Key to the species

1. Females (Metasoma 6-segmented, antennae 12-segmented) 2
 - Males (Metasoma 7-segmented, antennae 13-segmented) 4
2. Body markedly extensive yellow, brownish yellow and ferruginous: entire clypeus, frons except median part, vertex, mesosoma except mesonotum, legs, larger basal parts of metasomal segments yellow; remaining parts largely brownish yellow to ferruginous (Fig. 2A, for more detailed coloration, refer to diagnosis below). Wings yellowish, without subapical fascia in forewing (Fig. 2A); stigma and veins brown *Eopompilus luteus* Lelej
 - Body primarily black, at most inner orbit and (sub)basal parts of T1–3 and S2–3 light yellow, and foreleg and antennae yellowish brown. Forewing hyaline or fuscous, with distinct subapical dark fascia (Figs. 1B, 3A); stigma and veins dark brown to blackish 3
3. Body smaller, 7.5–11.0 mm long. Lateral margin of clypeus concave, forming a broad marginal lamina (Fig. 3B). Wings hyaline. Stripes on inner orbits narrow, narrower than F1 (Fig. 3B) *Eopompilus minor* Gussakovskij
 - Body larger, 13.0–24.0 mm long. Lateral margin of

- clypeus inclined, not distinctly laminate. Wings fuscous. Stripe on inner orbit broader, almost as broad as F1 (Fig. 1E) *Eopompilus internalis* (Matsumura)
- 4. Smaller species, 6.5–8.0 mm in body length. Ventral face of each F2–11 convex sub-basally (Fig. 3D). Apical margin of S6 obtusely notched medially, reversed broad V-shaped (Fig. 3E). Fore tarsal claw asymmetrical, inner claw much longer than outer one. Hypopygium comparatively stumpy, not widened basally (Fig. 3E) *Eopompilus minor* Gussakovskij
- Larger species, more than 10 mm in body length. Ventral face of each F2–11 convex near middle (Figs. 1F, 2C). Apical margin of S6 not distinctly notched medially but very minutely notched to almost straight (Figs. 1C, 2E). Fore tarsal claw symmetrical, inner and outer claws same in length and shape. Hypopygium slenderer in apical half, widened basally (Fig. 1C, white arrow), forming rhomboid expansion (not fully exposed in Fig. 1C and 2E, refer to Figs. 22–24 in Loktionov *et al.*, 2017) 5
- 5. Body markedly extensive yellow to brownish yellow, larger part of pronotum, mesopleuron, propodeum and basal parts of metasomal segments yellow; antennae, except for articulations and upper part of last four segments, brownish yellow (Fig. 2D). Forewing without dark fascia *Eopompilus luteus* Lelej
- Body primarily black, only frons, clypeus, mandible, fore coxa and outer side of fore tibia, small basal spots on metasomal segment 2–3 yellow (Fig. 1G). Forewing subapically with dark fascia *Eopompilus internalis* (Matsumura)

Annotated list of the species

***Eopompilus internalis* (Matsumura, 1911)**

Sialus (!) *internalis* Matsumura, 1911: 136, pl. 41, fig. 7, ♀ (syntypes), Japan: Honshu: Tokyo, Nakano [Hokkaido Univ., Japan].

Sialus (!) *bizonatus* Matsumura, 1912: 189, pl. 53, fig. 19, ♀ (syntypes), ♀, Japan: Honshu: Tokyo [Hokkaido Univ., Japan]. Junior subjective synonym of *Eopompilus internalis* (Matsumura, 1911) according to Ishikawa, 1962: 334.

Eopompilus orientalis Gussakovskij, 1932: 36, ♀ (lectotype, designated by Loktionov *et al.*, 2017: 415), Russia: Primorskii Terr.: Vladivostok, Sedanka [Zoological Institute, St. Petersburg, Russia]. Junior subjective synonym of *Eopompilus internalis* (Matsumura, 1911) according to Ishikawa, 1962: 334.

Eopompilus internalis (Matsumura, 1911): Ishikawa, 1962: 334, ♀, ♂; Lelej *et al.*, 1994: 138 (♀, GG: Gwangleung; ♂, GW: Panbumyeon).

Priocnemis bizonatus Matsumura: Kim, 1970: 566, pl. 55 fig. 66 (♀, GB: Mt. Gayasan), 806.

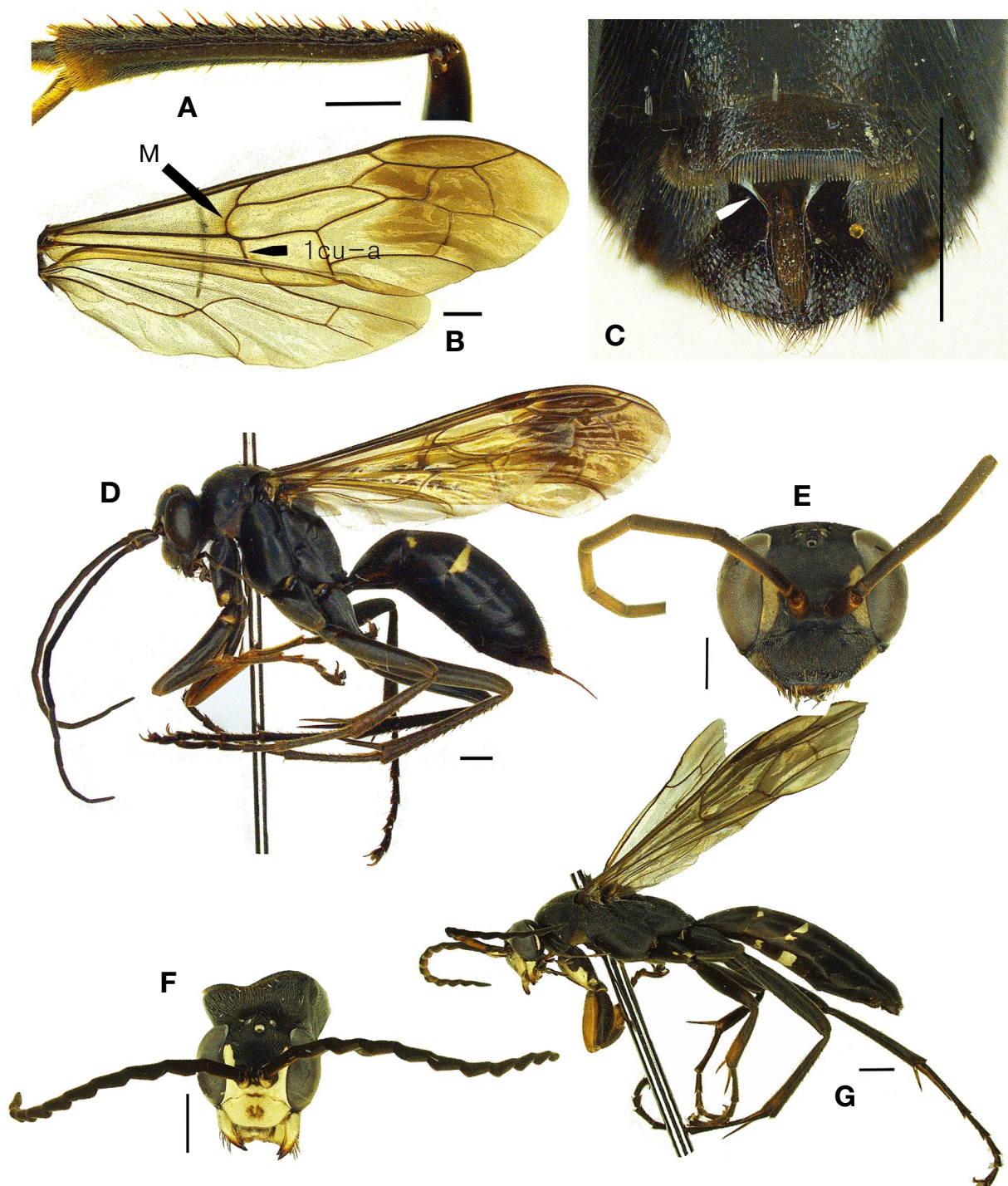


Fig. 1. *Eopompilus internalis*. A, Hind tibia, ♀. B, Wings, ♀. C, S5-6 and apical portion of hypopygium, ♂. D, Habitus in profile, ♀. E, Head in full frontal view, ♀. F, Head in full frontal view, ♂. G, Habitus in profile, ♂. Scale bars: 1 mm.

Poecilopompilus bioculata Bingham: Kim, 1970: 565, 807.

Diagnosis. Having large body, body length 13.0–24.0 mm in females and 10.0–16.5 mm in males.

In females, body mostly black, only lower two-thirds of face along inner orbit and basolateral spots or linear stripes on T2–3, S2–3 (sometimes also mid lateral roundish spots on T1) light yellow, inner sides of foreleg (except for coxa and trochanter) yellow. F1 long and slender, 5.3–

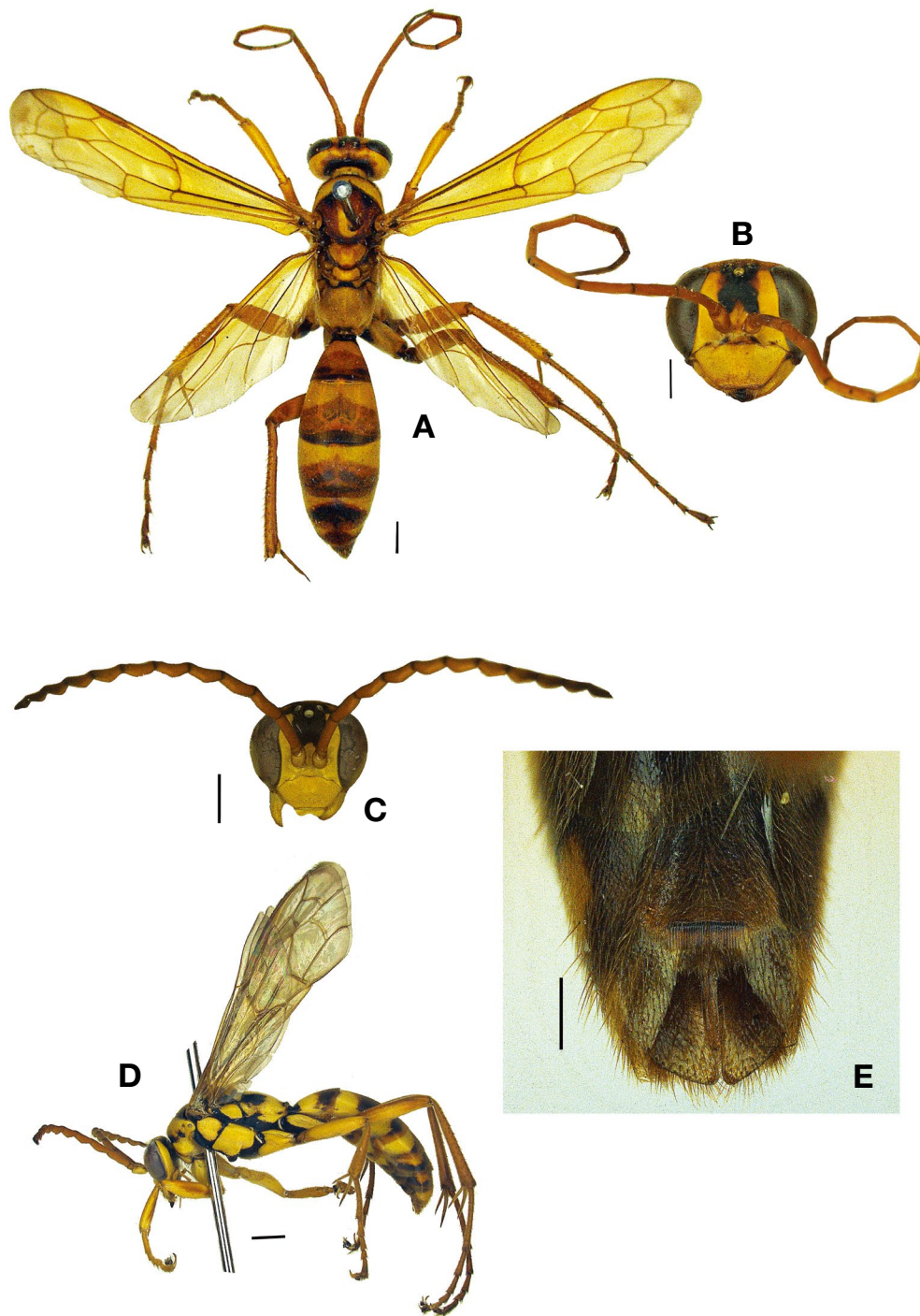


Fig. 2. *Eopompilus luteus*. A, Habitus in dorsal view, ♀. B, Head in full frontal view, ♀. C, Head in full frontal view, ♂. D, Habitus in profile, ♂. E, S6 and apical portion of hypopygium, ♂. Scale bars: 1 mm.

5.8 times as long as broad. Fore tarsal claw with a sub-mesal (before midpoint of claw, termed as ‘subbasal’ in Loktionov *et al.*, 2017) perpendicular tooth. Apical dark fascia of forewing distinct from marginal, second and third submarginal and apical half of second discoidal cells

to wing apex.

In males, F1 3.6–4.0 times as long as broad at apex. Posterolateral corners of S6 and S7 strongly produced. Forewing as in females, but sometimes less fuscous. Body mostly black, lower frons along inner orbit, supraclypeal

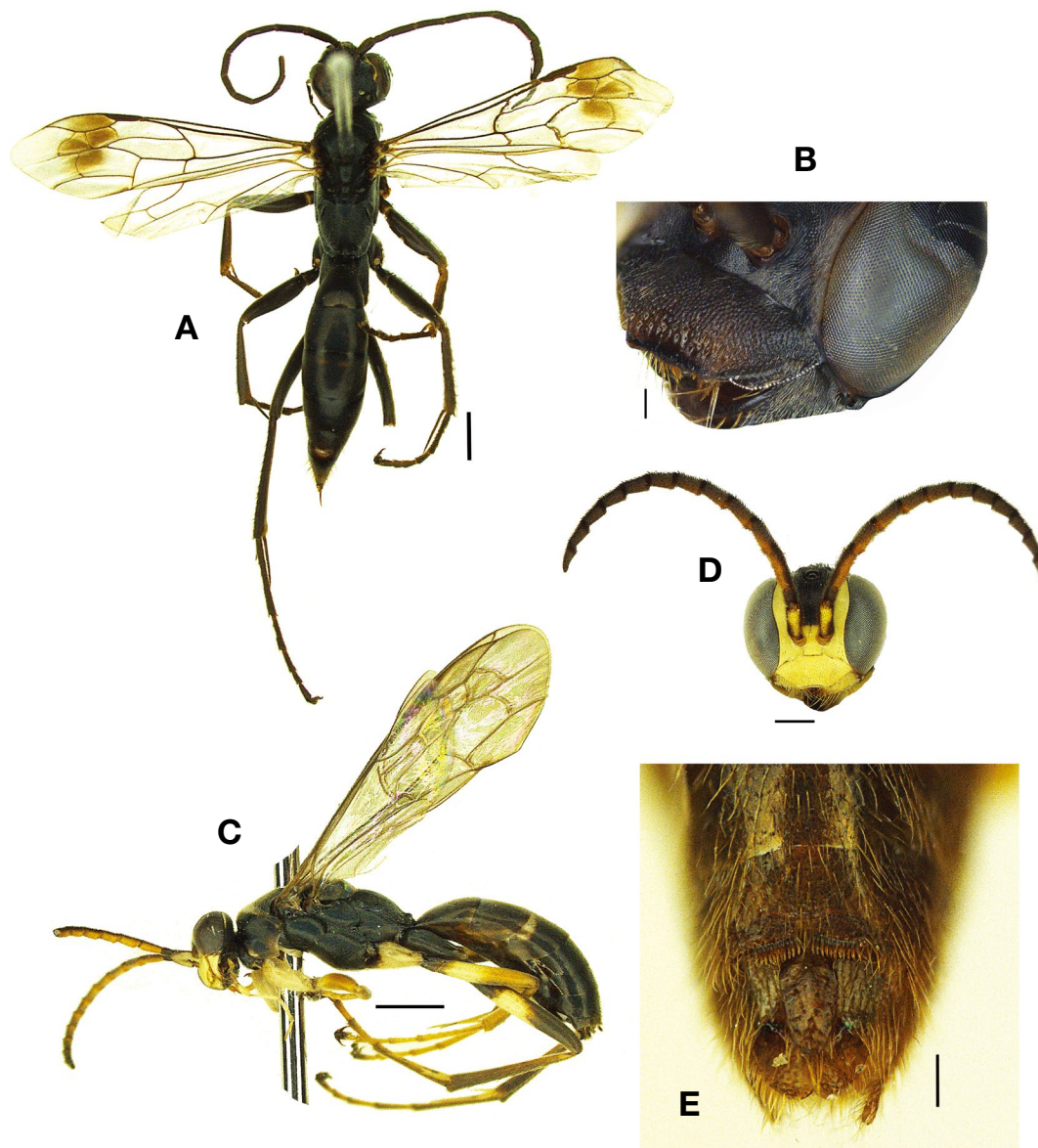


Fig. 3. *Eopompilus minor*. A, Habitus in dorsal view, ♀. B, Head in laterodorsal view, showing broad lamina on lateral margin of clypeus, ♀. C, Habitus in profile, ♂. D, Head in full frontal view, ♂. E, S5-6 and apical portion of hypopygium, ♂. Scale bars: 1 mm (A, C, D), 0.5 mm (B, E).

area, clypeus (sometimes darkened medially), basal half of mandible, genal stripe along outer orbit, inner side of fore coxa, basal paired spots and stripes of T1-3 and basal stripes of S2-3 light yellow, lower faces of F1-8 and inner side of foreleg yellowish brown.

Material examined. South Korea. [GW] ♀, Cheongpyeongsa, Chuncheon-si, 1986.viii.9, YJ Park; ♀, Osaek, Seorak Nat'l Park, 2000.vii.29, JD Yeo; ♀, Jindong-ri, Girin-myeon, Inje-gun (N38°02'65.58" E128°27'18.68"), 2017.vi.22-vii.20, OC Kwon (Malaise trap); ♀, Mt Gariwangsan, Jeongseon-eup, Jeongseon-gun (N37°25'12" E128°32'18"), 2011.vii.6, HS Lee; ♀, Nature Environ-

mental Research Park, Bukbang-myeon, Hongcheon-gun, 2011.ix.4, JK Kim; ♀, ditto, 2011.ix.19, JK Kim; [GG] ♂, Mt. Yongmun-san, Yangpyeong-gun, 1980.ix.1, HG Park; ♀, Namhansan-seong, Hanam-si, 1993.viii.7, YE Lee; ♀, Baekma, Gwangmyeong, 1994.ix.24, JY Im; ♀, Mt Baekunsan, Pocheon-gun, 1997.viii.27, JD Yeo; ♂, Gapyeong-eup, Gapyeong-gun, 2009.ix.2, JK Kim; ♀, Haegok-dong, Cheoin-gu, Yongin-si, 2011.vii.5, JK Kim; ♂, Angol, Mt. Sapaesan, Euijeongbu-si (N37°43'41" E127°00'25"), 2010.vi.6-ix.6, JK Kim (Malaise trap); [IMC] ♂, Is. Muui, Muui-dong, Junggu, 2017.vi.22-vii.6 (N37°23'46.09" E126°24'36.38"),

OC Kwon (Malaise trap); ♂, ditto, 2017.vii.6–20, OC Kwon (Malaise trap); [CB] ♀, Mt. Seondalsan, Namdae-ri, Chungju-si, 1998.vi.30, JK Kim; ♂, Sokrisan-ri, Sokrisan-myeon, Boeun-gun (N36°30'54.14" E 127°48'33.13"), 2018.vi.25–vii.9, SW Yang (Malaise trap); [CN] ♀, Mt. Gayasan, Daegok-ri, Haemi-myeon, Seosan-si (N36°41'24" E126°34'18"), 2011.vi.21–vii.27, JK Kim (Malaise trap); ♀, Sangga-ri, Deoksan-myeon, Yesan-gun, 2011.vii.17, JK Kim; ♀, Naeri, Iwon-myeon, Taean-gun, 2014.vii.16, JK Kim; ♀, Hwanglyong-ri, Cheongna-myeon, Boryeong-si (N36°26'30.75" E 126°39'33.15"), 2017.vi.22–vii.6, OC Kwon (Malaise trap); [GB] Yongheungsa, Mt Gapjongsan, Sangju-si, 2000.vii.16, SJ Lee (Light trap); [GN] ♀, Mt Baekunsan, Hamyang-gun, 1985.vii.26, DS Gu; ♀, Danjibong, Jungchon-ri, Gabuk-myeon, Geochang-gun, 2000.viii.22, JH Son; ♂, Mt. Geumosan, Goryong-ri, Jingyo-myeon, Hadong-gun, 2004.vii.20, JS Park (Light trap); ♀, Nabisaengtaegongweon, Bonghwa-ri, Samdong-myeon, Nasmhae-gun, 2011.vi.29–vii.12, JK Kim (Malaise trap); 2♂♂, Dodeok-ri, Angye-myeon, Uiseong-gun (N36°25'49.02" E128°27'35.70"), 2017.vi.21–vii.5, JK Kim (Malaise trap); [UMC] ♂, Ijeon-ri, Sangbuk-myeon, Ulju-gun, 1987.vii.30, collector not written; ♀, Goheonsa, Mt. Goheonsan, Sangbuk-myeon, Ulju-gun, 2001.vii.24, JS Shin (Light trap); [JN] ♂, Weolseonggyegok, Mt. Deokyusan, Seolcheon-myeon, Muju-gun, 2012.vi.13, JK Kim; 3♂♂, Oryang-ri, Sasdeung-myeon, Geje-si (N34°52'50.67" E128°30'30.48"), 2017.vi.20–vii.4, OC Kwon (Malaise trap); 3♂♂, ditto, 2017.vii.4–18, OC Kwon (Malaise trap); ♀, ditto, 2017.viii.1–15, OC Kwon (Malaise trap); 5♂♂, Seokhyeon-dong, Suncheon-si (N34°58'47.01" E127°27'40.56"), 2017.vi.20–vii.3, OC Kwon (Malaise trap); ♂, Ondang-ri, Gwangui-myeon, Gurye-gun (N36°17'08.87" E127°27'08.72"), 2017.vi.12–17, OC Kwon (Malaise trap).

Distribution. Russian Far East: Amur Prov., Khabarovsk Terr., Primorskii Terr., Sakhalin, Kurils; South Korea (GW, GG, IMC, CB, CN, GB, GN, UMC, JN); Japan (from Hokkaido in the north to Tanegashima and Kuroshima in the south).

Eopompilus luteus Lelej, 1986

Eopompilus luteus Lelej, 1986: 80, 81, ♂ (holotype), Russia: Primorskii Terr., Khasan District, Andreevka [Zoological Institute, St. Petersburg, Russia].
Cryptocheilus nicevilli Bingham: Kim, 1970: 557, pl. 53, fig. 638 (♀, GG: Gwangleung), 806.

Diagnosis. Large-sized species, body length 15.0–20.0 mm in females, ca. 14 mm in males. In both sexes, almost entire body yellow and yellowish brown to ferruginous. In females, following parts darkened to black: median large quadrat of frons, ocellar region, medioapical

part of vertex, anterior slope of pronotum, mesonotum except for a yellow broad median longitudinal mark, inner side of mesopleuron and middle parts of T1–4. Antennae, larger part of hind leg and apical part of metasoma yellowish brown to ferruginous. Lateral margin of clypeus somewhat concave, forming narrow lamina (narrower than that of *E. minor*). F1 5.8–6.3 times as long as broad. Fore tarsal claw with a submesal (before midpoint of claw) perpendicular tooth.

Male also very extensively marked, but black area more enlarged than in female, especially in metasoma. F1 4.0–4.2 times as long as broad. Posterolateral production of S6 weak, S7 without production.

Material examined. South Korea. [SL] ♀, Mt. Dobongsan, Dobong-gu, 1992.viii.12, SA Choi; ♀, ditto, 1992.viii.2, SH Lee; ♀, Mt. Bukhansan, 1992.viii.30, HG An; [GG] ♀, Dandae1-dong, Seongnam-si, 1988.ix.8, SJ Jeon; ♀, Ildong-myeon, Pocheon-si, 1996 Sep 30, Ha SB; ♂, Onsu-ri, Gilsang-myeon, Ganghwa-gun, 2019.vi.29–vii.18, MK Paik (Malaise trap); [GN] ♀, Mt. Mangunsan, Namsang-ri, Seo-myeon, Namhae-gun, 1998.ix.18, JS Park (Light trap); [DMC] ♂, Jinbatgil, Suseong-gu (N35°47'56.21" E128°40'27.81"), 2018.vii.9–20, S-h Oh (Malaise trap).

Distribution. China: Heilongjiang, Ningxia, Hebei, Henan; Russian Far East: Primorskii Terr.; South Korea (new record): SL, GG, DMC, GN.

Remarks. The specimen identified as *Cryptocheilus nicevilli* in Kim (1970) was examined. It is undoubtedly conspecific with this species.

Eopompilus minor Gussakovskij, 1932

Eopompilus minor Gussakovskij, 1932: 36, ♀ (holotype) "Sedanka" [Russia: Primorskii Terr.: environs of Vladivostok], [Swedish Museum of Natural History, Stockholm, Sweden]; Lelej *et al.*, 1994: 138 (♀, Korea: GG: Gwangleung).

Eopompilus minor itoi Ishikawa, 1965: 511, ♀ (holotype), Taiwan: Nantou Hsien: Sungkang, 2000 m to Tsifeng [National Science Museum, Tokyo, Japan]. Synonymized by Loktionov *et al.* (2017).

Diagnosis. In both sexes, body primarily black. In females, narrow stripe along inner orbit, apical marginal part of clypeus, inner side of foreleg partially and stripes on T1–2 light yellow to yellow. F1 5.2–5.9 times as long as broad. Fore tarsal claw with a submesal (beyond midpoint of claw, termed as 'subapical' in Loktionov *et al.*, 2017) perpendicular tooth.

In males, inner orbit, supraclypeal area, clypeus, labrum, palpal segments, mandible except for apical part, genal stripe along outer orbit, anterior lower part of lateral face of pronotum, transverse stripe before transparent apical lamina of pronotal dorsum, fore and mid

coxae light yellow, and paired spots or stripes on T3 basally; under side of antennal flagellomeres and fore and mid legs largely yellowish brown. Transparent apical lamina of pronotum broad, longer than anterior ocellus. Fl 2.4–2.8 as long as broad. Posterolateral production of S6 weak, S7 without production.

Material examined. South Korea. [GW] 2♀♀, ♂, Misiryong, Seoraksan Nat'l Park, Buk-myeon, Inje-gun (N38°12'48" E126°26'16"), 2010.v.10–24, JK Kim; ♀, Samhwa-ri, Hanam-myeon, Hwacheon-gun (N38°03'35.76" E127°43'46.53"), 2018.ix.5–19, SW Yang; ♀, ditto, 2018.ix.19–x.2, SW Yang (Malaise trap); [SL] ♀, Jeongleunggyegok, Bukhansan Nat'l Park (N37°37'19" E126°59'34"), 2010.vi.1–ix.7, JK Kim (Malaise trap); ♀, Mt. Umyeonsan, Umyeon-dong, Seocho-gu, 2012.ix.12, Kim JK; [GG] ♀, Chiljang-ri, Juksan-myeon, Anseong-si, 2011.vii.6, JK Kim; ♀, Nampungri, Bogae-myeon, Anseong-si, 2011.vii.6, JK Kim; ♂, Gwaneumri, Toechon-myeon, Gwangju-si, (N37°26'43.60" E127°19'55.26"), 2017.vi.21–vii.21, OC Kwon (Malaise trap); ♀, ditto, vii.6–19, OC Kwon (Malaise trap); ♀, Yagam-ri, Daegot-myeon, Gimpo-si (N37°37'50.7" E126°33'25.4"), 2019.vi.29–vii.18, MK Paik (Malaise trap); [IMC] ♀, Geumgok-dong, Seo-gu (N37°37'42.6" E126°38'36.6"), 2019.vi.27–vii.18, MK Paik (Malaise trap); [CB] Beopjusa, Mt. Sokrisan, Boeun-gun, 2011.viii.5–31, JK Kim (Malaise trap); [CN] ♂, Daejeon Univ., Yongeun-dong, Dong-gu, Daejeon-si, 2006.vi.1–15, JK Kim (Malaise trap); ♀, Geumhak-ri, Palbong-myeon, Seosan-si, 2009.ix.26, JK Kim; 2♀♀, Mt. Gayasan, Daegok-ri, Haemi-myeon, Seosan-si (N36°41'24" E126°34'18"), 2009.ix.17–27, JK Kim (Malaise trap); ♀, ditto, 2011.viii.8–ix.5, JK Kim (Malaise trap); ditto, 2011.ix.29–x.10; ♀, ♂, Hwangnyongri, Cheongna-myeon, Boryeong-si (N36°26'30.75" E126°39'33.15"), 2017.vi.22–vii.6, JK Kim (Malaise trap); ♀, ditto, vii.6–viii.20, OC Kwon (Malaise trap); ♀, ditto, vii.30–viii.3, OC Kwon (Malaise trap); [GB] ♀, Edennongjang, Mt. Gayasan, Bongam-ri, Suryun-myeon, Sangju-gun, 2009.ix.29, JS Park (Light trap); 4♀♀, San 141-4, Chisan-ri, Sinnyeong-myeon, Yeongcheon-si (N36°01'12.55" E128°42'26.29"), 2012.vi.12–vii.14, JW Lee (Malaise trap); ♀, Dodeok-ri, Angye-myeon, Uiseong-gun (N36°25'49.02" E128°27'35.70"), 2017.vi.1–vii.5, JK Kim (Malaise trap); [DMC] ♂, San 7, Sinmu-dong (N36°00'5.18" E128°40'54.712"), 2014.vi.11–vii.14, JW Lee (Malaise trap); ♀, Jinbatgil, Suseong-gu (N35°47'56.21" E128°40'27.81"), 2018.vii.9–20, Oh S-h (Malaise trap); [GN] ♀, Danjibong, Jungchon-ri, Gabuk-myeon, Geochang-gun, 2000.vi.30, TH An (Light trap); ♀, Mt Gajisan, Ijin-ri, Sangbuk-myeon, Ulju-gun, 1990.vii.1, JH Lim; [UMC] 3♂♂, Ulsan Gran Park, Daegongweon-ro 94, Nam-gu, 2017.vii.4, JK Kim; [JB] Songgye-ri, Muchang-myeon, Gochang-gun (N 37.93819444 E127.9496389), 2020.vii.15, KS Oh; [JN] ♀,

Weolseonggyegok, Mt. Deokyusan, Seolcheon-myeon, Muju-gun, 2012.vi.13, JK Kim; ♂, Ondang-ri, Gwan-gui-myeon, Gurye-gun (N35°17'08.87" E127°27'08.72"), 2017.vi.17–30, OC Kwon; ♀, Oryang-ri, Sadeung-myeon, Geoje-si (N34°52'50.67" E128°30'30.48"), 2017.vi.20–vii.4, OC Kwon (Malaise trap); ♀, ♂, Seokhyeon-dong, Suncheon-si (N34°58'47.01" E127°27'40.56"), 2017.vii.4–vii.18, OC Kwon (Malaise trap); ♀, ditto, 2017.viii.15–28.

Distribution. Russian Far East: Primorskii Terr., Sakhalin, Kurils; China: Heilongjiang, Hebei, Ningxia, Henan; Taiwan; South Korea: GW, SL, GG, IMC, CB, CN, GB, DMA, GN, JB, JN; Japan: Hokkaido in the north to Yakushima in the south.

Remarks. Lelej *et al.* (1994) commented that the basal light spot on T2–3 in a male was unusual. However, all the specimens examined herein have basal paired spots or stripe on T3 and also sometimes spots on T2.

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