

First Record of the Genus *Elampus* (Hymenoptera: Chrysoidea: Chrysididae) from Korea, with a Key and Checklist of Current Valid Species of Korean Chrysididae

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ABSTRACT

Elampus bidens (Förster) is reported from Korea. The genus and species are new to Korea. This species is easily distinguished by a pair of processes on apical margin of metasomal tergum III. A checklist of the 45 current valid Korean species placed in the family Chrysididae is presented. A key to subfamilies, tribes, genera of Korean Chrysididae is also provided.

Key words: *Elampus bidens*, Checklist, Chrysididae, Korea

INTRODUCTION

Recently in the course of examining Korean aculeate, we found a species, *Elampus bidens* (Förster) placed in the family Chrysididae. So far this genus and species have been unknown in Korea. Chrysididae is the most speciose in the superfamily Chrysoidea, and comprise about 3,000 extant species from almost all the zoogeographic regions (Kimsey and Bohart, 1990; Finnamore and Brother, 1993). All the members of Chrysididae are notable in their metallic luster cuticle. And they are distinguished by the following combination of characteristics: pronotum in dorsal view being shaped like truncated pyramid and measured along median as long as or longer than scutum, metasomal segment I in dorsal view conical or bell-shaped without angular anterolateral corners, and metasoma with three to five visible terga.

Chrysididae is solitary wasps, and exhibits diverse foraging habits. It is brood parasites, ectoparasitoids and endoparasitoids, including the only egg parasitoids among the aculeate Hymenoptera (O'Neill, 2001).

Among the aculeate, the superfamily Chrysoidea containing Plumariidae, Bethyidae, Chrysididae, Sclerogibbidae, Embolemidae, Scolebythidae and Dryinidae is the least known (Carpenter, 1999). Such is also the case for Korean fauna: at most pioneer works on Chrysididae provided by Tsuneki (1953a, b, 1959) and Kim (1970) are available. Furthermore, the species contained in these works were partial-

ly for Korean fauna, and some taxonomic conclusions are outdated. Thus revisional research on Chrysididae which might be also the most speciose of Korean Chrysoidea will furnish a key for the solution of biodiversity evaluation on Korean Chrysoidea.

In this study, we report an occurrence of *Elampus bidens* (Förster) for the first time in Korea, and of which diagnosis, description, distribution and photo images are presented. And for future researchers, we also provide a key to subfamilies, tribes, genera of Korean Chrysididae, and a revised checklist of Korean species of Chrysididae to which 45 current valid species belong.

MATERIALS AND METHODS

Morphological terminology used in the description of *E. bidens* and key follows Kimsey and Bohart (1990). All measurements were taken as the maximal length of the part being taken under a stereomicroscope. Body length was measured from the anterior margin of head to the posterior end of metasoma.

The checklist was compiled from literature. Although several species were represented by subspecies in Korea, we list the subspecies under synonymy of each species following the interpretation of Kimsey and Bohart (1990). The enumeration of higher taxa over tribes is the same as the appearance order in the key, and the species is alphabetically ordered in each higher taxon, including original citation, relevant literature for Korean fauna, synonyms and distribution.

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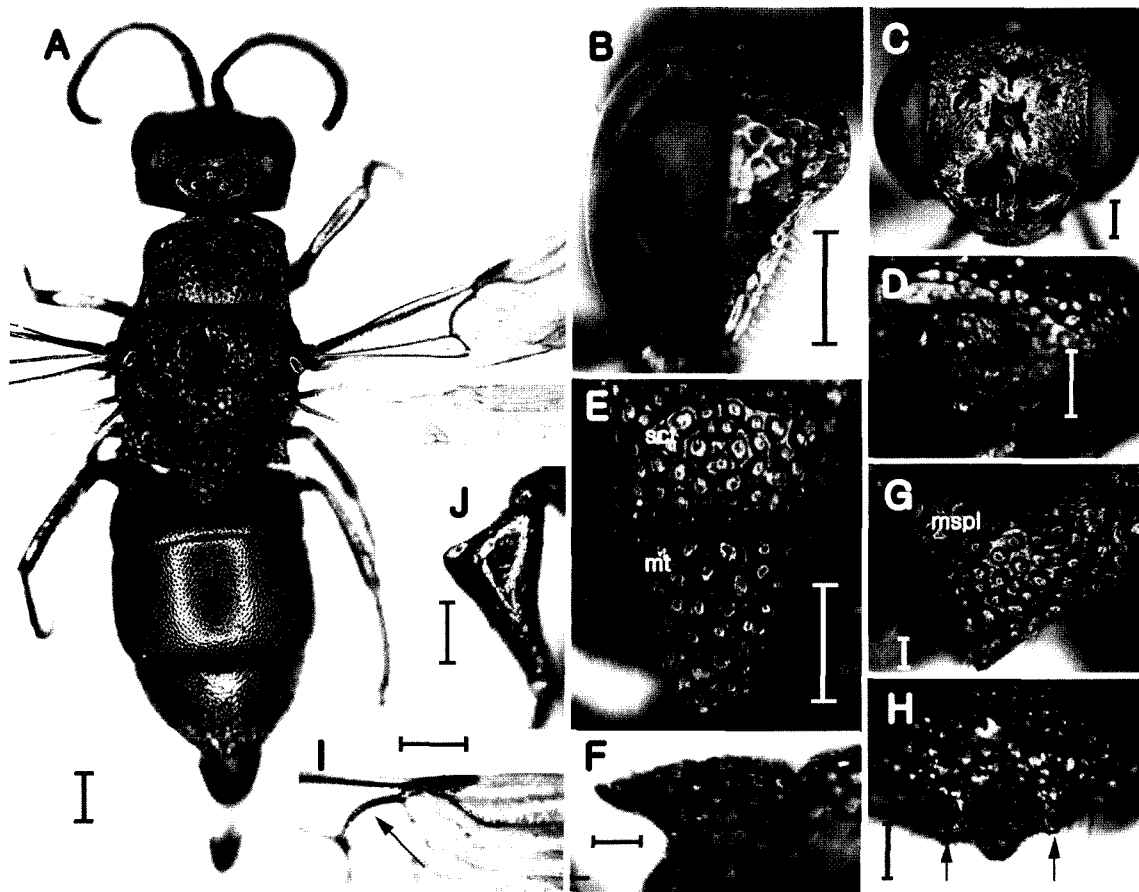


Fig. 1. *Elampus bidens*, ♀. A, General habitus; B, Head, profile, showing produced gena, and setae in lower part of gena; C, Head showing scapal basin flat; D, Lateral face of pronotum showing a deeply excavated fovea; E, Scutellum (sct) and mucronate metanotum (mt); F, metanotum, profile; G, Mesopleuron (mspl) showing strongly projecting downward and acutely convergent; H, Metasomal tergum III with a pair of apical submedial teeth; I, Medial vein of fore wing showing strongly arched; J, Fore femur showing strongly elbowed. Scale bars=0.5 mm (A-J).

RESULTS

Systematic accounts of *Elampus bidens* (Förster)

¹**Elampus bidens* (Förster) (Fig. 1)

Notozus bidens Förster, 1853: 335, ♀, Silesia, Poland (Zoologisches Museum der Humboldt-Universität, Berlin)

Diagnosis. The genus *Elampus* is the most closely related to the genus *Omalus* not occurred in Korea and excluded in the key given below. However in the latter, scapal basin usually deeply concave, metanotum rounded (not mucronate) and metasoma tergum III lacking membrane filled snout-like structure (Kimsey and Bohart, 1990). This species, *E. bidens*, is easily distinguished by a pair of apical processes

in tergum III (Fig. 1H, arrows). Of the members of Chrysidinae, this character is unique.

Description. Female. Body length 7.8 mm (Fig. 1A). Upper half of gena widely produced; gena in its lower half with a row of short and erect setae of uniform length (Fig. 1B). Scapal basin flat (Fig. 1C). Malar space half as long as diameter of middle ocellus. Antennal segment III about four times as long as broad, and segment IV about two times as long as broad. Almost entire lateral part of pronotum deeply excavated, forming a large fossa (Fig. 1D). Pronotum and scutum with dense and regularly set punctures which are almost touching one another except for dorsomedian parts (where the punctures sparser, not touching). Mesopleuron strongly project downward, its lower margin acutely convergent (Fig. 1G). Omalus and scrobal carina forming sharp ventral angle. Metanotum with large flat medial projection or

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muco (Figs. 1E, F); metanotum longer than 1.6 times as long as scutellum. Scutellum and metanotum reticulate. Metasoma with three segments; tergum III with apical membrane filled snout-like structure, and apex bent downward forming two submedial teeth (Fig. 1H, arrows). Wings as in Fig. 1A and I: medial vein of fore wing strongly arched (Fig. 1I, arrow), and arising at cu-a. Fore femur strongly elbowed with ventral carina, and subbasally angulate (Fig. 1J). Tarsal claws with five subsidiary teeth.

Entire body covered with sparse whitish hairs.

Larger part of body with metallic shine color: face shine greenish gold with partial violet; vertex dark blue with partial violet; clypeus largely greenish gold and median part of apical margin shine reddish brown to blackish; mandible tricolored, basal one-third shine greenish gold with partial reddish brown, middle part light brown, and apical one-third maroon; scape shine greenish gold; flagellum black; posterior part of vertex black; pronotum and scutum bluish green except for black in dorsomedian part; scutellum black; entire metasoma shine greenish gold except for black in posterior margin of tergum III; femora and tibiae of all legs shine greenish gold; tarsi of all legs brown.

Male unexamined in this study

Specimens examined. 1 ♀, Chungcheongbuk-do, Chungju-si, Noeun-myeon, Neungam-ri, 25.vii.2006 (J.K. Kim); 1 ♀, Chungcheongbuk-do, Chungju-si, Angseong-myeon, Bongpyeong-ri, 22.vii.2007 (S.B. Ha).

Distribution. Southern Europe, through Siberia to Korea (new record) and Japan.

Key to Korean subfamilies, tribes and genera of Chrysididae

(Modified from Kimsey and Bohart, 1990)

1. Metasoma with five external segments in males, and four in females; sternum strongly convex. Propodeum generally box-like in profile, with some horizontal dorsal face. Head above antennal sockets convex, without indication of scapal basin; basal margin of clypeus deeply emarginated below each antennal sockets and with a protruding medial truncation. Pronotum narrowed submedially, bisected by transverse groove...[**Subfamily Cleptinae**] ...Tarsal claw with a small perpendicular medial tooth. Pronotum simple medially or rarely with shallow medial groove joining groove or depression along posterior margin. Eyes generally small. Malar space 1.5 times as long as middle ocellus diameter (MOD) or more. Genus *Cleptes*
 - Metasoma with four or fewer segments in males and three or fewer in females; sternum strongly concave or flat. Propodeum abruptly declivitous posteriorly, short and

somewhat wedge shaped, without dorsal surface. Head above antennal sockets flat, with some indication of scapal basin. Pronotum not narrowed, without depression along posterior margin.

.....[**Subfamily Chrysidinae**] 2

2. Tegula large, covering both wing bases. Last metasomal tergum with two subapical foveae, and apically thickened with numerous small irregular teeth or denticles..... [Tribe **Parnopini**].....Maxillary palpus with three or fewer segments; labial palpus with one segment or absent. Metanotal projection large and mucronate in profile, and its apical margin truncate, bilobate or irregularly trilobate. Fore femur without sharp ventral tooth. Propodeal angle not deeply emarginated posteriorly.

..... Genus *Parnopes*

- Tegula normal in size, only covering fore wing base. Last metasomal tergum without two subapical foveae, at most slightly thickened apically, apical rim simple, dentate, denticulate, serrate, or medially notched. 3

3. Metasomal tergum III with subapical pit row (sometimes faint). Tarsal claws edentate. Occiput with transverse welt or carina foramen, often ending in a hook (rarely absent). Mesopleuron with scrobal sulcus horizontal (rarely absent). [Tribe **Chrysidini**] ... 4

- Tergum III without pit row and tarsal claws dentate (rarely edentate). Occiput without welt, carina, or hook. Mesopleuron with scrobal sulcus oblique.

..... [Tribe **Elampini**] ... 8

4. Rs with apex of sclerotized part at least three MOD from anterior wing margin; discoidal cell complete and its veins well sclerotized. Apical rim of tergum III not tridentate. Metanotum with a large cup-like posterior projection. Head unusually long and narrow. Mesopleuron with three teeth or knobs below scrobal sulcus.

..... Genus *Stilbum*

- Rs with apex of sclerotized part at most two MOD from anterior wing margin; or if not, discoidal cell incomplete with one or both of its outer vein not entirely sclerotized; or (rarely exception) apical rim of tergum III tridentate. Metanotum without posterior projection. Head broader than long. Mesopleuron without teeth or knobs below scrobal sulcus. Propodeal angle usually triangular; if strongly narrowed basally, apical rim of tergum III with four or more apical teeth; apical rim of tergum III various. 5

5. Apical rim of tergum III with three teeth and medial tooth sharp.

[Face deeply concave beneath bulging brow. Pronotum often with a partial or complete sublateral carina. Rs with apex of sclerotized part at or near anterior wing margin. Mesopleuron edentate. Scutum not unusually expand

- laterally]. Genus *Trichrysis*
- Apical rim of tergum III without teeth or one to two, four or more teeth, sometimes broadly rounded medially. 6
 - 6. Apical rim of tergum III with five distinct teeth. [First flagellomere less than 3 times as long as broad. Clypeus not broader least interocular distance (LID). Sides of face under eyes in front view converging below]. Genus *Praestochrysis*
 - Apical rim of tergum III without, or one, or four, or six, or more teeth; if five teeth, middle one extremely small. 7 - 7. Apical rim of tergum III edentate or rarely with a weak lateral angle. Frons without transverse frontal carina (TFC) Genus *Chrysura*
 - Apical rim of tergum III with 4-6 teeth. Frons usually with a single TFC or none. Genus *Chrysis* - 8. Tarsal claw with single, perpendicular, submedial tooth. Face flat or slightly concave with at least a narrow zone of fine cross-ridging in scapal basin. Medial vein of fore wing straight to strongly arched, arising at cu-a. Genus *Hedychridium*
 - Tarsal claw with one subparallel subsidiary tooth, or two or more subsidiary teeth. Face various; scapal basin either smooth and impunctate, or with at least narrow zone of cross-ridging, without appressed silver setae. Medial vein of fore wing usually arising before or after cu-a. 9 - 9. Head with sharp tubercle at base of oral fossa. Medial vein of fore wing straight or gently curved medially. Hind tarsal claw with single subsidiary tooth (except some males). [Hind femur of male enlarged and non-metallic black or brown. Sternum III of female with transverse sub basal sulci and often apicomедial lobe or tooth; mid and hind tibiae of female usually with pits on inner surfaces]. Genus *Hedychrum*
 - Head without sharp tubercle at base of oral fossa. Medial vein of fore wing strongly arched medially and medial cell asetose. Hind tarsal claw usually with two or more subsidiary teeth. 10 - 10. Metanotum mucronate and flat dorsally. Scutum coarsely and regularly punctate, often reticulate. Tergum III with apical membrane filled snout-like structure. Scapal basin flat or shallowly concave, often with U-shaped cross-ridges or wrinkles. Female gena with row of erect, even setae. Genus *Elampus*
 - Metanotum rounded or projecting, rarely mucronate. Scutum with large punctures clumped in its posterior

- half. Tergum III usually without apical snout-like structure. Scutal punctures usually sparse and clumped along or between notauli, or entirely absent. Scapal basin usually deeply concave and smooth. Female gena without row of setae. 11
- 11. Scutum with large punctures clumped along notauli, or rarely irregularly scattered. Malar space not bisected by genal carina. Genus *Philoctetes*

 - Scutum with large punctures clumped posteriorly between notauli. Malar space bisected horizontally by genal carina. Genus *Pseudomalus*

Checklist of Korean species of Chrysididae

¹*Family Chrysididae

²*Subfamily Cleptinae

³*Genus *Cleptes* Latreille

⁴****Cleptes doii* Tsuneki**

Cleptes doii Tsuneki, 1959: 5-6 (in key), 7, ♀, “Nanzan [Mt. Namsan]”, Seoul, Korea (Ministry of Agriculture and Forestry Technical Services, Tsukuba); Kim, 1970: 505; Kimsey and Bohart, 1990: 60 (listed).

Distribution. Korea, Japan.

⁵****Cleptes galloisi* Uchida**

Cleptes galloisi Uchida, 1926: 183, ♀, Japan (type depository uncertain); Tsuneki, 1959: 5 (in key), 12; Kimsey and Bohart, 1990: 60 (listed).

Distribution. Korea, Japan.

⁶****Cleptes nitidulus* (Fabricius)**

Ichneumon nitidulus Fabricius, 1793: 184, ♀, Italy (?Museum Nation d’Histoire Naturelle, Paris).

Cleptes femoralis Mocsáry, 1890: 47, ♂, Brussa, Turkey (Hungarian Natural History Museum, Budapest); Kim, 1970: 507.

Cleptes nitidulus (Fabricius): Kimsey and Bohart, 1990: 62 (listed).

Distribution. Europe to North East China, Korea and Japan.

⁷****Cleptes semiauratus* (Linnaeus)**

Sphex semiauratus Linnaeus, 1761: 413, ♀ (lectotype designated by Kimsey in Kimsey and Bohart 1990), Paris (Museum Nation d’Histoire Naturelle, Paris).

Cleptes semiauratus (Linnaeus): Kim, 1970: 506 (listed); Kimsey and Bohart, 1990: 63 (listed).

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Distribution. Europe to Far Eastern Russia and North Korea.

¹**Cleptes seoulensis* Tsuneki

Cleptes seoulensis Tsuneki, 1959: 6 (in key), 13, ♀, Seoul, Korea (Ministry of Agriculture and Forestry Technical Services, Tsukuba); Kim, 1970: 506; Kimsey and Bohart, 1990: 64 (listed).

Distribution. Korea.

²*Subfamily Chrysidinae

³*Tribe Parnopini

⁴*Genus *Parnopes* Latreille

⁵**Parnopes popovii* Eversmann

Parnopes popovii Eversmann, 1857: 567, holotype sex uncertain, "Siberia, Kiachta" Russian SFSR (?Polish Academy of Sciences, Krakow); Kimsey and Bohart, 1990: 586 (listed).

Parnopes popovi Eversmann: Tsuneki, 1953b: 24; Kim, 1970: 503, incorrect spelling in species-epithet.

Distribution. Far Eastern Russia, Mongolia, China, North Korea.

⁶*Tribe Chrysidini

⁷*Genus *Stilbum* Spinola

⁸**Stilbum cyanurum* (Förster)

Chrysis cyanurum Förster, 1771: 89, ♂, Spain (Natural History Museum, London).

Chrysis amethystinum cyanurum Fabricius, 1775: 395, ♀ ♂ (syntype), Australia (Natural History Museum, London/Zoologisk Museum, Copenhagen); Smith, 1874b: 469; Uchida, 1925: 335, 370; Matsumura, 1931: 30.

Stilbum cyanurum (Förster): Tsuneki, 1948b: 50-51; Tsuneki, 1969: 23 (listed); Kim, 1970: 504; Kimsey and Bohart, 1990: 567 (listed).

Stilbum cyanurum cyanurum (Förster): Tsuneki, 1947: 52; Tsuneki, 1948b: 50; Tsuneki 1953b: 24; Tsuneki, 1963: 99.

Distribution. Transpalaeartic: North Africa through Europe to Korea and Japan; India, Taiwan, Australia.

⁹*Genus *Trichrysis* Lichtenstein

¹⁰**Trichrysis buyssoni* (Mocsáry)

Chrysis pellucida Buysson, 1887: 183, ♂ ♀ (syntype), 'Asia Minor', China (Museum Nation d'Histoire Naturelle, Paris), nec Radoszkowski 1877; Tsuneki, 1953b:

25; Kim, 1970: 500; Kim, 1980: 117.

Trichrysis buyssoni (Mocsáry), 1889: 323, replace name for *pellucida* Buysson 1887; Kimsey and Bohart, 1990: 571 (listed).

Chrysis neptunia Semenov, 1967: 162, ♀, "Pal'Makh" Korea (Leningrad).

Distribution. Middle East to China, Korea.

¹¹**Trichrysis coreana* (Uchida)

Chrysis coreana Uchida, 1927: 153, ♀ (syntype), "Suigen" [Suweon], "Seiryori"[Cheongryangri], Korea (type depository uncertain); Tsuneki, 1948b: 47.

Ellampus corensis (Uchida): Tsuneki, 1953b: 25.

Trichrysis coreana (Uchida): Kimsey and Bohart, 1990: 571 (listed).

¹²**Trichrysis cyanea* (Linnaeus)

Sphex cyanea Linnaeus, 1758: 572, ♂ (lectotype designated by Morgan 1984), 'Europae' (Natural History Museum, London).

Chrysis cyanea Linnaeus: Tsuneki, 1947: 55; Tsuneki, 1953a: 58; Tsuneki, 1953b: 25; Tsuneki, 1970b: 48 (in key); Kim, 1970: 501.

Trichrysis cyanea (Linnaeus): Kimsey and Bohart, 1990: 571 (listed).

Distribution. Siberia, North China, Korea, Japan.

¹³**Trichrysis triacantha* (Mocsáry)

Chrysis triacantha Mocsáry, 1889: 325, ♀, Sumatra, Indonesia (Naturhistorische Museum, Vienna).

Trichrysis triacantha (Mocsáry): Kimsey and Bohart, 1990: 573 (listed).

Chrysis saohime Tsuneki, 1950: 68, ♀, Nagano, Japan (Ministry of Agriculture and Forestry Technical Services, Tsukuba).

Distribution. ?Korea, Japan, South China and Oriental region.

Remarks. As far as we have reviewed, the only Korean record of this species was Kim et al. (1994) that just enumerated species without citation information. Occurrence in Korea is very doubtful, considering its known distribution.

¹⁴*Genus *Praestochrysis* Linsenmaier

¹⁵**Praestochrysis lusca* (Fabricius)

Chrysis lusca Fabricius, 1804: 171, ♀, Italy (Zoologisk Museum, Copenhagen); Dalla Torre, 1892: 76; Uchida,

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1927: 152; Tsuneki, 1953b: 28; Tsuneki, 1955: 35 (in key), 36; Ishikawa, 1965: 290; Kim, 1970: 501.

Praestochrysis lusca (Fabricius): Kimsey and Bohart, 1990: 533 (listed).

Distribution. Korea, Japan, India, Java, Philippines, Celebes, Formosa, Loochoo Islands.

¹**Praestochrysis shanghaiensis* (Smith)

Chrysis shanghaiensis Smith, 1874b: 460, ♀, Shanghai, China (Natural History Museum, London); Dalla Torre, 1892: 95; Tsuneki, 1969: 23; Tsuneki, 1970b: 49 (in key); Kim, 1970: 502.

Praestochrysis shanghaiensis (Smith): Uchida, 1927: 151; Tsuneki, 1953a: 60; Kimsey and Bohart, 1990: 534 (listed).

Distribution. India to china and Korea.

²*Genus *Chrysura* Dahlbom

³**Chrysura hirsuta* (Gerstaecker)

Chrysura hirsuta Gerstaecker, 1869: 185, ♀, "Ober-Karnthen", Germany (type depository uncertain); Ishikawa, 1965: 290; Tsuneki, 1970b: 48 (in key); Kim, 1970: 503.

Chrysura davidi Buysson, 1898: 524, ♀, Jehol, India (Museum Nation d'Histoire Naturelle, Paris); Tsuneki, 1948a: 125; Tsuneki, 1948b: 47 (in text); Tsuneki, 1953b: 24.

Chrysura hirsuta (Gerstaecker): Kimsey and Bohart, 1990: 490 (listed).

Distribution. Europe to China, Korea, Japan.

⁴**Chrysura koma* (Tsuneki)

Chrysura koma Tsuneki, 1950: 65, ♀, "Kogendo", Korea (Ministry of Agriculture and Forestry Technical Services, Tsukuba); Tsuneki, 1953b: 24; Kim, 1970: 498.

Chrysura koma (Tsuneki): Kimsey and Bohart, 1990: 491 (listed).

Distribution. Korea.

⁵*Genus *Chrysis* Linnaeus

⁶**Chrysis angolensis* Radoszkowski

Chrysis angolensis Radoszkowski, 1881: 219, type uncertain, Angola (?Polish Academy of Sciences, Krakow); Kimsey and Bohart, 1990: 383 (listed); Yamane, 1999: 84 (in key), 86.

Chrysis fuscipennis Bullé 1846: 38, ♀, Philippines (Museum Nation d'Histoire Naturelle, Paris), nec Dahlbom

1829; Tsuneki, 1948a: 125; Tsuneki, 1957: 22; Tsuneki, 1961: 376; Kim, 1970: 499, pl. 41, Fig. 1 549; Kimsey and Bohart, 1990: 383 (listed).

Chrysis fuscipennis var. *murasaki* Uchida, 1927: 155, ♂ ♀ (syntype), Korea, Japan (Hokkaido University, Sapporo).

Chrysis fuscipennis murasaki Uchida: Tsuneki, 1953a: 59; Tsuneki, 1953b: 26; Tsuneki, 1969: 23 (listed).

Distribution. Transpalaeartic: Europe to North East China, Far Eastern Russia, Korea and Japan.

⁷**Chrysis carnifex* Mocsáry

Chrysis carnifex Mocsáry, 1889: 517, ♂, "Ta-tschiansy", China, (Hungarian Natural History Museum, Budapest); Tsuneki, 1948b: 48.

Distribution. China, Korea.

⁸**Chrysis cavaleriei* (Buysson)

Tetrachrysis cavaleriei Buysson, 1908: 211, ♀, China (Museum Nation d'Histoire Naturelle, Paris); Tsuneki, 1953b: 27.

Chrysis cavaleriei (Buysson): Kim, 1970: 498; Kimsey and Bohart, 1990: 394 (listed).

Distribution. Middle part of China, Korea.

⁹**Chrysis fasciata* Olivier

Chrysis fasciata Olivier, 1790: 677, type uncertain, S France (?Museum Nation d'Histoire Naturelle, Paris); Kimsey and Bohart, 1990: 410 (listed); Yamane, 1999: 84 (in key), 87.

Chrysis fasciata var. *daphne* Smith, 1874a: 399, ♀, Hiogo, Japan (Natural History Museum, London), nec Uchida 1927; Kimsey and Bohart, 1990: 410 (listed).

Chrysis daphne Smith: Tsuneki, 1948b: 49.

Chrysis fasciata daphne Smith: Tsuneki, 1970b: 49 (in key); Kim, 1970: 502.

Chrysis fasciata var. *zetterstedti* Dahlbom, 1845: 11, ♂ (syntype), Sweden, Norway (type depository uncertain); Uchida, 1927: 152; Kimsey and Bohart, 1990: 410 (listed).

Chrysis fasciata zetterstedti Dahlbom: Tsuneki, 1953a: 60; Tsuneki, 1953b: 28.

Chrysis zetterstedti Dahlbom: Tsuneki, 1948b: 50.

Distribution. North and East Europe, Siberia, North China, Korea, Japan.

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¹Chrysis fulgida* Linnaeus**

Chrysis fulgida Linnaeus, 1761: 415. ♀ (lectotype designated by Morgan 1984), Uppsala, Sweden (Natural History Museum, London); Tsuneki, 1953b: 27; Kim, 1970: 498; Kimsey and Bohart, 1990: 412 (listed).

Distribution. Transpalaeartic: Europe through European part of Russia to Korea.

²Chrysis fulgidaria* Tsuneki**

Chrysis fulgidaria Tsuneki, 1952: 32, ♀, Mt. Kaya, Korea (Ministry of Agriculture and Forestry Technical Service, Tsukuba); Tsuneki, 1953b: 27; Kim, 1970: 498; Kimsey and Bohart, 1990: 413 (listed).

Distribution. Korea .

³Chrysis galloisi* (Buysson)**

Tetrachrysis galloisi Buysson, 1908: 210, ♂ (lectotype designated by Bohart in Kimsey and Bohart 1990) Japan (Museum Nation d'Histoire Naturelle, Paris).

Chrysis galloisi (Buysson): Uchida, 1925: 335, 370; Kim, 1970: 499; Kim, 1980: 117; Kimsey and Bohart, 1990: 413 (listed).

Distribution. South East Russia, Korea and Japan.

⁴Chrysis ignita* (Linnaeus)**

Sphex ignita Linnaeus, 1758: 571, ♂ (lectotype designated by Bohart in Kimsey and Bohart 1990), Europe (Natural History Museum, London).

Chrysis ignita (Linnaeus): Matsumura, 1931: 30; Tsuneki, 1947: 55; Tsuneki, 1948a: 126; Tsuneki, 1953a: 58; Tsuneki, 1953b: 26; Ishikawa, 1965: 290; Kim, 1970: 501; Kim, 1980: 118; Kimsey and Bohart, 1990: 420 (listed).

Distribution. Transpalaeartic: North Africa through Europe to Korea and Japan.

⁵Chrysis japonica* Cameron**

Chrysis japonica Cameron, 1887: 125, ♀ (lectotype designated by Bohart in Kimsey and Bohart 1990), Japan (Natural History Museum, London); Tsuneki, 1953b: 24; Kim, 1970: 497; Kimsey and Bohart, 1990: 426 (listed).

Chrysis aututa Mocsáry, 1912: 562, ♂, Japan (Hungarian Natural History Museum, Budapest); Kimsey and Bohart, 1990: 426 (listed).

Chrysis japonica var. *cyanea* Uchida, 1927: 153, ♂ (syntype), Japan/Korea (Hokkaido University, Sapporo).

Chrysis japonicus var. *uchidai* Tosawa, 1931: 44-45 (replace name of *Chrysis japonica* var. *cyanea* Uchida, 1927).

Chrysis japonicus Cameron: Matsumura, 1931: 30; Tsuneki 1948b: 47.

Distribution. Far Eastern Russia, Korea, Japan.

⁶Chrysis longula* Abeille**

Chrysis ignita var. *longula* Abeille, 1879: 74, ♀ (lectotype designated by Morgan 1984), Frankfurt (Museum Nation d'Histoire Naturelle, Paris); Uchida, 1925: 335, 370.

Distribution. Transpalaeartic: North Africa through Europe to Korea and Japan.

⁷Chrysis niponica* Uchida**

Chrysis japonica Mocsáry, 1889: 490, ♂ (lectotype designated by Bohart in Bohart and French 1986), Japan (Hungarian Natural History Museum, Budapest).

Chrysis niponica Uchida, 1933: 4 (replace name for *japonica* Mocsáry, 1889); Kimsey and Bohart, 1990: 443 (listed).

Distribution. Korea, Japan

⁸Chrysis chosenensis* Tsuneki**

Chrysis nitidula chosenensis Tsuneki, 1950: 71, ♀ ♂ (syntype), Seoul, Soyosan, Korea. (Ministry of Agriculture and Forestry Technical Services, Tsukuba).

Chrysis chosenensis Tsuneki, 1953b: 25; Kim, 1970: 498; Kimsey and Bohart, 1990: 396 (listed).

Chrysis chosenensis f. *clariventris* Tsuneki 1953b: 26. ♂ ♀ (syntype), Seoul, Korea (type depository uncertain).

Distribution. Far Eastern Russia, Korea.

⁹Chrysis principalis* Smith**

Chrysis principalis Smith, 1874b: 461, ♀, Shanghai, China (Oxford University Museum, England); Dalla Torre, 1892: 85; Uchida, 1927: 155; Tsuneki, 1953b: 28; Tsuneki, 1961: 377; Kim, 1970: 502; Kim, 1980: 117; Kimsey and Bohart, 1990: 450 (listed); Yamane, 1999: 85 (in key), 87.

Distribution. India, China, Korea.

¹⁰Chrysis shoyozana* Tsuneki**

Chrysis shoyozana Tsuneki, 1950: 73, ♀, "Shoyosan [Mt.

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Soyosan]”, Korea (Osaka Museum of Natural History, Osaka); Tsuneki, 1953b: 25; Kim, 1970: 501; Kimsey and Bohart, 1990: 462 (listed).

Distribution. Korea.

¹**Chrysis splendidula* Rossi

Chrysis splendidula Rossi, 1790: 76, type uncertain, Tuscany, Italy (type depository uncertain); Tsuneki, 1948b: 47 (in text); Tsuneki, 1953a: 59; Tsuneki, 1953b: 26; Kim, 1970: 500; Kimsey and Bohart, 1990: 465 (listed); Yamane, 1999: 84 (in key); Yamane, 1999: 88.

Distribution. Transpalaeartic: North Africa, Europe, through Asia Minor to North East China, Korea and Japan.

²**Chrysis syrinx* Tsuneki

Chrysis syrinx Tsuneki, 1950: 75, ♀, “Heiko [Pyeongyang]”, Korea (Osaka Museum of Natural History, Osaka); Tsuneki, 1953b: 25; Tsuneki, 1970b: 49 (in key); Kim, 1970: 501; Kimsey and Bohart, 1990: 469 (listed).

Distribution. Korea, Japan.

³**Chrysis uljanini* Radoszkowski

Chrysis uljanini Radoszkowski, 1877: 22, ♀ (lectotype designated by Bohart in Kimsey and Bohart 1990) Tashkent desert, Sarafschan Valley, Uzbek SSR (Zoological Museum, Moscow); Kimsey and Bohart, 1990: 473 (listed).
Chrysis sarafschana sickmanni Mocsáry, 1893: 228, ♀, E. Siberia Russian SFSR: (Zoologisches Institut und Zoologisches Museum, Hamburg [destroyed]); Tsuneki, 1953b: 27; Kim, 1970: 500.

Distribution. Far Eastern Russia, Korea.

⁴**Chrysis viridura* Linnaeus

Chrysis viridura Linnaeus, 1761: 415, ♂ (lectotype designated by Morgan 1984), Europe (Natural History Museum, London); Kimsey and Bohart, 1990: 477 (listed).
Chrysis viridura var. *apicata* Uchida, 1927: 154, ♂ ♀, Korea, Japan (Entomology Hokkaido University, Japan); Kimsey and Bohart, 1990: 478 (listed).
Chrysis viridula f. *apicata* Uchida: Tsuneki, 1948b: 47.

Distribution. Eurasia, Europe, Korea, Japan.

⁵*Tribe Elampini

⁶*Genus *Hedychridium* Abeille

⁷**Hedychridium roseum* (Rossi)

Chrysis carnea roseum Rossi, 1790: 75, type uncertain, Italy (type depository uncertain).

Hedychridium roseum (Rossi): Dalla Torre, 1892: 28; Tsuneki, 1953b: 23; Kim, 1970: 496; Kim, 1980: 118; Kimsey and Bohart, 1990: 203 (listed).

Distribution. Transpalaeartic: North Africa, Europe to North East China and Korea.

⁸*Genus *Hedychrum* Latreille

⁹**Hedychrum gerstaeckeri* Chevrier

Hedychrum gerstaeckeri Chevrier, 1869: 47, ♀, Leman area, Switzerland (Museum of Natural History, Geneva); Kimsey and Bohart, 1990: 214 (listed).

Hedychrum marianum Mocsáry, 1911: 450, ♀ (lectotype designated by French in Bohart and French 1986), China (Hungarian Natural History Museum, Budapest); Uchida, 1925: 335, 370.

Distribution. Europe, China, Korea; Taiwan.

¹⁰**Hedychrum japonicum* Cameron

Hedychrum japonicum Cameron, 1887: 123, ♂, Fukui, Japan (Natural History Museum, London); Tsuneki, 1953b: 23; Ishikawa, 1965: 290; Kim, 1980: 118; Kimsey and Bohart, 1990: 214 (listed).

Hedychrum gerstaeckeri japonicum Cameron: Tsuneki, 1970b: 47 (in key); Kim, 1970: 496.

Distribution. North China, Korea, Japan.

¹¹**Hedychrum nobile* (Scopoli)

Sphex nobile Scopoli, 1763: 297, ♀, Austria (type depository uncertain).

Hedychrum nobile (Scopoli): Tsuneki, 1947: 7; Kim, 1970: 497; Kimsey and Bohart, 1990: 217 (listed).

Distribution. Transpalaeartic: North Africa through Europe to Far Eastern Russia, North China and Korea.

¹²**Hedychrum okai* Tsuneki

Hedychrum okai Tsuneki, 1954: 37, ♂, Sapporo, Japan (Ministry of Agriculture and Forestry Technical Services, Tsukuba); Kimsey and Bohart, 1990: 218.

Distribution. Korea, Japan.

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¹**Hedychrum simile* Mocsáry

Hedychrum cyaneum Radoszkowski, 1889: 10, ♂, ‘Siberia orientalis’ Russian SFSR (?Polish Academy of Sciences, Krakow), nec Bullé, 1846.

Hedychrum simile Mocsáry, 1889: 157, replace name for *cyaneum* Radoszkowski 1889, (invalid lectotype female designated by French 1986); Tsuneki, 1953b: 23; Kim, 1970: 497; Kimsey and Bohart, 1990: 220 (listed).

Hedychrum simile f. *pullatum* Tsuneki, 1953b: 23, ♂ ♀ (syntype), “Shoyosan [Mt. Soyosan], Seoul”/ Japan (Ministry of Agriculture and Forestry Technical Services, Tsukuba).

Distribution. Mongolia, Central and North China, Far Eastern Russia, Korea, Japan.

²*Genus *Elampus* Spinola

³**Elampus bidens* (Förster)

Notozus bidens Förster, 1853: 335, ♀, Silesia, Poland (Zoologisches Museum der Humboldt-Universität, Berlin).

Elampus bidens (Förster): Ha and Kim, 2008, this study.

Distribution. Transpalaeartic: South Europe through West Asia to Korean and Japan.

⁴*Genus *Philoctetes* Abeille

⁵**Philoctetes duplipunctatus* (Tsuneki)

Chrysellampus duplipunctatus Tsuneki, 1948a: 120, Holotype sex uncertain, China (Kyushu University, Japan); Tsuneki, 1953b: 23.

Chrysellampus duplipunctatus f. *variegatus* Tsuneki, 1950: 63, ♂ ♀ (syntype), Korea/Manchuria (Ministry of Agriculture and Forestry Technical Services, Tsukuba); Tsuneki, 1953a: 55; Kim, 1970: 496.

Philoctetes duplipunctatus (Tsuneki): Kimsey and Bohart, 1990: 255 (listed).

Distribution. North East China, Korea.

⁶**Philoctetes horvathi* (Mocsáry)

Elampus horvathi Mocsáry, 1889: 82, ♀ (lectotype designated by Móczár 1964), Hungary (Hungarian Natural History Museum, Budapest); Tsuneki, 1953b: 22.

Elampus horvathi Mocsáry: Kim, 1970: 496.

Philoctetes horvathi Mocsáry: Kimsey and Bohart, 1990: 256 (listed).

Distribution. South Europe through Middle East to China and Korea.

⁷*Genus *Pseudomalus* Ashmead

⁸**Pseudomalus auratus* (Linnaeus)

Sphex auratus Linnaeus, 1758: 572, ♀, Europe (Natural History Museum, London).

Ellampus auratus (Linnaeus): Tsuneki, 1953b: 22; Kim, 1970: 495.

Ellampus auratus f. *nigridorsus* Tsuneki, 1950: 63, ♂ ♀ (syntype), Japan/Korea/Manchuria (Ministry of Agriculture and Forestry Technical Services, Tsukuba); Tsuneki, 1953a: 54.

Omalus auratus nigridorsus Tsuneki: Tsuneki, 1970a: 27; Tsuneki, 1970b: 46 (in key).

Pseudomalus auratus (Linnaeus): Kimsey and Bohart, 1990: 265 (listed).

Distribution. Transpalaeartic: Europe, Caucasus through West Asia, Mongolia to Siberia, Korea and Japan; Introduced in Nearctic.

⁹**Pseudomalus joannisi* (Buysson)

Ellampus joannisi Buysson, 1909: 207, ♀, Nankin, China (Museum Nation d’Histoire Naturelle, Paris).

Pseudomalus joannisi (Buysson): Kimsey and Bohart, 1990: 268 (listed).

Distribution. North East China, Korea.

¹⁰**Pseudomalus punctatus* (Uchida)

Philoctetes punctatus Uchida, 1927: 152, ♂ ♀ (syntype), Japan (Hokkaido University, Sapporo); Kim, 1970: 503.

Philoctetes punctatus var. *corensis* Uchida 1927: 153, ♂, “Seirryori”[Cheongryangri], Korea (Hokkaido University, Sapporo); Kim, 1970: 504.

Ellampus corensis (Uchida 1927): Tsuneki, 1946: 33; Tsuneki, 1948a: 120; Tsuneki, 1953a: 55; Tsuneki, 1953b: 22.

Omalus punctatus (Uchida): Tsuneki, 1969: 23 (listed); Tsuneki, 1970b: 46.

Pseudomalus punctatus (Uchida): Kimsey and Bohart, 1990: 268 (listed).

Distribution. Korea, Japan.

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