

## Notes on Harpalini (Coleoptera, Carabidae) from Korea (1)

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### 韓國產 먼지벌레 족(1)

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#### ABSTRACT

The taxonomic revision was made on the tribe Harpalini (Coleoptera: Carabidae) in Korea. The Korean species are arranged after Kryzhanovskij *et al.* (1995) system with minor emendation. This present list is an attempt to bring together the available literature and collection-based information on fauna or taxa recorded from Korea (including some collections from the northern part of the Korean Peninsula, now North Korea). Materials examined for each species, an annotative checklist of Korean Carabidae, and the practical key to tribes and genera are provided. As a result, a total 86 species (and subspecies) belonging to 13 genera are recognized from the Korean Peninsula, of which one species (*Harpalus egorovi*) is new to South Korea. Distribution of two species, *Harpalus tardus* and *H. tibeticus hsifanicus*, are very doubtful in the Korean Peninsula. Besides, numerous new distribution records are given as based on materials deposited in various Universities and private collections.

**Key words :** Coleoptera, Carabidae, Haraplini, Taxonomy, new records, Korea

The Carabidae is one of the largest and diverse beetle families. This exceedingly large family (including Cicindelinae) composed of upto 34,275 species worldwide (Lorenz 2005), but probably at least twice as many taxa remain to be described.

The classification of Carabidae has received a great deal of attention in the past 30 years. About the history of systematic carabidology already reviewed and discussed by Ball (1979) & Ball *et al.* (1998).

The world fauna is divided into 6 families and 85 tribes (Erwin 1991). However, the classification of higher rank of this family is varied by authors. Also, the scope of the family have not been generally agreed upon. The classification of suprageneric taxa is generally accepted after Kryzhanovskij (1976, 1983), with only a few minor modifications by several authors (Casale, Sturani & Taglianti 1982, etc.), e.g. Kryzhanovskij's "supertribes" are treated as subfamilies. This

system is followed by the French schools. Some revisions of particular taxa published after Kryzhanovskij's treatise (1983) have also been taken into account, and others such as Habu (1973) for Japanese Harpalini and Platynini (1978), Casale (1988) for Sphodrini of Palaearctic Region, Fedorenko (1996) for Dyschiriini for Palaearctic Region, & etc.

Synonyms are presented chronologically. Most synonyms of species introduced from outside the Korean Peninsula are cited from current catalogues, e.g., Kataev *et al.* (2003 in Löbl & Smetana), Lorenz (1998, 2005), or other revisional works.

Recently, Park & Paik (2001) revised the checklist of Korean ground beetles (except Cicindelini, Carabini, and Cychrini). Unfortunately, this work contains a number of errors and omissions, and misinterpretation of earlier references of Korean ground beetles with many typographic errors. Incorrect subsequent citations and misspelled are amended and supplemented here.

The present study is mainly based on Korean materials collected by the authors and other material housed at several collections were also studied.

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As a result, the list of 86 species (and subspecies) belonging to 13 genera is recognized, of which one species (*Harpalus egorovi*) is new to South Korea. Distribution of two species, *Harpalus tardus* and *H. tibeticus hsifanicus*, are very doubtful in the Korean Peninsula. However, certain species and subspecies that are from the literature, have not yet been discovered from South Korea. Besides, numerous new distribution records are given based on materials deposited in various universities and private collections.

Most collections involved are those housed in the Suncheon National University, Suncheon, JN; Sanju National University, Sangju, GB, and Jejudo Folklore and Natural History Museum, Jeju. In addition, some materials recently were taken by a number of students of Department of Agricultural Biology or Life Sciences of various universities (see below Acronymy).

Herein for provincial names, institutions or university, and others are as follows. **CB**: Chungcheongbuk-do, **CN**: Chungchongnam-do, **GB**: Gyeongsanbuk-do, **GG**: Gyeonggi-do, **GN**: Gyeongsangnam-do, **GW**: Gangweon-do, **JB**: Jeonllabuk-do, **JJ**: Jeju-do, **JN**: Jeonllanam-do; **SE**: Seoul. The area code of China is after Löbl & Smetana (2003). **JBNAE**: Chonbuk National University, Faculty of Biological Resources Science, Jeonju, JB. **JFHNM**: Jejudo Folklore and Natural History Museum, Jeju. **KWNAE**: Kangwon National University, College of Agriculture, Chuncheon, GW. **NAIST**: National Institute of Agricultural Science and Technology, Department of Agricultural Insects, Suwon, GG. **SCNAE**: Suncheon National University, Department of Applied Biology, Suncheon, JN. **SJNAE**: Sangju National University, Department of Sericulture and Entomology Resources, Sangju, GB. **SNUAE**: Seoul National University, Department of Agricultural Biology, Seoul.

**Tribe Harpalini Bonelli, 1810 먼지벌레 족**

Type-genus: *Harpalus* Latreille, 1802.

Harpalii Bonelli, 1810, Tabula Synoptica.

Harpaliens Dejean, 1825, Spec. gén. Col., 1: 8.

Harpalides Lacordaire, 1854, Genera des Coléoptères, p. 257, 285.

Harpalini J. LeConte, 1861, Smithsonian Misc. Coll., 1: 17, 31.

Harpalinae Kolbe, 1898, Käfer Deutsch-Ost-Afrika, 4: 70.

Harpalina Jakobson, 1905, Zsuki Ross., fasc. 3: 202, 366.

Harpalidae Alluaud, 1916, Ann. Soc. Ent. France, 85: 50.

Harpalidae Jeannel, 1944, Faune de France, 39: 82, 87.

**Diagnostic characters.** The representative of the tribe can easily be recognized by the frons with one supraorbital seta on each side, palpi pubescent, scrobe of mandible devoid of any seta, antennal scape and pedicel glabrous, posterior-lateral setae of prothorax absent, elytral apex not markedly truncate and epipleura not interrupted at apex.

**Notes.** The Harpalini is one of the largest tribes among the subfamily Harpalinae. Subfamily Harpalinae corresponds to the Conchifera of Jeannel (1941). A number of recent authors, such as Deuve (1988), placed Pseudomorphinae this subfamily. However, Deuve's (1988) system is not widely accepted by most specialists.

More than 2,500 species are known, and they are one of the widely distributed ground beetles in the world. Most species are mixophagous, many of them are phytophagous; many species are seed eaters both as adults and larvae, such as *Harpalus* species feeding seeds, especially Cruciferae.

For supra-generic classification of Harpalini, Csiki (1932) proposed genera and subgenera into subtribes in the Coleopterorum Catalogus. Later, van Emden (1953) proposed a classification of Neotropical harpalines into 5 subtribes, which was followed later by various authors (Ball 1960a, b, 1963, 1968, Lindroth 1968, Darlington 1968, Noonan 1976). Subsequent workers dealt with harpalines of only specific areas of the world in agreement with the system proposed by Csiki but they fail to classify properly the genera and subgenera (cited from Noonan 1976: 6).

Noonan (1973) revised the genera of Anisodactylina, and in 1976, he presented a synopsis of the genera of the Harpalini of the world, grouping them in four subtribes, followed by van Emden (1953) with modification. But in revisional works of Habu (1973), the Japanese fauna of this group was divided into five subtribes. And later, *Sugimotoina* (distributed in Oriental Ryukyu and Southwest Pacific Solomon and Vanuatu archipelagos) was transferred from Harpalini to Lebiini by the phylogenetic study of Ball *et al.* (1985).

**Key to the subtribes and genera of Harpalini**

(Based on Habu, 1973)

- 1(2) Clypeus and labrum more or less asymmetrically emarginate at apex; penultimate segment of labial palpi with more than two setae at inner side; fore tarsi of male with two rows of adhesive hairs on ventral side (Subtribe *Amblystomina*). ..... [*Amblystomus* Erichson, 1837]

- 2(1) Clypeus and labrum normal, not asymmetrically emarginate at apex.
- 3(16) Penultimate segment of labial palpi with two (rarely three) setae at inner side; fore tarsi of male with two rows of adhesive hairs on ventral side; marginal series of pores on elytral interval 9 widely interrupted at middle, generally composed of fourteen pores (Subtribe Stenolophina).
- 4(9) Mentum with distinct median tooth.
- 5(6) Dorsal side distinctly punctate and pubescent; pronotum with posterior marginal setae near basal angles (sometimes difficult to observe). ..... *Dicheirotichus* (좁쌀털머리먼지벌레 속)
- 6(5) Dorsal side smooth and glabrous; segment 4 of fore and mid tarsi elongately bilobed in male.
- 7(8) Prosternum and abdominal sternites with hairs, punctate. .... *Bradycellus* (좁쌀애먼지벌레 속)
- 8(7) Prosternum and abdominal sternites without hairs, smooth. .... *Lioholus* (연해좁쌀애먼지벌레 속)
- 9(4) Mentum without median tooth.
- 10(11) Elytra without scutellar striole; segment 4 of fore and mid tarsi elongately bilobed in male (Fig. 756). .... *Loxoncus* (노란테먼지벌레 속)
- 11 (10) Elytra with scutellar striole.
- 12 (13) Last segment of maxillary palpi blunt; first segment of hind tarsus with thin keel externally; posterior eight pores of marginal series of elytra divided into two to three groups; fore tarsus of male dilated, 4th segment strongly bilobed. .... *Stenolophus* (좁쌀먼지벌레)
- 13(12) Last segment of maxillary palp acuminate; tarsal segment 4 of fore and mid tarsi somewhat bilobed in male; posterior eight pores of marginal series of elytra not divided; meta-tarsi not carinate externally; male with pro-tarsi and usually, though faintly, meso-tarsi dilated.
- 14(15) Pronotum with basal angles generally not angulate, more or less rounded, median line and basal foveae normal, not well cut; mandibles generally short. .... *Acupalpus* (꼬마노랑먼지벌레 속)
- 15(14) Pronotum with basal angles angulate, median line and basal foveae sulciform, deep and well cut; mandibles relatively long. .... [Anthracus Motschulsky, 1850]
- 16(3) Penultimate segment of labial palpi with more than three (rarely three) setae at inner side; marginal series of pores on elytral interval 9 often continuous, composed of more than fifteen pores in general.
- 17(18) Fore tarsi of male with compact, not two-lined, adhesive hairs on ventral side; suture between mentum and submentum generally (not always) incomplete, submentum with two setae on either side (Subtribe Anisodactylina). .... *Anisodactylus* Dejean, 1829 (먼지벌레 속)
- 18(17) 6(5) Fore tarsi of male with two rows of adhesive hairs on ventral side; suture between mentum and submentum complete, submentum with one or two setae on either side (Subtribe Harpalina).
- 19(20) Upper surface of body throughout with punctations and erect hairs. .... *Ophonus* Dejean, 1829 (구멍머리먼지벌레 속)
- 20(19) Upper surface of body without punctuation.
- 21(28) Dorsal side glabrous.
- 22(23) Frontal impression short, not extending in posterolateral direction; hind femora with at least three setae along hind margin; paraglossae pubescent. .... *Harpalus* Latreille, 1802 (머리먼지벌레 속)
- 23(22) Frontal impression more or less extending in posterolateral direction; hind femora with two setae along hind margin; paraglossae glabrous.
- 24(25) Body narrow, head small; mandibles relatively long; scutellar striole short; mentum shallowly emarginate, median tooth long. .... *Oxycentrus* Chaudoir, 1854 (긴머리먼지벌레 속)
- 25(24) Body moderately to well wide, head not small; mandibles less long; scutellar striole more or less developed; mentum moderately emarginate, median tooth not so long.
- 26(27) Elytra more or less iridescent, microsculpture consisting of fine close transverse lines or invisible, interval 3 with one dorsal pore; fore tibiae with three spines at anterior outer margin. .... *Trichotichnus* Morawitz, 1863 (윤머리먼지벌레 속)
- 27(26) Elytra not iridescent, microsculpture forming meshes, interval 3 without dorsal pore; fore tibia with more than three spines at outer margin. .... *Nipponoharpalus* Habu, 1973 (일본머리먼지벌레 속)
- 28(21) Dorsal side pubescent.
- 29(30) Mandibles more or less exposed at apical part, hooked at apex, right and left mandibles intersecting; mentum with median tooth. .... *Harapalus* (partim)
- 30(29) Mandibles almost hidden beneath labrum, short, not hooked at apex, both mandibles hardly intersecting; mentum without median tooth. .... *Platymetopus* Dejean, 1829 (털머리먼지벌레 속)

**Subtribe Anisodactylina Lacordaire, 1854** 먼지벌레 아족

Anisodactylides Lacordaire, 1854, Gen. Col., 1: 257, 268-269.

Type-genus: *Anisodactylus* Dejean, 1829.

Anisodactylini Tschitschérine, 1900, Trudy russk. ent.

Obshch., 34: 344, 351, 367. Other synonyms omitted. For other synonyms, see Habu (1973) and Noonan (1973).

**Diagnostic characters.** See key to the subtribe (above). Also for description, see Habu (1973: 19) or Noonan (1973: 276-279).

**Notes.** This subtribe is distinguished from other harapline subtribes by the penultimate segment of labial palpi plurisetose and the sponge-like adhesive hair on ventral side of fore tarsi in male. This subtribe is distributed in all zoogeographical regions. About 40 genera are known. A key to the genera of this subtribe, see Noonan (1973), Habu (1973) and Kataev & Wrase (2001).

In Korea, this subtribe is represented by a single genus *Anisodactylus* Dejean. The genus *Chydaeus* Chaudoir, 1854, is not yet discovered, but it may be found on the southern part of the Korean Peninsula including Jeju-do or neighbouring islands when detailed works follow.

**Key to the related genera of *Anisodactylus* Dejean**

(modified from literature)

- 1(2) Pronotum with three or more lateral setae on each side, located either before middle or along entire length. ....  
..... *Chydaeus* Chaudoir, 1854 (partim)
- 2(1) Pronotum with only one lateral seta on each side at middle.
- 3(4) Mentum and submentum separated by complete transverse suture; elytra with three and more setigerous pores at least on 3rd elytral interval; frontal impressions not or faintly extending towards eyes. ....  
..... *Gnathaphanus* W.S. MacLeay, 1825
- 4(3) Mentum and submentum completely fused.
- 5(6) Mentum with prominent long median tooth. ....  
..... *Chydaeus* (partim)
- 6(5) Mentum without prominent median tooth; elytra with more than one discal setigerous pore at least on 3rd elytral interval; frontal impressions distinctly extending towards eyes. ....  
..... *Pseudognathaphanus* Schaubberger, 1932 (partim)
- 7(8) Elytra mostly with one discal setigerous pore on 3rd

elytral interval; ligula strongly widened apically; fronto-clypeal suture shallow, not continuing postero-laterally as deep clypeo-ocular prolongation; mentum with two median setae. .... *Anisodactylus* (먼지벌레 속)

8(7) Ligula more or less parallel-sided or weakly widened apically.

9(10) Paraglossae very broad, not removed distally from ligula; metatarsomeres from 2nd to 4th of both sexes and pro- and mesotarsomeres from 2nd to 4th of female with dense ventrolateral cover of somewhat thickened setae. ...  
..... *Pseudognathaphanus* (partim)

10(9) Paraglossae narrow, well removed distally from ligula; tarsi lacking dense ventrolateral cover of somewhat thickened setae. .... *Harpalomimetes* Schaubberger, 1933

**Genus *Anisodactylus* Dejean, 1829** 먼지벌레 속

*Anisodactylus* Dejean, 1829, Spec. Gén. Col., 4: 132-134.

Type-species: *Carabus binotatus* Fabricius, 1787, by subsequent designation of Westwood, 1838: 4.

**Diagnostic characters.** Of medium size, oblong-oval, subconvex; next to last segment of labial palpi plurisetose and longer than the last; prosternum with several setigerous punctures at tip; protibia with outer angle not prolonged; protarsi of male with dense, spongy pubescence beneath; first metatarsal segment not as long as three following together. For more details, see Noonan (1973: 348; 1976: 8) and Habu (1973: 19).

**Notes.** This genus is widely distributed in Asia, Europe, northern Africa, North America, and New Zealand (introduced). This Holarctic genus, contains more than 50 species (Lorenz 1998), is divided into many subgenera. A detailed review of the genus was made by Noonan (1973, 1976, 1996) and Kataev & Wrase (2001) provided Oriental genera key. Also, for southeast Asian species, refer to Tanaka (1958) and Habu (1973); for Palaearctic species to Puel (1931); for Vietnam species to Kataev & Wrase (2001).

The genus *Harpalomimetes* Schaubberger, 1933 was treated as a junior subjective synonym of *Anisodactylus* Dejean, 1829 by Habu (1968), but Noonan (1973) resurrected it to a full genus. Most of specialists regard it as a distinct genus (see key to genera).

In Korea, 4 species are listed. Unfortunately, *A. binotatus* (Fabricius 1787) has not yet been collected from South Korea. The distinguishing characters are as follows (modified from references, e.g., Habu 1973).

### Key to the Korean species of *Anisodactylus*

- 1(4) Third elytral interval with 1 dorsal setigerous puncture; apical styluses of female triangular in shape (Subgenus *Anisodactylus* Dejean, 1829).
- 2(3) Elytra glabrous, with microsculpture very fine transverse meshes, or not forming distinct meshes; pronotum with basal angles obtuse, apex distinct; humeri angled; fore tibiae with apical spur well dentate, trifid on margins. ....  
..... *A. (Anisodactylus) tricuspιδatus* (애먼지벌레)
- 3(2) Elytra glabrous, except posterior apical area with short hairs, microsculpture of isodiametric meshes, somewhat granulate in many specimens; pronotum with posterior angles prominently dentate; humeri rounded; fore tibiae with distal apical spurs widened, but not subtrifid. ....  
..... *A. (Anisodactylus) binotatus*  
(두점박이애먼지벌레: 신칭)
- 4(1) Third elytral interval without dorsal setigerous puncture; apical styluses of female lobed in shape (Subgenus *Pseudanisodactylus* Noonan, 1973).
- 5(6) Elytra punctate, pubescent at lateral and apical areas, with microsculpture distinct and isodiametric, interval 3 without dorsal pore; fore tibiae with apical spur not dentate on margins; head with reddish patch on frons; pronotum with basal angles well dentate. ....  
..... *A. (Pseuda.) punctatipennis* (점박이애먼지벌레)
- 6(5) Elytra not punctate, with distinct isodiametric microsculpture, sometimes with faint greenish tinge, ciliate at base near shoulder; head with reddish patch on frons; pronotum with basal angles nearly rectangular in general shape, fairly rounded at apex. ....  
..... *A. (Pseuda.) signatus* (먼지벌레)

**Subgenus *Anisodactylus* Dejean, 1829** 애먼지벌레 아속  
*Anisodactylus* Dejean, 1829, Spec. Gén. Col., 4: 132.

Type-species: *Carabus binotatus* Fabricius, 1787, by subsequent designation of Westwood, 1838: 4.

*Cephalogyna* Casey, 1918, Memoirs on the Coleoptera, 8: 414.

Type-species: *Anisodactylus loedingi* Schaeffer, 1911, by monotypy. Synonymized by Lindroth, 1968: 849.

*Pseudhexatrichus* Noonan, 1973, Quaest. Ent., 9: 282, 352.

Type-species: *Anisodactylus dejeani* Buquet, 1840, by original designation. Synonymized by Noonan, 1996: 10.

**Diagnostic characters.** Refer to Noonan (1973: 349-351; 1996: 10-11). Also use the key to genera and subgenera of this

subtribe Anisodactylina in Noonan (1973, 1996).

**Notes.** According to Noonan (1973, 1996), the Old World species of this subgenus *Anisodactylus* s. str. are with 1 setigerous puncture on clypeus at each outer angle, but some species of New World are with additional seta on such angles.

Two species occurs from Korea, but *A. binotatus* has not yet been collected from southern part of the Korean Peninsula.

***Anisodactylus (Anisodactylus) binotatus* (Fabricius, 1787)**  
두점박이애먼지벌레 (신칭)

*Carabus 2-notatus* Fabricius, 1787, Mantissa Insectorum, 1: 199 (Germany); Fabricius, 1801, Syst. Eleuth., 1: 193. For other references, see Csiki, 1932, Col. Cat. 121: 1071-1073. *Anisodactylus spurcaticornis* Dejean, 1829, Spec. gén. Col., 4: 142-143 (Austria). Ganglbauer (1892: 362) listed the name as a junior synonym of *A. binotatus*.

*Harpalus calceatus* Stephens, 1835, Illustr. Brit. Ins., 5: 381, nec Duftschmid, 1812 (Great Britain). Ganglbauer (1892: 362) listed the name as a junior synonym of *A. binotatus*.

*Harpalus rufitarsis* Stephens, 1835, Illustr. Brit. Ins., 5: 381, nec Duftschmid, 1812 (Great Britain). Ganglbauer (1892: 362) listed the name as a junior synonym of *A. binotatus*.

*Anisodactylus brevicollis* Chaudoir, 1844, Bull. Soc. Nat. Mosc., 17: 431. Puel (1931: 76) listed the name as a junior synonym of *A. binotatus*.

*Anisodactylus binotatus* var. *espinssei* Puel, 1931, Ann. Soc. Ent. France, 1931: 67 (Locality not mentioned). Unavailable name for ICZN (1999).

*Anisodactylus binotatus* ab. *matheyi* Puel, 1931, Ann. Soc. Ent. France, 1931: 67 (Aude: Axat; Suisse: Nidau). Unavailable name for ICZN (1999).

*Anisodactylus (Anisodactylus) binotatus* (Fabricius): Puel, 1931, Ann. Soc. Ent. France, p. 67, 76 (syn.); Csiki, 1932, Coleop. Cat., 121: 1071-1073 (syn.); Noonan, 1996, Milwaukee Public Museum, Contributions, 89: 35-39 (S. Korea).

**Diagnostic characters.** Adults of both sexes resemble those of *A. nemorivagus*, *A. hispanus*, *A. antoinei*, and *A. pueli*. They differ from the former by a generally larger body size; by the pronotal lateral depressions being slightly more prominent near the anterior angles; and by having the inner elytral anterior and lateral borders at the humeri being rounded rather than angulate where they meet (after Noonan 1996: 35). For more detail, see Noonan (1996: 35-36).

**Material examined.** No specimens was available for the present study. Near Yeongcheon, GB (after Noonan 1996:

112).

**Distribution.** Korea (South), Russian Far East, Eurasia, Europe, North America.

**Notes.** First record for South Korea by Noonan (1996). For more detail of this species, see Noonan (1996: 35-39). A hygrophilous species, living in open country, mostly near standing or slow-running waters. It occurs on clay-mixed sandy, gravelly or peaty soil with tall vegetation of grasses, sedge, etc. Also in arable land. It is a typical spring breeder, most numerous in May (Lindroth 1986, Noonan 1996).

***Anisodactylus (Anisodactylus) tricuspидatus Morawitz, 1863 애먼지벌레***

*Anisodactylus tricuspидatus* Morawitz, 1863, Mem. Acad. Imp. Sci. St.-Petersb., (7), 6(3): 66-67 (Japan: Hakodate); Bates, 1873, Trans. R. Ent. Soc. Lond., p. 259; Bates, 1883, Trans. R. Ent. Soc. Lond., p. 235; Bates, 1888, Proc. Zool. Soc. Lond., 1888: 370 (Korea); Tschitschérine, 1897, L'Abeille, 29: 65 (Korea); Tschitschérine, 1901, Horae Soc. Ent. Ross., 35: 132; Kano, 1923, Ins. world, (Konchusekai), 27(315): 381 (Korea); Kano, 1924, Ins. world, (Konchusekai), 28(326): 349 (Korea); Schauburger, 1931, Col. Centralbl., 5: 155; Yano, 1941, Nippon no Kôchû, 4(1): 31 (Korea); Nakane, 1948, Trans. Kinki Col. Soc., 3(1): 5; Kurosa, 1949, Bull. Takarazuka Ins., 60: 11 (Korea); Tanaka, 1958, Mushi, 32: 90 (Korea); Nakane, 1963, Icon. Ins. Jap., Colore natur edit., 2 (Col.): 42 (Korea); Habu, 1968, Kontyû, 36: 272, 273 (syn. *Harpalomimetes*); Młynár, 1974, Acta zool. cracov., 19(6): 105 (N. Korea).

*Anisodactylus (Anisodactylus) formosanus* Ito, 1992, Ent. Rev. Japan, 47(1): 47-49 (Taiwan). [Synonymized by Noonan, 1996: 42].

*Anisodactylus (Anisodactylus) tricuspидatus nomurai* Ito, 1992, Ent. Rev. Japan, 47(1): 49-50 (Taiwan). [Synonymized by Noonan, 1996: 42].

*Anisodactylus (Anisodactylus) tricuspидatus* Morawitz: Puel, 1931, Ann. Soc. Ent. France, p. 68, 81, 85 (Korea, Japan); Habu, 1973, Fauna Japonica, Harpalini: 40-43 (Quelpart Is.).

*Anisodactylus (Pseudanisodactylus) tricuspидatus* Morawitz: Noonan, 1996, Milwaukee Public Museum, Contributions, 89: 42-44 (S. Korea).

**Diagnostic characters.** Body black, dorsum shiny, femora and tibiae reddish black; pronotal basal angle dentate or subdentate; elytral humeri angled; elytral intervals flat to slightly convex; apical spur of fore tibia trifold. For descrip-

tion, see Habu (1973) and Noonan (1996).

**Materials examined.** **JJ:** 2♂, 27-VI-1989; 1♂, 28-VI-1989, Jeju-do (SCNAE); 1♂, 17-VII-1994, Temple Gwaneumsa, Jeju-si (SCNAE); 3♀, 5-VII-1992, Mt. Hallasan, alt. 1600 m (SCNAE); 1♂, 3-VII-1998, Gyora, Bukjeju-gun (SCNAE); 1♀, 3-VI-1993, Wasan (JFNHM); 1♂, 1♀, 3-IV-1994, Saekdal, Seogwipo-si (JFNHM); 3♂, 10-VI-1995, Geomeunorum (JFNHM); 1♀, 15-V-1983, Muljangol, Mt. Hallasan (JFNHM); 2♀, 19-V-1983, Temple Gwaneumsa; 1♀, 25-VI-1993; 1♀, 3-VI-1995, Sarabong; 1♂, 2♀, 26-7-1999, Jeju-si (JFNHM); 1♀, 10-VI-1996, Hado (JFNHM); 1♂, 2♀, 5-VI-1983; 1♀, 20-VII-1994, Yeongsil, Mt. Hallasan (JFNHM); 1♀, 12-VI-1983; 1♂, 1♀, 29-VI-1994, Seongpanak, Mt. Hallasan (JFNHM); 1♂, 6-VIII-1994; 1♀, 16-VII-1998, Oerimok, Mt. Hanla (JFNHM); 2♀, 20-VI-2000, Mt. Hanla (1,100 m) (JFNHM); 2 ex., 7-VI-1972, Mt. Hallasan (NIAS). **GB:** 1 ex., 22-VIII-1992, Bonghwa, Bonghwa-gun (NIAS). **GG:** 3 ex., 7-IX-1996, Seodun-dong, Suweon-si (NIAS); 1 ex., 17-VII-1961, Mt. Taehwasan, Docheok-myeon, Gwangju-gun (NIAS). **JB:** 1 ex., 10-VI-1975, Mt. Naejangsan, Jeongeup-si, JB (NIAS). **JN:** 1 ex., 12-VIII-1981, Is. Hongdo, Sinan-gun (NIAS).

**Distribution.** Korea (incl. Jeju-do), Japan (Hokkaido, Honshu, Shikoku, Kyushu), China, Taiwan.

**Notes.** First record for the Korean Peninsula by Bates (1888). This species widely distributed in the Korean Peninsula including Jeju-do (=Cheju-do, Quelpart Island). Not common. According to Habu (1973), this species feeds on seeds of grasses and of *Setaria viridis* Beauvois.

Quite recently Ito (1992) described *A. fomosanus* from Taiwan, and *A. tricuspидatus nomurai* from Japan. Therefore, Noonan (1996) considered them as a junior subjective synonym of *A. tricuspидatus* each other, because the characters of these two (sub)species fall within the normal range of variation of *A. tricuspидatus* (see Noonan 1996: 43). However, Ito in Löbl & Smetana (2003) listed them separated from *A. tricuspидatus*. We followed Noonan (1996).

**Subgenus *Pseudanisodactylus* Noonan, 1973**

점박이애먼지벌레 아속

*Pseudanisodactylus* Noonan, 1973, Quaest. Ent., 9: 282, 351.

Type-species: *Anisodactylus punctatipennis* Morawitz, 1862, by original designation.

**Diagnostic characters.** Third elytral interval without setigerous puncture; the apical styluses (stylomere II; valvifer) of female not triangular, lobed in shape. For more details, see

Noonan (1973: 351-352).

**Notes.** The distinguishing characters of some southeast Asian species, refer to Tanaka (1958) and Habu (1973).

*Anisodactylus (Pseudanisodactylus) punctatipennis*

**Morawitz, 1862** 점박이먼지벌레

*Anisodactylus punctatipennis* Morawitz, 1862, Mel. Biol., 4: 244-245 (Japan: Hakodate); Morawitz, 1863, Mém. Acad. Imp. Sci. St.-Pétersb., (7), 6(3): 65; Bates, 1873, Trans. Ent. Soc. London, p. 259; Heyden, 1887, Horae Soc. ent. Rossicae, 29: 246, (Korea); Tschitschérine, 1897, L'Abeille, 29: 65 (Mou-Pin: China); Kano, 1924, Ins. world, (Konchusekai), 28(326): 349 (Korea); Schaubberger, 1932, Col. centralbl., 5(6): 154 (Korea); Yokoyama, 1932, Icon. Ins. Jap., p. 819 (Korea); Yano, 1941, Nippon no Kôchû, 4 (1): 31 (Korea); Kurosa, 1949, Bull. Takarazuka Ins., 60: 11 (Korea); Habu, 1950, Icon. Ins. Jap. (rev. ed.), p. 956 (Korea); Tanaka, 1958, Mushi, 32: 90 (Korea); Nakane, 1963, Icon. Ins. Jap. Colore Nat., 2, Col., p. 42 (Korea); Habu, 1968, Kontyû, 36: 273 (Korea); Paik, 1988a, Korean J. Entomol., 18(4): 242 (Korea); Paik, 1997b, Korean J. Soil Zool., 2(1): 30 (Korea); Kirschenhofer, 1997, Annls hist.-nat. Mus. natn. hung., 89: 109 (N. Korea).

*Anisodactylus (Anisodactylus) punctatipennis* Morawitz: Puel, 1931, Ann. Soc. Ent. France, p. 68, 81, 85; Habu, 1973, Fauna Japonica, Harpalini, p. 30-36 (Korea).

*Anisodactylus (Pseudanisodactylus) punctatipennis* Morawitz: Noonan, 1996, Milwaukee Public Museum, Contributions, 89: 17.

**Diagnostic characters.** See above key to species. For redescription, see Habu (1973).

**Material examined.** **JJ:** 4♂, 5♀, 23-IV-2004, Hyeobjae Beach, Hallim-eup (SCNAE); 3♂, 3♀, 26-IV-1992, Mt. Hallasan (300 m); 1♂, 4♀, 1-VI-1992, Mt. Hallasan (800 m), Jeju-si (SCNAE); 1 ex., 15-V-1983, Sujangol, Mt. Hallasan (NIAS); 1 ex., 14-X-1996, Jejudo (NIAS); 7 ex., 10-VII-1993, Bukjeju-gun (NIAS); 1 ex., 30-IX-1996, Namweon, Namjeju-gun (NIAS); 1♂, 2♀, 2-IV-1994; 1♂, 2-VI-1994, Pyoseon (JFNHM); 1♂, 9-IV-1987; Andeonk, Andeok-myeon (JFNHM); 1♀, 15-VII-1985, Sang-Chujado (JFNHM); 1♀, 5-VI-1983; 1♀, 4-VI-2000, Yeongsil, Mt. Hanla (JFNHM); more than 300 specimens from various localities of Jejudo (JFNHM). **CB:** 1♂, 25-V-1985, Mt. Weolak-san, Jecheon-si (SCNAE); 1 ex., 24-V-1985, Mt. Weolaksan, Jecheon-si, CB (NIAS); 1 ex., 11-VI-1993, Yeongdong, Yeongdong-gun (NIAS). **CN:** 1♂, 1♀, 13-V-2005, Sang-

ong-ri, Namil-myeon, Geumsan-gun (SCNAE); 2 ex., 8-VII-1996; 4 ex., 20-VIII-1996, Anmyeondo, Taean-gun, CN (NIAS). **GB:** 4♂, 21-V-2005, Bulyeon Velley, Uljin-eup, Yeongyang-gun (SCNAE); 1♂, 2♀, 10-VIII-1998, Mt. Gapjangan, Sangju-si (SCNAE); 1♀, 16-V-1999, Temple Haeinsa, Mt. Gayasan (SCNAE); 1♂, 11-VIII-2001, Mt. Cheongryangsan, Bonghwa-gun (SCNAE); 5♂, 5♀, 6-VI-2000, Naribunji, Is. Ulleungdo (SCNAE); 3 ex., 15-VII-1997, Sinha, Gilan-myeon, Andong-si (NIAS); 1 ex., 6-VII-1993; 2 ex., 11-VII-1993, Gimcheon-si (NIAS). **GG:** 1♂, 24-III-1985, Mt. Ungilsan, Namyangju-si, S.-M. Lee leg. (SCNAE); 1♀, 17-V-1987, Cheongpyeong, Oeseo-myeon, Gapyeong-gun (KWNAE); 1 ex., 10-V-1990, Goyang-si, GG (NIAS); 1 ex., 19-VIII-1998, Mt. Taehwasan, Docheok-myeon, Gwangju-gun (NIAS); 1 ex., 9-VIII-1997, Icheon, GG (NIAS); 1 ex., 12-VI-1996, Namyangju-si, GG (NIAS); 1 ex., 6-IX-1996, Seodun-dong; 1 ex., 3-VIII-1976, Suweon, GG (NIAS); 1 ex., 14-VI-1997, Mt. Yumyeongsan, Yangpyeong, GG. (NIAS); 1 ex., 14-VI-1997, Yangpyeong, Yangpyeong-gun, GG (NIAS); 14 ex., 21-VII-1994, Jayeon-nongweon, Yongin-si (NIAS); 1 ex., 5-VI-1988, Is. Ganghwado, Incheon City (NIAS); 1♀, 24-IX-1994, Gwanggyo, Suweon-si (SNUAE). **GN:** 1♀, 10-II-1984, Jinju-si (SCNAE); 3♂, 16-V-1986, Hadong-eup (SCNAE); 17♂, 25♀, 16-V-1999, Temple Haeinsa, Hapcheon-gun (SCNAE); 1♂, 7-VI-2001, Jungsan, Mt. Jirisan, Sancheong-gun (SCNAE); 2 ex., 27-VII-1994, Gimhae-si (NIAS); 1 ex., 18-VII-1998; 2 ex., 31-VII-1998, Is. Namhaedo, GN (NIAS); 6 ex., 7-VIII-1998, Idong-myeon, Is. Namhaedo (NIAS). **GW:** 1♀, 22-V-2005, Jeomchon, Imgye-ri, Imgye-myeon, Jeongseon-gun (SCNAE); 2♂, 5♀, 23-V-2002, Yongho-ri, Gandong-myeon, Hwacheon-gun (SCNAE); 3 ex., Daegwallyeong, Pyeongchang-gun (NIAS); 16 ex., 18-V-1981, Mt. Obongsan, Chuncheon-si (NIAS); 1 ex., 4-VI-1981, Gangneung-si (NIAS); 1♂, 20-V-1983, Chuncheon Dam; 1♀, 17-VI-1989; 1♀, 24-VI-1989, Chuncheon-si (KWNAE); 1♀, 23-V-1986; 1♂, 25-V-1986, Gangchon, Namsan-myeon, Chuncheon-si (KWNAE); 1♀, 5-VI-1987, Mt. Palbongsan, Seo-myeon, Hongcheon-gun (KWNAE); 2♀, 20-V-1988, Hongcheon (KWNAE); 1 ex., 8-VI-1994, Temple Weoljeongsa, Mt. Odaedan (NIAS); 1♂, 5-VII-1987, Mt. Jara, Province unknown (KWNAE). **JB:** 1♀, 13-V-2005, Weolpyeong-ri, Jeongcheon-myeon, Jinan-gun (SCNAE); 2♂, 2♀, 13-V-2005, Gamdong, Songpung-ri, Yongdam-myeon, Jian-gun (SCNAE); 2♂, 1♀, 3-VI-2004, Buan, Buan-gun (JBNAE); 1♀, 14-VI-1992, Mt. Seonunsan, Gochang-gun (JBNAE); 1♀, 1-X-1988, Oseong-ri, Ongdong-myeon, Jeongeup-si (JBNAE); 1♂, 3-VI-1984, Baemsagol,

Mt. Jirisan, Namweon-si (JBNAE); 1 ♀, 29-III-1989; 1 ♀, 10-V-1989; 1 ♂, 17-VI-1993, Mt. Geonjisan, Jeonju-si (JBNAE); 1 ♂, 18-IX-1999, Mt. Daedunsan, Unju-myeon, Wanju-gun (JBNAE); 1 ex., 10-VI-1975, Mt. Naejangsan, Jeongeup-si, (NIAS); 3 ex., 26-VII-1993; 10 ex., 13-VIII-1975, Muju, Muju-gun (NIAS). **JN**: 5 ♂, 1 ♀, 13-VI-1997, Piagol, Mt. Jirisan, Gurye-gun (SCNAE); 4 ♀, 8 ♂, 2-V-1993; 2 ♀, 8-VII-1998, Is. Nae-Narodo, Gocheung-gun (SCNAE); 4 ♀, 6 ♂, 3-IX-1996, Is. Oe-Narodo, Gocheung-gun (SCNAE); 1 ♀, 28-IV-2001, Eochi, Mt. Baekunsan, Jinsang-myeon, Gwangyang-si (SCNAE); 1 ♀, 13-V-1988; 1 ♀, 18-VIII-1988; 1 ♂, 4-VII-1995; 2 ♀, 1 ♂, 15-IV-1996; 5-IX-1998; 1 ♂, 26-VI-2000; 2 ♂, 2-VI-2001, Suncheon-si (SCNAE); more than 300 specimens collected from various cites of Suncheon areas (SCNAE); 1 ♂, 2 ♀, 23-VI-2000, Is. Dolsan, Yeosu-si (SCNAE); 4 ex., 26-VII-1993; 1 ex., 28-VII-1993, Damyang, Damyang-gun (NIAS); 1 ex., 11-VII-1995, Is. Heuksando, Sinan-gun (NIAS); 6 ex., 10-IV-1986, Mt. Mohusan, Juam-myeon, Suncheon-si (NIAS); 2 ♂, 1 ♀, 15-VIII-1994, Dapgok, Gwangyang-si (SNUAE).

**Distribution.** Korea (incl. Jeju-do), Japan (Hokkaido, Honshu, Shikoku, Kyushu), China (mainland, Manchuria).

**Notes.** First record for Korea by Heyden (1887). This species is widely distributed from the Korean Peninsula including Jeju-do (=Quelpart Island). Very common.

According to Habu (1973: 34), this species feeds on seeds of grass (*Capsella bursapastoris* Medius, *Amaranthus blitum* Linnaeus, & *Setaria viridis* Beauvois). It also feeds on seeds of wheat in northeastern China (Peiyu 1980)

*Anisodactylus (Pseudanisodactylus) signatus*

(Panzer, 1797) 먼지벌레

*Carabus signatus* Panzer, 1797, Faun. germ., 38, no. 4 (Germany).

*Anisodactylus signatus* ab. *tschitscherini* Puel, 1931, Ann. Soc. Ent. France, p. 65. Unavailable name for ICNZ.

*Anisodactylus signatus* ab. *brunneipennis* Puel, 1931, Ann. Soc. Ent. France, p. 65 (Vladiwostock). Unavailable name for ICNZ.

*Anisodactylus signatus* Illiger: Motschulsky, 1860, Schrencks Reisen u. Forsh. Amur., 2: 92 (Amur); Motschulsky, 1860, Etud. Ent., 9: 5 (Japan); Morawitz, 1863, Mém. Acad. Imp. Sci. St.-Petersb., (7), 6(3): 65 (Japan); Bates, 1873, Trans. R. ent. Soc. London, p. 258-259 (Japan); Kolbe, 1886, Archiv f. Naturgesch., 52(1): 176 (Korea); Bates, 1888, Proc. Zool. Soc. Lond., 1888: 369 (Korea); Tschitschérine, 1895, Horae Soc. Ent. Ross., 29: 155 (Korea); Tschit-

schérine, 1897, L'Abeille, 29: 65 (Korea); Matsumura, 1905, Thousand Ins. Japan, 2: 147 (Korea); Kano, 1923, Ins. world (Konchusekai), 27(315): 381 (Korea); Kano, 1924, Ins. world (Konchusekai), 28(326): 349 (Korea); Okamoto, 1924, Bull. Agr. Sta. Gov.-Gen. Chosen, 1(2): 163 (Quelpart Is.); Matsumura, 1931, Illust. Common Ins. Jpn., 3: 9 (Jpn.), 14 (Eng.) (Korea); Yokoyama, 1932, Icon. Ins. Jap. (1st ed.) p. 810 (Korea); Yano, 1941, Nippon no Kôchû, 4(1): 31 (Korea); Kurosa, 1949, Bull. Takarazuka Ins., 60: 10 (Korea).

*Anisodactylus signatus* (Panzer): Schaum, 1860, Natur. Ins. Deutschl., 1, Coleopt., 1: 565-566; Ganglbauer, 1892, Käf. Mitteleur., 1: 363; Tschitschérine, 1897, L'Abeille, 29: 65 (Korea); Jakobson, 1907, Coleoptera Russ., 5: 389; Reitter, 1908, Fauna Germanica, 1: 171; Schaubberger, 1935, Ark. Zool., 27A(4): 2 (NW China); Jedlička, 1942, Arb. Morphol. Taxon. ent. Berlin-Dahlem, 9: 12 (Mandschukuo); Jeannel, 1942, Faun. France, 40: 604, 607; Tanaka, 1958, Mushi, 32: 89; Jedlička, 1960, Anns hist.-nat. Mus. natn. hung., 52: 231 (Korea); Nakane, 1963, Icon. Ins. Jap. Colore Nat., 2, Col., p. 42 (Korea); Habu, 1968, Kontyû, 36: 272 (Korea); Młynar, 1974, Acta zool. cracov., 19(6): 105 (N. Korea); Paik, 1988, Korean J. Entomol., 18(4): 242 (Korea); Paik, 1997b, Korean J. Soil Zool., 2(1): 30 (Korea).

*Anisodactylus (Anisodactylus) signatus* (Panzer): Puel, 1931, Ann. Soc. Ent. France, p. 74 (syn.); Habu, 1973, Fauna Japonica, Harpalini, p. 21-30 (Korea).

*Anisodactylus (Pseudanisodactylus) signatus* (Panzer): Noonan, 1996, Milwaukee Public Museum, Contributions, 89: 17.

**Diagnostic characters.** See above key to species.

**Material examined.** **JJ**: 1 ♂, 1 ♀, 22-VI-1984, Ara-dong, Jeju-si (SCNAE); 1 ♀, 16-VII-1994, Yongsil (850 m), Mt. Hallasan (SCNAE); 1 ♀, 16-X-1987; 4 ♂, 5 ♀, 24-VI-1989, Jeju-do (SCNAE); 1 ♀, 23-X-1997, Seonheul (JFNHM); 1 ♀, 30-IV-1994, Donnaeko, Seogwipo-si (JFNHM); 1 ♂, 12-VI-1999, Mt. Hanla (250 m), Jeju-si (JFNHM); more than 200 specimens from various localities of Jeju-do (JFNHM); 1 ex., 1-XI-1984, Ara, Jeju-si (NIAS); 2 ex., 25-VII-1993, Bukjeju-gun (NIAS); 3 ex., 18-IV-1996, Samdal, Namjuju-gun (NIAS); 1 ex., 14-X-1996, Namjeju-gun (NIAS); 1 ♂, 1 ♀, 15-I-1983, Cheju (SNUAE). **CB**: 1 ♀, 19-V-2001, Mt. Weolaksan, Jecheon (SCNAE); 1 ♂, 2-VIII-1981, Maepo, Danyang-gun (KWNAE); 1 ex., 11-VI-1996, Okcheon, Okcheon-gun (NIAS). **CN**: 2 ex., 28-VII-1975; 1 ex., 2-VII-



1975, Seocheon, Seocheon-gun (NIAST); 1 ex., 29-VII-1996, Is. Anmyeondo, Taean-gun (NIAST). **GB**: 3 ♂, 6 ♀, 6-VI-2000, Naribunji, Is. Ulleungdo (SCNAE); 12 ex., 2-VII-1968, Andong-si (NIAST); 1 ex., 28-VII-1988, Janggal, Andong-si (NIAST); 6 ex., 31-VII-1993; 3 ex., 6-VII-1993; 1 ex., 11-VIII-1991, Bonghwa, Bonghwa-gun (NIAST); 1 ex., 26-V-1989, Geumnan, Weogwan-eup, Chilgok-gun (NIAST); 6 ex., 30-VII-1981, Daegu City (NIAST); 4 ex., 29-IX-1980, Temple Jikjisa, Gimcheon-si (NIAST); 1 ex., 31-III-1999, Yecheon, Yecheon-gun (NIAST); 1 ♂, 24-V-1996, Mt. Geumosan (SJNAE). **GG**: 1 ♂, 3-XI-2000, Temple Jeondeungsa, Is. Ganghwado, Incheon City (SCNAE); 1 ex., 23-X-1991; 1 ex., 23-V-1981, Mt. Surisan, Gunpo-si (NIAST); 1 ex., 10-VI-1982, Gwangreung, Soheul-eup, Pocheon-gun (NIAST); 1 ♂, 2-VIII-1986; 1 ♀, 16-V-1990; 1 ♀, 12-V-1992; 1 ♀, 6-IX-1994, Suweon-si (SNUAE); 5 ex., 08-VII-1996; 7 ex., 5-VI-1984; 4 ex., 8-VIII-1980; 6 ex., 15-III-1973, Suweon (NIAST); 2 ex., 13-III-1989, Ilweol, Suweon-si (NIAST); 1 ♀, 22-VI-1991, Gwanggyo, Suweon-si (SNUAE); 9 ex., 18-VII-1996; Seodun-dong, Suweon-si (SNUAE). **GN**: 1 ♂, 1 ♀, 18-VI-1981, Jinju (Light Trap) (SCNAE); 4 ♂, 1 ♀, 16-V-1999, Temple Haeinsa, Hapcheon-gun (SCNAE); 2 ex., 1-VII-1991, Jinju-si, GN (NIAST). **GW**: 3 ♂, 3 ♀, 23-V-2002, Yongho-ri, Gandong-myeon, Hwacheon-gun (SCNAE); 4 ex., 18-V-1981, Mt. Obongsan, Chuncheon-si (NIAST); 1 ♂, 9-VI-1982, Baekyang-ri, Namsan-myeon, Chuncheon-si (KWNAE); 1 ♂, 1 ♀, 10-VII-1982; 1 ♂, 21-V-1989, Chuncheon (KWNAE); 1 ♂, 23-IV-1989, Chunseong (KWNAE); 1 ex., 18-V-1986, Hoengseong, Hoengseong-gun (NIAST); 5 ex., 1-VIII-1989, Seoseok-myeon, Hongcheon-gun (NIAST); 2 ex., 26-VI-1993, Pyeongchang, Pyeongchang-gun (NIAST); 1 ex., 11-VII-1993, Samcheok (NIAST). **JB**: 2 ♂, 3-VI-2004, Buan, Buan-gun (JBNAE); 1 ♀, 7-V-1984, Chonbuk Univ. Campus, Jeonju-si (JBNAE); 1 ♀, 25-VIII-1988, Mt. Geonjisan, Jeonju-si (JBNAE); 1 ♀, 26-VI-1987, Mt. Moaksan, Jeonju-si (JBNAE); 1 ♀, 3-VI-1989, Sinchon, Geumgok-ri, Jangsu-gun (JBNAE); 1 ♀, 1-X-1988, Oseong-ri, Ongdong-myeon, Jeongeum-si (JBNAE); 1 ex., 13-VIII-1975, Muju-eup, Muju-gun (NIAST). **JN**: 2 ♂, 1 ♀, 1-V-1988; 1 ♂, 9-VII-1995, Temple Seonamsa, Seungju-eup, Sucheon-si (SCNAE); 5 ♀, 15-VI-1988, Cheongso-ri, Seomyeon, Suncheon-si (SCNAE); 1 ♂, 1 ♀, 21-V-1994, Is. Nae-Narodo, Gocheung-gun (SCNAE); more than 200 specimens collected from various cites of Suncheon areas (SCNAE); 3 ♂, 9-IV-1994; Mt. Baekunsan, Gwangyang-si (SCNAE); 2 ♀, 1 ♂, 10-V-2000; 1 ♀, 6-X-2000, Is. Dolsan, Yeosu-si (SCNAE); 2 ♀, 13-VII-1995, Piagol, Mt. Jirisan, Gurye-gun (SCNAE); 1 ex., 26-

VI-1991, Goheung, Goheung-gun, JN (NIAST); 1 ex., 30-VII-1981, Haenam, Haenam-gun (NIAST); 10 ex., 25-V-1986, Suncheon, JN (NIAST). **SE**: 1 ex., 4-VII-1978, Seoul (NIAST); 1 ♂, 22-VII-1985, Mt. Jirisan (SNUAE).

**Distribution.** Korea (incl. Jeju), Japan (Hokkaido, Honshu, Shikoku, Kyushu), China, Russia (Far East, Sakhalin, Siberia, Caucasus), Mongolia, Europe.

**Notes.** Belongs to subgenus *Pseudanisodactylus* Noonan, 1973, but formerly treated as a member of subgenus *Anisodactylus* s. str. (e.g., Habu 1973: 20).

First record for the Korean Peninsula by Kolbe (1886). Widely distributed in the Korean Peninsula including Jujudo (=Quelpart Island). Very common species, and occurs in woodless landscapes, common in fields. Attracted to light at night.

This species feeds on seeds of wheat, barley, and grasses (Habu 1973: 25; Peiyu 1980).

#### Subtribe Harpalina Bonelli, 1810 머리던지벌레 아족

Harpalii Bonelli, 1810, Obs. Ent., 1, Tab. Syn.

Type-genus: *Harpalus* Latreille, 1802.

Diorychi Csiki, 1932, Coleopt. Cat., 121: 1193.

Type-genus: *Dioryche* W.S. MacLeay, 1825. Treated as a junior synonym of Harpalina by Habu, 1973: 66 & confirmed by Noonan, 1976: 28.

Ophonini Antoine, 1959, Mém. Soc. Sci. Nat. Phys. Maroc, Zool. (N.S.), 6: 330.

Type-genus: *Ophonus* Dejean, 1821. Synonymized by Habu, 1973: 66. For other synonyms, see Habu (1973) and Noonan (1976).

**Diagnostic characters.** The chief diagnostic characters of the subtribe Harpalina are clypeus and labrum symmetric, penultimate segment of labial palpi with more than three setae on inner margin; transverse suture between mentum and submentum complete. Elytra with complete basal border. Fore tarsi of males of most species with some arcticles laterally expanded and with biseriate vestiture. For redescription, see Habu (1973) & Noonan (1976).

**Notes.** This is the most diverse of the harpaline subtribes. The Harpalina is often divided into two genus groups, *Harpalus*-group and *Selenophorus*-group. According to van Emden (1958), only the *Selenophorus*-group, whose males have the ostium of the aedeagus located dorsally, are represented in South America. Noonan (1976) divided into 8 genus-groups, and the two groups, *Selenophori* and the

Amblystomi, placed to Harpalina. However, the genus group Amblystomi sensu Noonan (1976) is treated as a full subtribe by some authors (e.g., Habu 1973; Kataev *et al.* Löbl & Smetana 2003, etc.). Ball & Bousquet (2001: 95) added one more genus group Trichotichni together with several genera into the genus group Selenophori by Noonan (1977).

Members of this group occur in all zoogeographical regions, mostly in tropical and temperate areas. Approximately 60 genera are known. In Korean Peninsula 5 genera are found. Of these, *Nipponoharpalus* Habu is treated as a distinct genus by the frontal impression short and more or less extending in postero-lateral direction like *Trichotichnus* Morawitz, hind femora with 2 hairs and elytra without dorsal pores, formerly regarded as a subgenus of *Harpalus* Lareille. Also, *Ophonus* Dejean is sometimes treated as a distinct genus, other times regarded congeneric with *Harpalus* by some researchers.

Genera and subgenera belonging to subtribes may be identified primarily by use of the faunal works for Korean beetles: Such as Habu (1973) for Japanese fauna; Lafer (1989, 1993, 1996a, b) for Russian Far East and adjacent area; Reitter (1900) for Palaearctic taxa with keys; Tschitschérine (1900, 1901, 1902) for Palaearctic genera with keys; Jakobson (1907) for Russian and European taxa; Freude *et al.* (2004) for mid Europe; Lindroth (1968) and Ball & Bousquet (2001) for North American taxa; and etc.

**Key to the genera of Harpalina (with expected genera)**

- 1(2) Upper surface of body throughout with punctuations and erect hairs. .... *Ophonus* Dejean, 1829  
(구멍머리먼지벌레 속)
- 2(1) Upper surface of body without punctation.
- 3(12) Dorsal side glabrous.
- 4(5) Elytra well spinous at apex, interval 3 with series of several pores; mandibles relatively long; frontal impressions more or less distinctly extending in posterolateral direction. .... *Coleolissus* Bates, 1892
- 5(4) Elytra generally rounded at apex, interval 3 with one pore or without pore, rarely with some pores.
- 6(10) Frontal impression short, not extending in posterolateral direction; hind femora with at least three setae along hind margin; paraglossae pubescent. .... *Harpalus* Latreille, 1802 (머리먼지벌레 속)
- 7(8) Frontal impression more or less extending in posterolateral direction; hind femora with two setae along hind margin; paraglossae glabrous.
- 8(9) Body narrow, head small; mandibles relatively long;

- scutellar striole short; mentum shallowly emarginate, median tooth long. .... *Oxycentrus* Chaudoir, 1854 (긴머리먼지벌레 속)
- 9(8) Body moderately to well wide, head not small; mandibles less long; scutellar striole more or less developed; mentum moderately emarginate, median tooth not so long.
- 10(11) Elytra more or less iridescent, microsculpture consisting of fine close transverse lines or invisible, interval 3 with one dorsal pore; fore tibiae with three spines at anterior outer margin. .... *Trichotichnus* Morawitz, 1863 (윤머리먼지벌레 속)
- 11(10) Elytra not iridescent, microsculpture forming meshes, interval 3 without dorsal pore; fore tibia with more than three spines at outer margin. .... *Nipponoharpalus* Habu, 1973 (일본머리먼지벌레 속)
- 12(3) Dorsal side pubescent.
- 13(14) Frontal impressions extending in posteriolateral direction; eyes developed, so postgenae indistinct; elytra with series of some pores on intervals 3, 5 and 7. .... *Parophonus (Hyparpalus)* Ganglbauer, 1891
- 14(13) Frontal impressions short, not extending in posterolateral direction; postgenae more or less developed.
- 15(16) Mandibles more or less exposed at apical part, hooked at apex, right and left mandibles intersecting; mentum with median tooth. .... *Harpalus* (partim)
- 16(15) Mandibles almost hidden beneath labrum, short, not hooked at apex, both mandibles hardly intersecting; mentum without median tooth. .... *Platymetopus* Dejean, 1829 (털머리먼지벌레 속)

**Genus *Harpalus* Latreille, 1802 머리먼지벌레 속**

*Harpalus* Latreille, 1802, Hist. Nat. Crust. et Lins., 3: 92.

Type-species: *Carabus proteus* Paykull, 1790 (= *Carabus affinis* Schrank 1781), by subsequent designation of Andrewes, 1935: 19. For other synonymy, see Habu, 1973 & Noonan, 1976.

**Diagnostic characters.** It is similar to the genus *Harpalobrachys* Tschitschérine, 1899. However, Noonan (1991) considered it as a junior synonym of *Harpalus*. The genus *Ophonus* Dejean, 1821, is also treated as a junior synonym of *Harpalus* by Lorenz (1998). A very large genus with species of moderate to rather large size, oblong; elytra usually with one or some discal setae in interval 3, and the “non-crossed” epipleura; the absence of a seta at hind-angle of pronotum. For more details, see Habu (1973) and Noonan (1991).

**Notes.** According to Bousquet and Laroche (1993: 230),

an earlier type species fixation of this genus has been overlooked by Latreille (1810: 426). Because the acceptance of Latreille's designation would require extensive nomenclatural changes at the subgeneric level with the genus *Harpalus* Latreille. However, Habu (1973) followed Motschulsky's view. The case is to be referred to the Commission for a ruling (see ICZN, Article 70.2).

This genus of more than 450 species is principally Holarctic, but has precinctive species in the Oriental and Afro-tropical Regions. The species are arranged in about 50 subgenera or groups of subgeneric rank (Ball & Bousquet 2001: 97).

The concept of the genus and its subgeneric division are not settled. Kataev (1995 in Kryzhanovskij *et al.*) rejected the suprageneric ranks of this very diverse genus *Harpalus*. Later Kataev *et al.* (2003 in Löbl & Smetana) arranged this group as several subgenera. The partial revisions of the Palaearctic species groups are published by Kataev since 1987.

The subgenus *Nipponoharpalus* Habu is regarded as a full genus (*sensu* Kataev 1995 in Kryzhanovskij *et al.* p. 139). The nominotypical subgenus contains most species of the genus, assigned to several tens of species groups, many of which were, or are, considered as subgenera (*cf.* Kryzhanovskij *et al.* 1995, Noonan 1976). Ball & Bosquet (2001) considered *Euharpalops* Casey, 1914 (= *Haploharpalus* Schaubberger, 1926) and *Harpalobius* Reitter, 1900 (= *Harpalellus* Lindroth, 1968) as a distinct subgeneric rank each other. Noonan (1991) combined the *Harpalobrachys* Tschitscherine, 1899, with *Harpalus* that was treated previously as a full genus, and downgraded to subgeneric rank.

Most *Harpalus* are pronouncedly xerophilous and many are nocturnal, buried in the soil during daytime. Their food, to a large extent, consists of vegetable matter, i.e., seeds, pollen, fruits, etc. or both of small insects. For synonymy and additional references, see Csiki (1932), Noonan (1976, 1991), and for more details of Korean species referred to Habu (1973), Młynar (1974), and Lafer (1989, 1996), *ect.*

The following simple key rather easily distinguishes subgenera and species for the Korean Peninsula species.

#### Key to the subgenera and species from Korea

(Modified from literature)

- 1(62) Tarsi glabrous on dorsal side.
- 2(5) Pronotum on the lateral margin in anterior part with 1-3 setae, with 2-3 short setae in the apical angles; outer angle of protibiae extended as a lobe, row of spines on anterior outer margin composed of rather many spines (Subgenus *Loboharpalus* Schaubberger).
- 3(4) Pronotum moderately convex, weakly narrowed towards base (PWM/PWB: 1.03), at lateral margin in apical half with 1-3 setae and with 2-3 short setae at apical angles, epipleura pubescent at hind angles. Reddish brown. L. 10.5-12.5 mm. SW Primorskij kraj; Japan (Honsu), Korea, E China (to Szechwan). Sandy coasts, banks of pond or rivers. .... *H. (Loboharpalus) rubefactus* (붉은머리먼지벌레)
- 4(3) Pronotum strongly convex, strongly narrowed toward base (PWM/PWB: 1.08-1.17), with one seta at lateral margin in apical half and without setae at apical angles. Black, antennae and legs brown or reddish brown. L. 9.0-16.0 mm. Sakhalin; Japan; Korea. Sandy coasts, banks of rivers or mountain valley. .... *H. (Loboharpalus) platynotus* (납작머리먼지벌레)
- 5(2) Pronotum only with 1 lateral seta on lateral margin; outer angle of protibiae usual or slightly expanded; body never entirely yellowish brown.
- 6(9) Frontal impressions extending in postero-lateral direction
- 7(8) 3rd elytral interval with 1 discal setiferous pores (Subgenus *Zangoharpalus* Huang). A single species occur. Rather easily recognized by the small body. Legs pale, rarely femora infuscated; elytra impunctate; base of pronotum evenly and densely punctate throughout. Upper surface of body unicolourous, black, often with greenish or coppery tinge. .... *H. (Z.) tinctulus luteicornoides* (대마머리먼지벌레)
- 8(7) Elytra without discal setiferous pores; elytra on outer intervals with fine punctuation, shiny in both sexes; hind-angles of pronotum rectangular, base throughout with dense punctures. Black. Antennae and tarsi dark brown. L. 10.5-11.7 mm. .... *Nipponoharpalus discrepans* (일본머리먼지벌레)
- 9(6) Frontal impressions not extending in postero-lateral direction (Subgenus *Harpalus* s. str.).
- 10(11) Elytra without basal setiferous pore. The outer angle of protibia very porrect and reaching the apex of the 1st tarsal segment. Length 8.0 mm. North Korea; NE. China; Mongolia; Transbaicalia; Russian Far East. .... *H. (Harpalus) longipelmatus* (섬머리먼지벌레)
- 11(10) Elytra with basal setiferous pore. Body usually larger.
- 12(21) Abdominal sternites IV and V with additional setae outside from usual pair of setae; meta-femora with 6 or more setae along hind margin.

Harpalini from Korea

- 13(16) Fore tibiae with 1 thick spine at ventro-apical prominence.
- 14(15) Hind-angles of pronotum nearly rectangular, punctates at basal area. Black. Larger, 13.0-16.0 mm. Korea, Japan, NE & E China, Russian Far East. ....  
 ..... *H. (Harpalus) corporosus* (검은머리먼지벌레)
- 15(14) Pronotum strongly transverse (PWM/PL: 1.64-1.66), hind-angles nearly rectangular, without punctures. Brownish black. Smaller, 8.8-10.5 mm. North Korea; N. China; Mongolia; Causasus; Europe. ....  
 ..... *H. (Harpalus) froelichi* (들판머리먼지벌레: 신칭)
- 16(13) Fore tibiae with two thick spines at ventro-apical prominence.
- 17(20) Hind angles of pronotum nearly rectangular with sharped or narrow rounded tip; pronotal base smooth or with faintly fine punctuation. Black, without green or bronze tinge.
- 18(19) Pronotum widest at the middle, obviously narrowed to base, hind-angles not rounded, basal areas smooth or with faintly fine punctures; elytra shiny in male, mat in female. Larger, 12.5-15.5 mm. Korea, Russian Far East. ....  
 ..... *H. (Harpalus) tichonis* (산마루머리먼지벌레: 신칭)
- 19(18) Basal areas of pronotum smooth, almost flattened, basal fovae narrow with very fine punctures or not, basal half of side margins almost straight; elytral striae simple or with very fine punctures, intervals flattened. Larger, 13.0-17.0 mm. North Korea, Siberia, Central Asia, Europe. ....  
 ..... *H. (Harpalus) zabroides* (국경머리먼지벌레)
- 20(17) Hind-angles of pronotum broadly rounded, with large dense punctures on base throughout; basal fovae hardly visible (*crates*-group). Upper surface of body usually with metallic green or bronze tinge. Larger, 12.6-16.0 mm. Korea; Japan; China; Russian Far East. ....  
 ..... *H. (Harpalus) crates* (한국머리먼지벌레)
- 21(12) Abdominal sternites IV and V with only one pair of setae, additional setae absent; hind femora usually with less than six setae along hind margin.
- 22(25) Elytra on outer intervals and near apex with dense punctuation and short, sometimes hardly visible hairs.
- 23(24) Elytra with deep sinuation before apex. Dorsum of body bright, metallic green or brassy, venter, antennae and legs yellowish or reddish brown, femora darkened sometimes. Larger, 10.0-12.0 mm. N. Korea; Russian Far East, Caucasus, & European part; Kazakhstan, Middle Asia, Mongolia, Europe, N America. In open areas in the forests zone. ....  
 ..... *H. (Harpalus) affinis* (어리머리먼지벌레)
- 24(23) Elytra without sinuation before apex. Black. Antennae and legs brownish black. Elytra with very fine hairs. Length 7.6-10.5 mm. Japan (Hokkaido); Russian Far East. ....  
 ..... *H. (Harpalus) torridoides* Reitter, 1900
- 25(22) Elytra without punctulation and hairs, if fine punctuation present, then without hairs and legs bicolor (*H. fuliginosus*).
- 26(33) Elytra with some discal pores in interval 3.
- 27(28) Abdominal sternites IV and V with hairs. Hind femora with 6 setae along hind margin; pronotum with obvious or slightly rounded hind angles at tip; elytral discal pores fine, situated along all length of interval. Dark brown, elytra usually with yellow spots of irregular shape, mat in both sexes. Length 8.8-9.5 mm. Korea, Japan, China, Mongolia, Russian Far East. Occurs in meadows or fields. ....  
 ..... *H. (Harpalus) pallidipennis* (알락머리먼지벌레)
- 28(27) Abdominal sternites IV and V without hairs. Hind femora usually with 3 setae along hind margin; hind-angles of pronotum broadly rounded; interval 3 of elytra with 2-7 foveate discal pores, situated usually behind the middle. Black, legs and antennae yellow or black; elytra shiny in male.
- 29(30) Elytra comparatively longer (EL/EW: 1.46-1.49), without sinuation behind humeral tooth; aedeagus with long, thin curved apical lamella. Black, legs and antennae yellow to black. Length 8.6-11.4 mm. Korea, Japan, N. China, Mongolia, Siberia, Russian Far East, Europe. Occurs in mountain forest. ....  
 ..... *H. (Harpalus) laevipes* (온달머리먼지벌레)
- 30(29) Elytra comparatively shorter (EL/EW: 1.41-1.45), with weak sinuation behind large humeral tooth; aedeagus with short apical lamella.
- 31(32) Elytral apical sinuation weak and without denticle at outer margin, basal setiferous pores distinct; hind coxae without additional setiferous pores; endophallus with one large sclerite and with some group of small spine-like sclerites. Black, antennae and legs reddish brown. Length about 8.4 mm. North Korea, Russian Far East. ....  
 ..... *H. (Harpalus) farkaci* (몽퉁머리먼지벌레: 신칭)
- 32(31) Elytral apical sinuation noticeably deeper and with tooth at outer margin, basal setiferous pores absent; hind coxa at inner area with one or some supplementary setae; endophallus without large sclerite. Length 8.0-10.6 mm. Korea, China. ....  
 ..... *H. (Harpalus) tibeticus* (서장머리먼지벌레)
- 33(26) Elytra with one discal pore in interval 3.
- 34(51) Pronotum densely punctate at basal area, reaching to

- lateral margins, or at least present on hind angles near lateral margin.
- 35(36) Abdominal sternites IV and V with hairs. Hind-angles of pronotum weakly obtuse, rounded at tip, lateral margins before them rectilinear. Black, upper surface usually bright, metallic green, brassy, blue or blackish blue. Length 9.0-11.0 mm. North Korea, northern China, Mongolia, Transbaicalia, Central & Middle Asia, Europe, NW Africa. Occurs in forest. .... *H. (Harpalus) distinguendus* (초록머리먼지벌레)
- 36(35) Abdominal sternites IV and V without hairs.
- 37(38) Elytral interval 7 (sometimes also interval 5) with short row of punctures near apex. Elytral intervals 8 and 9, and also elytral apex often with short hairs (without punctures). Apical sinuation faint. Black, elytra sometimes also pronotum blue or green. Antennae and legs brownish red. Length, 9.8-10.9 mm. North Korea; China; Russian Far East, Causasus, Siberia, & European part; Mountains of Middle Asia; Europe. Glades in forests. .... *H. (Harpalus) rubripes* (백두머리먼지벌레: 신칭)
- 38(37) Elytral intervals 7 and 5 without punctures near elytral apex, outer intervals and elytral apex without hairs.
- 39(40) Hind-angles of pronotum rectangular, not rounded at tip. Pronotal base with dense and deep punctures throughout; elytra faintly sinuate. Larger, 8.6-11.2 mm. Korea, Russian Far East. .... *H. (Harpalus) nigrans* (흑머리먼지벌레)
- 40(39) Hind-angles of pronotum rounded at tip.
- 41(46) In male, elytra with strongly shiny, with reticulation or without (polished), in female mat.
- 42(43) Elytra with obviously reticulation in male; hind-angles of pronotum broadly rounded, its surface between basal fovea and lateral margin convex, with sparse fine punctures. Black. Legs black with brown tarsi, sometimes brownish red. Larger, 11.5-13.8 mm. Korea, Mongolia, Russian Far East. Occurs in forest. .... *H. (Harpalus) major* (하늘머리먼지벌레)
- 43(42) In male, elytra with gentle, not obvious isodiametric reticulation or without. Lateral margins behind middle often sinuate, hind angles rectangular, narrow rounded; pronotal base between basal fovea and lateral margin with dense punctures. Smaller, less than 11.0 mm.
- 44(45) Lateral margins of pronotum more or less rectilinear in hind half, lateral margins of elytra less rounded, intervals of elytra less convex. Length 9.0-11.2 mm. Korea, Japan, Russian Far East, Middle Asia, Europe. Occurs in forest. .... *H. (Harpalus) latus* (산머리먼지벌레: 신칭)
- 45(44) Lateral margins in hind half weakly sinuate, lateral margins of elytra more rounded, elytral intervals more convex. Length 8.4-10.0 mm. Korea, Amur. .... *H. (Harpalus) ussuricus* (북해머리먼지벌레)
- 46(41) In male, elytra slightly shiny or mat due rough isodiametric reticulation, almost as in female.
- 47(48) Lateral margins of pronotum explanate, lateral furrow strongly dilated towards hind angle. Pronotal base, often also lateral furrow, with dense rough punctures. Head large. Outer elytral intervals often with very fine punctures (without hairs) in male. Black, legs bicolor. Length 10.0-11.0 mm. Korea, Japan, Russian Far East, Europe, N. America. .... *H. (Harpalus) solitarius* (천지머리먼지벌레: 신칭)
- 48(47) Lateral margins of pronotum not explanate. Pronotal base with fine and sparse punctures between basal fovea and lateral margin. Head not swollen.
- 49(50) Hind angles of pronotum obtuse, widely rounded, lateral margins before them arcuate convex. Pronotal apex arcuate emarginate, apical angles wider, rounded at tip. Black, antennae, tibiae (except blackened apex sometimes) and tarsi pale brown. Length 8.0-10.0 mm. Korea, Russian Far East. .... *H. (Harpalus) chasanensis* (자산머리먼지벌레)
- 50(49) Hind-angles of pronotum nearly rectangular, rounded, lateral margins before them rectilinear or faintly sinuate, pronotal apex emarginated almost trapezium-shaped, apical angles narrower rounded. Black, antennae and tarsi pale brown. Length 10.0-11.0 mm. Korea, Japan, NE China, Russian Far East. .... *H. (Harpalus) tarsalis* (애머리먼지벌레)
- 51(34) Punctulation at pronotal base absent or present only near basal foveae, or punctures very fine, not obvious.
- 52(53) Pronotum more or less trapezium-shaped, widest near base, apical angles obtuse and slightly rounded. Upper surface light brown to brownish black, antennae and legs light brown; hind angles of pronotum lighter than disk. Length 6.8-8.5 mm. North Korea, China, Mongolia, Russian Far East, Siberia, Causasus, Turkmenia. Occurs in steps. .... *H. (Harpalus) amplicollis* (풀머리먼지벌레: 신칭)
- 53(52) Pronotum widest at middle or just in front of middle.
- 54(55) Pronotum with rectilinear or straightly sinuate lateral margins in hind half (slightly cordate) with hind-angles rectangular, not rounded. Body black. Tarsi, sometimes also base of tibiae brown. Palpi and two basal antennal segments light brown, the other antennal segments black.

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- kened. Head and pronotum shiny, elytra mat in both sexes. Larger, 8.5-9.7 mm. Korea, Mongolia, Russian Far East. Occurs in forest. ....  
 ..... *H. (Harpalus) egorovi* (극동머리먼지벌레)
- 55(54) Pronotum with lateral margins slightly convex or rectilinear in hind half, with hind angles rectangular or obtuse, rounded.
- 56(59) Larger, more than 9.0 mm.
- 57(58) Hind-angles of pronotum obvious, widely rounded, lateral margins before them arcuate convex. Pronotal apex arcuate emarginate, apical angles wider rounded at tip. Black, antennae, tibiae (sometimes except blackened apices) and tarsi pale brown. Length 8.0-10.0 mm. (also, see column 49). ....  
 ..... *H. (Harpalus) chasanensis* (자산머리먼지벌레)
- 58(57) Hind-angles of pronotum almost rectangular, rounded, lateral margins before them reticulate or slightly sinuate, apex emarginate almost trapezium-shape, apical angles rounded narrower). Black, antennae and tarsi pale brown. Length 10.0-11.0 mm. (also, see column 50) ....  
 ..... *H. (Harpalus) tarsalis* (애머리먼지벌레)
- 59(56) Smaller, less than 9.0 mm.
- 60(61) Hind coxa without setiferous pore at inner (preapical) margin. Lamella of penis longer, endofallus with 3 fields of spines. Body black, elytra often dark brown or pitchy brown. Palpi, antennae, tarsi (often legs entirely) pale brown. 7.1-8.7 mm. Korea, Japan, NE China, Russian Far East, Mongolia. On meadows and fields. ....  
 ..... *H. (Harpalus) bungei* Chaudoir (애기민머리먼지벌레)
- 61(60) Hind coxa with 1 setiferous pore at inner margin. Lamella of penis shorter, endofallus with 2 fields of spines. Color as in previous species. 6.8-7.4 mm. Korea, Japan, China, Russian Far East, Mongolia, Europe. On open places in forest zone. ....  
 ..... *H. (Harpalus) modestus* Dejean (민머리먼지벌레)
- 62(1) Tarsi setose on dorsal side; dorsal side of body glabrous, or pronotum and elytra pubescent wholly or partially.
- 63(64) Elytral intervals 1, 3, 5 and 7 with series of some setae besides pubescence; pronotum and elytra densely pubescent; tooth of mentum short; palpigerae not carinate (Subgenus *Cephalomorphus* Tschitschérine). A single species occur. Head very large. Tooth of mentum short, sometimes indistinct. Upper surface pitchy-brown to black, palpi, antennae and legs reddish brown. Length 17.5-24.0 mm. Korea, Japan, China, Russian Far East. ....  
 ..... *H. (Cephalomorphus) capito* (머리먼지벌레)
- 64(63) Elytral intervals without series of setae; tooth of mentum distinct; palpigerae often with sharp carina on ventral side.
- 65(66) Tarsal segment 5 spinose and setose ventrally (Subgenus *Platus* Motschulsky). A single species occur. Hind angles of pronotum rectangular, acute at tip, basal area densely punctate. Upper surface of body black, shining, elytra mat. Tarsus and antennae brown. Length 12.5-14.2 mm. Korea, Japan, China, Mongolia, Russian Far East, Siberia, Middle Asia, Caucasus, Europe. Very rare species in Korea. ....  
 ..... *H. (Platus) calceatus* (큰가시머리먼지벌레)
- 66(65) Tarsal segment 5 with only setose ventrally (Subgenus *Pseudoophonus* Motschulsky).
- 67(66)(79) Elytra wholly pubescent.
- 68(71) Pronotum densely punctate throughout, with median line very fine. Length of body more than 15.0 mm.
- 69(70) Femora and tibiae black. Lateral sides of pronotum weakly rounded, hind-angles obtuse, hardly rounded at tip. Black, sides and base of pronotum, elytra with yellowish hairs. Antennae, fore and mid tarsi brown. Length 17.9-19.0 mm. Korea, China, Japan, Russian Far East. Occurs in forest. ....  
 ..... *H. (Pseudoophonus) roninus* (설악머리먼지벌레)
- 70(69) Legs brown. Lateral sides of pronotum weakly rounded, hind angles obtuse, feebly rounded. Dark brown, lateral sides and base of pronotum, elytra with yellowish hairs. Length 15.0-18.0 mm. Korea, Japan, China, Russian Far East. Occurs in forests. ....  
 ..... *H. (Pseudoophonus) ussuriensis* (우수리머리먼지벌레)
- 71(68) Pronotum not punctate in the centre of disk or only sparsely punctate. Length of body less than 15.0 mm.
- 72(77) Hind angles of pronotum more or less rounded. Elytra dull.
- 73(74) Pronotum at each side with some supplementary lateral setae besides usual one. Tempora with hairs behind eyes. Dorsum of body pitchy brown or brown, lateral sides and base of pronotum, elytra with yellowish hairs. Length 12.5-15.0 mm. Korea, Japan, China, Mongolia, Russian Far East. Occurs in forest. ....  
 ..... *H. (Pseudoophonus) eous* (가슴털머리먼지벌레)
- 74(73) Pronotum at each side only with one lateral seta.
- 75(76) Clypeus only with two usual setae. Pitchy brown. Length 9.0-12.5 mm. Korea, Japan, China, Mongolia, Russian Far East, Central Asia, Europe. ....  
 ..... *H. (Pseudoophonus) griseus* (찌앗머리먼지벌레)
- 76(75) Clypeus besides two usual setae with 1-2 pairs supplementary

- mentary setae. In others practically not distinguishable from previous species. Length 10.0-12.6 mm. Korea, Japan, China, Russian Far East, Oriental Regions. ....  
 ..... *H. (Pseudoophonus) jureceki* (수염머리먼지벌레)
- 77(72) Hind-angles of pronotum obtuse, more or less distinct, sometimes with denticle.
- 78(77)(78) Hind-angles of pronotum usually without denticle and thin in lateral view as in *H. tschiliensis*. Elytra shiny. Black, labrum, mandibles dark reddish brown, palpi, antennae and legs brown. Length 10.8-15.6 mm. Japan (Honshu, Kyushu). ....  
 ..... *H. (Pseudoophonus) pseudophonoides*  
 Schauberger [영실머리먼지벌레]
- 79(78)(77) Hind angles of pronotum with big denticle as in *H. coreanus*, its anterior margin goes under lateral margin of pronotum in lateral view. Brownish black, antennae and legs reddish brown. Length 13.5 mm. Korea, Japan, China. ....  
 ..... *H. (Pseudoophonus) aenigma* (청동머리먼지벌레)
- 80(79)(67) Elytra glabrous or with hairs along margins.
- 81(86) Hind-angles of pronotum obtuse, more or less rounded.
- 82(83) Outer elytral intervals with hairs. Length 12.0-12.5 mm. Korea, Japan. ....  
 ..... *H. (Pseudoophonus) babai* (탐라머리먼지벌레)
- 83(82) Outer elytral intervals without hairs.
- 84(85) Femora and tibiae reddish to yellowish brown. Apical spur of fore tibiae fairly dentate at either side. Elytra with impunctate striae, three outer intervals finely punctate and with short but obvious pubescence. Pitchy brown to black, antennae and legs reddish to yellowish brown. Length 9.8-15.5 mm. Korea, Japan, China, Russian Far East. Occurs in forest and woodless landscapes. ....  
 ..... *H. (Pseudoophonus) sinicus* (중국머리먼지벌레)
- 85(84) Femora and tibiae black. Apical spur of fore tibiae simple and slender. Elytra with distinctly crenulate striae (bottom of striae with very minute and dense punctures), three outer intervals finely punctate but without pubescence. Black, shiny in male, dull in female. Tarsi and antennae reddish brown. Length 10.0-13.0 mm. Korea, China. Occurs in forest. ....  
 ..... *H. (Pseudoophonus) davidi* (민들머리먼지벌레)
- 86(81) Hind-angles of pronotum obtuse, not rounded at tip, in some species with denticle.
- 87(90) Hind angles without denticle, or with faint denticle, lateral margin of pronotum at hind angles in lateral view thin.
- 88(89) *Metepisterna* longer, proportion of length at outer margin to width of anterior margin 1.34-1.50. Elytral interval 7 at apical area usually with two supplementary pores, rarer only with one supplementary pore. Elytra glabrous. Dark brown. Length 10.0-13.0 mm. Korea, Japan, China, Mongolia, Russian Far East. ....  
 ..... *H. (Pseudoophonus) simplicidens*  
 (서울머리먼지벌레)
- 89(88) *Metepisterna* shorter, its proportion of length to width 1.08-1.30. Elytral interval 7 at apical area with 1-3 supplementary discal pores. Dark brown to black, antennae and legs reddish brown. Length 9.5-14.5 mm. Korea, Japan, China, Mongolia, Russian Far East. Occurs in meadows, fields, forests. ....  
 ..... *H. (Pseudoophonus) pastor pastor*  
 (만주머리먼지벌레)
- 90(87) Hind angles with strong denticle; anterior edge of denticle usually not connected with lateral margin of pronotum and placed below (in lateral view), usually in *P. coreanus*.
- 91(92) Apical spur of fore tibiae simple. Larger, 13.0-16.0 mm. Korea, China, Russian Far East. Occurs meadows, fields, forest. ....  
 ..... *H. (Pseudoophonus) coreanus* (고려머리먼지벌레)
- 92(91) Apical spur of fore tibiae well dentate at margins.
- 93(94) Elytra densely pubescent at apical area and intervals 8 to 10; elytral disc without microsculpture (isodiametric at apex and along lateral margins of elytra, transverse on elytral disc); Pitchy brown or nearly black, antennae and legs brown. Length 9.0-14.0 mm. Korea, Japan, China, India. Occurs in fields, meadows, forests. ....  
 ..... *H. (Pseudoophonus) tridens* (꼬마머리먼지벌레)
- 94(93) Elytra glabrous, microsculpture well developed. Length 9.7-13.0 mm. Korea, China. ....  
 ..... *H. (Pseudoophonus) suensoni* (청도머리먼지벌레)

**Subgenus *Harpalus* Latreille, 1802** 어리머리먼지벌레 아속  
*Harpalus* Latreille, 1802, Hist. Nat. Crust. et Lins., 3: 92.

Type-species: *Carabus proteus* Paykull, 1790 (= *Carabus affinis* Schrank, 1781), by subsequent designation of Andrewes, 1935: 19.

**Diagnostic characters.** See above generic diagnostic characters.

**Notes.** A very large and diverse subgenus, often divided into several subgenera by some authors (Lafer 1989, 1997 & etc.).

- Harpalus (Harpalus) affinis* (Schrank, 1781)**  
 어리머리먼지벌레 (신칭)
- Carabus affinis* Schrank, 1781, Enum. Ins. Austr., p. 212 (Austria).
- Carabus aeneus* Fabricius, 1775, Syst. Ent., p. 245 (Germany), Preoccupied, nec De Geer, 1774: 98 (*Carabus*). Treated as a junior synonym of *affinis* by Csiki, 1932: 1133.
- Carabus latus* Goeze, 1777, Entomol. Beit., 1: 665. Preoccupied, nec Linnaeus, 1758: 415 (*Carabus*). Treated as a junior synonym of *affinis* by CPC, 2003: 372.
- Buprestis viridulus* Geoffroy, 1785, Ent. Paris, 1: 52. Treated as a junior synonym of *affinis* by Csiki, 1932: 1133.
- Carabus proteus* Paykull, 1790, Monog. Carab., p. 115. Treated as a junior synonym of *affinis* by Csiki, 1932: 1133.
- Harpalus viridiaeneus* Palisot de Beauvois, 1805, Ins. Afr. Amer., p. 108 (Pennsylvania). Treated as a junior synonym of *affinis* by Csiki, 1932: 1135.
- Harpalus viridis* Say, 1823, Trans. Amer. Philos. Soc., 2: 31 (Unknown). Treated as a junior synonym of *affinis* by Csiki, 1932: 1135.
- Harpalus aeneopiceus* Stephens, 1828, Illust. Brit. Ent., 1: 156 (London). Treated as a junior synonym of *affinis* by Kataev *et al.* in Löbl & Smetana, 2003: 371.
- Harpalus concinnus* Stephens, 1828, Illust. Brit. Ent., 1: 156 (London, Norfolk). Treated as a junior synonym of *affinis* by Kataev *et al.* in Löbl & Smetana, 2003: 371.
- Harpalus confinis* Stephens, 1828, Illust. Brit. Ent., 1: 156 (London, Suffolk). Treated as a junior synonym of *affinis* by Kataev *et al.* in Löbl & Smetana, 2003: 371.
- Harpalus dentatus* Stephens, 1828, Illust. Brit. Ent., 1: 156 (London, Suffolk). Treated as a junior synonym of *affinis* by Kataev *et al.* in Löbl & Smetana, 2003: 372.
- Harpalus subcaeruleus* Stephens, 1828, Illust. Brit. Ent., 1: 157 (London). Treated as a junior synonym of *affinis* by Kataev *et al.* in Löbl & Smetana, 2003: 372.
- Harpalus semipunctatus* Dejean, 1829, Spec. gén. Col., 4: 268. Treated as a junior synonym of *affinis* by Reitter, 1900: 85.
- Harpalus confusus* Dejean, 1829, Spec. gén. Col., 4: 271. Treated as a junior synonym of *affinis* by Reitter, 1900: 85.
- Harpalus assimilis* Dejean, 1829, Spec. gén. Col., 4: 272 (Amér. sept.). Treated as a junior synonym of *affinis* by Csiki, 1932: 1135.
- Harpalus borysthenticus* Krynicki, 1832, Bull. Soc. Nat. Mosc., 5: 74. Treated as a junior synonym of *affinis* by Csiki, 1932: 1134.
- Harpalus transparens* Motschulsky, 1844, Mém. Acad. Sci. St.-Pétersb., 5: 210. Treated as a junior synonym of *affinis* by Csiki, 1932: 1134.
- Harpalus bifoveolatus* Küster, 1846, Käfer Mitteleur., 4: no. 25. Treated as a junior synonym of *affinis* by Csiki, 1932: 1134.
- Harpalus limbopunctatus* Fuss, 1858, Progr. Gymnas. Hermannstadt, p. 44. Treated as a junior synonym of *affinis* by Csiki, 1932: 1135.
- Harpalus elegans* Preller, 1862, Käfer Hamburg, p. 16 (Germany). Treated as a junior synonym of *affinis* by Csiki, 1932: 1133.
- Harpalus interstitialis* Gredler, 1863, Käfer Tirol, p. 52 (Germany). Treated as a junior synonym of *affinis* by Reitter, 1900: 85.
- Harpalus aenescens* Casey, 1884, Contrib. N. Amer. Col, 1: 12 12 (Rhode Isl.). Treated as a junior synonym of *affinis* by Csiki, 1932: 1135.
- Harpalus convictor* Casey, 1884, Contrib. N. Amer. Col, 1: 12 (Eillets Point). Treated as a junior synonym of *affinis* by Csiki, 1932: 1135.
- Harpalus canonicus* Casey, 1884, Contrib. N. Amer. Col, 1: 12 (Rhode Isl.). Treated as a junior synonym of *affinis* by Csiki, 1932: 1135.
- Harpalus lustralis* Casey, 1884, Contrib. N. Amer. Col, 1: 12 (New York). Treated as a junior synonym of *affinis* by Csiki, 1932: 1135.
- Harpalus coeruleescens* Schilsky, 1888, Deutsche Ent. Zeitschr., p. 183. Treated as a junior synonym of *affinis* by Csiki, 1932: 1134.
- Harpalus nigrinus* Schilsky, 1888, Deutsche Ent. Zeitschr., p. 183. Treated as a junior synonym of *affinis* by Csiki, 1932: 1134.
- Harpalus viridis* Schilsky, 1888, Deutsche Ent. Zeitschr., p. 183. Treated as a junior synonym of *affinis* by Csiki, 1932: 1134.
- Harpalus (Epiharpalus) aeneolus* Reitter, 1900, Verhand. naturf. Ver. Brünn, 38: 86 (Portugal). Treated as a junior synonym of *affinis* by Kataev *et al.* in Löbl & Smetana, 2003: 371.
- Harpalus poganettii* Falch, 1907, Deutsche Ent. Zeitschr., p. 15. Treated as a junior synonym of *affinis* by Csiki, 1932: 1135.
- Harpalus aspromontis* Hille, 1914, Col. Rundschau, 3: 75. Treated as a junior synonym of *affinis* by Csiki, 1932: 1135.
- Harpalus aeneus* a. *pseudoaeneolus* Schaubberger, 1930, Col. Centralbl., 4: 203 (Spanien). Treated as a junior synonym of *affinis* by Csiki, 1932: 1135.



*Harpalus weiratheri* J. Müller, 1931, Col. Centralbl., 5: 73.

Treated as a junior synonym of *affinis* by Csiki, 1932: 1135.

*Harpalus kubanicus* Jedlička, 1957, Acta Musei Silesiae, 6: 103. Synonymized by Kataev, 1987: 11.

*Harpalus aeneus* Fabricius: Jedlička, 1960, Annl. hist.-nat. Mus. natn. hung., 52: 231 (North Korea: Sarivon=Sariweon); Kataev, 1987, Trudy Zool. Inst. Akad. Nauk SSSR (Proc. Zool. Inst., Leningrad), 170: 10-13 (syn.).

*Harpalus (Harpalus) affinis* Schrank: Csiki, 1932, Col. Cat., 121: 1133 (catalogue); Lindroth, 1968, Opusc. Ent. Suppl., 33: 768 (N America); Lindroth, 1986, Fauna Ent. Scand., 15 (2): 351.

**Diagnostic characters.** Body length 8.1-12.4 mm. Upper surface metallic green, but often brass, coppery, bluish to almost black, underneath piceous-brown, legs piceous-brown. Elytra deeply sinuated before apex, with 1-3 dorsal punctures, outer intervals and the apical part punctate and pubescent. Abdominal ventrites punctate and pubescent.

**Materials examined.** Russian Far East: 1 ex (Det. by G. Sh. Lafer).

**Distribution.** Korea (North), NE China, Mongolia, Russia, Asia, Europe, North America (introduced).

**Notes.** Belongs to *affinis*-group (cf. Kataev 1987). First record for North Korea by Jedlička (1960) as *H. aeneus*, but has not yet been collected from the southern part of the Korean Peninsula. Rather easily distinguishable from other Korean relatives by their metallic color of body. For more detail of this group, see Kataev (1987). Eurytopic species, occurring on all kinds of open ground, notably on sandy, grassy or weedy soil. The adults are predominantly phytophagous and mainly nocturnal (Lindroth 1986: 351).

#### *Harpalus (Harpalus) amplicollis* Ménériés, 1848

플머리먼지벌레 (신칭)

*Harpalus amplicollis* Ménériés, 1848, Mém. Acad. Sci. St.-Pétersb., 4: 38 (Siberia); Kataev, 1989, Ins. Mongolia, 10: 267 (Mongolia).

*Harpalus amplicollis* Ménériés, 1848, Mém. Acad. Sci. St.-Pétersb., 4: 38 (Siberia); Reitter, 1900, Verhand. Naturf. Ver. Brünn, 38: 116 (spp. key); Schaubberger, 1934, Ark. Zool., 27 A (4) [1934]: 5 (Mongolia); Mlýnář, 1974, Ent. Abh., 40 (1): 48 (Mongolia); Kataev, 1989, Ins. Mongolia, 10: 267 (Mongolia).

*Harpalus nitidulus* Motschulsky, 1844, Ins. Sibér., p. 219 (Siberia), (nec Stephens, 1828: 161 (*Ophonus*); nec Chaudoir, 1843: 788 (*Harpalus*). Treated as a junior synonym of

*aenus* by Reitter, 1900: 116.

*Harpalus obtusicollis* Putzeys, 1877, Verh. Naturf. Ver. Brünn, 16: 80 (Caucasus: Baku); Tschitschérine, 1895, Horae Soc. Ent. Rossicae, 29: 223 (Russia). Treated as a junior synonym of *aenus* by Reitter, 1900: 116.

*Harpalus ovatus* Chaudoir, 1844, Bull. Soc. Nat. Moscou, 17 (3): 450 (Mongolia). Nomina oblita. Treated as a junior synonym of *aenus* by CPC, 2003: 372.

*Harpalus (Pheuginus) amplicollis* Ménériés: Jakobson, 1907, Zhukii Rossii, 7: 382.

*Harpalus (Harpalus) amplicollis* Ménériés: Csiki, 1932, Col. Cat., 121: 1167; Lafer, 1989, Key Insects of Russian Far East, (3), 1: 192 (China); Krischenhofer, 1990, Koleopt. Rdschau, 60: 10 (N. Korea).

**Diagnostic characters.** Body length 6.8-8.5 mm, light brown to brownish black, antennae and legs light brown; hind angles of pronotum lighter than disk. Pronotum trapezium shaped, widest near base, strongly narrowed anteriorly with obtuse, slightly rounded apical angles.

**Material examined.** Russian Far East: 1 ex (Det. by G. Sh. Lafer). North Korea: Pyongyang, PN (after Kirschenhofer 1990: 10).

**Distribution.** Korea (North), China (BEI, HEB, LIA, NIN, NMO, SHX, XIN), Mongolia, Russian Far East, Europe.

**Notes.** First record for North Korea at Pyung-yang by Kriechenhofer (1990), but has not yet been collected from southern part of the Korean Peninsula. Likely to be found in the high mountains of central Korea. Rather easily distinguishable by the body shape from the other species. Occurs in steppe (Lafer 1989). See also the note of following species, *H. egorovi*.

#### *Harpalus (Harpalus) egorovi* Lafer, 1989

극동머리먼지벌레 (신칭)

*Harpalus (Harpalus) egorovi* Lafer, 1989, Key Insects Russian Far East, (3) 1: 192 (Primorij Krai; Korea, Mongolia).

**Diagnostic characters.** Body length 8.5-9.7 mm, black, tarsi and base of tibiae often brown, palpi and basal two antennal segments light brown, lest antennal segments blackened. Lateral margin of pronotum slightly convex or rectilinear in hind half, with rectangular hind angles. Elytra mat in both sexes.

**Materials examined.** Russian Far East: 2 paratypes (Det. G. Sh. Lafer). North Korea: Nungi, HN (after Lafer 1996). South Korea: 1 ♀, 25-V-2002, Jinbu, Hajinbu-ri, Jinbu-

## Harpalini from Korea

myeon, Pyeongchang-gun, GW (SCNAE).

**Distribution.** Korea (North, Central), China (HEI, QIN), Mongolia, Russian Far East.

**Notes.** First record for the Korean Peninsula by Lafer (1989). The distribution of this species from South Korea confirmed for the first time.

According to Mlýnář (1974) & Kataev (1989 & 1995 in Kryzhanovskij *et al.*), this species was treated as an *anxius*-species group (= *Ooistus* Motschulsky, 1864). Two species are listed from North Korea of which *H. amplicollis* has not yet been collected from South Korea. For more detail of this group, see Mlýnář (1974) or Kataev (1989).

### ***Harpalus (Harpalus) sp. aff. brevis* Motschulsky, 1844**

넓적머리먼지벌레 (가칭)

*Harpalus (Acardystus) rubefactus* Bates: Yahiro & Lee, 1995,

Esakia, 35: 232 (Jeju Junior College). Misidentification.

**Distribution.** Korea (Jejudo).

**Notes.** Yahiro & Lee (1995) reported *H. rubefactus* from Jeju Island (=Quelpart Island). When we visited the Entomological Laboratory, Kyushu University (Fukuoka, Japan) in 2003, we found a single specimen of this species but was the misidentification of *Harpalus* sp. aff. *brevis* Motschulsky (1844, Mém. Acad. Sci. St.-Pétersb., 5: 204) by K. Yahiro. This single male specimen is apparently undescribed one, but sufficient material needed to study further. Belongs to *hirtipes*-species group.

< Please find references at the end of the 4th article of the Harpalini series >