

Some Ground Beetles (Coleoptera, Carabidae) from Jeju Island (VI)<sup>1,2</sup>Paik, Jong-Cheol\* and Sae-Ho Jung<sup>1</sup>

(Department of Applied Biology, College of Agriculture, Suncheon National University, Suncheon 540-742, Korea,

<sup>1</sup>Jeju Folklore and Natural History Museum, Ildo-2 dong, Jeju 690-012, Korea)

## 濟州道の 먼지벌레 (VI)

白種哲\* · 鄭世瑠<sup>1</sup>(順天大學校 農科大學 應用生物學科 · <sup>1</sup>濟州道民俗自然史博物館)

## ABSTRACT

Herein, 15 species of the ground beetles are reported from Jeju. Of these, 4 species, *Bradycellus subditus* (Lewis, 1879), *Colpodes rubriolus* Bates, 1883, *Pentagonica angulosa* Bates, 1873, and *Porotachys recurvicollis* (Andrewes, 1925) are listed for the first time from the Korean Peninsula. The Korean tachyine species are briefly discussed.

**Key words** : Coleoptera, Carabidae, fauna, new record, Jeju, Korea

In this paper 15 species are reported from Jeju (= Chejudo, Cheju Island, Jeju Island, Quelpart Island). Of these, 4 species, *Bradycellus subditus* (Lewis 1879), *Colpodes rubriolus* Bates, 1883, *Pentagonica angulosa* Bates, 1873, and *Porotachys recurvicollis* (Andrewes 1925) are first reports for the Korean Peninsula with 6 other species listed from Jeju for the first time.

When necessary, a key to the related species is presented and brief discussion is also provided on the Korean tachyine species.

Materials collected by the authors were examined and all the specimens are deposited in Department of Agricultural Biology, Suncheon National University (SCNAE) and Jeju Folklore and Natural History Museum (JFNHM), Korea. Acronym CPC (2003) is "Catalogue of Palaearctic Coleoptera, Vol. 1, edited by Löbl & Smetana (2003)".

We wish to thank Dr. G. Sh. Lafer (Vladivostok) and Dr. S. Morita (Japan) for their help and gift of the specimens for comparing.

## RESULTS

(01) *Bembidion peleum* Jedlička, 1933

풍악강변먼지벌레 (신칭)

*Bembidion (Peryphus) peleum* Jedlička, 1933, Acta Soc. Ent. Praha, 30: 98 (China: Szetschuan); Netolitzky, 1943, Kol. Rdsch., 29: 37; Jedlička, 1965, Ent. Abh., 32(7): 145.

*Bembidion nanpingensis* Kirschenhofer, 1984, Koleopt. Rdschau, 57: 67 (China: Nanping). Synonymized by Toledana, 1999: 42.

*Bembidion peleum* Jedlička: Kirschenhofer, 1997, Annl. hist.-nat. Mus. natn. hung., 89: 106 (N. Korea).

*Bembidion (Ocydromus) peleum* Jedlička: Toledano, 2000, Mem. Soc. Entomol. Italiana, 78 (1): 42 (China).

**Materials examined.** 1 ♂, 24-VI-1989, Jeju (SCNAE); 1 ♀, 13-V-1983, Ara, Jeju-si (SCNAE).

**Distribution.** Korea (Jeju), China (Szetschuan, Fukien).

**Notes.** Belongs to subgenus *Asioperyphus* Vysoký (1986, Fauna Bohemiae Septentr., 11: 94). First record for the Korean Peninsula by Kirschenhofer (1997). This species is newly recorded from Jeju Island (= Quelpart Island). It has not yet been collected from the mainland of South Korea, however.

<sup>1</sup> Carabidae of Korea, XIII.

<sup>2</sup> This work was partially supported by a over-sea grant from the Suncheon National University (2003).

\* Corresponding author

Phone) +82-61-750-3863, Fax) +82-61-750-3708

E-mail) jcpaik@suncheon.ac.kr & jsh6200@provin.jeju.kr

*B. chloreum* widely distributed in the southern part of the Korean Peninsula. It is very similar to *B. chloreum* Bates, but separated from the former by the shape of pronotum, color of elytra, body size, etc. The following simple key rather easily separates each other.

Some of the supraspecific rank of *Bembidion* Latreille, 1802 have not yet been settled and varied by authors. *Peryphus* Dejean, 1821 (or *Ocydromus* Clairville 1806) is the largest subgenus in the tribe Bembidiini. *Asioperiphus* species are formerly included in the subgenus *Peryphus* (or *Ocydromus*), and/or species group of *Peryphus*. Recently they are divided into several subgenera, primarily on the basis of male genitalia, such as *Asioperiphus*, *Ocydromus*, *Peryphanes*, *Peryphus*, & etc. (see Müller-Motzfeld 1986a, b, 1998). CPC (2003) follows him by the restrict sense, but several authorities consider them as a species group of subgenus *Peryphus* or *Ocydromus*. However, Kryzhanovskij *et al.* (1995) downgraded several subgenera of *Bembidion* to eleven species group of the large subgenus *Ocydromus*. Toledano (2000) follows this system. We tentatively follow the CPC (2003). Because we have not yet examined the male genitalia and we are not able to answer at supraspecific level. Also, several European researchers treat a number of subgenera of the very diverse genus *Bembidion* as distinct genera.

1(2) Elytra brown at least when open (against the background of abdomen sometimes blackish with brownish apices); pronotum fairly transverse, widest before middle. Larger, 5.45-5.60 mm. Japan, Korea, China. ....  
..... *B. (Asioperiphus) chloreum* Bates, 1873  
(폴색강변면지벌레)

2(1) Elytra black, teneral beetles brownish; pronotum rather narrow, strongly narrowed posteriad. Smaller, 4.75-4.90 mm. ....  
..... *B. (Asioperiphus) peleum* (풍악강변면지벌레)

**참고.** 우리말 이름은 처음으로 채집하여 보고한 금강산의 옛 이름인 풍악산에서 따왔다. 이 종은 폴색강변면지벌레, *B. chloreum* Bates (1873, Trans. R. ent. Soc. Lond., p. 332)와 매우 비슷하지만, 몸길이나 색깔 또는 앞가슴의 모양으로 구별할 수 있다. 제주도는 처음으로 기록한다.

**(02) *Bradycellus subditus* (Lewis, 1879)**  
도림좁쌀애면지벌레 (신칭)

*Tachycellus subditus* Lewis, 1879, Ann. Mag. nat. Hist., (5), 4: 459-460 (Japan: Hiogo).

*Tachycellus mandli* Jedlička, 1953, Ent. Blatter, 49(3): 143 (Nikolsk Ussurisk). Synonymized by Jaeger, 1995: 1070.

*Bradycellus (Tachycellus) kuznetzovi* Lafer, 1989, Opred.

naseko. Daln. Vostoka, 3(1): 200 (Primorskij Kraj). Synonymized by Jaeger, 1993: 939.

*Bradycellus (Desbordesus) subditus* Lewis: Cskiki, 1932. Col. Cat., 121: 1227.

*Bradycellus (Tachycellus) subditus* (Lewis, 1879): Habu, 1973, Fauna Japonica, Harpalini, p. 306-309; Jaeger, 1993, Linzer biol. Beitr., 25(2): 939; Jaeger & Wrase, 1994, Linzer biol. Beitr., 26(1): 480; Jaeger, 1995, Linzer biol. Beitr., 27(2): 1070.

**Materials examined.** 1 ♂, 5-VI-1996, Geom-eun-orum, JJ (JFNHM); 16 ex., 1-VI-2002, Temple Dorimsa, Gokseong-eup, JN (SCNAE).

**Distribution.** Korea, Japan, China, Russian Far East.

**Notes.** New to Korea. Belongs to subgenus *Tachycellus* A. Morawitz (1862, Mém. Biol., 4: 185, 223). Four species of this subgenus have been hitherto known from the Korean Peninsula (Lafer 1989, CPC 2003). However, 3 species, *B. curtulus* (Motschulsky 1860), *kataevi* Jaeger & Wrase, 1994, and *laevicollis* Poppius, 1908 are not yet collected from southern part of the Korean Peninsula. *B. subditus* (Lewis 1879) is recorded from South Korea including Jeju for the first time.

More than 130 species of this worldwide genus are divided in many subgenera (Noonan 1976, Lorenz 1998). Seven species are listed in the Korean Peninsula, arranged in three subgenera (Mlynar 1974, Lafer 1989, CPC 2003). Some adults often attracted at light. The species are fully distinguished only on armature of endofallus of male genitalia, however, the discrimination of female is rather difficult. Quite recently, Jager (1990, 1993, 1999) and Jaeger & Wrase (1994, 1996) revised this genus. Thanks to Dr. G. Sh. Lafer (Vladivostok). He compared with Ussurian specimens and confirmed our identification. For more details of *B. subditus*, see Jaeger (1993, 1995) and Jaeger & Wrase (1994).

**참고.** 우리말 이름은 전남 곡성의 도림사에서 처음으로 채집하여 '도림좁쌀애면지벌레'로 붙였다. 이 종은 검정좁쌀애면지벌레, *B. anchomenoides* (Bates 1873)와 매우 비슷하지만 몸 크기가 달라서 쉽게 구분할 수 있다. 도림좁쌀애면지벌레는 몸길이가 3.0-4.7 mm이지만, 검정좁쌀애면지벌레는 4.7-5.6 mm로 몸이 더 크다. 밤에는 가끔 불빛에 날아온다.

**(03) *Clivina vulgivaga* Boheman, 1858**  
꼬마조롱박면지벌레

*Clivina vulgivaga* Boheman, 1858, Eugenes Resa. Zool. Ins., p. 9 (Japan).

*Clivina humilis* Morawitz, 1863, Mém. Acad. Sci. St.-

Petersb., (7), 6(3): 22 (Japan); Bates, 1873, Trans. R. ent. Soc. Lond., p. 238. Treated as a junior synonym of *vulgivaga* Boheman by Csiki, 1927: 512.

*Clivina vulgivaga* Boheman: Csiki, 1927, Coleopt. Cat., 92: 512; Yano, 1941, Nippon no Kôchû, 4(1): 22 (Korea: Quelpart Is.); Habu, 1942, Kontyu, 16(2): 76 (Korea); Kurosa, 1949, Bull. Takarazuka Ins., 60: 4 (Quelpart Is.); Nakane, 1952, Ent. Rev. Japan, 6(1): 2; Paik, 1995, Insects of Quelpart Island, p. 137 (Jejudo).

**Material examined.** 2 ex., 19-VII-2000; 1 ex., 15-VII-1997, Temple Gwaneumsa, Jeju-si (JFNHM).

**Distribution.** Korea, Japan, China, Taiwan, South East Asia.

**Notes.** First record for Quelpart Is. (= Jejudo), Korea by Yano (1941). Later Paik (1995) confirmed its distribution in this island. Three species are listed from the Korean Peninsula which are widely distributed, but very rare. For a key to the related species, see Nakane (1952).

**참고.** 몸길이는 5.5-6.0 mm로 가늘고 길며, 앞가슴의 가장 자리는 뒤쪽으로 약간 넓어진다. 머리방패와 앞머리 사이에는 가로홈으로 나뉘지 않는다. 배의 양쪽 가장자리에는 작은 점각이 있다. 강가의 진흙땅에서 볼 수 있으며, 제주도를 비롯하여 남부지역에서 분포한다. 종의 검색표는 Nakane (1952)를 참조하기 바란다.

#### (04) *Colpodes (Loxocrepis) rubriolus* Bates, 1883

붉은머리줄납작먼지벌레 (신칭)

*Colpodes rubriolus* Bates, 1883, Trans. R. ent. Soc. Lond., p. 263-264 (Japan: near Kami-ichi).

*Agonum (Loxocrepis) rubriolum* (Bates): Habu, 1978, Fauna Japonica, Platynini, p. 250-252.

*Loxocrepis rubriolum* (Bates): Löbl & Smetana, 2003, Cat. Pal. Coleopt., 1: 460.

**Material examined.** 1 ♀, 19-VII-2004, Gyorae (SCNAE).

**Distribution.** Korea, Japan.

**Notes.** New to Korea. Above specimen agrees well with redescription of Habu (1978). We examined also one specimen collected from Mt. Yuwan, Amami-Oshima, Japan, and it is conspecific with Korean specimen. It is easily distinguishable from other related species by the yellowish red color of head and thorax. For more detail, see Habu (1978).

This species was included previously in the subgenus *Loxocrepis* Eschscholts, 1829 of *Agonum* Bonelli, 1810, a group redefined by Habu (1978). It includes only two species

from Japan. Later Tanaka (1985) transferred to genus *Colpodes* MacLeay, 1825. He distinguished from the large genus *Platynus* Bonelli, 1810 and *Colpodes* by the shape of metatarsus (the 4th tarsal segment of fore and mid leg bilobed, mostly bilobed asymmetrically, with a series of hairs or irregularly distributed on either undersides). He also treated the large genus *Agonum* as a subgenus of *Platynus*. However, most authors treat them as full genera. Also the subgenus *Loxocrepis* is raised to the generic rank by CPC (2003).

The higher classification of Platynini is intricate and varying by authors. Sphodrini is treated as a distinct tribe by Casale (1982) and Kryzhanovskij (1983) but some authors regard as a subtribe of Platynini (Bousquet and Larochelle 1993, etc.). Also some genera are traditionally treated in a broad sense such as *Agonum*, and *Colpodes*. But Habu (1978) included in *Agonum* diverse supraspecific taxa, while many subgenera are treated as a full genus by several authors (Kryzhanovskij *et al.* 1995, CPC 2003, etc.).

Liebherr (1991) treats *Anchodemus* Motschulsky, *Chalenomimus* Semenov, and *Nipponanchus* Habu as junior synonyms of *Anchomenus* Bonelli, 1810. However, Kryzhanovskij *et al.* (1995) considered these several fairly diverse taxa as a full genus each other. The Korean platynine fauna also needs to detail.

**참고.** 몸길이는 7.5-9 mm로 머리와 가슴은 황갈색이거나 오렌지색이며 배는 황갈색이다. 앞날개는 금속광택이 있는 청색이나 녹색을 띠며, 날개 가장자리 끝 부분은 둥글다. 우리나라는 처음으로 기록한다.

#### (05) *Dyschirius (Dyschiriodes) aeneus ovicollis* Putzeys, 1873 알가슴먼지벌레

*Dyschirius ovicollis* Putzeys, 1873, Ann. Soc. ent. Belg., 16: 14. (China: Shanghai); Nakane, 1963, Icon. Ins. Jap. Colore Nat., 2, Col., p. 22 (Korea); Lafer, 1989, Opred. naseko. Daln. Vostoka, (3), 1: 134 (Korea).

*Dyschirius daimiellus* Bates, 1873, Trans. R. ent. Soc. Lond., p. 241 (Japan, China). Treated as a junior synonym of *ovicollis* Putzeys by Kult, 1949: 126.

*Dyschirius aeneus* (Dejean): Yano, 1941, Nippon no Kôchû, 4 (1): 22 (Korea); Kurosa, 1949, Bull. Takarazuka Ins., 60: 4 (Korea); Grüntal, 1978, Ent. Obozr., 57(4): 828.

*Dyschirius aeneus ovicollis* Putzeys: Fedorenko, 1995, Ent. Obozr., 74(1): 73 (Korea).

*Dyschiriodes (Dyschiriodes) aeneus ovicollis* (Putzeys): Fedorenko, 1996, Pensoft ser. faun., 4: 166 (N. Korea).

**Materials examined.** 1 ex., 1-VII-1991, Iho Beach, Jeju-si

(SCNAE).

**Distribution.** Korea, Japan, E China, Russia (Siberia, Far East), Europe.

**Notes.** Belongs to subgenus *Dyschiriodes* Jeannel (1941, Faune de France, 39: 263). First record for the Korean Peninsula by Yano (1941) as *D. aeneus*. For separation of sub-species, see Fedorenko (1996). Widely distributed including Jeju-do, but very rare.

According to CPC (2003), *Dyschiriodes* Jeannel (1941, Faune de France, 39: 263) treated as a subgenus of the genus *Dyschirius* Bonelli, 1810. We followed it. However, several authors treat as a full genus (Fedorenko, 1996 etc.). There is a quite recent revisional work by Fedorenko (1996) on world base of this tribe Dyschiriini. The species of *Dyschirius* live in burrows in wet, sandy places near fresh water or sea shore. In Korea two subgenera, *Dyschirioides* and *Eudyschirioides* Fedorenko, 1996 occur. The Korean fauna needs to detail.

**참고.** 몸길이는 2.5-3.2 mm, 머리방패 (clypeus) 뒤쪽에 V-자모양의 홈이 있으며, 앞가슴 양쪽 가장자리 융기선은 모서리에 있는 센털 뒤쪽까지 뻗는다. 앞날개홈은 거의 완전하며, 제3날개실에 3개의 센털구멍이 있다. 앞가슴면지벌레는 3 아종, ssp. *aeneus* s. str., ssp. *ovivollis* Putzeys와 ssp. *kouraensis* Puel, 1937로 구분하며, 우리나라와 일본 그리고 중국 동부 지방에 분포하는 것은 아종 ssp. *ovicollis* (Putzeys, 1873)로 다루지만 (Fedorenko, 1995: 71-73). 학자에 따라 독립한 종으로 다룬다.

앞가슴면지벌레 속은 여러 아속으로 나누지만, 대부분 아속의 구별은 수컷의 생식기를 형질로 쓰기 때문에 여기서는 설명하지 않으며, 학자에 따라 아속을 독립한 속으로 다루기도 하며, 더 자세한 것은 Fedorenko (1996)를 참고하기 바란다. 종에 따라 가끔 불빛에 날아온다. 제주도는 처음으로 기록한다.

**(06) *Elaphropus latissimus* (Motschulsky, 1851)**

동근강변면지벌레

*Tachys latissimus* Motschulsky, 1851, Bull. Soc. Nat. Mosc., 24(4): 508 (Burma).

*Tachys bifoveolatus* [sic] MacLeay: Kirschenhofer, 1997, Anns hist.-nat. Mus. natn. hung., 89: 106 (N. Korea).

*Tachys (Elaphropus) latissimus* (Motschulsky): Pawłowski, 1974, Acta Zool. Cracov., 19(9): 171 (N. Korea); Paik, 1997, Korean J. Soil Zool., 2(1): 25 (Korea).

*Elaphropus latissimus latissimus* (Motschulsky): Löbl & Smetana, 2003, Catalogue of Palaearctic Coleoptera, 1: 273 (N. Korea).

**Materials examined.** 4 ex, 1-VII-1991, Iho Beach, Jeju-si

(SCNAE); 1 ex, 1-VII-1991, Iho Beach, Jeju-si (SCNAE).

**Distribution.** Korea, Japan, China, Taiwan, Russian Far East, SE Asia, Australia, New Guinea, India.

**Notes.** First record for North Korea by Pawłowski (1974). This species was confirmed to distribute in southern part of the Korean Peninsula by Paik (1997). Occurs in woodless areas. Often attracted to light sources.

**참고.** 몸길이는 약 2.0 mm로 몸은 황갈색이다. 앞날개에는 제1날개홈만 있으며, 앞가슴의 밑홈 (basal sulcus) 중앙에는 2개의 작은 구멍이 있어서 다른 종과 쉽게 구분할 수 있다. 우리나라에 분포하는 것은 원아종 ssp. *latissimus* (Motschulsky), 동양구에 분포하는 것은 아종 ssp. *gracilis* Motschulsky (1862)로 다룬다 (CPC, 2003). 3월부터 평지나 논 또는 초원의 습기가 많은 곳에서 성충을 볼 수 있으며, 가끔 불빛에 날아온다. 제주도는 처음으로 기록한다. 이 속의 종들은 대개 몸은 둥글고 볼록하며, 아랫입술밑판 (mentum)에 커다란 구멍은 없으며, 날개밑홈 (recurrent striole)은 날개 중앙에 위치하고, 앞날개의 센털구멍은 1개며, 발톱에는 작은 이빨이 있지만 잘 보이지 않는다.

**(07) *Harpalus (Pseudoophonus) babai* Habu, 1973**

탐라머리면지벌레

*Harpalus (Pseudoophonus) babai* Habu, 1973, Harpalini, Fauna Japonica, p. (Japan, Korea: Jeju-do).

**Material examined.** 1 ♀, 4-IX-2004, Seonheul (Light trap).

**Distribution.** Korea (Jeju-do), Japan (Honshu).

**Notes.** First record for Quelpart Island (=Jeju-do), southernmost of the Korean Peninsula by Habu (1973). For more details, see Habu (1973: 108-110). The above specimen well agrees with the original description. It is easily distinguishable from other related species by the elytra well pubescent at the lateral & apical areas, and by the basal angles obtuse & round. The distinguishing characters of relatives are as follow.

- 1(6) Hind angles of pronotum more or less rounded.
- 2(3) Apical spur of fore tibiae obtusely angulate but not dentate; elytra rather densely ciliate at apical area and on intervals 8 to 10; lateral margins of pronotum black. Length, 12.0-12.5 mm. .... *H. (Pseudoophonus) babai* (탐라머리면지벌레)
- 3(2) Apical spur of fore tibiae well dentate on both margins; elytra almost glabrous or sparsely, faintly ciliate on intervals 8 to 10 or 9 and 10.
- 4(5) Femora and tibiae reddish or yellow brown; apical spur of fore tibiae fairly dentate at either side; elytra stria without punctures. Length, 9.8-15.5 mm. ....

- ..... *H. (Pseudoophonus) sinicus* (중국머리먼지벌레)  
 5(4) Femora and tibiae black. tarsi reddish brown; apical spur of fore tibiae simple and slender; elytral stria with very finely punctate, but apex densely punctate. Length, 10.0-13.0 mm. .... *H. (Pseudoophonus) davidi* (만들머리먼지벌레)  
 6(1) Hind angles of pronotum obtuse, more or less distinct, often with denticle.  
 7(8) Hind angles of pronotum usually without denticle or very small denticle. Length, 10.8-15.6 mm. ....  
 ..... *H. (Pseudoophonus) pseudophonoides* (어리털머리먼지벌레)  
 8(7) Hind angles of pronotum with big denticle. Length, 13.5 mm. .... *H. (Pseudoophonus) aenigma* (청동머리먼지벌레)

**참고.** 몸길이는 약 12 mm로 중국머리먼지벌레 (*Harpalus sinicus* Hope, 1845)와 매우 비슷하지만, 제8-10날개실과 날개 끝 부위에는 작은 털이 나 있고, 앞다리 머느리발톱에는 작고 뾰족한 이빨이 없어서 쉽게 구별할 수 있다. 우리나라는 Habu (1973)가 제주도에서 처음으로 기록했다.

#### (08) *Pentagonica angulosa* Bates, 1873

검정육모먼지벌레 (신칭)

*Pentagonica angulosa* Bates, 1873, Trans. R. ent. Soc. Lond., p. 286 (Japan); Jedlička, 1963, Ent. Abh., 28: 505, 506-507; Habu, 1967, Fauna Japonica. Truncatipennes, p. 43, 45-46; Habu, 1982, Ent. Rev. Japan, 36(2): 104; Lafer, 1989, Keys iden. insects Russian Far East., 3(1): 210.

**Material examined.** 1 ♀, 13-VII-1993, Bizarim (SCNAE).

**Distribution.** Korea, Japan, Russian Far East (Kurul).

**Notes.** New to Korea. This species is rather easily distinguished from other related species by the blackish body. The above specimen well agrees with the description of Habu (1967). Also we have seen three female specimens from Fukuoka, Japan which are not different from the above Korean specimen. For more detail, refer to Habu (1967, 1982).

**참고.** 몸길이는 약 4.5 mm이며, 몸 빛깔은 검정색으로 앞날개 가장자리는 황갈색이다. 날개홈의 작은 점각은 줄을 지어있다. 몸이 검정색이기 때문에 앞가슴이 적갈색인 육모먼지벌레 (*P. daimiella* Bates, 1892)와 쉽게 구별할 수 있다. 우리나라는 처음으로 기록한다.

#### (09) *Perigona nigriceps* (Dejean, 1831) 어깨무늬먼지벌레

*Bembidium nigriceps* Dejean, 1831, Species Général Coléop., 5: 44 (N. America).

*Trechicus japonica* Bates, 1873, Trans. R. ent. Soc. Lond., p. 281 (Japan). Treated as a junior synonym of *nigriceps* by Andrewes, 1919: 181.

*Perigona tachyoides* Bates, 1883, Trans. R. ent. Soc. Lond., p. 265 (Japan). Treated as a junior synonym of *nigriceps* by Jedlička, 1964: 272. For more synonymies, see Andrewes, 1919: 181-182; Csiki, 1931: 897.

*Perigona nigriceps* (Dejean): Csiki, 1931, Coleopt. Cat., 5: 897; Kurosa, 1949, Bull. Takarazuka Ins., 60: 7 (Korea); Habu, 1950, Mushi, 21(6): 52 (Japan); Jedlička, 1964, Reichenbachia, 2(61): 270.

*Perigona (Trechicus) nigriceps* (Dejean): Andrewes, 1919, Trans. Ent. Soc. London, p. 181; Kwon & Lee, 1986, Ins. Koreana, 6: 25 (Korea).

**Materials examined.** 1 ♀, 14-VII-1985, Seogwipo, JJ, K.-S. Lee leg. (SCNAE).

**Distribution.** Korea, Japan, China, Worldwide.

**Notes.** Belongs to subgenus *Trechicus* LeConte (1853, Trans. Amer. Philos. Soc., 10: 386). Noted from Korea by Kurosa (1949), but the earlier reference could not be traced. Later reported from South Korea by Kwon & Lee (1986). It is also distributed in North Korea (CPC, 2003: 449). The distribution of this species is confirmed from southern part of the Korean Peninsula including Jejudo. This species was collected from under compost rice straw with *Caelostomus picipes* plus many small nitidulid beetles from Gurye near Suncheon in mainland also. Nocturnal and often attracted to light. The specimen was identified as *P. nigriceps* based on the description in Lindroth (1968) and the illustration of that species in Darlington (1970) or Bousquet (1987).

**참고.** 몸길이는 2-3 mm, 머리는 검정색이며 앞가슴과 날개에 검정색의 무늬가 있지만, 개체에 따라 황갈색인 것도 있다. 앞날개의 제3, 4날개실은 점각만 약하게 남아있다. 우리나라는 두 종을 기록하고 있지만, Yano (1941)가 제주도에서 보고한 열대먼지벌레 (*P. acupalpoides* Bates, 1883)는 아직 채집하지 못했다. 제주도에는 처음으로 기록한다.

#### (10) *Perileptus japonicus* Bates, 1873 좁은지벌레

*Perileptus japonicus* Bates 1873, Trans. R. ent. Soc. Lond., p. 296 (Japan); Yano, 1941, Nippon no Kôchû, 4(1): 23 (Korea); Paik & Kim, 2003, Korea J. Soil Zoology, 8: 43 (Korea).

**Materials examined.** 1 ex., 3-IX-2004, Oedo-dong, Jeju-si, JJ (SCNAE).

**Distribution.** Korea, Japan, China, Taiwan, Russian Far East.

**Notes.** Belongs to subgenus *Perileptus s. str.* First record for Korea by Yano (1941). Widely distributed in mainland. Rather common species. Occurs at wet spots near rivers or valleys. For more details, see Uéno (1955, 1969).

**참고.** 몸길이는 2.5-3 mm. 몸은 짙은 적갈색이다. 겹눈은 매우 커서 불룩하며 작은 털이 나 있으며, 뺨은 매우 짧다. 앞가슴은 앞쪽에서 1/4지점이 가장 폭이 넓으며, 가장자리는 활같이 구부러진다. 전국에 분포하며, 대개 평지나 강 또는 계곡 따위의 습기가 많은 곳에서 볼 수 있다. 제주도는 처음으로 기록한다.

**(11) *Porotachys recurvicollis* (Andrewes, 1925)**

큰꼬마강변먼지벌레 (新稱)

*Tachys recurvicollis* Andrewes, 1925, Ann. Mus. Civ. Stor. Nat., Genoa, 51: 338 (Japan). New name for *T. reflexicollis* Bates, 1883: 268, nec Motschulsky, 1862.

*Tachys reflexicollis* Bates, 1883, Trans. R. Ent. Soc. London, p. 268. Preoccupied by Motschulsky, 1862: 31.

*Tachys recurvicollis* Andrewes: Csiki, 1928, Co. Cat., 97: 195; Jedlička, 1965, Ent. Abh., 32(7): 177.

*Macrotachys recurvicollis* (Andrewes): Uéno, 1953, Shin Konchu, 6(12): 42 (Japan).

*Porotachys recurvicollis* (Andrewes): Shilenkov, 2002, Ent. Obozr., 81(1): 35.

**Material examined.** 1 ♀, 20-III-1988, Seogwipo (SCNAE); 4 ex., 8-IV-1987, Hacheon-ri, Pyoseon-myeon, JJ (SCNAE).

**Distribution.** Korea (Jeju-do), Japan.

**Notes.** New to Korea. We are grateful to Dr. S. Morita, Japan, for supplying a Japanese female specimen. This species is probably a mesophilous species, collected from under rotten twigs. Often, it is attracted to light. This species has not yet been collected in mainland.

According to G. Sh. Lafer (personal communication, 2004), this species is regarded as subgenus of the genus *Elaphropus* Motschulsky by the convex elytra and 8th elytral stria deeply impressed on apical half, etc. Also, he considered the subgenus *Tachyuropsis* Shilenkov as subgenus of *Tachys* Dejean by the flattened body. In recent literatures (Lorenz, 1998; Bousquet, 2002; Shilenkov, 2002; CPC, 2003, etc.), *Porotachys* Netolitzky (= *Macrotachys* Ueno, 1953) is treated as a full genus. The following key is provided for rather easily distinguishable Korean species.

1(2) Mentum with two conspicuous foveae at base (*Porotachys* Netolitzky, 1914). Elytra very convex, nearly round, noticeably wider than pronotum; pronotum weakly transverse, cordate, central part of base projecting slightly backward, its sides slanting inward to the posterior angles; upper surface dark brownish red, elytra with obscure dark transverse band below middle; larger, 2.7-3.0 mm. .... *Porotachys recurvicollis*

(큰꼬마강변먼지벌레)

2(1) Mentum without conspicuous foveae.

3(4) Elytral stria 8 deep throughout; sutural stria (1st elytral stria) distinct, fully developed with 2nd to 4th elytral stria partly visible (*Tachyura* Motschulsky, 1862).

4(3) Elytral stria 8 deep posteriorly but obsolete anteriorly or broadly interrupted at middle; some sutural striae partly visible (*Elaphropus* Motschulsky, 1839).

5(6) Elytra depressed, elongate, microsculpture distinct, with 5-6 distinct striae and with 2 dorsal setiferous punctures on interval 3, adjoining stria 3 (sg. *Tachyuropsis* Shilenkov, 2002).

6(5) Elytra very convex, without microsculpture, with 1 or 2 sutural stria distinct and with 1 or 2 dorsal setiferous punctures (sg. *Elaphropus s. str.*)

7(8) Elytron with only one setiferous pore situated behind the middle on the place of invisible stria 3; elytral stria 8 deep posteriorly but obsolete anteriorly; basal sulcus of pronotum interrupted and with 2 foveae at middle. Upper surface yellow to brownish yellow. Length of body, 1.9-2.2 mm. .... *E. latissimus* (둥근강변먼지벌레)

8(7) Elytron with two dorsal setiferous pores situated on the place of invisible or visible stria 3; elytral stria 8 interrupted at middle and between humeral pores 3 and 4 well visible; basal sulcus of pronotum crenulate, not interrupted at middle; upper surface reddish brown to pitch-brown, concolorous. Length of body, 1.8-2.2 mm. ....

..... *E. zouhari* (북경둥근강변먼지벌레)

**참고.** 큰줄꼬마강변먼지벌레는 *Tachyura*나 *Elaphropus*속의 종들과 비슷하지만, 아래입술밑판(mentum)에 커다란 구멍이 있어서 쉽게 구분할 수 있다. 몸길이는 약 3.0 mm로 몸은 폭이 넓고 불룩하며 짙은 적갈색이다. 날개 중앙 밑에는 약간 짙은 색의 가로줄이 있다. 더듬이 제2마디의 길이는 제3마디와 같으며, 앞날개는 달걀모양으로 불룩하며, 제3날개홈에는 2개의 센털구멍이 있으며, 제1, 2날개홈은 분명하지만 제3날개홈부터는 밑 부분은 없어진다. 야산의 썩은 통나무 껍질이나 나무 가지 또는 낙엽 밑에서 볼 수 있지만, 혼란 종은 아니다. 가끔 불빛에 날아온다.

**(12) *Scarites aterrimus* Morawitz, 1863** 조롱박먼지벌레

*Scarites aterrimus* Morawitz, 1863, Mém. Acad. Imp. Sci. st. Péterb., (7), 6(3): 21 (Japan); Miwa, 1939, Nippon no Kochu, 3(1): 24 (Korea); Kurosa, 1949, Bull. Takarazuka Ins., 60: 3 (Korea); Nakane, 1963, Icon. Ins. Jap. Colore Nat., 2, Col., p. 20 (Korea); Kim, 1978, Distribution Atlas of Insects of Korea, 2: 26 (Quelpart Is.); Paik, 1993, J. Sci. & Education, Sunchon Natl. Univ., 1: 86 (Korea).

*Scarites (Parallelomorphus) aterrimus* Morawitz: Kwon & Lee, 1986, Ins. Koreana, 6: 16 (Korea).

**Material examined.** 1♀, 10-VII-2002, Jongdal-ri, Gujwa-eup (JFNHM); 1♀, 2-V-1994, Pyoseon (JFNHM); 2♀, 9-VI-1994, Moseulpo (JFNHM).

**Distribution.** Korea (including Jeju), Japan, China.

**Notes.** Noted from Korea by Miwa (1939), but the earlier reference could not be traced. Widely distributed, but seldom. Occurs in sandy seashore.

**참고.** 이 종은 앞가슴 앞쪽 가장자리가 돌출하며, 또한 몸의 폭이 넓어서 다른 종과 쉽게 구별할 수 있다. 제주도를 비롯하여 전국에 분포하며, 4월부터 바닷가의 모래밭에서 성충을 볼 수 있지만, 개체 수는 매우 적다. 우리나라에서 *S. acutidens* Chaudoir로 기록한 것은 모두 조롱박먼지벌레를 잘못 동정한 것이며, *S. acutidens* Chaudoir, 1855는 일본에만 분포한다.

**(13) *Tachys quadrillum* Schaum, 1860**

대륙애강변먼지벌레

*Tachys quadrillum* Schaum, 1860, Berl. Entomol. Zeit., 4: 201 (Celebes); Andrewes, 1925, Ann. Mus. Civ. Genova, 51: 372; Andrewes, 1935, Fauna British India etc., Col. Carabidae, 2: 228; Jedlička, 1965, Ent. Abh., 32(7): 171. For other synonymy, see Andrewes, 1935.

*Paratachys quadrillum* (Schaum): Kwon & Lee, 1986, Ins. Koreana, 6: 19 (Korea).

*Tachys (Paratachys) quadrillum* (Schaum): Löbl & Smetana, 2003, Cat. Pal. Coleopt., 1: 277.

*Tachys (s. str.) quadrillum* Schaum: Pawłowski, 1974, Acta zool. cracov., 19(9): 166 (N. Korea).

**Material examined.** 1♀ (teneral), 3-X-1985, Seogwipo (SCNAE).

**Distribution.** Korea, Japan (Tanegashima), S. China, Taiwan, Ceylon, India, New Guinea, Samoa, Philippines.

**Notes.** First record for North Korea by Pawłowski (1974) as

*T. (s. str.) quadrillum* Schaum. This species is recorded from southern part of the Korean Peninsula for the first time. Many specimens are collected from underside of stones or seaweeds at mud flat in intertidal zones from western coast of mainland.

This species is easily recognized by the elytral spots. However, this species is rather variable, especially in the size of elytral spotting varying individually. Most of the Korean specimens, the humeral spot connected with preapical spot, so forming a longitudinal band, sometimes reduced. The Korean species can be distinguished by the following simple key.

1(2) Posterior dorsal puncture of elytron inside recurrent striole, not attached to, its hooked tip; anterior dorsal puncture usually outside the 3rd stria; elytral stria 8 bent medially (*Paratachys* Casey, 1918).

2(1) Posterior dorsal puncture of elytron attached to hooked tip of recurrent striole; anterior dorsal puncture on interval 3 or adjoining stria 3; elytral stria 8 not bent medially (*Tachys* Dejean, 1821).

3(4) Elytra bicolored with distinct spots or longitudinal streaks. L. 2.6-2.9 mm. .... *T. quadrillum*  
(대륙애강변먼지벌레)

4(3) Elytra concolorous, without obvious spots or streaks. Less than 2.5 mm.

5(6) Pronotum with hind angles almost rectangular, pointed; lateral margin of elytra behind shoulders serrate; hind discal seta almost adjoining to apex of recurrent striole. Length of body, 2.4-2.5 mm. ....  
..... *T. gyotokuensis sohei* (대동애강변먼지벌레)

6(5) Pronotum with hind angles obtuse, angulate; lateral margin of elytra behind shoulders not serrate but setulose; hind discal seta remote of apex of recurrent striole. Length of body, 2.0-2.2 mm. ....  
..... *T. koreanum* (한국애강변먼지벌레)

**참고.** 몸길이는 약 2.5 mm로 몸은 흑갈색에서 흑색으로 광택이 있으며, 앞날개 양쪽 가장자리에 2개의 황갈색의 줄무늬가 있지만 개체에 따라 줄무늬는 다양하다. 더듬이 기부, 앞가슴과 날개 가장자리는 황갈색이다. 앞날개의 제3날개홈은 매우 얇다. 대개 바닷가나 조간대의 돌 밑에서 성충을 볼 수 있다. 제주도는 처음으로 기록한다.

**(14) *Tachyura fumicatus* (Motschulsky, 1851)**

구름꼬마강변먼지벌레

*Tachyura fumicatus* Motschulsky, 1851, Bull. Soc. Nat. Mosc., 24, part 2, No. 4, p. 509 (Ind. or.). Other synonymy and references, see Csiki (1928) and Andrewes (1935).

*Tachyura fumigatus* Motschulsky: of authors.

*Tachys fusicatus* Motschulsky: Csiki, 1928, Coleopt. Cat., 97: 180; Jedlička, 1965, Ent. Abh., 32(7): 175.

*Tachys (Sphaerotachys) fusicatus* Motschulsky: Paik, 1998, Korean J. Soil Zool., 3(1): 7 (Jeju).

*Tachyura (Sphaerotachys) fusicata* (Motschulsky): Löbl & Smetana, 2003 in Catalogue of Palaearctic Coleoptera, 1: 277.

**Materials examined.** 5 ex., 4-IX-2004, Myeongdoam, Juju-si (SCNAE); 8 ex., 2-VIII-1985, Jeju, K.-S. Lee leg. (SCNAE); 2 ♀, 2 ♂, 21-VIII-1983, Kyorae, JJ (SCNAE).

**Distribution.** Korea (Jeju), Japan, China, Taiwan, SE Asia, India, New Guinea, Africa.

**Notes.** Belongs to subgenus *Sphaerotachys* J. Müller (1926, Adephega Studi Ent., 1(2): 95), but treated as a subgenus of *Elaphropus* Motschulsky, 1839 by some researchers (Erwin, 1978; Shilenkov, 2002, etc.).

First record for South Korea by Paik (1998) as *Tachys fusicatus* Motschulsky. In Korea this species is recorded from Jeju, but has not yet been found from mainland. Attracted to light sources at night. For distinguishing characters, see notes on *Tachyura fuscicauda*.

**참고.** 몸길이는 약 2.0 mm, 앞날개 제1-2, 8날개홈은 분명하며, 매우 얇은 반문이 2 또는 4개 있다. 불빛에 가끔 날아온다. 이 속은 아랫입술밑판(mentum)에 둥근 구멍이 없으며, 앞날개의 센털구멍은 2개, 날개끝홈(recurrent stria; apical striole)는 중앙에 위치하며, 발톱에 이빨은 없다. 여러 아속으로 나뉜다. 아속 *Sphaerotachys*는 앞머리홈은 깊고 직선이며 앞쪽으로 모인다. 아속 *Tachyura*는 제1-3 날개홈만 있으며; 아속 *Tachyphanes*는 모든 날개홈을 볼 수 있다. 아속 *Tachylopha*는 날개 어깨에 작은 가시가 있다. 더 자세한 것은 Erwin (1978)이나 Shilenkov (2002)를 참고하기 바란다.

**(15) *Tachyura fuscicauda* (Bates, 1873)**

무늬꼬마강변먼지벌레

*Tachys fuscicauda* Bates, 1873, Trans. R. ent. Soc. Lond., p. 298 (Japan).

*Tachys (Tachyura) fuscicauda* Bates: Pawłowski, 1974, Acta Zool. Cracoviensia, 19(9): 182-183 (N Korea); Paik, 1997, Korean J. Soil Zool., 2(1): 38 (Korea); Paik, 1997, Korean J. Soil Zool., 2(2): 111 (Jeju).

*Tachyura (Tachyura) fuscicauda* (Bates): Yahiro et Lee, 1995, Esakia, 35: 229 (Quelpart Is.).

*Elaphropus (Tachyura) fuscicaudus* (Bates): Kwon et Lee, 1986, Ins. Koreana, 6: 20 (Korea); Kryzhanovskij et al.,

1995, Checklist of the Ground-beetles of Russia, p. 75.

**Materials examined.** 1 ♀, 17-VII-2004, Ganjeong-dong, Seogwipo-si (SCNAE).

**Distribution.** Korea, Japan, China.

**Notes.** Belongs to subgenus *Tachyura s. str.* First record for North Korea by Pawłowski (1974). Later it was reported from Jeju by Yahiro & Lee (1995) and confirmed distribution from southern part of mainland in the Korean Peninsula by Paik (1997). Widely distributed including Jeju, but seldom. Collected from in debris or under small stones in damp places on the ground or stream sides. Often attracted to light. The following simple key rather easily separates Korean species.

1(2) Frontal furrows deep and long, strongly convergent towards apex of clypeus. Labrum strongly emarginate at apex (sg. *Sphaerotachys* J. Müller, 1926). Body reddish brown or chestnut brown to blackish brown. Elytra sometimes with yellowish red preapical spot (rarely also with weak humeral one). Length of body, 2.0-2.20 mm. .... *T. (Sphaerotachys) fusicatus* (구름꼬마강변먼지벌레)

2(1) Frontal furrows short and not deep, not reaching of clypeal apex and not convergent. Apex of labrum transverse or weakly emarginate. Each elytron with two discal setiferous pores, elytral stria 8 entire. Pronotum with transverse impression at base (sg. *Tachyura s. str.*).

3(4) Dorsum of body light brown but usually darker at the middle of elytral disk, sometimes with weak yellowish preapical spot. Each elytron with 3-4 distinct punctate striae in sutural area. Length of body, 1.9-2.3 mm. .... *T. (Tachyura) fuscicauda* (무늬꼬마강변먼지벌레)

4(3) Dorsum of body brownish black to black. Each elytron with 2-3 distinct impunctate stria, with yellowish humeral and preapical spots (sometimes some humeral ones absent). Length of body, 2.8-3.0 mm. .... *T. (Tachyura) laetificus* (= ? *gradatus* Bates, 1873) (녁점꼬마강변먼지벌레)

**참고.** 우리나라는 Pawłowski (1974)가 북한에서 처음으로 기록했다. 학자에 따라 둥근(꼬마)강변먼지벌레 속의 아속으로 다룬다. 강가와 같은 습기가 많은 곳에서 볼 수 있으며, 가끔 불빛에 날아온다.

**Comments on Korean Tachyine Species**

Tachyini (or Tachyina) are the most diverse group of the Bembidiine beetles. These very small ground beetles repre-



sented all over the world, the most richly distributed in tropical regions. Occurs in various zone, such as in wood, under bark, under ground or caves and all kind of water sites including seashores.

Most authors have considered tachyine beetles as a subtribe of Bembidiini (Erwin 1974, Ball & Bousquet 2001, CPC, 2003, etc.). The treatment of supraspecific rank of *Tachys*-complex is variable. Erwin (1974) and Shilenkov (2002) separated the genus *Tachys* Dejean, 1821 and *Paratachys* Casey, 1918, but the latter genus was regarded as a subgenus of the genus *Tachys* by Kryzhanovskij (1970, 1983). He also united the genus *Macrotachys* Uéno (1953) with *Porotachys* Netolitzky (1914: Ent. Blätt., 10: 174), but Bousquet (2002: 30) treated it valid genus.

Recently, Shilenkov (2002) clarified the supraspecific position of *Tachys exaratus* Bates formerly treated it as a different genus or subgenus. He erected a new subgenus *Tachyruropsis*, but this new subgenus included in the genus *Elaphropus* Motschulsky. However, this species is treated as subgenus *Amaurotachys* Jeannel, 1946 of *Tachyura* by CPC (2003).

We did not examined any authentic specimens of *Tachys scutellaris* Stephens (type-species) and *Amaurotachys*. At present, *T. exaratus* is included in *Elaphropus* from the traditional sense (Erwin 1974, 1978, Shilenkov 2002). However, as Shilenkov (2002) already mentioned, the supraspecific rank of this species is still unclear because of the absence of mental fovea and the shape of 8th elytral stria. Because it resembles to *Paratachys* Casey and also possesses main characteristic of *Tachyura* Motschulsky. Therefore, we think, *Tachyruropsis* should be moved from *Elaphropus* by the flattened body and other characteristics.

The generic status of *Tachyura* and *Elaphropus* remains in question. Kryzhanovskij (1970) regarded them as separate genera. Later he (1983), following Erwin (1974), united into a single genus *Elaphropus*, but the new catalogue (CPC 2003) separated each other. However, Erwin (1978) and Shilenkov (2002) considered *Tachyura* as a subgeneric rank of *Elaphropus*. The separation of *Elaphropus* and *Tachyura* is done by the shape of 8th elytral stria: in *Elaphropus* broadly interrupted at middle or disappearing in front half, but *Tachyura* with entire 8th elytral stria.

We largely followed CPC (2003) in arranging the Korean taxa of this group, but slightly emended the generic or subgeneric position of this very large with many diverse groups by the shape (or length and position) of recurrent striae, by the shape of body (convex or flattened, and pubescent or

glabrous), by the situation (or number of pores) of elytral setiferous punctures, by the shape of 8th elytral stria (interrupted or not), and etc.

*Tachys micros* (= *Tachys pallescens*) is widely distributed in Old World. Kryzhanovskij (1970) and Shilenkov (2002) already noted that it is one of the most difficult species in this group with considerably variabilities and existence of several geographically separated forms. Also, the former suggested *Tachys pallescens* Bates is conspecific with *T. micros* and the latter confirmed it.

Having read the descriptions and figures of Pawłowski (1974), *Tachys dzosonicus* and *T. varsavianorum* are probably conspecific with *Tachys pallescens* Bates [= *P. micros* (Fischer von Waldheim)]. The Japanese species of *Tachys* (*Eotachys*) *kaorutanakai* Habu (1977) is probably also conspecific with this species by the descriptions and figures.

The Korean (or Japanese) species of *Paratachys* Casey are divided into two species-groups, (1) the first group, the elytral dorsal punctures situated on the 3rd stria or 4th stria (or on the 4th interval on adjoining 4th stria; (2) the second group, situated on the 6th interval. We think the latter group should be distinguished as members of a separate subgenus.

The status of *Tachys laetificus* Bates and *T. gradatus* Bates are still unclear. *T. gradatus* is a highly variable species, widely spread in eastern Asia (Korea, China, Russian Far East). *T. laetificus* represented in Japan and China (Tianjin, Shanxi) (CPC 2003). Pawłowski (1974) already discussed with good reason that it is not easy to distinguish the two. We tentatively assign this species to slightly different specimens from Korea, and also, occasionally, it is indistinguishable from Japanese species *T. laetificus* Bates. The senior author has seen two Japanese specimens of both species in Kyushu University, Japan, but hardly distinguishable except the number of elytral stria (not examined male genitalia; figures of genitalia, see Pawłowski 1974): in *laetificus* with 2 elytral stria; in *gradatus* with 3 stria. Therefore, we think *T. gradatus* should be united with *T. laetificus*. However, the new catalogue (CPC 2003) treated as two distinct species each, and the distribution of both species listed for the Korean Peninsula.

Judging from the descriptions and figures of Habu (1961), Jedlička (1965), and Pawłowski (1974), *Lymnastis pilosus yanoi* Nakane, (we have not seen this species), is also possibly conspecific with *L. pilosus* Bates because the shape of pronotum both taxa do not differ significantly. However, Pawłowski (1974) and CPC (2003) regarded it as a distinct species.

The Korean (Peninsula) species of the tribe Tachyini (or Tachyina) are as follow (\* collected by us or other private

## Carabidae of Jeju

collections from South Korea were examined), however, the Korean species of this taxon needs to detail.

Finally, we thank Dr. G. Sh. Lafer (Vladivostok) for permission to include his data and comments of this taxon with ours.

- \**Elaphropus (Elaphropus) latissimus* (Motschulsky, 1851)  
동근(꼬마)강변먼지벌레
- \**Elaphropus (Elaphropus) zouhari* Jedlicka, 1961  
북경동근(꼬마)강변먼지벌레
- \**Elaphropus (Tachyuroopsis) exarata* (Bates, 1873)  
꼬마강변먼지벌레
- \**Porotachys recurvicollis* (Uéno, 1953)  
동백꼬마강변먼지벌레
- \**Paratachys fasciatus* Motschulsky, 1851 줄애강변먼지벌레
- \**Paratachys micros* (Fischer von Waldheim, 1828)  
어리에강변먼지벌레  
[= *Paratachys pallescens* (H. Bates, 1873). Syn. by Shilenkov, 2002: 39]  
[?= *Tachys (Paratachys) dzosonicus* Pawłowski, 1974  
조선애강변먼지벌레]  
[?= *Tachys (Paratachys) varsavianorum* Pawłowski, 1974  
나루애강변먼지벌레]
- Tachys gyotokuensis sohei* Pawłowski, 1974  
대동애강변먼지벌레
- Tachys koreanorum* Pawłowski, 1974  
한국애강변먼지벌레
- \**Tachys quadrillum* Schaum, 1860 대륙애강변먼지벌레
- \**Tachyura (Sphaerotachys) fumicatus* Motschulsky, 1851  
구름꼬마강변먼지벌레
- \**Tachyura (Tachyura) fuscicaudus* Bates, 1873  
무늬꼬마강변먼지벌레
- \**Tachyura (Tachyura) laetificus* (Bates, 1873)  
넉점꼬마강변먼지벌레  
[?= *Tachyura (Tachyura) gradatus* Bates, 1873  
중국꼬마강변먼지벌레]
- \* *Tachyta nana* (Gyllenhal, 1810) 검정꼬마강변먼지벌레  
*Lymnastis pilosus yanoi* Nakane, 1963 중꼬마강변먼지벌레

## REFERENCES

- Andrewes, H.E. 1919. On the types of Oriental Carabidae in the British Museum, and in the Hope Department of the Oxford University Museum. - *Trans. Ent. Soc. Lond.*: 119-217.
- Andrewes, H.E. 1925. A revision of the Oriental species of the genus *Tachys*. - *Ann. Mus. civ. Stor. nat., Genoa* **51**: 327-502, pls. III-IV.
- Andrewes, H.E. 1935. Carabidae. Vol. II. Harpalinae I. Fauna of British India, London, 1-323, 5 pls.
- Andrewes, H.E. 1946. Stray notes on eastern Carabidae (Coleoptera). II. - *Proc. R. Ent. Soc. Lond. (B)*, **15**: 83-88.
- Ball, G.E. and Y. Bousquet. 2001. Carabidae Latreille, 1810. pp. 32-132. In: The late Ross H. Arnett, Jr. & Michael C. Thomson (ed.). American beetles. Archostemata, Myxophaga, Adephaga, Polyphaga: Staphyliniformia. CRC Press. 443 pp.
- Bates, H.W. 1873. On the Geadephagous Coleoptera of Japan. - *Trans. Ent. Soc. Lond.* **1873**: 219-322.
- Bousquet, Y. 1987. The carabid fauna of Canada and Alaska: Range extensions, additions and descriptions of two new species of *Dyschirius* (Coleoptera: Carabidae). - *Coleopterists Bulletin* **41**(2): 111-133.
- Bousquet, Y. 2002. Additions and corrections to the world catalogue of genus-group names of Geadephaga (Coleoptera) published by Wolfgang Lorenz (1998). - *Folia Heyrovskyana, Suppl.* **9**, 78 pp.
- Bousquet, Y. and A. Laroche. 1993. Catalogue of the Geadephaga (Coleoptera: Trachypachidae, Rhysodidae, carabidae including Cicindelini) of America north of Mexico. - *Mem. Ent. Soc. Canada* **167**: 1-397.
- Casale, A. 1982. Nuovi "Sphodrini" (Sphodrini sensu Habu, 1978) dell'Asia (Col. Carabidae, Pterostichinae). - *Entomologica Basiliensis* **7**: 142-155.
- Casale, A. 1988. Revisione degli Sphodrini (Coleoptera, Carabidae, Sphodrini). - Museo Regionale di Scienze Naturali (Torino), Monografie **5**: 1024 pp.
- Csiki, E. 1928. Carabidae II: Mormolycinae et Harpalinae I. Pars 97: 1-226. In: Junk, W. & S. Schenkling (eds.). *Coleopterorum Catalogus*, Vol. II. Berlin. W. Junk, 1022 pp.
- Csiki, E. 1931. Carabidae: Harpalinae V. Pars 115, pp. 739-1022. In: Junk, W. & S. Schenkling (eds.). *Coleopterorum Catalogus*, Vol. II. Carabidae II. Berlin. W. Junk, 1022 pp.
- Darlington, P.J.Jr. 1970. Coleoptera, Carabidae including Cicindelinae. - *Insects of Micronesia* **15**(1): 1-49.
- Erwing, T.L. 1974. Studies on the subtribe Tachyina (Coleoptera: Carabidae: Bembidiini) supplement A: Lectotype designations for new world species, two new genera, and notes on generic concepts. - *Proc. Entomol. Soc. Wash.* **76**(2): 123-155.
- Erwing, T.L. 1978. Studies of the subtribe Tachyina (Coleoptera: Carabidae: Bembidiini) supplement C: Discovery of the sister group for *Mioptachys* Bates, in the Amazon Basin. - *Inpa psydroides*, a new genus and species. - *Coleopterists Bulletin* **32**(1): 29-36.
- ESK & KSAE (The Entomological Society of Korea and The Korean Society Applied Entomology), 1994. Check list of Insects from Korea. Kon-Kuk University Press, 744 pp.
- Fedorenko, D.N. 1993. Carabids of the *Dyschirius chalybeus* Putz. species group (Coleoptera, Carabidae) in the fauna of Russia. - *Ent. Obozr.* **72**(4): 813-826 (in Russian).
- Fedorenko, D.N. 1995. Carabids of the *Dyschirius minutus* (Dej.) species group (Coleoptera, Carabidae) of the fauna of Russia and neighbouring territories. II. the *aeneus*, *cylindricus* and *macroderus* subgroups. - *Ent. Obozr.* **74**(1): 71-80 (in Russian).
- Fedorenko, D.N. 1996. Reclassification of world Dyschiriini, with a revision of the palearctic fauna (Coleoptera, Carabidae). - *Pensoft Series Faunistica*, No. 4, 224 pp.
- Grünthal, S.Ju. 1978. On the synonymy and taxonomy of ground beetles of the genus *Dyschirius* Bon. (Coleoptera, Carabidae from the USSR. - *Ent. Obozr.* **57**(4): 828-831 (in Russian).
- Habu, A. 1942. Notes on some carabid-beetles from Miyake Island. -

- Komya* 16(2): 76-79.
- Habu, A. 1950. On some cave-dwelling Carabidae from Japan (Coleoptera). - *Mushi* 21: 49-53 (in Japanese).
- Habu, A. 1961. Coleoptera from Southeast Asia. 1. Family Carabidae. IN: Nature and Life in Southeast Asia. Vol. 1. pp. 265-300.
- Habu, A. 1967. Fauna Japonica. Carabidae, Truncatipennes Group (Insecta, Coleoptera). Biogeographical Society of Japan. 338 pp.
- Habu, A. 1973. Fauna Japonica. Carabidae. Harpalini (Insecta, Coleoptera). Keigaku Publ. Co., Tokyo. 430 pp.
- Habu, A. 1977. Two new species of ground beetles from Honshu, Japan (Coleoptera, Carabidae). - *Ent. Rev. Japan* 30(1/2): 35-40.
- Habu, A. 1978. Fauna Japonica, Carabidae, Platynini (Insecta, Coleoptera). Keigaku Publ. Co., Tokyo. 447 pp.
- Habu, A. 1982. Revised and supplementary notes on and descriptions of the Truncatipennes group of Japan. I. (Coleoptera, Carabidae). - *Ent. Rev. Japan* 36(2): 85-142.
- Jaeger, B. 1993. Revision der ostasiatischen Arten des *Bradycellus* - subgenus *Tachycellus* Morawitz: 1 Teil: Die anchomenoides-Gruppe (Col., Carabidae). - *Linzer Biol. Beitr.* 25(2): 913-962.
- Jaeger, B. 1995. Drei neue *Bradycellus*-Arten aus China und Ergänzungen zur Synonymie und Verbreitung bekannter Arten der Untergattung *Tachycellus* (Col., Carabidae). - *Linzer biol. Beitr.* 27: 1063-1075.
- Jaeger, B. and D.W. Wrase. 1994. Revision der ostasiatischen Arten des *Bradycellus*-Subgenus *Tachycellus* Morawitz: 2. Teil: Die *B. curtulus* - und *chinensis*-Gruppe (Col., Carabidae). - *Linzer biol. Beitr.* 26(1): 443-513.
- Jaeger, B. and D.W. Wrase. 1995. Die taxonomische Stellung von "*Tachycellus yunnanus*" Jedlicka 1931 und zur Verbreitung von *Bradycellus laeticolor* Bates 1873 und *fimbriatus* Bates 1873 (Col., Carabidae). - *Linzer biol. Beitr.* 27(1): 311-318.
- Jakobson, G.G. 1906. Fasc. 4, pp. 241-320. In: Zhukii Rossii i Zapadnoi Evropy. Sankt-Petersburg: A. F. Devrien. 1024 pp., 83 pls. (In Russian).
- Jedlička, A. 1964. Monographie des Tribus Perigonini aus Ostasien (Coleoptera, Carabidae). - *Reichenbachia* 2(61): 267-274.
- Jedlička, A. 1963. Monographie der Truncatipennes aus Ostasien. Lebiinae-Odacanthina-Brachyninae (Coleoptera, Carabidae). - *Entomol. Abh., Dresden* 28: 269-579.
- Jedlička, A. 1965. Monographie des Tribus Bembidiini aus Ostasien (Coleoptera, Carabidae). - *Ent. Abh., Dresden* 32(7): 79-198.
- Kim, C.W. 1978. Distribution atlas of Insects of Korea. 2. Coleoptera, 414 pp. Korea University Press.
- Kirschenhofer, E. 1984. Neue paläarktische Bembidiinae unter besonderer Berücksichtigung der von Eigin Suenson in Ostasien durchgeführten auf Sammlungen (Col., Carabidae) I. Teil. *Bembidion* Latreille. - *Koleopt. Rdschau* 57: 57-92.
- Kirschenhofer, E. 1997. Beitrag zur Faunistik und Taxonomie der Carabidae (Coleoptera) Koreas. - *Annl. hist.-nat. Mus. natn. hung.* 89: 103-122.
- Kryzhanovskij, O.L. 1970. Taxonomy and distribution of species of the subtribe Tachyina (coleoptera, Carabidae) in the USSR. - *Ent. Obozr.* 49(1): 165-182 (in Russian).
- Kryzhanovskij, O.L. 1983. The beetles of the suborder Adephaga: Families Rhysodidae, Trachypachidae, Carabidae. (Introduction and a review of the USSR Fauna). - *Fauna SSSR* 128(1): 341 pp. (in Russian).
- Kryzhanovskij, O.L., I.A. Belousov, I.I. Kabak, B.M. Kataev, K.V. Makarov and V.G. Shilenkov. 1995. A checklist of the ground-beetles of Russia and adjacent lands (Insecta, Coleoptera, Carabidae). Sofia-Moscow. 271 pp.
- Kult. K. 1949. Revision of the genus *Dyschirius* Bon., species from S. E. Asia (Col. Carabidae) (21st contribution). - *Acta Soc. ent. Čech.* 46 (3/4): 122-132.
- Kurosa, K. 1949. Catalogue of Carabidae from Shikoku (Japan). - *Bulletin of Takarazuka Insectarium* 60: 1-20 (in Japanese).
- Kwon, Y.J. and S.M. Lee. 1986. Check list of superfamily Caraboidea from Korea (Coleoptera). - *Insecta Koreana* 6: 1-55.
- Lafer, G. Sh. 1989. Carabidae. pp. 71-222. In: Ler. P. A. (ed.) *Opredelitel nasekomykh Dalnego Vostoka SSSR. Volume 3. Zhestkokrylye, ili zhukii*. Part 1. 572 pp. (in Russian).
- Liebherr, James K. 1991. Phylogeny and revision of the *Anchomenus* clade: The genera *Tetraleucus*, *Anchomenus*, *Sericoda*, and *Elliptoleus* (Coleoptera: Carabidae: Platynini). - *Bull. Am. Mus Nat. Hist.* 202: 1-163.
- Lindroth, C.H. 1968. The ground-beetles (Carabidae, excl. Cicindelinae) of Canada and Alaska. Part 5. - *Opusc. Entomol. Suppl.* 33: 649-944.
- Löbl, L. and A. Smetana [Edited]. 2003. Catalogue of Palaearctic Coleoptera. Vol. 1, Archostemata-Myxophaga-Adephaga. 819 pp. Apollo Books.
- Lorenz, W. 1998. Systematic list of extant ground beetles of the world (Insecta Coleoptera "Geadephaga": Trachypachidae, and Carabidae incl. Paussinae, Cicindelinae, Rhysodinae). Published by author. Tutzing, Germany, 502 pp.
- Miwa, Y. 1939. Notes on *Scarites* in Japan. - *Nippon no Kochu* 3(1): 21-25 (in Japanese).
- Müller-Motzfeld, G. 1986a. Zur Taxonomie und Phylogenie im *Bembidion*-Subgenus *Ocydromus* Clairville (Col. Carab.). - *Entomologische Nachrichten und Berichte* 30: 31-40.
- Müller-Motzfeld, G. 1986b. Die Gruppe des *Bembidion* (Subgenus: *Ocydromus* Clairv.) *decorum* Zenker (Coleoptera: Carabidae). - *Dtsch. ent. Z., N.F.* 33(3/5): 137-175.
- Müller-Motzfeld, G. 1998. Bemerkungen zur Systematik in der Gattung *Bembidion* Latreille, 1802 (Col., Carabidae). - *Entomologische Nachrichten und Berichte* 42(1/2): 73-75.
- Nakane, T. 1952. New or little known Coleoptera from Japan and its adjacent regions, VIII. Caraboidea. - *Ent. Rev. Japan* 6(1): 1-3, 1 pl.
- Nakane, T. 1963. New or little-known Coleoptera from Japan and its adjacent regions. XVIII. - *Fragmenta Coleopterologica* 6: 23-26.
- Nakane, T. 1963. Harpalidae. In: Nakane, T., et al. (eds.), *Iconographia Insectorum Japonicorum Colore naturali edita*, 2: 22-54, pls. 11-27. Hokuryukan, Tokyo (in Japanese).
- Netolitzky, F. 1942-43. Bestimmungs-Tabellen europäischer Käfer. (9. Stuck.). II. Fam. Carabidae. Subfam. Bembidiinae. 66. Gattung: *Bembidion* Latr. Bestimmungstabelle der *Bembidion*-Arten des paläarktischen Gebietes. (Mit Hinweisen auf holarktische, äthiopische und orientalische Arten.). - *Koleopt. Rdsch., Wien* 28(1/3): 29-68 (1942); 28(4/6): 69-124 (1943); 29(1/3): 1-70 (1943).
- Noonan, G.R. 1976. Synopsis of the supra-specific taxa of the tribe Harpalini (Coleoptera, Carabidae). - *Quaestiones Entomologicae* 12: 3-87.
- Paik, J.C. 1993. Some carabid-beetles (Coleoptera, Carabidae) from Island Naro-do area. - *Jour. Sci. & Education, Suncheon Natl. Univ.* 1: 79-89 (in Korean).
- Paik, J.C. 1995. Some ground beetles from Cheju Island (Carabidae of Korea, V). In: Paik, J. C. et al. *Insects of Quelpart Island*, pp. 135-148 (in Korean). Chejudo Folklore and Natural History Museum, Cheju, Korea.
- Paik, J.C. 1997. Carabidae (Insecta, Coleoptera) of Korea. - *Korean J. Soil Zool.* 2(1): 19-28 (in Korean).

## Carabidae of Jeju

- Paik, J.C. 1997a. Some carabid-beeltes (Coleoptera, Carabidae) from the Is. Naro-do (II). -*Korean J. Soil Zool.* **2**(1): 29-40 (in Korean).
- Paik, J.C.. 1997b. Some carabid-beeltes (Coleoptera, Carabidae) from Cheju Island (IV). -*Korean J. Soil Zool.* **2**(2): 104-114 (in Korean).
- Paik, J.C. 1998. Some ground-beetles (Coleoptera, Carabidae) from Korea. -*Koeran J. Soil Zool.* **3**(1): 1-9.
- Paik, J.C. and T.H. Kim. 2003. Some ground beetles (Coleoptera, Carabidae) from Korea. -*Korean Jour. Soil Zool.* **8**(1/2): 37-45.
- Pawłowski, J. 1974. Tachyni (Coleoptera, Carabidae) of North Korea. -*Acta Zool. Cracoviensia* **19**(9): 155-195.
- Schaum, H.R. 1860b. Beiträge zur Kenntniss einiger Laufkäfer-Gattungen. -*Berliner Entomologische Zeitschrift* **4**: 180-203.
- Shilenkov, V.G. 2002. New data on the taxonomy of the Carabidae tribe Tachyini (Coleoptera, Carabidae). -*Ent. Obozr.* **81**(1): 31-41 (in Russian).
- Tanaka, K. 1985. Carabidae. Pterostichinae. pp. 105-135. In: Uéno, S.-I., Y. Kurosawa & M. Satô [ed.] The Coleoptera of Japan in Color, Vol. II. Hoikusha Publishing Co., Osaka, Japan. (In Japanese).
- Toledano, Luca. 2000. Systematic notes on the Palearctic Bembidiini with particular reference to the fauna of China (Coleoptera Carabidae). -*Memorie della Societa Entomologica Italiana* **78**(1): 5-70.
- Uéno, S.-I. 1953. The Coleoptera of Japan. -*Shin-Konchu* **6**(12): 37-43 (in Japanese).
- Uéno, S.-I. 1955. Studies on the Japanese Trechinae (III) (Coleoptera, Harpalidae). -*Publ. Seto Mar. Biol. Lab.* **4**(2/3): 337-351.
- Uéno, S.-I. 1969. The trechid beetles of the Islands of Tsushima. -*Mem. Nat. Sci. Mus. Tokyo* **12**(2): 57-72.
- Yahiro, K. and C.E. Lee. 1995. Carabid fauna of Cheju Island, Korea (Insecta, Coleoptera). -*Esakia* **35**: 227-238.
- Yano, Y. 1941. A list of Carabidae from Corea. -*Nippon no Kochu* **4**(1): 15-35.