김진일 교수지도

박사학위청구논문

Systematics of the Korean Cantharidae (Coleoptera)

2008

성신여자대학교 대학원

생 물 학 과

강 태 화

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김진일 교수지도

이 논문을 박사학위논문으로 제출함

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생물학과

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강태화의 박사학위 논문으로 인준함

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Disclaimer: Any nomenclatural changes or new taxa proposed in this thesis should be regarded as unpublished personal data.

논문개요

한국산 병대벌레과의 분류학적 연구 및 극동아시아산 병대벌레아과의 계통분류학적 연구를 수행하였다. 한국산 병대벌레과에 대한 분류학적 연구에서는 총 1,878 개체가 사용되었으며, 이 중 헝가리 자연사 박물관에서 북한산 표본을 대여함으로써 북한종들에 대한 재검토를 포함하였다. 그 결과 새로이 2 신종, 4 미기록종이 발견되었으며, 또한 기록종 중 4 종은 오동정이며, 1 종은 한국산 목록에서 제외되어져야하는 것으로 확인되었다. 따라서, 한국산 병대벌레과는 총 4 아과, 7 족, 13 속, 36 종으로 정리되었다.

- New species and unrecorded species

Podabrus dilaticollis Motschulsky (New recorded species)

Asiopodabrus parvitas sp. nov.

Dichelotarsus angusticollis Motschulsky (New recorded genus and species)

Hatchiana baekripoensis sp. nov.

Cantharis knirschi Pic (New recorded species)

Podosilis omissa (Wittmer) (New recorded genus and species)

- Misidentification

Podabrus annulatus Mannerheim (=*Podabrus dilaticollis* Motchulsky)

Asiopodabrus nigriventris Fischer (=*Asiopodabrus fragiliformis* (Kang et Kim))

Rhagonycha cembricola Eschscholtz (=*Rhagonycha asiatica* Wittmer)

Cantharis tenuelimbata Ballion (=*Cantharis nigricolor* Pic)

- Excluded species from the Korean fauna

Lycocerus suturellus (Motschulsky)

극동아시아산 병대벌레아과의 계통분류학적 연구가 추가적으로 수행되었다. 병대벌레아과는 통상적으로 2 족체계가 받아들여지고 있다. 그러나 이에 이용되는 형질에 있어 각 족의 단계통을 설명하기는 어렵다. 따라서 병대벌레과의 자매군인 Omethidae 를 외군으로 사용하였으며, 병대벌레아과의 단계통군을 평가하기 위하여 반날개병대벌레아과, 뿔병대벌레아과, 밑빠진병대벌레아과의 4 속을 포함하여 분지분석을 수행하였다. 그 결과, 병대벌레과는 다음의 벤다이어 그램과 같은 분지양상을 나타내었다:
((반날개병대벌레아과(병대벌레족 1,목가는병대벌레족))(밑빠진병대벌레아과(병대벌레족 2(병대벌레족 3(병대벌레족 4(뿔병대벌레아과,병대벌레족 4)))))).

병대벌레족 1: *Rhagonycha*

병대벌레족 2: *Themus*

병대벌레족 3: *Lycocerus*, *Podistra*, *Habronychus*, *Stenothemus*

병대벌레족 4: *Lycocerus*

병대벌레족 5: *Cantharis*, *Prothemus*

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Abstract

I. Introduction

The family Cantharidae in the order Coleoptera is characterized by a membranous clypeus, an S-shaped anapleural suture between the metasternum and metepisternum (Bracucci, 1980; Brooth et al., 1990), and elytra with no declivity. The tarsal formula is 5-5-5, with the fourth palpomere lobed beneath (Figure 1).

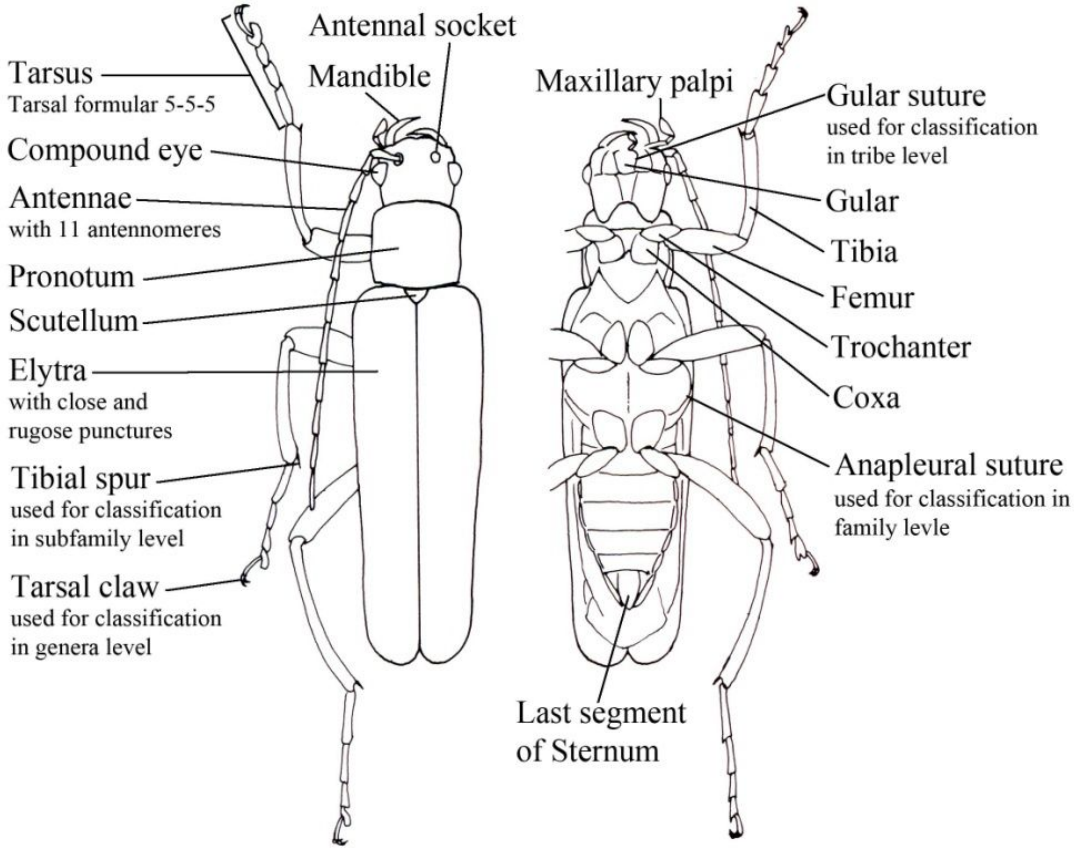

Figure 1. General habitus of the adult cantharids (Modified Okushima, 1998).

Cantharidae are found mainly from early April to early July. Most adult cantharids occur most frequently in valley forests and riverside grasslands, as well as on mountaintops (Figure 2). Many species are primarily active diurnally, but some are attracted to light at night (Ramsdale, 2002; Figure 3).

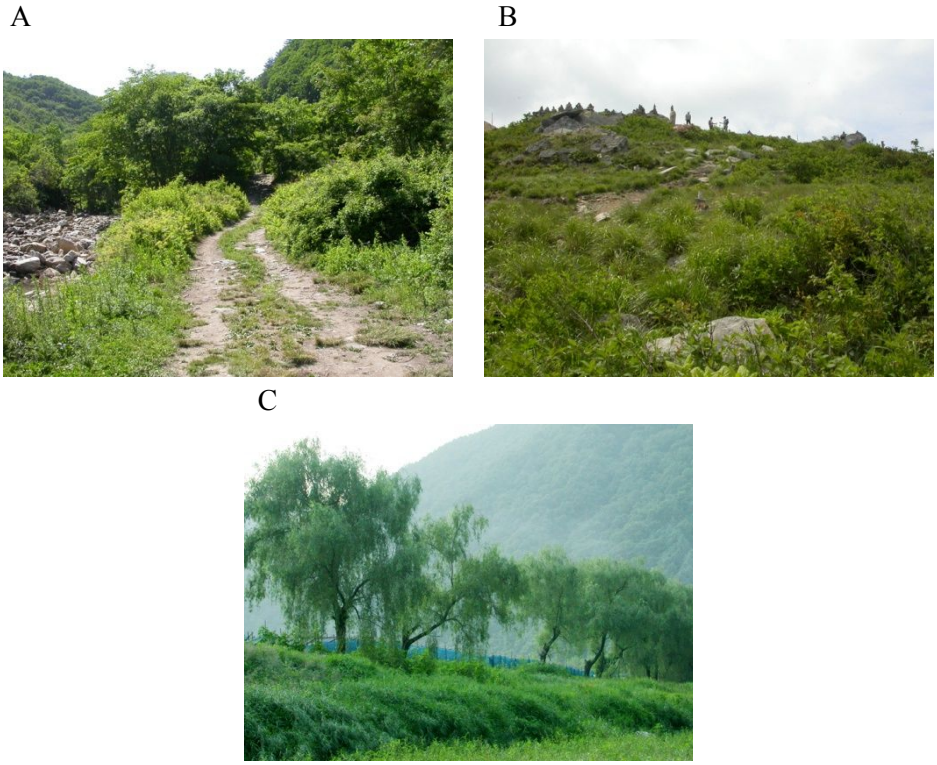

Figure 2. Habitats of the Cantharidae. A. The forest close to valley; B. grassland on the mountaintop; C. The grassland on the riverside.

Cantharids prey upon small insects that gather around flowers and plant foliage (Brooth et al., 1990). Several *Podabrus* Westwood and *Cantharis* Linnaeus

species feed extensively upon Aphididae (Clausen, 1962; Figure 4). A few such as *Chauliognathus* Hentz are omnivorous and feed on wheat, potatoes, celery, and other vegetable tissues (Clausen, 1962; Arnett, 1963). Some species may also feed on nectar and pollen (Arnett, 1963). The larvae are also predaceous and feed on grasshopper eggs, small caterpillars, maggots, lepidopteran and coleopteran larvae, and other soft insects.

Figure 3. *Podabrus dilaticollis* Motschulsky. This is frequently attracted to lights at night.

Adult and larval cantharids possess paired tergal glands that secrete compounds that reduce the insect's palatability. These compounds are probably

synthesized in part from dietary material (Ramsdale, 2002) and may be mimicked by other coleopteran groups (Morimoto and Hayashi, 1986).

A B

C

Figure 4. Predaceous species of the Cantharidae. A. *Asiopodabrus circumangulatus*; B. *Hatchiana rosinae*; C. *Cantharis soeulensis*.

The family Cantharidae was established by Imhoff (1856). It is closely related to Omethidae and belongs, together with Lycidae and Lampyridae, to Elateroidea (Lawrence et Newton Jr. 1995). Linnaeus (1758) first described 30 species of the

genus *Cantharis*. Currently, approximately 7000 species are known worldwide (Okushima, 1998).

In higher classification, Champion (1914) first proposed to raise Cantharini and Chauliognathini to the subfamily rank. For Chauliognathini, he used the asymmetry of the aedeagus as the diagnostic character to validate the subfamily rank. Miskimen (1961) treated Chauliognathinae as a family rank, using several diagnostic characters such as wing venation, the very long mentum, and the asymmetry of the last abdominal segment and aedeagus. However, Arnett (1963), Crowson (1972), Magis and Wittmer (1974), and Dekeskamp (1977) followed Champion's scheme. Magis and Wittmer (1974) refuted Miskimen's (1961) classification by using his characters to compare Cantharinae (*Themus*, *Kandyosilis*, *Laemoglyptus*, *Hyponotum*, *Malchinus*, and *Malthodes*) with Chauliognathinae (*Chauliognathus*, *Ichthyurus*, and *Trypherus*).

Brancucci (1980) conducted the first significant phylogenetic study of Cantharidae as a subfamily and produced the following scheme: (Chauliognathinae (Cantharinae (Silinae (Dysmorphocerinae, Malthininae)))). Brancucci's (1980) five-subfamily scheme was accepted by most specialists, including Wittmer (1982), Satô (1986), and Lawrence and Newton (1995).

Many researchers have conducted local faunistic surveys in regions adjacent to Korea. For example, the major genera *Podabrus* Westwood, *Rhagonycha* Eschscholtz, *Cantharis* Linnaeus, and *Lycocerus* Gorham were reviewed by Švihla

(1993, 1995, 2002, 2006) in the Palearctic region, Kazantsev (1994, 1995, 1996, 1998) in Far Eastern Russian, and Okushima (2005) in Japan. The cantharid fauna of regions adjacent to Korea has been reported as follows: 316 species in 29 genera from Russia (Kazantsev, 2004), with a total of 68 species in 14 genera recorded in Far Eastern Russia (Medvedev and Ryvkin, 1992; Kazantsev, 1994, 2004); 498 species in 37 genera from China (Hua, 2002); and 196 species in 23 genera from Japan (Takahashi, 1998). However, the total inventory of Korean Cantharidae has not yet been confirmed. The goals of this study were to confirm the Cantharidae family members occurring in Korea and elucidate the phylogenetic relationships of cantharid tribes based on materials from Far Eastern Asia.

II. Taxonomy of the Cantharidae in Korea

1. Introduction

Since Heyden (1887) first reported four species of Cantharidae in Korea, many researchers have conducted faunistic surveys. Their reports have contained some taxonomic errors, most of which were solved by Kim and Kang (2000), Kang and Kim (2000a, b), and Kang et al. (2000). Based on materials from South Korea, they confirmed that the Korean Cantharidae comprise 28 species in nine genera and four subfamilies. However, they did not confirm species from North Korea and did not examine Švihla's (1995) description of four species from North Korea: *Rhagonycha indistinct* Medvedev et Ryvkin, *Rh. kanwonensis* Švihla, *Rh.mlikovskyi* Švihla, and *Rh. transita* Wittmer. Since then, Kang and Kim (2002) have added one unrecorded species, and in their review of the cantharids of Jejudo Island, Kang and Okushima (2003) inventoried nine species in five genera under one subfamily and added three new species. Thus, the Korean Cantharidae comprise a total of 35 species in nine genera and four subfamilies (Table 1). However, this total includes nine unexamined Cantharidae species from North Korea.

In this review of Korean (North and South) Cantharidae, I used specimens collected from Korea, including North Korean materials loaned from the Hungarian Natural History Museum (HNHM) in Budapest, as well as China, Russia, and Japan. As a result of my analysis, the Korean Cantharidae now

comprise 36 species in 13 genera and four subfamilies, including two new species and four previously unrecorded species.

Table 1. Historical review of the Cantharid species in Korea with corresponding references.

Author (year)	No. Species Added	Added species	Confirmed name	Remarks
Heyden (1887)	4	*Cantharis suturellus* *C. vitellinus* *C. tenuelimbata* *C.*(*Podabrus*) *heydeni*	*Lycocoerus suturellus* *L. vitellinus* *Cantharis nigricolor* *Hatchiana glochidiatus*	North Korea
Heyden (1889)	1	*Cantharis plagiata*	*Canthairs plagiata*	North Korea
Pic (1921)	1	*Rhagonycha coreana*		South Korea
Pic (1922)	1	*Cantharis soeulensis*		South Korea
Haku (1936)	1	*Podabrus macilentus*	*Asiopodabrus fagiliformis*	South Korea
Mochizuki et Masui (1936)	1	*Telephorus japonicus*	*Lycocerus nigrimembris*	South Korea
Cho (1967)	5	*Podabrus longissimus* *Cantharis ciusianus* *C. oedemeroides* *C. vulcana* *Rhagonycha caroli*	*Podabrus dilaticollis* *Hatchiana glochidiatus* *Cantharis soeulensis* *C. plagiata* *Rhagonycha asiatca*	South Korea
Wittmer (1969)	6	*Podabrus ochoticus* *P. rosinae* *P. nigriventris* *Cantharis raddensis* *C. pallida* *Rhagonycha cembricola*	*Podabrus annulatus* *Hatchiana rosinae* *Asiopodabrus fagiliformis* *Cantharis plagiata* *Rhagonycha asiatca*	North Korea
Kim et Kim.(1971)	2	*Athemus attristarus* *Themus episcopalis*	*Podabrus dilaticollis* *P. dilaticollis*	South Korea
Wittmer (1971)	2	*Rhagonycha asiatica* *R. lederi*		North Korea
Kim et al. (1972)	1	*Podabrus lictorius*	*Asiopodabrus fragiliformis*	South Korea
Lee et al. (1985)	1	*Podabrus temporalis*	*Asiopodabrus circumangulatus*	South Korea

(*continued* Table 1)

Author (year)	No. Species Added	Added species	Confirmed name	Remarks
Kim et al. (1992)	1	*Athemus nigerrimus*	*Podabrus dilaticollis*	South Korea
Park et al. (1993)	1	*Athemus lineatipennis*	*Lycocerus nigrimembris*	South Korea
Švihla (1995)	4	*Rhagonycha indistincta* *Rhagonycha kanwonensis* *Rhagonycha mlikovskyi* *Rhagonycha transita*		North Korea
Kazansev (1996)	1	*Podabrus glochidiatus*	*Hatchiana glochidiatus*	North Korea
Kim et Kim (1996)	1	*Athemus ishihara*	*Lycocerus nigrimembris*	South Korea
Shin et al. (1996)	1	*Prothemus ryukyanus*	*Cantharis pallida*	South Korea
Kwon et al. (1996)	1	*Trypherus niponicus*		South Korea
Kim et Kang (2000)	3	*Silis triimpressa* *Malthinus quadratipennis* *Malthinellus bicolor*		Reviewed as 28 species of 9 genera under 4 subfamilies except 4 species of Švihla (1995) from South Korea
Kang et Kim (2000a)	4	*Podabrus longissimus* *Podabrus jirisanensis* *Podabrus fragiliformis* *Podabrus circumangulatus*	 *Hatchiana jirisanensis* *Asiopodabrus fragiliformis* *A. circumangulatus*	
Kang et al. (2000)	1	*Athemus nigrimembris*	*Lycocerus nigrimembris*	
Kang et Kim (2000b)	2	*Rhagonycha koreaensis* *Rhagonycha parviocellata*		
Kang et Kim (2002)	1	*Pseudoabsidia ussurica*	*Podistra ussurica*	South Korea
Kang et Okushima (2003)	3	*Asiopodabrus asperipunctatus* *Asiopodabrus oreumsensis* *Athemus jejuensis*	 *Lycocerus jejuensis*	South Korea
Total	35 species of 9 genera under 4 subfamilies			

2. Materials and methods

Collection and examination of specimens

The specimens examined were deposited in Insect Resources, Division of Agricultural Biology, National Institute of Agricultural Science and Technology (NIAST), Suweon, Korea, and Sungshin Women's University (SWU), Seoul, Korea, or borrowed from the following institutions: Insect Collection of Korea University (ICKU), Seoul; Department of Biology, Yeongnam University (DBYU), Gyeongsan, Korea; Natural History Museum, Kurashiki (NHMK), Japan; and the Hungarian Natural History Museum (HNHM), Budapest, Hungary.

In all, I examined 1878 specimens. Specimens were collected from April to July by sweeping and beating trees and herbage. Collected materials were dried or preserved in 95% alcohol. I used a stereomicroscope (LEICA MS 5; Olympus SZX12) to observe specimens for description and illustration. I used a digital camera (Nikon D70S; Nikon Coolpix 4500) to photograph the bodies and wings. The aedeagi were prepared as follows: dried specimens were relaxed by immersion in 70–90°C distilled water; the genitalia were removed through the anal opening crack; the genitalia were examined and illustrated under the stereomicroscope; after examination, the genitalia were preserved in a microtube containing glycerin.

Abbreviations of province in Korea

The abbreviations used in locality for provinces are as follows (Figure 5):

HB: Hamgyeongbukdo, HN: Hamgyeongnamdo, PB: Pyeonganbukdo,

PN: Pyeongannamdo, HH: Hwanghaedo, GW: Gangweondo,

GG: Gyeonggido, CB: Chungcheongbukdo, CN: Chungcheongnamdo,

GB: Gyeongsangbukdo, GN: Gyeongsangnamdo, JB: Jeollabukdo,

JN: Jeollanamdo, JJ: Jejudo.

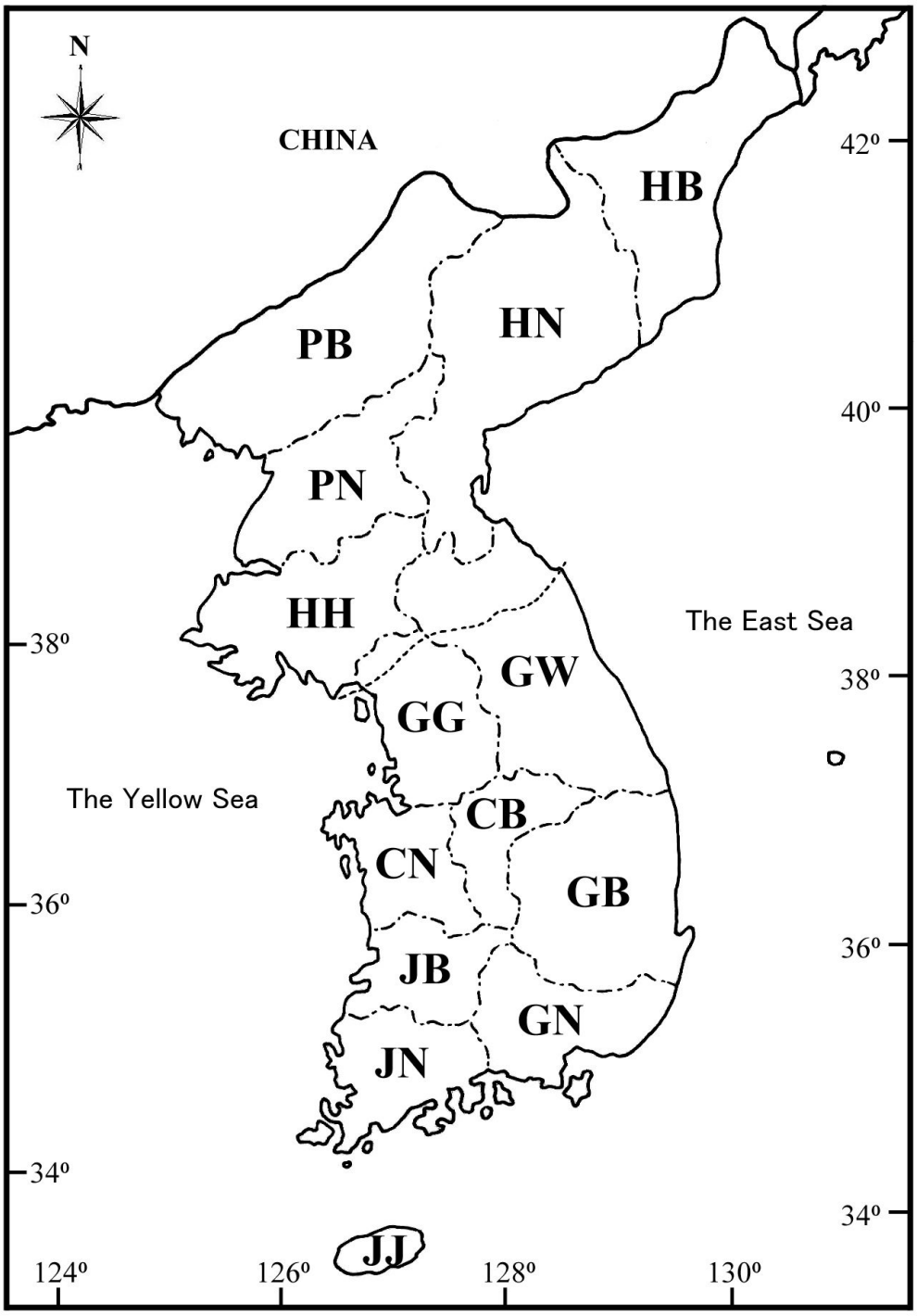

Figure 5. Distributional map of Korea and abbreviation for province

Terminology

The terminology for morphological features largely follows that of Brancucci (1980) and Okushima (2005); however, aedaegal terminology follows that of Magis (1971) and Makino and Nakane (1981). The explanation of the position of the tarsal claws was corrected according to the traditional methods of Gulan and Cranston (2005). Thus, on the basis of living samples, an inner claw is defined as a claw that is close to the centro-longitudinal line.

Head capsule (Figure 6): The shape of the head is used as a diagnostic character at the subfamily level. The position of gular sutures and the head shape behind the eyes are very useful for classifying cantharid tribes. The membranous labrum is a synapomorphy for the Cantharidae.

Mouth parts (Figure 6): The shape of the mandible is used as a diagnostic character at the family and subfamily levels. The shapes of the last palpomeres of the maxillary and labial palpi are synapomorphies for the Malthininae (Brancucci, 1980).

Prothorax (Figure 7): The shape of the pronotum is very important in higher classification. The ratio of width to length and the presence or absence of a depression are used as diagnostic characters at the genus level. The shape of the

lateral margins is frequently used as a diagnostic character at the species level. The posterior angle shape is used as a diagnostic character for the Silinae.

Mesothorax (Figure 8): The shape of the scutellum is used as a diagnostic character at the species level.

Metathorax (Figure 8): The shape of the anapleural sutures is a synapomorphy for the Cantharidae.

Appendages (Figure 9): The shape of the elytra is used as a diagnostic character at the family level and occasionally the genus level. The venation of the hind wing is used as a diagnostic character at the subfamily level, and the position of the radial transversal vein is very useful for classifying tribes in the Cantharinae. Leg characters are very significant at the subfamily and genus levels. The presence or absence of tibial spurs is used as a diagnostic character at the subfamily level, and the shape of the tarsal claws is a very useful character at the genus level.

Aedeagus (Figure 10): The aedeagus is very useful in identifying species. Dorsal processes, laterophyses, and ventral processes are used as diagnostic characters at the species level.

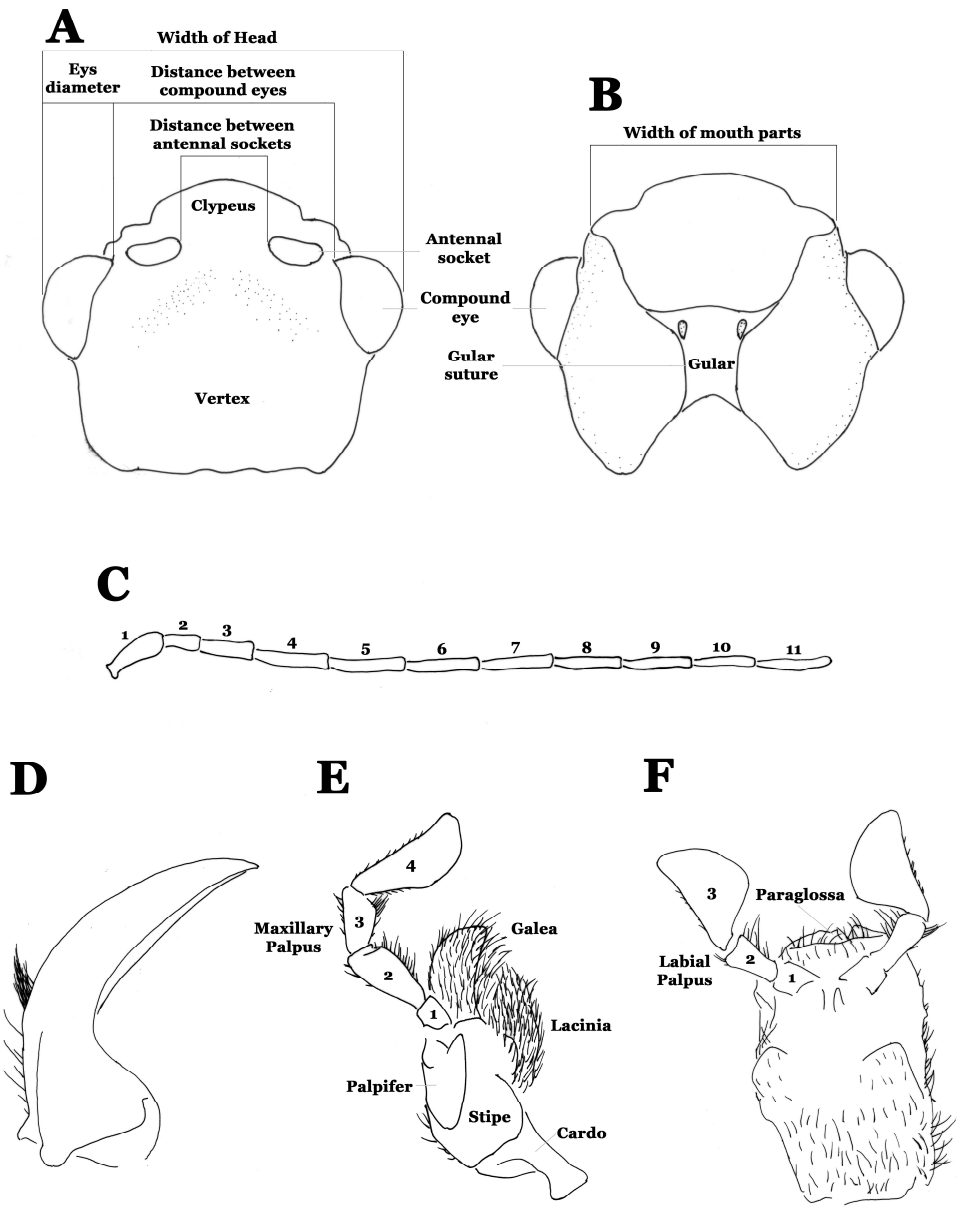

Figure 6. Head. A-B. Head Capsule (A. dorsal view; B. Ventral view); C. Antennae; D. Mandible; E.Maxillar; F. Labia.

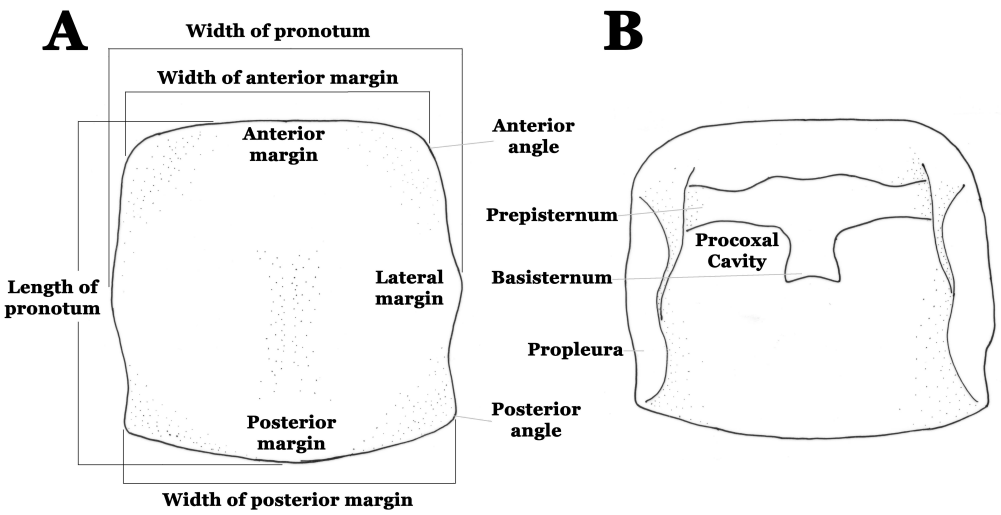

Figure 7. Prothrax. A. Dorsal view; B. Ventral view.

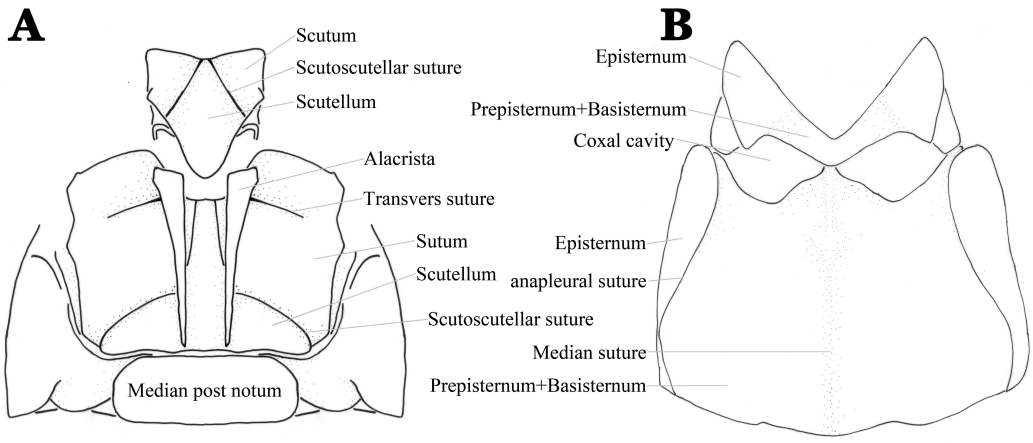

Figure 8. Meso- and Metathorax. A. Dorsal view; B. Ventral view.

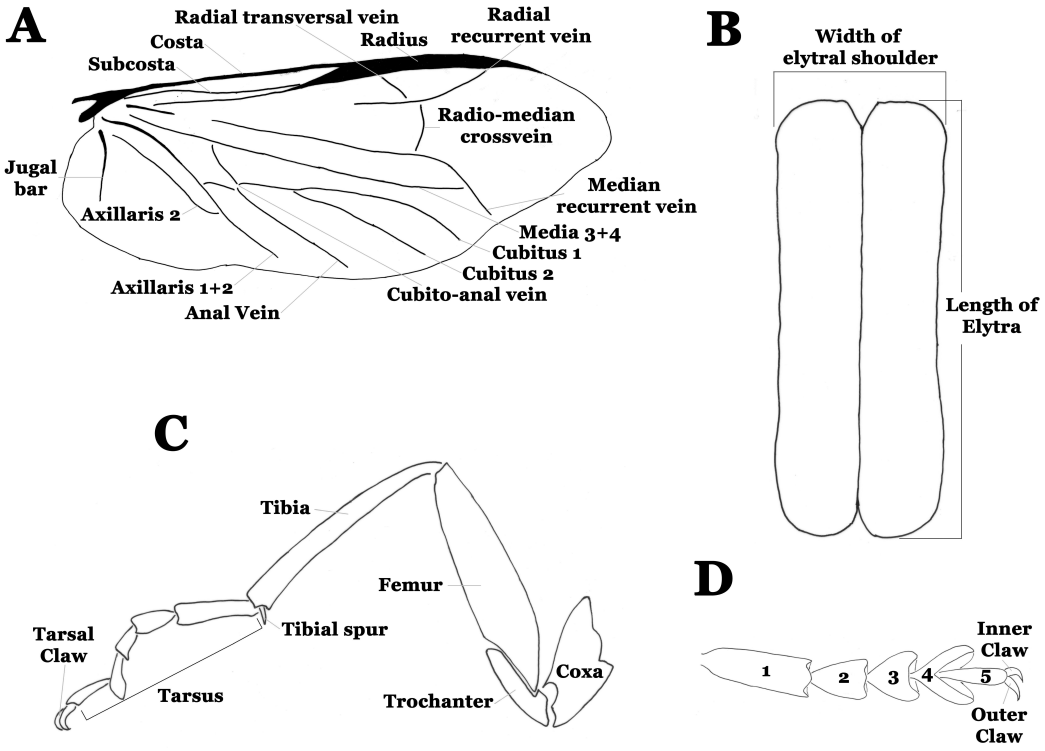

Figure 9. Appendages. A. Hind wing; B. Elytra; C. Leg; D. Tarsus.

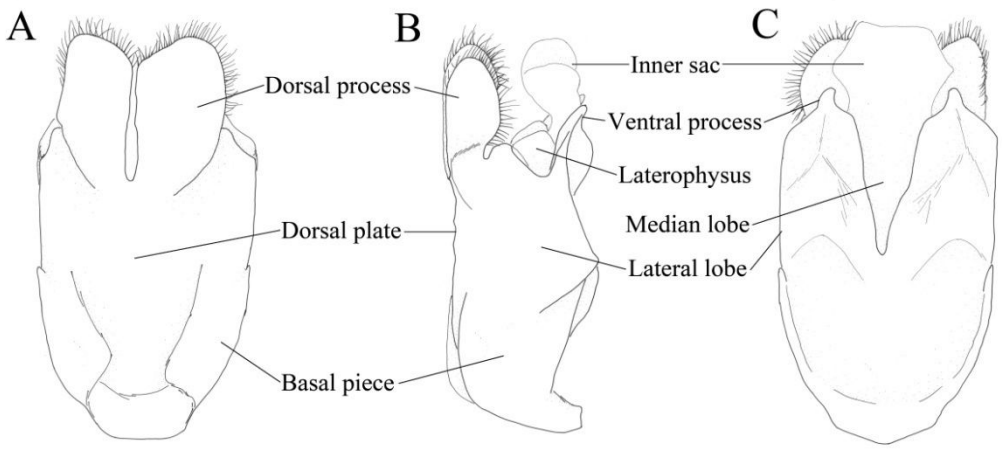

Figure 10. Aedeagus. A. Dorsal view; B. Lateral view; C. Ventral view.

3. Taxonomic Account

Family Cantharidae Imhoff, 1856

Privately Pub. Basel, **31:** 69

Type Genus: *Cantharis* Linnaeus, 1758

Diagnosis. Body length 2-30 mm. Body color yellow, red or black, rarely metallic. Antennae usually filiform, serrate, or pectinated, rarely clubbed. Head prognathous, mandibles sickle shape. Eyes round, prominent. Palpi variable, but apical palpomere mainly hatchet-like or cylindrical. Pronotum flat, with distinct side margins. Scutellum small. Elytra flat, rarely costate, without apical declivity, sometimes shortened to expose hind wings, confusedly punctate. Epipleura narrowed. Anapleural suture S-shaped. Abdomen with seven sternites. Procoxae conical, procoxal cavities widely open behind. Mesocoxae contiguous. Tarsal formula 5-5-5, 4th tarsomere lobate. Apical tibial spurs short or absent.

Korean Name. 병대벌레과

Key to the subfamilies of the Korean Cantharidae Imhoff

1. At least a pair of legs without tibial spurs • • • • • • • • • • • • • Chauliognathinae

- All tibia with tibial spurs • 2

2. Last palpomere of maxillary and labial palpi cylindrical; hind wings slightly expose behind elytra • Malthininae

- Last palpomere of maxillary and labial palpi hatchet-shaped; elytra perfectely covered hind wings • 3

3. Lateral margins of pronotum in male excised and modified; eighth ventral segment in male longitudinally divided; last sternite in female more or less sclerified • Silinae

- Lateral margins of pronotum in male not excied and modified; eighth ventral segment in male not divided; last sternite in female not sclerified • Cantharinae

Subfamily Chauliognathinae LeConte, 1861

Classif. Col. N. Amer., **p.** 186

Type genus: *Chauliognathus* Hentz, 1830

Chauliognathidae: Mikimen, 1961: 18.

Chauliognathinae: Arnett, 1963: 538; Crowson, 1972: 61; Magis and Wittmer, 1974: 91; Delkeskam, 1977: 431; Brancucci, 1980: 289.

Diagnosis. Body color various, rarely metallic. Head prognathous, semi-hypognathous, or hypognathous. Gular sutures widely separated, or converged. Eyes

convex. Antennae filiform. fourth palpomere of maxillar elongated hatchet-shape, or oval shaped with hairy stubby apex. Pronotum flat, quadrated. Elytra long and covered abdomen in tribe Chauliognathini, or very short and uncovered abdomen and hind wing in tribe Ichthyurini. Last segment of sternite and aedeagus asymmetry. Tibial spurs absent.

Korean Name. 반날개병대벌레아과

Tribe Ichthyurini Champion, 1915

Trans. ent. Soc. London, **p.** 128

Type genus: *Ichthyurus* Westwood, 1848

Diagnosis. Body long and slender. Head hypognathus. Gular sutures converged. Last maxillary and labial palpomere hatchet-shaped. Pronotum flat and quadrated. Elytra very short and uncovered abdomen. Last segment of sternum and aedeagus asymmetry..

Korean Name. 반날개병대벌레족

Genus *Trypherus* LeConte, 1851

Proc. Acad. Nat. Sci. Philad., **5:** 346

Type species: *Malthinus latipennis* Germar, 1824.

Diagnosis. Body long and slender. Head hypognathus. Antennae filiform; second antennomere as long as third antennomere. Gular sutures converged. Last maxillary and labial palpomere hatchet-shaped. Pronotum flat and quadrated. Elytra very short and uncovered abdomen. Last segment of sternum and aedeagus asymmetry. Leg long with expanded femur in male, but long and slender in female; all tarsal claws with basal tooth in both sexes.

Korean Name. 반날개병대벌레속

***Trypherus niponicus* (Lewis, 1879)**

Ann. Mag. nat. Hist. **5(4):** 463

***Trypherus niponicus*:** Kwon *et al.*, 1996: 155; Kang and Kim, 2000: 118; Kim, 2002: 247.

Description. Body length: 7.0-9.5 mm. Male. Body mostly black; head yellow, but posterior head of eye black; pronotum black, except yellowish bordering; scutellum dark brown; elytra black, with yellowish bordering; leg yellowish brown.

Head flat, covered with thin and minute punctures. Eye relatively large, ratio of an eye to interocular space 9 : 20. Antennae relatively short, nearly reaching to end of elytra, approximate ratio of each antennomere, 17 : 11 : 10 : 11 : 13 : 13 : 12: 12 : 11 : 11 : 11. Last maxillary and labial palpomere hatchet- shaped.

Pronotum quadrate, with thin and minute puncturing; pronotum 1.24 times wider than long; lateral margins slightly archform curved, with round angles; anterior margin 1.04 times wider than posterior. Scutellum tongue-shape; apex of scutellum flat.

Elytra sharply reduced, ratio of width at elytral shoulder to length of elytra 21 : 23. Hind wing exposed behind elytra. Leg long; mid-femur strongly expanded; tibia without spur; all tarsal claws with tooth at basal part.

Aedeagus asymmetry; left paramere bent upward, with sharpened end; right paramere expanded to posteriorly, with round end; median lobe expanded to posteriorly, with round end; tegumen prolongated to posteriorly; end of tegumen roundly expanded.

Female. Body with darkened color compared to male; eye relatively smaller than that in the male, ratio of an eye to interocular space 6 : 17; antennae relatively shorter than that in the male, approximate ratio of each antennomere, 9 : 6 : 7 : 8 : 8 : 8 : 8 : 7 : 7 : 7 : 7; mid-femur slender.

Materials Examined (12 individuals). [**KOREA] <GW>** 1♀1♂, Mt. Gachilbong, Hongcheon-gun, 21. VI. 1984; 1♀, Mt. Seoraksan (Temple of Baikdamsa), Inje-gun, 5. VI. 1979 (NIAST); **<GN>** 4♀2♂, Weondang-gyo, Yongdang-ri, Weondang-myeon, Yangsan-si, 3. VI. 2000, Lab. of Entomology, Yeongnam Univ (DBYU); **[JAPAN]** 2♀2♂, Koetoi, Wakkanai, Hokkaido Pref., 7. VIII. 1991, Y. Andou (NHMK).

Korean Name. 반날개병대벌레

Distributions. Korea (GW, GN), Japan (Hokkaido, Honshu, Shikoku, Kyushu), Russia (Russian Far East).

Subfamily Cantharinae Imhoff, 1856

Privately Pub. Basel, **31:** 69

Type genus: *Cantharis* Linnaeus, 1758

Cantharinae: Arnett, 1963: 537; Brancucci, 1980: 287.

Diagnosis. Body color various, rarely metallic. Head slightly round, or rarely elongated. Gular sutures widely separated, or rarely converged. Eye convex. Antennae filiform. fourth maxillary palpomere hatchet-shape. Pronotum flat. Elytra long and covered abdomen. Hind wing not exposed behind elytra. Last segment of sternum and aedeagus symmetry. Tibia with apical spurs.

Korean Name. 병대벌레아과

Key to the genera of the Korean Cantharinae Imhoff

1. All tarsal claws bifid or with appendage • 2

- At least two tarsal clasws simple • 6

2. Gular sutures convergence at centre • Podabrini • 3

- Gular sutures not convergence • *Rhagonycha*

3. Body size smaller than 10 mm • 4

- Body size over 10 mm • 5

4. Body color mainly pale yellow; tarsal claws of fore and mid legs bifid, but hind with blunt tooth • *Asiopodabrus*

– Body color mainly black; tarsal claws of fore legs bifid, but mid and hind with blunt tooth • *Dichelotarsus*

5. Legs black; all tarsal claws bifid in male, but female with blunt tooth • *Podabrus*

– Legs dusky brown or dusky black; tarsal claws of fore legs with blunt tooth in both sexes • *Hatchiana*

6. At least more than two tarsal claws with blunt tooth at base • *Cantharis* (s. lato) • 7

- All tarsal claws simple, or at least more than two tarsal claws with sharp tooth at base • 8

7. Pronotum quadrate; all tarsal claws with blunt tooth in male, but simple in female • *Cantharis* (*Cyrtomophtila*)

- Pronotum circulate; at least two tarsal claws with blunt tooth at base in both sexes • *Cantharis* (s. str.)

8. All tarsal claws simple • 9

- At least more than two tarsal claws with sharp tooth at base • • • • • • • • • • • • • •

• *Lycocerus* (*Andrathemus*)

9. Second antennomere shorter than 1/2 third antennomere • • • • • • • • • • • • • • • •

• *Lycocerus* (*Athemellus*)

– Second antennal segment longer than 1/2 third segment • • • • • • • • • • • • • • • •

• *Podistra*

Tribe Podabrini LeConte, 1881

Trans. Amer. Ent. Soc., **9:** 44 et 45

Type genus: *Podabrus* Westwood, 1838

Diagnosis. Body long and slender. Head prognathus. Antennae filiform; second antennomere with various length. Gular sutures converged. Last maxillary and labial palpomere hatchet-shaped. Pronotum convexed and quadrated. Elytra completely covered abdomen. Radial transvein connected to radio-median crossvein, or closed to apical area rather than radio-median crossvein. Last segment of sternum and aedeagus symmetry. Leg long and slender; tarsal claws bifid or with appendages in both sexes.

Korean Name. 목가는병대벌레족

Genus *Podabrus* Westwood, 1838

Introd. mod. Class. Ins. II, App. Gen. Synops, **p.** 27

Type species: *Cantharis alpinus* Paykull, 1798

***Podabrus*:** Makino and Nakane, 1981: 55; Medvedev and Ryvkin, 1992: 34; Kazantsev, 1996: 106.

Diagnosis. Body long and slender. Head prognathus. Antennae filiform; second antennomere as long as third antennomere. Gular sutures converged. Last maxillary and labial palpomere hatchet-shaped. Pronotum convexed and quadrated. Elytra completely covered abdomen. Radial transvein connected to radio-median crossvein. Last segment of sternum and aedeagus symmetry. Leg long and slender; all tarsal claws bifid in male, but with basal tooth in female.

Korean Name. 목가는병대벌레속

Key to the species of the Korean *Podabrus* Westwood

1. Pronotum yellowish brown • *P. annulatus*

- Pronotum black, but lateral margin yellowish brown • • • • • • • • • • • • • • • • • • 2

2. Posterior angles of pronotum obtuse; Scutellum tongue-shaped with round apex • *P. dilaticollis*

- Posterior angles of pronotum with right angles; Scutellum triangular with sharp apex • *P. longissimus*

***Podabrus annulatus* Mannerheim, 1825**

Essais ent., **1(4):** 28

***Podabrus annulatus*:** Kazantsev, 1996: 111.

***Podabrus annulatus*:** Kang and Kim, 2000: 202. **[Misidentification of *P. dilaticollis*]**

***Podabrus ochoticus*:** Wittmer, 1969: 107; Delkeskamp, 1977: 18; Medvedev and Ryvkin, 1992: 35. [**Synonymized by Kazantsev (1996)**]

Description. Body length: 11.5 – 14.0 mm. Male. Body mostly black; head dusky brown in anterior area, but black in posterior area behind antennal sockets; eye dark brown; antennae almost black, but first and second antennomere dusky brown; pronotum yellowish brown; scutellum, elytra and legs black.

Head flat, covered with rough punctures in posterior area behind antennal sockets and provided with slightly transverse depression behind antennal sockets. Eye relatively small, ratio of an eye to interocular space 6 : 25. Antennae relatively long, nearly reaching to the middle of elytra, approximate ratio of each antennomere, 16 : 9 : 10 : 15 : 15 : 15 : 15 : 15 : 14 : 13 : 15. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate, covered with rough punctures; pronotum 1.31 times wider than long; median area strongly convex, but postero-central region slightly

depressed and with a medio longitudinal groove; lateral margins round, with round anterior angles and obtuse posterior angles; posterior margin 1.12 times wider than anterior. Scutellum triangular, with round apex.

Elytra parallel sided, ratio of width at elytral shoulder to length of elytra 34 : 113; dorsal surface closely and rugosely punctate. Legs long and slender; all tarsal claws bifid at apex.

Aedeagus elongated; dorsal plate membraneous, expanded to basal part of dorsal processes; dorsal processes widely expanded to posterior, with hairs at distal part; laterophyses exposed at apex; ventral process short; basal part of ventral process broad, but sudden narrow to posterior; apex of ventral process bent downward.

Female. Body color same to male; body somewhat longer and wider than that in the male; eye relatively smaller than that in the male, ratio of an eye interocular space 5 : 23; each tarsal claw of all legs provided with blunt basal tooth.

Materials Examined (11 Individuals). [KOREA] <HB> 2♀, 2000-2500m, Explosion-Lake, Mt. Baekdusan, 18. VII. 1977, Dely & Draskovits (HNHM); 1♀, lake-shore, before Sam-zi-yan hotel, Mt. Baekdusan (Light trap), 19. VII. 1977, Dely & Draskovits (HNHM); 1♂, Chondjin, 4. VI. 1991, Ronkay & Vojnits (HNHM); 1♂, 1500m,Milyong, Mt. Baekdu-san (Ryanggang. Prov.), 27. VI. 1988, O. Merkl & Gy. Szél (HNHM); 1♀, 800m, Konchang (Ryanggang Prov.), 30. VI. 1988, O. Merkl & Gy. Szél (HNHM); 1♀, 900m, Chong-bong (Ryanggang Prov.),

30. VI. 1988, O. Merkl & Gy. Szél (HNHM); **<HN>** 1♀, 1000m, River Dumangang, Mupo (Ryanggang Prov.), 29. VI. 1988, O. Merkl & Gy. Szél (HNHM); **[CHINA]** 1♀, Musonghyeong, Seopa, Mt. Baekdusan, 6. VII. 2005, KIM, Ah-young (NIAST); 1♀1♂, Waterfall Jangbaekpokpo, Bukpa, Mt. Baekdusan, 7. VII. 2005, KIM, Ah-young (NIAST).

Remarks. This species is found only in HB and HN, North Korea. Also, a comparison of voucher specimens of *P. annulatus* and *P. dilaticollis* from North Korea (Table 2) revealed that *P. annulatus* from South Korea is a misidentification of *P. dilaticollis*.

Korean Name. 북방목가는병대벌레 (신칭)

Distributions. Korea, China (Jilin), Russia (Transbaikalia, Amur, Primor'e, Northern Sakhalin), Mongolia.

Table 2. Diagnostic characters of *P. annulatus* and *P. dilaticollis.*

Diagnosis	*P. annulatus*	*P. dilaticollis*
Body color	pronotum yellowish brown	pronotum black, but lateral margin yellowish brown
Head Surface	provided with slightly transverse depression behind antennal sockets	provided with triangulated depression between eyes
Eye Ratio	6:25	8:26
Shape of Pronotum	pronotum 1.31 times wider than long with obtuse posterior angles posterior margin 1.12 times wider than anterior	pronotum 1.45 times wider than long with slightly projected posterior angles posterior margin 1.06 times wider than anterior
Shape of Scutellum	triangular	tongue shape
Shape of Aedeagus	elongated basal part of ventral process broad, but sudden narrow to posterior	oval in outline basal part of ventral processes narrow, but broad to posterior

***Podabrus dilaticollis* Motschulsky, 1860**

Reisen Amurl., **2:** 115

***Athemus attristatus*:** Kim and Kim, 1971: 156; Kim et al., 1972: 221; Kim et al., 1992: 154; Kim et al., 1994: 181; Kim and Kim, 1996: 48; Kim and Kim, 1996: 128; Kim and Kim, 1998: 171. [**Misidentification**]

***Athemus nigerrimus*:** Kim et al., 1992: 154; Kim et al., 1993: 148; Kim and Kim, 1996: 48. [**Misidentification**]

***Podabrus annulatus*:** Kang and Kim, 2000: 202. **[Misidentification]**

***Podabrus longissimus*:** Cho, 1967: 193; Kim and Kim, 1971: 156; Kim and Kim, 1972: 78, Kim and Nam, 1984: 329; Kim, 1993: 201; Kim et al., 1993: 148; Kim et al., 1994: 181; Kim and Kim, 1998: 171. [**Misidentification**]

***Themus episcopalis*:** Kim and Kim, 1971: 156; Kim *et al.*, 1994: 181; Kim and Kim, 1998: 171. [**Misidentification**]

Description. Body length: 14.5 – 16.5 mm. Male. Head black, but anterior part of eyes yellowish brown; antennae black, but first antennomere yellowish brown and second antennomere dark brown; maxillary palpi yellowish brown, but last palpomere black with brownish basal part; labial palpi yellowish brown, but last palpomere black with brownish basal part; pronotum black, but lateral margin yellowish brown; scutellum, elytra, legs, abdomen black.

Head flat; anterior part of eyes with thin and minute punctures, but posterior part with close and rough punctures; antennal sockets rised to posterior; area between eyes depressed with triangular. Eyes relatively small, ratio of an eye to interocular space 8 : 26. Antennae nearly reaching to the middle of elytra, approximate ratio of each antennomere, 17 : 9 : 9 : 14 : 14 : 14 : 14 : 15 : 15 : 13 : 14. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate, covered with close and rough punctures, but thin and minute punctuated to lateral; pronotum 1.45 times wider than long; median area strongly convex, with medio-central groove and posterio-central triangulated depression; lateral margins round, with round anterior angles and slightly projected posterior angles; posterior margin 1.06 times wider than anterior. Scutellum tongue shape, with round apex.

Elytra parallel sided, ratio of width at elytral shoulder to length of elytra 21 : 66; dorsal surface with thin and minute punctures at basal part, but close and rugous punctuated posteriorly. Legs slender; tibia straight; all tarsal claws bifid at apex.

Aedeagus oval in outline; dorsal plate membraneous, expanded to basal part of dorsal processes; dorsal processes widely expanded to posterior, with hairs at distal part; laterophyses exposed at apex; ventral processes short, bent downward; basal part of ventral processes narrow, but broad to posterior; apex of ventral processes round.

Female. Body color duskier than in male; body somewhat longer and wider than in the male. Eyes relatively smaller than in the male, ratio of an eye to interocular space 6 : 30; each tarsal claw of all legs provided with blunt basal tooth.

Materials Examined (43 individuals). [KOREA] <HB> - 1♀, 1700m, Sam-zi-yan, Chann-Pay plateau (Ryang-gang Prov.), 24. VII. 1975, J. Papp & A. Vojnits (HNHM); 1♂, Chondjin, 4. V. 1991, Ronkay & Vojnits (HNHM); **<PN>**

3♀, Ison-nam valley, Mt. Myohyang-san, 23. V. 1991, Ronkay & Vojnits (HNHM); **<GW>** 1♀, Mt. Manmul-san ~ Mt. Geumgang-san, 11. VI. 1991, Ronkay & Vojnits (HNHM); 1♀, Mt. Gwangdeoksan, Hwacheon-Gun, 14. VI. 2002, SOHN, J. C. (NIAST); 1♀1♂, Osaek gate to 1st resting post, Mt. Seoraksan, 24. V. 2003, KIM, J. K. (NIAST); 1♀, Temple Baekdamsa, Mt. Seoraksan, 22. V. 2003, KIM, J. K. (NIAST); 3♀, Mt. Seoraksan (from Jangsudae to 12 Seonyeotang), Hangye-Ri, Buk-Myeon, Inje-Gun, 26. VI. 2005, KANG, T. H. (NIAST); 1♂, Mt. Hanseoksan (Broadleaf tree), Inje-Gun, 18. VI. 1997, PARK, H. C. (NIAST); 1♀1♂, Mt. Hanseoksan, Inje-Gun, 8. VI. 1997, PARK, H. C. (NIAST); 2♀1♂, Mt. Odaesan (Bangadari Yaksu-at light), Jinbu-Myeon, Pyeongchang-Gun, 22. VI. 2005, KIM, T. W. (NIAST); 3♀1♂, Mt. Odaesan (Valley Jogyego), Jinbu-Myeon, Pyeongchang-Gun, 23. VI. 2005, KIM, T. W. (NIAST); 1♂, Mt. Taebaeksan, Taebaek-Si, 30. V. 1999, KANG, T. H. (NIAST); 11♀1♂, Mt. Hambaeksan (Valley Jeolgolgyegok), Hwangji-Dong, Taebaek-Si, 5. VI. 2005, KANG, T. H. (NIAST); 1♀1♂, Mt. Baekdeoksan (Front gate of Temple Gwaneumsa), Suju-Myeon, Yeongweol-Gun, 14. V. 2001, PARK, H. C. (NIAST); 1♀, Mt. Gyebangsan, 21. VI. 1999, YOO, J. S. (NIAST); 1♀, Mt. Taebaeksan, 14. V. - 20. VI. 1999, GU, D. S. (NIAST); 1♂, Mt. Odaesan, 12. VI. 1997, KIM, Y. M. (NIAST); 1♂, Mt. Odaesan, 20. VI. 1997, LEE, O. I. (NIAST); **<GG>** 1♂, Dodae-Ri (Valleyhouse), Bal-Myeon, Gapyeong-Gun, 28. V. 2001, HWANG, J. H. (NIAST); 1♂, Mt. Myeongjisan, Baekdun-Ri, Buk-Myeon, Gapyeong-Gun, 22. V.

2001, LEE, H. S. (NIAST); 1♂, Mt. Myeongjisan (Temple Seungcheonsa), Baekdun-Ri, Buk-Myeon, Gapyeong-Gun, 28. V. 2001, KIM, T. W. (NIAST); 2♀, Mt. Myeongjisan (Temple Seungcheonsa), Baekdun-Ri, Buk-Myeon, Gapyeong-Gun, 28. V. 2001, PARK, H. C. (NIAST); 2♀, Mt. Myeongjisan (Temple Seungcheonsa), Baekdun-Ri, Buk-Myeon, Gapyeong-Gun, 28. V. 2001, HWANG, J. H. (NIAST).

Remarks. This species is new to Korea. A comparative analysis of voucher specimens of *P. dilaticollis* showed that *P. annulatus* from South Korea is a misidentification of this species.

Korean Name. 노랑테병대벌레

Distribution. Korea, Russia (Amur, Primor'e).

***Podabrus longissimus* Pic, 1905**

Echange, **21:** 113

***Podabrus longissimus*:** Kang and Kim, 2000: 204.

Description. Body length: 12.0 – 13.5 mm. Male. Head black, but anterior part of antennal sockets yellowish brown; antennae black, but first two antennomeres dark brown at dorsal part and yellowish brown at ventral part; each palpomere of maxillary palpi yellowish brown, but distally dark brown; labial palpi yellowish

brown, but last palpomere black; pronotum black, but lateral margin dusky brown; scutellum, elytra, legs, abdomen black.

Head flat; anterior part of antennal sockets with thin and minute punctures, but posterior part with close and rough punctures; antennal sockets rised to posterior; area between eyes depressed with semicircular. Eye relatively small, ratio of an eye to interocular space 7 : 21. Antennae nearly reaching to the middle of elytra, approximate ratio of each antennomere, 16 : 8 : 8 : 12 : 12 : 13 : 12 : 12 : 12 : 11 : 12. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate, covered with thin and minute punctures; pronotum 1.18 times wider than long; median area strongly convex, with medio-central groove and posterio-central triangulated depression; lateral margin round, with round anterior angles and sharp posterior angles; posterior margin 1.10 times wider than anterior. Scutellum triangular, with round apex; median area with triangulated depression.

Elytra parallel sided, ratio of width at elytral shoulder to length of elytra 17 : 59; dorsal surface with thin and minute punctures at basal part, but close and rugous punctuated posteriorly. Legs slender; tibia straight; all tarsal claws bifid at apex.

Aedeagus elongated; basal part of dorsal processes exposed; dorsal processes widely expanded to posterior, with hairs at distal part; distal line of dorsal processes clearly cutted and sloped outward; laterophyses exposed at apex; ventral

processes short, bent downward; basal part of ventral processes expanded; apex of ventral processes round.

Female. Body color duskier than in male; body somewhat longer and wider than in male; each tarsal claw of all legs provided with blunt basal tooth.

Materials Examined (7 individuals). [KOREA] <GW> 1♂, Mt. Odaesan (Spa Yambongyaksu), Hongcheon-Gun, 4. VI. 1998, KIM, J. I. (NIAST); 2♀1♂, Mt. Gariwangsan, Jeongseon-Eup, Jeongseon-Gun, 21. V. 1998, KIM, B. Y. et al. (NIAST); 1♂, Mt. Hambaeksan (1450-1570m), Hwangji-Dong, Taebaek-Si, 6. VI. 2005, KANG, T. H. (NIAST); **[JAPAN]** 1♂, Toyosato, Nakagawa-cho, Hokkaido, 24. VI. 1996, H. Asano (NHMK); 1♀1♂, Shiretoko-toge, Hokkaido, 29. VII. 1981, K. Ijima (NHMK); 1♀, Shiretoko-toge, Shari-cho - Rausu-cho, Hokkaido, 25. VII. 1992, T. Miyata (NHMK).

Korean Name. 목가는병대벌레

Distributions. Korea, Russia (Sakhalin, Kurils), Japan (Hokkaido, Honshu).

Genus *Asiopodabrus* Wittmer, 1982

Ent. Rev. Japan, **37:** 122

Type species: *Podabrus taiwanus* Wittmer, 1982

***Podabrus*:** Makino and Nakane, 1981: 55 ; Medvedev and Ryvkin, 1992: 34.

***Dichelotarsus*:** Kazantsev, 1992: 268.

***Asiopodabrus*:** Takahashi, 2002: 195.

Diagnosis. Body long and slender. Head prognathus. Antennae filiform; second antennomere more or less longer than third antennomere. Gular sutures converged. Last maxillary and labial palpomere hatchet-shaped. Pronotum convexed and quadrated. Elytra completely covered abdomen. Radial transvein connected to radio-median crossvein. Last segment of sternum and aedeagus symmetry. Leg long and slender; fore and mid tarsal claws bifid, and hind tarsal claws with basal tooth in male; all tarsal claws with basal tooth in female.

Korean Name. 연노랑목가는병대벌레속

Key to the species of the Korean *Asiopodabrus* Wittmer

1. Pronotum as long as wide • 2

– Pronotum wider than long • 3

2. Distal margins in dorsal processes of aedeagus expand to each side • • • • • • • •

• *A. asperipunctatus*

- Distal margins in dorsal processes of aedeagus round • • • • • • • • • • • • • • • • • •

• *A. parvitas* n. sp.

3. Last antennomere shorter than third antennomere •

• *A. circumangulatus*

- Last antennomere longer than third antennomere • 4

4. Antennae nearly reaching to 1/3 of elytra; second antennomere distinctly longer than third antennomere • *A. fragiliformis*

- Antennae nearly reaching to the middle of elytra; second antennomere nearly same length to third antennomere • *A. oreumsensis*

Asiopodabrus asperipunctatus Kang et Okushima, 2003

Elytra, Tokyo, **31(2):** 346

Description. Body length: 4.5-6.0 mm. Male. Body mostly pale yellow; head pale yellow in anterior area, but black in posterior area behind eyes; eyes black; antennae almost blackish brown, but each jointal portion yellowish brown, first and second antennomeres yellow, third and eleventh yellowish brown; pronotum pale yellow, but postero-medial area black, scutellum black; elytra pale yellow.

Head flat; surface minutely punctuate in anterior portion before eyes, but strongly punctuate in posterior portion; intermediate area of eyes slightly and triangularly depressed. Eyes relatively small, ratio of the diameter of an eye to interocular space 4 : 18. Antennae relatively short, nearly reaching to one third of elytra, ratio of each antennomere, 17 : 11 : 9 : 12 : 12 : 11 : 11 : 11 : 11 : 11 : 14. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate; pronotum 1.04 times wider than long and strongly punctate on disc and minutely so on lateral areas; median area strongly convex, but postero-central

portion strongly depress with medio-longitudinal groove; lateral margins sinuate with angulated anterior angles and sharp posterior angles; posterior margin 1.37 times wider than anterior. Scutellum triangular with rounded apex.

Elytra subparallel sided, ratio of width at elytral shoulder to length of elytra 29 : 97; dorsal surface covered with close and rugose punctures. Legs long and slender; each tarsal claw bifid in fore and mid legs, blunt toothed in hind legs.

Aedeagus oval shaped; tegmen 1.94 times longer than its width; dorsal process very short, conjointly forming wide dorsal plate with acute corner on each side of terminal margin; postero-lateral margins sinuated. Laterophyses bent upward, exposed to apex of posterior portion of dorsal plate. Each ventral process expanded at base, but narrowed apically.

Female. Body color duskier than in the male; body somewhat longer and wider than in the male; eyes relatively smaller than in the male, ratio of an eye to interocular space 4 : 20; scutellum with more obtuse apex than in the male; each tarsal claw of all legs provided with blunt basal tooth.

Materials Examined (23 individuals). [KOREA] <CN> 1♂, Beach Baekripo, Wihyang-Ri, Soweon-Myeon, Taean-Gun, 11. VI. 2005, LEE, J. G. (NIAST); **<JB>** 13♀7♂, Temple Naesosa, Yongdong-Ri, Jinseo-Myeon, Buan-Gun, 12. V. 2004, KANG, T. H. (NIAST); **<JJ>** 1♂, Mt. Hallasan (Area between Oreumse to Uioreumse), 11. VI. 2000, LEE, Y. B. (NIAST); 1♀, Mt. Sanbangsan, Andeok-Myeon, Namjeju-Gun, 28. V. 2005, JUNG, B. H. (NIAST).

Remarks. Previously, this species was thought to be distributed only on Jejudo Island. However, the species has also been found in the area close to the beach in CN and JB.

Korean Name. 거친목가는병대벌레

Distribution. Korea.

Asiopodabrus circumangulatus (Kang et Kim, 2000)

Ins, Koreana, **17(3):** 209

***Asiopodabrus circumangulatus*:** Kang and Okushima, 2003: 342; Kim *et al*., 2004: 117.

***Podabrus* (*Asiopodabrus*) *circumangulatus*:** Kim, 2002: 246; Kim, 2002: 284.

***Podabrus lictorius*:** Lee and Kwon, 1974: 39. [**Misidentification**]

***Podabrus temporalis*:** Lee *et al.*, 1985: 406; Kim *et al.*, 1992: 154; Kim *et al.*, 1994: 148; Kim and Kim, 1996: 48; Kim and Kim, 1996: 128; An, 1997: 31. [**Misidentification**]

Description. Body length: 7.0-9.5 mm. Male. Head pale yellow, but posterior part of eyes black; antennae yellowish brown; maxillary and labial palpi yellowish brown; pronotum pale yellow, but median part black; scutellum black, but

posterior part pale yellow; elytra pale yellow; legs yellowish brown, but tarsus dusky brown; abdomen black.

Head flat; anterior part of antennal sockets thin and minute punctures, but posterior part with close and rough punctures; antennal sockets rised to posterior; area between antennal sockets depressed with inverted triangular, with medio-central groove. Eyes relatively small, ratio of an eye to interocular space 6: 26. Antennae nearly reaching to the middle of elytra, approximate ratio of each antennomere, 14 : 11 : 8 : 12 : 12 : 12 : 12 : 11 : 11 : 10 : 11. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate, covered with close and rough punctures, but thin and minute punctuated to lateral; pronotum 1.19 times wider than long; median area strongly convex, with medio-central groove and posterio-central quadrated depression; lateral margin sinuated, with round anterior angles and sharp posterior angles; posterior margin 1.22 times wider than posterior. Scutellum triangular, with round apex.

Elytra parallel sided, ratio of width at elytral shoulder to length of elytra 25 : 87; dorsal surface with thin and minute punctures at basal part, but close and rugous punctuated posteriorly. Legs slender; tibia straight; fore and mid tarsal claws bifid at apex, but post tarsal claws with blunt tooth.

Aedeagus quadrate; dorsal processes slander; distal part of dosal processes with hairs; ventral processes straight, with round apex; each side of ventral processes parallel, but convergent at apex.

Female. Body color duskier than in the male; body somewhat longer and wider than in the male; eye relatively smaller than in the male, ratio of an eye to interocular space 5 : 31; each tarsal claw of all legs provided with blunt basal tooth.

Materials Examined (65 individuals). [KOREA] <GW> 1♀, Kumgang-san, Manmul-san, 21. VI. 1988, O. Merkl & Gy. Szél (HNHM); 1♀, Mt. Shinseongbong (Area between Mishiryeong to Shinseongbong), Toseong-Myeon, Goseong-Gun, 25. V. 2002, YEO, J. D. (NIAST); 1♀, Mt. Gachilbong, Nae-myeon, Hongcheon-gun, 21. VI. 1984, Hwang, Geum-ju (SWU); 1♀, Mt. Gachilbong, Hongcheon-gun, 21. VI. 1984, Park, Seong-hwa; 1♀, Mt. Gachilbong, 21. VI. 1984, I.H.Kim (SWU); 1♀, Mt. Gachilbong, Hongcheon-gun, 21. VI. 1984, Hwang, Hyeon-sook (SWU); 1♂, Mt. Gachilbong, 21. VI. 1984, Kang, Seong-jun (SWU); 2♀, Mt. Gachilbong, 22. VI. 1984, Choi, Yeong-cheol (SWU); 1♂, Mt. Gachilbong, Hongcheon-gun, 23. VI. 1984, Yeo, Jeong-hwa (SWU); 1♂, Mt. Gachilbong, Hongcheon-gun, 23. VI. 1984, Hwang, Geum-ju (ICKU); 2♀, Mt. Gachilbong, 21-23. VI. 1984, Kim, Eun-yeong (SWU); 2♀, Mt. Gachilbong, 21-23. VI. 1984, Seok-jin (SWU); 1♀, Mt. Bangtaesan, Inje-gun, 4-6. VI. 1999, Lee, Mi-ji (ICKU); 1♀, Mt. Seoraksan (from Jangsudae to 12 Seonyeotang), Hangye-Ri, Buk-Myeon, Inje-Gun, 26. VI. 2005, KANG, T. H. (NIAST); 1♀, Osaek gate to 1st

resting post, Mt. Seoraksan, 24. V. 2003, KIM, J. K. (NIAST); 1♀, Jeohangryeong, Mt. Seoraksan, 23. V. 2003, KIM, J. K. (NIAST); 1♂, Mt. Sangweolsan, Jeongseon-gun, 17. VI. 1997, Park, Hae-chul (SWU); 2♀, Mt. Gariwangsan, Jeongseon-eup, Jeongseon-gun, 22. V. 1998, Kim, Bo-yeong (SWU); 1♀, Mt. Gariwangsan, Jeongseon-Eup, Jeongseon-Gun, 21. V. 1998, KIM, B. Y. et al. (NIAST); 1♀, Mt. Odaesan (Spa Bangadari Yaksu-at light), Jinbu-Myeon, Pyeongchang-Gun, 22. VI. 2005, KIM, T. W. (NIAST); 1♀, Mt. Odaesan (Valley Jogyegol), Jinbu-Myeon, Pyeongchang-Gun, 23. VI. 2005. KIM, T. W. (NIAST); 2♂, Mt. Seoraksan (Osaek: 1st resting post~seorak fall), Ganghyeon-Myeon, Sokcho-Si, 24. V. 2003, KIM, J. K. (NIAST); 8♀2♂, Mt. Hambaeksan (Valley Jeolgolgyegok), Hwangji-Dong, Taebaek-Si, 5. VI. 2005, KANG, T. H. (NIAST); 1♀, Mt. Chiaksan, 6. VI. 1992, Lee, Seong-min (SWU); **<GG>** 1♀, Mt. Cheonmasan, 20. V. 1984, Choi, Yeong-cheol (SWU); **<CB>** 1♀, Mt. Weolaksan, Jecheon-si, 27. V. 1996, Jo, Seong-eun (SWU); 1♂, Mt. Weolaksan, 12. VII. 1996, D.H.Kim (SWU); 1♀, Valley Mulhangyegok, Mulhan-Ri, Sangchon-Myeon, Yeongdong-Gun, 29. V. 2002, PARK, H. C. (NIAST); **<CN>** 1♀, Temple Gapsa, Mt. Gyeryongsan, 6. VI. 1992, Lee, Seong-min (SWU); **<GB>** 1♀, Second Waterfall, Mt. Juwangsan, 4. VI. 1989, DEL (SWU); 1♀, Third Waterfall, Mt. Juwangsan, 4. VI. 1989, KJH (SWU); 1♂, Waterfall Dalgipokpo, Mt. Juwangsan, 5. VI. 1989, W.K.J (SWU); 1♂, Temple Unmunsa, Cheongdo-gun, 20. V. 1989, Kim, Shin-dong (SWU); 1♀, Daegu-si, 6. VI. 1987, Choi, Sang-jo (ICKU); 1♀,

Mungyeong-saejae, 26. V. 1996, Yoo, Ji-hyeon (SWU); 1♀, Naeweon-dong, 4. VI. 1989, Kimp (SWU); 1♂, Temple Heebangsan, Mt. Sobaeksan, 7. VI. 1974, Lee, Bong-jin (ICKU); 2♀, Mt. Sobaeksan, 5. VI. 1981, S.H.Nam (SWU); 1♀, Mt. Sobaeksan, 5. VI. 1981, M.R.Kim (SWU). **<JB>** 1♂, Gucheondong, Muju-gun, 9. VI. 1973, Yoo, Jae-hyeok (SWU); 1♂, Gucheondong, Muju-gun, 7. VI. 1972, Kim, Jin-ill (ICKU); 1♀, Samgong-ri, Muju-gun, 24. V. 1993, Kang, Hyeon-jong (ICKU); 1♂, Daebul-ri, Seolcheon-myeon, 26. V. 1993, Kim, Sang-ryeong (ICKU); **<JN>** 1♀, Mt. Jirisan, 26. VI. 1986, Lee, Geun-hwa (SWU); 1♀, Imgeolryeong, Mt. Jirisan, Gurye-gun, 4. VI. 1998, Joon jung (ICKU); 1♀, Imgeolryeong, Mt. Jirisan, Gurye-gun, 4. VI. 1998, Yi, Jae-sung (ICKU); 1♀, Valley Dangchi, Mt. Jirisan, Gurye-gun, 5. VI. 1998, Yun, Ji-young (ICKU); 1♀1♂, Valley Piagol, Mt. Jirisan, Gurye-gun, 22. V. 1999, Han, Tae-man (SWU).

Korean Name. 원통목가는병대벌레

Distribution. Korea.

Asiopodabrus fragiliformis (Kang et Kim, 2000)

Ins. Koreana, **17(3):** 208

***Asiopodabrus fragiliformis*:** Kang and Okushima, 2003: 342.

***Podabrus* (*Asiopodabrus*) *fragiliformis*:** Kim, 2002: 246; Kim, 2002: 284.

***Podabrus lictorius*:** Kim and Kim, 1972: 78; Kim, 1981: 343; Lee *et al.*, 1985: 406; Park, 1992: 265; Kim, 1993: 201; Kim *et al.*, 1993: 148; Kim *et al.*, 1994: 112; An, 1997: 31; Kim and Kim, 1998: 171. [**Misidentification**]

***Podabrus macilentus*:** Haku, 1936: 124; Cho, 1957: 41; Cho, 1967: 193; Cho, 1969: 262; Kim and Kim, 1971: 156; Lee and Kwon, 1974: 39; Kim and Nam, 1984: 329; Kim and Chang, 1987: 104; Park *et al.*, 1993: 179; Kim *et al.*, 1994: 181; Kim and Kim, 1998: 171. [**Misidentification**]

***Podabrus* spec. prope *nigriventris*:** Wittmer, 1969: 108. **[Misidentification]**

Description. Body length: 4.5 – 8.0 mm. Male. Head yellow, but posterior part of eyes black; antennae, maxillary and labial palpi, legs yellowish brown; pronotum pale yellow, but median part black; scutellum, meso- and metathorax black; elytra pale yellow; abdomen black, but last two segment yellowish brown.

Head flat, with thin and minute punctures, but close and rough punctuated to basal part; antennal sockets slightly rised to posterior; area between eyes slightly depressed with triangular, with medio-central groove vestigially. Eyes relatively small, ratio of an eye to interocular space 5 : 21. Antennae nearly reaching to one third of elytra, approximate ratio of each antennomere, 20 : 13 : 10 : 14 : 13 : 13 : 13 : 12 : 12 : 11 : 15. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate, covered with close and rough punctures, but thin and minute punctuated to lateral; pronotum 1.03 times wider than long; lateral margins

sinuated, with blunt anterior angles and sharp posterior angles; posterior margin 1.24 times wider than anterior. Scutellum tongue shaped, with round apex.

Elytra parallel sided, ratio of width at elytral shoulder to length of elytra 21 : 69; dorsal surface with thin and minute punctures, but close and rogous punctuated posteriorly. Legs slender; tibia straight; fore and mid tarsal claws bifid at apex, but post tarsal claws with blunt tooth.

Aedeagus oval in outline; dorsal processes slender; distal part of dorsal processes with hairs; laterophyses unexposed; ventral processes expanded at basal part, but suddenly narrow to posterior; area until middle part of ventral process slightly wide; last part of ventral process narrow to posterior.

Female. Body color duskier than in the male; body somewhat longer and wider than in the male; eyes relatively smaller than in the male, ratio of an eye to interocular space 5 : 25; longitudinal groove between eyes more distincted than in the male; each tarsal claw of all legs provided with blunt basal tooth.

Materials Examined (644 individuals). [KOREA] <GW> 1♀, Deokduweon, Seo-Myeon, Chuncheon-Si, 23. V. 2002, PARK, H. C. (NIAST); 1♀, Valley Samhangol, Balsan 2 Ri, Chuncheon-Si, 17. V. 1998, PARK, H. C. (NIAST); 1♀, Naegok-Dong, Gangreung-Si, 20. V. 2002, LEE, Y. B. (NIAST); 1♂, Temple Geonbongsa, Goseong-gun, 22. V. 1992, Park, Hae-chul (ICKU); 2♀, Mt. Hyangrobong, 18. VI. 1967, Kim, Jin-ill (ICKU); 1♀, Mt. Hyangrobong, 16. VI. 1968, Oh, Jin-gook (ICKU); 1♀1♂, Go-song choni upper reaches of brook below

Hotel, Kumgang-san, 30. V. 1970, S. Mahunka et H. Steinmann (HNHM); 1♀, Mt. Geumgangsan ~ Mt. Manmulsan, 21. VI. 1988, O. Merkl & Gy. Szél (HNHM); 8♀1♂, Mt. Hyangrobong, 13. VI. 1992, Park, Hae-chul (ICKU); 1♀, Mt. Hyangrobong, Goseong-gun, 13. VI. 1992, Park, Hae-chul (SWU); 2♀, Mt. Hyangrobong, Goseong-gun, 6. VII. 1995, Kim, Jin-ill (SWU); 1♀, Mt. Shinseonbong (Area between Mishiryeong to Shinseonbong), Toseong-Myeon, Goseong-Gun, 25. V. 2002, YEO, J. D. (NIAST); 1♀, Mt. Gachilbong, Hongcheon-gun, 21-23. VI. 1984, K.S.Choi (ICKU); 1♀, Mt. Gachilbong, Hongcheon-gun, 21-23. VI. 1984, Go, Jeong-hee (ICKU); 1♂, Mt. Gachilbong, Nae-myeon, Hongcheon-gun, 22. VI. 1984, Hwang, Geum-ju (ICKU); 1♀, Mt. Gachilbong, Hongcheon-gun, 23. VI. 1984, Yeo, Jeong-hwan (ICKU); 1♀, Mt. Gachilbong, Hongcheon-gun, 21-23. VI. 1984, Lee, Hee-gyeong (SWU); 1♀, Jogaedong, Mt. Odaesan, Hongcheon-gun, 30. VI. 1997, J. I. Kim (SWU); 1♀, Jogaedong Valley, Mt. Odaesan, Hongcheon-gun, 20. VI. 1997, Park, H. C. (SWU); 2♀, Jogaedong 800m, Mt. Odaesan, Hongcheon-gun, 30. VI. 1997, H. C. Park (SWU); 2♀, Sambong-Yaksu, Mt. Odaesan, Hongcheon-gun, 29-30. VI. 1997, J. I. Kim et als (SWU); 1♂, Bangadari-Yaksu, Mt. Odaesan, Hongcheon-gun, 4. VI. 1998, Kim, Jin-ill (SWU); 2♂, Mt. Odaesan (Spa SambongYaksu), Hongcheon-Gun, 5. VI. 1998, KIM, J. I. (NIAST); 3♀6♂, Sambong-Yaksu, Mt. Odaesan, Hongcheon-gun, 5. VI. 1998, Kim, Jin-ill (SWU); 5♀, Mt. Gwangdeoksan, Gwangdeok-Ri, Sanae-Myeon, Hwacheon-Gun, 10. VI. 2004. LEE, Y. B.

(NIAST); 1♀, Temple Baekdamsa, Mt. Seolaksan, 3. VI. 1979, Lee, Gwang-ho (ICKU); 1♀, Temple Baekdamsan, Mt. Seolaksan, 4. VI. 1979, Lee, Min-yeol (ICKU); 2♀, Temple Baekdamsa, Mt. Naeseolaksan, 4. VI. 1979, Choi, Byeong-hee (ICKU); 1♀, Temple Baekdamsan, 5. VI. 1979, Cha, Yoon-jong (ICKU); 1♀, Temple Baekdamsan, 5. VI. 1979, Lee, In-yeol (ICKU); KANG, T. H. (NIAST); 1♀, Mt. Bangtaesan, Misan-ri, Inje-gun, 25. VI. 1996, Lab. of Entomology, Yeongnam Univ. (SWU); 1♀1♂, Mt. Gachilbong, Inje-gun, 12-13. VI. 1997, J.I.Kim & S.Y.Kim (SWU); 5♀, Mt. Hanseoksan (Broadleaf tree), Inje-Gun, 18. VI. 1997, PARK, H. C. (NIAST); 1♀, Mt. Hanseoksan (Needleleaf tree), Inje-Gun, 26. VIII. 1997(?),PARK, H. C. (NIAST); 1♀, Mt. Hanseoksan (Needleleaf tree), Inje-Gun, 18. VI. 1997, PARK, H. C. (NIAST); 1♀, Temple Baekdamsa, Yongdae-Ri, Buk-Myeon, Inje-Gun, 25. V. 2002, YEO, J. D. (NIAST); 1♀, Temple Yongsiam, Mt. Seoraksan, 22. V. 2003. KIM, J. K. (NIAST); 1♀1♂, Mt. Seoraksan (Oknyeotang), Hangye-Ri, Buk-Myeon, Inje-Gun, 25. VI. 2005, KANG, T. H. (NIAST); 5♀2♂, Mt. Seoraksan (from Jangsudae to 12 Seonyeotang), Hangye-Ri, Buk-Myeon, Inje-Gun, 26. VI. 2005, 8♀1♂, Mt. Sangweolsan, Jeongseon-Gun, 17. VI. 1997, PARK, H. C. (NIAST); 1♀, Mt. Gariwangsan, Jeongseon-eup, Jeongseon-gun, 22. V. 1998, Kim, Bo-young et als (SWU); 2♀1♂, Mt. Gyebangsan, Pyeongchang-gun, 16. VI. 1993, Kim, Jin-ill (SWU); 1♀, Bangadari-Yaksu, Mt. Odaesan, Jinbu-myeon, Pyeongchang-gun, 25. VI. 1998, Han, Tae-man et Tae-hwa, Kang (SWU); 1♀, Mt. Odaesan, Pyeongchang-gun, 24.

VI. 1998, Han, Tae-man et Tae-hwa Kang (SWU); 1♀, Chiksa-Ri, Bangrim-Myeon, Pyeongchang-Gun, 14. VII. 2004, KIM, M. A. (NIAST); 3♀3♂, Mt. Odaesan (Valley Jogyego), Jinbu-Myeon, Pyeongchang-Gun, 23. VI. 2005, KIM, T. W. (NIAST); 16♀15♂, Mt. Hambaeksan (Valley Jeolgolgyegok), Hwangji-Dong, Taebaek-Si, 5. VI. 2005, KANG, T. H. (NIAST); 2♀, Mt. Hambaeksan (1450-1570m), Hwangji-Dong, Taebaek-Si, 6. VI. 2005, KANG, T. H. (NIAST); 7♀, Mt. Hambeaksan, 20. VI. - 11. VIII. 1999; 4♀, Mt. Hambeaksan, 14. V. - 20. VI. 1999. (NIAST); 1♂, Mt. Taebaeksan, 23. VII. 1986, Jang, Gwang-suk (SWU); 2♀, Mt. Taebaeksan, 14. V. - 20. VI. 1999, GU, D. S. (NIAST); 8♀, Temple Yuilsa, Mt. Taebaeksan, Gangweon-Do, 20. VI. - 11. VIII. 1999, GU, D. S. (NIAST); 1♀, Mt. Taebaeksan, 14. V. - 20. VI. 1999 (NIAST); 1♀, Dangungak, Mt. Taebaeksan, 30. V. 1999, Yoo, Ji-seon (SWU); 2♀, Mt. Taebaeksan, Taebaek-si, 30. V. 1999, Kang, Tae-hwa (SWU); 1♀, Mt. Chiaksan, 6. VI. 1991, Lee, Gang-woo (ICKU); 1♀, Mt. Chiaksan, Weonju-si, 5. VI. 1992, No, Gyu-nam (ICKU); 1♀, Mt. Chiaksan, Weonju-si, 5. VI. 1992, Song, Sook-geun (SWU); 1♂, Yongneup, Mt. Daeamsan, Yanggu-gun, 24. V. 1998, Kim, Jin-ill (SWU); 1♀, Mt. Taehwasan (Temple Bongseonsa), Palgoi-Ri, Yeongweol-Eup, Yeongweol-Gun, 14. V. 2001, KIM, T. W. (NIAST); **<GG>** 1♀, Mt. Geumdansan, 15. V. 1977, Kim, Yeon-sik (ICKU); 1♀, Mt. Wangbangsan, 29. V. 1985, Jeon, Dong-jun (ICKU); 1♀, Hyeon-ri, 2. VI. 1991, H.K.C (ICKU); 1♂, Hokumon, Keijo, 17. V. 1934, S. Eguchi (ICKU); 1♀, Anyang, garden, Anyang-si, 25. V. 1996, Baek, Su-jin

(SWU); 1♀, Anyang garden, Anyang-si, 25. V. 1996, Park, Se-ra; 1♀, Isl. Jebudo, Ansan-Si, 12. IX. 2002. LEE, Y. B. (?) (NIAST); 6♀2♂, Guseong 2 Ri, Yeongin-Myeon, Asan-Si, 19. V. 2000, KIM, H. B. (NIAST); 1♂, Cheongpyeong-gun, 24. V. 1996, Kim, Ah-young (SWU); 1♀, Mt. Wangbang, Dongducheon-si, 29. V. 1985, Nam, Jeong-gu (SWU); 2♀1♂, Waterfall Bagyonpokpo about 27 km SW from gaeseong, Mt. Bagyonsan, 7. VI. 1970, S. Mahunka & H. Steinmann (HNHM); 1♀1♂, Dodae-Ri (Valleyhouse), Bal-Myeon, Gapyeong-Gun, 28. V. 2001, JANG, S. J. (NIAST); 1♀1♂, Mt. Myeongjisan (Temple Seungcheonsa), Baekdun-Ri, Buk-Myeon, Gapyeong-Gun, 28. V. 2001, PARK, H. C. (NIAST); 1♀, Mt. Myeongjisan (Temple Seungcheonsa), Baekdun-Ri, Buk-Myeon, Gapyeong-Gun, 28. V. 2001, LEE, H. A. (NIAST); 2♀, Mt. Myeongjisan (Temple Seungcheonsa), Baekdun-Ri, Buk-Myeon, Gapyeong-Gun, 28. V. 2001, KIM, T. W. (NIAST); 1♂, Mt. Myeongjisan (Temple Seungcheonsa), Baekdun-Ri, Buk-Myeon, Gapyeong-Gun, 28. V. 2001, HWANG, J. H. (NIAST); 1♀, Temple Bogwangsa, Mt. Aengmubong, Goyang-si, 15. IV. 1984, Nam, Seung-gyeong (SWU); 1♀, Jichuk-dong, Goyang-si, 24. V. 1992, Kim, Gang-yeon (SWU); 4♂, Mt. Gwanaksan, Gwacheon-si, 26. V. 1989, Mok, Mun-hye (SWU); 2♀, Mt. Gwanaksan, Gwacheon-si, 4. VI. 1994, Yoon, Ja-yeong (SWU); 1♀, Castle Namhansanseong, Gwangju-si, 20. V. 1998, Woo, So-hyeon (SWU); 2♀, Mt. Chukryeongsan, 15. VI. - 3. VII. 1999; 2♀3♂, Gwaneum-Ri (Mountain behind Village), Twichon-Myeon, Gwangju-Si, 5. V. 2005, KANG, T. H. (NIAST); 1♀2♂,

Bagyon popo about 27km SW from Kaeson, Bagyon-san, 7. VI. 1970, S. Mahunka et H. Steinmann (HNHM); 1♀, Mt. Cheonmasan, 18. VI. 1983, M.S.Kim (ICKU); 1♀, Mt. Cheonmasan, 26. VI. 1984, Lee, Myeong-hee (ICKU); ♀, Naebang-ri, Sodong-myeon, 13. VI. 1980, Kim, Jin-ill (ICKU); 2♀, Mt. Bulamsan, Namyangju-si, 20. V. 1990, Kim, Nam-ryun (ICKU); 1♀, Mt. Cheonmasan, Namyangju-si, 27. V. 1995, Choi, Mun-yeong (SWU); 11♀, Mt. Chukryeongsan, Namyangju-si, 1. V. 1999, Choi, Su-kyoung (ICKU); 4♀, Mt. Cheonmasan, Hwado-Eup, Namyangju-Si, 13. V. 2004, KANG, T. H. (NIAST); 1♂, Mt. Ungilsan, 17. V. 1992, Song, Sook-geun (ICKU); 1♀, Pocheon-si, 22. VI. 1972, Choi, Seon-nam (ICKU); 1♂, Gwangreung garden, Pocheon-si, 10. VI. 1973, Gu, Seong-hee (ICKU); 1♀, ilyeong, 17. VI. 1988, Lee, Sang (ICKU); 2♀2♂, Mt. Maengsan, Bundang-Gu, Seongnam-Si, 7. V. 2004, KANG, T. H. (NIAST); 7♀10♂, Mt. Namhansan, Hadaeweon-dong, Seongnam-si, 3. V. 1998, KANG, T. H. (SWU); 1♀, Mt. Namhansan, Hadaeweon-Dong, Seongnam-Si, 5. V. 1998, KANG, T. H. (NIAST); 1♂, Mt. Namhansan, Hadaeweon-Dong, Seongnam-Si, 5. V. 1998, HAN, T. M. (NIAST); 4♀38♂, Mt. Namhansan, Hadaeweon-dong, Seongnam-si, 5. V. 1998, KANG, T. H. (SWU); 2♀16♂, Mt. Namhansan, Hadaeweon-dong, Seongnam-si, 5. V. 1998, Han, T. M.; 2♂, Mt. Namhansan, Hadaeweon-dong, Seongnam-si, 24. V. 1999, KANG, Tae-hwa (SWU); 1♀, Daeya-dong, Siheung-si, 21. V. 1995, Jeong, Hye-yeong (SWU); 2♀1♂, Ogang-Dong, Shiheung-Si, 16. V. 2001, LEE, H. A. (NIAST); 1♀, Sanggwanggyo-Dong, Suweon-Si, 17. V. 1998,

JANG, S. S. (NIAST); 1♀, Around River Hantangang, Yeoncheon-Gun, 27. V. 2001, KIM, T. W. (NIAST); 2♀2♂, Broadleaf tree, Mt. Gwanaksan, Seoul-Si, 3. V. 1997, PARK, H. C. (NIAST); 1♂, Baekdong, Deoksu-Ri, Danweol-Myeon, Yangpyeong-Gun, 14. V. 2003, PARK, H. C (NIAST); 1♂, Mt. Cheonggyesan, Wiwang-si, 2. VI. 1996, Kang, Mun-ju (SWU); 1♀, Temple Yongmunsa, Mt. Yongmunsan, Yangpyeong-gun, 8. V. 1998, Shim, Yoo-sun (SWU); 1♀, Cheongsujang, Dobong-gu, 8. VI. 1986, Lee, Yong-mi (ICKU); 1♀, Uiryeong, Mt. Bukhansan, 19. VI. 1996, Kim, Mi-ryang (ICKU); 1♀, Tumb Heoninreung, 17. V. 1981, H.O.Kim (ICKU); 1♂, Tumb Heoninreung, 17. V. 1981, Kim, Sang-ho (ICKU); 1♂, Tumb Heoninreung, Gangnam-gu, Seoul, 24. V. 1986, Kim, Yeon-shim (ICKU); 1♀, Weonji-dong, Gangnam-gu, Seoul, 1. VI. 1985, Lee, Eun-yeong (ICKU); 2♀, Mt. Cheonggyesan, Weonji-dong, Seoul, 12. V. 1988, Kim, Seon-bi (ICKU); 1♀, Mt. Cheonggyesan, Weonji-dong, 28. V. 1993. Kim, Mi-ri (ICKU); 1♀, Sinrim-dong, Gwanak-gu, Seoul, 15. V. 1993, Yoon, Hye-yeong (ICKU); 1♀, Mt. Cheonggyesan, Seoul, 24. V. 1987, Song, Min-ah (ICKU); 1♂, Mt. Cheonggyesan, Seoul, 17. V. 1990, An, Jae-gyun (ICKU); 1♀1♂, Mt. Cheonggyesan, Seoul, 17. V. 1990, Jeong, Gwan-hye (ICKU); 1♀, Mt. Cheonggyesan, Seoul, 24. V. 1990, Jeong, Gwan-hye (ICKU); 1♀, Mt. Cheonggyesan, 24. V. 1990, Lee, Cheol (ICKU); 1♂, Mt. Cheonggyesan, Seoul, 24. V. 1990, Kim, In-jung (ICKU); 1♀, Mt. Cheonggyesan, Seocho-gu, 28. V. 1991, Kim, Eun-mi (ICKU); 1♂, Mt. Cheonggyesan, Seoul, 11. V. 1992, Lee, Sun-nam

(ICKU); 1♀, Mt. Cheonggyesan, Seocho-gu, Seoul, 11. V. 1992, Yeom, Myeong-ju (ICKU); 1♀, Mt. Cheonggyesan, Seocho-gu, Seoul, Yeom, Myeong-ju (ICKU); 1♀, Mt. Cheonggyesan, Seocho-gu, Seoul, 31. V. 1992, Sohn, Hye-ryeon (ICKU); 1♀, Jeongreung, 6. VI. 1986, I.S.Y. (ICKU); 1♀, Mt. Dobongsan, Dobong-gu, Seoul, 20. V. 1988, Kang, Jeong-hyeon (SWU); 1♂, Mt. Dobongsan, Dobong-gu, Seoul, 23. V. 1990, Son, Su-yeon (SWU); 1♂, Mt. Dobongsan, Dobong-gu, Seoul, 21. V. 1991, Kim, Eun-gyeong (SWU); 1♀, Mt. Dobongsan, Dobong-gu, Seoul, 18. V. 1994, Shin, Yeong-ji (SWU); 1♀1♂, Mt. Dobongsan, Dobong-gu, Seoul, 17. V. 1997, So, Jin-gyeong (SWU); 1♂, Mt. Dobongsan, Dobong-gu, Seoul, 30. V. 1999, Choi, Hee-jeong (SWU); 1♀, Mt. Guryongsan, Gangnam-gu, 5. V. 1998, Go, Hye-young (SWU); 1♂, Mt. Guryongsan, Gangnam-gu, Seoul, 5. V. 1999, Bae, Min-ah (SWU); 1♀, Tumb Heoninreung, Gangnam-gu, Seoul, 8. V. 1988, Kim, Mi-young (SWU); 1♂, Tumb Seonjeongreung, Gangnam-gu, Seoul, 31. V. 1992, Choi, Hyeon-ju (SWU); 2♀, Sinrim-dong, Gwanak-gu, Seoul, 15. V. 1993, Yoon, Hye-yeong (SWU); 1♀, Sinrim-dong, Gwanak-gu, Seoul, 19. V. 1993, Yoon, Hye-yeong (SWU); 1♀, Mt. Gwanaksan, Sinrim-dong, Seoul, 7. V. 1994, Seol, Hye-weon (SWU); 1♀, Mt. Gwanaksan, Seoul, 19. V. 1996, Jang, Hye-jin (SWU); 2♀, Mt. Gwanaksan, Gwanak-gu, Seoul, 8. V. 1998, Choi, Jeong-seop (SWU); 1♀, Mt. Inwangsan, Jongro-gu, Seoul, 1. VI. 1993, Kim, Yoon-seon (SWU); 1♀1♂, Mt. Suraksan, Noweon-gu, Seoul, 9. V. 1998, Oh, Seon-gyeong (SWU); 1♀, Mt. Cheonggyesan, 18. V. 1986, Y. J. Lee (SWU); 1♀, Mt. Cheonggyesan, Yangjea-

dong, Seocho-gu, Seoul, 31. V. 1992, Ham, Gyeong-mi (SWU); 1♀, Mt. Umyeonsan, Seocho-gu, 10. V. 1997, Kim, Ji-yeon (SWU); 2♀, Mt. Umyeonsan, Seocho-gu, Seoul, 25. V. 1997, Yeom, Hwa-yeong (SWU); 1♀, Mt. Umyeonsan, Seocho-gu, Seoul, 15. V. 1999. Yoon, Hee-jeong (SWU); 1♀, Sungshin Univ., Seongbuk-gu, Seoul, 24. V. 1988, Kim, Hee-seon (SWU); **<CB>** 2♀, Mt. Guryongsan (Broadleaf tree in Village), Boeun-Gun, 20. V. 1997, PARK, H. C. (NIAST); 2♀1♂, Mt. Guryongsan (Farm area), Boeun-Gun, 20. V. 1997, PARK, H. C. (NIAST); 4♀, Mt. Guryongsan (Forest area), Boeun-Gun, 20. V. 1997, PARK, H. C. (NIAST); 6♀3♂, Mt. Daemisan (Forest area), Chungju-Si, 19. V. 1997, PARK, H. C. (NIAST); 2♀1♂, Mt. Daemisan (Forest Around Temple Bongseonam), Chungju-Si, 19. V. 1997, PARK, H. C. (NIAST); 1♀, Mt. Daemisan (*Pinus densiflora* in forest area), Chungju-Si, 19. V. 1997, PARK, H. C. (NIAST); 2♀, Mt. Daemisan (*Pinus densiflora*), Chungju-Si, 19. V. 1997, PARK, H. C. (NIAST); 11♀1♂, Mt. Weolaksan, Chungju-si, 22. V. 1998, Han, Tae-man (SWU); 1♀, Valley Bucheogol, Goisan-Gun, 26. V. 2002, KIM, M. A. (NIAST); 2♂, Hwayang-ri, Gwisan-gun, 25. V. 1996, Dept. of Biology, SWU (SWU); 1♀, Mt. Weolaksan, 30. V. 1987, Kim, Jeong-cheol (SWU); 1♂, Mt. Weolaksan, 30. V. 1987, Kim, Su-jin (ICKU); 1♀, Mt. Weolaksan, Jecheon-si, 27. V. 1996, Dept. of biology, Sungshin Univ. (SWU); **<CN>** 3♀1♂, Mt. Bonghwasan (Forest area), Boryeong-Si, 18. V. 1997, PARK, H. C. (NIAST); 4♀4♂, Mt. Bonghwasan (Grassland), Boryeong-Si, 18. V. 1997, PARK, H. C. (NIAST); 21♀9♂, Mt.

Bonghwasan, Boryeong-Si, 18. V. 1997, PARK, H. C. (NIAST); 4♀2♂, Mt. Bonghwasan (*Pinus densiflora*), Boryeong-Si, 18. V. 1997, PARK, H. C. (NIAST); 1♀, Mt. Oseosan, Boryeong-Si, 16. V. - 29. VI. 1999, GU, D. S. (NIAST); 1♀, Mt. Gwangdeoksan, Cheonweon-gun, 18. V. 1994, Kim, Jin-ill (SWU); 1♀, Gyeryong-myeon, Gongju-si, 5-7. VI. 1997, Lee, Young (ICKU); 1♀, Mt. Gyeoryongsan, 26. V. 1974, Shin, Chung-hee (ICKU); 1♀, Mt. Gyeoryongsan, 7. VI. 1997, Shin, Jin-wook (ICKU); 1♀, Geumdae-Ri, Gyeryong-Myeon, Gongju-Si, 14. V. 2001, LEE, H. S. (NIAST); 3♀, Mt. Seokbongsan (Farm area), Nonsan-Si, 19. V. 1997, PARK, H. C. (NIAST); 4♀1♂, Mt. Seokbongsan, Nonsan-Si, 19. V. 1997, PARK, H. C. (NIAST); <**GB>** 1♀, Ojeon-Yaksu, Mulya-myeon, Bonghwa-gun, 20. V. 1998, J. I. Kim (SWU); 1♀, Mt. Juwangsan, Cheongsong-gun, 14. V. 1987, C.J.Kim (ICKU); 1♂, Mt. Juwangsan, Naeweon-dong, 5. VI. 1989, Kim, Gu (ICKU); 1♀, Naeweon-dong, 4. VI. 1989, Y.J.S; 1♂, Mt. Apsan, Daegu-si, 20. V. 1990, Lee, Yoon-hee (ICKU); 1♀, Yeongnam Univ. Gyeongsan-si, 20. V. 1990, Lee, Ju-yeong (ICKU); 1♂, Yeongnam Univ. Gyeongsan-si, 5. V. 1992, Kim, Sang-gweon (ICKU); 1♂, Yeongnam Univ., Gyeongsan-si, 2. VI. 1990, Jeong, Dong-sik (ICKU); 1♂, Mt. Juheulsan, Mungyeong-si, 24. V. 1997, J. I. Kim (SWU); 1♀, Mungyeong-Seajae, Mungyeong-si, 26. V. 1996, Kim, Bo-seong (SWU); 1♀, Temple Heebangsa, Mt. Sobaeksan, 8. VI. 1974, Park, Jeong-ho (ICKU); 1♀, Valley Heebang-Gyegok, Mt. Sobaeksan, Ponggi-gun, 28. V. 1999, Jang, Jeong-eun (SWU); 1♀, Valley Bulyeong-Gyegok, Uljin-gun, 9. V. 1991,

Kim, Jeong-ah (ICKU); 1♂, Valley Bulyeong-Gyegok, Uljin-gun, 9. V. 1991, Kim, Hyeon-mi (ICKU); 1♂, Valley Bulyeong-Gyegok, Uljin-gun, 9. V. 1991, Kim, Yeong-ah (ICKU); 2♀, Valley Bulyeong-Gyegok, Uljin-gun, 9. V. 1991, Bae, So-hyeon (ICKU); 1♀, Valley Bulyeong-Gyegok, Uljin-gun, 10. V. 1991, Kim, Hyeon-jeong (ICKU); 1♂, Valley Bulyeong-Gyegok, Uljin-gun, 10. V. 1991, Park, Su-yeong (ICKU); 1♂, Valley Bulyeong-Gyegok, Uljin-gun, 10. V. 1991, Bae, So-hyeon (ICKU); 1♀, Valley Bulyeong-Gyegok, Uljin-gun, 14. V. 1993, Kim, Na-yeong (ICKU); 2♀8♂, Valley Bulyeonggyegok, Uljin-gun, 2. V. 1999, Park, S. W. (SWU); 2♀, Mt. Baekamsan, Uljin-Gun, 29. V. 1999, KANG, T. H. (NIAST); 8♀, Mt. Baekamsan, Uljin-Gun, 20. VI. - 12. VIII. 1999, GU, D. S. (NIAST); 1♂, Valley Bulyeonggyegok, Uljin-Gun, 29. V. 1999, KANG, T. H. (NIAST); 1♀, Mountain around Ecological garden for Firefly, Shinam-Ri, Subi-Myeon, Yeongyang-Gun, 7. V. 2004, KANG, T. H. (NIAST); 1♀1♂, Ecological garden for Firefly, Shinam-Ri, Subi-Myeon, Yeongyang-Gun, 19. V. 2004, KANG, T. H. (NIAST); **<GN>** 1♀, Village Bungeochon, Woongseok, Sancheong-Gun, 28. V. 1998, LEE, Y. B. (NIAST); <**JB>** 8♀1♂, Naebyeonsan, Buan-Gun, 8. V. 2000, PARK, H. C. (NIAST); 1♀, Temple Seonunsa, Gochang-gun, 21. V. 1992, Yoo, Eun-jeong (ICKU); 3♂, Mt. Shinjangsan, Neungdong-Ri, Iksan-Si, 15. V. 2001, LEE, H. S. (NIAST); 2♀, Gucheondong, Muju-gun, 9. VI. 1972, Kim, Chang-whan (ICKU); 1♀, Gucheondong, Muju-gun, 9. VI. 1972, Yoo, Jae-hyeok (ICKU); 1♀, Gucheondong, Muju-gun, 22. V. 1983, M. Y. Song (ICKU); 1♀, Daebul-ri,

Muju-gun, 26. V. 1993, Jeong, Gyeong-eon (SWU); 1♀, Mt. Deokyusan, Muju-gun, 25. V. 1993, Heo, Jeong-sook (SWU); 1♀, Temple Ansimsa, Unju-Myeon, Wanju-Gun, 15. V. 2001, LEE, H. S. (NIAST); 3♀, Mt. Naejangsan (Forest Around Temple Baekyangsa), Jeong-Eup, 7. V. 2000, PARK, H. C. (NIAST); 1♀, Mt. Naejangsan (Temple Baekyangsa), Jeong-Eup, 7. V. 2000, PARK, H. C. (NIAST); **<JN>** 1♀, Mt. Duryunsan, Gurim-Ri, Samsan-Myeon, Haenam-Gun, 10. V. 2001, HWANG, J. H. (NIAST); 1♀, Mt. Gosanbong, Hampyeong-Gun, 6. V. 2000, KANG, T. H. (NIAST); 1♀, Mt. Gosanbong, Hampyeong-Gun, 6. V. 2000, PARK, H. C. (NIAST); 1♀, Temple Hwaeomsa, Mt. Jirisan, 23. V. 1984, Kim, Yeong-shin (SWU); 1♀, Mt. Jirisan, 25. VI. 1986, Park, Jeong-ho (ICKU); 1♀, Mt. Jogyesan, 23. V. 1988, Han (ICKU); 1♀, Mt. Jogyesan, 23. V. 1988, Jeong, So-yeong (ICKU); 1♂, Mt. Jogyesan, 23. V. 1988, Dokgo (ICKU); 1♂, Mt. Jogyesan, 23. V. 1988, Im, Jong-woo (ICKU); 1♀, Mt. Jogyesan, Seungju-gun, 5. V. 1990, Lee, Hye-ju (ICKU); 1♀, Jikjeon, Mt. Jirisan, Gurye-gun, 5. VI. 1998, Shin, Eun-yeong (ICKU); 1♀2♂, Imgeolryeong, Mt. Jirisan, Gurye-gun, 5. VI. 1998, Shim, Yoo-sun (ICKU); 1♀, Valley Dangchi, Mt. Jirisan, Gurye-gun, 4. VI. 1998, Joon, jeong (ICKU); 1♀, Valley Dangchi, Mt. Jirisan, Gurye-gun, 4. VI. 1998, Lee, Jong-geun (ICKU); 1♂, Valley Dangchi, Mt. Jirisan, Gurye-gun, 4. VI. 1998, Shim, Yoo-sun (ICKU); 1♂, Valley Dangchi, Mt. Jirisan, Gurye-gun, 5. VI. 1998, Park, Chan-ho (ICKU); 2♀, Imgeolryeong, Mt. Jirisan, Gurye-gun, 5. VI. 1998, Shim, Yoo-sun (SWU); 1♀, Imgeolryeong, Mt. Jirisan, Gurye-gun, 5. VI. 1998,

Cho, Chin-young (SWU); 1♀, Jikjeon, Mt. Jirisan, Gurye-gun, 3. VI. 1998, Park, Jae-il (SWU); 1♀, Jikjeon, Mt. Jirisan, Gurye-gun, 3. VI. 1998, Park, Chan-woo (SWU); 1♀1♂, Jikjeon, Mt. Jirisan, Gurye-gun, 4. VI. 1998, Lim, Soen-ok (SWU); 1♀, Valley Dangchi, Mt. Jirisan, Gurye-gun, 4. VI. 1998, Lee, Ju-youn (SWU); 1♀1♂, Valley Dangchi, Mt. Jirisan, Gurye-gun, 4. VI. 1998, Park, Kwan-woo (SWU); 3♀2♂, Valley Piagol, Mt. Jirisan, Gurye-gun, 21. V. 1999, Park, S. W. (SWU); 3♀6♂, Valley Piagol, Mt. Jirisan, Gurye-gun, 22. V. 1999, Han, T. M. (SWU); 1♀, Mt. Guksabong, Yeongam-Gun, 15. V. 2000, KIM, M. A. (NIAST); <**JJ>** 2♀, 18. V. 1988, Kim, Sang-ryong (ICKU); 1♀, Valley Andeokgyegok, 5. V. 1990, Park, Hae-chul (ICKU); 1♀, Temple Gwaneumsan, 2. V. 1990, Jeon, Dong-jun (ICKU); 1♀, Temple Gwaneumsan, 2. V. 1990, Kim, Jeong-gyu (ICKU); 1♂, Temple Gwaneumsan, 5. V. 1990, Yoon, Tae-jung (ICKU); 1♀, Seongpanak, 5. V. 1990, Yoon, Tae-jung (ICKU); 22♀13♂, Mt. Hallasan Between Oreumse to Uioreumse, 11. VI. 2000, LEE, Y. B. (NIAST).

Korean Name. 연노랑목가는병대벌레

Distribution. Korea.

Asiopodabrus oreumsensis Kang et Okushima, 2003

Elytra, Tokyo, **31(2):** 342

Description. Body length: 6.5-9.0 mm. Male. Body mostly pale yellow; head pale yellow in anterior area, but black in posterior area behind eyes with V-shaped line; eyes black; antennae almost brown, but first antennomere yellow, ventral parts of second and third antennomeres yellow, ventral parts of fourth and fifth antennomeres yellowish brown; pronotum pale yellow, but median area black; scutellum black; elytra pale yellow; legs yellow, but tarsi dusky yellow.

Head flat, covered with thin and minute punctures and provided with slightly subquadrated depression between eyes. Eye relatively small, ratio of an eye to interocular space 5 : 25. Antennae relatively long, nearly reaching to the middle of elytra, approximate ratio of each antennomere, 16 : 10 : 9 : 12 : 12 : 12 : 12 : 12 : 11 : 10 : 12. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate, covered with thin and minute punctures; pronotum 1.03 times wider than long; median area strongly convex, but postero-central region quadrately depressed, and with a medio longitudinal groove; lateral margins slightly sinuated, with round anterior angles and obtuse posterior angles; posterior margin 1.36 times wider than anterior. Scutellum triangular, with sharp apex.

Elytra subparallel sided, ratio of width at elytral shoulder to length of elytra 23 : 89; dorsal surface closely and rugosely punctate. Legs long and slender; tarsal claws bifid in fore and mid legs, blunt toothed in hind.

Aedeagus elongated; dorsal process long and slender and bent inward; ventral process long and slender, slightly expand at basal part.

Female. Body color duskier than in the male; body somewhat longer and wider than that in the male; head and pronotum covered with more close punctures than those in the male; scutellum tongue-shaped with obtuse apex; each tarsal claw of all legs provided with blunt basal tooth.

Materials Examined (25 individuals). [KOREA] <JJ> 18♀7♂, Mt. Hallasan Between Oreumse to Uioreumse, 11. VI. 2000, LEE, Y. B (NIAST).

Remarks. This species is known to be distributed only on Jejudo Island. Thus, the species may be very important in both biogeography and conservation.

Korean Name. 오름목가는병대벌레

Distribution. Korea (JJ).

Asiopodabrus parvitas sp. nov.

Description. Body length: 4.5 – 8.0 mm (in holotype: 4.5 mm.). Male. Body mostly pale yellow; head pale yellow, but black in posterior area behind eyes; eye black; antennae almost dusky brown, but first three antennomeres pale yellow; pronotum pale yellow, but median area black; scutellum black; elytra and legs pale yellow.

Head flat, covered with thin and minute punctures and provided with slightly transverse depression behind antennal sockets. Eye relatively small, ratio of an eye to interocular space 4 : 21. Antennae relatively long, nearly reaching to the middle of

elytra, approximate ratio of each antennomere, 10 : 7 : 6 : 8 : 8 : 8 : 8 : 8 : 8 : 7 : 10. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate, covered with thin and minute punctures; pronotum as long as wide; median area strongly convex, but postero-central region quadrately depressed, and with a medio longditudinal groove; lateral margins sinuated, with round anterior angles and sharp posterior angles; posterior margin 1.33 times wider than anterior. Scutellum tongue shape, with round apex.

Elytra parallel sided, ratio of width at elytral shoulder to length of elytra 18 : 69; dorsal surface closely and rugosely punctuate. Legs long and slender; tarsal claws bifid in fore and mid legs, blunt toothed in hind.

Aedeagus oval in outline; dorsal process very short, conjointly forming wide dorsal plate with round in distal line; laterophyses bent upward, exposed to apex of posterior portion of dorsal plate. Each ventral process expanded at base, but narrowed apically.

Female. Body mostly black; head black, but yellowish brown between antennal sockets and dusky brown in anterior area of antennal sockets; antennae black, but first three antennomeres yellow; pronotum black, but distal part yellow; scutellum and elytra black; legs dusky brown, except blackish femora; body longer and wider than that in the male; each tarsal claw of all legs provided with blunt basal tooth.

Materials Examined (17 individuals). [Holotype] 1♂, Valley Jeolgolgyegok, Mt. Hambaeksan, Hwangji-dong, Taebaek-si, GW, 5. VI. 2005, KANG, Tae-hwa

(NIAST). **[Paratype] <GW>** 16♀, Valley Jeolgolgyegok, Mt. Hambaeksan, Hwangji-dong, Taebaek-si, 5. VI. 2005, KANG, Tae-hwa (NIAST).

Diagnosis. The species is very similar to *Asiopodabrus asperipunctatus*, but see Table 3 for distinguishing characters.

Table 3. Diagnostic chatacters of *Asiopodabrus parvitas* n. sp. and *A. asperipunctatus.*

Diagnosis	***A. parvitas* n. sp.**	***A. asperipunctatus***
Eye Ratio	4:21	4:18
Shape of Pronotum	Pronotum as long as wide Posterior margin 1.33 times wider than anterior	Pronotum 1.04 times wider than long Posterior margin 1.37 times wider than anterior
Aedeagus	Lateral part of dorsal process not expand	Lateral part of dorsal process widely expand

Remarks. This species was collected from shrubs on Mt. Hambaeksan, Taebaek-si, Gangwon-do, Korea. However, the type locality is currently being destroyed by the construction of golf courses. Thus, additional surveys are needed to determine if the species is more widely distributed.

Etymology. The scientific name *parvitas*, meaning “small size” in Latin, is based on a morphological peculiarity in that the body size of this species is smaller than that of others in the genus.

Korean Name. 애기목가는병대벌레(신칭)

Distribution. Korea (Taebaek-si, GW).

Genus *Dichelotarsus* Motschulsky, 1860

Bull. Soc. Nat. Moscou, **32:** 400

Type species: *Dichelotarsus flavimanus* Motschulsky, 1860

***Podaburs*:** Medvedev and Ryvkin, 1992: 34.

***Dichelotarsus*:** Kazantsev, 1992: 267.

Diagnosis. Body long and slender. Head prognathus. Antennae filiform; second antennomere more or less shorter than third antennomere. Gular sutures converged. Last maxillary and labial palpomere hatchet-shaped. Pronotum convexed and quadrated. Elytra completely covered abdomen. Last segment of sternum and aedeagus symmetry. Leg long and slender; fore tarsal claws bifid, and mid and hind tarsal claws with basal tooth in male; all tarsal claws with basal tooth in female.

Korean Name. 검정목가는병대벌레속(신칭)

***Dichelotarsus angusticollis* Motschulsky, 1860**

Reisen Amurl., **2:** 117

Description. Body length: 8.5-9.5 mm. Male. Body mostly black; head, pronotum and scutellum black; eye redish brown; antennae dark brown, but first two antennomeres dusky brown; elytra brown; legs brown, but tarsi dark brown.

Head flat, covered with thin and minute punctures and provided with distinctly triangulated depression behind antennal sockets. Eye relatively large, ratio of an eye to interocular space 8 : 27. Antennae relatively long, nearly reaching to two third of elytra, approximate ration of each antennomere, 17 : 8 : 12 : 14 : 15 : 16 : 18 : 17 : 16 : 16 : 18. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate, covered with rough punctures; pronotum 1.10 times wider than long; median area strongly convex, but postero-central region triangulately depressed; lateral margins sinuated, with round anterior angles and sharp posterior angles; posterior margin 1.19 times wider than anterior. Scutellum triangular, with round apex.

Elytra parallel side, ratio of width at elytral shoulder to length of elytra 21 : 72; dorsal surface closely and rugosely punctuate. Legs long and slender; tarsal claws bifid in fore legs, blunt toothed in mid and hind les.

Aedeagus oval in outline; dorsal plate divided two part at posterior margin; posterior margin of each divided part round; distal margin of dorsal plate with long hairs; ventral process widely expand at the middle part, but slightly narrow to posterior; apex of ventral process round.

Female. Body color duskier than in the male; body somewhat longer and wider than that in the male; eye relatively smaller than that in the male, ratio of an eye to interocular space 8 : 33; antennae relatively shorter than that in the male, nearly reaching 1/3 of elytra, approximate ratio of each antennomere, 19 : 10 : 12 : 16 : 14 : 14 : 14 : 14 : 14 : 13 : 17; each tarsal claws of all legs provided with blunt basal tooth.

Materials Examined (5 Individuals). [KOREA] <HB> 1♂, 2000m, NW of Samjiyon, 31km on Mt. Baekdusan road, 28. VI. 1988, O. Merkl & Gy. Szél (HNHM). <**HN>** 2♀, 1000m, River Dumangang, Mupo, 29. VI. 1988, O. Merkl & Gy. Szél (HNHM). **[CHINA].** 2♀, Waterfall Jangbaekpokpo, Bukpa, Mt. Baekdusan, 7. VII. 2005, KIM, Ah-young (NIAST).

Remarks. This species has been reported to be distributed in Japan, Russia, and Mongolia. I found the species in Korea and China as well.

Korean Name. 검정목가는병대벌레(신칭)

Distributions. Korea (HB, HN), Japan, China (Jilin), Russia (East Siberia), Mongolia.

Genus *Hatchiana* Fender, 1966

Pan-Pac. Ent., **42:** 321.

Type species: *Hatchiana arizonensis* Fender, 1966

***Podaburs*:** Makino and Nakane, 1981: 55; Medvedev and Ryvkin, 1992: 34; Kazantsev, 1996: 106.

***Hatchiana*:** Imasaka, 2001: 280.

Diagnosis. Body long and slender. Head prognathus. Antennae filiform; second antennomere as long as third antennomere. Gular sutures converged. Last maxillary and labial palpomere hatchet-shaped. Pronotum convexed and quadrated. Elytra completely covered abdomen. Radial transvein more or less closed to apical area rather than radio-median crossvein. Last segment of sternum and aedeagus symmetry. Leg long and slender; all tarsal claws with basal tooth in both sexes.

Korean Name. 등점목가는병대벌레속

Key to the species of the Korean *Hatchiana* Fender

1. Eye relatively large; pronotum color black; posterior angles of pronotum with right angles • *H. rosinae*

- Eye relatively small; prontum color yellowish brown; posterior angles of pronotum obtuse • 2

2. Scutellum tongue-shaed; elytra black • • • • • • • • • • • • • • • • • • • *H. kimjinilli* n. sp.

- Scutellum triangular; elytra pale yellow • 3

3. Pronotum yellowish brown; antennae nearly reaching to the middle of elytra;

posterior margin of pronotum as wide as anterior • *H. glochidiatus*

– Pronotum black, but lateral margins yellowish brown; antennae nearly reaching to 2/3 of elytra; posterior margin of pronotum distinctly wider than anterior • *H. jirisanensis*

Hatchiana kimjinilli **sp. nov.**

Description. Body length: 9.5-13.5 mm (in holotype, 9.5 mm). Male. Body mostly black; head yellow in anterior area, but black in posterior area behind antennal sockets; eye blackish brown; antennae almost black, but ventral part of first and second antennomere yellow; pronotum redish yellow; scutellum and elytra black; legs yellow, but tarsi dusky yellow.

Head flat, covered with rough punctures and provided with centro longitudinal groove between antennal sockets. Eye relatively large, ratio of an eye to interocular space 7 : 23. Antennae relatively long, nearly reaching to the middle of elytra, approximate ratio of each antennomere, 14 : 8 : 10 : 13 : 13 : 13 : 14 : 14 : 14 : 13 : 15. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate, covered with rough punctures; pronotum 1.11 times wider than long; median area strongly convex, but postero-central region quadrately depressed, and with a medio longitudinal groove; lateral margins round, with

round anterior angles and obtuse posterior angles; posterior margin 1.20 times wider than anterior. Scutellum tongue shape, with round apex.

Elyra parallel sided, ratio of width at elytral shoulder to length of elytra 29 : 89; dorsal surface closely and rugosely punctuate. Legs long and slender; each tarsal claw of all legs provided with blunt basal tooth.

Aedeagus oval in outline; dorsal plate expand to posterior, divided at distal part; distal part of dorsal plate with hairs; lateral margins of distal part slightly expanded to each side; laterophyses exposed at basal part; apex of laterophyses bent upward; ventral process wide until the middle area, but narrowed from the middle of ventral process to posterior; apex of ventral process sharp and bent downward.

Female. Body color duskier than in the male; body somewhat longer and wider than in the male. Eyes relatively smaller than in the male, ratio of an eye to interocular space 7 : 26. Antennae relatively shorter than in the male, approximate ratio of each antennomere, 16 : 9 : 9 : 12 : 12 : 12 : 12 : 12 : 12 : 11 : 15.

Materials Examined (6 individuals). [Holotype] 1♂, Beach Baekripo, Euihyang-ri, Soweon-myeon, Taean-gun, CN, 3. VI. 2007, LEE, Jun-gu (NIAST); **[Paratype] <CN> -** 2♀, Sindu-ri, Weonbuk-myeon, Taean-gun, 8. VI. 2005, LEE, Young-bo (NIAST); 1♂, Beach Baekripo, Euihyang-ri, Soweon-myeon, Taean-gun, 11. VI. 2005, KANG, Tae-hwa (NIAST); 2♀, Beach Baekripo, Euihyang-ri,

Soweon-myeon, Taean-gun, 28. V. 2006, KIM, Tae-woo & YOO, In-seong (NIAST).

Diagnosis. The species is very similar to *Hatchiana jirisanensis*, but see Table 4 for distinguishing characters.

Table 4. Diagnostic characters of *Hatchiana kimjinilli* n. sp. and *H. jirisanensis.*

Diagnosis.	***H. kimjinilli* n. sp.**	***H. jirisanensis.***
Eye Ratio	7:23	11:31
Length of Antennae	Antennae nearly reaching to the middle of elytra, approximate ratio of each antennomere, 14 : 8 : 10 : 13 : 13 : 13 : 14 : 14 : 14 : 13 : 15	Antennae nearly reaching to two third of elytra, approximate ratio of each antennomere, 20 : 12 : 13 : 19 : 19 : 19 : 19 : 19 : 18 : 16: 20
Shape of Pronotum	Pronotum 1.11 times wider than long Posterior angles obtuse	Pronotum 1.33 times wider than long Posterior angles slightly projected
Shape of Scutellum	Tongue shape, with round apex	Triangular, with sharp apex
Aedeagus	Ventral process of aedeagus wide until the middle area, but narrowed from the middle of ventral process to posterior	Ventral process wide at basal part, but narrowed to posterior

Remarks. Field and sample surveys of this species over several years have indicated that it inhabits shrubs close to Taean-gun beaches.

Etymology. The scientific name *kimjinilli* honors the achievements and retirement of my mentor, Dr. Kim Jin-Ill, a scarabidologist who contributed to the development of entomology in Korea. Professor Kim Jin-Ill retired in August 2007.

Korean Name. 진일목가는병대벌레(신칭)

Distribution. Korea (Taean-gun, CN).

Hatchiana glochidiatus (Kazantsev, 1996)

Zool. Zhurn., **75(2):** 206

***Cantharis* (*Podabrus*) *heydeni*:** Heyden, 1887: 25. **[Misidentification]**

***Cantharis ciusianus*:** Cho, 1957: 41; Cho, 1967: 193; Kim and Nam, 1984: 329; Kim and Nam, 1987: 104. [**Misidentification**]

***Hatchiana glochidiatus*:** Kim *et al*., 2004: 117.

***Podabrus glochidiatus*:** Kang and Kim, 2000: 205.

***Podabrus* (*Hatchiana*) *glochidiatus*:** Kim, 2002: 246; Kim, 2002: 284.

***Podabrus heydeni*:** Kim and Kim, 1972: 78; Lee and Kwon, 1974: 39; Kim, 1981: 343; Lee et al., 1985: 406; Kim and Park, 1991: 193; Kim et al., 1991: 171; Park, 1992: 265; Kim, 1993: 201; An, 1995: 23, 53. [**Misidentification**]

***Prothemus ciusianus*:** Kim and Lee, 1991: 69; Kim, 1993: 258; Park et al., 1993: 179. [**Misidentification**]

Description. Body length: 10.5 – 14.0 mm. Male. Head yellowish brown, but posterior part of antennal sockets black; first antennomere yellowish brown; second antennomere yellowish brown, but distal part dusky brown; rest antennomeres black, but basal part dusky brown; maxillary palpi yellowish brown, but last palpomere with dark brownish distal part; labial palpi yellowish brown, but last palpomere dusky brown; pronotum, legs yellowish brown; scutellum, abdomen black; elytra pale yellow.

Head flat; anterior part of eyes with thin and minute punctures, but posterior part with close and rough punctures; antennal sockets rised to posterior; area between eyes with medio-central groove, and depressed with triangular. Eyes relatively large, ratio of an eye to interocular space 7 : 19. Antennae nearly reaching to the middle of elytra, approximate of each antennomere, 12 : 6 : 8 : 11: 10 : 11 : 11 : 12 : 11 : 10 : 12. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate, covered with close and rough punctures; pronotum 1.47 times wider than long; median area strongly convex, with medio-central groove and posterio-central quadrated depression; lateral margins round, with round anterior angles and sharp posterior angles; posterior margin 1.09 times wider than anterior. Scutellum triangular, with sharp apex.

Elytra parallel sided, ratio of width at elytral shoulder to length of elytra 14 : 48; dorsal surface with thin and minute punctures at basal part, but close and

rugous punctuated posteriorly. Legs slender; tibia straight; each tarsal claw of all legs provided with blunt basal tooth.

Aedeagus quadrated; dorsal plate expanded to posterior, divided at distal part; distal part of dorsal plate with hairs; lateral margins of distal part expanded to each side; laterophyses exposed at basal part; apex of laterophyses bent upward; ventral processes wide at basal part, but narrowed to posterior; apex of ventral processes bent downward.

Female. Body color duskier than in the male; body somewhat longer and wider than in the male; eye relatively smaller than in the male, ratio of an eye to interocular space 5 : 28; lateral margins of pronotum sinuated; scutellum tongue shape with round apex.

Materials Examined (44 individuals). [KOREA] <PB> 1♂, Ison-nam valley, Mt. Myohyangsan, 23. V. 1991, Ronkay & Vojnits (HNHM); **<GW>** 2♀, Valley Samhangolgyegok, Balsan 2 Ri, Chuncheon-Si, 28. V. 1998, PARK, H. C. (NIAST); 5♀2♂, Around factory of Ssangyong Ciment, Changweon 2 Ri, Yeongweol-Gun, 20. V. 2003, SOHN, J. C. (NIAST); **<GG>** 1♀, Dodae-Ri (Valleyhouse), Bal-Myeon, Gapyeong-Gun, 28. V. 2001, KIM, I. Y. (NIAST); 4♀, Mt. Cheonmasan, Mukhyeon-Ri, Hwado-Eup, Namyangju-Si, 15. VI. 2000, LEE, Y. B. (NIAST); 3♀, Mt. Jugeumsan, Eumhyeon-Ri, Naechon-Myeon, Pocheon-Gun, 10. VI. 2004, LEE, Y. B. (NIAST); 1♀, Valley Botonggol (Castle Namhansanseong), Seongnam-Si, 5. VI. 2000, PARK, H. C. (NIAST); 1♀, Valley

Botonggol (Castle Namhansanseong), Seongnam-Si, 5. VI. 2000, AHN, M. K. (NIAST); 1♂, Mt. Namhansan, Hadaeweon-Dong, Seongnam-Si, 14. V. 1998, KANG, T. H. (NIAST); 1♀, Mt. Gwanggyosan, Sanggwanggyo-Dong, Suweon-Si, 7. V. 1998, JANG, S. S. (NIAST); 1♀, Mt. Gwanggyosan, Sanggwanggyo-Dong, Suweon-Si, 17. V. 1998, JANG, S. S. (NIAST); 2♀1♂, Hagwanggyo-Dong, Suweon-Si, 19. V. 1998, JANG, S. S. (NIAST); 1♀, Hagwanggyo-Dong, Suweon-Si, 19. VI. 1998, LEE, H. S. (NIAST); 1♀, Mt. Umyeonsan, Gangnam-Gu, Seoul, 14. VI. 1998, PARK, H. C. (NIAST); **<CB>** 1♂, Area between Valley Hwayanggugok to Astronomical Observatory, Boeun-Gun, 26. V. 2002, SOHN, J. C. (NIAST); 1♀1♂, Spa Suansbo, Suanbo-Ri, 18. V. 2001, HWANG, J. H. (NIAST); **<CN>** 1♂, Mt. Bonghwasan, Boryeong-Si, 18. V. 1997, PARK, H. C. (NIAST); **<GB>** 1♂, Ecological garden for Firefly, Shinam-Ri, Subi-Myeon, Yeongyang-Gun, 7. V. 2004, KANG, T. H. (NIAST); 1♀, Ecological garden for Firefly, Shinam-Ri, Subi-Myeon, Yeongyang-Gun, 19. V. 2004, KANG, T. H. (NIAST); **<GN>** 1♀, Mt. Nojasan, Hak-Dong, Geoje-Si, 27. V. 1998, PARK, H. C. (NIAST); 1♀, Village Ungseokbongeochon (Shrub), Sancheong-Gun, 28. V. 1998, LEE, Y. B. (NIAST); **<JJ>** 1♀4♂, Mt. Hallasan Between Oreumse to Uioreumse, 11. VI. 2000, LEE, Y. B. (NIAST); 1♀1♂, The top of Mt. Hallasan, 11. VI. 2000, LEE, Y. B. (NIAST); 1♂, Mt. Hallasan (Uiseoreum), 11. VI. 2000, LEE, Y. B. (NIAST).

Korean Name. 등점목가는병대벌레

Distribution. Korea.

Hatchiana jirisanensis (Kang et Kim, 2000)

Ins. Koreana, **17(3):** 207

***Podabrus* (*Hatchiana*) *jirisanensis*:** Kim, 2002: 246; Kim, 2002: 284.

Description. Body length: 10.0 – 12.5 mm. Male. Head dusky brown, but posterior part of antennal sockets black; first antennomere dusky brown; second, third and fourth antennomere black, but basal part yellowish brown; rest antennomeres black; maxillary palpi yellowish brown, but last palpomere black to distal; labial palpi yellowish brown, but last palpomere black; pronotum black, but lateral margins yellowish brown; scutellum, meso- and metathorax, abdomen black; elytra pale yellow, but median area black; legs yellowish brown, but tarsus dusky brown.

Head flat; posterior part of antennal sockets with close and rough punctures, but punctures of anterior part undistincted; antennal sockets rised to posterior; area between eyes with medio-central groove, and depressed with triangular. Eyes relatively large, ratio of an eye to interocular space 11 : 31. Antennae nearly reaching to two third of elytra, approximate ratio of each antennomere, 20 : 12 :

13 : 19 : 19 : 19 : 19 : 19 : 18 : 16: 20. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate, covered with close and rough punctures, but thin and minute punctuated to lateral; pronotum 1.33 times wider than long; median area strongly convex, with medio-central groove and posterio-central quadrated depression; lateral margins round, with round anterior angles and slightly projected posterior angles; posterior margin 1.23 times wider than anterior. Scutelum triangular, with sharp apex.

Elytra parallel sieded, ratio of width at elytral shoulder to length of elytra 23 : 72; dorsal surface with thin and minute punctures at basal part, but close and rugous punctuated posteriorly. Legs slender; tibia straight; each tarsal claw of all legs provided with blunt basal tooth.

Aedeagus oval in outline; dorsal plate expand to posterior, divided at distal part; distal part of dorsal plate with hairs; lateral margins of distal part slightly expanded to each side; laterophyses exposed at basal part; apex of laterophyses bent upward; ventral process wide at basal part, but narrowed to posterior; apex of ventral process bent downward.

Female. Body color duskier than in the male; body somewhat longer and wider than in the male. Eyes relatively smaller than in the male, ratio of an eye to interocular space 5 : 21. Antennae relatively shorter than in the male, approximate

ratio of each antennomere, 19 : 11 : 12 : 16 : 15 : 16 : 16 : 16 : 16 : 14 : 16. Scutellum triangular with round apex.

Materials Examined (107 individuals). [KOREA] <GW> 1♀, Temple Baekdamsa, Mt. Naseoraksan, 4. VI. 1977, Lee, Hwi-hyeon (ICKU); 1♀, Temple Baekdamsa, Mt. Seoraksan, 6. VI. 1979, Lee, Gwang-ho (ICKU); 1♂, Mt. Hanseoksan, Inje-Gun, 8. VI. 1997, PARK, H. C. (NIAST); **<GG>** 1♀, Mt. Hwaaksan, 7. VI. 1997, K.H.Ryu (SWU); 1♂, Ogeum Park, Songpa-gu, Seoul, 27. VI. 1998, Yun, Chi-wung (ICKU); **<GB>** 1♀, Valley Heebang-Gyegok, Mt. Sobaeksan, Ponggi-gun, 28. V. 1999, Kang, Tae-hwa (SWU); **<JB>** 1♀, Gucheondong, Muju-gun, 9. VI. 1976, Kim, Jin-ill (ICKU); **<JN>** 1♀, Temple Ssanggyesa, Mt. Jirisan, 5. VI. 1977, Jeong, Seung-ju (ICKU); 1♀, Mt. Jirisan, 24. VI. 1986, Kim, Hyeon-mi (ICKU); 1♀, Mt. Jirisan, 25. VI. 1986, Gwak, Hyo-gil (ICKU); 1♀, Mt. Jirisan, 25. VI. 1986, S.H.Kim (ICKU); 3♀, Jikjeon, Mt. Jirisan, Gurye-gun, 3. VI. 1998, Park, Jae-il (SWU); 1♀, Imgeolryeong, Mt. Jirisan, Gurye-gun, 4. VI. 1998, Joon jung (SWU); 1♀, Jikjeon, Mt. Jirisan, Gurye-gun, 5. VI. 1998, Yi, Seong-jae (SWU); 1♀, Jikjeon, Mt. Jirisan, Gurye-gun, 3. VI. 1998, Kim, Jun-hyun (ICKU); 2♂, Jikjeon, Mt. Jirisan, Gurye-gun, 3. VI. 1998, Lim, Soen-ok (ICKU); 1♀, Jikjeon, Mt. Jirisan, Gurye-gun, 4. VI. 1998, Han, Ji-myung (ICKU); 1♀, Valley Dangchi, Mt. Jirisan, Gurye-gun, 4. VI. 1998, Yang, Hyung-suk (ICKU); 2♀, Valley Dangchi, Mt. Jirisan, Gurye-gun, 5. VI. 1998, Yun, Ji-young (ICKU); 1♀, Imgeolryeong, Mt. Jirisan, Gurye-gun, 5. VI. 1998, Kim,

Sung-kyu (ICKU); 4♀5♂, Valley Piagol, Mt. Jirisan, Gurye-gun, 21. V. 1999, Park, Sang-wook (SWU); 38♀11♂, Valley Piagol, Mt. Jirisan, Gurye-gun, 22. V. 1999, Han, Tae-man (SWU); 1♂, Simweon, Mt. Jirisan, Gurye-gun, 21. V. 1999, Kim, Heung-tae (SWU); 6♂, Simweon, Mt. Jirisan, Gurye-gun, 23. V. 1999, Kim, Heung-tae (SWU); 3♂, Mt. Jirisan (Shimweon), Gurye-Gun, 23. V. 1999, KIM, H. T. (NIAST); 3♀4♂, Mt. Jirisan (Valley Piagol), Gurye-Gun, 22. V. 1999, HAN, T. M. (NIAST); 1♀, Mt. Jirisan (Mountain ridge of Peak Yoopyeongsaejae), 7. VII. 1999, GU, D. S. (NIAST).

Korean Name. 지리목가는병대벌레

Distribution. Korea.

Hatchiana rosinae **(Pic, 1904)**

Echange, **20:** 25

Podabrus rosinae**:** Wittmer, 1969: 107; Delkeskamp, 1977: 32; Medvedev and Ryvkin, 1992: 34; Kang and Kim, 2000: 205.

Description. Body length: 10.0 – 12.5 mm. Male. Head black; antennae black; maxillary palpi yellowish brown, but last palpomere black at distal half; labial palpi yellowish brown, but last palpomere dark brown; pronotum, elytra and abdomen black; legs dusky black.

Head flat; anterior part of eyes with thin and minute punctures, but posterior part with close and rough punctures; antennal sockets rised to posterior; area between eyes with medio-central groove, and depressed with triangular. Eyes relatively large, ratio of an eye to interocular space 7 : 17. Antennae nearly reaching to the middle of elytra, approximate ratio of each antennomere, 12 : 6 : 8 : 10 : 10 : 10 : 13 : 9 : 9 : 9 :10. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate, covered with close and rough punctures; pronotum 1.33 times wider than long; median area strongly convex, with medio-central groove and postero-central quadrated depression; lateral margins round, with round anterior angles and sharp posterior angles; posterior margin 1.16 times wider than anterior. Scutellum triangular, with round apex.

Elytra parallel sided, ratio of width at elytral shoulder to length of elytra 22 : 68; dorsal surface with thin and minute punctures at basal part, but close and rugous punctuated posteriorly. Legs slender; tibia straight; each tarsal claw of all legs provided with blunt basal tooth.

Aedeagus oval in outline; dorsal plate expanded and divided to posterior; distal part of dorsal plate with hairs; laterophyses exposed at basal part; apex of laterophyses bent upward; ventral processes wide at basa part, but narrowed to posterior; apex of ventral processes bent downward.

Female. Body somewhat longer and wider than in male; eyes relatively smaller than in male, ratio of an eye to interocular space 6 : 19; lateral margins of pronotum sinuated.

Materials Examined (56 individuals). [KOREA] <HB> 1♀, Chondjin, 5. VI. 1991, Ronkay & Vojnits (HNHM); **<PB>** 1♀, Mt. Myohyangsan, 21. V. 1985, A. Vojnits & L. Zombori (HNHM); **<GW>** 1♀, Mt. Gwangdeoksan, Gwangdeok-Ri, Sanae-Myeon, Hwacheon-Gun, 10. VI. 2004, LEE, Y. B. (NIAST); 1♂, Mt. Hanseoksan (Broadleaf tree), Inje-Gun, 18. VI. 1997, PARK, H. C. (NIAST); 1♀1♂, Spa Osaek: 1st resting post to Fall SeorakPokpo, Mt. Seoraksan, 24. V. 2003, KIM, J. K. (NIAST); 1♀, Temple Baekdamsa, Yongdae-Ri, Buk-Myeon, Inje-Gun, 25. V. 2002, YEO, J. D. (NIAST); 2♀, Mt. Seoraksan (from Jangsudae to 12 Seonyeotang), Hangye-Ri, Buk-Myeon, Inje-Gun, 26. VI. 2005, KANG, T. H. (NIAST); 1♂, Mt. Gariwangsan, Jeongseon-Eup, Jeongseon-Gun, 21. V. 1998, KIM, B. Y. et al. (NIAST); 1♀, Mt. Sangweolsan, Jeongseon-Gun, 17. VI. 1997, PARK, H. C. (NIAST); 1♀, Mt. Odaesan (Bangadari Yaksu-at light), Jinbu-Myeon, Pyeongchang-Gun, 22. VI. 2005, KIM, T. W. (NIAST); 2♂ 24♀, Mt. Hambaeksan (Valley Jeolgolgyegok), Hwangji-Dong, Taebaek-Si, 5. VI. 2005, KANG, T. H. (NIAST); 1♀, Mt. Hambaeksan (1450-1570m), Hwangji-Dong, Taebaek-Si, 6. VI. 2005, KANG, T. H. (NIAST); 1♀, Mt. Gyebangsan, 21. VI. 1999, YOO, J. S. (NIAST); 1♀, Mt. Odaesan, Rodong-Ri, 21. VI. 1999, LEE, Y. B. (NIAST); 1♀, Mt. Odaesan, 12. VI. 1997, LEE, Y. B. (NIAST); **<GG>** 2♀, Dodae-Ri

(Valleyhouse), Bal-Myeon, Gapyeong-Gun, 28. V. 2001, JANG, S. J. (NIAST); 2♀, Dodae-Ri (Valleyhouse), Bal-Myeon, Gapyeong-Gun, 28. V. 2001, LEE, K. S. (NIAST); 1♂, Mt. Myeongjisan (Temple Seungcheonsa), Baekdun-Ri, Buk-Myeon, Gapyeong-Gun, 28. V. 2001, HWANG, J. H. (NIAST); 2♀, Mt. Myeongjisan (Temple Seungcheonsa), Baekdun-Ri, Buk-Myeon, Gapyeong-Gun, 28. V. 2001, PARK, H. C. (NIAST); [**CHINA]** 5♀, Bangcheon, Yeongil, Gillim-Seong, 20. VI. 2005, PARK, H. C. (NIAST).

Korean Name. 극동병대벌레

Distributions. Korea, China (Manchuria), Russia (Siberia).

Tribe Cantharini Imhoff, 1856

Privately Pub. Basel, **31:** 69

Type genus: *Cantharis* Linnaeus, 1758

Diagnosis. Body long and slender. Head prognathus. Antennae filiform; second antennomere as long as third antennomere, or shorter than third segment. Gular sutures separated. Last maxillary and labial palpomere hatchet-shaped. Pronotum convexed, and quadrated or circulated. Elytra completely covered abdomen. Position of radial transvein various. Last segment of sternum and aedeagus symmetry. Leg long and slender; tarsal claws simple, bifid, or with appendages in both sexes.

Korean Name. 병대벌레족

Genus *Rhagonycha* Eschscholtz, 1830

Bull. Soc. Imp. Nat. Moscou, **2(1):** 64

Type species: *Cantharis fulva* Scopoli, 1763

Rhagonycha**:** Medvedev and Ryvkin, 1992: 35; Kazantsev, 1995: 74.

Diagnosis. Body long and slender. Antennae filiform; second antennomere shorter than third antennomere. Gular sutures separated. Last maxillary and labial palpomere hatchet-shaped. Pronotum convexed and quadrated. Radial transvein closed to apical area rather than radio-median crossvein. Leg long and slender; all tarsal claws bifid in both sexes.

Korean Name. 산병대벌레속

Key to the species of the Korean *Rhagonycha* Eschscholtz

1. First two antennomeres black; apical margin of scutellum flat • • • • • • • • • • • 2

- First two antennomere yellowish brown; apical margin of scutellum round • 4

2. Elytra wide to posterior • *Rh. asiatica*

- Elytra parallel-sided • 3

3. Eyes relatively large, ratio of an eye to interocular space 7 : 14 • *Rh. koreaensis*

– Eyes relatively small, ratio of an eye to interocular space 5 : 16 • *Rh. parviocellata*

4. Head with transverse depression behind antennal sockets; protibia yellowish brown • *Rh. coreana*

- Head without transverse depression; protibia black • • • • • • • • • • • *Rh. transita*

***Rhagonycha* (s. str.) *asiatica* Wittmer, 1971**

Ann. Hist. nat. Mus. nat. Hung. **63:** 195, 199.

***Rhagonycha cembricola*:** Wittmer, 1969: 109. [**Misidentification**]

***Rhagonycha asiatica asiatica*:** Delkeskamp, 1977: 165; Medvedev and Ryvkin, 1992: 36.

***Rhagonycha asiatica*:** Kang and Kim, 2000: 160.

***Rhagonycha* (*Rhagonycha*) *asiatica*:** Kim, 2002: 284.

***Rhagonycha coroli*:** Cho, 1967: 193; Kim and Kim, 1971: 156; Kim et al., 1972: 221; Kim and Nam, 1984: 329; Kim *et al.*, 1994: 181. [**Misidentification**]

***Rhagonycha latiuscula*:** Kim and Kim, 1998: 171. [**Misidentification**]

Description. Body length: 8.0-9.0mm. Male. Body black; head, pronotum, elytra black; eye, antennae dark brown; legs dark brown, but tarsi brown.

Head flat, covered with thin and minute punctures and provided with slightly transverse depression behind antennal sockets. Eye relatively large, ratio of an eye to interocular space 10 : 23. Antennae relatively long, nearly reaching to two third of elyra, approximate ratio of each antennomere, 17 : 8 : 13 : 18 : 18 : 20 : 20 : 20 : 18 : 16 : 20. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate, covered thin and minute punctures; pronotum 1.14 times wider than long; median area strongly convex; lateral margins straight, with round anterior and posterior angles; posterior margin 1.21 times wider than anterior. Scutellum tongue shape; apex of scutellum flat.

Elytra wide to posterior, ratio of width at elytral shoulder to length of elytra 35 : 111; dorsal surface closely and rugosely punctuate. Legs long and slender; all tarsal claws bifid.

Aedeagus oval in outline; dorsal process with round apex; ventral process bent downward, with sharp apex.

Female. Body color same to male, but antennae and legs duskier than in the male; body somewhat longer and wider than that in the male; eye relatively smaller than that in the male, ratio of an eye to interocular space 7 : 29; antennae relatively shorter than that in the male, approximate ratio of each antennomere, 15 : 10 : 11 : 14 : 14 : 14 : 14 : 13 : 13 : 11 : 13.

Materials Examined (33 individuals). [KOREA] <PB> 1♂, Mt. Myohyangsan, 20. V. 1985, A. Vojnits & L. Zombori (HNHM); 1♂, Mt. Myohyangsan, 21. V. 1985, A. Vojnits & L. Zombori (HNHM); 3♀, Ison-nam, Mt. Myohyangsan, 23. V. 1991, Ronkay & Vojnits (HNHM); **<GW>** 1♀, Wetland Wooponeup, Changryeong-Gun, 29. V. 2003, PARK, H. C. (NIAST); 2♂, Mt. Seokbyeongsan (Peak Sapdangryeong), Wangsan-Myeon, Gangreung-Si, 21. V. 2002, YEO, J. D. (NIAST); 1♀, Mt. Shinseonbong (Between Peak Misiryeong to Peak Shinseonbong), Toseong-Myeon, Goseong-Gun, 25. V. 2002, YEO, J. D. (NIAST); 2♀, Mt. Baekamsan (Peak Ahopgogye), Naechon-Myeon, Hongcheon-Gun, 22. V. 2002, YEO, J. D. (NIAST); 1♀, Mt. Seoraksan (from Jangsudae to 12 Seonyeotang), Hangye-Ri, Buk-Myeon, Inje-Gun, 26. VI. 2005, KANG, T. H. (NIAST); 1♀, Mt. Sangweolsan, Jeongseon-Gun, 17. VI. 1997, PARK, H. C. (NIAST); 2♀, Mt. Gyebangsan, Yongpyeong-Myeon, Pyeongchang-Gun, 22. VI. 2005, KIM, T. W. (NIAST); 1♂, Mt. Seoraksan (Between Spa Osaekyaksu to Peak Daecheongbong), Oga-Ri, Seo-Myeon, Yangyang-Gun, 25. V. 2002, YEO, J. D. (NIAST); 1♂, Mt. Baekdeoksan (Temple Gwaneumsa), Suju-Myeon, Yeongweol-Gun, 15. V. 2001, KIM, T. W. (NIAST); 1♀, Mt. Baekdeoksan (Front gate of Temple Gwaneumsa), Suju-Myeon, Yeongweol-Gun, 14. V. 2001, KIM, T. W. (NIAST); 1♂, Mt. Taehwasan (Temple Bongseonsa), Palgoi-Ri, Yeongweol-Eup, Yeongweol-Gun, 14. V. 2001, KIM, T. W. (NIAST); **<GG>** 2♀, Mt. Myeongjisan (Temple Seungcheonsa), Baekdun-Ri, Buk-Myeon, Gapyeong-Gun, 28. V. 2001,

KIM, M. A. (NIAST); 1♀, Mt. Myeongjisan (Temple Seungcheonsa), Baekdun-Ri, Buk-Myeon, Gapyeong-Gun, 28. V. 2001, PARK, H. C. (NIAST); 1♀, Mt. Myeongjisan (Temple Seungcheonsa), Baekdun-Ri, Buk-Myeon, Gapyeong-Gun, 28. V. 2001, KIM, T. W. (NIAST); 2♀, Mt. Myeongjisan (Temple Seungcheonsa), Baekdun-Ri, Buk-Myeon, Gapyeong-Gun, 28. V. 2001, HWANG, J. H. (NIAST); 3♀, Dodae-Ri (Valleyhouse), Buk-Myeon, Gapyeong-Gun, 28. V. 2001, JANG, S. J. (NIAST); **<GB>** 1♀, Mt. Baekamsan, Uljin-Gun, 14. V. - 19. VI. 1999, GU, D. S. (NIAST); 2♂, Ecological garden for Firefly, Shinam-Ri, Subi-Myeon, Yeongyang-Gun, 19. V. 2004, KANG, T. H. (NIAST); **<GN>** 1♀, Mt. Palgongsan, Daegu-Si, 12. VI. 2000, KIM, M. A. (NIAST); <**JB>** 1♀, Temple Naesosa, Yongdong-Ri, Jinseo-Myeon, Buan-Gun, 11. V. 2004, KANG, T. H. (NIAST).

Remarks. This species was identified as *Rh. cembricola* Eschscholtz by Wittmer (1969). Later, however, Wittmer (1971) reported that this taxon was a misidentification of *Rh. asiatica* Witter and *Rh. lederi* Pic. Therefore, *Rh. cembricola* Eschscholtz must be excluded from the Korean Cantharidae.

Korean Name. 아세아산병대벌레

Distributions. Korea, Russia (Maritime territory).

***Rhagonycha* (s. str.) *coreana* Pic, 1921**

Mélanges exot.-ent., **33:** 28.

***Rhagonycha coreana*:** Winkler, 1925: 510; Wittmer, 1969: 107; Wittmer, 1971: 199; Delkeskamp, 1977: 169; Kazantsev, 1994: 92; Kim and Kim, 1998: 171; Kwon et al., 1996: 155; Kang and Kim, 2000: 158.

Description. Body length: 5.0-8.0 mm. Male. Body black; head black; eyes black; antennae black, but first two antennomeres yellowish brown; pronotum, scutellum, elytra black; legs black, but femuro-tibial joint, fore, and mid tibia brown.

Head flat, covered with thin and minute punctures and provided with slightly transverse depression behind antennal sockets. Eye relatively small, ratio of an eye to interocular space 6 : 21. Antennae relatively long, nearly reaching to the middle of elytra, approximate ratio of each antennomere, 12 : 8 : 10 : 14 : 14 : 14 : 15 : 14: 14 : 12 : 14. Last maxillary and labial palpomere palpi hatchet-shaped.

Pronotum quadrate, covered with thin and minute punctures; pronotum 1.06 times wider than long; median area strongly convex; lateral margins straight, with round anterior and posterior angles; posterior margin 1.03 times wider than anterior. Scutellum tongue shape, with round apex.

Elytra wide to posterior, ratio of width at elytral shoulder to length of elytra 18 : 57; dorsal surface closely and rugosely punctuate. Legs long and slender; all tarsal claws bifid.

Aedeagus oval in outline; dorsal process with round apex; ventral process slender, with sharp apex.

Female. Body color same to male, but legs duskier than in the male; body somewhat longer and wider than that in the male; eye relatively smaller than that in the male, ratio of an eye to interocular space 4 : 16.

Materials Examined (36 individuals). [KOREA] <GW> 1♀, Naegok-Dong, Gangreung-Si, 20. V. 2002, LEE, Y. B. (NIAST); 1♀, Mt. Baekamsan (Peak Ahopgogye), Naechon-Myeon, Hongcheon-Gun, 22. V. 2002, YEO, J. D. (NIAST); 1♀, Mt. Sangweolsan, Jeongseon-Gun, 17. VI. 1997, PARK, H. C. (NIAST); 1♀, Mt. Chiaksan, 19. VI. - 14. VIII. 1999 (NIAST); **<GG>** 1♀1♂, Mt. Myeongjisan (Temple Seungcheonsa), Baekdun-Ri, Buk-Myeon, Gapyeong-Gun, 28. V. 2001, KIM, T. W. (NIAST); 1♀, Mt. Myeongjisan (Temple Seungcheonsa), Baekdun-Ri, Buk-Myeon, Gapyeong-Gun, 28. V. 2001, LEE, H. A. (NIAST); 1♀, Mt. Jugeumsan, Palya-Ri, Soheul-Eup, Pocheon-Gun, 23. V. 2004, PARK, H. C. (NIAST); 2♀, Mt. Gwanaksan (*Pinus* spp.), 3. V. 1997, PARK, H. C. (NIAST); 1♂, Mt. Gwanaksan (Broadleaf tree), 3. V. 1997, PARK, H. C. (NIAST); **<CB>** 5♀, Mt. Guryongsan (Forest area), Boeun-Gun, 20. V. 1997, PARK, H. C. (NIAST); 1♀, Mt. Guryongsan (Shrub), Boeun-Gun, 20. V. 1997, PARK, H. C. (NIAST); 1♀, Mt. Daemisan (Broadleaf tree in forest area), Chungju-Si, 19. V. 1997, PARK, H. C. (NIAST); 2♀, Mt. Daemisan (Pinus densiflora in forest area), Chungju-Si, 19. V. 1997, PARK, H. C. (NIAST); 1♀, Mt. Weoraksan, Chungju-Si,

22. V. 1998, HAN, T. M. (NIAST); 1♀, Gungchon-Ri, Sangchon-Myeon, Yeongdong-Gun, 30. V. 2002, PARK, H. C. (NIAST); **<CN>** 3♀1♂, Mt. Bonghwasan (*Pinus densiflora*), Boryeong-Si, 18. V. 1997, PARK, H. C. (NIAST); 2♀3♂, Mt. Bonghwasan, Boryeong-Si, 18. V. 1997, PARK, H. C. (NIAST); 3♀, Mt. Seokbongsan, Nonsan-Si, 19. V. 1997, PARK, H. C. (NIAST); 1♀, Mt. Seokbongsan (Forest area), Nonsan-Si, 19. V. 1997, PARK, H. C. (NIAST); **<JB>** 1♀, Mt. Naejangsan (Around Temple Baekyangsa), Jeong-Eup, 7. V. 2000, PARK, H. C. (NIAST).

Korean Name. 우리산병대벌레

Distributions. Korea, Japan (Hokkaido), Russia (Maritime territory).

***Rhagonycha* (s. str.) *koreaensis* Kang et Kim, 2000**

Korean J. Entomol., **30(3):** 160

***Rhagonycha* (*Rhagonycha*) *koreaensis*:** Kim, 2002: 247; Kim, 2002: 284.

Description. Body length: 6.0-7.5 mm. Male. Body black; head, pronotum, elytra black; eye redish black; antennae, legs dark brown.

Head flat, covered with thin and minute punctures and provided with slightly transverse depression behind antennal sockets. Eyes relatively large, ratio of an eye to interocular space 7 : 14. Antennae relatively long, nearly reaching to the middle of

elytra, approximate ratio of each antennomere, 9 : 5 : 8 : 9 : 9 : 10 : 10 : 10 : 10 : 9 : 11. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate, covered with thin and minute punctures; pronotum 1.30 times wider than long; median area strongly convex; lateral margins straight, with round anterior and posterior angles; posterior margin 1.09 times wider than anterior. Scutellum tongue shape; apex of scutellum flat.

Elytra wide to posterior, ratio of width at elytral shoulder to length of elytra 22 : 68; dorsal surface closely and rugosely punctate.Legs long and slender; all tarsal claws bifid.

Aedeagus elongated; dorsal process with round apex; ventral process expanded at the middle area, with round apex.

Female. Body color same to male; body somewhat longer and wider than that in the male; eye relatively smaller than that in the male, ratio of an eye to interocular space 4 : 15.

Materials Examined (92 individuals). [KOREA] <GW> 1♀, Gangchon, 22. V. 1977, Han, Ho-yeon; 1♀, Temple Geonbongsa, Goseong-gun, 22. V. 1992, Park, Hae-chul (SWU); 1♀, Mt. Hyangrobong, Goseong-gun, 13. VI. 1992, Park, Hae-chul (SWU); 1♀2♂, Mt. Taebaeksan, Taebaek-si, 30. V. 1999, KANG, Tae-hwa (SWU); 1♂, Mt. Gachilbong, Yanggu-gun, 31. V. 1992, Park, Hae-chul (SWU); **<GG>** 1♂, Mt. Namhansan, Hadaeweon-Dong, Seongnam-Si, 28. IV. 1998, KANG, T. H. (SWU); 18♀21♂, Mt. Namhansan, Hadaeweon-Dong, Seongnam-Si, 5. V. 1998, KANG, T. H. (SWU); 2♀, Mt. Namhansan, Hadaeweon-

Dong, Seongnam-Si, 14. V. 1998, KANG, T. H. (SWU); 3♀, Mt. Namhansan, Hadaeweon-Dong, Seongnam-Si, 24. V. 1999. KANG, Tae-hwa (SWU); 2♀, Mt. Maengsan, Bundang-Gu, Seongnam-Si, 14. V. 2000, KANG, T. H. (NIAST); 13♀12♂, Mt. Maengsan, Bundang-Gu, Seongnam-Si, 7. V. 2004, KANG, T. H. (NIAST); 1♀2♂, Valley Botonggol, Hadaeweon-Dong, Jungweon-Gu, Seongnam-Si, 5. V. 2004, KANG, T. H. (NIAST); 1♂, Mt. Namhansan, Hadaeweon-Dong, Seongnam-Si, 5. V. 1998, KANG, T. H. (NIAST); 1♂, Castle Namhansanseong (Valley Botonggol), Seongnam-Si, 5. VI. 2000, PARK, H. C. (NIAST); 1♀, Mt. Namhansan, Hadaeweon-Dong, Seongnam-Si, 28. IV. 1998, KANG, T. H. (NIAST); 1♀, Mt. Cheonggyesan, Gangnam-gu, Seoul, 12. V. 1988, Kim, Jin-hyeon (SWU); **<GB>** 1♂, Mt. Sobaeksan (Valley Heebanggyegok), Ponggi-Gun, 28. V. 1999, KANG, T. H. (NIAST); 1♀, Valley Heebanggyegok, Mt. Sobaeksan, 28. V. 1999, Kim, Hye-jin (SWU); 1♀, Mt. Baekamsan, Uljin-gun, 29. V. 1999, KANG, Tae-hwa (SWU); **<JN>** 1♀, Valley Piagol, Mt. Jirisan, Gurye-gun, 22. V. 1998, Han, Tae-man (SWU); **[CHINA]** 1♀1♂, Waterfall Jangbaekpokpo, Bukpa, Mt. Baekdusan, 7. VII. 2005, KIM, Ah-young (NIAST).

Remarks. Field and specimen surveys have indicated that this species is distributed in the area of China adjacent to North Korea.

Korean Name. 눈큰산병대벌레

Distribution. Korea, China (Jilin).

***Rhagonycha* (s. str.) *parviocellata* Kang et Kim, 2000**

Korean J. Entomol., **30(3):** 161

***Rhagonycha* (*Rhagonycha*) *parviocellata*:** Kim, 2002: 247; Kim, 2002: 284.

Description. Body length: 7.0-9.5 mm. Male. Body black; antennae, pronotum, elytra black; eye redish black; legs black, but tarsi dark brown.

Head flat, covered with thin and minute punctures and provided with slightly transverse depression behind anntenal sockets. Eye relatively large, ratio of an eye to interocular space 5 : 16. Antennae relatively long, nearly reaching to the middle of elytra, approximate ratio of each antennomere, 11 : 5 : 8 : 10 : 11 : 11 : 11 : 11 : 10 : 9 : 11. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate, covered with thin and minute punctures; pronotum 1.13 times wider than long; median area strongly convex; lateral margins straight, with round anterior angles and obtuse posterior angles; posterior margin 1.11 times wider than anterior. Scutellum tongue shape; apex of scutellum flat.

Elytra wide to posterior, ratio of width at elytral shoulder to length of elytra 25 : 85; dorsal surface closely and rugosely punctate. Legs long and slender; all tarsal claws bifid.

Aedeagus elongated; dorsal process with round apex; ventral process expanded at middle area, with round apex.

Female. Body color duskier than in the male; body somewhat longer and wider that in the male; eye relatively smaller than that in the male, ratio of an eye to interocular space 4 : 19.

Materials Examined (99 individuals). [KOREA] <GW> 2♀, Temple Yongsiam, Mt. Seoraksan, 22. V. 2003, KIM, J. K. (NIAST); 6♀, Osaek gate to 1st resting post, Mt. Seoraksan, 24. V. 2003, KIM, J. K. (NIAST); 2♀, Mt. Taebaeksan, Taebaek-Si, 14. V. - 20. VI. 1999, GU, D. S. (NIAST); 1♀, Mt. Taebaeksan (Temple Yooilsa), Taebaek-Si, 20. VI. - 11. VIII. 1999, GU, D. S. (NIAST); 7♀1♂, Mt. Hambaeksan (Valley Jeolgolgyegok), Hwangji-Dong, Taebaek-Si, 5. VI. 2005, KANG, T. H. (NIAST); 12♀2♂, Mt. Hambaeksan (1450-1570m), Hwangji-Dong, Taebaek-Si, 6. VI. 2005, KANG, T. H. (NIAST); 1♀, Gangchon, 21. V. 1977, Song, Cheol-geun (SWU); 1♂, Mt. Hyangrobong, 13. VI. 1992, Park, Hae-chul (SWU); 1♀, Mt. Gachilbong, Hongcheon-gun, 22. VI. 1984, Lee, Gi-chang (SWU); 1♀, Jogaedong 800m, Mt. Odaesan, Hongcheon-gun, 30. VI. 1997. H.C.Park (SWU); 1♂, Joaedong, Mt. Odaesan, Hongcheon-gun, 30. VI. 1997, J.I.Kim (SWU); 1♂, Mt. Naeseorak, Yongdae-ri, 26. V. 1983, Jang, Gwang-sook (SWU); 1♀, Undu-ri, Hongcheon-gun, 17. VI. 1993, Kim, Su-yeon (SWU); 2♀, Mt. Unduryeong, 6. VI. 1996; 1♀, Mt. Gariwangsan, Jeongseon-eup, Jeongseon-gun, 21. V. 1998, Kim, Bo-yeong et als (SWU); 7♀3♂, Mt. Taebaeksan, Taebaek-si, 30. V. 1999, Kang, Tae-hwa (SWU); 1♀, Dangungak, Mt. Taebaeksan, 30. V. 1999, Kim, Hye-jin (SWU); 1♀, Dangungak, Mt. Taebaeksan, 30. V. 1999,

Jo, Seung-hee (SWU); 1♀, Mt. Chiaksan, 5. VI. 1992, Kim, Seong-jung (SWU); **<GG>** 12♀13♂, Gwaneum-Ri (Mountain behind Village), Toichon-Myeon, Gwangju-Si, 5. V. 2005, KANG, T. H. (NIAST); 1♂, Mt. Chukryeongsan, Namyangju-si, 23. V. 1996, Woo, Su-jeong (SWU); 1♀, Castle Namhansanseong, Seongnam-si, 4. V. 1997, Kim, Byeong-hee (SWU); **<CB>** 1♂, Hwayang-ri, Gwisan-gun, 25. V. 1996, Kim, Eun-yeong (SWU); 1♀, Mt. Weolaksan, Jecheon-si, 27. V. 1996, Jeong, Hye-yeong (SWU); **<GB>** 1♀, Mt. Juwangsan, Cheongsong-gun, 25. V. 1989, Shin, Yeong-ran (SWU); 1♀, Second Waterfall, Mt. Juwangsan, 4. VI. 1989, PEL (SWU); Mt. Juwangsan, Naeweong-dong, 4. VI. 1989, LSJ (SWU); 1♂, Third Waterfall, Mt. Juwangsan, 4. IV, 1989, K.J.M (SWU); 1♀, Mt. Juheulsan, Mugyeong-si, 24. V. 1997, J.I.Kim (SWU); 1♀, Mungyeong-saejae, 26. V. 1996, Kim, Jin-ill (SWU); **<JB>** 1♂, Daebul-ri, Seolcheon-myeon, 26. V. 1993. Lee, Yeong-eun (SWU); 1♀, Samgong-ri, Muju-gun, 24. V. 1993, Lee, Ji-sook (SWU); 1♀, Mt. Deokyusan, Muju-gun, 21. V. 1983, S.S.Han (SWU); 1♂, Mt. Deokyusan, Muju-gun, 25. V. 1993, Lee, Yeong-eun (SWU); 1♂, Mt. Deokyusan, Muju-gun, 25. V. 1993, Hong, Hye-gyeong (SWU); 1♂, Mt. Deokyusan, Muju-gun, 25. V. 1993, Kim, Eun-hee (SWU); 1♀, Mt. Minjujisan, Muju-gun, 26. V. 1993. Lee, Gyeong-ah (SWU).

Korean Name. 작은눈산병대벌레

Distribution. Korea.

***Rhagonycha* (s. str.) *transita* Wittmer, 1971**

Ann. Hist. nat. Mus. nat. Hung., **63:** 195 ,200.

***Rhagonycha transita*:** Švihla, 1995: 87; Kang and Kim, 2000: 158.

***Rhagonycha* (*Rhagonycha*) *transita*:** Kim, 2002: 247.

Description. Body length: 4.0-6.0 mm. Male. Body black; head black; eyes redish black; antennae black, but first two antennomeres yellowish brown; pronotum, scutellum, elytra black; legs black, but femuro-tibial joints brown.

Head flat, covered with thin and minute punctures. Eye relatively small, ratio of an eye to interocular space 6 : 19. Antennae relatively long, nearly reaching 1/3 of elytra, approximate ratio of each antennomere, 11 : 7 : 10 : 11 : 12: 12 : 12 : 11 : 11 : 10 : 11. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate, covered with thin and minute punctures; pronotum 1.19 times wider than long; median area strongly convex; lateral margins straight, with round anterior angles and obtuse posterior angles; posterior margin 1.04 times wider than anterior. Scutellum tongue shape, with round apex.

Elytra wide to posterior, ratio of width at elytral shoulder to length of elytra 23 : 72; dorsal surface closely and rugosely punctuate. Legs long and slender; all tarsal claws bifid.

Aedeagus elongated; dorsal process with round apex; ventral process bent inward at apex and with sharp apex.

Female. Body color same to male, but antennae and legs duskier than in the male; Body somewhat longer and wider than that in male; eye smaller than that in male, ratio of an eye to interocular space 5 : 22.

Materials Examined (109 individuals). [KOREA] <GW> 1♀1♂, Mt. Seokbyeongsan (Peak Sapdangryeong), Wangsan-Myeon, Gangreung-Si, 21. V. 2002, YEO, J. D. (NIAST); 1♀, Mt. Gwangdeoksan, Gwangdeok-Ri, Sanae-Myeon, Hwacheon-Gun, 10. VI. 2004, LEE, Y. B. (NIAST); 6♀, Mt. Baekamsan (Peak Ahopgogye), Naechon-Myeon, Hongcheon-Gun, 22. V. 2002, YEO, J. D. (NIAST); 1♂, Jeohangryeong, Mt. Seoraksan, 23. V. 2003, KIM, J. K. (NIAST); 4♀, Mt. Seoraksan (from Jangsudae to 12 Seonyeotang), Hangye-Ri, Buk-Myeon, Inje-Gun, 26. VI. 2005, KANG, T. H. (NIAST); 1♂, Mt. Hanseoksan, Inje-Gun; 18. VI. 1997, PARK, H. C. (NIAST); 1♀, Mt. Seokbyeongsan, Imgye-Ri, Imgye-Myeon, Jeongseon-Gun, 22. V. 2002, LEE, Y. B. (NIAST); 3♀, Mt. Seokbyeongsan, Imgye-Ri, Imgye-Myeon, Jeongseon-Gun, 21. V. 2002, LEE, Y. B. (NIAST); 1♀, Mt. Sangweolsan (Forest area), Jeongseon-Gun, 7. IV. 1997, PARK, H. C. (NIAST); 2♀, Mt. Odaesan (Valley Jogyegol), Jinbu-Myeon, Pyeongchang-Gun, 23. VI. 2005, KIM, T. W. (NIAST); 5♀, Mt. Hambaeksan (Valley Jeolgolgyegok), Hwangji-Dong, Taebaek-Si, 5. VI. 2005, KANG, T. H. (NIAST); 13♀10♂, Mt. Hambaeksan (1450-1570m), Hwangji-Dong, Taebaek-Si,

6. VI. 2005, KANG, T. H. (NIAST); 5♀4♂, Changweon 2 Ri (Around factory of Ssangyong Ciment), Yeongweol-Gun, 20. V. 2003, KANG, T. H. (NIAST); 2♀2♂, 20. V. 2003, SOHN, J. C. (NIAST); 1♀, Changweon 3 Ri (Around factory of Ssangyong Ciment), Yeongweol-Gun, 23. V. 2000, KIM, M. A. (NIAST); 4♀, Mt. Hambaeksan, 20. VI. - 11. VIII. 1999; 1♀, Mt. Taebaeksan, 14. V. - 20. VI. 1999, GU, D. S. (NIAST); 1♀, Mt. Taebaeksan, 14. V. - 20. VI. 1999 (NIAST); **<GG>** 3♀, Mt. Chukryeongsan, 6. VI. - 15. VI. 1999 (NIAST); 1♂, Gwaneum-Ri (Mountain behind Village), Twichon-Myeon, Gwangju-Si, 5. V. 2005, KANG, T. H. (NIAST); 1♂, Mt. Cheonmasan, Maseoku-Ri, Namyangju-Si, 13. V. 2004, KANG, T. H. (NIAST); 1♀, Mt. Maengsan, Bundang-Gu, Seongnam-Si, 14. V. 2000, KANG, T. H. (NIAST); 1♂, Mt. Maengsan, Bundang-Gu, Seongnam-Si, 20. V. 2004 (NIAST); 1♂, Mt. Namhansan, Hadaeweon-Dong, Seongnam-Si, 5. V. 1998, KANG, T. H. (NIAST); 1♀1♂, Mt. Namhansan, Hadaeweon-Dong, Seongnam-Si, 3. V. 1998, KANG, T. H. (NIAST); **<CB>** 1♀, Mt. Guryongsan, Boeun-Gun, 20. V. 1997, PARK, H. C. (NIAST); 2♂, Mt. Daemisan (Forest area Around Temple Bongseonam), Chungju-Si, 19. V. 1997, PARK, H. C. (NIAST); 1♂, Mt. Weoraksan, Chungju-Si, 22. V. 1998, HAN, T. M. (NIAST); 1♀, Mt. Daemisan (*Pinus densiflora* in forest area), Chungju-Si, 19. V. 1997, PARK, H. C. (NIAST); **<CN>** 2♂: Mt. Bonghwasan (*Pinus densiflora*), Boryeong-Si, 18. V. 1997, PARK, H. C. (NIAST); **<GB>** 1♂, Mt. Baekamsan, Uljin-Gun, 20. VI. - 12. VIII. 1999, GU, D. S. (NIAST); 1♀, Mt. Baekamsan, Uljin-Gun, 14. V. - 19. VI.

1999, GU, D. S. (NIAST); <**JB**> 1♀, Temple Naesosa, Yongdong-Ri, Jinseo-Myeon, Buan-Gun, 12. V. 2004, KANG, T. H. (NIAST); 4♀4♂, Mt. Naejangsan (Around Temple Baekyangsa), Jeong-Eup, 7. V. 2000, PARK, H. C. (NIAST); <**JN**> 1♀, Gangjin-Gun, 14. V. 2000, KIM, H. B. (NIAST); 2♀, Mt. Duryunsan, Gurim-Ri, Samsan-Myeon, Haenam-Gun, 10. V. 2001, HWANG, J. H. (NIAST); 1♀, Mt. Jeamsan, Jangheung-Gun, 14. V. 2000, JANG, S. J. (NIAST); **<JJ>** 1♂, *Brassica campestris*, Jocheon-Ri, Jocheon-Eup, Bukjeju-Gun, 25. IV. 2001, LEE, H. S. (NIAST); 5♀1♂, Mt. Hallasan (Area Between Oreumse to Uioreumse), 11. VI. 2000, LEE, Y. B. (NIAST).

Korean Name. 꼬마산병대벌레

Distributions. Korea, Japan, Russia (Buryatia, Amur, Maritime territory).

Genus *Cantharis* Linnaeus, 1758

Syst. Nat., **10:** 400

Type species: *Cantharis fusca* Linnaeus, 1758

***Cantharis*:** Medvedev and Ryvkin, 1992: 38; Wittmer and Kazantsev, 1997: 368.

Diagnosis. Body long and slender. Antennae filiform; second antennomere as long as third antennomere (subgenus *Cyrtomoptila*), or shorter than third segment (subgenus *Cantharis*). Last maxillary and labial palpomere hatchet-shaped.

Pronotum convexed, and quadrated or circulated. Radial transvein closed to basal area rather than radio-median crossvein. Leg long and slender; fore inner tarsal claws and mid- and hind-outer tarsal claws with blunt tooth at basal part; fore outer tarsal claws and mid- and hind-inner tarsal claws simple in both sexes (subgenus *Cantharis*), or fore inner tarsal claws and mid- and hind-outer tarsal claws with blunt tooth at basal part; fore outer tarsal claws and mid- and hind-inner tarsal claws simple in male, but simple in female (subgenus *Cyrtomoptila*).

Korean Name. 병대벌레속

Key to the species of the Korean *Cantharis* Linnaeus

1. Pronotum quadrate; fore inner tarsal claws and mid- and hind-outer tarsal claws with blunt tooth at basal part in male, but all tarsal claws simple in female • Subgen. *Cyrtomoptila* • *C. plagiata*

- Pronotum circulate; fore inner tarsal claws and mid- and hind-outer tarsal claws with blunt tooth at basal part in female • Subgen. *Cantharis* • 2

2. Scutellum triangular, with sharp apex • *C. nigricolor*

- Scutellum tongue shape, with round apex • 3

3. Scutellum and legs black • *C. knirschi*

– Scutellum and legs yellow or yellowish brown • 4

4. Anterior width of pronotum narrower than posterior width; elytra wide to posterior • *C. pallida*

- Anterior width of pronotum nearly same to posterior width; elytra parallel-sided • *C. soeulensis*

Cantharis (s. str.) *knirschi* Pic, 1929

Mélanges exot.-ent., **53:** 5

Description. Body length: 11.5 – 15.5 mm. Male. Body mostly black; head yellowish brown in anterior area, but black behind antennal sockets; eye dark brown; antennae black, but ventral part of first two antennomeres brown; pronotum redish brown; scutellum, elytra and legs black.

Head flat, covered with thin and minute punctures and provided with slightly triangulate depression behind antennal sockets. Eye relatively large, ratio of an eye to interocular space 7 : 27. Antennae relatively long, nearly reaching to two third of elytra, approximate ratio of each antennomere, 12 : 6 : 9 : 11 : 11 : 11 : 11 : 12 : 12 : 10 : 11. Last maxillary and labial palpomere hatchet-shaped.

Pronotum circulate, covered with thin and minute punctures; pronotum as long as wide; median area strongly convex, with a medio longitudinal groove; lateral margins round, with round anterior angles and obtuse posterior angles; posterior margin 1.09 times wider than anterior. Scutellum tongue shape, with round apex.

Elytra parallel sided, ratio of width at elytral shoulder to length of elytra 36 : 132; dorsal surface closely and rugosely punctate. Legs long and slender; fore inner tarsal claws and mid- and hind-outer tarsal claws with blunt tooth at basal part; fore outer tarsal claws and mid- and hind-inner tarsal claws simple.

Aedeagus quadrate; dorsal process very short, conjointly forming wide dorsal plate; laterophyses exposed at basal part; apex of laterophyses bent upward; ventral process slightly bent downward; apex of ventral process sharp.

Female. Body color duskier than in the male; body somewhat longer and wider than that in the male; eye relatively smaller than that in the male, ratio of an eye to interocular space 7 : 32.

Materials Examined (13 Individuals). [KOREA] <HB> 3♀3♂, Mt. Baekdusan, 2-6 km N Sam-zi-yan hotel, wood, 18. VII. 1977, Dely & Draskovits (HNHM); 2♀, Mt. Baekdusan, Explosion-Lake, 2000-2500 m, 18. VII. 1977 (HNHM); **<PB>** 2♂, Mt. De-sang-san, 10 km NE Pyeongyang, 1. VII. 1977, Dely & Draskovits (HNHM); 1♂, Mt. Myohyangsan, 28. V. 1991, Ronkay & Vojnits (HNHM); **[CHINA]** 2♀, Waterfall Jangbaekpokpo, Bukpa, Mt. Baekdusan, 7. VII. 2005, KIM, Ah-young (NIAST).

Remarks. This species is known to be distributed in China and Russia. I found that it is distributed in North Korea as well.

Korean Name. 홍가슴병대벌레(신칭)

Distributions. Korea (New record), China, Russia.

Cantharis (s. str) *nigricolor* Pic, 1906

Echange, **22:** 83

***Cantharis tenuelimbata*:** Heyden, 1887: 258; Wittmer, 1969: 108; Delkeskamp, 1977: 128; Kang et al., 2000: 153.

Description. Body length. 8.0-12.0 mm. Male. Body mostly black; head, scutellum, elytra, and leg black; pronotum black with narrow yellowish bordering.

Head flat, covered with thin and minute punctures and provided with weak transverse depression. Eye relatively small, ratio of an eye to interocular space 5 : 22. Antennae relatively short, nearly reaching to one third of elytra, approximate ratio of each antennomere, 11 : 7 : 9 : 13 : 13 : 13 : 13 : 12 : 12 : 11 : 12. Last maxillary and labial palpomere hatchet-shaped.

Pronotum circulate, with thin and minute punctures; pronotum 1.38 times wider than long; median plate with weak longitudinal groove; lateral margins archform curved, with obtusely round angles; posterior margin 1.46 times wider than anterior. Scutellum triangular, with sharped apex.

Elytra parallel-sided, ratio of width at elytral shoulder to length of elytra 33 : 97. Leg long and slender; fore inner tarsal claws and mid- and hind-outer tarsal claws with

blunt tooth at basal part; fore outer tarsal claws and mid- and hind-inner tarsal claws simple.

Aedeagus. Oval in outline; dorsal plate non-divided at slightly sinuated posterior margin; laterophyses not exposed at posterior part; ventral process bent inward.

Female. Body color same to male, but body larger and wider than male; eye relatively smaller than that in the male, ratio of an eye to interocular space 5 : 27; antennae relatively shorter than that in the male, approximate ratio of each antennomere, 11 : 7 : 7 : 10 : 10 : 10 : 10 : 9 : 9 : 9 : 10.

Materials Examined (7 individuals). [KOREA] <GW> 1♀, Mt. Hanseoksan (Broadleaf tree), Inje-Gun, 18. VI. 1997, PARK, H. C. (NIAST); 1♀, Mt. Hanseoksan, Inje-Gun, 18. VI. 1997, PARK, H. C. (NIAST); 1♀, Temple Yongsiam, Mt. Seoraksan, 22. V. 2003, KIM, J. K. (NIAST); 1♀, Osaek gate to 1st resting post, Mt. Seoraksan, 24. V. 2003, KIM, J. K. (NIAST); **<JN>** 1♀, Mt. Jirisan (Top Nogodan), Gurye-Gun, 22. V. 1999, HAN, T. M. (NIAST); **<JJ>** 1♀, Mt. Hallasan Between Oreumse to Uioreumse, 11. VI. 2000, LEE, Y. B. (NIAST); **[RUSSIA]** 1♂, Kamenushka (42km E.), Kray, Primorski, Ussuriysk, 6. VI. 1997, KIM, J. I. (NIAST).

Remarks. This species was identified as *C. tenuelimbata* Ballion by Heyden (1887). However, Kazantsev (2004) reported that this species is distributed in Korea. Dr. Kazantsev (*personal communication*) indicated that *C. tenuelimbata* Ballion is a misidentification of the species.

Korean Name. 대륙병대벌레

Distributions. Korea, China (Kansu), Russia.

Cantharis (s. str.) *pallida* Goeze, 1777

Ent. Beytr., **1:** 541

***Cantharis pallida*:** Wittmer, 1969: 108; Delkeskamp, 1977: 107; Kang *et al*., 2000: 151.

Description. Body length: 9.0-11.0 mm. Male. Body yellowish brown; head, and scutellum yellowish brown; pronotum, elytra, and leg yellow.

Head flat, covered with thin and minute punctures. Eye relatively large, ratio of an eye to interocular space 7 : 20; antennae relatively long, nearly reaching to the middle of elytra, approximate ratio of each antennomere, 13 : 7 : 10 : 12 : 12 : 13 : 13 : 13 : 12 : 11 : 12. Last maxillary and labial palpomere hatchet-shaped.

Pronotum circulate, covered with thin and minute punctures; pronotum 1.19 times wider than long; median plate with short and weak longitudinal groove; lateral margins slightly archform curved, with round anterior anles and obtusely angulated hind angles; posterior margin 1.28 times wider than anterior. Scutellum triangular, with round apex.

Elytra parallel-sided, ratio of width at elytral shoulder to length of elytra 30 : 91. Leg long and slender; fore inner tarsal claws and mid- and hind-outer tarsal claws with

blunt tooth at basal part; fore outer tarsal claws and mid- and hind-inner tarsal claws simple.

Aedeagus elongated; dorsal plate non-divided at sinuated posterior margin; laterophyses exposed at basal part; ventral process slightly bent downward.

Female. Body color same to male, but body longer and wider than in the male; eye relatively smaller than that in the male, ratio of an eye to interocular space 7 : 23; antennae relatively shorter than that in the male, approximate ratio of each antennomere, 12 : 7 : 10 : 12 : 12 : 12 : 12 : 11 : 11 : 11 : 12.

Materials Examined (28 individuals). [KOREA] <HB> 2♀, Samjiyon, 1000m (Ryanggang Prov.), 26. VI. 1998, O. Merkl & Gy. Szél (HNHM); **<PB>** 1♂, Mt. Myohyangsan, 21. V. 1985, A. Vojnits & L. Zombori (HNHM); **<GW>** 2♂, Mt. Baekamsan (Peak Ahopgogae), Naechon-Myeon, Hongcheon-Gun, 22. V. 2002, LEE, Y. B. (NIAST); 1♂, Mt. Odaesan (Spa SambongYaksu), Hongcheon-Gun, 4. VI. 1998, KIM, J. I. (NIAST); 1♂, Mt. Baekamsan (Peak Ahopgogae), Naechon-Myeon, Hongcheon-Gun, 22. V. 2002 (NIAST); 1♀, Temple Baekdamsa, Yongdae-Ri, Buk-Myeon, Inje-Gun, 25. V. 2002, YEO, J. D. (NIAST); 2♂, Mt. Hanseoksan (Broadleaf tree), Inje-Gun, 18. VI. 1997, PARK, H. C. (NIAST); 3♀, Mt. Hanseoksan, Inje-Gun, 18. VI. 1997, PARK, H. C. (NIAST); 1♀, Mt. Sangweolsan, Jeongseon-Gun, 17. VI. 1997, PARK, H. C. (NIAST); 2♀2♂, Mt. Odaesan (Samyang pasture), Byeongnae-Ri, Doam-Myeon, Pyeongchang-Gun, 23. VI. 2005, KIM, T. W. (NIAST); 1♀, Mt. Odaesan, Jinbu-Myeon, Pyeongchang-

Gun, 24. VI. 1998, HAN, T. M. (NIAST); 1♂, Mt. Odaesan (Bangadari Yaksu-at light), Jinbu-Myeon, Pyeongchang-Gun, 22. VI. 2005, KIM, T. W. (NIAST); 1♀, Mt. Odaesan (Valley Jogyegol), Jinbu-Myeon, Pyeongchang-Gun, 23. VI. 2005, KIM, T. W. (NIAST); 2♀, Mt. Hambaeksan (Valley Jeolgolgyegok), Hwangji-Dong, Taebaek-Si, 5. VI. 2005, KANG, T. H. (NIAST); 4♀1♂, Mt. Hambaeksan (1450-1570m), Hwangji-Dong, Taebaek-Si, 6. VI. 2005, KANG, T. H. (NIAST). **[JAPAN]** 1♀, Futatsuyama, Kushiro, Shibecha, 24. VI. 1974, K. Ijima (NHMK); 1♂, Arekinai, Shibecha-cho, Hokkaido, 19. VII. 1996, H. Asano et al (NHMK). **[CHINA]** 1♂, Waterfall Jangbaekpokpo, Bukpa, Mt. Baekdusan, 7. VII. 2005, KIM, Ah-young (NIAST); 1♀, Donha, Forest Hwangniheosamrim, Gillim-Seong, 18. VI. 2005, PARK, H. C. (NIAST).

Korean Name. 멋쟁이병대벌레

Distributions. Korea, Japan, China, Russia, Mongolia. Central Europe

Cantharis (s. str.) *soeulensis* Pic, 1922

Mélanges exot.-ent. **37:** 1

***Cantharis oedemeroides*:** Cho, 1967: 193; Kim and Nam, 1984: 329. [**Misidentification**]

***Cantharis soeulensis*:** Winkler, 1925: 506; Wittmer, 1969: 108; Delkeskamp, 1977: 126; Kang *et al.*, 2000: 152; Kim, 2002: 284.

Description. Body length: 11.0-15.0 mm. Male. Body mostly black; head and scutellum yellowish brown; pronotum and leg yellowish brown; elytra black with narrow yellowish brown bordering and sutural line.

Head flat, covered with thin and minute punctures. Eye relatively small, ratio of an eyer to interocular space 7 : 30. Antennae relatively long, nearly reaching to two third of elytra, approximate ratio of each antennomere, 17 : 8 : 14 : 18 : 19 : 19 : 19 : 19 : 19 : 17 : 19. Last maxillary and labial palpomere hatchet-shaped.

Pronotum circulate, covered with thin and minute punctures; lateral margins slightly archform curved, with obtusely round corner; pronotum 1.22 times wider than long; posterior margin 1.07 times wider than anterior. Scutellum triangular, with round apex.

Elytra parallel sided, ratio of width at elytral shoulder to length of elytra 38 : 116; dorsal surface closely and rugosely punctate. Leg long and slender; fore inner tarsal claws and mid- and hind-outer tarsal claws with blunt tooth at basal part; fore outer tarsal claws and mid- and hind-inner tarsal claws simple.

Aedeagus oval in outline; dorsal plate non-divided at archform curved posterior margin; laterophyses exposed at basal part; ventral process narrowed to posteriorly, with sharp apex.

Female. Body color same to male, but body wider than in the male; eye relatively smaller than that in the male 5: 30; antennae relatively shorter than that in the male, approximate ratio of each antennomere, 14 : 8 : 10 : 13 : 13 : 13 : 14 : 13 : 13 : 12 : 14.

Materials Examined (93 individuals). [KOREA] <GW> 1♂, Balsan 2 Ri (Around Village), Chuncheon-Si, 1. V. 1998, PARK, H. C. (NIAST); 2♂, Balsan 2 Ri (*Hibiscus syriacus*), Chuncheon-Si, 1. V. 1998, PARK, H. C. (NIAST); 2♀, Balsan 2 Ri (Pasture), Chuncheon-Si, 1. V. 1998, PARK, H. C. (NIAST); 1♀, Balsan 2 Ri (*Pinus koraiensis*), Chuncheon-Si, 1. V. 1998, PARK, H. C. (NIAST); 1♂, Balsan 2 Ri (Pond Achimmot), Chuncheon-Si, 1. V. 1998, PARK, H. C. (NIAST); 2♀2♂, Balsan 2 Ri (Around Village), Chuncheon-Si, 17. V. 1998, PARK, H. C. (NIAST); 2♀3♂, Balsan 2 Ri (Bank Around rice field), Chuncheon-Si, 17. V. 1998, PARK, H. C. (NIAST); 2♀1♂, Balsan 2 Ri (*Hibiscus syriacus*), Chuncheon-Si, 17. V. 1998, PARK, H. C. (NIAST); 3♂, Balsan 2 Ri (Pasture), Chuncheon-Si, 17. V. 1998, PARK, H. C. (NIAST); 1♂1♀, Balsan 2 Ri (*Pinus koraiensis*), Chuncheon-Si, 17. V. 1998, PARK, H. C. (NIAST); 1♂, Balsan 2 Ri, Chuncheon-Si, 20. V. 1999, LEE, J. C. (NIAST); 1♂, Agricultural area without agrochemicals, Hongcheon-Gun, 2003, KIM, J. G. (NIAST); 1♀, Mt. Hanseoksan, Inje-Gun, 8. VI. 1997, PARK, H. C. (NIAST); 2♀1♂, Mt. Hambaeksan (Valley Jeolgolgyegok), Hwangji-Dong, Taebaek-Si, 5. VI. 2005, KANG, T. H. (NIAST); 1♀5♂, Mt. Hambaeksan (1450-1570m), Hwangji-Dong, Taebaek-Si, 6. VI. 2005, KANG, T. H. (NIAST); 1♀, Mt. Daeamsan (Wetland Yongneup), Yanggu-Gun, 24. V. 1998, KIM, J. I. (NIAST); 1♀, Mt. Baekdeoksan (Front gate of Temple Gwaneumsa), Suju-Myeon, Yeongweol-Gun, 14. V. 2001, PARK, H. C. (NIAST); 1♂, Mt. Baekdeoksan (Temple Gwaneumsan), Suju-Myeon, Yeongweol-Gun, 15.

V. 2001, KIM, T. W. (NIAST); 1♂, Mt. Baekdeoksan (Temple Gwaneumsan), Suju-Myeon, Yeongweol-Gun, 14. V. 2001, PARK, H. C. (NIAST); 1♀, Mt. Odaesan, Rodong-Ri, 21. VI. 1999, LEE, Y. B. (NIAST); 1♀, Mt. Odaesan, 20. VI. 1997, AHN, M. K. (NIAST); 1♀, Mt. Odaesan, 12. VI. 1997, JANG, S. J. (NIAST); 1♂, Mt. Seoraksan (from Spa OsaekYaksu to Peak Daecheongbong), Oga-Ri, Seo-Myeon, Yangyang-Gun, 25. V. 2002, YEO, J. D. (NIAST); **<GG>** 1♂, Dodae-Ri (Valleyhouse), Buk-Myeon, Gapyeong-Gun, 28. V. 2001, JANG, S. J. (NIAST); 1♂, Mt. Hwaaksan, Gapyeong-Gun, 29. V. 1998, KIM, S. Y. (NIAST); 1♀3♂, Mt. Gwanggyosan, Sanggwanggyo-Dong, Jangan-Gu, Suweon-Si, 30. V. 2004, KANG, T. H. (NIAST); 2♀, Ecogarden, Department of Agrobiology, Seodun-Dong, Suweon-Si, 21. V. 2001, KIM, T. W. (NIAST); 1♀, Ecogarden, Department of Agrobiology, Seodun-Dong, Suweon-Si, 7. VI. 1999, LEE, J. C. (NIAST); 3♀, Ecogarden, Department of Agrobiology, Seodun-Dong, Suweon-Si, 8. V. 2001, PARK, H. C. (NIAST); 1♀, Ecogarden, Department of Agrobiology, Seodun-Dong, Suweon-Si, 9. V. 2003, PARK, H. C. (NIAST); 1♂, Ecogarden, Department of Agrobiology, Seodun-Dong, Suweon-Si, 6. V. 1999, LEE, J. C. (NIAST); 6♂, Ecogarden, Department of Agrobiology, Seodun-Dong, Suweon-Si, 8. V. 2001, KIM, T. W. (NIAST); 3♂, Ecogarden, Department of Agrobiology, Seodun-Dong, Suweon-Si, 21. V. 2001, KIM, T. W. (NIAST); 1♂, Deoksu-Ri (Baekdong), Danweol-Myeon, Yangpyeong-Gun, 14. V. 2003, PARK, H. C. (NIAST); 1♂, Ecogarden, Department of Agrobiology, Suweon-Si, 13. V. 1998

(NIAST); **<CN>** 3♀1♂, Galsan-Ri (Around bank), Galsan-Myeon, Hongseong-Gun, 11. V. 2004, KANG, T. H. (NIAST); 1♂, Mt. Deoksungsan, Sacheon-Ri, Deoksan-Myeon, Yesan-Gun, 3. V. 2002, SOHN, J. C. (NIAST); <**GB>** 4♀10♂, Ecological garden for Firefly, Shinam-Ri, Subi-Myeon, Yeongyang-Gun, 7. V. 2004, KANG, T. H. (NIAST); 2♀1♂, Ecological garden for Firefly, Shinam-Ri, Subi-Myeon, Yeongyang-Gun, 19. V. 2004, KANG, T. H. (NIAST); **[CHINA]** 1♂, Gujeon-jin, Eomgil-Hyeon, Jilin, 16. VI. 2005, PARK, H. C. (NIAST); 1♀, Mt. Jangbaeksan, Jilin, 5-7. VII. 2005, KIM, T. W. (NIAST).

Remarks. This species has been reported to be endemic to Korea. However, my examinations revealed that the species is also distributed in China. Therefore, further studies of its distribution are needed.

Korean Name. 서울병대벌레

Distributions. Korea, China (Jilin).

Cantharis (*Cyrtomoptila*) *plagiata* Heyden, 1889

Horae. Soc. Entomol. Rossicae, **23:** 675

***Athemus plagiata*:** Kang *et al*., 2000: 155; Kim, 2002: 246.

***Cantharis inlateralis*:** Kang *et al*., 2000: 155.

***Cantharis plagiata*:** Švihla, 2004: 175.

***Cantharis vulcana*:** Cho, 1967: 193; Kim *et al.*, 1972: 221; Kim and Nam, 1984: 329; Kim and Yoo, 1987: 507.

***Wittmercantharis vulcana*:** Kim and Kim, 1996: 128; Kang *et al*., 2000: 154.

Description. Body length: 6.0-8.0 mm. Male. Body yellow; head yellow, but post-vertex region black; pronotum yellow, but middle area black; scutellum black; elytra yellow; leg yellow, but hind tibia with blackish stripe.

Head flat, covered with thin and minute punctures. Eye relatively small, ratio of an eye to interocular space 4 : 19. Antennae relatively short, nearly reaching to one third of elytra, approximate ratio of each antennomere, 9 : 5 : 7 : 7 : 8 : 8 : 7 : 6 : 6 : 6 : 8. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate, covered with thin and minute punctures; pronotum 1.16 times wider than long; median plate with weak longitudinal groove; lateral margins slightly sinuated, with round anterior angles and angulated hind angles; posterior margin 1.03 times wider than posterior. Scutellum triangular, with round apex.

Elytra parallel-sided, ratio of width at elytral shoulder to length of elytra 21 : 60. Leg long and slender; fore inner tarsal claws and mid- and hind-outer tarsal claws with blunt tooth at basal part; fore outer tarsal claws and mid- and hind-inner tarsal claws simple.

Aedeagus elongated; dorsal plate non-divided at sinuated posterior margin; laterophyses exposed to posteriorly, but apex not exposed; ventral process slightly narrowed to posteriorly, with round apex.

Female. Body color duskier than in the male; body longer and wider than in the male; eye relatively smaller than in the male, ratio of an eye to interocular space 4 : 22; all tarsal claws simple.

Materials Examined (149 individuals). [KOREA] <HB> 1♀, Chondjin, 3. VI. 1991, Ronkay & Vojnits (HNHM); <**PN>** 1♀, Mt. Myohyangsan, 21. V. 1985, A. Vojnits & L. Zombori (HNHM); <**GW>** 1♂, Balsan 2 Ri (Pond Achimmot), Chuncheon-Si, 17. IV. 1998, PARK, H. C. (NIAST); 2♀1♂, Balsan 2 Ri (Around Village), Chuncheon-Si, 1. V. 1998, PARK, H. C. (NIAST); 15♀7♂, Balsan 2 Ri (*Hibiscus syriacus*), Chuncheon-Si, 1. V. 1998, PARK, H. C. (NIAST); 1♀, Balsan 2 Ri (Pasture), Chuncheon-Si, 1. V. 1998, PARK, H. C. (NIAST); 13♀11♂, Balsan 2 Ri (*Pinus koraiensis*), Chuncheon-Si, 1. V. 1998, PARK, H. C. (NIAST); 2♀, Balsan 2 Ri (River side), Chuncheon-Si, 1. V. 1998, PARK, H. C. (NIAST); 3♀, Balsan 2 Ri (Bank Around rice field), Chuncheon-Si, 17. V. 1998, PARK, H. C. (NIAST); 4♀, Balsan 2 Ri (*Hibiscus syriacus*), Chuncheon-Si, 17. V. 1998, PARK, H. C. (NIAST); 1♀, Balsan 2 Ri (Pasture), Chuncheon-Si, 17. V. 1998, PARK, H. C. (NIAST); 5♀1♂, Balsan 2 Ri (*Pinus koraiensis*), Chuncheon-Si, 17. V. 1998, PARK, H. C. (NIAST); 2♀1♂, Balsan 2 Ri (Valley Samhangolgyegok), Chuncheon-Si, 17. V. 1998, PARK, H. C. (NIAST); 1♀, Balsan 2 Ri, Chuncheon-

Si, 31. V. 1999, JANG, S. S. (NIAST); 1♀1♂, Temple Baekdamsa, Yongdae-Ri, Buk-Myeon, Inje-Gun, 25. V. 2002, YEO, J. D. (NIAST); 1♂, Imgye-Myeon (Around Cave Hwacheondong), Jeongseon-Gun, 21. V. 2002, SOHN, J. C. (NIAST); 3♀1♂, Mt. Seokbyeongsan, Imgye-Ri, Imgye-Myeon, Jeongseon-Gun, 22. V. 2002, YEO, J. D. (NIAST); 2♀4♂, Mt. Seokbyeongsan, Imgye-Ri, Imgye-Myeon, Jeongseon-Gun, 22. V. 2002, LEE, Y. B. (NIAST); 2♀, Mt. Gariwangsan (Abolition of School), Jeongseon-Gun, 11. VI. 2002, PARK, H. C. (NIAST); 4♀, Mt. Sangweolsan, Jeongseon-Gun, 17. VI. 1997, PARK, H. C. (NIAST); 1♂, Mt. Odaesan (Samyang pasture), Byeongnae-Ri, Doam-Myeon, Pyeongchang-Gun, 23. VI. 2005, KIM, T. W. (NIAST); 1♀, Mt. Odaesan, Jinbu-Myeon, Pyeongchang-Gun, 24. VI. 1998, HAN, T. M. (NIAST); 3♀3♂, Mt. Odaesan (Valley Jogyegol), Jinbu-Myeon, Pyeongchang-Gun, 23. VI. 2005, KIM, T. W. (NIAST); 1♀1♂, Mt. Hambaeksan (Valley Jeolgolgyegok), Hwangji-Dong, Taebaek-Si, 5. VI. 2005, KANG, T. H. (NIAST); 4♀, Mt. Seoraksan (Area between Spa Osaekyaksu to Peak Daecheongbong), Oga-Ri, Seo-Myeon, Yangyang-Gun, 25. V. 2002, YEO, J. D. (NIAST); 1♀1♂, Mt. Baekdeoksan (Temple Gwaneumsa), Suju-Myeon, Yeongweol-Gun, 14. V. 2001, KIM, T. W. (NIAST); 1♀, Mt. Taehwasan (Temple Bongjeongsa), Palgoi-Ri, Yeongweol-Eup, Yeongweol-Gun, 14. V. 2001, KIM, T. W. (NIAST); 1♀, Mt. Taehwasan (Temple Bongjeongsa), Palgoi-Ri, Yeongweol-Gun, 14. V. 2001, PARK, H. C. (NIAST); **<GG>** 1♀, Mt. Bagyonsan, near Sanchon-ri, at Sanchon-dong, 22 km SE of Gaeseong, 7. VI. 1970, S. Mahunka &

H. Steinmann (HNHM); 2♀, Mt. Myeongjisan (Temple Seungcheonsa), Baekdun-Ri, Buk-Myeon, Gapyeong-Gun, 28. V. 2001, KIM, M. A. (NIAST); 1♀, Mt. Myeongjisan (Temple Seungcheonsa), Baekdun-Ri, Buk-Myeon, Gapyeong-Gun, 28. V. 2001, PARK, H. C. (NIAST); 1♀, Mt. Myeongjisan (Temple Seungcheonsa), Baekdun-Ri, Buk-Myeon, Gapyeong-Gun, 28. V. 2001, KIM, T. W. (NIAST); 2♀1♂, Mountain behind Village, Gwaneum-Ri, Twichon-Myeon, Gwangju-Si, 5. V. 2005, KANG, T. H. (NIAST); 1♂, Anjung-Myeon, Pyeongtaek-Si, 9. V. 1998, HAN, T. M. (NIAST); 1♂, Ecological Garden of Department of Agrobiology, Seodun-Dong, Suweon-Si, 8. V. 2001, KIM, T. W. (NIAST); 1♀, Yulgok 2 Ri, Heungcheon-Myeon, Yeoju-Si, 7. V. 2000, LEE, Y. B. (NIAST); 1♂, Hantaek Plant Garden, Jangpyeong-Ri, Baekam-Myeon, Yongin-Si, 14. V. 2001, LEE, Y. B. (NIAST); 1♂, Hantaek Plant Garden, Jangpyeong-Ri, Baekam-Myeon, Yongin-Si, 6. V. 2002 (NIAST); 1♀, Hantaek Plant Garden, Baekam-Myeon, Yongin-Si, 20. V. 2002, LEE, Y. B. (NIAST); 1♀, Jangpyeong-Ri (*Lonicera sachalinensis*), Baekam-Myeon, Yongin-Si, 14. V. 2001, LEE, Y. B. (NIAST); **<CB>** 1♀, Mt. Sokrisan (Area between Valley Hwayanggugok to Peak Cheomseongdae), Boeun-Gun, 26. V. 2002, KIM, M. A. (NIAST); **<CN>** 6♀1♂, Guseong 2 Ri, Yeongin-Myeon, Asan-Si, 19. V. 2000, KIM, H. B. (NIAST); 3♀1♂, Galsan-Ri (Around bank), Galsan-Myeon, Hongseong-Gun, 11. V. 2004, KANG, T. H. (NIAST); 1♂, Seong 1 Gu, Inji-Myeon, Seosan-Si, 19. V. 2000, KIM, H. B. (NIAST); **<GB>** 4♀1♂, Ecological garden for Firefly, Shinam-Ri,

Subi-Myeon, Yeongyang-Gun, 7. V. 2004, KANG, T. H. (NIAST); 1♂, Ecological garden for Firefly, Shinam-Ri, Subi-Myeon, Yeongyang-Gun, 19. V. 2004, KANG, T. H. (NIAST); <**JB>** 2♀, Temple Geumsansa, Gimje-Si, 15. V. 2000, KIM, M. A. (NIAST); **[JAPAN]** 1♀1♂, Kyouwa, Chitose Shi, Hokkaido, 27-28. V. 1991, Y. Okushima (NHMK); **[CHINA]** 1♂, Mt. Namsan, Pungman-Gu, Jilin, 17. VI. 2005, PARK, H. C. (NIAST).

Korean Name. 붉은가슴병대벌레

Distributions. Korea, Japan (Hokkaido, Honshu), China (Jilin), Russia (Amur, Siberia).

Genus *Podistra* Motschulsky, 1839

Bull. Soc. Nat. Moscou, **12(1):** 78

Type species: *Podistra alpina* Motschulsky, 1839

***Podistra*:** Kazantsev, 1998: 391.

***Pseudoabsidia*:** Medvedev and Ryvkin, 1992: 39.

Diagnosis. Body long and slender. Antennae filiform; second antennomere shorter than third segment. Last maxillary and labial palpomere hatchet-shaped. Pronotum convexed, and quadrated. Radial transvein connected to radio-median crossvein. Leg long and slender; tarsal claws simple in both sexes.

Korean Name. 고산병대벌레속

***Podistra* (*Pseudoabsidia*) *ussurica* (Wittmer, 1979)**

Ent. Arb. Mus. Frey, **28:** 138

***Pseudoabsidia ussurica*:** Kang and Kim, 2002: 21; Kim, 2002: 246.

Description. Body length: 7.0-7.5 mm. Male. Body mostly dark brown; head black; eye, antennae, pronotum, leg brown, elytra dark brown.

Head flat, covered with thin and minute punctures and provided with distinctively transverse depression behind antennal sockets. Eye relatively large, ratio of an eye to interocular space 6 : 16. Antennae relatively long, nearly reaching to the middle of elytra, approximate ratio of each antennomere, 9 : 4 : 8 : 10 : 11 : 11 : 11 : 11 : 10 : 9 : 11. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate, scarecely impunctated; pronotum 1.04 time wider than long; median area strongly convex, with medio longitudinal groove; lateral margins straight, with round anterior angles and obtuse posterior angles; posterior margin 1.08 times wider than anterior. Scutellum tongue shape, with round apex.

Elytra parallel-sided, ratio of width at elytral shoulder to length of elytra 22 : 79; dorsal surface closely and rugosely punctuate. Legs long and slender; all tarsal claws simple.

Aedeagus elongated; dorsal plate nearly covered dorsal process; posterior part of dorsal process slightly exposed at base, and covered with dorsal plate to posteriorly; ventral process slender, and curved to downward at posterior part.

Female. Body color duskier than in the male; body somewhat longer and wider than that in the male; eye relatively smaller than that in the male, ratio of an eye to interocular space 5 : 15.

Materials Examined (27 individuals). [KOREA] <GW> 1♀, Mt. Seoraksan (from Jangsudae to 12 Seonyeotang), Hangye-Ri, Buk-Myeon, Inje-Gun, 26. VI. 2005, KANG, T. H. (NIAST); 1♂, Mt. Hanseoksan (Needleleaf tree), Inje-Gun, 18. VI. 1997, PARK, H. C. (NIAST); 1♀, Mt. Odaesan (Samyang pasture), Byeongnae-Ri, Doam-Myeon, Pyeongchang-Gun, 23. IV. 2005, KIM, T. W. (NIAST); 3♀3♂, Mt. Odaesan (Spa Bangadari Yaksu-at light), Jinbu-Myeon, Pyeongchang-Gun, 22. VI. 2005, KIM, T. W. (NIAST); 1♀, Mt. Hambaeksan, Taebaek-Si, 20. V.-11. VIII. 1999 (NIAST); 11♀6♂, Mt. Hambaeksan (Valley Jeolgolgyegok), Hwangji-Dong, Taebaek-Si, 5. VI. 2005, KANG, T. H. (NIAST).

Korean Name. 고산병대벌레

Distributions. Korea, Russia (Primorskii territory, Amur, Altai).

Genus *Lycocerus* Gorham, 1889

Proc. Zool. Soc. London, **p.** 108

Type species: *Lycocerus serricornis* Gorham, 1889

Athemellus**:** Wittmer, 1972: 23.

Athemus**:** Lewis, 1895: 16; Medvedev and Ryvkin, 1992: 38; Wittmer, 1995: 171.

Lycocerus**:** Okushima, 2005: 14.

Diagnosis. Body long and slender. Antennae filiform; second antennomere shorter than third segment. Last maxillary and labial palpomere hatchet-shaped. Pronotum convexed and quadrated. Radial closed to basal area rather than radio-median crossvein. Leg long and slender; tarsal claws simple, or with appendages in both sexes.

Korean Name. 어리병대벌레속

Key to the species of the Korean *Lycocerus* Gorham

1. All tarsal claws simple • • • • • • • • • • • • Subgen. *Athemellus* • *L. nigrimembris*

- At least more than two tarsal claws with sharp tooth at basal part • Subgen. *Andrathemus* • 2

2. Pronotum yellowish brown • *L. jejuensis*

- Pronotum yellowish brown, with black spot at median part • *L. vitellinus*

Lycocerus (_Andrathemus_) _jejuensis_ (Kang et Okushima, 2003)

Elytra, Tokyo, **31(2):** 347

***Lycocerus jejuensis*:** Okushima, 2005: 117.

Description. Body Length: 10.3−11.1 mm. Male. Body mostly yellow. Eyes black; mandibles and claws reddish brown; antennae, 4th tarsomere, metasternum and abdominal sternites somewhat dusky. Body closely covered with fine yellowish pubescence; apical margin of clypeus fringed with yellowish bristles; each elytron provided with intermingled yellowish bristles in addition to primary pubescence.

Body moderately slender. Head slightly shorter than its width; dorsum depressed along the apical margin of clypeus and in lateral areas before eyes; surface smooth with faint luster, sparsely with minute and indistinct punctures; apical margin of clypeus arcuate with its center faintly indented; eyes large, globular and strongly prominent, ratio of the diameter of an eye to interocular space 1.00: 1.55; apical palpomere of labial palpus blunt triangular; apical palpomere of maxillary palpus knife-shaped; antennae filiform and slender, attaining to the middle of elytra, 1st antennomere clavate, second short and a little expanded apicad, third to eleventh subcylindrical, each of fourth to

seventh antennomere with a short groove on the dorso-external side, relative lengths of antennomeres as follows : - 17 : 10 : 15 : 19 : 19 : 18 : 18 : 17 : 17 : 16 : -.

Pronotum subquadrate, faintly expanded posteriad, 0.87 times as wide as head, 1.00 times as long as wide; anterior margin arcuate; posterior margin weakly arcuate; lateral margins sinuate, weakly hollowed behind anterior angles and constricted just before posterior angles; anterior angles rounded; posterior angles obtuse; disc convex, particularly so in the postero-lateral areas, strongly depressed along the posterior margin, antero-lateral areas hollowed; medio-longitudinal furrow distinct in posterior area; surface smooth with faint luster. Scutellum triangular with blunt apex.

Elytra conjointly 1.62 times as wide as pronotum, 2.95 times as long as wide, the sides subparallel though slightly convex at basal fourth; dorsum closely and rugosely punctuate, though weakly in basal part; each elytron provided with two vague costae. Legs considerably slender; each femur mostly straight; each tibia feebly arcuate; each outer claw of fore and middle legs provided with a digitiform tooth, other claws simple.

Aedeagus stout. Ventral process of each paramere mostly straight and leaning ventrad, the apex expanded; apical margin of each dorsal plate roundly expanded on lateral side, acutely angular on inner side. Each laterophysis curved towards the apex of each dorsal plate with pointed tip. Inner sac lengthened behind and ventrad, as long as tegmen.

Female. Body somewhat longer and wider than in the male. Eyes not so large as in male, ratio of the diameter of an eye to interocular space 1.00 : 1.90. Antennae a little

shorter than in the male and lacking a groove on each antennomere. Pronotum 0.85–0.95 times as wide as head, 0.91–0.98 times as long as wide. Elytra conjointly 1.49–1.62 times as wide as pronotum, 2.95–3.06 times as long as wide. Eighth abdominal sternite deeply emarginated on each side of terminal margin, forming subtriangular lateral lobes and a wide median lobe, the latter of which is feebly concave at the apical margin and rounded on each side; disc swollen at the central area, the top overhanged apicad with a notch at the middle.

Materials Examined (3 individuals). [KOREA] <JJ> 1♂, Stream Gangjeongcheon, Bokpan-Dong, 16. IV. 1998, CHOI, W. (NIAST); 2♀, Mt. Hallasan Between Oreumse to Uioreumse, 11. VI. 2000, Y. B. LEE (NIAST).

Korean Name. 제주어리병대벌레

Distribution. Korea.

Lycocerus (*Andrathemus*) *vitellinus* (Kiesenwetter, 1874)

Berl. ent. Zeitschr., **18:** 277

***Cantharis vitellina*:** Heyden, 1887: 258.

***Athemus vitellinus*:** Kim and Kim, 1972: 78; Kim and Park, 1991: 223; Kim et al., 1991: 180; Kim, 1993: 201; Kim, 1993: 168; Kim, 1993: 258; Park, 1993: 179; Kim, 1995: 140; Okushima, 1996: 9; An, 1997: 31; Kang et al., 2000: 148.

***Telephorus vitellinus*:** Haku, 1936: 124.

***Lycocerus vitellinus*:** Okushima, 2005:

Description. Body length: 10.0-13.0 mm. Male. Body mostly yellowish brown; head yellowish brown, except blackish vertex; pronotum yellowish brown, but central region black; scutellum and leg yellowish brown; elytra yellow.

Head flat, covered with thin and minute punctures and provided with slightly transverse depression behind antennal sockets. Eye relatively large, ratio of an eye to interocular space 9 : 25. Antennae relatively long, nearly reaching to the middle of elytra, approximate ratio of each antennomere 15 : 7 : 12 : 15 : 16 : 16 : 16 : 15 : 14 : 13 : 13. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate, scarcely impunctate; pronotum 1.02 times wider than long; median area strongly convex, but antero-central region diaperedly depressed and postero-central region depressed to posterior, with longitudinal groove; lateral margins straight, with round anterior angles and obtuse posterior angles; posterior margin 1.09 times wider than anterior. Scutellum tongue shape, with round apex.

Elytra parallel-sided, ratio of width at elytral shoulder to length of elytra 35 : 102; dorsal surface rugosely punctuate. Legs long and slender; inner tarsal claw of fore leg with sharp tooth, but outer tarsal claw simple; outer tarsal claws of mid- and hind leg with sharp tooth, but inner tarsal claws simple.

Aedeagus oval in outline; dorsal process with blunt apex; laterophyses exposed to posterior; ventral process bent inward.

Female. Body color duskier than in the male; body somewhat longer and wider than that in the male; eye relatively smaller than that in the male, ratio of an eye to interocular space 6 : 26; depressions of pronotum less distinct than that in the male.

Materials Examined (27 individuals). [KOREA] <GG> 4♀2♂, Mt. Gwanggyosan, Sanggwanggyo-Dong, Jangan-Gu, Suweon-Si, 30. V. 2004, KANG, T. H. (NIAST); **<CB>** 1♀, Mt. Guryongsan (Farm area), Boeun-Gun, 20. V. 1997, PARK, H. C.; 2♀, Mt. Guryongsan (Forest area), Boeun-Gun, 20. V. 2000, PARK, H. C. (NIAST); 1♂, Valley Mulhangyegok, Mulhan-Ri, Sangchon-Myeon, Yeongdong-Gun, 29. V. 2002, HWANG, J. H. (NIAST); 1♀1♂, Valley Mulhangyegok, Mulhan-Ri, Sangchon-Myeon, Yeongdong-Gun, 29. V. 2002, PARK, H. C. (NIAST); **<CN>** 1♀, Mt. Seokbongsan (Farm area), Nonsan-Si, 19. V. 1997, PARK, H. C. (NIAST); **<GB>** 1♀2♂, Mt. Baekamsan, Uljin-Gun, 29. V. 1999, KANG, T. H. (NIAST); **<GN>** 1♀, Wetland Wooponeup, Changnyeong-Gun, 28. V. 2003, AHN, M. K. (NIAST); 1♀, Wetland Wooponeup, Changnyeong-Gun, 28. V. 2003, SOHN, J. C. (NIAST); **<JB>** 3♀, Mt. Shinjangsan, Neungdong-Ri, Iksan-Si, 15. V. 2001, LEE, H. S. (NIAST); 1♀, Gaok-Ri, Jeoksang-Myeon, Muju-Gun, 29. V. 2000, JANG, S. J. (NIAST); 1♀ Goimok-Ri, Jeoksang-Myeon, Muju-Gun, 30. V. 2000, JANG, S. J. (NIAST); **[JAPAN]** 1♀1♂, Entsu-ji, Tamashima, Kurashiki-shi, Okayama Pref., 7. V. 1995, Y. Okushima (NHMK); 1♀1♂, Mt. Ohtaki-yama, Waki Cho, Tokushima Pref., 23. V. 1993, Y. Okushima (NHMK).

Korean Name. 회황색병대벌레

Distributions. Korea, Japan (Hokkaido, Honshu).

***Lycocerus* (*Athemellus*) *nigrimembris* (Kazantsev, 1994)**

Zool. Zh., **73(3):** 13

***Athemus lineatipennis*:** Park *et al.*, 1993: 179; Kim and Kim, 1996: 48. [**Misidentification**]

***Athemus nigrimembris*:** Kang *et al*., 2000: 150.

***Athemus* (*Athemellus*) *nigrimembris*:** Kim, 2002: 246; Kim, 2002: 284.

***Mikadocantharis japonicus*:** Kim and Kim, 1996: 128. [**Misidentification**]

***Rhagonycha japonicus*:** Cho, 1957: 41; Cho, 1969: 262. [**Misidentification**]

***Telephorus japonicus*:** Mochizuki and Masui, 1939: 60. [**Misidentification**]

Description. Body length: 7.0-9.0 mm. Male. Body mostly black; head black, except yellowish brown region between antennal sockets; pronotum yellowish brown, but middle area black; scutellum, leg black; elytral black, except yellowish longitudinal stripe.

Head flat, covered with thin and minute punctures and provided with strongly transverse depression behind antennal sockets. Eye relatively small, ratio of an eye to interocular space 4 : 19. Antennae relatively long, nearly reaching to two third

of elytra, approximate ratio of each antennomere, 9 : 4 : 9 : 11 : 12 : 13 : 13 : 13 : 13 : 11 : 13. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate, covered thin and minute punctures; pronotum 1.26 times wider than long; median area strongly convex, with a medio longitudinal groove; lateral margins straight, with obtuse anterior and posterior angles; anterior margin 1.03 times wider than posterior. Scutellum tongue shape, with round apex.

Elytra narrow to posterior, ratio of width at elytral shoulder to length of elytra 25 : 64; dorsal surface closely and rugosely punctuate. Legs long and slender; all tarsal claws simple.

Aedeagus oval in outline; dorsal process with round apex; laterophyses exposed to posterior; ventral process hook-shape, with round apex.

Female. Body color duskier than in the male; body somewhat longer and wider than in the male; eye relatively smaller than that in the male, ratio of an eye to interocular space 3 : 21; antennae relatively shorter than that in the male, approximate ratio of each antennomere, 9 : 4 : 7 : 8 : 7 : 7 : 7 : 7 : 7 : 6 : 8.

Materials Examined (35 individuals). [KOREA] <GW> 1♂, Balsan 2 Ri (Farm between mountains), Chuncheon-Si, 17. IV. 1998, PARK, H. C. (NIAST); 1♀10♂, Mt. Gwangdeoksan, Gwangdeok-Ri, Sanae-Myeon, Hwacheon-Gun, 14. V. 2004, KANG, T. H. (NIAST); 1♀1♂, Mt. Seokbyeongsan (Sapdangryeong), Gangreung-Si, 21. V. 2002, YEO, J. D. (NIAST); 1♀1♂, Mt. Seokbyeongsan, Imgye-Ri, Imgye-Myeon, Jeongseon-Gun, 22. V. 2002, LEE, Y. B. (NIAST); 1♂,

Mt. Hambaeksan (Valley Jeolgolgyegok), Hwangji-Dong, Taebaek-Si, 5. VI. 2005, KANG, T. H. (NIAST); **<GG>** 1♂, Village Bineulchimaeul, Sasa-Dong, Ansan-Si, 9. V. 2002, LEE, Y. B. (NIAST); 1♂, Around Temple Seungcheonsa in Mt. Myeongjisan, Dodae-Ri, Bal-Myeon, Gapyeong-Gun, 26. IV. 2001, PARK, H. C. (NIAST); 2♂, Around Temple Seungcheonsa in Mt. Myeongjisan, Baekdun-Ri, Buk-Myeon, Gapyeong-Gun, 26. IV. 2001, KIM, M. A. (NIAST); 1♂, Mt. Myeongjisan, Baekdun-Ri, Buk-Myeon, Gapyeong-Gun, 26. IV. 2001, PARK, H. C. (NIAST); 1♀1♂, Mt. Maengsan, Bundang-Gu, Seongnam-Si, 7. V. 2004, KANG, T. H. (NIAST); 2♂, Valley Botonggol, Hadaeweon-Dong, Jungweon-Gu, Seongnam-Si, 5. V. 2004, KANG, T. H. (NIAST); 1♂, Mt. Gwanaksan (Broadleaf tree), 3. V. 1997, PARK, H. C. (NIAST); 1♂, Mt. Gwanggyosan, 14. V. 1996; 1♂, Oksan-Ri, Baekdam-Myeon, Yongin-Si, 2. V. 2003, LEE, Y. B. (NIAST); **<GB>** 2♀1♂, Mt. Baekamsan, Uljin-Gun, 14. V. - 19. VI. 1999, GU, D. S. (NIAST); **<JB>** 1♂, Naebyeonsan, Buan-Gun, 8. V. 2000, PARK, H. C. (NIAST); **<JN>** 1♀1♂, Mt. Jirisan (Peak Nogodan), Gurye-Gun, 23. V. 1999, HAN, T. M. (NIAST).

Korean Name. 노랑줄어리병대벌레

Distributions. Korea, Russia.

Subfamily Silinae Mulsant, 1862

Hist. nat. Col. Fr. Mollip., **p.** 131, 342

Type genus: *Silis* Charpentier, 1825

Silinae: Brancucci, 1980: 289; Wittmer, 1982: 121; Kim and Kang, 2000: 112.

Diagnosis. Pronotum glabrous at anterior half, without distinct pores; male apical abdominal circle consisting of almost equally wide sternite and tergite; apical abdominal sternite in female semicircularly cut, apical tergite with pronounced angles; all outer claws with blunt tooth at basal part in male, but all tarsal claws simple in female.

Korean Name. 뿔병대벌레아과

Key to the genera of the Korean Silinae Mulsant

1. Postero-median area of pronotum with longitudinal pores; inner claw cleft at apex • *Podosilis*

\- Each lateral part of pronotum with large distinct pores; inner claw simple, provided with a tooth at basal part • *Silis*

Tribe Silini Mulsant, 1862

Hist. nat. Col. Fr. Mollip., **p.** 131, 342

Type genus: *Silis* Charpentier, 1825

Diagnosis. Body long and slender. Head prognathus. Antennae slightly serrate; second antennomere as long as third antennomere, or shorter than third segment. Gular sutures separated. Last maxillary and labial palpomere hatchet-shaped. Pronotum convexed, and quadrated (genus *Podosilis*) or circulated (genus *Silis*), with distinct pore; posterior angles of pronotum with excised regions. Elytra completely covered abdomen. Last segment of sternum and aedeagus symmetry. Leg long and slender; tarsal claws bifid, or with appendages in both sexes.

Korean Name. 뿔병대벌레족

Genus *Silis* Charpentier, 1825

Horae ent., **p.** 194

Type species: *Cantharis nitidula* Fabricius, 1792

***Silis*:** Kazantsev, 1994: 29; Kim and Kang, 2000: 114.

Diagnosis. Body long and slender. Antennae slightly serrate; second antennomere shorter than third segment. Gular sutures separated. Last maxillary and labial palpomere hatchet-shaped. Pronotum convexed and circulated, with distinct pore at each lateral part. Radial transvein connected to radio-median crossvein. Leg long and slender; fore inner tarsal claws and mid- and hind-outer tarsal

claws with blunt tooth at basal part; fore outer tarsal claws and mid- and hind-inner tarsal claws simple in male, but simple in female.

Korean Name. 뿔병대벌레속

Silis triimpressa Pic, 1926

Echange **42:** 1

***Silis triimpressa*:** Kim and Kang, 2000: 114; Kim, 2002: 247; Kim, 2002: 284.

Description. Body length: 6.0-8.0 mm. Male. Body black; head, pronotum, scutellum, and elytra black; leg black, but fore tibia yellow, mid and hind femoro-tibial joint yellow.

Head flat, covered with thin and minute punctures and provided with strong transverse depression behind antennal sockets. Eye relatively small, ratio of an eye to interocular space 8 : 27. Antennae relatively long, as long as body, approximate ratio of each antennomere, 8 : 4 : 9 : 11 : 12 : 13 : 13 : 13 : 12 : 11 : 12. Last maxillary and labial palpomere hatchet-shaped.

Pronotum. glabrous sub-circulated, covered with thin and minute punctures; pronotum 1.47 times wider than long; posterior margin with two distincted pores at each side; hind anles excised, and with sharp processes. Scutellum triangular, with round apex.

Elytra parallel-sided, ratio of width at elytral shoulder to length of elytra 20 : 58. Leg long and slender; fore inner tarsal claws and mid- and hind-outer tarsal claws with blunt tooth at basal part; fore outer tarsal claws and mid- and hind-inner tarsal claws simple.

Aedeagus subquadrate; dorsal plate non-divided at posterior margin; dorsal process exposed behind posterior margin of dorsal plate; ventral process strongly expanded, but slightly narrowed to posteriorly.

Female. Body color duskier than in the male; body slightly wider than in the male; eye relatively smaller than that in the male, ratio of an eye to interocular space 4 : 29; antennae shorter than that in the male, approximate ratio of each antennomere, 11 : 6 : 11 : 12 : 14 : 14 : 13 : 13 : 12 : 10 : 13; hind angles of pronotum unexcised, and without processes; all tarsal claws simple.

Materials Examined (26 individuals). [KOREA] <HB> 3♂, Samjiyon, 1000m (Ryanggang Prov.), 25. VI. 1988, O. Merkl & Gy. Szél (HNHM); **<PB>** 1♂, Mt. Myohyangsan, 23. V. 1991, Ronkay & Vojnits (HNHM); **<GW>** 1♂, Mt. Taebaeksan, Taebaek-Si, 30. V. 1999, KANG, T. H. (NIAST); 1♀, Mt. Hambaeksan (Valley Jeolgolgyegok), Hwangji-Dong, Taebaek-Si, 5. VI. 2005, KANG, T. H. (NIAST); 6♀14♂, Mt. Hambaeksan (1450-1570m), Hwangji-Dong, Taebaek-Si, 6. VI. 2005, KANG, T. H. (NIAST).

Korean Name. 뿔병대벌레

Distributions. Korea, Russia (Siberia, Maritime territory).

Genus *Podosilis* Wittmer, 1978

Entomologica Basiliensia, **3:** 159

Type species: *Silis fruhstorferi* Pic, 1906

Diagnosis. Body long and slender. Antennae slightly serrate; second antennomere shorter than third segment. Gular sutures separated. Last maxillary and labial palpomere hatchet-shaped. Pronotum convexed and quadrated, with centro-longitudinal pore; posterior angles of pronotum with excised regions. Leg long and slender; fore inner tarsal claws and mid- and hind-outer tarsal claws bifid; fore outer tarsal claws and mid- and hind-inner tarsal claws simple.

Korean Name. 살짝뿔병대벌레속

Podosilis omissa (Wittmer, 1954)

Mitt. Schweiz. ent. Ges., **27:** 111

Description. Body length: 4.0 mm. Male. Body mostly black; head black, but clypeus and mandible brown; antennae black, but first four antennomeres brown; pronotum, elytra, scutellum black; legs dusky yellow, but tarsi dusky brown.

Head flat, with thin and minute punctures; antennal sockets slightly rised to posterior; area between eye slightly depressed with triangular. Eye relatively small, ratio

of an eye to interocular space, 5 : 23. Antennae nearly reaching to two third of elytra, approximate ratio of each antennomere, 13 : 4 : 13 : 16 : 16 : 16 : 16 : 16 : 16 : 16 : 20. Last maxillary and labial palpomere hatchet-shaped.

Pronotum quadrate, covered with thin and minute punctures; pronotum 1.39 times wider than long; median area strongly convexed, with postero-central pore; lateral margins straight, but anterior part slightly projected, and slightly expand to each side; anterior angles round and posterior angles obtuse; posterior margin excision at each side; anterior margin as wide as posterior. Scutellum tongue shaped, with round apex.

Elytra parallel sieded, ratio of width at elytral shoulder to length of elytra 28 : 66; dorsal surface rugosed, with thin and minute punctures; Legs slender; fore inner tarsal claws and mid and hind tarsal claws bifid, but fore outer and mid and hind inner tarsal claws simple.

Aedeaus oval in outline; dorsal plate narrow to posteriorly; posterior margin of dorsal plate sinuated. Laterophyses bent upward; basal part of laterophyses unexposed, but exposed from middle area; apex of laterophyses exposed to each side of apical angles of dorsal plate. Ventral plate suddenly narrow to postero-central area; posterior margin of ventral plate sinuate.

Female. Unknown.

Materials Examined (2 individuals). [KOREA] <GN> 2♂, Weondong-gyo, Weondong-myeon, Yangsan-si 3. VI. 2000, Je, Hyeon-Jeong (DBYU).

Remarks. This species has been reported to be endemic to Japan. However, my examinations revealed that the species is also distributed in GB, Korea. In Japan, the distribution of this species is very limited. Therefore, further studies of its distribution are needed.

Korean Name. 살짝뿔병대벌레

Distributions. Korea (New record), Japan.

Subfamily Malthininae Kiesenwetter, 1852

Linn. Ent., **7:** 239

Type genus: *Malthinus* Latreille, 1806

Malthininae: Brancucci, 1980: 294; Kim and Kang, 2000: 115.

Diagnosis. Body color yellowish brown, brown, and black. Head prognathous. Gular sutures widely separated, or converged. Eye slightly convex. Antennae filiform. fourth maxillary and labial palpomere round, or oval shaped with hairless sharp apex. Pronotum flat. Elytra often slightly short and uncovered abdomen. End of elyra with spots in some *Malthinus*. Hind wing slightly exposed behind elytra. Last segment of sternum and aedeagus symmetry. Tibia with apical spurs.

Korean Name. 밑빠진병대벌레아과

Key to the genera of the Korean Malthininae Kiesenwetter

1. Length of antennae longer than body length; elytra without distinct puncture line •• *Malthinus*

- Length of antennae shorter than body length; elytra with distinct puncture line • *Malthinellus*

Tribe Malthinini Kiesenwetter, 1852

Linn. Ent., **7:** 239

Type genus: *Malthinus* Latreille, 1806

Diagnosis. Body long and slender. Head prognathus. Antennae filiform; antennae longer than body (genus *Malthinus*), or not (genus *Malthinellus*); second antennomere shorter than third. Gular sutures converged. Last maxillary and labial palpomere con-shaped. Pronotum convexed (genus *Malthinus*), or flat (*genus Malthinellus*), and quadrated. Elytra more or less short, and hind wing slightly exposed, and with puncture line (genus *Malthinellus*), or not (genus *Malthinus*). Last segment of sternum and aedeagus symmetry. Leg long and slender; all tarsal claws simple.

Korean Name. 밑빠진병대벌레족

Genus *Malthinus* Latreille, 1806

Gen. Crust. Ins., **1:** 261

Type species: *Cantharis flaveolus* Herbst, 1786

Diagnosis. Body long and slender. Head prognathus. Antennae filiform; antennae longer than body; second antennomere shorter than third. Gular sutures converged. Last maxillary and labial palpomere con-shaped. Pronotum convexed, and quadrated. Elytra more or less short, and hind wing slightly exposed. Last segment of sternum and aedeagus symmetry. Leg long and slender; all tarsal claws simple.

Korean Name. 밑빠진병대벌레속

Malthinus quadratipennis Kim et Kang, 2000

Ins. Koreana, 17 (1/2): 115

***Malthinus quadratipennis*:** Kim, 2002: 246; Kim, 2002: 284; Kim et al., 2004: 117.

Description. Body length: 4.0-6.0 mm. Male. Body black; head, pronotum, scutellum, elytra, and leg black.

Head flat, covered with dense and minute punctures and provided with weak transverse depression. Eye relatively small, ratio of an eye to interocular space 4 : 14.

Antennae relatvely long and slender, nearly 1.5 times longer than body, approximate ratio of each antennomere, 13 : 8 : 10 : 15 : 16 : 16 : 15 : 14 : 13 : 11 : 12. Last maxillary and labial palpomere cylindrical with sharped apex.

Pronotum quadrate, covered with dense and minute punctures; pronotum 1.19 times wider than long; median plate with weak depression to posteriorly; lateral margins slightly sinuated, with round anterior angles and obtusely angulated hind angles; posterior margin 1.15 times wider than anterior. Scutellum triangular with round apex.

Elytra parallel-sided, ratio of width at elytral shoulder to length of elytra 22 : 67. Hind wing slightly exposed behind elytra. Leg long and slender; all tarsal claws simple.

Aedeagus subquadrated; dorsal plate non-divided at posterior margin; posterior margin expanded to posteriorly; ventral process sharply expanded to posteriorly, with round apex.

Female. Body color same to male; body slightly wider than in the male; antennae shorter than that in the male, approximate ratio of each antennomere, 14 : 9 : 11 : 12 : 13 : 13 : 13 : 12 : 11 : 9 : 11.

Materials Examined (21 individuals). [KOREA] <GW> 1♂, Mt. Chiaksan, 19. VI. - 14. VIII. 1999 (NIAST); **<GG>** 1♂, Mt. Jugeumsan, Pocheon-Gun, 2 - 16. VI. 2002, YEO, J. D. (NIAST); 2♂, Mt. Myeongseongsan, Pocheon-Gun, 13. VI. - 3. VII. 1999 (NIAST); 2♀, Mt. Maengsan, Bundang-Gu, Seongnam-Si, 7. VI. 2002, PARK, H. C. (NIAST); 2♂, Mt. Chukryeongsan, Sudong-myeon, Namyangju-si, 6. VI.-4. X. 1999 (SWU); 1♂, Mt. Gwanggyosan, Suweon-si, 18. V.

1992, K.S.I (SWU); 1♀, Mt. Suraksan, Noweon-gu, Seoul, 30. V. 1998, Kang, Hee-jeong (SWU); 1♀, Mt. Cheonggyesan, Seocho-gu, Seoul, 11. V. 1992, Yeom, Yeong-ju (SWU); 1♀, Mt. Gwanaksan, Sinrim-dong, Noweon-gu, Seoul, Seol, Hye-weon (SWU); **<CN>** 1♀2♂, Mt. Oseosan, Boryeong-Si, 16. V. - 29. VI. 1999, GU, D. S. (NIAST); 1♂, Mt. Mansusan, Buyeo-Si, 12. V. 1999, KIM, T. W. (NIAST); 2♀2♂, Mt. Chilgapsan (Temple Janggoksa), Cheongyang-Gun, 18. VI. 2000, KIM, T. W. (NIAST); **<GB>** 1♀, Temple Bogyeongsa, Songra-Myeon, Pohang-Si, 23. VI. 2001, HWANG, J. H. (NIAST).

Korean Name. 밑빠진병대벌레 [mitpajin-byeongdaebeolle]

Distributions. Korea.

Genus *Malthinellus* Kiesenwetter, 1874

Berl. ent. Zeitschr. **18:** 280

Type species: *Malthinellus bicolor* Kiesenwetter, 1874

Diagnosis. Body long and slender. Head prognathus. Antennae filiform; antennae long, but shorter than body; second antennomere shorter than third. Gular sutures converged. Last maxillary and labial palpomere con-shaped. Pronotum flat, and quadrated. Elytra more or less short, and hind wing slightly exposed, and with puncture line. Leg long and slender; all tarsal claws simple.

Korean Name. 어리밑빠진병대벌레속

Malthinellus bicolor Kiesenwetter, 1874

Berl. ent. Zeitschr. **18:** 281

***Malthinellus bicolor*:** Kim and Kang, 2000: 116; Kim, 2002: 246.

Description. Body length: 4.0 mm. Male. Body black; head black, but anterior head of antennal socket yellowish brown; pronotum, scutellum, and elytra black; leg yellowish brown.

Head flat, covered with thin and minute punctures. Eye relatively small, ratio of an eye to interocular space 4 : 18. Antennae relatively long, nearly reaching to two third of elytra, approximate ratio of each antennomere, 13 : 7 : 9 : 10 : 11 : 11 : 11 : 11 : 11 : 10 : 13. Last maxillary and labial palpomere cylindrical with sharpened apex.

Pronotum quadrate, with thin and minute punctures; pronotum 1.30 times wider than long; laterial margins slightly sinuated, with obtusely angulated angles; posterior margin 1.13 times wider than anterior. Scutellum triangular, with round apex.

Elytra parallel-sided, but narrowed to posteriorly, with strongly punctures, ratio of width at elytral shoulder to length of elytra 16 : 41. Hind wing slightly exposed behind elytra. Leg long and slender; all tarsal claws simple.

Aedeagus quadrate in outline; dorsal plate non-divided at slightly archform curved posterior margin; ventral process bent upward at middle area, with sharped apex.

Female. Body color same to male; body slightly wider than in the male; eye relatively smaller than that in the male, ratio of an eye to interocular space 3 : 16; antennae relatively shorter than that in the male, approximate ratio of each antennomere, 11 : 5 : 7 : 8 : 8 : 8 : 8 : 8 : 7 : 7 : 9.

Materials Examined (13 individuals). [KOREA] GW - 2♂, Donghae-si Mt. Cheongoksan, 23. VIII. 1997, RYU, S. M. (NIAST); 2♀, Donghae-si Mt. Cheongoksan, 23. VIII. 1997, RYU, S. M. (DBYU); **<CN>** 5♀4♂, Daejeon Univ., Dong-gu, Daejeon-si, 1-22. VII. 2006, Lab. of Entomology, Yeongnam Univ. (DBYU).

Remarks. Field and specimen surveys have indicated that the distribution of this species is very limited in Korea and Japan. Therefore, further studies of its distribution are needed.

Korean Name. 어리밑빠진병대벌레

Distributions. Korea, Japan.

Unexamined North Korean Species

Rhagonycha indistincta Medvedev and Ryvkin, 1989

Zoologicheskiy Zhurnal, **68:** 140

***Rhagonycha indistincta*:** Švihla, 1995: 87.

Remarks. The type specimens of this species were examined and deposited in NHMB. However, studies of its distribution are needed.

Distribution. North Korea.

Rhagonycha kanwonensis Švihla, 1995

Entomologica Basiliensia, **18:** 77.

Remarks. The type specimens of this species were examined and deposited in NHMB. However, studies of its distribution are needed.

Distribution. North Korea.

Rhagonycha lederi Pic, 1909

Echange, 25: 117

***Rhagonycha cembricola*:** Wittmer, 1969: 109.

***Rhagonycha lederi*:** Wittmer, 1971: 196; Delkeskamp, 1977: 181; Medvedev and Ryvkin, 1992: 37.

Remarks. Wittmer (1969) identified this species as *Rh. cembricola* Eschscholtz. However, in 1979, he reported that the taxon reported from Korea in 1969 was a misidentification of *Rh. asiatica* Wittmer and *Rh. lederi* Pic (Wittmer,

1971). Voucher specimens of the species were deposited in Wittmer's personal collection (Wittmer, 1969). Unfortunately, the voucher specimens are now of doubtful origin because Wittmer died in 1998. However, vouchers may also have been deposited in NHMB. Therefore, studies of its distribution of this species are needed.

Distributions. North Korea, Russia.

Rhagonycha mlikovskyi Švihla, 1995

Entomologica Basiliensia, **18:** 74

Remarks. The type specimens of this species were examined and deposited in NHMB. However, studies of its distribution are needed.

Distribution. North Korea.

Excluded Species from Korean Fauna

Lycocerus suturellus (Motschulsky, 1860)

Etud. ent., **9:** 10

***Cantharis suturellus*:** Heyden, 1887: 258.

***Athemus suturellus*:** Winkler, 1925: 496; Kusanagi, 1936: 315; Cho, 1957: 41; Cho, 1969: 261; Kim and Kim, 1972: 78; Delkeskamp, 1977: 45; Medvedev and Ryvkin, 1992: 38; Kim, 1993: 201.

Remarks. This species was first reported in Korea by Heyden (1887), and many surveys have cited Heyden's report. These surveys were examined by Kang et al. (2000), who showed that since 1980, the species has been misidentified as *Cantharis soeulensis* Pic. Okushima (2005) suspected that this species was not distributed in Korea because he could not find Korean specimens in several years of surveys. Since 1998, this species has not been recovered in field or specimen surveys. Thus, this species is probably not distributed in Korea and should be excluded from the Korean Cantharidae.

Distributions. Japan, Russia.

4. List of the Korean Cantharidae

Family Cantharidae Imhoff, 1856

Subfamily Chauliognathinae LeConte, 1861

Tribe Ichthyrini Champion, 1915

Genus *Trypherus* LeConte, 1861

Trypherus niponicus (Lewis, 1879)

Subfamily Cantharinae Imhoff, 1856

Tribe Podabrini LeConte, 1881

Genus *Podabrus* Westwood, 1838

Podabrus annulatus Mannerheim, 1825

Podabrus dilaticollis Motschulsky, 1860 - New to Korea

Podabrus longissimus Pic, 1905

Genus *Asiopodabrus* Wittmer, 1982

Asiopodabrus asperipunctatus Kang et Okushima, 2003

Asiopodabrus circumangulatus (Kang et Kim, 2000)

Asiopodabrus fragiliformis (Kang et Kim, 2000)

Asiopodabrus oreumsensis Kang et Okushima, 2003

Asiopodabrus parvitas sp. nov.

Genus *Dichelotarsus* Motschulsky, 1860 - New to Korea

Dichelotarsus angusticollis Motschulsky, 1860 - New to Korea

Genus *Hatchiana* Fender, 1966

Hatchiana baekripoensis sp. nov.

Hatchiana glochidiatus (Kazantsev, 1996)

Hatchiana jirisanensis (Kang et Kim, 2000)

Hatchiana rosinae (Pic, 1904)

Tribe Cantharini Imhoff, 1856

Genus *Rhagonycha* Eschscholtz, 1830

Rhagonycha (s. str.) *asiatica* Wittmer, 1971

Rhagonycha (s. str.) *coreana* Pic, 1921

Rhagonycha (s. str.) *indistincta* Medvedev et Ryvkin, 1989

Rhagonycha (s. str.) *kanwonensis* Švihla, 1995

Rhagonycha (s. str.) *koreaensis* Kang et Kim, 2000

Rhagonycha (s. str.) *mlikovskyi* Švihla, 1995

Rhagonycha (s. str.) *parviocellata* Kang et Kim, 2000

Rhagonycha (s. str.) *transita* Wittmer, 1971

Rhagonycha (*Ussurycha*) *lederi* Pic, 1909

Genus *Cantharis* Linnaeus, 1758

Cantharis (s. str.) *knirschi* Pic, 1929 - New to Korea

Cantharis (s. str.) *nigricolor* Pic, 1906

Cantharis (s. str.) *pallida* Goeze, 1777

Cantharis (s. str.) *soeulensis* Pic, 1922

Cantharis (*Cyrtomophtila*) *plagiata* Heyden, 1889

Genus *Podistra* Motschulsky, 1839

Podistra (*Pseudoabsidia*) *ussurica* (Wittmer, 1979)

Genus *Lycocerus* Gorham, 1889

Lycocerus (*Andrathemus*) *jejuensis* (Kang et Okushima, 2003)

Lycocerus (*Andrathemus*) *vitellinus* (Kiesenwetter, 1874)

Lycocerus (*Athemellus*) *nigrimembris* (Kazantsev, 1994)

Subfamily Silinae Mulsant, 1862

Tribe Silini Mulsant, 1862

Genus *Silis* Charpentier, 1825

Silis triimpressa Pic, 1926

Genus *Podosilis* Wittmer, 1978 - New to Korea

Podosilis omissa (Wittmer, 1954) - New to Korea

Subfamily Malthininae Kiesenwetter, 1852

Tribe Malthinini Kisenwetter, 1852

Genus *Malthinus* Latreille, 1806

Malthinus quadratipennis Kim et Kang, 2000

Genus *Malthinellus* Kiesenwetter, 1874

Malthinellus bicolor Kiesenwetter, 1874

5. Discussion

For the family Cantharidae, a total of 36 species in 13 genera and four subfamilies, including two new species, four unrecorded species and two unrecorded genera, have been confirmed as occurring on the Korean peninsula. Two new species were discovered: *Hatchiana kimjinilli* sp. nov. (type locality: Taean-gun, CN) and *Asiopodabrus parvitas* sp. nov. (type locality: Mt. Hambaeksan, Taebeak-si, GW). Fieldwork may show their habitats to be narrow, especially because of habitat degradation, which may threaten their existence (Samways, 2005). For example, the type locality of *A. parvitas* is being destroyed by the construction of golf courses. Thus, cantharid surveys of the area adjacent to the type locality are needed.

My analysis confirmed four unrecorded species: *Podabrus dilaticollis* Motschulsky, *Dichelotarsus angusticollis* Motschulsky, *Cantharis knirschi* Pic, and *Podosilis omissa* (Wittmer). *P. dilaticollis*, *D. angusticollis*, and *C. knirschi* were examined from North Korean specimens. *P. dilaticollis* and *C. knirschi* are also distributed in China and Far Eastern Russia, and *D. angusticollis* is distributed in Far Eastern Russia and Japan. *D. angusticollis* may be distributed throughout Korea; however, I found it only in HB and HN. In South Korea, *Podabrus dilaticollis* Motschulsky has been known as *P. annulatus* Mannerheim. I confirmed that *P. annulatus* Mannerheim is distributed in HB and HN and that the

species known from South Korea is a misidentification of *Podabrus dilaticollis* Motschulsky.

Podosilis omissa (Wittmer) has been known as a rare species that has a restricted distribution in Honshu, Japan (Okushima, 1994). I examined this species from GN, Korea, for the first time. Thus, further studies of its distribution in Korea are needed.

Specimens of North Korean species were reviewed, including voucher specimens identified by Wittmer (1969). Three species identified by Wittmer (1969) as *Podabrus nigriventris* Fischer, *Rhagonycha cembricola* Eschscholtz, and *Cantharis tenuelimbata* Ballion were misidentifications of *Asiopodabrus fragiliformis* (Kang and Kim), *Rhagonycha asiatica* Wittmer, and *Cantharis nigricolor* Pic, respectively. *Cantharis inlateralis* Pic and *Cantharis vulcana* Lewis were synonymized as *C. plagiata* by Švihla (2004).

I excluded *Lycocerus suturellus* (Motschulsky) from the Korean Cantharidae. Since 1998, this species has not been found in field or specimen surveys. Also, Okushima (2005) reported that *L. suturellus* might not be distributed in Korea. Therefore, I propose that *L. suturellus* (Motschulsky) be excluded from the Korean cantharid fauna.

I was unable to examine specimens of *Rhagonycha indistincta* Medvedev and Ryvkin, *Rhagonycha kanwonensis* Švihla, *Rhagonycha mlikovskyi* Švihla, and *Rhagonycha lederi* Pic. However, Švihla (1995) examined *Rhagonycha indistincta*

Medvedev and Ryvkin, *Rhagonycha kanwonensis* Švihla, and *Rhagonycha mlikovskyi* Švihla specimens deposited at NHMB. The voucher specimens of *Rhagonycha lederi* Pic were deposited in Wittmer's personal collection and are now of doubtful origin because Wittmer died in 1998. However, additional specimens may be deposited in NHMB. Thus, new studies of its distribution are needed for this species.

The distributional patterns based on collected specimens are shown in Table 5. Species that have been collected from more than five regions may be regarded as common in Korea. Six species that were collected from only one region may be rare species in Korea, and five species that were collected from two only regions are not currently common in Korea.

Table 5. Distributional Patterns of the Cantharidae based on collected specimens in Korea.

No	Species name	HB	HN	PB	PN	HH	GW	GG	CB	CN	GB	GN	JB	JN	JJ
1	*Trypherus niponicus*						+					+			
2	*Podabrus annulatus*	+	+												
3	*Podabrus dilaticollis*	+			+		+	+							
4	*Podabrus longissimus*						+								
5	*Asiopodabrus asperipunctatus*									+			+		+
6	*Asiopodabrus circumangulatus*						+	+	+	+	+		+	+	
7	*Asiopodabrus fragiliformis*						+	+	+	+	+	+	+	+	+
8	*Asiopodabrus oreumsensis*														+
9	*Asiopodabrus parvitas* sp. nov.						+								
10	*Dichelotarsus angusticollis*	+	+												
11	*Hatchiana baekripoensis* sp. nov.									+					
12	*Hatchiana glochidiatus*			+			+	+	+	+	+	+			+
13	*Hatchiana jirisanensis*						+	+			+		+	+	
14	*Hatchiana rosinae*	+		+			+	+							
15	*Rhagonycha asiatica*			+			+	+			+	+	+		
16	*Rhagonycha coreana*						+	+	+	+			+		
17	*Rhagonycha indistincta*														
18	*Rhagonycha kanwonensis*														
19	*Rhagonycha koreaensis*							+	+		+			+	
20	*Rhagonycha mlikovskyi*														
21	*Rhagonycha parviocellata*						+	+	+		+		+		
22	*Rhagonycha transita*						+	+	+	+	+		+	+	+
23	*Rhagonycha lederi*														
24	*Cantharis knirschi*	+		+											
25	*Cantharis nigricolor*						+							+	+
26	*Cantharis pallida*	+		+			+								
27	*Cantharis soeulensis*						+	+		+	+				
28	*Cantharis plagiata*	+			+		+	+	+	+	+		+		

(*continued* Table 5)

No	Species name	HB	HN	PB	PN	HH	GW	GG	CB	CN	GB	GN	JB	JN	JJ
28	*Cantharis plagiata*	+			+		+	+	+	+	+		+		
29	*Podistra ussurica*						+								
30	*Lycocerus jejuensis*														+
31	*Lycocerus vitellinus*							+	+	+	+	+	+		
32	*Lycocerus nigrimembris*						+	+			+		+	+	
33	*Silis triimpressa*	+		+			+								
34	*Podosilis omissa*											+			
35	*Malthinus quadratipennis*						+	+		+	+				
36	*Malthinellus bicolor*						+			+					
	Total	**8?**	**2?**	**6?**	**2?**	**?**	**22**	**16**	**9**	**12**	**13**	**6**	**11**	**7**	**7**

III. Phylogeny of the Cantharinae in Far Eastern Asia

1. Introduction

About 1,100 Cantharinae species in 35 genera under 2 tribes (modified Delkeskamp, 1976) have been known in the world. Also, in the Russian Far East, 53 species in 11 genera have been recorded (Medvedev and Ryvkin, 1992; Kazantsev, 1994, 2004). In 2005, Okushima studied on the phylogeny of the genus *Lycocerus* Gorham. He revealed the monophyly of *Lycocerus* Gorham and the relationships among subgenera mainly based on the characters of tarsal claws and aedeagus. However, the phylogenetic study on Cantharinae and related taxa is not performed, so far.

Cantharinae is usually classified into two tribes, Podabrini and Cantharini by the position of gular sutures (Delkeskamp, 1977, 1978). This character is used as diagnostic character which distinguishes each taxon simply. But this character for the classification of the tribe has difficulty in supporting a monophyly of each tribe. Also, taxonomic recombinations are frequent in generic level. Therefore, in this study, monophyly of the Cantharinae and the relationships among genera is tested on the basis of 71 adult morphological characters including above characters by modern cladistic methology.

The objects of this study are to 1) test the monophyly of Cantharidae and 2) reconstruct the phylogenetic relationships of the genera in Cantharidae. In

conclusion, I systematically reconstruct the Korean Cantharidae by the result of this study.

2. Materials and Methods

The specimens for this study are deposited in Insect Resources, Division of Agricultural Biology, National Institute of Agricultural Science and Technology (NIAST, Suweon) and Sungshin Women's University (SWU, Seoul), or they were borrowed from the following institutions: The Insect Collection of Korea University (ICKU, Seoul), Dept. of Biology, Yeongnam University (DBYU, Gyeongsan), Natural History Museum of Kurashiki (NHMK, Kurashiki), Hungarian Natural History Museum (HNHM, Budapest).

Choice of taxa

Several exemplar species of each known genus and subgenera hypothesized to be in the Far Eastern Asian Cantharinae were included, with the exception of the genera *Dichelotarsus* Motschulsky, *Micropodabrus* Pic and *Yukikoa* Satô of which I could not obtain specimens. Also, four genera in other subfamilies were included as reference taxa to test for the monophyly of Cantharinae. Therefore, 11 genera and three subgenera [*Podabrus* Westwood, *Asiopodabrus* Wittmer, *Hatchiana* Fender, *Rhagonycha* Eschscholtz, *Prothemus* Champion, *Cantharis* (s. str.) Linnaeus, *Cantharis* (*Cyrtomophtila* Motschulsky), *Themus* Motschulsky, *Podistra* Motschulsky, *Habronychus* Wittmer, *Stenothemus* Bourgeois, *Lycocerus* (s. str.) Gorham, *Lycocerus* (*Andrathemus* Wittmer), *Lycocerus* (*Athemellus* Wittmer)] of the Far Eastern Asian Cantharinae and 4 genera [*Trypherus* LeConte

(Chauliognathinae), *Silis* Charpenter (Silinae), *Malthinus* Kiesenwetter (Malthininae), *Malthinellus* Kiesenwetter (Malthininae)] of other subfamilies were included.

The family Omethidae (*Drilonius*, *Omethes*) was included as outgroups. Therefore, 2 outgroup genera and 15 ingroup genera were included in this study. The taxa studied, with their distributions, are listed in table 6.

Table 6. Distributions of out- and in-group taxa.

No	Species name	Distributions	Remarks
1	*Drilionius stratulus*	Japan	Out group
2	*Omethes rugiceps*	Japan	Out group
3	*Trypherus niponicus*	Japan	In-group
4	*Trypherus similis*	Taiwan	In-group
5	*Podabrus dilaticollis*	Korea, China, Russia, Mongolia	In group
6	*Podabrus longissimus*	Korea, Japan, Russia	In group
7	*Hatchiana rosinae*	Korea, China, Russia	In group
8	*Hatchiana glochidiatus*	Korea	In group
9	*Hatchiana jirisanensis*	Korea	In group
10	*Asiopodabrus fragiliformis*	Korea	In group
11	*Asiopodabrus ainu*	Japan	In group
12	*Asiopodabrus asperipunctatus*	Korea	In group
13	*Asiopodabrus circumangulatus*	Korea	In group
14	*Asiopodabrus oreumsensis*	Korea (Is. Jejudo)	In group
15	*Asiopodabrus kiiensis*	Japan	In group
16	*Rhagonycha asiatica*	Korea, Russia	In group
17	*Rhagonycha parviocellata*	Korea	In group
18	*Rhagonycha transita*	Korea, Japan, Russia	In group
19	*Rhagonycha coreana*	Korea, Japan, Russia	In group
20	*Prothemus ciusianus*	Japan	In group
21	*Prothemus ryukyuanus*	Japan	In group
22	*Cantharis* (s. str.) *pallida*	Korea, Japan, China, Russia, Mongolia, Central Europe	In group
23	*Cantharis* (s. str.) *soeulensis*	Korea, China	In group
24	*Cantharis* (s. str.) *nigricolor*	Korea, China, Russia, Mongolia, Tibet	In group
25	*Cantharis* (*Cyrtomophtila*) *plagiatus*	Korea, Japan, China, Russia	In group
26	*Cantharis* (*Cyrtomophtila*) *curtata*	Japan	In group
27	*Themus stigmaticus*	China	In group
28	*Themus cyanipennis*	Japan	In group

(*Continued* Table 6.)

No	Species name	Distributions	Remarks
29	*Themus episcopalism*	Japan	In group
30	*Lycocerus* (*Andrathemus*) *ishidai*	Japan	In group
31	*Lycocerus* (*Andrathemus*) *babai*	Japan	In group
32	*Lycocerus* (*Andrathemus*) *vitellinus*	Korea, Japan	In group
33	*Lycocerus* (*Andrathemus*) *jejuensis*	Korea	In group
34	*Lycocerus* (s. str.) *sturellus*	Japan	In group
35	*Lycocerus* (*Athemellus*) *adusticollis*	Japan	In group
36	*Lycocerus* (*Athemellus*) *nigrimembris*	Korea, Russia	In group
37	*Podistra ussurica*	Korea, Russia	In group
38	*Habronychus providus*	Japan	In group
39	*Stenothemus badius*	Japan	In group
40	*Silis triimpressa*	Korea, Russia	In group
41	*Malthinus japonicas*	Japan	In group
42	*Malthinus quadratipennis*	Korea	In group
43	*Malthinellus bicolor*	Korea, Japan	In group

Selection of characters

Adult morphological characters are exclusively used in these analyses. Hind wing, tarsal claws and aedeagus have been used by Brancucci (1980) and Okushima (2005). For this reason, 71 characters including 11 characters found in hind wing and tarsal claws are used. The list of the characters used in this study as followings and the data matrix is made as table 7.

Characters and character states

Head

1. Shape of head. Hypognathus (0); prognathus (1)
2. Shape of gular suture. Separate (0); convergence (1)
3. Shape of gular. Not reduced (0); reduced (1)
4. Position of labrum. Visible in dorsal view (0); not visible in dorsal view (1)
5. Shape of mandible. Without tooth (0); with tooth (1)
6. Shape of maxillar. Stipe narrow to posterior (0); wide to posterior (1)
7. Shape of maxillar. Palpifer expand to galea (0); not expand (1)
8. Shape of maxillary palpi. First palpomere shorter than other palpomere (0); palpomere not shortest (1)
9. Shape of maxillary palpi. Third palpomere shorter than second (0); longer than second (1)
10. Shape of maxillary palpi. Last palpomere hatchet-shape (0); conical (1);

cylindrical (2)

11. Shape of labial palpi. First palpomere shorter than second (0); longer than second (1)
12. Shape of maxillary palpi. Last palpomere hatchet-shape (0); conical (1); cylindrical (2)
13. Position of antennal sockets. Present at anterior area of eyes (0); present between eyes (1)
14. Position of antennal sockets. Distance between antennal sockets relatively narrow compared with width of head (0); distance between antennal sockets slightly wide (1); relatively wide (2)
15. Antennal feature. Filiform (0); serrate (1); flabellate (2)
16. Length of antennae. Excessed body (0); relatively long, but nearly reaching 2/3 elytra (1); relatively short, nearly reaching 1/3 elytra (2)
17. Shape of the second antennomere. Shorter than 1/2 third antennomere (0); shorter than third antennomere, but longer 1/2 third antennomere (1); same length to thirtd antennomere (2); longer than third antennomere (3)
18. Shape of the last antennomere. longer than third antennomere (0); shorter than third antennomere (1)
19. Size of eye. Relatively small compared with interocular space (0); relatively large (1); very large (2)
20. Surface of head. Punctures uniformly distributed (0); punctures not uniformly

distributed (1)

21. Surface of head. Antennal sockets flat (0); slightly rised (1); strongly rised (2)
22. Shape of head. Area behind eye suddenly narrow (0); slightly narrow (1); paralelle-sided (2)

Prothorax

23. Shape of pronotum. Quadrated (0); semi-circulated (1); circulated (2)
24. Shape of pronotum. Anterior width narrower than posterior width (0); anterior width same to with (1); wider than posterior width (2)
25. Shape of pronotum. Wider than long (0); same to long (1); narrower than long (2)
26. Shape of pronotum. Anterior margin flat (0); anterior margin rised (1)
27. Shape of pronotum. Anterior margin widely expand (0); anterior margin silghtly expand (1); anterior margin not expand (2)
28. Shape of pronotum. Anterior angle round (0); with right angle (1)
29. Shape of pronotum. Lateral margin round (0); lateral margin sinuated (1); lateral margin straight (2)
30. Shape of pronotum. Lateral margin widely expand (0); lateral margin slightly expand (1); lateral margin not expand (2)
31. Shape of pronotum. Posterior angle with right angle (0); posterior angle acuted (1); posteior angle obtused (2)

32. Shape of pronotum. Posterior margin sinuated (0); posterior margin round (1); posterior margin flat (2)
33. Shape of prosternum. Basisternum relatively short (0); relatively long (1)

Fore-leg

34. Shape of fore-leg. Inner tarsal claw simple (0); with sharpen tooth (1); with blunt tooth (2); bifurcated (3) (Ordered) (length=12, ci=0.25, ri=0.8)
35. Shape of fore-leg. Outer tarsal claw simple (0); with sharpen tooth (1); with blunt tooth (2); bifurcated (3) (Ordered) (length=12, ci=0.25, ri=0.82)

Mesothorax

36. Shape of mesonotum. Scutellum triangular (0); tongue shape (1)
37. Shape of mesonotum. Apical margin of scutellum sharpen (0); round (1); flat (2); sinuated (3)
38. Shape of mesonotum. Scutellum wider than long (0); same to long (1); narrower than long (2)
39. Shape of mesosternum. Distance between mesocoxal cavities narrow (0); wide (1)

Elytra

40. Surface of elytra. Without puncture line (0); with puncture line (1)

41. Shape of elytra. Covered hind wing and abdomen (0); exposed hind wing behind elytra (1); exposed hind wing and abdomen behind elyra (2)
42. Shape of elytra. wide to posterior (0); paralell-sided (1); narrow to posterior (2)
43. Shape of elytra. Posterior margin slightly narrow (0); suddenly narrow (1)

Mid-leg

44. Shape of mid-leg. Meso-femora flat (0); cylindrical (1)
45. Shape of mid-leg. With tibial spurs (0); without tibial spurs (1)
46. Shape of mid-leg. Inner tarsal claw simple (0); with sharpen tooth (1); with blunt tooth (2); bifurcated (3)
47. Shape of mid-leg. Outer tarsal claw simple (0); with sharpen tooth (1); with blunt tooth (2); bifurcated (3)

Metathorax

48. Shape of metanotum. With distinctly rised portion (0); without rised portion (1)
49. Shape of metanotum. Alacrista relatively long compared with length of metathorax (0); more or less long (1); relatively short (2)
50. Shape of metanotum. Scutellum triangular (0); quadrated (1); semicircular (2)
51. Shape of metanotum. Metanotum with longitudinal goove (0); without longitudinal groove (1)
52. Shape of metasternum. Anapleural suture straight (0); round (1); S-shaped (2)

53. Shape of metasternum. Median line complete (0); not complete (1)

Hind wing

54. Venation. r distinctly closed to basal part rather than r-m (0); r closed to basal part rather than r-m (1); r connected with r-m (2); closed to apical area rather than r-m (3); r-m absent (3)
55. Venation. r diverged at basal part (0); not diverged (1)
56. Venation. Cross vein between Cu and A connected with cu2 (0); connected with Cu (1); absent (2)
57. Venation. Cross vein between A and Ax1 present (0); absent (1)
58. Venation. Ax2 not combined with Ax1 (0); Ax2 combine with Ax1 (1)
59. Venation. Acc distinct (0); indistict (1)
60. Venation. Acc diverged from the side of Ax2 (0); diverged from the lower part of Ax2 (1)

Hind leg

61. Shape of hind leg. With tibial spurs (0); without tibial spurs (1)
62. Shape of hind leg. Inner tarsal claw simple (0); with sharpen tooth (1); with blunt tooth (2); bifurcated (3)
63. Shape of hind leg. Outer tarsal claw simple (0); with sharpen tooth (1); with blunt tooth (2); bifurcated (3)

Abdoman

64. Number of tergum. Tergum with 10 segments (0); 9 segments (1); 8 segments (2); 7 segments (3)
65. Position of spiracles. Spiracles posited on median part of tergum (0); on lateral margin of tergum (1)
66. Shape of spiracles. Spiracles distinct (0); indistinct (1)
67. Shape of sternum. Sternum with 9 segments (0); 8 segments (1); 7 segments (2); 6 segments (3)
68. Shape of sternum. Last second segment divided (0); not divided (1)
69. Shape of sternum. Last segment semicircular (0); conical (1)
70. Shape of sternum. Apical portion of last segment divided (0); not divided (1)
71. Shape of sternum. Last segment symmetry (0); asymmetry (1)

Table 7. Character data matrix.

	1	11	21	31
Drilonius stratulus	1000200001	0201021001	1000001001	2102212000
Omethes rugiceps	1110200002	0001220100	0000001002	2102213011
Trypherus niponicus	0111210110	1010012011	0101001022	2103312010
Trypherus similis	0111211110	1010012011	0101001022	2103313010
Podabrus dilaticollis	1111010000	0012011001	1200002001	2213311100
Podabrus longissimus	1111010000	0012011001	1200002001	0213300100
Hatchiana rosinae	1111010000	0012012011	1200002001	0212201100
Hatchiana glochidiatus	1111010000	0012012001	1200002001	1212201100
Hatchiana jirisanensis	1111010000	0012012001	1200002001	1212201100
Asiopodabrus fragiliformis	1111010000	0012013001	1200002011	1213311100
Asiopodabrus ainu	1111010000	0012013001	1200002011	1213311100
Asiopodabrus circumangulatus	1111010000	0012013101	1200002011	1213311100
Asiopodabrus oreumsensis	1111010000	0012013001	1200002011	1213311100
Asiopodabrus kiiensis	1111010000	0012013001	1200002011	1213311100
Asiopodabrus asperipunctatus	1111010000	0012013001	1200102011	1213311100
Habronychus providus	1001010000	0012010010	1101101022	0001111000
Stenothemus badius	1001010000	0012011010	1101001001	0000001000
Rhagonycha transita	1001010000	0012011000	1100011022	0103311010
Rhagonycha coreana	1001010000	0012011000	1100011022	0003311010
Rhagonycha asiatica	1001010000	0012010011	1000011022	0003312010
Rhagonycha parviocellata	1001010000	0012010011	1000011022	0103312010
Themus cyanipennis	1001010000	0012013001	1200001001	2000012100
Themus episcopalis	1001010000	0012013001	1200001101	2000012100
Themus stigmaticus	1001010000	0012013001	1200001001	2100012100
Podistra ussurica	1001010000	0012011010	1100111022	0100011000
Lycocerus suturellus	1001010000	0012011001	1101101122	0100011100
Lycocerus vitellinus	1001010000	0012011010	1100101022	0001011000
Lycocerus jejuensis	1001010000	0012011010	1100101022	0101011100
Lycocerus ishidai	1001010000	0012011001	1100001022	0101001000
Lycocerus babai	1001010000	0012011001	1100001022	0101001000
Lycocerus adusticollis	1001010000	0012010000	1101101022	0100011000
Lycocerus nigrimembris	1001010000	0012010000	1101001022	0100011000
Prothemus ciusianus	1001010000	0012011001	1120011001	2102001000
Prothemus ryukyuanus	1001010000	0012011001	1120011001	2102001000
Cantharis pallida	1001010000	0012011000	0120011001	2102011000
Cantharis soeulensis	1001010000	0012011000	0121011001	2002011000
Cantharis nigricolor	1001010000	0012011000	0120001001	2002001000
Cantharis plagiatus	1001010000	0012011001	0100001011	2002011000
Cantharis curtata	1001010000	0012010000	0100001001	2002011000
Silis triimpressa	1001110000	0012010000	1101001011	0102011000
Malthinus japonicus	0111210001	0111001011	1100002012	1100013010
Malthinus quadratipennis	0111210001	0111001001	1100002012	1100012010
Malthinellus bicolor	0111210001	0111011000	0100002002	2100012011

	4	5	6	7
(continued Table 7)	**1**	**1**	**1**	**1**
Drilonius stratulus	0101022011	0110000010	0221111101	0
Omethes rugiceps	0111022020	1100010010	0221111101	0
Trypherus niponicus	2112123100	02031-1101	1220000120	1
Trypherus similis	2212122100	02031-1101	1220000121	1
Podabrus dilaticollis	0111033102	0202011101	0331011111	0
Podabrus longissimus	0111033102	0202011101	0331011111	0
Hatchiana rosinae	0111022102	0202001101	0221011111	0
Hatchiana glochidiatus	0111022102	0202011101	0221011111	0
Hatchiana jirisanensis	0111022102	0202011101	0221011111	0
Asiopodabrus fragiliformis	0111033102	0202011101	0221011111	0
Asiopodabrus ainu	0111033102	0202011101	0221011111	0
Asiopodabrus circumangulatus	0111033102	0202011101	0221011111	0
Asiopodabrus oreumsensis	0111033102	0202011101	0221011111	0
Asiopodabrus kiiensis	0111033102	0202011101	0221011111	0
Asiopodabrus asperipunctatus	0111033102	0202011101	0221011111	0
Habronychus providus	0111011102	0202011101	0001011111	0
Stenothemus badius	0111000102	0202011101	0001011111	0
Rhagonycha transita	0011033102	0202011101	0331011110	0
Rhagonycha coreana	0011033102	0202011101	0331011110	0
Rhagonycha asiatica	0011033102	0202011101	0331011110	0
Rhagonycha parviocellata	0111033101	0202001101	0331011110	0
Themus cyanipennis	0211000102	0201011101	0001011110	0
Themus episcopalis	0211000102	0202011101	0001011110	0
Themus stigmaticus	0211000102	0201011101	0001011110	0
Podistra ussurica	0111000102	0201011101	0001011111	0
Lycocerus suturellus	0111000100	0201011101	0001011111	0
Lycocerus vitellinus	0111001100	0201011101	0001011111	0
Lycocerus jejuensis	0111001100	0201011101	0001011111	0
Lycocerus ishidai	0211001102	0201011101	0011011111	0
Lycocerus babai	0011001100	0201011101	0001011111	0
Lycocerus adusticollis	0111000102	0201011101	0001011111	0
Lycocerus nigrimembris	0211000102	0201011101	0001011111	0
Prothemus ciusianus	0111002102	0201011101	0021011121	0
Prothemus ryukyuanus	0111002102	0201011101	0001011121	0
Cantharis pallida	0011002102	0201011101	0021011110	0
Cantharis soeulensis	0111002102	0201011101	0021011110	0
Cantharis nigricolor	0111002102	0201001101	0021011110	0
Cantharis plagiatus	0111002100	0201011101	0021011110	0
Cantharis curtata	0211002100	0201011101	0021011110	0
Silis triimpressa	0011002100	02020-1101	0021001011	0
Malthinus japonicus	1111000120	12131-1101	0001011110	0
Malthinus quadratipennis	1111000120	12131-1101	0001011110	0
Malthinellus bicolor	1111000120	12131-1101	0001011111	0

3. Cladistic Analysis

The cladistic analysis was performed using NONA 2.0 (Goloboff, 1998), run within WinClada (Beta) 0.99 (Nixon, 1999). Tree search options of HOLD 10,000, HOLD/100, MULT*1,000 were used.

Multistate characters were treated as unordered except 11 characters ordered by Branham and Wenzel (2003). To test the monophyly of the Cantharinae, I included all outgroup and ingroup taxa in the analysis during tree construction in a simultaneous analysis (Nixon and Carpenter, 1993). All cladogram were rooted on the family Omethidae.

In order to estimate clade support on a cladogram I calculated Bremer support (Bremer, 1994) value. In NONA I calculated this value using the following command sequence to avoid an overestimation of the value. After finding the most parsimonious cladograms, the commands 'hold 32760; sub 3; find*' are used to find suboptimal trees. The number 3 of the 'sub' command was found heuristically by gradual increase to avoid a saturation of computer memory with suboptimal trees. 3 most parsimonious trees with 233 steps, 33 trees with 233-234 (sub 1) steps and 594 trees with 233-235 (sub 2) steps were found, respectively. However, the number 32760 of the hold command were used, although more than 100,000 trees with 233-236 (sub 3) steps could be retained, because NONA can not calculate the Bremer support and relative Bremer support values of more than 32760 trees. Therefore, several values are indicated as '>3'. Character distributions were studied using

WinClada (Beta) 0.99 (Nixon, 1999). All illustrated cladograms were prepared using WinClada and edited using Microsoft Excel.

4. Results

In the result of cladistic analysis, the total of three most parsimonious cladograms with 233 steps were found, and consistency and retention indices of 0.44 and 0.79 respectively. I produced 3 most parsimonious trees with the unambiguously optimized characters mapped (Figure 11). A strict consensus tree of these 3 most parsimonious trees with Bremer support values is presented in Figure 12.

The Cantharidae is supported as the monophyletic group, and the Cantharinae is a paraphyletic group. I confirmed that the Cantharidae is diverged with two monophyletic groups: 1) Chauliognathinae+*Rhagonycha*+Podabrini by two apomorphies (33, 34), 2) Malthininae+Cantharini+Silinae by five apomorphies (33, 34, 45, 46, 61) and one homoplastic character (62).

The Podabrini is well supported by two apomorphies (31, 32) and five homoplastic characters (21, 26, 29, 37, 38), but the Cantharini is revealed as paraphyletic group. Especially, in the Cantharini the *Lycocerus* is confirmed as a paraphyletic group with three monophyletic groups, and *Rhagonycha* is analyzed as a monophyletic group, composing of the sister group of the Podabrini by one apomorphy (45) and three homoplastic characters (5, 49, 53)

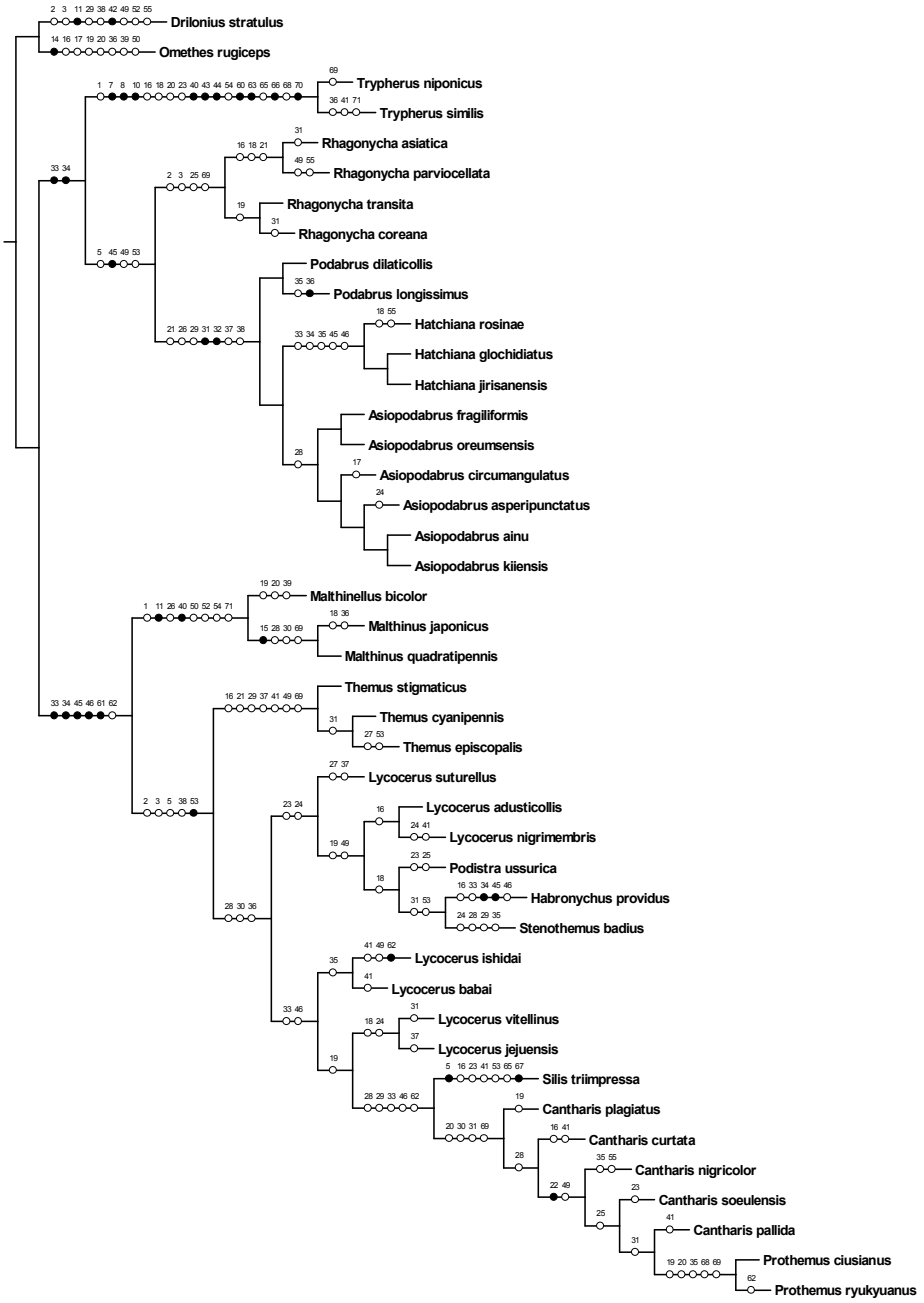

Figure 11. Three most parsimonious cladogram with unambiguously optimized characters. Unique characters are indicated by closed circles, homoplasies by open circles.

(*continued* Figure 11)

(*continued* Figure 11)

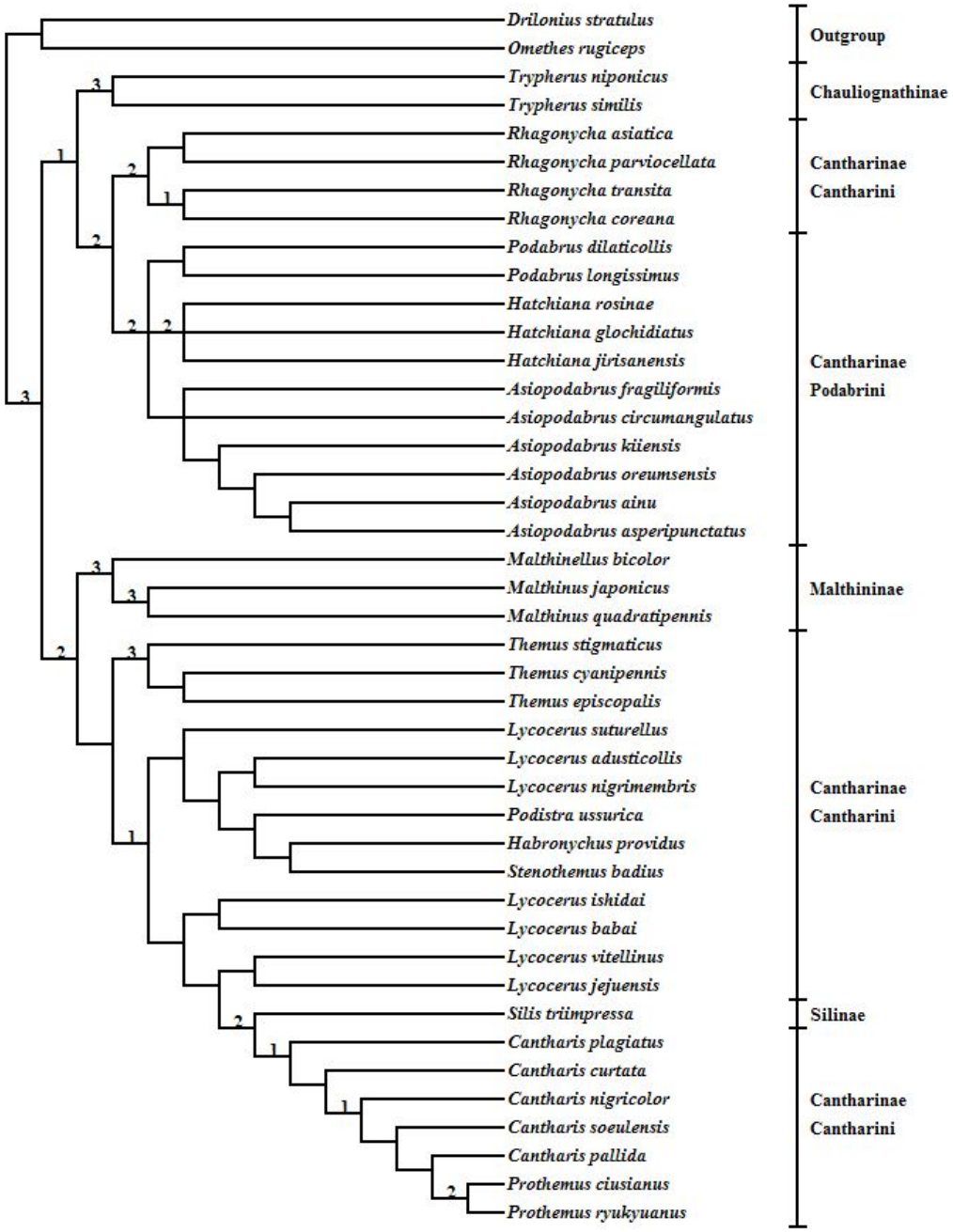

Figure 12. The strict consensus tree of 3 most parsimonious cladograms with Bremer support values.

5. Discussion

The subfamily Cantharinae is currently classified into 2 tribe, Podabrini and Cantharini. In other words, Podabrini has the gular sutures converged at centre, but Cantharini has the gular sutures not converged. The synapomorphy of position of gular sutures for the classification of the tribes can be used for testing of the monophyly of Podabrini but not for the monophyly of Cantharini.

The results show that the Cantharidae is a monophyletic group, but the Cantharinae is a paraphyletic group. Especially, Silinae is ambiguous in phylogenetic pattern. I consider that the cause of this result is the insufficiency of the samples.

In these results, the *Rhagonycha* composed of the sister group of the Podabrini by one apomorphy (45) and three homoplastic characters (5, 49, 53). Also, *Lycocerus* was analyzed as a paraphyly. So the further study on *Rhagonycha* and *Lycocerus* are needed.

Although this result is based on the Far Eastern Asian species, I consider that the phylogenetic informations on the Cantharidae are contained in this study. Therefore, the further phylogenetic study should be conducted with sufficient samples.

Ⅳ. References

An, S. L. 1995. Study on the Biota of the T'aean seashore National Park in Korea. *National Science Museum*, **p.** 1-60.

An, S. L. 1997. Study on the Biota of the Kyŏngju National Park in Korea. *National Science Museum*, **p.** 1-60.

Arnett, R. H. 1963. The beetles of the United States. *The Catholic University of America Press*, *Washington*, *D. C.*, **p.** 535-540.

Ramsdale, A. S. 2002. Cantharidae: In American beetless vol. 2. Polyphaga : Scarabaeoidea through Curculionoidea. *CRC Press LLC*, **p.** 202-218.

Brancucci, M. 1980. Morphologie comparée, évolution et systématique des Cantharidae (Insecta: Coleoptera). *Entomologica Basiliensia*, **5:** 215-388.

Brancucci, M. 1983. La famille des Cantharidae (Coleoptera) sur l'île de Taiwan. 4. La sous-famille des Chauliognathinae. *Entomologica Basiliensia*, **8:** 256-309.

Brancucci, M. 1985. Révision du genre *Trypherus* Leconte (Coleoptera, Cantharidae). *Entomologica Basiliensia*, **10:** 251-322.

Branham, M. A and J. W. Wenzel. 2003. The origin of photic behavior and the evolution of sexual communication in fireflies (Coleoptera: Lampyridae). *Cladistics*, **19:** 1-22.

Bremer, K. 1994. Branch support and tree stability. *Cladistics*, **10:** 295-304.

Brooth, R. G., M. L. Cox and R. B. Madge. 1990. IIE Guides to Insects of Importance to Man. 3. Coleoptera. *The UK at The University Press, Cambridge*, **p.** 384.

Champion, G. C. 1914. Revision of the Mexican and Central American Chauliognathinae (Fam. Telephoridae), based on the genital armature of the males. *Transactions of the Entomological Society of London*, **p.** 128-168.

Clausen, C. P. 1962. Entomophagous insects. *Hafner publishing company*, *New York*, **p.** 544-545.

Cho, P. S. 1957. A Systematic Catalogue of Korean Coleoptera. *Humanities and Sciences, Korea University*, **2:** 173-338.

Cho, P. S. 1967. Report of Academic Survey of Mt. Sul Ak. *Ministry of Education*, **p.** 160-203.

Cho, P. S. 1969. Illustrated Encyclopedia of Fauna & Flora of Korea Vol. 10. Insecta (II). *Ministry of Education*, **p.** 261-265.

Crowson, R. A. 1972. A Review of the Classification of Cantharoidea (Coleoptera), With the Definition of two New Families, Cneoglossidae and Omethidae. *Revista de la Universidad de Madrid*, **21(82):** 35-77.

Crowson, R. A. 1981. The Biology of the Coleoptera. *Academic Press*, **p.** 802.

Delkeskamp, K. 1977. Coleopterorum Catalogus Supplementa, Pars 165, Fasc. 1. Col. Cantharidae. *Dr. W. Junk bv Publishers*, *The Hague*, **p.** 485.

Delkeskamp, K. 1978. Coleopterorum Catalogus Supplementa, Pars 165, Fasc. 2. Col. Cantharidae. *Dr. W. Junk bv Publishers*, *The Hague*, **p.** 487-556.

Goloboff, P. A. 1998. NONA 2.0: a tree searching program. Program and documentation vailable at ftp.unt.edu.ar/pub/parsimony.

Gordh, G. and D. Headrick. 2001. A Dictionary of Entomology. *CABI Publishing*, **p.** 1032.

Gorham, H. S. 1889. 2. Descriptions of new Species and of a new Genus of Coleoptera of the Family Telephoridae. *Proceedings of the Zoological Society of London*, **p.** 96-111.

Gullan, P. J. and P. S. Cranston. 2005. The Insects. An Outline of Entomology. Second Edition. *Blackwell Science*, **p.** 470.

Haku, K. 1936. A List of Collected from North Keisho-do (I). *Journal of Chosen Natural Historical Society*, **21:** 115-125.

Heyden, L. von. 1887. Verzeichniss der von Herrn Otto Herz Otto der chinesischen Halbinsel Korea gesammelten Coleoptera. *Horae Societatis Entomologicae Rossicae*, **21:** 243-273.

Heyden, L. von. 1889. Insecta, á C l. G. N. Potanin in China et in Mongolia novissime lecta. XII. Scarabaeidae, Cantharidae, Cleridae, Lagriidae, Melandryidae, Pedilidae, Anthicidae, *Horae Societatis Entomologicae Rossicae*, **23:** 654-677.

Imasaka, S. 2001. Taxonomic Study of the Genus *Hatchiana* in Japan (Coleoptera, Cantharidae, Podabrini). *Japanese Journal of Systematic Entomology*, **7:** 279-313.

Ishida, K. 1986. A Revision of the two Genera, *Athemus* and *Athemellus*, of Japan (Coleoptera: Cantharidae). *Transactions of the Shikoku Entomological Society*, **17(4):** 193-213.

Ishida, K. 1986. The Genus *Habronychus* Wittmer of Japan (Coleoptera: Cantharidae). *Transactions of the Shikoku Entomological Society*, **17(4):** 215-220.

Kang, T. H. and J. I. Kim. 2000a. Taxonomic Study of Korean Cantharidae (Coleoptera). II. Cantharinae: Genus *Podabrus. Insecta Koreana*, **17(3):** 199-213.

Kang, T. H. and J. I. Kim. 2000b. Taxonomic Study of Korean Cantharidae (Coleoptera). IV. Subfamily Cantharinae: Genus *Rhagonycha. Korean Journal of Entomology*, **30(3):** 157-162.

Kang, T. H. and J. I. Kim. 2002. Taxonomic Study of Korean Cantharidae. V. A Newly Recorded Genus and Species, *Pseudoabsidia ussurica* Wittmer, from Korea. *Korean Journal of Entomology*, **32(1):** 21-23.

Kang, T. H. and Y. Okushima. 2003. Taxonomic Study of Korean Cantharidae (Coleoptera). VI. Three New Species from Is. Jejudo, Korea. *Elytra*, *Tokyo*, **31(2):** 341-351.

Kang, T. H., J. I. Kim and K. M. Kim. 2000. Taxonomic Study of Korean Cantharidae (Coleoptera). III. Subfamily Cantharinae: Tribe Cantharini. *Korean Journal of Entomology*, **30(3):** 147-156.

Kazantsev, S. V. 1994. Supplementary remarks concerning the Fauna of Soldier Beetles (Coleoptera, Cantharidae) of the Russian Far East. *Zoologiicheskyi Zhurnal*, **73(3):** 11-19.

Kazantsev, S. V. 1994. Review of the species of Rhagonycha (Coleoptera, Cantharidae) of the Asian part of Russia. *Zoologiicheskiy Zhurnal*, **73(7-8):** 71-100.

Kazantsev, S. V. 1995. A Key to *Rhagonycha* (Coleoptera, Cantharidae) East of the Ural Mountain with a description of a New Subgenus. *Entomologica Basiliensia*, 18: 91-98.

Kazantsev, S. V. 1996. Review of Soldier-Beetles of The Genus *Podabrus* (Coleoptera, Cantharidae) of Russia. *Zoologiicheskiy Zhurnal*, **75(2):** 200-211.

Kazantsev, S. V. 1998. On *Podistra* Complex (Coleoptera, Cantharidae) of Russia and Adjacent Territories. *Entomological Review*, **78(3):** 391-397.

Kazantsev, S. V. A checklist of Cantharidae (Coleoptera) of the ex-USSR. *Russian Entomological Journal*, **13(1-2):** 23-34.

Kiesenwetter, H. 1874. Die Malacodermen Japans. *Berliner entomologische Zeitschrift*, **18:** 241-288.

Kiesenwetter, H. 1879. Coleoptera Japoniae collecta a Domino Lewis et aliis. *Deutsche entomologische Zeitschrift*, **23:** 305-320.

Kim, C. W., J. I. Kim, J. K. Oh, Y. T. Noh, and Y. H. Shin. 1972. Faunistic Study of Insect near the DMZ. *The Report of the Korean Association for Conservation of Nature*, **7:** 182-257.

Kim, C. W. and J. I. Kim. 1971. Report Prelim Survey Mt. Odae & Sogumgang. *Ministry of Culture*, **p.** 139-173.

Kim, C. W. and J. I. Kim. 1972. A Report in the Scientific Survey of Gucheondong, Muju-Gun. *The Report of the Korean Association for Consevation of Nature*, **5:** 65-101.

Kim, C. W. and S. H. Nam. 1984. Insect Fauna of Mt. Paekun P'och'ŏn-gun, Kyŏnggi-do. *Report of the Scientific Survey of Mt. Paekun and its surround Region*, **p.** 95-107.

Kim, C. W. and S. H. Nam. 1984. On the Relation between the Insect Fauna and the Vegetation in Mt. Sŏrak. *Report of the Academic Survey of Mt. Sŏrak*, **p.** 303-329.

Kim, J. I. 1981. The faunistic study on the insects from Sudong-myeon, Namyangju-gun, Gyeonggi-do, Korea. *Bulletin of the Korean Association for Consevation of Nature*, **3:** 329-367.

Kim, J. I. 1993. National Park Natural Resource Investigation. - Mt. Sokrisan – *Ministry of Internal Affairs*, **p.** 63-68, 153-181.

Kim, J. I. 1993. National Park Natural Resource Investigation. - Mt. Deokyusan – *Ministry of Internal Affairs*, **p.** 77-80, 182-214.

Kim, J. I. 1993. National Park Natural Resource Investigation. - Mt. Jirisan – *Ministry of Internal Affairs*, **p.** 79-85, 205-285.

Kim, J. I. 1995. Fauna of Coleoptera and Diptera (Insecta) from Pyonsan Peninsula National Park. *Report of the Korean Association for Conservation of Nature*, **34:** 129-145.

Kim, J. I. 2002. A Tentative list of Korean Coleoptera (Insecta), contatining a species of newly recorded family. *Journal of Korean Biota*, **7:** 225-261.

Kim, J. I. 2002. The Korean Endemic Species of Coleoptera (Insecta). *Journal of Korean Biota*, **7:** 263-293.

Kim, J. I. and H. J. Yoo. 1987. Study on the insect fauna and its change from near the DMZ of the province Kyŏnggi-do, Korea. *Report of the Environmental Study of DMZ Korea, Kyŏnggi-do*, **p.** 489-528.

Kim, J. I. and K. S. Chang. 1987. Insect Fauna of the Mt. T'aebaek in Korea. *Report of the Korean Association for Conservation of Nature*, **25:** 91-120.

Kim, J. I. and H. C. Park. 1991. A Faunistic Study of Terrestrial Insects in the Daechung lake. *Report of the Survey of Daechung Lake Ecosystem*, **p.** 215-236.

Kim, J. I. and H. C. Park. 1991. The Survey on the Entomofauna at the Mt. Myungji under the Resting-year Scheme ; the first year report. *Report of the Survey of Mt. Myungji and Mt. Mugap Ecosystem*, **p.** 167-208.

Kim, J. I. and O. J. Lee. 1991. Change in Changes in insect fauna due to urbanization of Suwon city. *Bulletin of the Korean Association for Conservation of Nature*, **11:** 49-105.

Kim, J. I. and J. K. Kim. 1996. On the Insect Fauna of Mt. Daiam and Dutayeon. - Coleoptera, Hymenonptera, Diptera- *Nature Conservation*, **94:** 43-51.

Kim, J. I. and S. Y. Kim. 1996. Coleopteran Fauna of the Mt. Pangtae, Inje-kun, Kangwŏn-do, Korea. *Report of the Korean Association for Conservation of Nature*, **38:** 163-177.

Kim, J. I. and S. Y. Kim. 1998. Coleopteran Fauna of Mt. Odae National Park Hongchŏn, Kangwŏn-do, Korea. *Report of the Korean Association for Conservation of Nature*, **38:** 163-177.

Kim, J. I. and T. H. Kang. 2000. Taxonomic Study of Korean Cantharidae (Coleoptera). I. Silinae, Malthininae and Chauliognathinae. *Insecta Koreana*, **17(1/2):** 111-120.

Kim, J. I., O. J. Lee, and S. H. Jeon. 1991. Insect Fauna from Chojongchŏn Upstream area. *Ministry of Environment*, **p.** 139-185.

Kim, J. I., O. J. Lee, and H. C. Park. 1992. Study of the insect fauna from the Northern area of Civilian Control Line neighbouring DMZ, South Korea. *Ministry of Culture*, **p.** 129-162.

Kim, J. I., S. Y. Kim, and E. J. Lee. 1994. Mt. Gyebang. *Report of Area Detail Survey of Ecosystem '93, Ministry of Environment*, **p.** 135-156.

Kim, J. I., T. Y. Moon, and J. K. Kim. 1994. National Park Natural Resource Investigation. - Mt. Odaesan – *National Park Managing Agency*, **p.** 67-74, 160-198.

Kim, J. I., K. D. Han and T. W. Kim. 2004. Insects Fauna (Coleoptera and Orthopteroidea) of Mt. Gyemyeong, Chungju-si. *Korean Journal of Nature Conservation*, **2(1-2):** 111-222.

Kim, J. I., J. M. Kim, S. Y. Kim, and H. S. Choi. 1994. Mt. Kwangdŏk. *Report of Area Detail Survey of Ecosystem '93, Ministry of Environment*, **p.** 101-116.

Kusanagi, T. 1936. A List of Coleoptera from Shikoku. *Insect World*, **4(27):** 292-329.

Lawrence, J. F. and A. F. Newton, Jr. 1995. Families and subfamilies of Coleoptera (with selected genera, notes, references and data on family-group names). Biology, Phylogeny, and Classification of Coleoptera. Paper Celebrating the 80th Birthday of Roy. A. Crowson. *Muzeum i Instytut Zoologii PAN, Warszawa*, **p.** 779-1006.

Lee, C. E. and Y. J. Kwon. 1974. Coleoptera of Quelpart Island (Cheju-Do) (Part I). *Nature and Life*, **4:** 27-52.

Lee, Y. I., W. T. Kim, and D. H. Kim. 1985. Insect fauna of Mt. Halla. *Report of the Academic Survery of Hallasan (Mountain) Natural Preserve, Cheju-do*, **p.** 351-455.

Lewis, G. 1895. 14. On the Dascillidae and Malacoderm Coleoptera of Japan. *Annals and Magazine of Natural History*, **5(4):** 98-122.

Lincoln, R., G. Boxshall and P. Clark. 1998. A Dictionary of Ecology, Evolution and Systematics. Second Edition. *Cambridge University Press*, **p.** 361.

Linnaeus, C. 1758. Insecta. *Systemae Naturae*, **10:** 339-496.

Li-zhong, H. 2002. List of Chinese Insects. *Zhongshan* (*Sun Yat-sen*) *University Press*, *Guangzhou*, **p.** 71-76.

Magis, N. and W. Wittmer. 1974. Nouvelle Répartition des genre de la sous-famille des Chauliognathinae (Coleoptera, Cantharoidea: Cantharidae). *Bulletin de la Société Royale des Sciences de Liège*, **43:** 78-95.

Makino, T. and T. Nakane. 1981. A Revision of the Genus *Podabrus* Westwood in Japan (I) (Insecta, Coleoptera, Cantharidae). *The Reports of the Faculty of Science, Kagoshima University*, **14:** 55-63.

Medvedev, L. N. and A. B. Ryvkin. 1989. New species of *Rhagonycha* (Coleoptera, Cantharidae) from Siberia and Far East. *Zoologicheskiy Zhurnal*, **68:** 138-141.

Medvedev, L. N. and A. B. Ryvkin. 1992. The family Cantharidae. In: Opredelitel' Nasekomykh Dal'nego Vostoka SSSR. *Nauka*, *St. Petersburg*, **p.** 29-40.

Miskimen, G. W. 1961. A new family of beetles found in the Cantharoidea. *The Coleopterist Bulletin*, **15:** 17-25.

Mochizuki, M. and S. Masui. 1939. List of Remain of Mr. Matsue. *Scientific Report of Keityu*, **4:** 51-78.

Morimoto, K. and N. Hayashi. 1986. The Coleoptera of Japan in Color Vol. I. *Hoikusha Publishing Co.*, *Ltd.*, *Osaka*, **p.** 124-130.

Motschulsky, V. 1860. Insectes du Japon. *Etudes Entomologiques*, **9:** 1-41.

Nakane, T. and T. Makino. 1989. A Revision of the Genus *Podabrus* Westwood in Japan (II). *Review of Miyazaki Sangyo-Keiei University*, **1(2):** 1-18.

Nakane, T. and T. Makino. 1990. A Revision of the Genus *Podabrus* Westwood in Japan (III) (Insecta, Coleoptera, Cantharidae). *Fragmenta Coleopterologica*, **45-48:** 183-189.

Nichols, S. W. and R. T. Schuh. 1989. The Torre-Bueno Glossary of Entomology. *The United States of America*, **p.** 840.

Nixon, K. 1999. WinClada. Cornell University Herbarium, Ithaca.

Nixon, K. and J. M. Carpenter. 1993. On outgroups. *Cladistics*, **9:** 413-426.

Okushima, Y. 1996. Distributions and Colour Variations *Athemus vitellinus* (Kiesenwetter) and *Athemus okabei* Takahashi (Coleoptera, Cantharidae). *Bulletin of the Kurashiki Museum of Natural History*, **11:** 1-13.

Okushima, Y. 1997. Additional Records of *Athemus vitellinus* and *Athemus okabei* (Coleoptera, Cantharidae). *Bulletin of the Kurashiki Museum of Natural History*, **12:** 105-106.

Okushima, Y. 1998. A General Survey of Cantharid Beetles. *Insectarium*, **35(6):** 16-21.

Okushima, Y. 2005. A Taxonomic Study on the Genus *Lycocerus* (Coleoptera, Cantharidae) from Japan, with Zoogeographical Considerations. *Japanese Journal of Systematic Entomology, Monographic Series,* **2:** 383.

Park, H. S. 1992. National Park Natural Resource Investigation. - Mt. Hallasan – *Ministry of Internal Affairs*, p. 147-153, 248-276.

Park, J. S., D. S. Ku, and K. D. Han. 1993. Faunistic Study on the Insect from Hamyang-gun and Paemsagol area of Mt. Chiri. *Report of the Korean Association for Conservation of Nature*, **31:** 153-218.

Pic, M. 1904. Diagnoses de Coléoptères Asiatiques. Provenant Surtout de Sibérie (1). *L'Échange, Revue Linnéenne*, **20:** 25.

Pic, M. 1905. Descriptions Abrégées et Notes Diverses (2^{e} article). *L'Échange, Revue Linnéenne*, **21:** 113.

Pic, M. 1906. Noms nouveaux et diagnoses de 《Cantharini》(Telephorides). *L'Échange*, **22:** 81-85

Pic, M. 1922. Nouveautés diverses (1). *Mélanges, Exotico~Entomologiques*, **37:** 1-3.

Pototskaja, V. A. 1983. Phylogenetic links and composition of the Cantharoidea based on study of larval characters. *Entomologicheskoe Obozrenie,* **42(3):** 549-554.

Satô, M. 1976. New Cantharoidea from Japan (Coleoptera). *Transactions of the Shikoku Entomological Society*, **13(1-2):** 51-60.

Satô, M. 1986. New Cantharoidea from Japan, II (Coleoptera). *Transactions of the Shikoku Entomological Society*, **17(4):** 255-261.

Steinmann, H. and L. Zombori, 1981. An Atlas of Insect Morphology. *Akadémiai Kiadó, Budapest*, **p.** 248.

Švihla, V. 1995. Contribution to the Knowledeg of the Genus *Rhagonycha* Eschscholtz (Coleoptera, Cantharidae) II. *Entomologica Basiliensia*, **18:** 71-90.

Švihla, V. 2004. New taxa of the subfamily Cantharinae (Coleoptera, Cantharidae) from southeastern asia with notes on other species. *Entomologica Basiliensia*, **26:** 155-238.

Swofford, D. L. 2002. PAUP*: Phylogenetic analysis using parsimony (and other methods). Sinauer Associates, Sunderland, MA.

Takahashi, K. 1998. Check-List of Cantharidae of Japan. *Kanagawa Chûhô*, *Odawara*, 122: 29-48

Takahashi, K. 2002. A New Species of the Genus *Asiopodabrus* (Coleoptera, Cantharidae) from Eastern Honshu, Japan. *Elytra*, *Tokyo*, **30:** 195-201.

Winkler, A. 1925. Catalogus Coleopterorum regionis palaearcticae. *Dittesgasse*, **11:** 295-522.

Winston, J. E. 1999. Describing Species. Practical Taxonomic Procedure for Biologists. *Columbia University Press*, **p.** 518.

Wittmer, W. 1969. Cantharidae und Malachiidae (Coleoptera) aus Korea. *Fragmenta Faunistica*, **15(9):** 107-110.

Wittmer, W. 1971. Ergebnisse der zoologischen Forschungen von Dr. Z. Kaszab in der Mongolei. 257. Cantharidae der V. und VI. Expedition (Coleoptera). (49. Beitrag zur Kenntnis der palaearktischen Cantharidae). *Annales Historico-naturales Musei Nationalis Hungarici*, **63:** 189-203.

Wittmer, W. 1975. 61. Beitrag zur Kenntnis der palaearktischen Cantharidae und Malachiidae. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*, **48(3-4):** 259-267.

Wittmer, W. 1978. Ergebnisse der Bhutan-Expedition 1972 des Naturhistorischen Museums in Basel. Coleoptera: Fam. Cantharidae (4. Teil) und Bemerkungen zu einigen Arten aus angrenzenden Gebieten. *Entomologica Basiliensia*, **3:** 151-161

Wittmer, W. 1979. 65. Beitrag zur Kenntnis der palaearktischen Cantharidae und Malachiidae (Col.). *Entomologische Arbeiten aus dem Museum Georg Frey*, **28:** 133-156.

Wittmer, W. 1982. Die Familie Cantharidae (Col.) auf Taiwan (1. Teil). *Entomological Review of Japan*, **37(2):** 119-140.

Wiley, E. O., D. Siegel-Gausey, D. R. Brooks and V. A. Funk, 1991. The Compleat Cladist. A Primer of Phylogenetic Procedures. Special Publication 19. The University of Kansas, Museum of Natural History, Lawrence, Kansas, **p.** 158.

Yajima, T. and T. Nakane. 1969. On the Species of the Genus *Athemus* Lewis in Japan, with Descriptions of a Few New Forms (Insecta, Coleoptera, Cantharidae). *Bulletin of the National Science Museum*, **12(2):** 183-189.