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First Record of the Genus *Cis* Latreille (Coleoptera: Tenebrionoidea: Ciidae) from Korea, with Six Unrecorded Species with Host Fungi

Boo Hee Jung*
Korean Entomological Institute, Korea University, Seoul 136-701, Korea

한국산 미기록속 애기버섯벌레속(*Cis* Latreille)(딱정벌레목: 거저리상과: 애기버섯벌레과)에 속한 6 미기록종과 숙주버섯

정부희*
고려대학교 한국곤충연구소

ABSTRACT: The Genus *Cis* Latreille known as fungivorous ciids is taxonomically reviewed for the first time from Korea. Six unrecorded species - *Cis boleti* (Scopoli, 1763); *Cis seriatopilosus* Motschulsky, 1861; *Cis mikagensis* Nobuchi & Wada, 1955; *Cis jezoensis* Nobuchi, 1960; *Cis sasajii* Kawanabe, 2001; *Cis hieroglyphicus* Reitter, 1877- are present. All of *Cis* members are associated with the fruiting body of higher fungi. The author provides the taxonomical information and the ecological information on the host fungi of the Korean *Cis* species.

Key words: *Cis* Latreille, Six species, New record, Taxonomy, Host fungi

초 록: 한국산 애기버섯벌레과(Ciidae, Leach)에 속한 애기버섯속(*Cis* Latreille) 분류학적으로 검토하였다. 이 속에 속한 *Cis boleti* (Scopoli, 1763); *Cis seriatopilosus* Motschulsky, 1861; *Cis mikagensis* Nobuchi & Wada, 1955; *Cis jezoensis* Nobuchi, 1960; *Cis sasajii* Kawanabe, 2001; *Cis hieroglyphicus* Reitter, 1877 등 6종을 국내에서 처음으로 분류학적으로 검토하여 보고하였다. 또한 야외관찰과 실내사육을 통해 6종에 대한 숙주버섯을 처음으로 밝혀 보고 하였다. 따라서 이번 연구에서는 한국산 애기버섯벌레속에 대한 분류학적 정보와 더불어 한국산 종들의 숙주버섯에 대한 생태적 정보를 제공하였다.

검색어: 애기버섯벌레과(Ciidae), 애기버섯벌레속 (*Cis* Latreille), 미기록 6종, 분류, 숙주버섯

The beetle family Ciidae Leach is a relatively moderate family, which comprises about 640 described species in 42 genera worldwide (Abdullah, 1973; Thayer and Lawrence, 2002; JelÍnek, 2008; Buder et al., 2008; Jung, 2010). This family is distributed throughout the world (Abdullah, 1973; JelÍnek, 2008; Buder et al., 2008, Jung, 2010),

The genus *Cis* Latreille is the largest group and most widespread in the family Ciidae, and contains various heterogeneous species (Kawanabe, 1997). *Cis* comprises about 350 (Buder et al., 2008) species in the worldwide (Abdullah, 1973; Thayer and Lawrence, 2002; Kawanabe, 2003) including about 93 species in Palaearctic region (JelÍnek, 2008) and about 24 species in Japan (Kawanabe, 2003).

Cis is characterized by the following features: body convex, covered with distinctive seta, or with indistinctive seta and very shining; antennae with 10 antennomeres, apical antennomeres 3 forming a club; fronto-clypeus of male head usually bearing plates, teeth, or tubercles; anterior margin of pronotum usually produce anteriad, often rounded; outer apical angle of protibia usually produced and dentate or blunt and angulate, without seta;

***Corresponding author:** starrylight12@hanmail.net
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male sternite with fovea (Lawrence, 1973; Kawanabe, 2003).

Cis members are mostly fungivorous (Lawrence, 1973; Buder et al., 2008). These members are considered mycetobiont because they depend upon the basidiocarps for food and breeding throughout their life span (Scheerpeltz and Höfler, 1948; Gumier-Costa et al., 2003; Jung, 2010). For example, *Cis boleti* preferentially colonizes in the fruiting bodies of fungi from the genus *Trametes* that are known as important wood decomposers. (Lawrence 1971; Orledge and Reynolds, 2005).

The purpose of this study is to review the Korean *Cis* taxonomically and to account for the relationship between Korean ciids and their host fungi. In this paper the genus *Cis* is reviewed for the first time in Korea, as representative unrecorded 6 species by *Cis boleti* (Scopoli, 1763); *Cis seriatopilosus* Motschulsky, 1861; *Cis mikagensis* Nobuchi & Wada, 1955; *Cis jezoensis* Nobuchi, 1960; *Cis sasajii* Kawanabe, 2001; *Cis hieroglyphicus* Reitter, 1877.

A key, description, photos of adults, fungal hosts, and illustrations of diagnostic characteristics are provided. The author first reported additional ecological data for the 6 species including their host fungi and habitat based on field observations and laboratory-rearing data.

Materials and Methods

The following records are based on specimens collected from host fungi growing on dead or decaying trees from 2005 to 2011 and then reared in the laboratory. The detailed morphological characters are carefully examined under stereomicroscopy (M50, DM2500, Leica, Switzerland) and captured by using digital camera (Canon, Japan). And the host fungi were identified based on Breitenbach and Kränzlin (1986) and Lee (1988).

In this study, the following 5 stages of maturation of the fruiting body were recognized: 1) stage I means the first appearance of the young, growing fruiting body; 2) stage II means the old fruiting body between the maturation of the spores and dissemination of ripe spore; 3) stage III means the beginning of tissue breakdown in the conk; 4) stage IV means the rapidly decaying stage of the fruiting body; 5) stage V means mounting stage (Grave, 1960; Klimaszewski and Peck, 1987; Jung, 2010). These specimens were preserved in 70% ethanol, dry-mounted and deposited in the Jung's Insect Collection (Seoul, Korea).

The following abbreviations were used to indicate the provinces in which the various specimens were collected: GW; Gangweon-do, GG: Gyeonggi-do, S: Seoul, CB: Chungcheongbuk-do, CN: Chungcheongnam-do, JB; Jeollabuk-do, GB: Gyeonsangbuk-do.

Systematic accounts

Family Ciidae Leach 애기버섯벌레과

Genus *Cis* Latreille, 1796 애기버섯벌레속(신칭)
Cis Latreille, 1796: 50
Cisdygma Reitter, 1885: 209.
Eridaulus C. G. Thomson, 1859: 91.
Macrocis Reitter, 1878: 34.
Xestocis Casey, 1898: 85.

type species *Dermestes boleti* Scopoli, 1763

Key to the species of Korean *Cis*

1. Elytra with two kinds of seta; male fronto-clypeal ridge of head strongly produced and reflexed, forming 'M' type projection ····· *C. jezoensis*
- Elytra almost with one kind of seta; male fronto-clypeal ridge of head produced, not forming 'M' type projection ·· ····· 2
2. Elytral seta strongly short, about 0.5 times shorter than length of scutellum ····· 3
- Elytral seta long, about more than 0.7 times longer than length of scutellum ····· 4
3. Body covered with short seta,; elytral puncutres partially seriate ····· *C. sasajii*
- Body covered with short seta like scale; elytral puncutres not forming striae ····· *C. boleti*
4. Elytra with two kinds of punctures; male fronto-clypeal ridge of head with four denticle protuberance ····· ····· *C. mikagensis*
- Elytra with one kind puncture; male fronto-clypeal ridge of head with two triangular protuberance ····· 5
6. Elytra without wavy patterns; abdomen with one pubescent fovea at middle part ····· *C. seriatopilosus*

- Elytra with unshaped wavy patterns; abdomen with 3 (often 2) pubescent foveae at middle part ····· C. *hieroglyphicus*

Cis boleti (Scopoli, 1763) 큰애기버섯벌레(신칭) (Figs. 1, 7, 13, 18)

Dermestes boleti Scopoli, 1763: 17.

Description

Body length 2.35-3.6 mm, greatest breadth of elytra 1.33-1.7 mm. Body oblong, strongly convex, almost parallel-sided, opaque on dorsum, densely covered with golden short seta like scale; body color mostly brownish black, anterior area of head and mandibles dark reddish black; antennae, palpi and legs reddish brown. **Head** strongly convex, deeply and ovally concave in middle of vertex and weakly convex at middle part of concavity, with dense and tiny punctures; punctures uniform in size, bearing short, robust and golden seta like scale; antennae 10-segmented, strongly enlarged from antennomere eight to 10, forming loose club; fronto-clypeal ridge produced forward, not armed with a conspicuous triangular protuberance on inner margin of each lamella. **Pronotum** with dense and regular punctures, transverse, about 1.5 times broader than its length, strongly convex; anterior margin strongly produced, slightly emarginate at middle part; lateral margins gently arcuate, narrowed apically; lateral sides weakly expanded and flattened; basal margin sinuous, expanded posteriad. **Elytra** oblong, strongly convex; parallel-sided at basal 3/4, and gently rounded apically; humeral callosities slightly raised, covered with irregular, dense punctures, not forming striae; interstice of punctures nearly smooth, covered with two kinds (short and longer) of yellow setae. Prosternum carinate at middle; prosternal process rather widely produced posteriorly and curved proximally.

Sexual characteristics. male: fronto-clypeal ridge produced forward, strongly reflexed upward, forming an arcuate lamella on each side; anterior margin of pronotum strongly produced, slightly emarginate at middle part; abdomen with a pore in middle of first sternite; fore tibiae with a denticulation at apical outside. **female**: fronto-clypeal ridge roundly produced anteriad, very weakly reflexed upward, not forming an arcuate lamella on each side, anterior margin of pronotum simply rounded, slightly produced, not emarginate at middle part; without fore tibial denticulation and abdominal pore.

Specimens Examined. <GW>: 2♀♀ Temple Sangweon, Weonju-si, 15 III 2006, B.-H. Jung *ex Coriolus versicolor* (L.: Fr.) Quél.; 2♂♂3♀♀ Sanghaga-ri, Hwaengseong-gun, 5 IV 2006, B.-H. Jung *ex Coriolus versicolor*; 3♂♂ Temple Weoljeong, Mt. Odae, Jinbu-myeon, Pyeonchang-gun, 3 Ⅵ 2007. B.-H. Jung *ex Coriolus versicolor*; 4♂♂11♀♀ Suha-ri, Daegwanryeong-myeon, Pyeonchang-gun, 10 V 2010. B.-H. Jung *ex Coriolus versicolor*; 2♂♂10♀♀ Daegwanryeong, Daegwanryeong-myeon, Pyeonchang-gun, 2 Ⅺ 2010. H.-G. Ahan. *ex Coriolus hirsutus*; **<SL>:** 2♂♂1♀ Gildong Natural Ecological Park, Gil-dong, Gandong-gu, Seoul-si, 18 IV 2006, B.-H. Jung *ex Coriolus versicolor* (successional stages III, IV); 10♂♂3♀♀ Mt. Cheong-gye, Seocho-gu, Seoul-si, 22 Ⅵ 2008, B.-H. Jung *ex Daedaleopsis tricolor* (successional stages III); **<GG>:** 1♂ 1♀ Mt. Mugap, Choweol-up, Gwangju-si, 6 VIII 2005, B.-H. Jung *ex Coriolus versicolor;* 4♂♂2♀♀ Iseongsanseong, Chungon-dong, Hanam-si 25 VIII 2005, B.-H. Jung *ex Coriolus versicolor*; 1♂1♀ Mt. Jungmi, Okcheon-myeon, Yangpyeong-gun, 29 I 2006, B.-H. Jung *ex Daedaleopsis tricolor*; 2♀♀ Namhansanseong, Jungbu-myeon, Gwanju-si, 12 III 2006, B.-H. Jung *ex Coriolus versicolor*; 1♂ Weongog-dong, Ansan-si, 12, V 2006, B.-H. Jung *ex Coriolus versicolor*; 2♂♂ Donggureong, Guri-si, 8 IV 2006, B.-H. Jung *ex Inonotus hispidus*; 2♂♂ Mt. Mugap, Choweol-up, Gwangju-si, 22 V 2006. B.-H. Jung *ex Bjerkandera adusta*; 4♂♂2♀♀ Okhyeon-ri, Jije-myeon, Yangpyeong-gun, 26 V 2006. B.-H. Jung *ex Coriolus versicolor* (Suc. IV); 1♀ Byeogje-dong, Deogyang-gu, Goyang-si, 10 Ⅵ 2006. B.-H. Jung *ex Laepiporus sulphureus*; 1♂ Mt. Mugap, Choweol-up, Gwangju-si, 30 IX 2006, B.-H. Jung *ex Lenzites beulina*.; 5♂♂6♀♀ Donggureong, Guri-si, 10 X 2006, B.-H. Jung *ex Daedalea dickinsii*; 2♀♀ Mt. Seowun, Seowum-myeon, Anseong-si, 21 Ⅻ 2006. B.-H. Jung *ex Daedaleopsis styracina* (P. Henn. et Shirai) Imaz.; 9♂♂11♀♀ Mt. Chugryeong, Sudong-myeon, Namyangju-si, 11 IV 2009. B.-H. Jung *ex Coriolus hirsutus*; 3♂♂9♀♀ Gwangreung, Jinjeop-eup, Namyangju-si, 9 X 2009. B.-H. Jung *ex Coriolus versicolor*; **<CN>:** 1♂ Mt. Mansu, Oesan-myeon, Buyeo-gun, 20 Ⅵ 2008. B.-H. Jung *ex Coriolus versicolor* (successional stages IV); 1♂ Mt. Mansu, Oesan-myeon, Buyeo-gun, 20 VI 2008, B.-H. Jung *ex Daedaleopsis tricolor* (successional stages

III); **<JN>:** 2♀♀ Temple Mihwan, Seojeong-myeon, Haenam-gun, 15 VIII 2005, B.-H. Jung *ex Coriolus versicolor.*

Distribution. Korea (New Record)**,** Europe, North Africa (Algeria), Iran, Russia (Far East), Mongolia, China (Sichuan), Japan,

Fungal Hosts. *Coriolus versicolor* (L.: Fr.) Quél., *Coriolus hirsutus* (Wulf. : Fr.) Quél. (Fig. 8), *Lenzites beulina* (L.: Fr.) Fr., *Daedaleopsis tricolor* (Bull. : Fr.) Bond. et Sing., *Coriolus hirsutus* (Wulf. : Fr.), *Daedalea dickinsii* (Berk. ex Cooke) Yasuda, *Laepiporus sulphureus* (Fr.) Murr., *Daedaleopsis styracina* (P. Henn. et Shirai) Imaz., *Bjerkandera adusta* (Willd. : Fr.) Karst.

Cis seriatopilosus Motschulsky, 1861 줄애기버섯벌레(신칭) (Figs. 2, 8, 14, 19, 22)

Cis seriatopilosus Motschulsky, 1861: 17

Description

Body length 2.2-2.8 mm, greatest breadth of elytra 1.33-1.7 mm. Body oblong, almost parallel-sided, strongly convex, opaque on dorsum, densely covered with erect seta; mostly brownish black; anterior area of head, antennae, mandibles, palpi and legs reddish brown. **Head** with dense and clear, coarse punctures, frons widely concaved; strongly and deeply concaved between eyes; punctures uniform in size, relatively large, bearing short, robust and yellowish seta; interstices between punctures finely reticulated; Antennae 10-segmented, strongly enlarged from antennomere eight to 10 forming loose club. **Pronotum** transverse; with dense, clear and large punctures; strongly convex; all margins distinctively rimmed. **Elytra** oblong, strongly convex; parallel-sided at basal 3/4, and gently rounded apically; elytral base almost equal to base of pronotum in width; covered with irregular, dense, coarse and large punctures, forming longitudinal rows; interstice of punctures nearly smooth and net-like, covered with erect yellow setae. Prosternum carinate at middle part; prosternal process produced posteriorly and slightly curved behind.

Sexual characteristics. male: fronto-clypeal ridge distinctively and strongly produced anteriad, strongly reflexed upward, weakly emarginate at middle part, forming an arcuate lamella on each side; anterior margin of pronotum strongly produced, strongly concave at middle part. and reflexed upward; abdomen with a pore in middle of first sternite; fore tibiae with a denticulation at apical outside. **female**: fronto-clypeal ridge roundly produced anteriad, very weakly reflexed upward, not forming an arcuate lamella on each side; anterior margin of pronotum simply rounded, slightly produced, not emarginate at middle part; without fore tibial denticulation and abdominal pore.

Specimens Examined. <GW>: 4♂♂6♀♀ Temple Sangweon, Weonju-si, 15 III 2006, B.-H. Jung *ex Coriolus versicolor*; 2♂♂2♀♀ Sanghaga-ri, Hwaengseong-gun, 12 IV 2006, B.-H. Jung *ex Coriolus versicolor*; 3♂♂8♀♀ Mt. Chiak, Socho-myeon, Weonju-si, 15 IV 2006, B.-H. Jung *ex Coriolus hirsutus*; 1♂2♀♀ Temple Sangweon, Weonju-si, 15 IV 2006, B.-H. Jung *ex Trametes* sp.; 3♂♂1♀♀ Daegwanryeong, Daegwanryeong-myeon, Pyeonchang-gun, 3.XI.2010, H.-G. Ahn *ex Laepiporus sulphureus*; **<SL>:** 1♂8♀♀ Gildong Natural Ecological Park, Gil-dong, Gandong-gu, Seoul-si, 18 IV 2006, B.-H. Jung *ex Coriolus versicolor* (successional stages III); 4♂♂4♀♀ Mt. Cheong-gye, Seocho-gu, Seoul-si, 22 Ⅵ 2008, B.-H. Jung, 18 VIII 2009, B.-H. Jung *ex Coriolus versicolor*; 1♀ Mt. Jungmi, Okcheon-myeon, Yangpyeong-gun, 29 I 2006, B.-H. Jung *ex Daedaleopsis tricolor*; 3♂♂1♀ Mt. Chugryeong, Sudong-myeon, Namyangju-si, 8.IV.2006, B.-H. Jung *ex Lenzites beulina*; 2♂♂3♀♀ Donggureong, Guri-si, 25.IV.2006, B.-H. Jung *ex Coriolus versicolor*; 1♂1♀ Mt. Mugap, Gwangju-si, 30 IX 2006, B.-H. Jung *ex Lenzites beulina*; 1♂3♀♀ Mt. Yongmum, Yongmum-myeon, Yangpyeong-gun, 1 X 2006, B.-H. Jung *ex Microporus vernicipes*; 1♀ Donggureong, Guri-si, 10.X.2006, B.-H. Jung *ex Daedalea dickinsii*; 6♂♂8♀♀ Donggureong, Guri-si, 20.IX.2009, B.-H. Jung *ex Daedaleopsis tricolor*; 6♂♂5♀♀ Donggureong, Guri-si, 20.IX.2009, B.-H. Jung *ex Microporus vernicipes* (Berk.) O. Kuntze; **<CN>** 5♂♂7♀♀ Mt. Mansu, Oesan-myeon, Buyeo-gun, 18.IV.2009, B.-H. Jung *ex Coriolus versicolor*; 1♂1♀ Mt. Mansu, Oesan-myeon, Buyeo-gun, 27.IV.2009, B.-H. Jung *ex Microporus vernicipes*;; **<JB>:** 1♂3♀♀ Mt. Moak, Gui-myeon, Wanju-gun, 15 IV 2007, B.-H. Jung *ex Coriolus hirsutus*; **<JN>:** 2♂♂6♀♀ Jangheung, 24 III 2009, B.-H. Jung *ex Coriolus versicolor*; **<GB>:** 1♂ Sogwang-ri, Bug-myeon, Uljin-gun, 12 VIII 2006, B.-H. Jung *ex Coriolus versicolor* (successional stages III); **<JJ>** 14♂♂6♀♀ Seonpanak, Mt. Halla, Jocheon-eup, Jeju-si, 12 IX 2011, B.-H. Jung *ex Microporus vernicipes.*

Distribution. Korea (New record), Far East, Japan.

Fungal Hosts. *Microporus vernicipes* (Berk.) O. Kuntze, *Coriolus versicolor* (L.: Fr.) Quél., *Coriolus hirsutus* (Wulf. : Fr.) Quél.,

Lenzites beulina (L.: Fr.) Fr., *Daedaleopsis tricolor* (Bull. : Fr.) Bond. et Sing., *Trametes* sp.

Cis mikagensis Nobuchi & Wada, 195 네뿔애기버섯벌레(신칭)
(Figs. 3, 9, 15, 23)

Cis mikagensis Nobuchi & Wada, 1955: 106

Description

Body length 1.43-2.09 mm, greatest breadth of elytra 0.74-1.06 mm. **Body** oblong, robust, strongly convex, shinning, densely covered with golden stiff and short seta, color mostly reddish black; antennae, palpi and legs yellowish brown. Head convex, deeply concave in front of clypeus, with dense and tiny punctures; antennae 10-segmented, strongly enlarged from antennomere eight to 10 forming club. **Pronotum** with dense and large punctures; strongly convex; all margins rimmed; lateral sides rimmed, gradually narrowed anteriad, visible dorsally; basal margin weakly sinuous. **Elytra** oblong, strongly convex; parallel-sided at basal 3/4, and gently rounded apically; all punctures same in size, with regular, large and dense punctures, not forming longitudinal rows; length of seta about 0.7 times shorter than length of scutellum. Prosternum without longitudinal line at middle part; prosternal process parallel-sided.

Sexual characteristics. male: fronto-clypeal ridge of head strongly produced forward, forming four denticle protuberance; anterior margin of pronotum strongly produced forward and slightly reflexed, with two triangular protuberance at middle part; two protuberances strongly round at apex, very slightly emarginate between protuberances at middle part; abdomen with a pore in middle of first sternite. **female**: fronto-clypeal ridge of head roundly produced anteriad, very weakly reflexed above, not forming an arcuate lamella on each side, anterior margin of pronotum simply rounded, slightly produced, not emarginate at middle part; abdominal pore lacking.

Specimens Examined. <SL>: 6♂♂2♀♀ Mt. Choan, Chang-dong, Dobong-gu, 31 V 2007, B.-H. Jung *ex Amillaria mellea* (dried); 4♂♂1♀ Hangang, Gwangjin-gu, Seoul-si, 25 IV 2009, B.-H. Jung *ex Daedaleopsis congragosa*; **<GG>:** 6♂♂ Mushroom specimen room, Rural development administration,15 IX 2006, S.-J.Seok *ex Ganoderma applanatum*; 15♂11♀♀ Mushroom specimen room, Rural development administration, 21 I 2007, S.-J. Seok *ex Pholiota aurivella*; 6♂3♀♀ Mushroom specimen room, Rural development administration, 21.I.2007, S.-J. Seok *ex Hericium erinaceum*;

Distribution. Korea (New record), Japan (Honshu), Lia

Fungal Hosts. *Ganoderma applanatum* (Pers. : Wallr.) Pat., *Pholiota aurivella* (Batsch.: Fr.) (dreid), *Hericium erinaceum* (Fr.) Pers., *Amillaria mellea* (Vahl : Fr.) P. Kummer(dried), *Daedaleopsis congragosa* (Fr.) Schroet.

Cis jezoensis Nobuchi, 1960 엠뿔애기버섯벌레(신칭)
(Figs. 4, 9, 16, 20)

***Cis jezoensis* Nobuchi, 1960: 38**

Description

Body length 1.42-1.54 mm, greatest breadth of elytra 0.69-0.73 mm. **Body** cylindrical, slightly narrowed anteriad and posteriad, weakly shining, covered with moderate and erect seta dorsally; mostly darkish brown; antennae, legs yellowish brown. **Head** with sparse and minute punctures, interstice between punctures minutely reticulate, sparsely scattered with short setae; deeply impressed at middle part; antennae 10-segmented, enlarged from eighth antennomere to 10th antennomere, forming a club. **Pronotum** strongly convex, transverse; with dense puncture and indistinctly reticulate; anterior margin strongly rounded, moderately produced subtriangularly and weakly reflexed, lateral sides narrowed anteriad, slightly visible dorsally; basal margin slightly bisinuate, very narrowly rimmed; **Elytra** convex, with dense punctures, larger than punctures of pronotum; punctures smaller at apical part; equal to base of pronotum in width; lateral sides gradually narrowed apically; covered with two kinds (short and longer) of yellow setae; longer setae often forming striae in longitudinal rows; interstice almost smooth. Prosternum raised, not carinate at middle part; prosternal process rather widely produced posteriad and curved behind.

Sexual characteristics. male: fronto-clypeal ridge of head very strongly produced and reflexed, forming 'M' type projection; abdomen with a pore at first sternite in middle part. **female:** fronto-clypeal ridge of head not produced, very slightly raised at each

side; anterior margin of pronotum simply rounded; abdominal pore lacking.

Specimens Examined. <GW>: 2♂♂ Nodong Valley, Yongpyeong-myeon, Pyeongchang-gun, 13 VIII 2006, B.-H. Jung *ex Trametes* sp.; 1♂1♀ Temple Suta, Dong-myeon, Hongcheon-gun, 17 X 2009, B.-H. Jung *ex Coriolus versicolor* (successional stages III); 4♂♂4♀♀ Suha-ri, Daegwanryeong-myeon, Pyeonchang-gun, 10 V 2010, B.-H. Jung *ex Lenzites beulina.*

Distribution. Korea (New record), Japan (Hokkaido)

Fungal Hosts. *Trametes* sp., *Coriolus versicolor* (L.: Fr.) Quél., *Lenzites beulina* (L.: Fr.) Fr.

Remark. This species is simillar to *Cis mikagensis* Noubuch et Wada, but may be easily separately by 'M' type projections of head in male and smaller and narrower body.

Cis sasajii Kawanabe, 2001 공주애기버섯벌레(신칭) (Figs. 5, 11, 24)

Cis sasajii Kawanabe, 2001: 267.

Description

Body length 1.7mm; greatest breadth of elytra 0.82 mm. Body oblong, strongly convex, weakly shining; color mostly reddish black; anterior part of head and mandibles dark reddish brown; antennae, palpi and legs yellowish brown. **Head** convex; frons deeply and ovally concave in middle part and weakly convex at posterior part of the concavity, with dense and small punctures, uniform in size, bearing short, robust and yellowish bristles; interstices between punctures finely reticulated; antennae 10-segmented, forming a club from eighth antennomere to 10th antennomere; transversely and strongly convex; with dense and distinctive punctures, uniform in size; each punctures bearing a short, robust, yellowish bristle; interstices between punctures finely reticulate; anterior margin not rimmed, broadly round; lateral margins narrowly rimmed, nearly arcuate, weakly reflexed, finely serrated, slightly visible dorsally; basal margin narrowly rimmed and sinuate. **Elytra** strongly convex, parallel-sided, gradually narrowed from apical 1/3 to apex; with irregular and very dense punctures; punctures dual in size, the larger ones shallow and umbeliform, smaller than those on pronotum, bearing bristles, partially seriate and similar to those on pronotum; interstice between punctures rugulose; suture not margined. Prosternal process broad.

Sexual characteristics. male: fronto-clypeal ridge of head produced anteriad, weakly reflexed upward, forming an arcuate small lamella on each side, and with conspicuous triangular protuberance on inner margin of each lamella; first abdominal sternite with pubescent fovea at middle part. **female:** head not depressed at the vertex; fronto-clypeal ridge slightly reflexed and forming arcuate lamella on each side; first abdominal sternite without pubescent fovea.

Specimens Examined. <CN>: 4♂♂1♀ Jeonwei-myeon, Gongju-si, 3 III 2006, B.-H. Jung *ex Coriolus unicolor.*

Distribution. Korea (New record), Japan (Hokkaido).

Host fungi. *Coriolus unicolor* (Fr.) Pat.

Cis hieroglyphicus Reitter, 1877 무늬애기버섯벌레(신칭) (Figs. 6, 12, 17, 21, 25)

Cis hieroglyphicus Reitter, 1877: 380.

Description

Body length 1.73-2.12mm, greatest breadth of elytra 0.9-1.1 mm. **Body** cylindrical, weakly shining, covered with erect seta dorsally; mostly brownish black; antennae, legs yellowish brown; elytra with unshaped wavy pattern. Antennae 10-segmented, enlarged from eighth antennomere to 10th antennomere, forming a loose club. **Pronotum** strongly convex, with dense punctures and indistinctly reticulate; all margins rimmed; anterior margin rounded, lateral sides narrowed anteriad and posteriad, slightly explanate and weakly reflexed, with canal, visible dorsally. **Elytra** strongly convex, with dense punctures, larger than punctures of pronotum; elytal base broader than base of pronotum; elytra with unshaped wavy patterns; punctures dual in size, bearing seta, not forming striae, but often partially seriate in longitudinal rows; seta almost equal to length of scutellum in length; interstice almost smooth. Prosternum raised, not carinate at middle part; prosternal process rather wide and parallel-sided

Sexual characteristics. male: fronto-clypeal ridge of head produced anteriad, weakly reflexed upward, forming a triangular protuberance on each side; abdomen with pubescent three (sometimes two) foveae from first sternite to third sternite at middle part or often

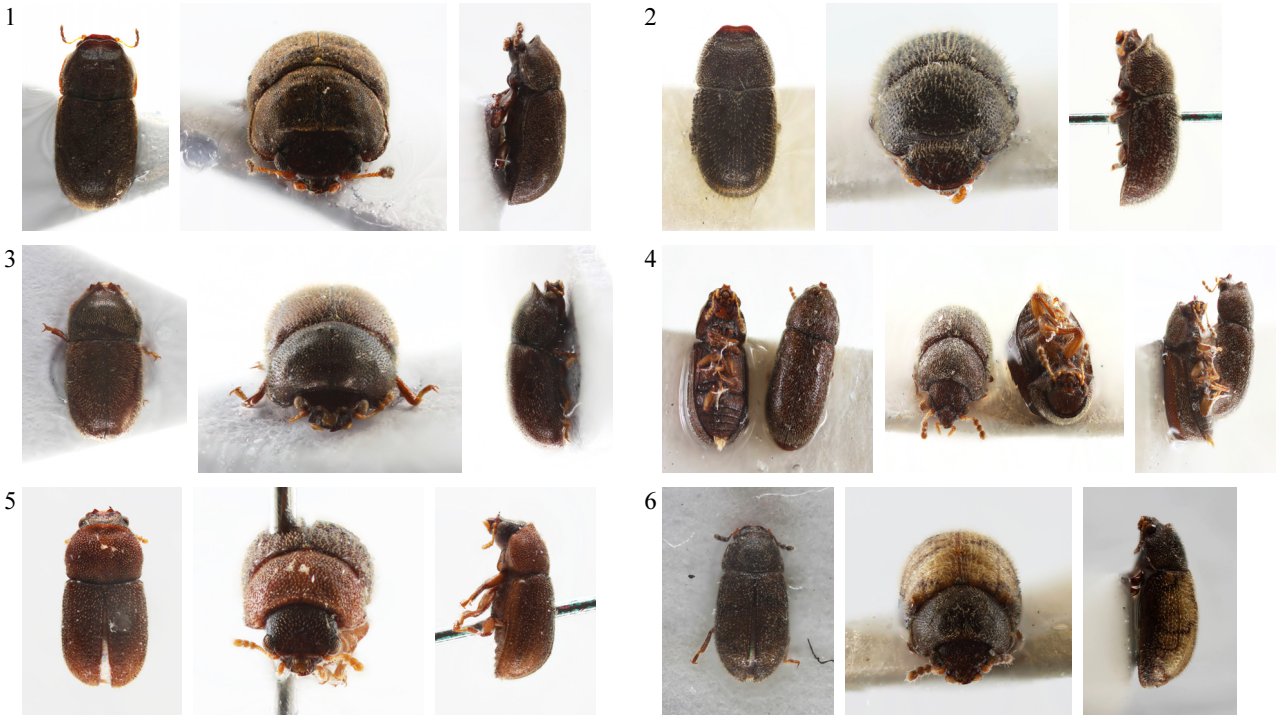

Fig. 1-6. Habitus of *Cis* (left: dorsal; middle: frontal; right: lateral). 1. *Cis boleti*; 2. *Cis seriatopilosus*; 3. *Cis mikagensis*; 4. *Cis jezoensis*; 5. *Cis sasajii*; 6. *Cis hieroglyphicus*.

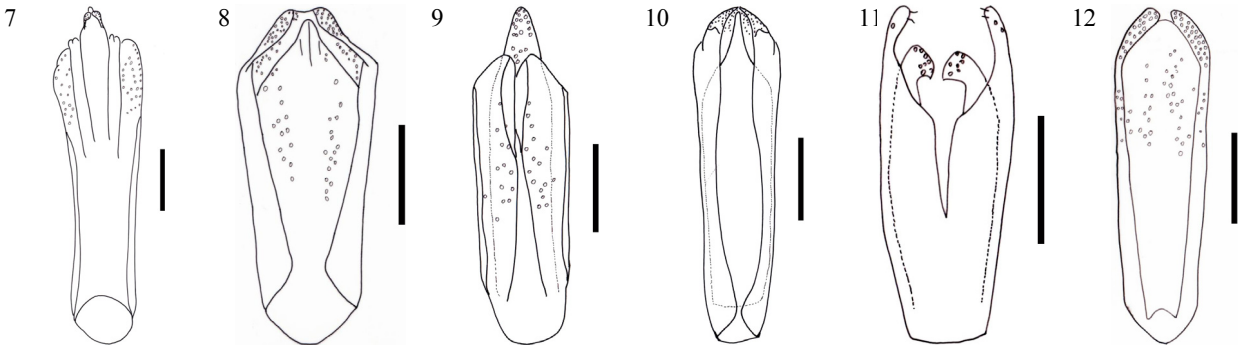

Fig. 7-12. Genitalia of *Cis*. (Each scale bar = 0.1mm). 7. *Cis boleti*; 8. *Cis seriatopilosus*; 9. *Cis mikagensis*; 10. *Cis jezoensis*; 11. *Cis sasajii*; 12. *Cis hieroglyphicus*.

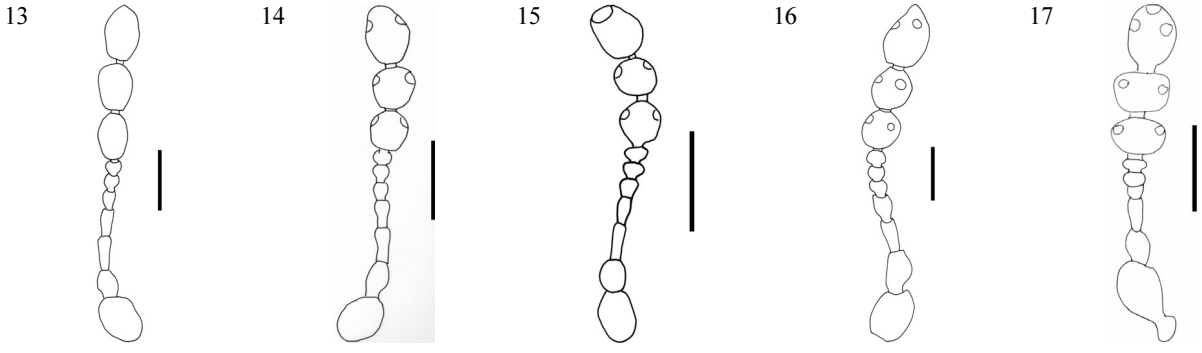

Fig. 13-17. Antenna of *Cis*. (scale bar = 0.2mm). 13. *Cis boleti*; 14. *Cis seriatopilosus*; 15. *Cis mikagensis*; 16. *Cis jezoensis*; 17. *Cis hieroglyphicus*.

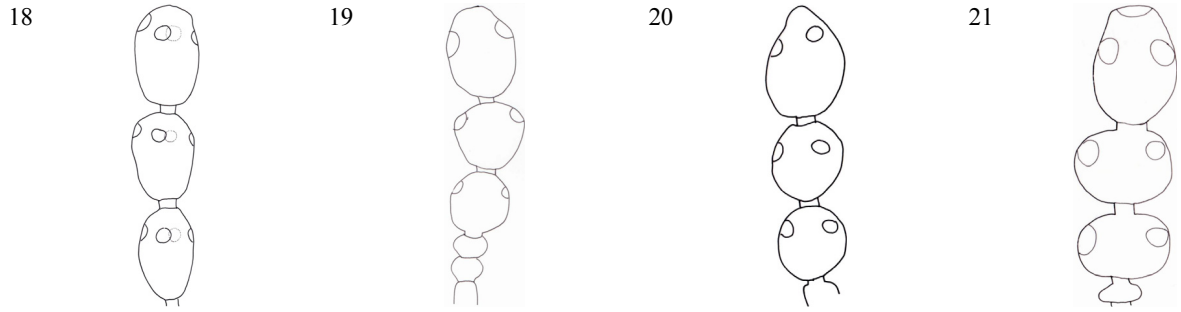

Fig. 18-21. Apical Antemmomeres of *Cis*. (scale bar = 0.2mm). 18. *Cis boleti*; 19. *Cis seriatopilosus*; 20. *Cis jezoensis*; 21. *Cis hieroglyphicus*.

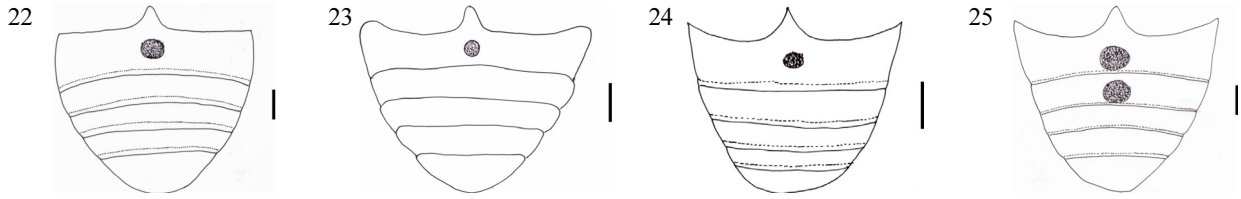

Fig. 22-25. Abdomen of *Cis*. (scale bar = 0.2mm). 22. *Cis seriatopilosus*; 23. *Cis mikagensis*; 24. *Cis sasajii*; 25. *Cis hieroglyphicus*.

from first sternite to second sternite. **female:** head not depressed at the vertex; fronto-clypeal ridge slightly reflexed and forming weak lamella on each side; first abdominal sternite without pubescent fovea.

Specimens Examined. <GW>: 4exs. Sanghaga-ri, Hwaengseong-gun, 5 IV 2006, B.-H. Jung *ex Coriolus versicolor* (successional stages II); **<SL>:** 1ex. Gildong Natural Ecological Park, Gil-dong, Gandong-gu, 2 V 2006, B.-H. Jung *ex Coriolus versicolor*; **<GG>:** 11exs. Okhyeon-ri, Jije-myeon, Yangpyeong-gun, 5 V 2007, B.-H. Jung *ex Coriolus versicolor* (successional stages III); **<GN>:** 20 exs. Mt. Dubong, Jaeun-do, Jaeun-myeon, Sinan-gun, 6.VI.2010, B.-H. Jung *ex Coriolus versicolor*; <GB>: 1ex. Temple Bongjeongsa, Seohu-myeon, Andong-si, 3.VIII.2008, B.-H. Jung *ex Pycnoporus coccineus*; 4♂♂ Gyesan-dong, Sangju-si, 6.VI.2008, A.-Y. Kim *ex Coriolus versicolor*.

Distribution. Korea (New record), Japan.

Fungal Hosts. *Coriolus versicolor* (L.: Fr.) Quél, *Pycnoporus coccineus* (Fr.) Bond. et Sing.

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