

Seven Newly Recorded Species of the Genus *Centistes* Haliday (Hymenoptera: Braconidae: Euphorinae) from Korea

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한국산 *Centistes* Haliday속 (벌목: 고치벌과: 잎벌레고치벌아과)에 대한 보고

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ABSTRACT: Seven species of the genus *Centistes* (Hymenoptera: Braconidae: Euphorinae) are reported for the first time from Korea: *C. (Ancylocentrus) ater* (Nees), *C. (A.) mucri* Belokobylskij, *C. (A.) paupella* (Shenefelt), *C. (A.) rufus* Chen and Achterberg, *C. (Centistes) pumilio* Belokobylskij, *C. (C.) tsherskii* Belokobylskij, and *C. (Syrhhizus) delusorius* (Förster). Diagnosis, distribution, host information and photographs are given for each species.

Key words: *Centistes*, Braconidae, Hymenoptera, Korea, New record

초 록: 본 연구를 통해 *Centistes* Haliday (벌목: 고치벌과: 잎벌레고치벌아과)에 속하는 7종 *C. (Ancylocentrus) ater* (Nees), *C. (A.) mucri* Belokobylskij, *C. (A.) paupella* (Shenefelt), *C. (A.) rufus* Chen and Achterberg, *C. (Centistes) pumilio* Belokobylskij, *C. (C.) tsherskii* Belokobylskij, *C. (Syrhhizus) delusorius* (Förster)을 한국에 처음으로 보고한다. 또한 각 종에 대한 식별형질과 숙주 정보, 사진 등의 정보를 포함하였다.

검색어: 넓은칼집고치벌속 (신칭), 고치벌과, 벌목, 한국, 미기록

The genus *Centistes* comprise 68 species worldwide (except for the Australian region), including 40 species in the Eastern Palearctic fauna (Rousse and Braet, 2012; Yu et al., 2012). According to van Achterberg (1985), *Centistes* was divided into four subgenera: *Centistes* Haliday, 1835, *Syrhhizus* Förster, 1862, *Ancylocentrus* Förster, 1862, and *Anartionyx* van Achterberg, 1985. Shaw (1985) disagreed with the use of these subgeneric divisions. Belokobylskij (1992) reported that *Syrhhizus* is an independent genus due to lacking of a medial vein and agreed

with the position of the remaining three subgenera of *Centistes*. Belokobylskij (2000c) suggested that the subgenus *Chaetocentistes* Belokobylskij, 2000. We followed van Achterberg (1985) in this paper.

All *Centistes* species are solitary koinobiont endoparasitoids of Coleopteran adults, particularly the families Curculionidae, Chrysomelidae, Coccinellidae, Anthicidae, and Carabidae (Loan, 1972; Shaw, 1985; Chen and van Achterberg, 1997).

Previously, seven Korean *Centistes* species were recorded by Papp (1994) and Ku et al. (2001). In this study, seven *Centistes* species are reported as new to Korea. We provide their diagnosis, distribution, host information, and photographs.

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Materials and Methods

All examined materials were deposited in the Science Museum of Natural Enemies (SMNE), Geochang, Korea. The specimens were photographed with Leica DMS 1000 using the Leica Application Suite (LAS). Terminology used in this paper follows that of van Achterberg (1993). Abbreviations used in the present study are as follows: CB-Prov. Chungbuk, CN-Prov. Chungnam, GB-Prov. Gyeongbuk, GG-Prov. Gyeonggi, GW-Prov. Gangwon, JN-Prov. Jeonnam, LT-Light trap, MT-Malaise trap.

Systematic accounts

Family Braconidae Nees, 1811

Subfamily Euphorinae Förster, 1862

Genus *Centistes* Haliday, 1835 넓은칼집고치벌속 (신칭)

Centistes (Ancylocentrus) ater (Nees, 1834) (치복넓은칼집고치벌 :신칭) (Figs. 1-2)

Leiophron ater Nees, 1834: 45.

Leiophron (Ancylos) excrucians Haliday, 1835: 461.

Ancylocentrus ater; Shenefelt, 1969: 9.

Ancylocentrus excrucians; Shenefelt, 1969:10; Tobias, 1986: 225.

Allurus lativalvis Jakimavicius, 1972: 51.

Centistes (Ancylocentrus) excrucians; van Achterberg, 1985: 358.

Ancylocentrus lativalvis; Tobias, 1986: 225

Centistes (Ancylocentrus) ater; van Achterberg, 1985: 358; Belokobylskij, 1992: 208.

Diagnosis. Length of body 2.5-3.0 mm. Maxillary palpi 6-segmented. Metasoma of female with pair of teeth medio-ventrally. Ovipositor sheath apically slightly widened. First metasomal tergite usually with distinct transverse medial depression or depression only laterally present.

Materials examined. KOREA, 5 ♀♀ 14 ♂♂ (SMNE); 1 ♀, Norujae, Oji, Pobjon, Bonghwa, GB, 28.v.1993, Deok-Seo Ku; 1 ♀, Jeomwon, Paju, GG, 3.vi.1998, Heung-Sik Lee; 2 ♀♀ 1 ♂, Pakdaljae, Pongyang, Checheon, CB, 23.v.1993, Deok-Seo Ku; 1 ♀, Kuhak, Bongwang, Checheon, CB, 24.v.1993, Deok-Seo Ku; 1 ♂, Mt. Yongmunsan, GG, 29.v.1991; 1 ♂, Komkangkol,

Taebaek Cheolam, GW, 15.v.1992, Jong-wook Lee; 1 ♂, Sanhye (Mt. Yeongdeungsan), Imam, Yeongyang, GB, 5.v.1997, Je-Sik Jeon; 1 ♂, Sokpo, Sokpo, Bonghwa, GB, 28.v.1993, Deok-Seo Ku; 1 ♂, Suwon, GG, 15.vi.1994, Deok-Seo Ku; 1 ♂, Chongchon, Koesan, CB, 23.v.1993, Deok-Seo Ku; 7 ♂♂, Yongdong, Sanchok, Chungju, CB, 23.v.1993 Deok-Seo Ku.

Distribution. Korea (new record), Belgium, Bulgaria, Canada (Ontario), China (Jilin), Finland, France, Germany, Hungary, Ireland, Italy, Lithuania, Netherlands, Poland, Russia (Kamchatka Oblast, Nobgorod Oblast, Primorsky Krai, Sakhalin Oblast), Sweden, Turkey, United Kingdom.

Host. *Sitona scissifrons* Say (Curculionidae) (Belokobylskij, 1992); *Stigmella basiguttella* (Heinemann), *Stigmella poterii* (Stainton) (Nepticulidae) (Szocs, 1979).

Centistes (Ancylocentrus) mucri Belokobylskij, 2000 (뿔족 넓은칼집고치벌 :신칭) (Figs. 3-4)

Centistes (Ancylocentrus) mucri; Belokobylskij, 2000b: 16.

Diagnosis. Length of body 2.1-2.8 mm; fore wing length 1.8-2.2 mm. Mesoscutum almost glabrous. Notauli present, crenulate. Sternauli distinct, oblique. Vein r arising from middle of pterostigma. Hypopygium simple and partly setose. Ovipositor sheath short.

Material examined. KOREA, 1 ♂ (SMNE), Mt. Yogisan, Suwon, GG, 11.v.1994, Deok-seo Ku.

Distribution. Korea (new record), Russia (Primorsky Krai),

Host. Unknown.

Centistes (Ancylocentrus) paupella (Shenefelt, 1969) (뿔나방살이넓은칼집고치벌 :신칭) (Figs. 5-6)

Ancylocentrus paupella Shenefelt, 1969: 10.

Centistes (Ancylocentrus) paupella; Belokobylskij, 1992: 203; Belokobylskij, 2000a: 271.

Diagnosis. Length of body 2.8-3.6 mm. Notauli shallow and usually smooth. Scutellum convex. Sternauli widely and irregularly sculptured. Propodeum completely irregularly sculptured, without transversal carina. Length of first abdominal tergite nearly equal to its apical width. Ovipositor sheath rather long, thin and slender.

Materials examined. KOREA, 3 ♀♀ 2 ♂♂ (SMNE); 2 ♀

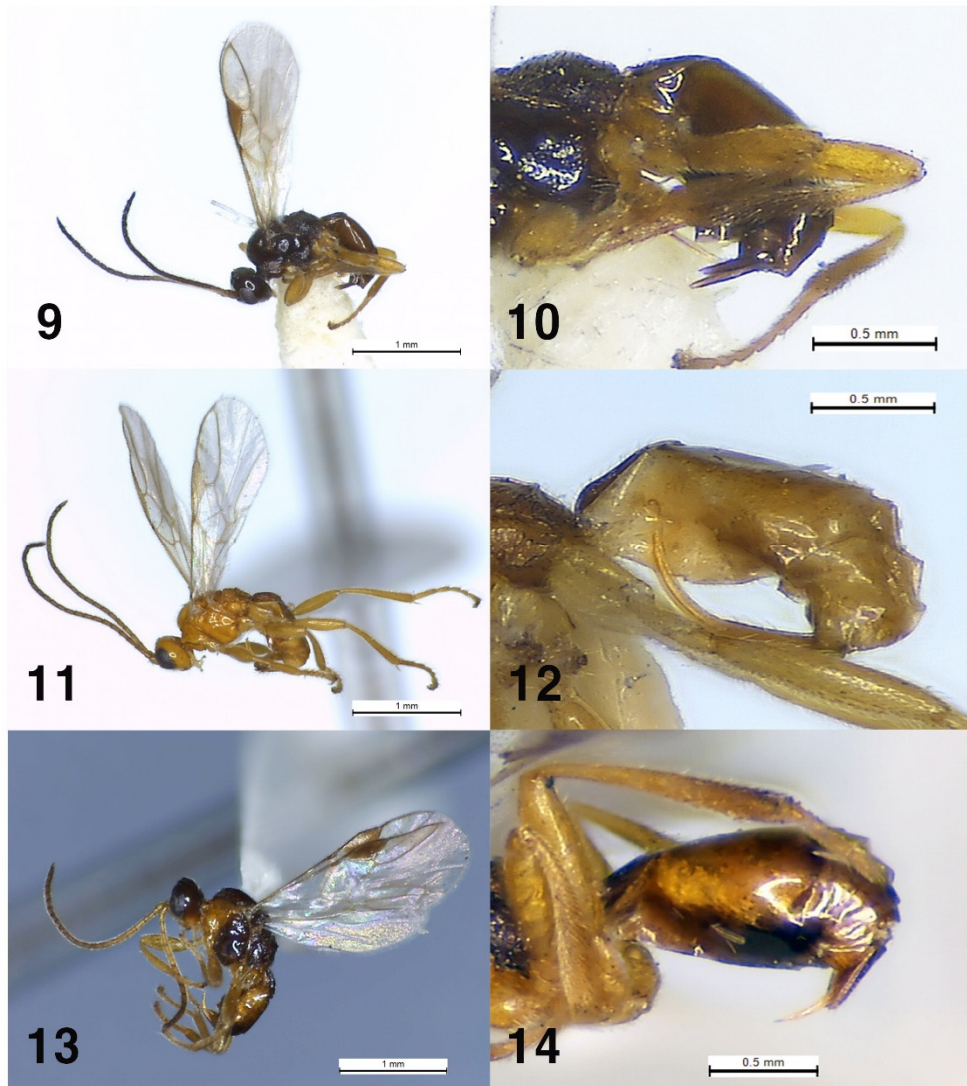


Figs. 1-8. Adult of *Centistes* spp.: 1, habitus of *C. (Ancylocentrus) ater*, lateral aspect; 2, metasoma of *C. (A.) ater*, lateral aspect; 3, habitus of *C. (A.) mucri*, lateral aspect; 4, metasoma of *C. (A.) mucri*, lateral aspect; 5, habitus of *C. (A.) paupella*, lateral aspect; 6, metasoma of *C. (A.) paupella*, lateral aspect; 7, habitus of *C. (A.) rufus*, lateral aspect; 8, metasoma of *C. (A.) rufus*, lateral aspect.

♀, Norujae, Oji, Pobjon, Ponghwa, GB, 28. v. 1993, Deok-Seo Ku; 1 ♀, Mountain Examination site, Bongpyeong, Pyeongchang, GW (LT), 1.ix.1998, Deok-Seo Ku; 1 ♂, Balsan rest area, Bongam, Jinjeon, Happogu, Masan, GN (LT), 18-19. vi. 1999, Jeong-Ran Baek; 1 ♂, Bongjeongsa (Mt. Taecheongsan), Singi, Samgye, Yeonggwang, JN (LT), 10-11. vii. 1998, Je-Sik Jeon.

Distribution. Korea (new record), Belgium, China (Liaoning), France, Germany, Hungary, Russia (Bashkirskaya Republika, Kamchatka Oblast, Khabarovsk Krai, Primorsky Krai), Ukraine.

Host. *Ptocheuusa paupella* (Zeller) (Gelechiidae) (Jacobs, 1905).



Figs. 9-14. Adult of *Centistes* spp.: 9, habitus of *C. (Centistes) pumilio*, lateral aspect; 10, metasoma of *C. (C.) pumilio*, lateral aspect; 11, habitus of *C. (C.) tsherskii*, lateral aspect; 12, metasoma of *C. (C.) tsherskii*, lateral aspect; 13, habitus of *C. (Syrhizus) delusorius*, lateral aspect; 14, metasoma of *C. (S.) delusorius*, lateral aspect.

***Centistes (Ancylocentrus) rufus* Chen and Achterberg, 1997**
(붉은옆가슴고치벌 : 신칭) (Figs. 7-8)

Centistes (Ancylocentrus) rufus, Chen and Achterberg, 1997: 36; Belokobylskij, 2000a: 261.

Diagnosis. Length of body 3.0 mm; fore wing length 2.8 mm. Antenna 22-segmented. Length of vein 1-R1 as long as pterostigma; vein r arising distinctly behind middle of pterostigma. Vein 1-CU1 of fore wing much longer than vein cu-a. Hypopygium simple. Ovipositor sheath about as long as first metasomal tergite.

Materials examined. KOREA, 7 ♀♀ (SMNE); 2 ♀♀,

Yongdong, Sanchok, Chugju, CB, 23. v. 1993, Deok-Seo Ku; 1 ♀, Konbongsa, Kansongi, Kosong, GW, 26. v. 1993, Deok-Seo Ku; 1 ♀, Soksa, Geumsan, Jinyang, GN (LT), 8. vii. 1993, Jeon; 2 ♀♀, Dasol, Gonmyeong, Sacheon, GN, 29. iv. 1989; 1 ♀, Songdeokam (Mt. Songuisan), Ojeon, Obu, Sancheong, GN, 5. ix. 1998, Je-Sik Jeon.

Distribution. Korea (new record), China (Guizhou).

Host. Unknown.

***Centistes (Centistes) pumilio* Belokobylskij, 2000** (꼬마넓은칼집고치벌 : 신칭) (Figs. 9-10)

Centistes (Centistes) pumilio, Belokobylskij, 2000a: 253;

Belokobylskij, 2000b: 20.

Diagnosis. Length of body 1.5-1.9 mm; fore wing length 1.8-2.0 mm. Antenna 21-22-segmented. Notauli entirely absent. Sternauli distinct. Vein r arising behind middle of pterostigma. Hypopygium simple and partly setose. Ovipositor sheath rather long, narrow, flat, with short numerous and erect hairs.

Material examined. KOREA, 1 ♀ (SMNE), Osilgol (Mt. Yeohangsan), Yeoyang, Jinjeon, Happogu, Masan, GN, 12. vi.1996, Jung-Suk Park.

Distribution. Korea (new record), Russia (Primorsky Krai).

Host. Unknown.

***Centistes (Centistes) tsherskii* Belokobylskij, 1995** (세스키 고치벌 :신칭) (Figs. 11-12)

Centistes (Centistes) tsherskii; Belokobylskij, 1995: 294; Belokobylskij, 2000a: 254.

Diagnosis. Length of body 2.3-2.4 mm; fore wing length 2.6-2.7 mm. Notauli entirely absent. Sternauli lost. Vein r arising from middle of pterostigma. First tergite uniformly and linearly widened from base to apex. Hypopygium simple. First abdominal tergite striate, smooth apically. Ovipositor sheath rather long and narrow.

Materials examined. KOREA, 10 ♀ ♀ (SMNE); 1 ♀, Mt. Yeohangsan, Juseo, Yeohang, Haman, GN (MT), 15-18. vi.1994, Sang-Deok Yeo; 1 ♀, Forestry experiment station, Sucheong, Osan, GG, 24. v.1999, Hyeong-geun Lee; 3 ♀ ♀, Mt. Taecheongsan, Pongjeongsa, Samgye, Changseong, CN (LT), 11.vii.1998, Deok-Seo Ku; 1 ♀, Mt. Myeongseongsan, GG (LT), 17.viii.1999, Deok-Seo Ku; 1 ♀, Dapo, nambu, Geoge, GN, 15-16.vii.1994, Su-Jeong Hwang; 1 ♀, Mt. Taehwasan, Sangrim, Docheok, Kwangju, GG (LT), 5.viii.1998, Deok-Seo Ku; 2 ♀ ♀, Baekunbunso (Mt. Gayasan), Baekun, Suryun, Seongju, GB (LT), 1-2.vii.2000, Tae-Ho An.

Distribution. Korea (new record), Russia (Primorsky Krai).

Host. Unknown.

***Centistes (Syrrhizus) delusorius* (Förster, 1862)** (바구미살이 넓은 칼집 고치벌 :신칭) (Figs. 13-14)

Syrrhizus delusorius Förster, 1862: 254; Belokobylskij, 2000a: 273; Papp, 2005: 161; Belokobylskij et al., 2012: 364.

Centistes (Syrrhizus) delusorius; Achterberg, 1985: 357; Chen and Achterberg, 1997: 21.

Diagnosis. Length of body 1.5-2.6 mm. Antenna 22-segmented. Submarginal and discal cells not separated. Vein 1-SR+M of fore wing, notauli, and precoxal sulcus usually absent. Vein r arising behind middle of pterostigma. Metasoma without ventral teeth. Ovipositor sheath (fig. 14). Body reddish brown. Lower part of head, propleuron, dorsal part of metasoma (except first tergite) and legs brownish yellow.

Materials examined. KOREA, 6 ♀ ♀ 6 ♂ ♂ (SMNE); 4 ♀ ♀, Forestry experiment station, Hongrung, Seoul (LT), 20. v.1998, Seung-Ho Gang; 2 ♀ ♀, same locality, 20. v.1998, Seung-Ho Gang; 5 ♂ ♂, same locality, 20. v.1998, Seung-Ho Gang, 1 ♂, Mt. Sobaeksan, Heebangsa, pungki, Yueongju, GB, 9. v.1997, Deok-Seo Ku.

Distribution. Korea (new record), Finland, Germany, Hungary, Lithuania, Netherlands, Russia (Khabarovsk Krai, Primorsky Krai, Sakhalin Oblast), United Kingdom.

Host. *Anthonomus pomorum* (Linnaeus) (Tobias, 1986), *Rynchaenus testaceus* Muller (Viramo, 1968) (Curculionidae).

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