

## Notes on the Genus *Cosmophorus* Ratzeburg (Hymenoptera: Braconidae: Euphorinae) from Korea

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## 한국산 큰턱고치벌속(*Cosmophorus* Ratzeburg) (벌목: 고치벌과: 잎벌레고치벌아과)에 대한 보고

안태호 · 김효중<sup>1\*</sup> · 서홍렬<sup>2</sup> · 김기경<sup>2</sup> · 구덕서

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**ABSTRACT:** Two species of the genus *Cosmophorus* (Hymenoptera: Braconidae) are reported in this study. Among them, *Cosmophorus* (*Cosmophorus*) *klugii* Ratzeburg is new to Korea. Diagnosis and distribution data are included.

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

**초록:** 본 연구를 통해 2종의 큰턱고치벌속(벌목, 고치벌과)을 보고한다. 수원큰턱나무좀고치벌 *Cosmophorus* (*Cosmophorus*) *klugii* Ratzeburg 1종은 한국미기록종으로 보고한다. 식별형질과 분포 등의 정보를 포함하였다.

**검색어:** 큰턱고치벌속, 미기록종, 고치벌과, 벌목, 한국

The genus *Cosmophorus* Ratzeburg, 1848 of the subfamily Euphorinae is small in the size and enigmatic in the ecology, which has been recorded in Holarctic, Oriental, Afrotropical and Australian regions (Achterberg and Quicke, 2000). Only five species are known in East Palaearctic (Belokobylskij and Tobias, 2000). Previously, *Cosmophorus cembrae* was reported from Korea by Belokobylskij and Ku (1998).

Members of *Cosmophorus* are known as solitary koinobiont endoparasitoids of adults of bark-boring and wood-boring Scolytidae (Shaw and Huddleston, 1991).

Two species of this genus from Korea are recognized in this

paper, of which one species, *Cosmophorus klugii* Ratzeburg, is new to Korea.

In this study, we describe its diagnostic characters and also provide distribution and host information. All examined materials are deposited in the Science Museum of Natural Enemies (SMNE), Geochang, Korea.

### Systematic accounts

Family Braconidae Nees, 1811

Subfamily Euphorinae Foerster, 1862

**Genus *Cosmophorus* Ratzeburg, 1848 (큰턱고치벌속: 신칭)**

*Cosmophorus* Ratzeburg, 1848: 42; Shenefelt, 1969: 135;

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Shaw, 1985: 317.

Type species: *Cosmophorus klugii* Ratzeburg, 1848.

***Cosmophorus (Cosmophorus) klugii* Ratzeburg 수원큰턱나무좀고치벌 (신칭) (Fig. 1)**

*Cosmophorus klugii* Ratzeburg, 1848: 72; Watanabe, 1960: 56; 1968: 2; Shenefelt, 1969: 136; Chen et al., 2000: 67.

*Cosmophorus lapponicus* Hedqvist, 1955: 97.

*Cosmophorus (Cosmophorus) klugii* Ratzeburg; Belokobylskij and Tobias, 2000: 373; Achterberg and Quicke, 2000: 298; Belokobylskij et al., 2012: 357.

**Diagnosis:** Body length 2-2.5 mm. Antennae with 16-19 segments; occiput slightly notched; anterior ocellus anterior to line connecting posterior margin of eye; first metasomal tergite widened towards apex, 1.5 times as long as width at apex, less robust; Ovipositor straight, almost as long as abdomen.

**Material examined:** Korea, 1 ♀ (SMNE), Mt. Yeogi, Suwon, Gyeonggi Prov., 11. V. 1994, Deok-Seo Ku.

**Distribution:** Korea (new record), Japan, China, Russia (European part, Primorski krai, West Siberia), Europe.

**Host:** (Scolytidae) *Dryocoetes autographus* Ratzeburg, *Estenoborus perrisi* Chapuis, *Hylastes glabratus* Zetterstedt, *Ips amitinus* Eichhoff, *Ips typographus* Linnaeus, *Pityogenes*



**Fig. 1.** Female specimen of *Cosmophorus (Cosmophorus) klugii* Ratzeburg.

*bidentatus* Herbst, *Pityokteines spinidens* Reitter, *Pityokteines vorontzovi* Jacobson, *Polygraphus proximus* Blandford, and *Polygraphus poligraphus* Linnaeus (after Shenefelt, 1969).

**Remarks:** This species is recorded for the first time from Korea. It was known to be a solitary endoparasitoid of the adults of bark beetles (Watanabe, 1960).

***Cosmophorus (Cosmophorus) cembrae* Ruschka, 1925 큰턱나무좀고치벌(신칭)**

*Cosmophorus cembrae* Ruschka, 1925: 200; Shenefelt, 1969: 135; Tobias et al., 1986: 247; Shaw, 1989: 241; Belokobylskij and Ku, 1998: 139; Ku et al., 2001: 111; Ku, 2010: 181.

*Cosmophorus (Cosmophorus) cembrae* Ruschka; Belokobylskij and Tobias, 2000: 375; Achterberg and Quicke, 2000: 298; Belokobylskij et al., 2012: 357.

**Diagnosis:** Body length 1.5-2.2 mm. Antennae with 13-16 segments; mandible robust and distinctly angulate; occiput distinctly notched; anterior ocellus on line connecting posterior margin of eye; first metasomal tergite widened towards apex, more than 1.5 times as long as width at apex, uniformly rugose almost over entire surface; ovipositor shorter than abdomen; body dark brown.

**Material examined:** Korea, 12♂ (SMNE); 1♂, Gwangseon-ri, Unju-myeon, Wanju, Jeonbuk, 16. VI. 1992, D-S Ku; 1♂, Sobaeksan, Jeondong Valley, Jeondong-ri, Danyang-eup, Chungbuk, 22. V. 1997, Seung-Hyeon Baek; 1♂, Mt. Jiri, Chotdaebong, Yeongwonsa, Samjeong-ri, Macheon-myeon, Hamyang, Gyeongnam, 3-4. X. 2002, (LT), Tae-Ho An; 1♂, Seokbyeongsan, Hwacheon, Imgye, Jeongseon, Gangwondo, 2. VIII. 2002, D-S Ku, (LT); 1♂, Baekdamsa, Mt. Seolak, Gangwondo, 1. VIII. 2002, D-S Ku, (LT); 1♂, Taebaekbunchon, Korean National Training Center, Mt. Hambae, Gangwon, 12-13. VIII. 1999, D-S Ku, (LT); 3♂, Yuilsa, Mt. Taebaek, Gangwon, 12-13. VIII. 1999, (LT), D-S Ku; 1♂, Forestry research station, Hongneung, Seoul, 3. IX. 1998, Seung-Ho Gang, (LT); 2♂, ditto, 25. VIII. 1998, ditto.

**Distribution:** Korea, Japan, Russia (Kuril Islands, Far East, Siberia, European part), West Europe.

**Host:** (Scolytidae) *Cryphalus abietis* Ratzeburg, *C. piceae* Ratzeburg, *Pityogenes bistridentatus* Eichhoff, *P. chalcographus*

L., *P. conjunctus* Reitt., *P. quadridens* Hartig, *Pityokteines spinidens* Reitt., *Pityokteines vorontzovi* Jac., *Pityophthorus henscheli* Seitner (after Shenefelt, 1969). *Cryphalus fulvus* Nijima 노랑애나무좀(노랑소나무좀) (Watanabe, 1968).

## Literature Cited

- Achterberg, C. van, Quicke, D.L.J., 2000. The Palaeotropical species of the tribe Cosmophorini Capek (Hymenoptera: Braconidae: Euphorinae) with description of twenty-two new species. *Zool. Med. Leiden* 74(19), 283-338, figs 1-186.
- Belokobylskij, S.A., Ku, D.S., 1998. New species and rare genera of the Family Braconidae from Korea. *J. Asia-Pacific Entomol.* 1(2), 131-145.
- Belokobylskij S.A., Tobias, V.I., 2000. Fam. Braconidae. In: Lehr P.A. (Ed.). Key to insects of the Russian Far East. Neuropteroidea, Mecoptera, Hymenoptera. Vladivostok: Dal'nauka, 4(4), 8-571. (In Russian).
- Belokobylskij S.A., Tobias, V.I., Kotenko, A.G., Proshchalikin, M.Y., 2012. Fam. Braconidae - braconidy. In: Lelej A.S. (Ed.). Annotated Catalogue of Insects of the Russian Far East. Hymenoptera. Vladivostok: Dal'nauka, 1, 300-389. (In Russian).
- Chen, X., Belokobylskij, S.A., He, J.-H., Ma, Y., 2000. An Outline of the taxonomic studies of the subfamily Euphorinae (Excluding the genus *Meteorus* Haliday) (Hymenoptera: Braconidae) from China, with a Checklist of the Chinese species. *Entomotaxonomia* 22(1), 65-70.
- Foerster, A., 1862. Synopsis der Familien und Gattungen der Braconen. *Verh. Naturh. Ver. Preuss. Rheinl.* 19, 224-288.
- Hedqvist, K.J., 1955. Studien über Braconiden. I. Revision der Gattung *Cosmophorus* Ratz. *Ent. Tidskr.* 76: 92-98.
- Ku, D.S., Belokobylskij, S.A., Cha, J.Y., 2001. Family Braconidae. Economic Insects of Korea 16. *Ins. Koreana Suppl.* 23, 283pp.
- Ku, D.S., 2010. Family Braconidae: 174-190. In: Paek, Mun-Ki (Ed.). Checklist of Korean Insects. Nature & Ecology, Academic Series 2, 1-598.
- Nees von Esenbeck, C.G.D., 1811. *Ichneumonides adsciti*, in genera et familias divisi. *Mag. Ges. Fr. Berlin* 5, 3-37.
- Ratzeburg, J.T.C., 1848. Die Ichneumoniden der Forstinsekten in entomologischer und forstlicher Beziehung. 2, 1-238. Berlin.
- Ruschka, F., 1925. Beitrag zur Kenntnis der forstlichen Braconiden. *Zeitschrift für Angewandte Entomologie.* 11:197-202.
- Shaw, M.R., 1989. *Cosmophorus cembrae* Ruschka new to Britain (Hymenoptera: Braconidae: Euphorinae). *Entomologist's Gazette* 40, 241-243.
- Shaw, M.R., Huddleston, T., 1991. Classification and Biology of Braconid wasps (Hymenoptera: Braconidae), Handbooks for the Identification of British Insects Vol. 7, Part 11, 1-126.
- Shaw, S.R., 1985. A phylogenetic study of the subfamilies Meteorinae and Euphorinae (Hymenoptera: Braconidae). *Entomography* 3, 277-370.
- Shenefelt, R.D., 1969. Braconidae 1. Hymenoptera, Euphorinae, Cosmophorinae, Neoneurinae, Macrocentrinae. *Hymenopterorum Catalogus(nova editio)* 4, 1-176.
- Tobias, V.I., Belokobylskij, S.A., Kotenko, A.G., 1986. Subfamily Euphorinae: 181-250. In Medvedev, G.S., (Ed.), *Opredelitel' Nasekomykh Evropeiskoi Chasti SSSR, Tom III, Pereponchatokrylye, 4.- Opr. Faune SSSR 145: 1-501* (in Russian)[English translation; Keys to the Fauna of the USSR. 145, 1-883. Amerind Publishing Co. Pvt. Ltd., New Delhi.
- Watanabe, C., 1960. Discovery of *Cosmophorus klugi* Ratzeburg in Japan. (Hymenoptera, Braconidae). *Ins. Mats.* 23, 55-56.
- Watanabe, C., 1968 Notes on the genera *Cosmophorus* and *Orgilus* in Japan with description of a new species (Hymenoptera, Braconidae). *Ins. Mats.* 31, 1-6.