# NOTES ON THE GENERA COSMOPHORUS AND ORGILUS IN JAPAN WITH DESCRIPTION OF A NEW SPECIES*

## (HYMENOPTERA, BRACONIDAE)

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In the following pages are given notes on *Cosmophorus* Ratzeburg and *Orgilus* Haliday in Japan, both of which are aberrant genera of the Braconidae. In addition, a new species of *Orgilus* is described, of which the type is deposited in the collection of the Entomological Institute, Hokkaido University.

On this occasion I wish to express my sincere thanks to Dr. T. Kumata, Mr. K. Kusigemati, Dr. H. Takada and Mr. H. Watashi for their kindness in offering valuable material.

### Subfamily **Cosmophorinae**

### Genus ***Cosmophorus*** Ratzeburg

*Cosmophorus* Ratzeburg, Ichneum. Forstinsect. 2: 71, 1846. [Type-species: *Cosmophorus klugii* Ratzeburg, 1846].

*Cosmophorinus* Viereck, Canad. Ent. 57: 75, 1915. [Type-species: *Cosmophorus hopkinsii* Ashmead, 1896].

The subfamily Cosmophorinae was originally proposed by Muesebeck and Walkley (1951) for *Cosmophorus* and *Cosmophorinus*, being placed nearest to the subfamily Doryctinae in the Cyclostomine section. Recently it has been removed from that section and placed after the subfamily Euphorinae by Muesebeck (1967). Furthermore, *Cosmophorinus* was already suppressed by Muesebeck (1958) as a synonym of *Cosmophorus*.

Insofar as their habits are known, the species of this genus are endoparasites of the adults of bark beetles. The genus is represented by five species in the Palaearctic region and by four in the Nearctic region. In 1960 I discussed this genus, giving Japan as a locality of *Cosmophorus klugii*. In the following lines will be added to the fauna of Japan two other species, both of which have been known to occur in Europe. The species occurring in Japan may be distinguished by the following key:—

#### Key to the Japanese species of *Cosmophorus*

1. Head (Fig. 2) dorsally with a median longitudinal hollow broad and shallow; hind margin of head strongly concave. Antennae with 21 or 22 segments in both sexes. Hind wing (Fig. 7)

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with radial cell strongly petiolate. Abdomen with petiole long and slender, more than 2 times as long as width at apex. Ovipositor-sheath as long as half of abdomen. Larger species. Length 3 mm. . . . . 1. *regius* Niezabitowski

- Head (Figs. 1 & 3) dorsally flat without such a hollow; hind margin of head slightly concave. Antennae with less than 20 segments. Hind wing (Figs. 4 & 5) with radial cell hardly petiolate. Abdomen with petiole short and stout, less than 2 times as long as width at apex. Ovipositor-sheath longer, nearly as long as abdomen. Smaller species. . . . . 2

2. Antennae with 19, rarly 20 segments in female and 16-19 segments in male. Petiole widened towards apex, 1.5 times as long as width at apex. Length 2-2.5 mm. . . . . 2. *klugii* Ratzeburg

- Antennae 14 or 15 segments in both sexes. Petiole widened towards apex, more than 1.5 times as long as width at apex. Length 1.5-2 mm. . . . . 3. *cembrae* Ruschka

## 1. ***Cosmophorus regius*** Niezabitowski (Figs. 2 & 7)

*Cosmophorus regius* Niezabitowski, Spraw. Kom. Fizyogr., Kraków. 44: 92, ♀♂, 1910.
*Cosmophorus klugii*: Heqvist, Ent. Tidscr. 76: 93, ♀, Fig. 1, 1955.
*Cosmophorus regius*: Čapek, Act. Ent. Mus. Nat. Pragae 32: 159, ♀♂, Figs. 6-8, 1958.

This species is readily distinguishable from any other Palaearctic species of the genus by the structure of the head, by the number of the antennal segments and by the larger corpus. On the basis of the present material I give Japan as a new locality of this species. The specimens examined agree well enough with descriptions given by Heqvist (1955) and Čapek (1958). In the present specimens, however, the antennae are 22 (2♀♀) and 21 (1♂) or 22 (3♂♂) segmented. Furthermore, the species stated by Heqvist (1955) under the name of *Cosmophorus klugii* is, in reality, to be the same as the present species as Čapek (1958) already pointed out.

Japan. Hokkaido—Aizankei, 2♀♀, 4♂♂, 3-viii-66, K. Kusigemati leg.; Soranuma-dake, 1♀, 3-vii-64, H. Takada leg.

Host: In Europe the following species of bark beetles have been recorded as its hosts:—*Hylastes cunicularius* Erichhoff, *Pityophagus ferrugineus* Linné, *Polygraphus polygraphus* Linné, *Xyloterus lineatus* Olivier and *Dryocoetes hectographus* Reitter. In Japan no host has been recorded.

Distribution: Europe; Japan.

## 2. ***Cosmophorus klugii*** Ratzeburg (Figs. 1 & 4)

*Cosmophorus klugii* Ratzeburg, Ichneum. Forstinsect. 2: 72, ♀, Pl. 2, Fig. 37, 1848.
*Cosmophorus lapponicus* Heqvist, Ent. Tidschr. 76: 97, ♀, Fig. 2 C, 1955.
*Cosmophorus klugii*: Ruschka. Zeitschr. angew. Ent. 11: 198, ♀, 1925.
*Cosmophorus klugii*: Sachtleben, Beitr. Ent. 2: 156, ♀♂, 1952.
*Cosmophorus klugi*: Čapek, Act. Ent. Mus. Nat. Pragae 32: 157, ♀♂, Figs. 3-5, 1958; Watanabe, Ins. Mats. 23: 56, ♀, 1960.

In my previous paper (1960) I have discussed this species in detail, giving Japan as its locality. No further information can be given in the present state of my knowledge. Furthermore, *Cosmophorus lapponicus* Heqvist was already suppressed as a synonym of *C. klugii* by Čapek (1958).

Japan. Hokkaido—Okoppe, 2♀♀, 8-x-58, collected in gallery of *Polygraphus proximus* Bladford by Watanabe.

Host. In Europe the following species of bark-beetles have been recorded as its hosts:—*Polygraphus polygraphus* Linné, *Ips typographus* Linné, *I. amitinus* Eichhoff, *Hylurgops glabratus* Zetterstedt, *Estenoborus perrisi* Chapuius, *Dryocoetes autographus*

Ratzeburg, *Pityogenes bidentatus* Herbst, *Pityokteines vorontzovi* Jacobson and *P. spinidens* Reitter.

Distribution: Europe; Japan.

3. ***Cosmophorus cembrae*** Ruschka (Figs. 3 & 5)

*Cosmophorus cembrae* Ruschka, Zeitschr. angew. Ent. 11: 200, ♀♂, 1925.

*Cosmophorus cembrae*: Heqvist, Ent. Tidschr. 76: 96, ♀♂, Fig. 2 a & b, 1955; Čapek, Zeitschr. angew. Ent. 41: 280, ♀♂, Figs. 2–7 1957; idem, Act. Ent. Mus. Pragae, 32: 163, Figs. 1 & 14–16, 1957.

On the basis of the present material I give Japan as a new locality of this species. The specimens examined agree well with the original description of *cembrae* as well as its redescriptions given by Heqvist (1955) and Čapek (1957 & 1958) except for the following aspects:—

Head (Fig. 3) with hind margin more conspicuously concave; antennae with 15 (6 ♀♀) segments and 14 (2♂♂) or 15 (10♂♂) segments; propodeum reticulate-rugose but not so distinct as in European form, the rugosity being, in general, fainter in female than in male. Abdomen with petiole more slender, a little shorter than twice as long as width at apex. Length 1.5–1.7 mm.

Japan. Honshu—Mihara, Mie-ken, 8♀♀, 13♂♂, iv~v-67, bred from adults of *Cryphalus fulvus* by H. Watashi.

Host. In Europe the following species of bark-beetles have been recorded as its hosts:—*Pityogenes bistridentatus* Eichhoff; *Pityogenes quadridens* Hartig; *Pityokteines vorontzovi* Jacobson. In Japan the present material has been reared from adults of *Cryphalus fulvus* Niishima.

Distribution: Europe; Japan.

## Subfamily **Blacinae**

### Genus ***Orgilus*** Haliday*

*Orgilus* Haliday, Ent. Mag. 1: 202, 1833. [Type-species: *Microdus obscurator* Nees, 1812].

This genus is one of the most puzzling genera of the Braconidae, having been placed in different subfamilies by previous authors: Marshall (1885 & 1890), Dalla Torre (1898) and Szépligeti (1904) place it in the Agathidinae; Ashmead (1900), Muesebeck & Walkley (1951) and Martin (1956) in the Blacinae; Fahringer (1937) and Watanabe (1937) in the Microtypinae (=Mimagathidinae); and Granger (1949) in the Orgilinae.

On account of the clypeus normal, not forming with mandibles a mouth-opening, the occiput margined, the abdomen sessile, and the fore wing with two cubital cells, I am inclined to the opinion that *Orgilus* should be placed in the Blacinae (s. lat.), to which *Triaspis* Haliday, *Leiophoron* Nees, *Blacus* Nees, *Calyptus* Haliday and *Eubadizon* Nees are referred, too. This genus is readily distinguished from any other genera of this subfamily by the 2nd discoidal cell open at apex, by the 2nd abscissa of radius nearly straight, forming with the 1st intercubitus an almost straight line.

Insofar as their habits are known the species of this genus are endoparasites of larvae of Microlepidoptera.

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* There are several synonyms of this genus: detailed synonymy may be seen in Muesebeck & Walkley (1951).

In Japan only one species, *Orgilus longiceps*, has been known to occur. In the course of the present studies has been found another species, which is described below as new to science. These species may be distinguished by the following key:—

**Key to the Japanese species of *Orgilus***

Head (Fig. 8) more strongly compressed and longer, the hind margin being strongly concave; face more conspicuously prominent, rugose. Mesonotum punctate, with notaulices sharply impressed, crenulate. Propodeum rugose. Fore wing (Fig. 10) with radial cell smaller; 1st abscissa of radius more sharply oblique and as long as 1st intercubitus; 2nd abscissa of radius received far from apex of wing. Abdomen with 1st tergite broadened gradually to apex; two basal tergites strongly, longitudinally rugose. Ovipositor-sheath longer, as long as hind tibia and tarsus combined. Palpi dark brown: legs brownish yellow. Length 3–3.5 mm. . . . . 1. *longiceps* Muesebeck

Head (Fig. 9) normal, not so strongly compressed as in *longiceps* and shorter, the hind margin being slightly concave; face weakly prominent, shagreened. Mesoscutum shagreened, with notaulices less impressed, not crenulate. Propodeum finely rugose medially. Fore wing (Fig. 11) with radial cell larger; 1st abscissa of radius hardly oblique, as long as half of 1st intercubitus; 2nd abscissa of radius received just before apex of wing. Abdomen with 1st tergite broadened more strikingly to apex; basal two tergites finely, longitudinally rugose. Ovipositor-sheath shorter, a little shorter than hind tibia. Palpi pale yellow; legs including coxae yellow. Length 3–3.5 mm. . . . . 2. *kumatai*, sp. nov.

1. ***Orgilus longiceps*** Muesebeck (Figs. 8 & 11)

*Orgilus longiceps* Muesebeck, Proc. Ent. Soc. Wash. 35: 52, ♀♂, 1933.

*Orgilus longiceps*: Fahringer, Opus. bracon. 4: 384, 1937; Watanabe, Jour. Facul. Agr., Hokkaido Imp. Univ. 42: 97, 1937; Haeussler, U. S. Dept. Agr. Tech. Bull. No. 728: 17, 1940.

This species is readily characterized by the strongly compressed head. It has been known to be an endoparasite of the twig-infesting larvae of the Oriental fruit moth, *Grapholita molesta*, in Japan.

Japan. Honshu—Togo, Shizuoka-ken & Mito, Ibaragi-ken (after Muesebeck). Kyushu—Yukuhashi, Fukuoka-ken & Shimazaki-cho, Kumamoto-ken (after Haeussler). I had the opportunity to examine the type-series of *longiceps* in the U. S. National Museum, Washington, D. C., in 1956.

Host. *Grapholita molesta* Busck

Distribution: Japan.

2. ***Orgilus kumatai,*** sp. nov. (Figs. 9 & 11)

♀. Head (Fig. 9) transverse dorsally, normal, not so compressed as in *longiceps*; hind margin of head slightly concave; occipital carina broadly effected medially; face slightly prominent, a little shorter than broad, punctate; vertex broad, shagreened; clypeus convex; eyes twice as long as broad, not narrowing below; malar space a little longer than basal width of mandible; distance between eye and posterior ocelli 3 times as long as diameter of an ocellus; antennae as long as body, 30–31 segmented, the apical 10 segments shorter than broad.

Thorax as broad as head; mesoscutum shagreened, hairy, with notaulices impressed but not crenulate; mesoscutellum convex, almost smooth, finely shagreened; mesopleuron smooth and shining, finely shagreened below discal furrow, which is strongly crenulate. Propodeum slightly convex, almost smooth, only rugose medially. Fore wing (Fig. 11) with stigma less than one-third as broad as long; radial cell comparatively

larger than in *longiceps*; 1st abscissa of radius longer, as long as one-third of 1st intercubitus and the 2nd abscissa slightly curved outwardly, received just before apex of wing; nervulus interstitial. Hind coxa finely shagreened; inner spur of hind tibia a little shorter than half of metatarsus.

Abdomen as long as thorax; 1st tergite broadened more strikingly to apex than in *longiceps*, its apical width four-fifths as broad as long; 2nd tergite almost rectangular, 1.5 times as broad as long, finely, longitudinally rugose; 3rd tergite shorter than the 2nd, mostly smooth and shining except that the basal third is finely punctate; 4th and following tergites smooth and shining. Ovipositor-sheath a little shorter than hind tibia. Length 3–3.5 mm.

Dark brown to black; palpi pale yellow; clypeus, mandibles, prothorax, and legs including coxae yellow; hind tibia and tarsi somewhat darkened. Antennae brownish yellow, darkened towards apex. Abdomen dark brown to black dorsally and brownish yellow ventrally; 1st tergite yellowish at apex. Ovipositor-sheath dark brown. Wings subhyaline; stigma and veins brownish yellow; 2nd abscissa of cubitus colourless.

♂. Like female except that abdomen is more slender and that antennae are 28–30 segmented. Length 3 mm.

Japan. Hokkaido—Nopporo, 7♀♀ (one the holotype), ix-64, bred from larvae of *Caloptilia magnoliae* by T. Kumata; Sapporo, 6♂♂, vii-64, bred from larvae of *Gracillaria albicapitata* by T. Kumata.

Host. *Caloptilia magnoliae* Kumata & *Gracillaria albicapitata* Issiki.

This species is readily distinguished from *longiceps* by the structure of the head, by the venation of the fore wing and by the shorter ovipositor-sheath.

It is a great pleasure to name this species after T. Kumata who has collected the type-series.

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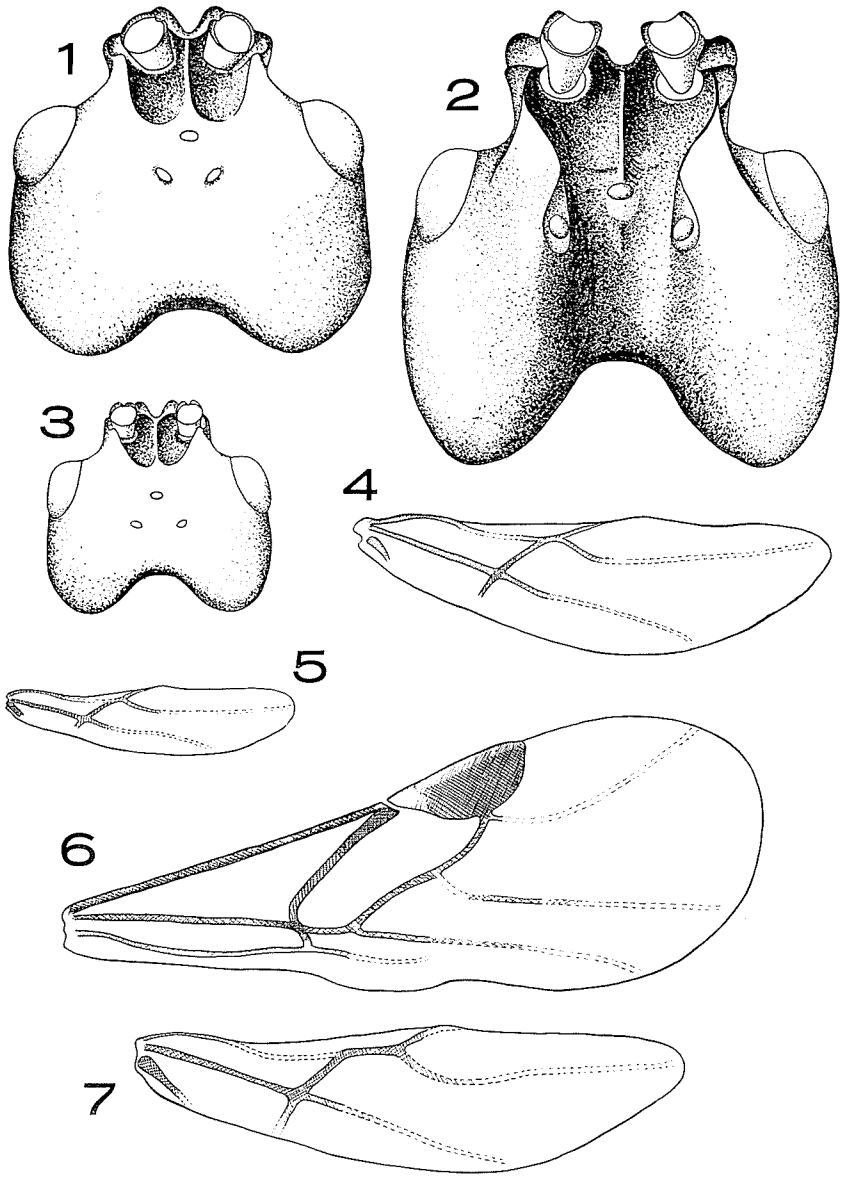
## Explanation of plates

**Plate I.** Figs. 1-3. Head (in dorsal view) of : 1. *Cosmophorus klugii* Ratzeburg ; 2. *C. regius* Niezabitowski ; 3. *C. cembrae* Ruschka. Figs. 4-5. Hind wing of : 4. *C. klugii* ; 5. *C. cembrae*. Fig. 6. Fore wing of *C. regius*. Fig. 7. Hind wing of *C. regius*.

**Plate II.** Figs. 8-9. Head (in dorsal view) of ; 8. *Orgilus longiceps* Muesebeck ; 9. *O. kumatai*, sp. nov. Figs. 10-11. Fore wing of : 10. *O. longiceps* ; 11. *O. kumatai*, sp. nov.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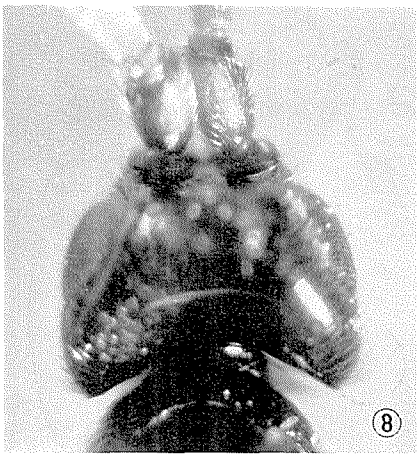
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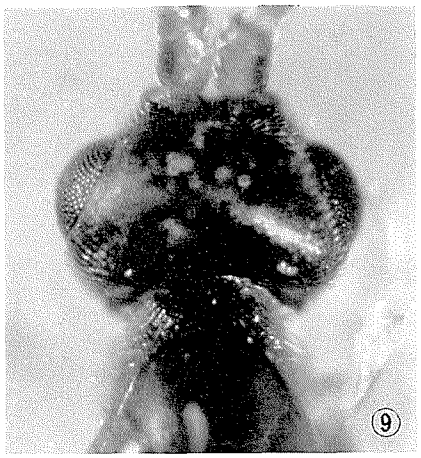
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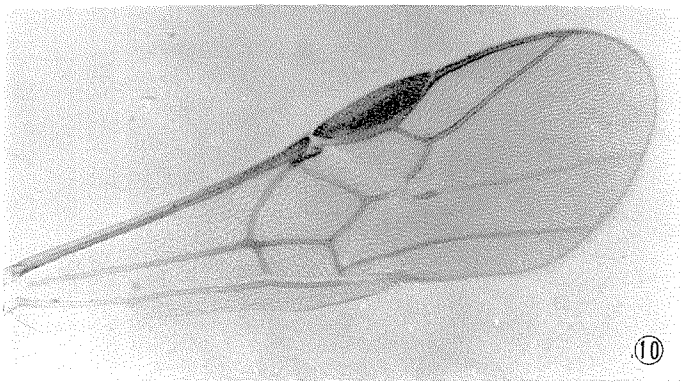
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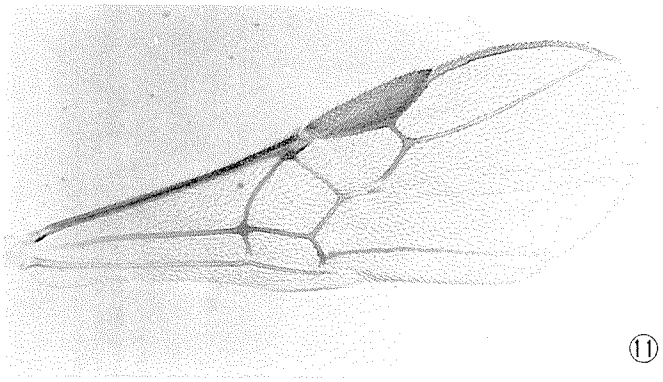
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