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## A REVISION OF THE SPECIES OF THE GENUS *COELOIDES* WESMAEL OCCURRING IN JAPAN, WITH DESCRIPTION OF A NEW SPECIES

(Hymenoptera, Braconidae)

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The genus *Coeloides* WESMAEL, a small group of the subfamily Braconinae, is represented by ten species in the Palaearctic fauna and by ten species in the Nearctic fauna. Insofar as their habits are known, the species belonging to this genus appear to be parasitic on the larvae of xylophagous Coleoptera, e. g., various species of Ipidae and *Pissodes*-species of Curculionidae. Up to the present time, only one species, *Coeloides scolyticida* WESMAEL, has been recorded in Japan. In this paper two other species are added to the fauna, one of these being new to science.

Before going further, the writer wishes to express his hearty gratitude to Prof. Dr. HANS SACHTLEBEN, of the "Deutsches Entomologisches Institut", Berlin, for his kindness in offering valuable advice. Thanks are also due to the Department of Agriculture and Forestry of Japan for their financial assistance.

### Genus *Coeloides* WESMAEL

*Coeloides* WESMAEL, Nouv. Mém. Acad. Sci. Bruxelles 11: 59, 1838.

[Genotype: *Coeloides scolyticida* WESMAEL].

*Syntomomelus* KOKUJEW, Rev. Russe Entom. 3: 163, 1902.

[Genotype: *Syntomomelus rossicus* KOKUJEW].

*Habrobraconidea* VIERECK, Proc. U. S. Nat. Mus. 43: 578, 1912.

[Genotype: *Habrobraconidea bicoloripes* VIERECK].

*Coeloidina* VIERECK, Proc. U. S. Nat. Mus. 59: 133, 1921.

[Genotype: *Coeloides melanotus* WESMAEL].

*Cerobracon* VIERECK, Canad. Entom. 58(3): 54, 1926.

[Genotype: *Bracon secundus* DALLA TORRE].

The nomenclature of the genus is more or less in a state of confusion. Recently, this problem has been stated by HINCKS,<sup>1,2</sup> SHENEFELT,<sup>3</sup> MUESEBECK and WALKLEY,<sup>4</sup> and SACHTLEBEN.<sup>5</sup> Then, in the present paper the writer prefers to use the name *Coeloides* for this genus as those recent authors adopted.

This genus can be distinguished from the genus *Atanycolus* FOERSTER and other allied genera by the following combination of the characters:—

Head subcubical; front between antennae and ocelli distinctly impressed; no furrow present between mandibles and face. Scape simple, not rimmed at apex; pedicel as long as 1st segment of flagellum; 1st or 1st and 2nd segments of flagellum flaring apically on one side. Propodeum without a median longitudinal carina. Radius reaching top of wing; nervulus interstitial. Abdomen elongate-elliptical; 2nd tergite with lateral oblique diverging furrows and without a distinct median raised area; suturiform articulation distinct, smooth or crenulate; ovipositor prominently exerted.

The species known to occur in Japan can be distinguishable by the following key:—

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

1. First segment of flagellum flaring at apex, distinctly shorter than 2nd; recurrent nervure just received into 1st cubital cell or interstitial; 2nd tergite as long as 3rd; suturiform articulation crenulate; ovipositor apparently longer than body; hypopygium slender, extending far beyond apex of abdomen. Length 3~5 mm. (♂), 3.5~6 mm. (♀). . . . . *japonicus*
- First and 2nd segments of flagellum flaring at apex, 1st being a little longer than 2nd; recurrent nervure received into 1st cubital cell far distant from apex; 2nd tergite short, as long as half of 3rd; suturiform articulation smooth; ovipositor as long as or shorter than body; hypopygium stout, extending just beyond apex of abdomen. . . . . 2
2. Third segment of flagellum slightly flaring at apex; antennae with 37~40 segments in male, 40~44 segments in female; legs dark brown to black; wings subfuscous; ovipositor as long as body. Length 3~5 mm. (♂), 4~6 mm. (♀). . . . . *scolyticida*
- Third segment of flagellum simple; antennae with 31~37 segments in both sexes; legs brown to dark brown; wings subhyaline; ovipositor as long as thorax and abdomen united. Length 2.5~4 mm. (♂), 3~5 mm. (♀). . . . . *bostrichorum*

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1. Entomologist 76: 97, 1943.
  2. Proc. Roy. Entom. Soc. London (B) 13: 31, 1944.
  3. Research Studies State Coll. Washington 11: 160, 1943.
  4. MUESEBECK, C. F. W., K. V. KROMBEIN, H. K. TOWNES and others: Hymenoptera of America North of Mexico—Synoptic Catalog. Agric. Monogr. U. S. Dept. Agric. 2: 160, 1951.
  5. Beit. Entom. 2 (2/3): 153, 1952.

1. *Coeloides japonicus* sp. nov. (fig. 1, A & fig. 2, A)

♀. Head reddish yellow; palpi brownish yellow; stemmaticum and tips of mandibles black; vertex with a large black spot; antennae black, with three basal segments brownish. Thorax black, with prothorax and tegulae reddish yellow; propodeum black. Fore legs reddish yellow; middle and hind legs black, with articulations brownish. Wings subfuscous, with a hyaline strip beneath stigma; stigma and veins dark brown. Abdomen black, with venter pale yellow; ovipositor sheath black.

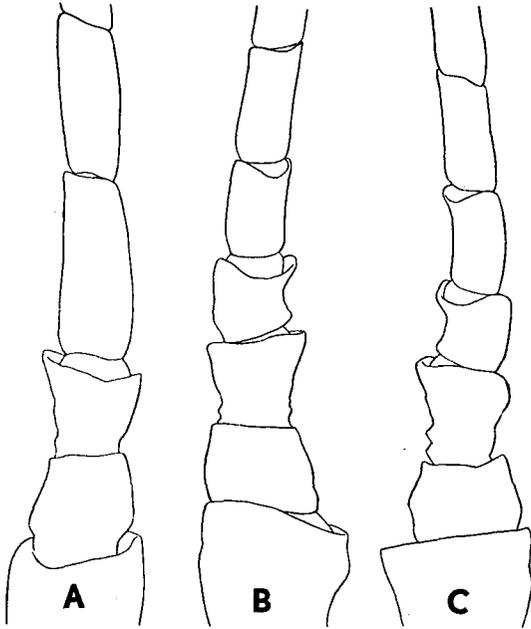


Fig. 1. Antenna (basal segments) of :

- A. *Coeloides japonicus* sp. nov. (♀).
- B. *Coeloides bostrichorum* GIRAUD (♀).
- C. *Coeloides scolyticida* WESMAEL (♀).

Head subcubical, smooth and shining; front between antennae and ocelli impressed; eyes large, their longer diameter 2 times as long as malar space. Antennae with 28~38 segments (holotype with 36 segments); scape simple, 2 times as long as apical breadth; pedicel as long as half length of scape; 1st segment of flagellum as long as pedicel, flaring apically on one side; 2nd segment simple, 2 times as long as 1st, and slightly longer than 3rd. Thorax smooth and shining; parapsidal furrows weakly defined apically, smooth; scutellum flattened, with

scutellar sulcus crenulate; praepectus of mesopleuron and metapleuron densely pubescent; mesopleural furrow wanting. Propodeum smooth and shining, without a median longitudinal carina. First abscissa of radius as long as half length of 2nd; recurrent nervure just received into 1st cubital cell or interstitial; 1st cubital cell distinctly petiolate. Legs of normal form; hind tibial spurs curved, as long as one-fifth of metatarsus. Abdomen smooth and shining; 1st tergite slightly convex, gradually widened towards apex, with lateral furrows between median plate and lateral carinae crenulate, the median length being 1.5 times as long as apical breadth; 2nd tergite with oblique furrows well marked, the apical breadth being 1.5 times as long as median length; suturiform articulation bisinuate, crenulate (in small examples crenulate element is much reduced); 3rd

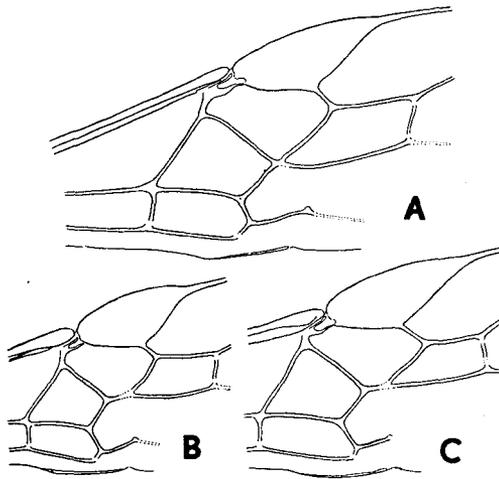


Fig. 2. Fore wing (part) of:

- A. *Coeloides japonicus* sp. nov. (♀).
- B. *Coeloides bostrichorum* GIRAUD (♀).
- C. *Coeloides scolyticida* WESMAEL (♀).

tergite as long as 2nd; hypopygium slender, extending far beyond apex of abdomen; ovipositor longer than body.

Length 3.5~6 mm.; ovipositor length 3.8~6.5 mm.

♂. Like female except for usual sexual differences, but antennae with 26~36 segments (allotype with 35 segments) and wings subhyaline, lighter in colour than in female.

Length 3~5 mm.

Holotype (♀), allotopotype (♂) and paratopotypes (17 ♀♀, 17 ♂♂): Tomuraushi, Tokachi, Hokkaido, 25~27, VIII, 1954, C. WATANABE leg., emerged from borings

in the swamp ash, *Fraxinus mandschurica* RUPR. var. *japonica* MAXIM., made by *Hylesinus* sp. Paratypes (3 ♀♀, 3 ♂♂): Sapporo, 10, VII, 1939, T. SAWAMOTO leg., bred from *Hylesinus* sp.

Types are deposited in the collection of the Entomological Institute, Hokkaido University, Sapporo.

Host: *Hylesinus* sp.

This species is closely related to *Coeloides melanotus* WESMAEL<sup>1</sup>, from which it is immediately distinguished in having the 2nd tergite as long as the 3rd, and the suturiform articulation crenulate. It also resembles *Coeloides rossicus* (KOKUJEW),<sup>2</sup> but the most obvious differences between them lie in the number of antennal segments, the sculpture of the basal tergites and the size of the body.

## 2. *Coeloides scolyticida* WESMAEL (fig. 1, C & fig. 2, C)

*Bracon initiator* FABRICIUS var.  $\gamma$  NEES, Hymen. affin. Monogr. 1: 102, 1834.

*Bracon initiator* WESMAEL, Nouv. Mém. Acad. Sci. Bruxelles 9: 60, 1838 (nec FABRICIUS).

*Coeloides scolyticida* WESMAEL, Nouv. Mém. Acad. Sci. Bruxelles 9: 220, 1838; RATZBURG, Ichneum. Forstinsect. 3: 41, 1852; GIRAUD, Ann. Soc. Entom. France (5) 2: Bull. p. X, 1852; MARSHALL, Trans. Entom. Soc. London p. 67, 1885; MARSHALL, Spec. Hymén. Europe 4: 222, 1888; THOMSON, Opusc. Entom. p. 1845, 1892; DALLA TORRE, Cat. Hymen. 4: 254, 1898; SZÉPLIGETI, Gen. Insect. 22: 19, 1904; FAHRINGER, Opusc. Bracon. 1: 149, 1926; TELENGA, Faune de l'URSS, Hymén. 5(2): 79, 1936; WATANABE, Jour. Facul. Agric., Hokkaido Imp. Univ. 42: 14, 1937; SACHTLEBEN, Beit. Entom. 2(2/3): 155, 1952; STARY, Act. Soc. Entom. Cechosloveninae 54(3): 281, 1957.

*Bracon iniatellus* RATZBURG, Ichneum. Forstinsect. 2: 39, 1848.

The following brief description, together with the characters given in the key, will readily distinguish the species:—

♀. Head reddish yellow; tips of mandibles, palpi and stemmaticum black; antennae black, the basal segments being brownish. Thorax black, with prothorax reddish yellow. Wings subfuscous with a hyaline strip beneath stigma. Legs dark brown to black, the fore legs being brownish. Abdomen reddish yellow, the median plate of 1st tergite being black.

Head and thorax smooth and shining; parapsidal furrows slightly defined apically, smooth; scutellar sulcus slightly crenulate. Abdomen smooth and shining; median plate of 1st tergite nearly parallel-sided, with lateral furrows smooth; 2nd tergite short, as long as half of 3rd.

♂. Darker in colour than in female; prothorax brown; abdomen brown, darkened toward apex. Wings lighter in colour than in female.

Specimens examined: Hokkaido (Sapporo, 8 ♀♀, 24, VII, 1915, S. MATSUMURA leg., bred from *Scolytus esuriens*. Sapporo, 1 ♀, 2 ♂♂, 28, V, 1948, K.

1. Nouv. Mém. Acad. Sci. Bruxelles 11: 61, 1838.

2. Rev. Russe Entom. 2: 164, 1902 (as *Syntomomellus rossicus*).

KOSUGI leg. Tomuraushi, 10 ♀♀, 5 ♂♂, 25~27, VIII, 1954, C. WATANABE leg.).

Host: *Scolytus esuriens* BLANDFORD (in Japan).

In a previous paper (1937) the writer gives *Ips japonicus* NIISIMA as a host of this species. In the course of the present studies, however, he has found that the specimens bred from *Ips japonicus* should be referable to *Coeloides bostrichorum* GIRAUD. Furthermore, this species is a well-known parasite of *Scolytus scolytus* FABRICIUS in Europe.

Distribution: Europe, Siberia and Japan.

### 3. *Coeloides bostrichorum* GIRAUD (fig. 1, B & fig. 2, B)

*Coeloides bostrichorum* GIRAUD, Ann. Soc. Entom. France (5) 2: Bull. p. X, 1892; SACHTLEBEN, Beit. Entom. 2(2/3): 153, 1952; STARY, Act. Soc. Entom. Cechosloveninae 54 (3): 280, 1957.

*Coeloides bostrychorum* MARSHALL, Spec. Hymén. Europe 5(B): 112, 1897; SZÉPLIGETI, Gen. Insect. 22: 19, 1904; FAHRINGER, Opusc. Bracon. 1: 147, 1926; TELENGA, Faune de l'URSS, Hymén. 5 (2): 80, 1936.

*Coeloides scolyticida* DALLA TORRE, Cat. Hymen. 4: 253, 1898; WATANABE, Jour. Facul. Agric., Hokkaido Imp. Univ. 42: 14, 1937 (partim).

*Coeloides scolyticida* TAMANUKI, On the Bark-beetles of Spruce-fir in Southern Saghalien (Publication of the "Karafuto-cho, Shokusan-bu, Rinmu-ka") p. 47, fig. 16, 1940 (nec WESMAEL).

This species is closely allied to *C. scolyticida*, from which it can be immediately distinguished by means of the characters given in the key. In general, the species is darker in colour than in *scolyticida*: head reddish brown to brown; vertex with a large fuscous spot; prothorax brown; abdomen brown to dark brown, sometimes reddish yellow in the female.

Specimens examined: Saghalien (Horo, 19 ♀♀, 24, VII, 1933, 13 ♀♀, IX, 1933, K. TAMANUKI leg., bred from *Ips typographus*). Hokkaido (Tarumae, 1 ♀, 13, VIII, 1954, M. KONISHI leg., Antaroma, 3 ♀♀, 7, IX, 1957, C. WATANABE leg., Tomakomai, 3 ♀♀, 5 ♂♂, 30, VII, 1957, T. NAKASHIMA leg., Jōzankei, 2 ♀♀, 2 ♂♂, 8, VII, 1956, K. KAMIJO leg., Chitose, 3 ♀♀, 4 ♂♂, 14, IX, 1955, C. WATANABE leg., all specimens bred from *Ips typographus*. Garugawa, 4 ♀♀, 1 ♂, 24, V, 1949, C. WATANABE leg., bred from *Ips cembrae*).

Hosts: *Ips typographus* LINNÉ (= *Ips japonicus* NIISIMA) (in Saghalien and Japan) and *Ips cembrae* HEER (in Japan).

Furthermore, SACHTLEBEN (1952) gives the following species of Ipinae as hosts of this species in Europe:—

*Carphoborus minimus* FABRICIUS, *Ips amitinus* EICHHOFF, *I. cembrae* HEER, *I. duplicatus* SCHLBERG, *I. sedentatus* BOERNER, *I. typographus* LINNÉ, *Orthotomicus laricis* FABRICIUS, *O. proximus* EICHHOFF and *Pityokteines curvidens* GERMAR.

Distribution: Europe, Saghalien and Japan.