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Author(s)	Watanabe, Chihisa
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# HYMENOPTEROUS PARASITES OF THE MULBERRY PYRALID MOTH, *MARGARONIA PYLOALIS* WALKER, IN JAPAN (I)

By

CHIHISA WATANABE

(渡邊千尙)

(With 3 Textfigures)

After the writer had described the previously recorded species of the Hymenopterous parasites of the Mulberry Pyralid Moth, *Margaronia pyloalis* WALKER, (Kontyû, XIII, pp. 231-236, 1939), he commenced work on the species which are found in Japan. In this paper eight species including one Bethyloid, two Ichneumonids and five Braconids are described, one of which is new to science and two of which are new as parasites of the Mulberry Pyralid Moth.

The writer is much indebted to the Foundation for the Promotion of Science and Industrial Research of Japan (Nippon Gakujutsu Shinkôkai) for its kind assistance, also to Dr. C. F. W. MUESEBECK of the Bureau of Entomology and Plant Quarantine, Washington, D.C., U.S.A. and to Dr. TOICHI UCHIDA, professor of the Hokkaido Imperial University, for their kindness in determining certain species. Furthermore, he has to thank Mr. MASUO KUROSAWA of the Kyoto College of Sericulture, Mr. MICHITOSHI MATSUZAKI of the Fukuoka Sericultural Experiment Station and Mr. JINHAKU SONAN of the Taihoku Agricultural Experiment Station of the Government of Formosa who have very kindly presented valuable specimens to him.

## Family *BETHYLIDAE*

### *Goniozus japonicus* ASHMEAD

*Goniozus japonicus* ASHMEAD, Jour. New York Ent. Soc., XII, p. 67, ♀ (1904); KIEFFER, Das Tierreich, *Bethylidae*, p. 526, ♀ (1914); WATANABE, Kontyû, XIII, p. 231 (1939).

This species was originally described by W. H. ASHMEAD from Gifu, Japan, without host record, and the type is preserved in the United States National Museum. The writer has not examined the type, but his observations have convinced him that the present material bred from *Margaronia pyloalis* WALKER might be identical with *Goniozus japonicus*. Furthermore, it was Dr. C. F. W.

MUESEBECK who gave to the writer a good suggestion with regard to the identification. MUESEBECK's letter reads as follows:—

"The single specimen of *Goniozus* which you sent seems to me to be *Goniozus japonicus* ASHMEAD. Unfortunately ASHMEAD's two type specimens are in poor condition but enough of the sculpture and structure can be made out to enable one to be reasonably certain of the species they represent. We have in the collection other specimens, some of them from Japan, which I had previously identified as *japonicus* and which agree exactly with the single individual you forwarded."

As a supplement to the original description the following aspects may be added:—

♀. Black; mandibles, palpi and antennae testaceous or red-testaceous; tegulae black; wings hyaline; stigma and parastigma dark brown; nervures pale; legs testaceous or red-testaceous; coxae and femora dark brown to black, the fore femora usually darker than the other ones.

Head as viewed from above subquadrate, triangularly produced in front of the eyes, convergent behind the eyes; surface shining, finely alutaceous, sparsely

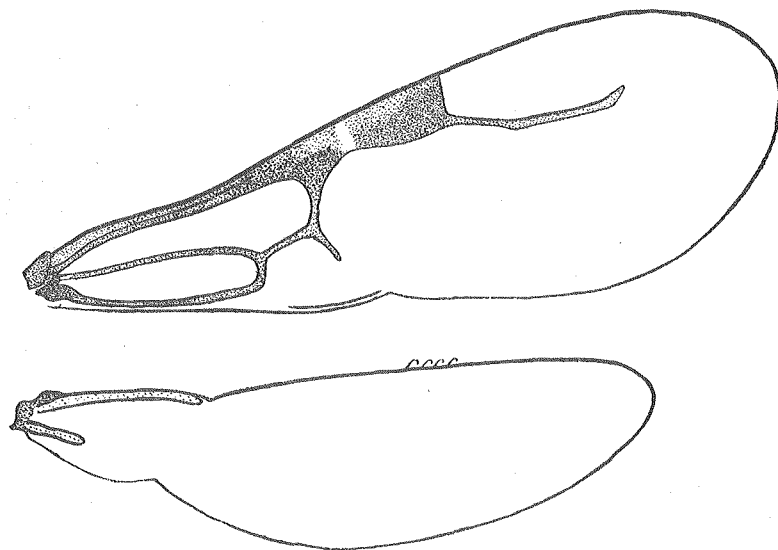


Fig. 1

Wings of *Goniozus japonicus* ASHMEAD (♀)

punctured, with pale hairs; clypeus triangularly produced at the apex, with a median keel; antennae moniliform, 13-jointed. Thorax sculptured like the

head; prothorax finely striate laterally. Propodeum shagreened; dorsal surface about quadrate, defined at the lateral sides and posteriorly by weak carinae, with a triangular median basal area which is smooth and shining; posterior surface subquadrate, narrowed towards the apex, broadly smooth and shining medially, defined laterally by carinae, the sculpture weaker than that of the dorsal surface. Stigma truncate at the apex, 2 times as long as broad; radius inserted at the apex of the stigma, 2.5 times as long as the stigma; radial cell open; basal nervure with a branch which is a little shorter than the apical portion of the basal nervure; anal nervure of the hind wing less than one-half the length of the costal nervure. Legs rather stout; femora dilated; claws split. Abdomen subpetiolate, smooth and shining, with sparse pubescence; 1st tergite slightly excavated at the base.

Length, 2.5–3 mm.

♂. Unknown.

Host: The present material was bred by M. KUROSAWA at Kyoto and by M. MATSUZAKI at Fukuoka as a parasite of *Margaronia pyloalis* WALKER.

Cocoon: Brown, ellipsoidal,  $4.5 \times 2.5$  mm. in size.

Habitat: Honshu (Kyoto, 4 ♀♀, 11. IX, 1938, M. KUROSAWA leg.); Kyushu (Fukuoka, 4 ♀♀, 31. VIII, 1939, M. MATSUZAKI leg.).

General Distribution: Japan.

Remarks: This species comes nearest to *Goniozus claripennis* (FÖRSTER)<sup>1</sup>, a common species in Europe, but differing from it by the nervation of the hind wing.

### Family *ICHNEUMONIDAE*

The following two Ichneumonid species are kindly determined by Dr. T. UCHIDA.

#### *Epiurus persimilis* ASHMEAD

*Epiurus persimilis* ASHMEAD, Proc. U. S. Nat. Mus., XXX, p. 180, ♀ (1906); UCHIDA, Jour. Facul. Agr., Hokkaido Imp. Univ., XXV, p. 62, ♂ (1928); MATSUMURA, 6000 Ill. Insect. Japan-Empire, p. 46, fig. 247, ♀ (1931); UCHIDA, Ins. Mats., IX, p. 84 (1935), XI, p. 54 (1936); WATANABE, Kontyû, XIII, p. 234 (1939).

Host: This series was bred by M. KUROSAWA at Kyoto as a parasite of *Margaronia pyloalis* WALKER. According to M. SHIMIZU<sup>2</sup> this species is an exoparasite of the larva of *Margaronia pyloalis*, two or three eggs being laid

1) Verh. Naturh. Ver. Preuss. Rheinl., VIII, p. 7 (1851); RICARDS, Trans. Roy. Ent. Soc. London, Vol. 89, p. 330, ♀, fig. 107 (1939).

2) Kontyû, VI, pp. 169–171 (1932).

on the surface of the host-larva or on the leaf of the mulberry near the host. This species is also recorded by Dr. T. UCHIDA as a parasite of *Samia cynthia* DRURY and *Sylepta balteata* FABRICIUS in Japan and as a parasite of *Sylepta derogata* FABRICIUS in China.

Habitat: Honshu (Kyoto, 5 ♂♂, 18. IV, 1938; 2 ♀♀, 6 ♂♂, 15.-21. IV, 1939, M. KUROSAWA leg.).

Gen. Distr.: Saghalien; Japan; Korea; China.

### ***Spilocryptus japonicus* UCHIDA**

*Spilocryptus japonicus* UCHIDA, Jour. Facul. Agr., Hokkaido Imp. Univ., XXV, p. 314, ♀♂, Pl. VI, fig. 12 (1930); MATSUMURA, 6000 Ill. Insect. Japan-Empire, p. 66, fig. 368, ♀ (1931); ISHII, Nippon Konchu Zukan, p. 397, ♀, fig. 774 (1932); UCHIDA, Ins. Mats., XI, p. 6 (1936).

Host: This series was bred by M. KUROSAWA at Kyoto as a solitary parasite of *Margaronia pyloalis* WALKER. Further, according to Dr. T. UCHIDA this species is parasitic on *Chilo simplex* BUTLER.

This is the first record of the species as a parasite of *Margaronia pyloalis* WALKER.

Habitat: Honshu (Kyoto, 2 ♂♂, 16. IV, 1938, 2 ♀♀, 17. IV, 1938, M. KUROSAWA leg.).

Gen. Distr.: Japan.

## Family **BRACONIDAE**

### ***Chelonus tabonus* SONAN**

*Chelonus tabonus* SONAN, Trans. Nat. Hist. Soc. Formosa, XXII, p. 71, ♀♂ (1932); WATANABE, Ins. Mats., VIII, p. 196, ♀♂ (1934), X, p. 47, ♀♂ (1935); id., Jour. Facul. Agr., Hokkaido Imp. Univ., XLII, p. 70, Pl. V, fig. 14 (1937).

*Chelonella yami* SONAN, Trans. Nat. Hist. Soc. Formosa, XXII, p. 74, ♀ (1932).

*Chelonus inanitus* WATANABE, Kontyû, VII, p. 247, ♀♂ (1933) (nec LINNÉ).

Host: This series was bred by M. KUROSAWA at Kyoto as a solitary parasite of *Margaronia pyloalis* WALKER. Further, *Sylepta derogata* FABRICIUS is recorded as a host of this species in Japan and North China.

This is the first record of the species as a parasite of *Margaronia pyloalis* WALKER.

Habitat: Honshu (Kyoto, 1 ♀, 1 ♂, 17. VI, 1938, M. KUROSAWA leg.).

Gen. Distr.: Japan; Formosa; North China.

### ***Phanerotoma planifrons* (NEES)**

*Sigalphus planifrons* NEES, Magaz. Ges. Naturf. Fr. Berlin, VII, p. 259, Pl. IV, fig. 3 (1813).

*Chelonus planifrons* NEES, Hymen. Ichneum. affin. Monogr., I, p. 281 (1834).

*Phanerotoma planifrons* MARSHALL, Spec. Hymén. Europe, IV, p. 381, ♀ ♂ (1889); LYLE, Entomologist, LVII, p. 102, fig. 2 (1924); FAHRINGER, Opusc. bracon., III, p. 573, ♀ ♂ (1934); WATANABE, Jour. Facul. Agr., Hokkaido Imp. Univ., XLII, p. 79 (1937); id., Ins. Mats., XII, p. 132, ♀ ♂ (1938); id., Kontyû, XIII, p. 232 (1939).

*Chelonus diversus* WALKER, Cist. ent., I, p. 308, ♂ (1874).

*Phanerotoma flavida* ENDERLEIN, Ent. Mitt., I, p. 259, ♀ ♂ (1912).

*Phanerotoma bicolor* SONAN, Trans. Nat. Hist. Soc. Formosa, XXII, p. 81, ♀ (1932).

*Phanerotoma grapholithae* MUESEBECK, Proc. Ent. Soc. Washing., XXXV, p. 50, ♀ ♂ (1933).

*Phanerotoma formosana* ROHWER, Proc. Ent. Soc. Washing., XXXVI, p. 45, ♂ (1934).

This species is widely variable in size and colour: the present material bred from *Margaronia pyloalis* WALKER belongs to a large and nigrescent form, its description being as follows:—

♀ ♂. Red-testaceous; head, thorax and propodeum tinged with dark brown in various degree; abdomen pale testaceous, the 2nd tergite laterally and the 3rd entirely dark brown to black; wings hyaline, with a fine cloud below the stigma; stigma brown, pale at the base; hind tibiae fuscous at the apex.

Length, 5–5.5 mm.

Host: The present series was bred by M. KUROSAWA as a solitary parasite of *Margaronia pyloalis* WALKER. According to M. KUROSAWA and K. MABUCHI<sup>1)</sup> the egg of this species is laid in the egg of *Margaronia pyloalis*, the larva just pupating when the host-larva has attained full growth. Further, this species is widely distributed in the Eurasian region, the following host-species being represented:—

*Grapholitha strobilella* LINNÉ and *Hyphantidium terebrella* ZINCKEN (after FAHRINGER, 1934, in Europe); *Grapholitha molesta* BUSCK (after MUESEBECK, 1933, in Japan and Korea); *Margaronia pyloalis* WALKER (after ROHWER, 1934, in Formosa); *Grapholitha glycinivorella* MATSUMURA (after WATANABE, 1938, in Manchoukuo).

Cocoon: Pure white, covered with a thin web, 7 × 3 mm. in size.

Habitat: Honshu (Kyoto, 11 ♀, 9 ♂ ♂, VI, 1938, M. KUROSAWA leg.).

Gen. Distr.: Japan; Korea; Formosa; Europe; West and Central Asia; Siberia; North Africa; Manchoukuo; Ceylon.

### ***Apanteles minor* (ASHMEAD)**

*Glyptapanteles minor* ASHMEAD, Proc. U. S. Nat. Mus., XXX, p. 192, ♀ (1906).

*Apanteles minor* WATANABE, Ins. Mats., VII, p. 99 (1932); FAHRINGER, Opusc. bracon., IV, p. 241, ♀ (1935); WATANABE, Jour. Facul. Agr., Hokkaido Imp. Univ., LXII, p. 127 (1937).

*Apanteles* sp. WATANABE, Kontyû, XIII, p. 233, no. 10 (1939).

This species was originally described by W. H. ASHMEAD from Gifu, Japan,

1) Kinugasa Sampô, XXXIV, pp. 33–43 (1939).

and the type-specimens are preserved in the United States National Museum.

Through the kindness of Dr. C. F. W. MUESEBECK, the writer knows that the present material may be identical with *Apanteles minor* (ASHMEAD). The following is a redescription of this species:—

♀. Black; antennae red-testaceous to reddish brown, darkened towards the apex; mouthparts, tegulae, legs, 1st to 3rd tergites laterally and venter except apically red-testaceous; hind coxae more usually dark brown, somewhat red-testaceous at the apex, very occasionally almost completely red-testaceous; hind tibiae slightly fuscous apically; 3rd tergite normally black with red-testaceous lateral margins, sometimes broadly red-testaceous; palpi and tibial spurs

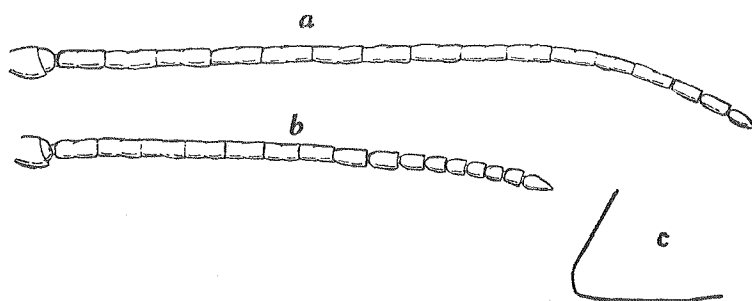


Fig. 2

*Apanteles minor* (ASHMEAD)

a. Antenna (♂) b. Antenna (♀) c. Hypopygium (viewed from the side) (♀)

pale; wings hyaline; stigma and veins dark brown. Antennae, hind coxae and 3rd tergite variable in colour.

Head minutely punctate; vertex smooth and shining; antennae a little shorter than the combined length of the thorax and abdomen, submoniliform; mesonotum minutely punctate, the punctation becoming weaker and sparser posteriorly; mesopleura smooth and shining, with punctures along the anterior margin; scutellum smooth and shining, with scattered minute punctures; propodeum smooth, sparsely punctate basally, without a median carina. Breadth of the stigma as long as the 1st abscissa of the radius, which forms a strong angle with the intercubitus; recurrent nervure nearly equal to the intercubitus in length; pigmented portion of the 2nd abscissa of the cubitus as long as the apical portion of the 1st abscissa of the cubitus. Hind coxae smooth, with the outer face minutely punctate; the longer hind tibial spur three-fifths and the shorter spur just less than one-half the length of the hind metatarsus. First tergite smooth and shining, slightly excavated at the base, with some

scattered minute punctures, 2.5 times as long as broad, its lateral margins very slightly converging towards the apex; 2nd tergite a little shorter than the 3rd, smooth and shining, often with some minute punctures, the discal sulci distinctly marked, straight; 3rd and following tergites smooth and shining; hypopygium (as viewed from the side) rounded at the apex, not acute; ovipositor-sheath as long as the hind metatarsus.

Length, 2.5–3 mm.

The male was not previously known. It differs from the female as follows:—

♂. Darker than the female in colour; antennae longer than the body, normally filiform.

Length, 2–2.5 mm.

Host: The present specimens were bred by M. KUROSAWA at Kyoto and by J. SONAN at Taihoku as a gregarious parasite of *Margaronia pyloalis* WALKER; in KUROSAWA's collection it is found that as many as from 9 to 13 individuals occur in a single host-larva.

Cocoons: Pure white, with some loose silk, usually attached irregularly to the leaf of the mulberry.

Habitat: Honshu (Kyoto, 9 ♀♀, 8 ♂♂, X, 1938; 40 ♀♀, 12 ♂♂, XII, 1938, M. KUROSAWA leg.); Formosa (Taihoku, 4 ♀♀, 1 ♂, 10. VI, 1936, J. SONAN leg.).

Gen. Distr.: Japan; Formosa.

Remarks: This species belongs to MARSHALL's Section IV or WILKINSON's Group A, and may be placed nearest to *Apanteles glyphodes* WILKINSON<sup>1)</sup>, a parasite of the Pyralid, *Glyphodes sericea* DRURY, in Uganda, differing from that species in the sculpture of its 1st and 2nd tergites and in the antennae of its female being submoniliform.

***Apanteles kurosawai* sp. nov.**

*Apanteles* sp. WATANABE, Kontyû, XIII, p. 233, no. 9 (1939).

♀. Black; antennae entirely black; tegulae black; palpi and tibial spurs pale; wings hyaline; stigma discally hyaline, narrowly margined with pigmentation; costal nervures, outer margin of the stigma and metacarp dark brown; inner margin of the stigma, radius, intercubitus and pigmented portion of the 2nd abscissa of the cubitus brownish, the remaining nervures almost colourless; legs black; apical two-thirds of the fore femora, and their tibiae and tarsi red-testaceous; tibiae and tarsi of the middle legs, hind tibiae at the base and their tarsi sometimes tinged with brown.

1) Trans. Ent. Soc. London, LXXX, p. 306, ♀ ♂ (1932).



Head closely punctate; antennae a little shorter than the body, filiform. Mesonotum closely punctate, the punctation rather stronger than that of the head; scutellum with some indefinite punctures; mesopleura smooth and shining posteriorly and on the anterior half closely punctate; propodeum rugosely reticulate with the areola and costulae well marked, the areola open at the base, U-shaped at the apex. Breadth of the stigma as long as the radius which

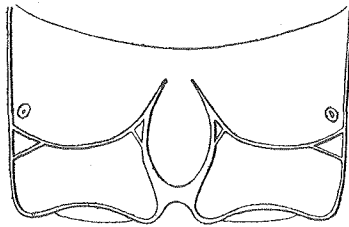


Fig. 3

*Apanteles kurosawai* sp. nov. (♀)  
Areolation of the propodeum

forms a slight angle with the intercubitus; recurrent nervure as long as the intercubitus; pigmented portion of the 2nd abscissa of the radius a little longer than half the length of the intercubitus. Hind coxae with sparse, minute punctures; the longer hind tibial spur as long as one-half, the shorter spur less than two-fifths the length of the hind metatarsus. First tergite 1.5 times as long as broad, parallel-sided, basally excavated, apically turned over, longitudinally striate laterally and rugosely reticulate medially, with a smooth median apical knob; 2nd tergite minutely striate, with the lateral sulci very short; 2nd suture strongly rounded outwardly; 3rd tergite 1.5 times as long as the 2nd; 3rd and following tergites smooth and shining; hypopygium sharply acute at the apex; ovipositor-sheath as long as the hind femur.

Length, 2.5–3 mm.

♂. Differs from the female, apart from the usual sexual differences, in the following respects:—

Antennae longer than the body; stigma paler than that of the female; 1st tergite slightly rounded at the lateral margins, rugosely reticulate throughout, not longitudinally striate laterally, with a smooth median apical knob; 2nd tergite almost smooth, with some scattered minute punctures.

Length, 2–2.5 mm.

Host: This type-series was bred by M. KUROSAWA as a solitary parasite of *Margaronia pyloalis* WALKER.

Cocoon: Pure white, with some loose silk, usually attached to the leaf of the mulberry.

**Holotype** (♀) & **Allotype** (♂), Kyoto, 29. X, 1938, M. KUROSAWA leg. **Paratypes**, Kyoto, 1 ♂, 5. IX, 1938, 1 ♀, 1 ♂, 10. X, 1938, 1 ♀, 20. X, 1938, 1 ♀, 1 ♂, 25. X, 1938, 1 ♂, 27. X, 1938, 1 ♀, 28. X, 1938, 2 ♀ ♀, 29. X, 1938, 3 ♀ ♀, 2 ♂ ♂, 31. X, 1938, M. KUROSAWA leg.

The type-specimens are deposited in the Entomological Institute of the Hokkaido Imperial University, Sapporo.

**Habitat:** Honshu (Kyoto).

**Remarks:** This new species closely resembles *Apanteles earterus* WILKINSON<sup>1)</sup>, belonging to WILKINSON's Group S, from which it differs in the sculpture of the propodeum and the two basal tergites. It is also allied to *Apanteles molestae* MUESEBECK<sup>2)</sup>, a parasite of *Grapholitha molesta* BUSCK in Japan and Korea, but may be immediately distinguished by its discally hyaline stigma and by the sculpture of its 1st tergite.

### ***Macrocentrus philippinensis* ASHMEAD**

*Macrocentrus philippinensis* ASHMEAD, Proc. U. S. Nat. Mus., XXVIII, p. 145, ♀ (1904); CHU, 1934 Year Book, Bur. Ent. Hangchow, p. 19 (1935); WATANABE, Kontyû, XIII, p. 233 (1939).

*Macrocentrus japonicus* WATANABE, Ins. Mats., VI, p. 133, ♀ ♂ (1932); id., Kontyû, VII, p. 247, ♀ ♂ (1933); id., Ins. Mats., VIII, p. 205 (1934); CHU, 1934 Year Book, Bur. Ent. Hangchow, p. 19 (1935); WATANABE, Jour. Facul. Agr., Hokkaido Imp. Univ., XLII, p. 157 (1937); id., Ins. Mats., XII, p. 43 (1937).

The present writer had considered that *Macrocentrus japonicus* might be placed nearest to *Macrocentrus philippinensis*, but the original description of the latter is too incomplete to allow one to come to a definite conclusion. In the previous paper (1939), however, the writer accepted Dr. MUESEBECK's view and synonymized *M. japonicus* under *M. philippinensis*. MUESEBECK's letter reads as follows:—

"I have compared carefully your specimens of *Macrocentrus japonicus* with ASHMEAD's type of *M. philippinensis* and can find no basis for holding the two distinct. I believe your name will need to be suppressed as a synonym."

This species may be easily distinguishable from the congeneric ones by the antennae which have a broad pale yellow ring at the middle and by the 1st tergite which is transversely striate.

**Host:** This species has been already recorded as a parasite of *Margaronia pyloalis* WALKER from Japan, Formosa and China, and as a parasite of *Pyrausta diniasalis* WALKER from Manchoukuo. The present series was bred by M.

1) Bull. Ent. Res., XXI, p. 278, ♀ ♂ (1939).

2) Proc. Ent. Soc. Washing., XXXV, p. 51, ♀ ♂ (1933).

KUROSAWA as a solitary parasite of *Margaronia pyloalis* at Kyoto.

Cocoon: Dark brown to light brown, spindle-shaped, covered with a small amount of loose silk. Length, 7-10 mm., width, 3-4 mm.

Habitat: Honshu (Kyoto, 7 ♀ ♀, 9 ♂ ♂, VI, 1939, M. KUROSAWA leg.).

Gen. Distr.: Japan; Formosa; Manchoukuo; China; The Philippines.

### 摘 要

本文に記述せるクハノメイガの寄生蜂の學名及び和名は次の如し。

<i>Goniozus japonicus</i> ASHMEAD	ハマキアリガタバチ (ハマキタマゴバチ*)
<i>Epiurus persimilis</i> ASHMEAD	クロヒゲヒラタヒメバチ
<i>Spilocryptus japonicus</i> UCHIDA	シロフトガリヒメバチ
<i>Chelonus tabonus</i> SONAN	ワタノメイガカウラコマユ
<i>Phanerotoma planifrons</i> (NEES)	ヒメキイロカウラコマユ
<i>Apanteles minor</i> (ASHMEAD)	ヒメクロツヤサムラヒコマユ (ヒメクロツヤドリ**)
<i>Apanteles kurosawai</i> WATANABE (sp. nov.)	クハノメイガサムラヒコマユ
<i>Macrocentrus philippinensis</i> ASHMEAD	キマダラヒゲナガコマユ

\*松村松年: 日本益蟲目錄, p. 96 (1908).

\*\*——: 同上, p. 212 (1908).

## A BRACONID PARASITE OF *THERETRA JAPONICA* DE L'ORZO

(HOST RECORD OF *BRACONIDAE*, III)

By

CHIHISA WATANABE

### *Microplitis theretrae* WATANABE

*Microplitis theretrae* WATANABE, Jour. Facul. Agr., Hokkaido Imp. Univ., XLII, p. 108, ♀, Pl. III, fig. 3 (1937).

Host: *Theretra japonica* DE L'ORZO

This species was originally described as a parasite of *Theretra nessus* DRURY. The writer has received a female bred from the larva of *Theretra japonica* DE L'ORZO by Mr. T. ISHIZAWA at Ogikubo, Tokyo.

Habitat: Honshu (Ogikubo, Tokyo, 1 ♀, 12. V, 1939, T. ISHIZAWA leg.).

General Distribution: Japan (Honshu).