

Descriptions of New Species and Genera of the Chrysoidea (Insecta: Hymenoptera) from the Ryukyus, Japan

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Abstract. Four new species of the chrysidoid wasps are described from the Ryukyus, Japan. They are *Okinawasega eguchii* gen. et sp. nov. and *Calosega kamiteta* gen. et sp. nov. in the family Chrysididae, and *Acrepyris orihime* sp. nov. and *Odontepyris marishi* sp. nov. in the family Bethylinidae. The new genus *Okinawasega* most closely resembles the genera *Imasega* Krombein, *Colocar* Krombein and *Kryptosega* Kimsey, but is separated from the latter three by the long median longitudinal groove on the pronotum, the simple tarsal claw without medial tooth, the hind coxa without dorsobasal carina, the long R1 vein of forewing, and the pronotum not posteriorly declivitous. The second new genus *Calosega* is most related to the genera *Magdaliium* Kimsey and *Rohweria* Fouts. However, it is separated from the latter two by the short pronotum, the clypeus not apically thickened, the vertex without impunctate stripe, the pronotum with posteromedial pit, the cu vein interstitial with and the non-metallic coloration.

Key words: Hymenoptera, Chrysoidea, Amiseginae, Pristocerinae, Bethylinae, new genus, new species, Japan.

Introduction

In the course of my study on the chrysidoid wasps of Japan, I have examined several specimens from the Ryukyu Islands of Japan. After careful examination, I recognized two new genera and four new species. Thus I described and illustrated them herein.

Concerning the morphological structures, the following abbreviations are used in this paper: HL-head length; HW-head width; WF-width of frons; LM-length of mesosoma; LP-length of propodeum; LPD-length of propodeal disc; WPD-width of propodeal disc; FWL-forewing length; TL-total body length; EL-eye length; POL-shortest distance between posterior ocelli; AOL-shortest distance from posterior ocellus to anterior ocellus; OOL-shortest distance from posterior ocellus to nearest eye margin; WOT-distance across and including posterior ocelli.

The institutions are also abbreviated as follows: MNHA-Museum of Nature and Human Activities, Hyogo; MUA-Laboratory of Entomology, Faculty of Agriculture, Meijo University, Aichi; NIAES-National Institute of Agro-Environmental Sciences, Tsukuba; NSMT-National Science Museum, Tokyo.

Family Chrysididae

Subfamily Amiseginae

Okinawasega gen. nov.

Type species: *Okinawasega eguchii* gen. et sp. nov.
Gender: feminine.

Diagnosis (male). Moderate-sized amisegine wasps (TL ca 3.5 mm) with the following combination of characteristics.

1. Eye with erect setae.

2. Occipital carina absent.
3. Malar space moderately long, with a vertical sulcus.
4. Antennal flagellum long and slender, cylindrical.
5. Pronotum with a median longitudinal groove posteriorly, and with a pit in front of each lateral lobe; anterolateral corners forming a dull angle in dorsal view.
6. Mesoscutum with deep notauli and weak parapsidal furrows.
7. Mesopleuron without scrobal sulcus and omaulus.
8. Metanotum medially 0.6 times as long as scutellum medially, without a triangular median enclosure.
9. Posterodorsal corner of propodeum forming a dull angle.
10. Posterior surface of propodeum with a horseshoe-shaped enclosure bisected by a longitudinal carina.
11. Forewing with a relatively small and thin pterostigma and a moderately long R1 vein.
12. Rs vein extended by evenly curved dark streak.
13. Medial vein arising before cu-a.
14. Tarsal claw simple, without medial tooth.
15. Hind coxa with a dorsobasal carina.

Etymology. *Okinawa*, the name of locality + the known generic name, *sega*.

Distribution. Japan (The Ryukyus).

Remarks. According to the phylogenetic analysis of the subfamily Amiseginae by Kimsey and Bohart (1991), this new genus is mostly related to the genera *Imasega* Krombein, 1983, *Colocar*, Krombein, 1957, and *Kryptosega* Kimsey, 1986, by the characters 2, 3, 4, and 10. However, it is separated from the latter by the following points: From *Imasega* by the long median longitudinal groove on pronotum (character 5), simple tarsal claw without medial tooth (character 14), and hind coxa with dorsobasal carina (character 15); from *Colocar* by the long R1 vein (character 11); from *Kryptosega* by the presence of R1 vein (character 11), and pronotum not posteriorly declivitous.

Okinawasega eguchii sp. nov.

(Figs 1-5)

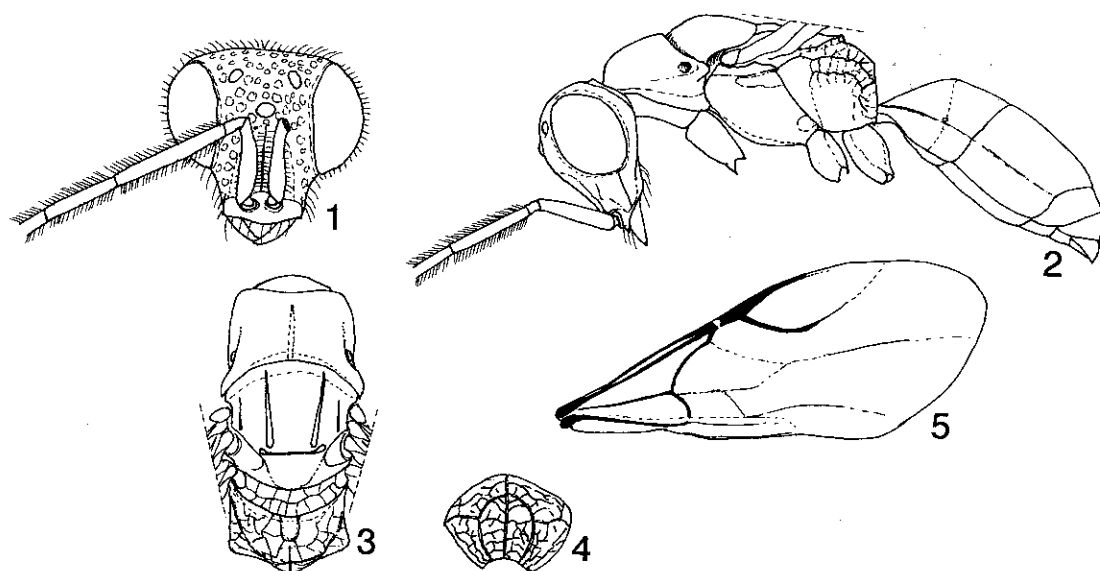
(Japanese name: Okinawa-nanafushi-yadoribachi)

Holotype. Male. HL 0.79 mm; HW 0.85 mm; WF 0.40 mm; LM 1.60 mm; WM 0.80 mm; FWL 2.8 mm; TL 3.5 mm.

Head black; pronotum, propleuron and mesopleuron light reddish brown; mesonotum black; metanotum dark reddish brown; propodeum black; 1st metasomal tergite yellow; 2nd to apical tergites black; leg yellow; antenna black; mandible yellow with red tips; labrum yellow; wings hyaline; wing veins dark brown.

Head 0.93 times as long as wide including eyes, with almost straight dorsal margin in frontal view; vertex moderately punctate; punctures *ca* 0.02-0.03 mm in diameter, separated by 0.5-1.0 times their own diameters; malar space moderately long, 0.4 times EL in frontal view. Mandible thin, with an acute tip. Clypeal apex broadly rounded. Antenna long, extending to the posterior end of gaster, and covered with straight suberect setae which are *ca* 0.06 mm in length; first 5 antennomeres in a ratio of 17 : 3 : 18 : 12 : 12 in length; scape 3.4 times as long as wide; 2nd segment as long as wide; 3rd 5.1 times as long as wide; 4th 4.0 times as long as wide; 5th 4.0 times as long as wide. Eye 0.53 mm long, with abundant erect setae; the setae *ca* 0.03 mm in length. Ocelli arranged in a right triangle; anterior ocelli 0.10 mm in diameter; POL : AOL = 1.1 : 1; OOL 0.17 times WOT.

Pronotal dorsum moderately convex in profile; pronotal disc seen from above wider than long, with almost parallel sides and straight anterior margin, 0.5 times as long as combined length of mesoscutum and scutellum in dorsal view; surface coarsely punctate; punctures separated by *ca* 0.5 times their own diameters. Mesonotum punctate, but punctures sparser than those on the pronotum; notauli narrow and straight, diverging anteriorly. Mesoscutum 0.3 times as long as and metanotum 0.5 times as long as scutellum when measured along the median line. Propodeum smooth, 0.44 times as long as wide, with



Figs 1-5. *Okinawasega eguchii* gen. et sp. nov., male. 1. Head in frontal view. 2. Body in profile. 3. Mesosoma in dorsal view. 4. Propodeum in posterior view. 5. Forewing.

blunt lateral angles; dorsum with broadly convex posterior margin; posterior surface abruptly declivitous and reticulate.

Metasoma seen from above 0.80 mm in maximum width; 1st segment smooth and shining, impunctate; 2nd segment smooth with small punctures of moderate density; 3rd smooth with small punctures; punctures on 3rd coarser than those on 2nd.

Forewing as in Fig. 5; R1 vein subequal in length to pterostigma; Rs vein longer than R1; Cu vein arising well down on M + Cu.

Variation. Paratype males vary in size, from 0.73 to 0.83 mm in HL and from 0.85 to 0.88 mm in HW. Pronotum, metanotum and propodeal dorsum vary from reddish brown to dark brown.

Holotype. ♂, Iriomote-jima, Yaeyama Is, Okinawa Pref., Japan, 1. XI. 1995, K. Eguchi leg.

Paratypes. 3 ♂, Shiiminato, Iriomote-jima, Okinawa Pref., 2-15. V. 1996, T. Muroi leg.; 1 ♂, same locality, 11-24. VII. 1996, T. Muroi leg.; 1 ♂, same locality, 18. X.- 1. XI. 1995, T. Muroi leg.; 2 ♂,

same locality, 30. XI.-13. XII. 1995, T. Muroi leg.

Type depository. The holotype is preserved in MNHA, and paratypes in MNHA, MUA and NIAES.

Etymology. This species is named after the collector of holotype, Mr. K. Eguchi.

Distribution. Ryukyus (Yaeyama Is).

Remarks. This species is the only component species of the genus *Okinawasega*.

Calosega gen. nov.

Type species: *Calosega kamiteta* gen. et sp. nov.
Gender: feminine.

Diagnosis. Moderate-sized amisegines (TL 4-5 mm) with the following combination of characteristics.

1. Eye with erect setae.
2. Occipital carina present.
3. Malar space short, with vertical sulcus.
4. Antennal flagellum short and broad; 4th to

- terminal segments each slightly longer than wide in male and wider than long in female.
5. Pronotum flat, with a posteromedial pit, and with a pit in front of each lateral lobe; anterolateral corners forming a dull angle in dorsal view.
 6. Mesoscutum with notauli and weak parapsidal furrows.
 7. Mesopleuron with scrobal sulcus and omaulus; the sulcus long and parallel-sided.
 8. Metanotum medially as long as scutellum medially, with triangular median enclosure.
 9. Propodeum with angulate posterodorsal corners in male; acutely spinose in female.
 10. Posterior surface of propodeum with a horseshoe-shaped enclosure bisected by a longitudinal carina.
 11. Forewing with long and slender pterostigma, and R1 not differentiated.
 12. Rs vein extended by evenly curved dark streak.
 13. Medial vein arising at Cu-a.
 14. Tarsal claw, with a large submedial tooth.

15. Hind coxa with a dorsobasal carina.

Etymology. *Calo*, beautiful + *sega*.

Distribution. Japan (the Ryukyus).

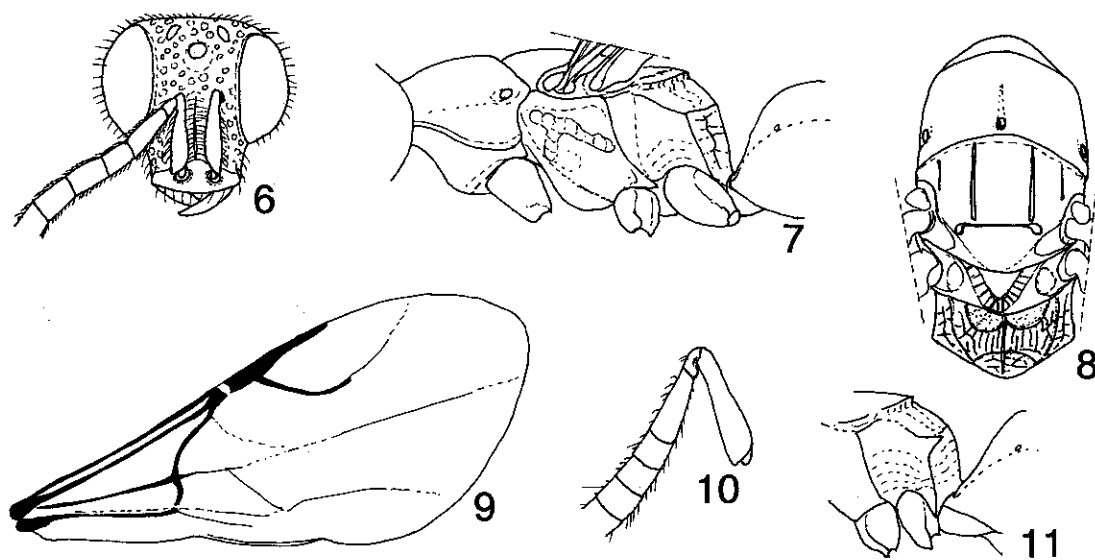
Remarks. This new genus should be most related to the genera *Magdalius* Kimsey, 1986, and *Rohweria* Fouts, 1925, by the characters 2, 3, 7 and 8. However, it is separated from the latter by the following points: From *Magdalius* by the short pronotum, clypeus not apically thickened and vertex without impunctate stripe; from *Rohweria* by the non-metallic coloration of body (body strongly bluish in the *Rohweria* species), Cu vein interstitial with M + Cu, and pronotum with posteromedial pit.

***Calosega kamiteta* sp. nov.**

(Figs 6-11)

(Japanese name: Toge-nanafushi-yadoribachi)

Holotype. Male. HL 0.78 mm; HW 0.93 mm; WF 0.48 mm; LM 1.63 mm; WM 0.88 mm; FWL 2.9 mm; TL 3.9 mm.



Figs 6-11. *Calosega kamiteta* sp. nov. 6. Head in frontal view, male. 7. Mesosoma in profile, male. 8. Mesosoma in dorsal view, male. 9. Forewing, male. 10. First 6 antennal segments, female. 11. propodeum in profile, female.

Head, mesosoma, metasoma black; antenna black; mandible dark brown; legs yellow; wings hyaline; wing veins dark brown.

Head 0.84 times as long as wide including eyes, with almost straight dorsal margin in frontal view; vertex moderately punctate; punctures *ca* 0.02-0.03 mm in diameter, separated by 1-2 times their own diameters; malar space 2.1 times WF, 2.3 times EL. Mandible slender, with acute tip. Clypeus with a broadly rounded anterior margin. Antenna covered with short suberect setae; first 5 antennomeres in a ratio of 13 : 4 : 7 : 4.5 : 4.5 in length; scape 2.6 times as long as wide, with subparallel sides; 2nd segment slightly longer than wide; 3rd 1.4 times as long as wide, broadest at apical end; 4th 4.5 times as long as wide; 5th 4.5 times as long as wide. Eye 0.53 mm long, with abundant erect setae; the setae *ca*. 0.04 mm in length. Ocelli arranged in a flat triangle; anterior ocellus 0.10 mm in diameter; POL : AOL = 6 : 2.5; OOL 0.17 times WOT.

Pronotum flat; dorsum very weakly convex in profile; dorsal disc seen from above 0.60 times as long as wide, coarsely punctate, with almost parallel sides and straight anterior margin in dorsal view. Mesonotum coarsely punctate; notauli narrow, subparallel; parapsidal furrows relatively weak. Mesoscutum 2.0 times as long as scutellum medially. Metanotum 0.5 times as long as scutellum medially. Propodeum 0.28 times as long as wide, with broadly convex posterior margin; posterodorsal angle blunt in profile; posterolateral margin carinate.

Metasoma seen from above 0.95 mm in maximum width; tergites smooth with small punctures of moderate density; punctures on 2nd tergite coarser than those on 1st.

Forewing as in Fig. 9; Rs vein longer than length of pterostigma.

Paratype female. HL 0.85 mm; HW 0.90 mm; WF 0.28 mm; LM 1.65 mm; WM 0.93 mm; FWL 2.1 mm; TL 3.2 mm (one measured).

Head, mesosoma and metasoma black excepting the under portion of 1st metasomal tergite brown. Antennal scape brown; 2nd to 4th segments whitish; 5th to terminal segments black; underside of funiculus

yellowish white. Legs yellowish white. Antenna covered with short suberect setae; first 5 antennomeres in a ratio of 13 : 4 : 7 : 4.5 : 4.5 in length; scape 2.6 times as long as wide, with subparallel sides; 2nd segment slightly longer than wide; 3rd 1.4 times as long as wide, broadest at apical end; 4th 4.5 times as long as wide; 5th 4.5 times as long as wide. Eye 0.53 mm long

Propodeum in profile with an acute posterodorsal tooth as in Fig. 11.

Holotype. ♂, Shiramizu, Ishigaki-jima, Yaeyama Is, Okinawa Pref., Japan, 30.VI.-3.VII.1993, K. Ohara leg.

Paratypes. 2 ♀, 1 ♂, Shinminato, Iriomote-jima, Yaeyama Is, Okinawa Pref., 8. VIII.- 4. IX. 1996, T. Muroi leg.; 1 ♀, same locality, 30. V. -12. IV. 1996, T. Muroi leg.; 1 ♂, same locality, 18. X. - 1. XI. 1995, T. Muroi leg.

Type depository. The holotype is preserved in NIAES, and paratypes in NIAES, NSMT, and MNHA.

Etymology. The specific epithet is the Japanese noun kamiteta, which is the name of a god of sun appearing in an ancient mythology of the Ryukyus.

Distribution. Ryukyus (Yaeyama Is).

Remarks. This species is the only component species of the genus *Calosega*.

Family Bethyilidae

Subfamily Pristocerinae

Acrepyris orihime sp. nov.

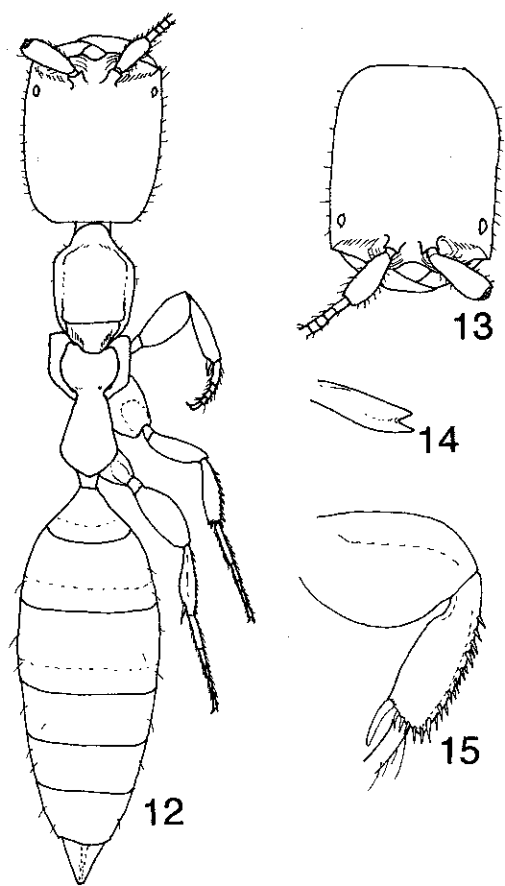
(Figs 12-15)

(Japanese name: Orihime-arigatabachi)

Holotype. Female. HL 1.15 mm; HW 0.93 mm; LM 1.60 mm; LP 0.88 mm; WPD 0.48 mm; TL *ca* 6.1 mm.

Head and mesosoma brown; metasoma blackish brown; 1st to 3rd metasomal tergites each with a yellowish brown transverse broad band posteriorly; mandible and antenna yellowish brown; legs yellowish brown.

Head rectangular, 1.24 times as long as wide, with parallel sides and shallowly concave posterior margin



Figs 12-15. *Acrepyris orihime* sp. nov., female. 12. Body in dorsal view. 13. Head in frontal view. 14. Mandible. 15. Middle femur and tibia.

in frontal view; frons and vertex smooth, without distinct punctures. Mandible with 4 triangular teeth. Anterior margin of clypeus with a median notch. First 5 antennomeres in a ratio of 7 : 1.5 : 1 : 1 : 1 in length; scape 2.2 times as long as wide, broadest at apical end; 2nd segment longer than wide; 3rd and 4th segments each as long as wide; 5th to 12th segments each wider than long; terminal segment 2.0 times as long as wide, as long as preceding 2 segments combined. Eye relatively small (*ca* 0.06 mm in maximum diameter), oval, and consisting of about 10 indistinct facets.

Mesosoma with flat dorsal outline in profile. Pronotal disc smooth, 1.5 times as long as wide. Mesonotal disc smooth, wider than long, with a convex posterior margin. Mesopleura weakly microreticulate and impunctate. Propodeum weakly microreticulate and impunctate, with a concave anterior margin and convex posterior margin in dorsal view; midlength 1.6 times maximum width; maximum width 1.9 times minimum width. Middle tibiae spinose.

Metasoma sessile, very weakly microreticulate; seen from above 1.05 mm in maximum width.

Holotype. Female, Kunigami-son, Okinawa-jima, Okinawa Pref., 13. III. 1998, I. Yasuda leg.

Type depository. The holotype is deposited in NIAES.

Etymology. The specific epithet is the Japanese noun *orihime*, which is the name of a heroine appearing in an old tale of Japan.

Distribution. Ryukyus (Okinawa-jima I.).

Remarks. This species is distinguished from the other Japanese congener, *A. japonicus*, in female by the largely smooth head and pronotum (head and pronotum moderately punctate and propodeal disc with more than 10 shallow punctures in *A. japonicus*) and much weak constriction of propodeum (maximum width of propodeum 1.9 times its minimum width, whereas maximum width 2.2-2.3 times minimum width in *A. japonicus*). It is known only from the northern part of Okinawa-jima Island of the Ryukyu Islands.

Subfamily Bethylinae

Odontepyris marishi sp. nov.

(Figs 16-18)

(Japanese name: Yaeyama-washibana-arigatabachi)

Holotype. Female. HL 1.25 mm; HW 1.43 mm; WF 0.90 mm; LM 1.85 mm; LPD 0.60 mm; WPD 0.95 mm; FWL 3.4 mm; TL 6.2 mm.

Body black; mandible black; antenna black, excepting 1st to 3rd segments brown; legs reddish brown; forewing subhyaline, tinged with brown.

Head wider than long, 1.14 times as long as wide,

with concave posterior margin; frons microreticulate with very shallow punctures moderately; punctures separated by 1.0-2.0 times their own diameters. Mandible with 4 teeth; basal 2 teeth small. Anterior margin of clypeus forming an acute triangle. First 5 antennomeres in a ratio of 16 : 6 : 7 : 6.5 : 6.5 in length. Eye 0.58 mm in length; WF 1.52 times EL. Ocelli forming a regular triangle; OOL 1.60 times WOT.

Pronotal disc 0.54 times as long as wide, microreticulate with very weak punctures sparsely; lateral margin carinate. Mesoscutum microreticulate and punctate; mesoscutellum smooth and shining. Propodeal disc 0.63 times as long as wide, with parallel sides and straight posterior margin in dorsal view; outer discal carinae straight and subparallel; median area reticulate; sublateral areas with oblique and transverse rugae.

Metasomal tergites smooth and shining; 2nd to 6th metasomal sterna with relatively coarse punctures.

Forewing without discoidal cell; a very short stub of vein arising from posterior most of rs-vein.

Paratype male. HL 1.00 mm; HW 1.10 mm; WF 0.76 mm; LM 1.08 mm; LPD 0.50 mm; WPD 0.71 mm; FWL 2.8 mm; TL 4.8 mm (one measured).

Wings and general shape of body as in the female.

Body black; mandible and antenna brown; legs yellowish brown. 2nd to 6th metasomal sterna largely smooth, but small sparse punctures recognizable.

Holotype. Female, Nakano, Iriomote-jima, Okinawa Pref., 29. IV. 1998, K. Toyoda leg.

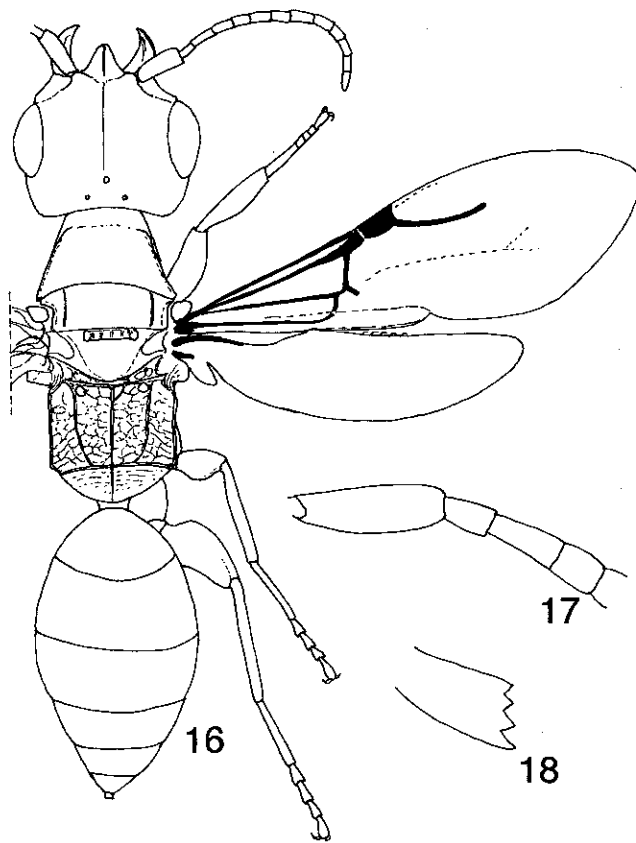
Paratypes. 2 males, same data as holotype.

Type depository. Types are deposited in NIAES.

Etymology. The specific epithet is the Japanese noun *marishi*, which is the name of a deity.

Distribution. Ryukyus (Iriomote-jima I.).

Remarks. This species resembles *O. ventralis*



Figs 16-18. *Odontepyrus marishi* sp. nov., female. 16. Body in dorsal view. 17. First 4 antennal segments. 18. Mandible.

Krombein, 1996, from Sri Lanka and *O. liukueiensis* Terayama, 1997, from Taiwan by the absence of discoidal cell of forewing. However, it is easily distinguished from *O. ventralis* by the head with weak punctures, and from *O. liukueiensis* by the punctate 2nd to 6th gastral sterna, concave posterior margin of head and larger body size.

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