

On Four Dorilaid Parasites of the Green Rice Leafhopper,  
*Nephotettix cincticeps* Uhler. (Diptera)

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ツマグロヨコバイに寄生する4種の  
アタマアブについて

小 泉 憲 治

Of recent years the population density of the rice green leafhopper in paddy-fields has increased. One of the reasons of this increase is said to be the result of the decrease of the natural enemies of this hopper owing to the wide application of insecticide in the paddy-fields. And so the more informations concerning in the natural enemies of this hopper are needed. Up to now, following natural enemies of this hopper has been listed from Japan\*. Among these, Nos. 3, 8, 10, 14 and 17 are said to be most useful for the check of this hopper. On the parasitic Dorilaidae, there has been no further informations since the valuable paper of Esaki and Hashimoto (1937). Thus the members of this family have long been throughly neglected. But these flies no doubt play a very important part in helping to keep this pest in check, judging from the high percentage of parasitism found in the data of the hoppers dissected and the abundance of hovering adult flies in the paddy-fields.

In this paper, four species of the Dorilaid fly reared from the green rice leafhopper are described, of which three are new to the science and one is new to the fauna of Japan. Ecological items and about immature stages of these flies will be given in the forthcoming series of paper.

Before going further, I wish to express my sincer gratitude to the entomologists mentioned below for the loan of materials ; Dr. S. Ito of the College of Agriculture, University of Osaka Prefecture, Messrs. H. Hasegawa and N. Fukuhara of the National Institute of Agric. Sciences, Tokyo and Mr. A. Tsuboi of the Okayama Agric. Exp. Station.

\*List of the Natural Enemies of *Nephotettix cincticeps* Uhler in Japan.

- I. Parasitic Fungi.
  1. *Isaria farinosa* (Dick.) Fr. (Deuteromycetes : Stilbaceae)
- II. Parasitic Nematode.
  2. Mermithidae sp.
- III. Egg Parasites.
  3. *Japania andoi* Ishii (Hym. : Trichogrammatidae)
  4. Mymaridae sp. (Hymenoptera)
- IV. Nymphal Parasites. (also Adult).
  5. *Tettigoxenos orientalis* Esaki et Hashimoto (Strepsih. : Halictophagidae)
  6. *Ephigonatopus sakaii* Esaki et Hashimoto (Hym. : Drynidae)
  7. *Dorilas* sp. (Dipt. : Dorilaidae)
- V. Insect Predators.
  8. *Microvelia douglasi* Scott (Hem. : Veliidae)
  9. *Nabis apicalis* Matsum. (Hem. : Nabidae)
  10. *Cyrtorrhinus lividipennis* Reuter (Hem. : Miridae)
  11. *Triphleps sauteri* Poppius (Hem. : Anthocoridae)

12. *Orius* sp. (Hem. : Anthocoridae)
  13. *Omatius chinensis* Fab. (Dipt. : Asilidae)
- VI. Arachnid Predators.
14. *Oedothorax insecticeps* B. et S. (Micryphantidae)
  15. *Tetragnatha praedonia* L. Koch. (Argiopidae)
  16. *Meta doenitzii* B. et S. (Argiopidae)
  17. *Lycosa pseudoannulata* B. et S. (Lycosidae)
  18. *Pirata* sp. (Lycosidae)
  19. *Hytia magister* Karsh (Salticidae)
- VII. Hunting Wasps.
20. *Psen fulvitaris* Gussckovskii (Hym. : Psenidae)
  21. *Psen sameshimai* Yasumatsu (Hym. : Psenidae)

### *Tömösváryella oryzaetora* n. sp.

(Figs. 1 a—f)

*Pipunculus* sp., Esaki et Hashimoto (1932), Ent. Lab. Dept. Agric. Kyushu  
Imp. Univ., Publication No. 3: 39—41, Figs., 8, 9.; (1937),  
Noji-Kairyō-Shiryō No. 127: 124—126, Pl. 14, Figs., 1—5.

This is one of the most abundant Dorilaidae found in the paddy-fields from April to late November. This is the same species that Esaki and Hashimoto reported as a parasite of the green rice leafhopper. And I also have reared many specimens of this species from the same host.

This species is near to *T. minimus* (Becker) of Europe in having the eyes in male touching for only a very short space and is differentiated by having the more conspicuous dark hairs and the more whitish dusting on the abdomen; by having the black humeri; by the hind trochanter of both sexes having no spines or bristles on its underside; by the r-m crossvein being situated in the middle or slightly before the middle of discal cell and in female the piercer being upcurved.

**Male. Head** : Eyes jointed for only a short distance on the upper portion of the front; junction about equal to the length of ocellar triangle, portion of front above junction shining black, lower part silvery pubescent, at the middle of frontal triangle a small depression; face silvery pubescent; vertex and upper occiput subshining, lower occiput silvery. Antennae (fig. 1 a) black, bristles of second segments short, third segment dark yellow, long acuminate, densely white pubescent, arista all black. **Thorax** : Subshining black in ground color, rather densely brownish pollinose, grayed on the margins, pleurae and metanotum; dorsocentral hairs long, humeri and scutellum haired; humeri black, halteres yellow; metanotum no transverse furrow. **Legs** : Chiefly black, extreme apices of femora and tibiae, base of tibiae and first four subsegments of tarsi yellow; femora with no flexor bristles; posterior trochanters with no spines or bristles, only with thinly white pubescence. **Wings** : Hyaline, stigma clear, third costal section about one half the length of the fourth; fifth section almost twice as long as third and fourth combined; r-m crossvein situated just before the middle of discal cell and well beyond the end of first vein. **Abdomen** : Slender, sides almost straight; subshining black, lightly dusted, side densely cinereous; fifth segment almost twice as long as fourth; thickly covered with small black setae. **Genitalia** (figs. 1 c, d) : Small, about one third the fifth abdominal segment in length, somewhat compressed to the right, subtriangular in outline with a membranous area in right side; seventh segment not seen from dorsal view. From ventral view the membranous portion extend about the middle of eighth segment; ninth segment black in color, somewhat wider than long; apical cleft

broadly "V" shaped, extending about half the length of the segment on a middle line; claspers are elongate, longer than the length of ninth segment, slender and simple, almost symmetrical, yellow in color; cerci small, slender, orange yellow in color with long hairs.

Length : body, 3.2—3.8 mm. ; wings, 4—4.2 mm.

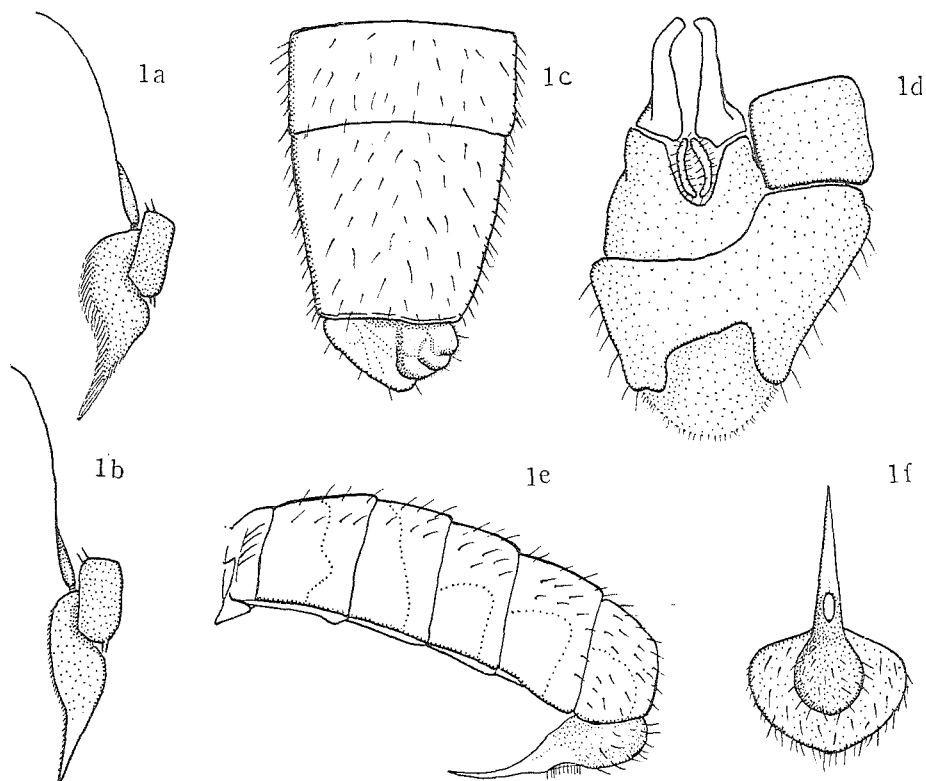


Fig. 1. *Tömösváryella oryzaetora* n. sp.

- |                             |                             |                            |
|-----------------------------|-----------------------------|----------------------------|
| a. male antenna.            | b. female antenna.          | c. male genitalia, dorsal. |
| d. male genitalia, ventral. | e. female abdomen, lateral. | f. ovipositor, dorsal.     |

**Female. Ovipositor** (figs. 1 e, f) : Base of ovipositor subshining black, almost globose in shape, faintly dusted and with long black setae; piercer but little longer than base, thickened and gradually tapering from base, slightly upcurved, extending the middle of fourth abdominal segment, reddish yellow in color. Front very broad, widest at below ocellar triangle, entirely silvery opaque; third antennal segment (fig. 1 b) more slender and yellowish than male. Front and middle femora with a pair of little spines at abse, posterior trochanter with no spines or bristles. Abdomen with more densely black bristles and dusting white than male. Otherwise like the male.

Length : body, 3.2—4.0 mm. ; wings, 3.5—3.8 mm.

Holotype male, allotype female and 20 paratypes, 10 males and 10 females; Tsushima, Okayama City, September–November, 1958, reared from *Nephotettix cincticeps*.

Other specimens examined : Reared from *Nephotettix cincticeps*, 1 female, Tokyo, October 6, 1951 (H. HASEGAWA). Specimens collected by sweeping in paddy-fields. HONSHU : Saitama Pref. (Warabi); Chiba Pref. (Kisarazu); Shizuoka Pref.

(Shizuoka, Hamamatsu); Gifu Pref. (Gifu); Kyoto Pref. (Kibune, Kizu); Osaka Pref. (Takatsuki, Hirakata, Sakai); Okayama Pref. (Okayama, Takahashi, Niimi, Katsuyama, Tsuyama); Tottori Pref. (Yonago, Mt. Daisen). SHIKOKU : Kagawa Pref. (Takamatsu, Zentsuji); Tokushima Pref. (Tokushima, Kuwano, Mugi).

Distribution : Japan (Honsyu, Shikoku)

### **Dorilas (Eudorylas) tsuboii n. sp.**

(Figs. 2 a—f)

This species is common in paddy-fields as well as in neighbouring grasslands, especially in autumn. And this is one of the important parasites of the green rice leafhopper. In general appearance this species is related to *D. fuscipes* (Zetterstedt) of Europe, but may be separable by the genital structure of both sexes; in male the terminal depression is not so large, in female the ovipositor is very stout and the piercer is strongly upcurved instead of being short and straight.

**Male. Head :** Eyes joined on upper portion of front for about the length of the frontal triangle; front and face silvery pubescent; vertex shining, occiput dull black on upper portion, gray pollinose below. Antennae (fig. 2 a) black, ventral bristles of second segment strong, extends almost to the tip of the third segment; third segment brown, thinly covered with light pubescence, short acuminate; basal two sections of arista brown, otherwise black. **Thorax :** Mesonotum brownish pollinose, margins gray; pleurae and metanotum cinereous; metanotum evenly convex, with no indication of a transverse furrow; humeri, stems of halteres yellow and knobs of halteres brown. Dorsocentral and marginal hairs weak, propleurae bare. **Legs :** Chiefly black, apices of femora yellow, outside of tibiae discolored with black medianly, first four tarsal subsegments yellow, last subsegment brown; posterior trochanter with 2 or 3 weak bristles; no prominent apical bristles on all tibiae; posterior surface of mid-femora with a row of weak hairs. **Wings :** Almost hyaline, stigma brown, fills all of the third costal section; third costal section slightly longer in length than the fourth or sub-equal, fifth costal section slightly longer than third and fourth combined; r-m crossvein at basal one third of discal cell, just below the end of subcostal vein; last section of fifth about equal to the posterior crossvein. **Abdomen :** Entirely opaque, chiefly brownish pruinose on the dorsum, lightly grayed on apical margins of segments and more cinereous on the side, fifth segment about one and one half times as long as fourth, segments second to fourth subequal, sides almost straight, slightly wider at segments three to four. First tergum with a row of about 4—5 strong black bristles on each side, abdomen otherwise with sparse, minute hairs. **Genitalia** (figs. 2 c, d) : About half the length of fifth abdominal segment, somewhat compressed to the right, subquadrate in outline with a large apical depressed area. Seventh segment not seen from dorsal view. From ventral view, eighth segment round and wide, thinly covered with yellowish pile, membranous area large subquadrate, not bisect the eighth segment. Ninth segment brownish in color, one and one half times wider than long, densely covered with light pubescence; apical cleft broadly "U" shaped; outer and inner clasper symmetrical, longer than ninth segment, elongate rectangular, two and one half times longer than wide, square tipped at apices, black in color except brown basal one third, covered with dense micro pile all over the outer surface. Cerci orange yellow in color, with long hairs.

Length : body, 3.3—3.5 mm.; wings, 3.6—4.0 mm.

**Female. Ovipositor** (figs. 2 e, f) : Basal part elongate oval, shining black, without

furrow, merges into piercer; piercer about equal to base in length, yellowish red in color, strongly upcurved, extending about posterior edge of second abdominal segment.

Front widest in the middle, gently narrowed toward the vertex, entirely cinereous. Third antennal segment (fig. 2 b) much light color and more acuminate than male. Otherwise like the male.

Length: body, 3.0—3.5 mm.; wings, 4.0—4.2 mm.

Holotype male, allotype female and 20 paratypes, 10 males and 10 females; Tsushima, Okayama City, September—November, 1958, all reared from *Nephotettix cincticeps*.

Other specimens examined (collected by sweeping in paddy-fields). HONSHU: Kyoto Pref. (Yamashina, Kizu); Osaka Pref. (Hirakata, Sakai); Okayama Pref. (Okayama, Gokei, Niimi, Tsuyama, Kanagawa); Tottori Pref. (Yonago); Hiroshima Pref. (Saijo, Kawaziri). SHIKOKU: Kagawa Pref. (Takamatsu, Zentsuji); Tokushima Pref. (Tokushima, Kuwano, Mugi).

Distribution: Japan (Honshu, Shikoku).

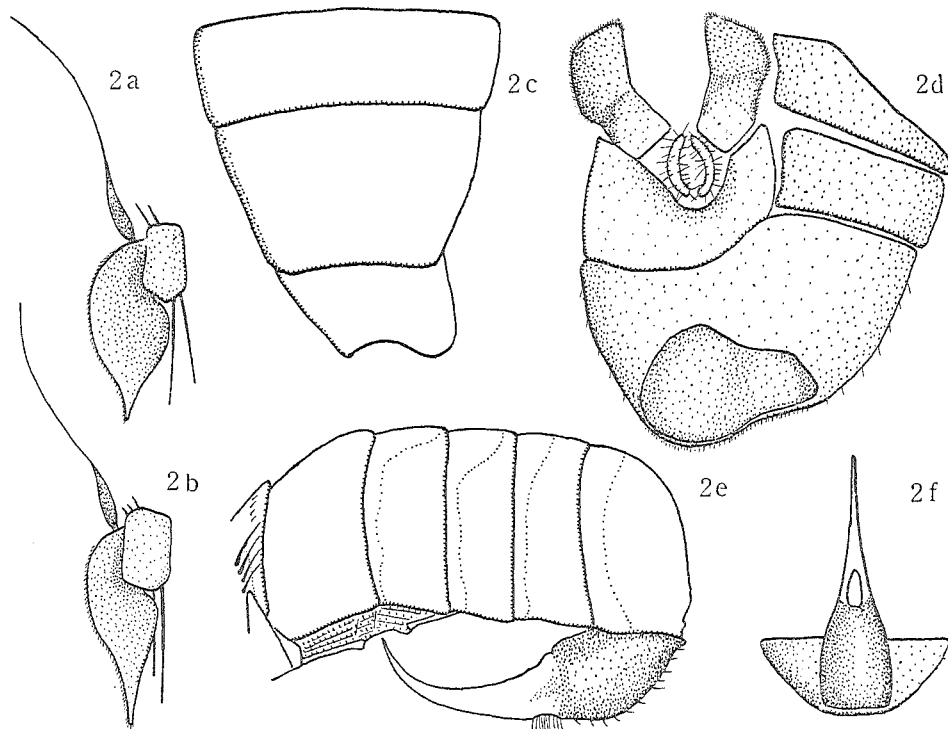


Fig. 2. *Dorilas (Eudorylas) tsuboii* n. sp.

a. male antenna      b. female antenna      c. male genitalia, dorsal  
d. male genitalia, ventral      e. female abdomen, lateral      f. ovipositor, dorsal

### *Dorilas (Eudorylas) cruciator* (Perkins)

(Figs. 3 a—f)

*Pipunculus cruciator* Perkins (1905), Hawaiian Sugar Planters Assoc. Exp. Sta. Bull., 1 (4): 137—138, Pl. 5, Figs. 1, 6, Pl. 7, Figs. 1, 6, 7.

*Dorylas? cruciator* Kertész (1912), Ann. Mus. Nat. Hung., 10: 296—7.

So far as compared with the original descriptions and drawings, the Japanese specimens appear to belong to this Australian species in both the adult features and the shape of the pupal posterior spiracular plate.

Kertész hesitated determining his male specimen from Formosa to be this species and cited it in his paper of Formosan Dorilaidae with an interrogation mark. The reasons of his hesitation were in the absence of such scuteller marginal hairs those cited by Perkins, and in the fact that the shape of the antennae does not agree with the Perkins' figure. But the former reason seems little important, because in the original description, they are "very short fine hairs" and such sparse very short hairs are sometimes observed out of many specimens. The latter reason is that the Perkins' figure is female antenna while the Kertész' specimen is male. Judging from these consideration, this species seems to distribute through Oriental and Australian regions. This species reared from a species of *Hecalus* and a very different Jassid in Cairns, Queensland.

**Male. Head** : Eyes jointed for about the length of the front above antennae, front and face silvery pubescent ; upper half of occiput opaque black, brown dusted ; side and lower portion cinereous. Antennae (fig. 3 a) black, bristles of second segment short ; third segments acute at apex, light yellow, arista all black. **Thorax** : Mesonotum brownish pollinose, margins gray ; pleurae and metanotum cinereous ; humeri yellow ; stems of halteres yellow, knobs brown ; metanotum without transverse furrow ; dorsocentral and marginal hairs weak, propleurae bare. **Legs** : Chiefly yellow, coxae, distal subsegment of tarsi and median dorsal surface of each femora are black ; tibiae without prominent apical bristles ; middle femora lack a row of extenser hairs. **Wings** : Hyalin, stigma brown, fills all of the third costal section, third costal section slightly shorter in length than fourth section, third and fourth combined longer than fifth costal section, r-m crossvein at one third of discal cell, slightly beyond the end of subcostal vein. **Abdomen** : Entirely opaque, brownish pruinose on the dorsum, grayed on apical half and side ; sides almost straight, slightly wider at third segment, fifth segment about twice as long as fourth segment, segments second to fourth subequal ; first tergum with a row of about 4—5 strong black bristles on each side ; abdomen otherwise with minute hairs. **Genitalia** (figs. 3 c, d) : About half the length of fifth abdominal segment, subquadrate, deep oblique longitudinal groove situated right side. Seventh segment not seen from dorsal view. From ventral view the small subquadrate membranous depression on apical area of eighth segment ; ninth segment almost as long as wide, reddish yellow in color ; claspers asymmetrical, yellow to rufous in color, outer clasper broad and rounding, a sub-acutely pointing at inner apices, inner clasper orbiculate, no apical pointing.

Length : body, 3.8—4.3 mm. ; wings, 4.5—4.8 mm.

**Female. Ovipositor** (figs. 3 e, f) : Basal portion black, short and globose ; piercer yellowish, narrow, twice as long as basal part, abruptly terminating its base, strongly upcurved, and extending to posterior edge of third abdominal segment. Front parallel at side, not widened at the middle, entirely cinereous ; third antennal segment yellowish, strongly acuminate (fig. 3 b). Otherwise like the male.

Length : body, 3.5—4.0 mm. ; wings, 4.3—4.5 mm.

Specimens examined : Specimens reared from *Nephotettix cincticeps*, 12 males and 14 females, Tsushima, Okayama City, September-November, 1958. Specimens collected by sweeping in paddy-fields. HONSHU : Kyoto Pref. (Yase, Kizu, Kameoka) ; Osaka Pref. (Takatsuki, Moriguchi, Sakai) ; Okayama Pref. (Okayama, Takahashi, Katsuyama, Kanagawa). SHIKOKU : Kagawa Pref. (Takamatsu) ; Tokushima

Pref. (Tokushima, Kuwano, Mugi).

Distribution : Japan (Honshu, Shikoku), Formosa (Koshun), Australia (Cairns)

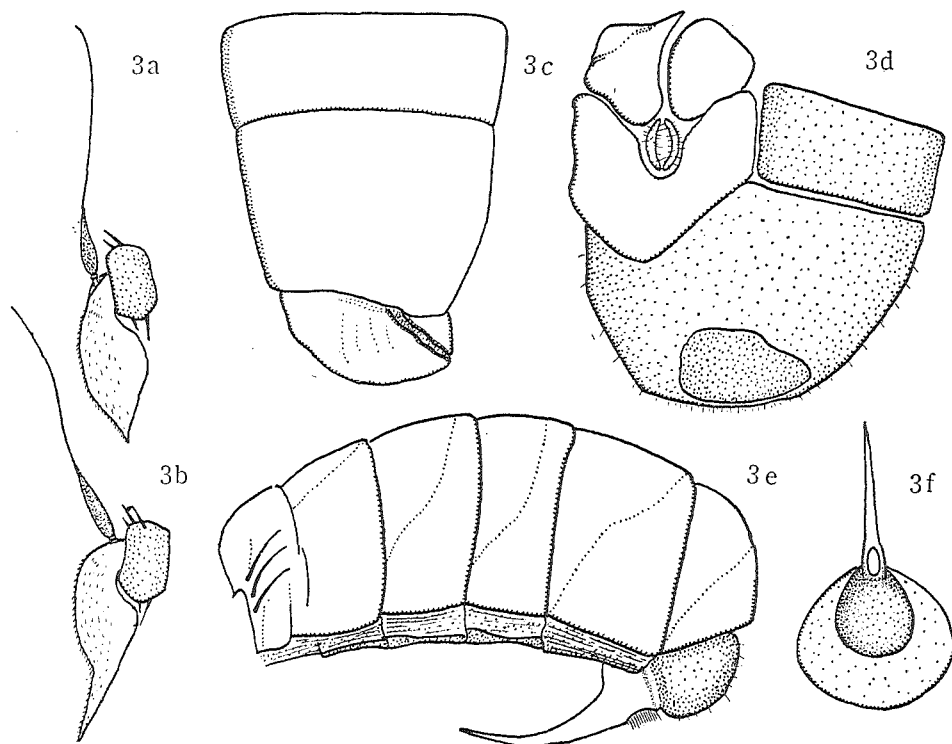


Fig. 3. *Dolilas (Eudorylas) cruciator* (Perkins)

a. male antenna                      b. female antenna                      c. male genitalia, dorsal  
d. male genitalia, ventral    e. female abdomen, lateral    f. ovipositor, dorsal

### *Dorilas (Eudorylas) orientalis* n. sp.

(Figs. 4 a—c)

This species was reared from the green rice leafhopper in Sado Is., Niigata Pref. by the entomologist of the Niigata Agric. Exp. Station. I have had an opportunity to examine this reared specimen by the courtesy of Mr. N. Fukuhara of the National Inst. Agric. Sci., Tokyo. According to my field collecting data, this species is common in the paddy-fields through the southern half of Japan, but rather small in number than the preceding three species. I have collected many male specimens always associated with the female here described. And they are estimated to be really the male of this species. But I have not found corroborative evidence of this point yet. I shall leave the description of the male till next time.

This species is related to *D. unicolor* (Zetterstedt) and *D. ruralis* (Meigen) of Europe. It differs from the former in having the straight piercer, instead of the upcurved piercer; in having the third costal section of the wing about twice the length of fourth section, instead of being shorter than fourth. It differs from the latter in having the more cinereous abdomen, yellow humeri, more acuminate third antennal segment and longer third costal section of the wings as well as the different shape of the basal part of ovipositor. Also, the present species is related to *D.*

*shanghaiensis* Ohuchi from Shanghai and is differentiated by the more acuminate third antennal segment.

**Female. Head** : Front shining black on upper two-third, lower portion silvery pubescent; raised in the center on upper part with a ridge of shining black extending down into the silvery portion; widest at about middle and slightly narrowed toward the antennae and the vertex. Face silvery pubescent; occiput brown dusting on upper portion, side and below cinereous. Antennae (fig. 4 a) dark brown to black, bristles of second segment short, third segment brown, drawn out into a long slender apex, this rostrate portion is about equal in length to the remainder of segment; arista all black. **Thorax** : Mesonotum brownish pollinose; pleurae and metanotum cinereous; metanotum with transverse furrow; humeri yellow, halteres brown. Dorsocentral and marginal hairs weak, propleurae bare. **Legs** : Black, extreme apices of femora, base and apices of tibiae, four basal subsegments of tarsi yellow; fore and mid tibiae with prominent apical bristles, femora without extensor hairs. **Wings** : Hyaline, stigma brown, fills all of the third costal section; third costal section about twice as long as fourth section, fifth costal section slightly longer than third and fourth combined; r-m crossvein at basal one third of discal cell, just below the end of subcostal vein. **Abdomen** : Almost cinereous, brownish pruinose on the dorsum; side almost straight. First tergum with a row of strong black bristles on each side. **Ovipositor** (figs. 4 b, c) : Basal part of ovipositor globular, opaque black with gray polen; piercer reddish yellow, straight, slender, reaching to the base of third abdominal segment and about twice the length of base.

Length : body, 2.5—3.0 mm.; wings, 3.2—3.5 mm.

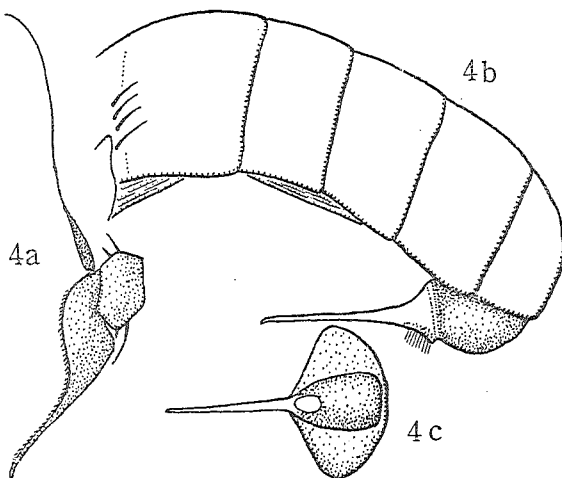


Fig. 4. *Dolilas (Eudorylas) orientalis* n. sp.

a. female antenna b. female abdomen, lateral c. ovipositor, dorsal.

Holotype female, Tsushima, Okayama City, September 23, 1956, collected by sweeping in paddy-fields, 15 female paratypes, same as type.

Other specimens examined : One female reared from *Nephotettix cincticeps*, Sado Is., Niigata Pref., 1958 (other exact data not known). Specimens collected by sweeping in paddy-fields. HONSHU : Miyagi Pref. (Sendai); Shizuoka Pref. (Shizuoka); Gifu Pref. (Gifu); Kyoto (Yamashina, Kizu); Osaka Pref. (Hirakata, Sakai); Okayama Pref. (Okayama, Takahashi, Gokei, Kanagawa). SHIKOKU : Tokushima Pref. (Tokushima, Kuwano, Mugi).



Distribution : Japan (Honshu, Shikoku).

All the types are preserved in the Collection of the Entomological Laboratory, Faculty of Agriculture, Okayama University.

### 摘 要

ツマグロヨコバイに寄生するアタマアブ類に関しては江崎・橋本(1932)が種不明の一種を報じて以来、何等の知見もない。近年、ツマグロヨコバイに寄生する本類を調査し、次ぎの4種を認めた。うち3種は新種であり、1種は日本への新分布であつた。4種とも水田には極めて多い種類である。本報では、これ等の命名記載を行つた。生態的知見に関しては別報にゆずる。

- |   |                 |
|---|-----------------|
| 1. <i>Tömösváryella oryzaetora</i> Koizumi        | ツマグロツヤアタマアブ(新称) |
| 2. <i>Dorilas (Eudorylas) tsuboii</i> Koizumi     | ツボイアタマアブ(//)    |
| 3. <i>Dorilas (Eudorylas) cruciator</i> (Perkins) | ツマグロキアタマアブ(//)  |
| 4. <i>Dorilas (Eudorylas) orientalis</i> Koizumi  | ツマグロヒメアタマアブ(//) |