Descriptions of three species of muscid larvae and eggs
newly recorded from cow dung in Japan
(Diptera : Muscidae)*

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Abstract: The 3rd instar larvae and eggs of one species of the genus *Polietes* and two species of the genus *Hydrotaea* are described and figured. These are *P. nigrolimbatus* (Bonsdorff), *H. albipuncta* (Zetterstedt), and *H. meteorica* (Linnaeus). Among these, *P. nigrolimbatus* and *H. meteorica* are newly described, and *H. albipuncta* is redescribed.

INTRODUCTION

Hitherto three species of the genus *Polietes* and 8 species of the genus *Hydrotaea* were recorded from Japan. Among these, *P. albolineatus* (Fallén), *P. nigrolimbatus* (Bonsdorff), *H. meteorica* (Linnaeus) are known to occur from cow dung in Japan. *H. albipuncta* (Zetterstedt) which is newly recorded from Japan in this study also occurs from cow dung. The larva of *P. albolineatus* was described in detail by Keilin and Tate (1930). The larvae and eggs of *H. albipuncta* were described by Lobanov (1968) and Hammer (1941), respectively. However, the larvae and eggs of *P. nigrolimbatus* and *H. meteorica* have been never known until now. In the present paper, the author describes the 3rd instar larvae and eggs of *P. nigrolimbatus* and *H. meteorica* and redescribes those of *H. albipuncta*.

MATERIAL AND METHODS

The female flies were collected by sweeping

net in pastures of Obihiro, Hokkaido. The captured flies were identified and kept in plastic cups (6×12 cm) for the oviposition. The obtained eggs were placed on fresh cow dung in plastic cups (4×8 cm) and reared to mature larvae. Some coprophagous larvae of Diptera were feeded for breeding the larvae of *H. albipuncta* and *H. meteorica*. The mature larvae were killed in boiling water and preserved in 70% ethanol for study.

DESCRIPTION

***Polietes nigrolimbatus* (Bonsdorff, 1866)**
(Figs. 1, 4-9)

Polietes nigrolimbatus Bonsdorff, 1866, Finland Tråving. Ins. (Dipt.), 2, p. 172: *Aricia*.

Egg. Length about 2.5 mm, width 0.8 mm; white colour; the chorion sculpture with a reticulation of hexagonal meshes; the sole is long and with faint hexagons.

Third instar larva. Large sized, fully mature larvae 13 to 15 mm in body length; yellow colour; tapering anteriorly and truncated posteriorly; 2nd segment with broad microscopic spine band around anterior margin, 6th to 12th segment with ventral papillae; anal papillae and subanal papillae developed; postanal papilla with spines; numerous small papillae present on posterior

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Figs. 1-3 The eggs

1. *Polietes nigrolimbatus*; 2. *Hydrotaea albipuncta*; 3. *H. meteorica*

part of anal plate.

Anterior spiracles: With 8 to 11 branches. **Posterior spiracles:** Broad kidney-shaped; peritreme closed and heavily pigmented; button clear inside of the peritreme; slits sinuate. **Cephalopharyngeal sclerite:** Mouth hooks sharply pointed; accessory sclerites consist of a pair of oral bars and a pair of anterior rods with heavily pigmented; cutaneous teeth absent; pharyngeal sclerite strongly pigmented; dorsal cornua slender and shorter than ventral cornua, ventral cornua with prominent triangular projection on the upper margin; longitudinal ventral pharyngeal ridges present; dental sclerite without ventral bridge.

Biological notes: The adult of this species closely resembles to that of *P. lardarius* (Fabricius). Séguy (1923) reported that the larvae of *P. lardarius* were carnivorous. Keilin and Tate (1930) mentioned that the larvae of this species were semi-carnivorous. But the larvae of *P. nigrolimbatus* seems to be coprophagous. The eggs are laid on the underside of the dung or the ground beneath the dung cake.

***Hydrotaea albipuncta* (Zetterstedt, 1845)**

(Figs. 2, 10-15)

Hydrotaea albipuncta Zetterstedt, 1845, Dipt. Scand., 4, p. 1581: *Aricia*; Hammer, 1941, Vidensk. Medd. Dansk. Naturhist. Foren. Kobh., 105, pp. 118-119: Egg; Lovanov, 1968, Zool. J. Moscow, 47, pp. 85-90: 3rd instar larva.

Figs. 4-9 The third instar larva of *Polietes nigrolimbatus*

4. Lateral view; 5. Posterior view of 12th segment; 6. Ventral view of 12th segment; 7. Lateral view of cephalopharyngeal sclerite; 8. Posterior view of posterior spiracle; 9. Lateral view of anterior spiracle

Egg. Length 0.9-1.0 mm, width 0.2-0.3 mm; white colour; the chorion sculpture consists of a reticulation of distinct hexagonal meshes; the sole is short and hexagons invisible.

Third instar larva. Body length 6 to 7 mm; yellow colour; tapering anteriorly and truncated posteriorly; ventral surface of 6th segment with microscopic spines, those of 7th to 11th segments with microscopic spines and papillae; anal papillae and extra-anal papillae present; subanal and postanal papillae absent; the sculpture on the posterior surface of 12th segment with squamous pattern; posterior spiracular plates slightly raised on stalks.

Anterior spiracles: With 3 branches. **Posterior spiracles:** Small sized and weakly pigmented; slits elongate oval; button not distinct. **Cephalopharyngeal sclerite:** Mouth hooks pointed sharply; accessory sclerites consist of a pair of oral bars and a pair of anterior rods; anterodorsal process pointed; dorsal cornua slender and slightly curved downward, ventral cornua shorter than dorsal cornua; longitudinal ventral pharyngeal ridges absent; dental sclerite without ventral bridge.

Biological notes: The larvae of this species seems to be carnivorous. They feed on the larvae of Diptera which live in the same cow dung. Adult flies gather on pasturing cattle. The eggs are generally deposited on the soil or grass beneath the dung cake in pastures.

***Hydrotaea meteorica* (Linnaeus, 1758)**

(Fig. 3. 16-21)

Hydrotaea meteorica Linnaeus, 1758, Syst. Nat., 10, p. 597 : *Musca*.

Egg. Length 1.0-1.1 mm, width 0.3-0.35 mm; white colour; the chorion sculpture with a distinct reticulation of hexagonal meshes; the sole is long and without hexa-

Figs. 10-21 The third instar larvae of *Hydrotaea albipuncta* and *H. meteorica*.

10-15. *H. albipuncta*

16-21. *H. meteorica*

10, 16. Lateral view of 3rd instar larva;
11, 17. Posterior view of 12th segment;
12, 18. Ventral view of 12th segment;
13, 19. Lateral view of cephalopharyngeal sclerite;
14, 20. Posterior view of posterior spiracle;
15, 21. Lateral view of anterior spiracle

gones.

Third instar larva. Body length about 7 mm; yellow colour; tapering anteriorly and truncated posteriorly; 6th to 11th segments with microscopic spines on the ventral surface; ventral papillae absent; anal papillae inconspicuous; extra-anal, subanal and post-anal papillae absent; the sculpture on the posterior surface of 12th segment without squamous pattern; posterior spiracular plates slightly raised on stalks.

Anterior spiracles: With 3 branches. **Posterior spiracles:** Small sized and kidney-shaped with weakly pigmented; slits elongate oval; button not distinct. **Cephalopharyngeal sclerite:** Mouth hooks pointed sharply; accessory sclerites consist of a pair of oral bars and a pair of anterior rods; anterodorsal process pointed; dorsal cornua slender and longer than ventral cornua; longitudinal ventral pharyngeal ridges absent; dental sclerite without ventral bridge.

Biological notes: The feeding habits of this larvae are similar to those of *H. albipuncta*. The larvae seems to be carnivorous. They prey upon the fly larvae living in the cow dung. It was impossible to breed them to maturity on pure dung. The adult behavior also is similar to that of *H. albipuncta*. They gather on the pasturing cattle and human body. The eggs are deposited on the soil or grass beneath the dung cake.

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REFERENCES

- Hammer, O. (1941): Biological and ecological investigation on flies associated with pasturing cattle and their excrement. *Vidensk. Medd. Dan. Naturhist. Foren. Kjobenhavn*, 105: 141-393.
Keilin, D. and P. Tate, (1930): On certain semi-carnivorous Anthomyid larvae. *Parasitology*,

22: 168-181.

Lobanov, A. M. (1968): The morphology of the third instar larvae of the synanthropic flies from the genus *Hydrotaea* R. D. (Diptera: Muscidae). *Zool. J. Moscow*, 47: 85-90.

Séguy, E. (1923): Faune de France. Dipteres Anthomyides. 393 pp. Paris.

摘 要

牛糞より発生するクロハナバエ属 (genus *Polietes* Rondani) の1種とモモエグリハナバエ属 (genus *Hydrotaea* R. D.) の2種の3令幼虫および卵について
(双翅目, イエバエ科)

著者は、牛糞より発生するクロハナバエ属の1種

Polietes nigrolimbatus (オオクロハナバエ) とモモエグリハナバエ属の2種, *Hydrotaea albipuncta*, *H. meteorica* (キリガクレメマトイ) の3令幼虫および卵を記載した。 *P. nigrolimbatus* の幼虫は Fig. 4-9 のごとく、肛板後方に多くの小さな突起を有し、咽頭骨格は強く硬化し、腹翼の上縁は著しく三角状に突出しているなどの特徴があり、わが国に生息する *Polietes* 属の1種 *P. albolineatus* (ニセセジロハナバエ) とは容易に区別できる。またこの幼虫は、近縁でかつ肉食性として知られている *P. lardarius* (Fabricius) の幼虫に類似しているが、*P. nigrolimbatus* は糞食性である。*H. albipuncta* と *H. meteorica* の両種の幼虫の間には、第12節の後方表面のうろこ状の模様の有無、第6節より第11節までの腹部の棘帯と突起、肛板の突起などに差異がみられ、これらにより種の同定が可能である。この両種の幼虫は牛糞を与えただけでは成熟しないことなどから obligate な肉食性と考えられる。