Description of the 3rd instar larvae of the genus
Scatophaga Meigen (Diptera : Scatophagidae)
from Hokkaido*

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Abstract: In this paper, the author described and redescribed the 3rd instar larvae of 3 species belonging to the genus *Scatophaga* Meigen, namely *S. scybalaria* (Linné), *S. stercoraria* (Linné) and *S. suilla* (Fabricius), and presented a key to the species from Hokkaido.

INTRODUCTION

Fly larvae of the genus *Scatophaga* are known to be scavenger and many of them occur in animal dung. Hitherto 3 species of adults were recorded from Hokkaido (Fukuhara and Kurahashi, 1966 a, b). Therefore, our knowledge of their larvae are still fragmentary.

On the larvae of *S. stercoraria*, Cotterell (1920) and Schumann (1959/60) described in detail. The larvae of the other 2 species, *S. scybalaria* and *S. suilla* have so far been unknown and they are described and figured here for the first time.

METHODS OF COLLECTING LARVAE

Adult flies mating were collected by sweeping net in the pasture and identified. A pair of flies were kept in each plastic cup, 6 cm in height × 12 cm in diameter, with fresh cow dung for oviposition. The eggs laid in the dung were transferred into the other cups with fresh cow dung and they were reared to mature larvae. About a half of the mature larvae was killed in boiling

water and preserved in 70 % ethanol. The remaining larvae were reared to adults in order to reconfirm the species. Body length was measured in the extended state. Cephalopharyngeal sclerites and posterior spiracles were mounted in Canadian balsam and were illustrated under an optical microscope.

The preserved larvae were refixed with glutaraldehyde and osmic acid, and then dehydrated through a graded ethanol. Specimens were then dried by the conventional critical point method. The dried specimens were mounted on specimen stubs, sputter-coated with gold and examined with a scanning electron microscope (HHS-2R).

KEY TO THE SPECIES OF 3RD INSTAR
LARVAE OF *SCATOPHAGA* FROM
HOKKAIDO

1. Fifth to 12th segments covered with numerous spines..... *S. stercoraria*
- Fifth to 11th segments only with spinebands around anterior margin and spots of ventral spines..... 2
2. Fifth to 9th segments with ventral spines; small species, body length about 7-8 mm..... *S. suilla*
- Fifth segment without ventral spines; large species, body length about 11-12 mm..... *S. scybalaria*

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Figs. 1-3 Lateral view of 3rd instar larvae
Fig. 1 *S. scybalaria* Fig. 2 *S. stercoraria* Fig. 3 *S. suilla*

Figs. 4-6 Cephalopharyngeal sclerites
Fig. 4 *S. scybalaria* Fig. 5 *S. stercoraria*
Fig. 6 *S. suilla*

Figs. 7-9 Posterior spiracle
Fig. 7 *S. scybalaria* Fig. 8 *S. stercoraria*
Fig. 9 *S. suilla*

Figs. 10-12 Ventral view of 12th segment

Fig. 10 *S. scybalaria* Fig. 11 *S. stercoraria*Fig. 12 *S. suilla*

Figs. 13-15 Posterior view of 12th segment

Fig. 13 *S. scybalaria* Fig. 14 *S. stercoraria*Fig. 15 *S. suilla*ABBREVIATIONS USED
IN FIGURES

an	anus
ap	anal plate
as	anterior spiracle
b	button
dc	dorsal cornua
ds	dental sclerite
hs	hypostomal sclerite
IdE	Inner dorsal Elevation
MaT	Mesal anal tubercle
mh	mouth hook
MT	Mesal tubercle
ps	posterior spiracle
T1	Tubercle-1
T7	Tubercle-7
s	slit
vc	ventral cornua
vs	ventral spines
1-12	Body segment

DESCRIPTION

***Scatophaga scybalaria* (Linné, 1761)**

(Figs. 1, 4, 7, 10, 13, 16, 19)

Japanese name: Kibane Fun-bae

Musca scybalaria Linné 1761, *Fauna Suecica*, p. 1,860*Scatomyza scybalaria* Fallén 1819, *Dipt. Suec. Scatomyz.* p. 3*Scopeuma scybalarium* Meigen 1826, *System. Besch.*, Bd. 5, S. 247*Scatophaga scybalaria* Macquart 1835, *S. à Buff.*, Vol. 2, p. 392

Body: length about 11-12 mm, cylindrical and tapering anteriorly and truncated posteriorly, creamy white; 2nd to 12th segments with spine-band on anterior margins; 6th to 10th segments with ventral spines; the last segment with 7 pairs of tubercles, a pair of mesal anal tubercles and mesal tubercle, a pair of inner dorsal elevations evident.

Anterior spiracles: with 16-17 branches.

Posterior spiracles: wry rounded shaped and brownish; button present; interspiracular processes all dendriform.

Cephalopharyngeal sclerites: dark brown and extremely horn shaped mouth hook; accessory sclerites absent; dental sclerite wry diamond shaped.

Material examined: 13 examples, Noporo, Hokkaido, X 3, 1977.

Bionomics: This species is abundant and distributed widely in pastures of Hokkaido. The adults seem to like a shady place such as pasture with high plants and shades of urine patches.

The larvae are mainly found in dung on such shady places.

***Scatophaga stercoraria* (Linné, 1763)**

(Figs. 2, 5, 8, 11, 14, 17, 20)

Japanese name: Hime Fun-bae

Musca stercoraria Linné 1763, *Fauna Suecica*, p. 1,861*Scatomyza stercoraria* Fallén 1819, *Dipt. Suec. Scatomyz.*, p. 4*Scopeuma stercorarium* Meigen 1826, *System. Besch.*, Bd. 5, S. 248*Scatophaga stercoraria* Macquart 1835, *S. à Buff.*, Vol. 2, p. 393

Description of 3rd instar larvae:

Cotterell, G. S. 1920, *Proc. Zool. Soc. London*, 1920 : 629-647

Sack, P. 1937, 62a *Cordyluridae*, S. 6, Text-fig. 11

Schumann, H. 1959/60, *Wissenschaftliche Zeitschrift der Ernst-Moritz-Arndt-Universität Greifswald, Mathematisch-naturwissenschaftlich Reihe*, Nr. 3/4 : 209-215

Body : length about 9-10 mm, cylindrical and tapering anteriorly and truncated posteriorly, creamy white ; 5th to 12th segments heavily covered with numerous spines ; 3rd segment with spine-band on anterior margin ; 4th segment with spine-bands on anterior margin and middle of segment ; the last segment with 7 pairs of tubercles, a pair of mesalanal tubercles and a mesal tubercle, a pair of inner dorsal elevations not evident.

Anterior spiracles : with 13-21 branches.

Posterior spiracles : rounded shaped and brownish ; button present ; peritreme near button hollowly ; interspiracular process existing between middle and lower slits manifold and the others dendriform.

Cephalopharyngeal sclerite : horn shaped and slender mouth hook ; accessory sclerite absent ; dental sclerite triangular shaped.

Material examined : 16 examples, Noporo, Hokkaido, IX 12, 1977.

Bionomics : This species is commonly found in Japan. The males are found on dung in a sunny place such as pastures with low plants and paddocks. The females are usually observed on the grasses of pastures.

The larvae are mainly found in dung on such sunny places.

Figs. 16-18 Anterior spiracle

Fig. 16 *S. scybalaria* ($\times 250$) Fig. 17 *S. stercoraria* ($\times 300$) Fig. 18 *S. suilla* ($\times 300$)

Figs. 19-21 Posterior spiracle (arrow shows the interspiracular process existing between middle and lower slits)

Fig. 19 *S. scybalaria* ($\times 200$) Fig. 20 *S. stercoraria* ($\times 200$) Fig. 21 *S. suilla* ($\times 300$)

***Scatophaga suilla* (Fabricius, 1974)**

(Figs. 3, 6, 9, 12, 15, 18, 21)

Japanese name: Nise Kibane Fun-bae

Musca suilla Fabricius 1794, *Ent. Syst.*, Vol. 4, p. 343*Scatomyza suilla* Fallén 1819, *Dipt. Suec. Scatomyz.*, p. 3*Scatophaga suilla* Becker 1894, *Berlin. Entom. Z.*, Bd. 39, S. 167*Scopeuma suillum* Coquillett 1900, *Proc. Wash. Acad. Sci.* Vol. 2, p. 454

Body: length about 7-8 mm, cylindrical and tapering anteriorly and truncated posteriorly, creamy white; 2nd to 12th segments with spine-bands; 5th to 10th segments with ventral spines; the last segment with 7 pairs of tubercles, a pair of mesalanal tubercles and a mesal tubercle, a pair of inner dorsal elevations evident.

Anterior spiracles: with about 13 branches.

Posterior spiracles: elliptic shaped and brownish; button present; interspiracular process existing between middle and lower slits rakeform and the others dendriform.

Cephalopharyngeal sclerites: mouth hook horn shaped; accessory sclerite absent; dental sclerite triangular shaped.

Material examined: 12 examples, Noporo, Hokkaido, X 8, 1977.

Bionomics: The adults are abundantly found on dung at a shady place similar to the place where *S. scybalaria* is found, but some are also seen on dung at sunny places.

The larvae are mainly found in dung on such shady places.

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摘 要

北海道産ヒメフンバエ属3種(双翅目: フンバエ科)の終齢幼虫の形態

ヒメフンバエ属の幼虫形態についての詳細な記載は, Cotterell (1920), Schumann (1959/60) など数例を数えるにすぎない。

本報は, キバネフンバエ, ヒメフンバエ, およびニセキバネフンバエの終齢幼虫の一般形態および電子顕微鏡的形態を記載した。

ヒメフンバエ属の終齢幼虫は, 各体節の棘の配列, 腹部第12節の疣状突起, 後方気門などの特徴により, 種の同定が可能である。