A Systematic Study on the Larvae of the Subfamily Eumolpinae from Japan (Coleoptera: Chrysomelidae)

Jong Eun Lee

Department of Biology, Andong National University, Andong, Kyungbuk, 760-749

ABSTRACT: The present paper is a part of the study on the larvae of leaf-beetles in Japan. It described and illustrated nine species belonging to seven genera in the subfamily Eumolpinae; Basilepta fulipes, Colposcelis signata, Demotina fasciculata, D. modesta, Hyperaxia fasciata, Lypesthes ater, L. lewisi, Scolodonta sauteri and Xanthonia placida. It is the first to deal the larvae taxonomically in Japan. Their taxonomic remarks are also given.

Key Words: Chrysomelidae, Eumolpinae, Larva, Soil-dweller, Taxonomy

INTRODUCTION

The Eumolpinae are an old and comparatively primitive group of leaf beetles (Medvedev, 1957) and their larvae are interesting in that they are soil dwellers, unlike the larvae of the majority of Chrysomelidae. Like the study of larvae of other insect groups study of the larval stage of the Eumolpinae opens the way to correcting the systematics based on the characters of the adult stage, bringing the classification more in line with the natural systematics and reviewing the phylogenetic relationships. The adult classification of Japanese Eumolpinae has been established by Chujo and Kimoto (1961). Very little has been known on their bionomics and the larvae except for following a few papers. Boving & Craighead (1931) and Peterson (1951) illustrated the larvae of two eumolpine species, respectively. Kurucheva (1958, 1967), and Medvedev (1971) described and figured some larvae of Eumolpinae in the Soviet Union. The present author described and illustrated the larvae belonging to Eumolpinae collected in Japan; Basilepta fulipes, Colposcelis signata, Demotina fasciculata, D. modesta, Hyperaxia fasciata, Lypesthes ater, L. lewisi, Scolodonta sauteri and Xanthonia placida. The larvae of these species are described in Japan for the first time.

MATERIALS & METHODS

The materials used in this study were preserved in 70% ethyl alcohol. The larvae were macerated in 10% KOH solution for several minutes, rinsed in water, and then dissected under a stereoscopic microscope. For detailed morphological studies on the various parts of larva, the stereoscopic microscope and compound microscope were used. Drawings were made with aid of an ocular grid micrometer attached to stereoscopic microscope. The terminology of setae in this study is adopted essentially from Anderson (1947), and those for tubercles from Kimoto (1962).

SYSTEMATICS

Subfamily Eumolpinae Chapuis, 1874

Larval Characters of Subfamily Eumolpinae

Body creamy yellow, convexed dorso-ventrally, C-shaped. Head yellow to brown; mandible brown; prothorax and legs yellow to brown. Egg bursters present on 1st instar larva.

Head. Hypognathous, rounded, slightly sclerotized. Endocarina absent. Stemmata present or absent. Fronto-clypeal suture well sclerotized. Clypeus with 2 pairs of clypeal setae. Labrum with 3 pairs of labral setae. Antenna with 2-segmented, segment 1 with a large subconical sensory papilla and 1 seta, segment 2 with transverse dome-like, with 1 sensilla basiconicum and 4 or 5 setae at apex. Mandible well
sclerotized, with 3 teeth. Two mandibular setae present on dorsal surface. Maxillay palp 4-segmented; lacinia fused with stipes; galea with 1 spine-like seta and 8–11 setae. Cardo subtriangular, with 1 seta. Labial palp 1-segmented, somewhat elongated; ligula rounded; prementum with 1 pair of setae; postmentum with 2 or 3 pairs of setae.

Thorax. Pronotum slightly sclerotized; epipleural (EP) tubercles with 1 seta on each side. Thoracic spiracles ovoid or rounded, uniforous, situated on epipleural anterior (EPa) part; spiracular opening slit or rounded. Legs long and slender; trochanter with 5 sensilla; tarsungulus perpendicularly curved, awl-shaped, with 1 seta at base.

Abdomen. Typical abdominal segments with two folds. Abdominal spiracles uniforous, present on segment 1–8 similar to thoracic but smaller. Pygopod well developed.

Remarks: The larvae of the Eumolpinae live in the soil. These are feed on roots of host plants. The soil dwelling larvae of eumolpine species is closely related to those of Synetinae, which are also soil dwellers. By the larval characters, Eumolpinae is close to Synetinae in having the similar head capsule, mandibles, labial palpi, claws and setal arrangement, but is characteristic by the not sclerotized tergites of abdominal segment 9 and 10, two-segmented antennae, and not fused trochanter and femora. Egg bursters present on meso- and metathoraxces, and 1st abdominal segment of 1st instar larva.

Furthermore, the larvae of the Eumolpinae occupy the same ecological niche as those of Synetinae feeding on root in the soil.

Key to known species of Eumolpine larvae

1. Stemmata present ........................................... 2
   - Stemmata absent .................................................. 3
2. Tarsungulus strongly curved; stipes with 2 pairs of setae ........................................ Demotina modesta
   - Tarsungulus moderately curved; stipes with 3 pairs of setae .................................. Hyperaxis fasciata
3. Hind corners of epicranium produced ........................................... 4
   - Hind corners of epicranium rounded ........................................... 5
4. Spiracular opening slit .......... Xanthonia placida
   - Spiracular opening rounded .......... Lystephes lewisi
5. Frontal suture indistinct ........................................... 6
   - Frontal suture distinct ........................................... 7
6. Pulvillus present; frons with 3 pairs of frontal setae ................................ Basileptula fulvipes
   - Pulvillus absent; frons with 4 pairs of frontal setae ........................................ D. fasciculata
7. Epipharynx with 4 pairs of club-shaped setae and 1 pair of spiniform setae ....................... 8
   - Epipharynx with 3 pairs of spiniform setae .......... L. ater
   - Third tooth of mandible stumpy ................ Colposcelis signata
   - Third tooth of mandible sharp .......... Scolodontia sauteri

Genus Basileptula Baly, 1860

Basileptula fulvipes (Motschulsky)(Fig. 1)

Adult:

Nodostoma fulvipes Motschulsky, 1860: 176; 1858: 23.
Nodostoma aeneipennis Motschulsky, 1860: 177.
Nodostoma atripes Motschulsky, 1860, l.c.
Nodostoma coerulescens Weise, 1889: 97.
Nodostoma picicolle Weise, 1889, l.c.
Nodostoma rufotestaceum Motschulsky, 1860: 177; 1858: 23.

Second instar larva. Body creamy yellow, C-shaped; head yellow; mandible brown; thoracic tubercles and legs pale yellow.

Head. Hypognathous, rounded, slightly sclerotized. Epicranial suture indistinct; coronal suture indistinct.

![Fig. 1. Basileptula fulvipes (Motschulsky)](image)
A. second instar larva; B, spiracle; C, pronotum; D, head; E, antenna; F, clypeus, epipharynx and labrum; G, maxilla and labium; H, leg; I, mandible.