

Article ID: 1000-5692(2005)01-0073-04

# Last stage larval description of two species of Noctuidae from Korea (Lepidoptera)

PIAO Mei-hua<sup>1</sup>, LEE Chan-young<sup>2</sup>, FANG Zhi-gang<sup>1</sup>

(1. College of Life Sciences, China Jiliang University, Hangzhou 310018, Zhejiang, China; 2. Department of Forest Resources Protection, College of Forest Sciences, Kangwon National University, Chuncheon 200-701, Korea)

**Abstract:** The mature larval external morphologies of *Herminia tarsicrinalis* (Knoch) and *Pseudoips sylpha* (Butler) of Noctuidae were observed. All specimens are deposited in the Insect Collection of Department of Forest Resources Protection, Kangwon National University, Korea. [En, 2 fig. 5 ref.]

**Key words:** entomology; larval morphology; Noctuidae; Lepidoptera; Korea

**CLC number:** Q969.42; S763.42      **Document code:** A

The family Noctuidae is large and widely distributed in Korea, nearly 1 000 species have been described from adult specimens, but larvae are known for only a few species. The Noctuidae larvae is mostly important pests of agriculture and forestry. Many of the documented larvae are so poorly understood that redescrptions, more host plant data, and direct, field behavioral observations are needed. Abbreviated description of late stage larvae have been given for *Herminia* Latreille and others 44 genera of Noctuidae by Gardner (1948)<sup>[1]</sup>. The authors here provide detailed descriptions and illustrations of the larvae of *Herminia tarsicrinalis* and *Pseudoips sylpha*.

## 1 Materials and Methods

The morphological features of the body of matures larvae in alcohol were examined. Then, they were macerated in 10% KOH for several minutes and dissected under stereoscopic microscope (40×). The head capsule with attached mouthparts was first removed from the body by a cut made with a fine forceps around the edges of the occipital foramen. The maxillae and labium as a unit were removed from the head capsule. The head was sketched under this condition from dorsal and ventral sides. Then the mandibles with attached tendons were removed from the head capsule. Mouthparts and skins were mounted on microscopic slides for detailed examinations (100× or 150×). The nomenclature of larvae setae and puncture follows Hinton (1946)<sup>[2]</sup>, and the terminology of labrum, maxillary lobe, and palpi follows Heinrich (1916)<sup>[3]</sup>, Grimes and Neunzig (1986a, b)<sup>[3]</sup>.

## 2 Description

### 2.1 *Herminia tarsicrinalis* (Knoch) (Figure 1)

---

Received date: 2004-08-10; Revised date: 2004-10-08

Biography: PIAO Mei-hua, associate professor, Ph. D., specializing in systematic entomology and molecular phylogeny. E-mail: mhpliao991@hotmail.com

Larva length: 13.0—19.0 mm. Head width: 1.2—1.6 mm.

Body yellow, with reddish brown speckles, dorsal area with segmental series black triangles on  $T_3$  and  $A_1$ — $A_8$ , spiracle anterior with oblique blackish bars on  $A_1$ — $A_8$ ; head blackish yellow, reticulations blackish, integuments granulous; thoracic shield blackish yellow; anal shield of the body color; thoracic legs brownish yellow; body setae moderately short and brown; setal pinacula small and black; spiracles blackish yellow with black peritremes.

Head: Wider almost long. The distance from adfrontal sutures to the vertical triangle greater than the distance from frontal sutures to adfrontal ecdysial lines; the front extends about one-third of distance to vertical triangle.  $A_1$ ,  $A_2$  and  $A_3$  forming an obtuse angle at  $A_2$ .

Mouthparts: Labral emagination one-fifths deep, forming a right angle;  $M_2$  slightly lateroventral to  $M_1$ ;  $L_1$  and  $L_2$  close approximate,  $L_1$  directly lateral to  $L_2$ . Epipharynx with small spines. Mandible with five apical teeth on cutting edge; inner surface without internal tooth. Labium having membranous postmentum with two conspicuous setae; mentum sclerotized and brown; prementum with median spinneret distally and labial palpi laterally; spinneret apical rounded, about 4 times as long as median breadth, and shorter than tip of seta on apical segment of labial palpi. Maxillae: cardo mostly membranous with hook-like sclerites basally; stipes mostly membranous, with dark sclerite and two setae; palpifer sclerotized and with one seta; palpus: basal segment with a maxillary lobe and one seta, on the lobe with two sensilla styloconica, three sensilla trichodea, and two sensilla basiconica; median segment stout and with one puncture; apical segment with eight sensilla basiconica distally.

Thorax:  $T_1$   $D_1$  closer to  $D_2$  than to  $XD_1$ ;  $SD_1$  and  $SD_2$  close approximate and on the shield,  $SD_1$  usually thinner than  $SD_2$ ;  $L_1$  and  $L_2$  close to each other, anterior to spiracle,  $L_2$  usually thinner than  $L_1$ ;  $SV_1$  and  $SV_2$  present above leg.  $T_2$  and  $T_3$   $D_1$ ,  $D_2$  and  $SD_2$  forming an almost straight vertical line;  $SD_1$  slightly anteroventral to  $SD_2$  and usually hair like. Thoracic leg: coxa with seven setae; femur with two setae; tibia with six setae and one puncture; tarsus with four setae (lanceolate, spatulate, thick and narrow seta).

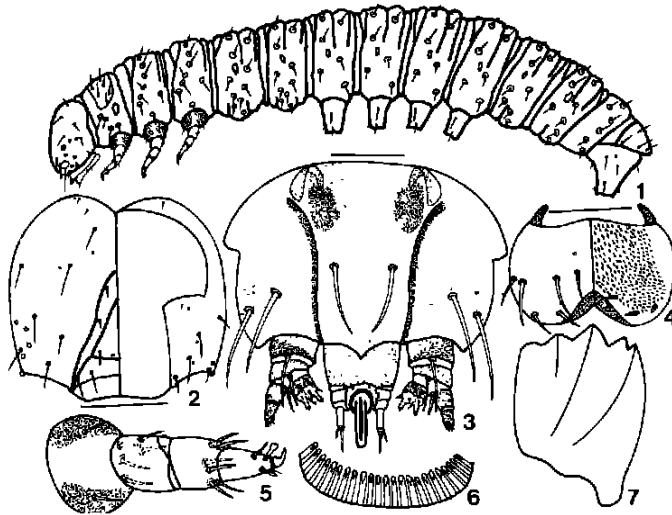


Figure 1 *Herminia tarsicrinalis* (Knoch)

1. larva; 2. head (dorsal and ventral view); 3. maxillae and labium; 4. labrum and epipharynx; 5. thoracic leg; 6. crochets of  $A_3$ — $A_6$ ; 7. mandible (ventral view). scales: 0.5 mm

Abdomen: On  $A_1$ — $A_8$ ,  $D_1$  anterodorsal to  $D_2$ ;  $SD_1$  dorsal to spiracle in  $A_1$  and  $A_7$ , anterodorsal to spiracle in  $A_2$ — $A_6$  and  $A_8$ ;  $L_1$  directly lateral to spiracle in  $A_1$  and  $A_8$ , posteroventral to spiracle in  $A_2$ — $A_7$ ;  $L_2$  anteroventral to spiracle;  $L_3$  posteroventral to  $L_2$  in  $A_1$ — $A_6$  and  $A_8$ , straight below from  $L_2$  in  $A_7$ . On  $A_9$ ,  $D_1$

equidistant from  $D_2$  and  $SD_1$ , L group unisetose. Anal shield rounded posteriorly, with four short setae; anal legs with nine setae and one puncture. SV group on abdominal segments 1, 2, 7, 8 and 9 usually 3 : 3 : 1 : 1. Ventral prolegs of  $A_3 - A_6$  complete and equal, the crochets uniordinal, homoideous mesoseries. All spiracles oval, those on  $T_1$  and  $A_8$  the largest, on  $A_1$  slightly larger than on  $A_2 - A_7$ .

Materials examined: mature larvae collected from leaves of *Quercus mongolica* Fisch. ex Ledeb. at Experiment Forest of Kangwon National University, Chunchon City, Kangwon Do, 1997-07-08.

This species may be characterized by the body setae moderately short; prolegs of  $A_3 - A_6$  complete and equal; mandible with five apical teeth, without internal tooth.

## 2.2 *Pseudoips sylpha* (Butler) (Figure 2)

Larva length: 23.0–29.0 mm. Head width: 2.8–3.1 mm.

Body yellowish white with several irregularly stripes; head yellow; thoracic shield and anal shield of the body color; thoracic legs yellow with brown claws; body setae moderate; setal pinacula white; spiracles yellow with pale brown peritremes.

Head: Longer than wide. The adfrontal sutures indistinct; the front extends one-third of distance to vertical triangle.  $A_1$ ,  $A_2$  and  $A$  forming an acute angle at  $A_2$ .

Mouthparts: Labral emargination about half deep, forming a U-shape;  $M_2$  lateroventral to  $M_1$ ;  $L_1$  and  $L_2$  not close approximate,  $L_1$  laterodorsal to  $L_2$ . Epipharynx without spine. Mandible with five apical teeth on cutting edge, the second and third teeth bilobed distally, fifth tooth small; inner surface with a transverse large internal tooth. Labium having membranous postmentum with two conspicuous setae; mentum weakly sclerotized and light brown; prementum with spinneret distally and labial palpi laterally; spinneret apical rounded, about 6 times as long as median breadth and slightly shorter than tip of seta on apical segment on labial palpi. Maxillae: cardo having membranous with hook-like sclerites basally; stipes mostly membranous and with two setae; palpifer weakly sclerotized and with one seta; palpus: basal segment with one seta and a lobe, on the lobe with two sensilla styloconica, three sensilla trichodea, three sensilla basiconica and one puncture; median segment subequal to apical segment and with one puncture; apical segment with eight sensilla basiconica distally.

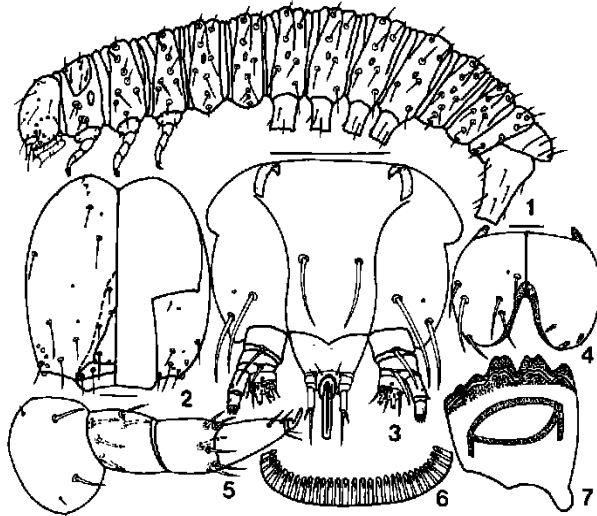


Figure 2 *Pseudoips sylpha* (Butler)

1. larva; 2. head (dorsal and ventral view); 3. maxillae and labium; 4. labrum and epipharynx; 5. thoracic leg; 6. crochets of  $A_3 - A_6$ ; 7. mandible (ventral view). scales: 0.5 mm

Thorax:  $T_1$  :  $D_1$  closer to  $D_2$  than to  $XD_1$ ,  $SD_1$  and  $SD_2$  forming an obtuse angle at  $SD_1$ ;  $SD_1$  usually thinner than  $SD_2$ ;  $L_1$  and  $L_2$  close to each other, anterior to spiracle,  $L_2$  usually thinner than  $L_1$ ;  $SV_1$  and  $SV_2$  present

above leg.  $T_2$  and  $T_3$ :  $D_1$  above from  $D_2$ ;  $SD_1$  below from  $SD_2$ ,  $SD_1$  hair like;  $L_1$ ,  $L_2$  and  $L_3$  present; SV group; unisetose. Thoracic leg: coxa with seven setae; femur with two setae; tibia with six setae; tarsus with four setae (one narrow seta and three thick setae).

Abdomen: On  $A_1$ — $A_8$ ,  $D_1$  distinctly anterodorsal to  $D_2$ ;  $SD_1$  dorsal to spiracle in  $A_1$ — $A_7$ , anterodorsal to spiracle in  $A_8$ ;  $L_1$  directly lateral to spiracle in  $A_1$ , lateroventral to spiracle in  $A_2$ — $A_8$ ;  $L_2$  anteroventral to spiracle;  $L_3$  straight below from spiracle in  $A_1$ — $A_2$  and  $A_7$ — $A_8$ , lateroventral to spiracle in  $A_3$ — $A_6$ . On  $A_9$ ,  $D_1$  closer to  $D_2$  than to  $SD_1$ ; L group unisetose. Anal shield rounded posteriorly; anal legs with nine setae. SV group on abdominal segments 1, 2, 7, 8 and 9 usually 1:2:1:1:1. The crochets of  $A_3$ — $A_6$  and  $A_{10}$  uniordinal, homoideous mesoseries. All spiracles elongate oval, those on  $T_1$  larger than the others.

Materials examined: mature larvae collected from leaves of *Quercus aliena* Blume. at Experiment Forest of Kangwon National University, Chunchon City, Kangwon Do, 1998-06-01.

This species may be characterized by the setae SD group on the  $T_1$  shield; adfrontal sutures indistinct; mandible with five apical teeth, the second and third teeth bilobed, and with a large internal tooth; thoracic legs with three thick setae.

## References:

- [1] Gardner J C M. On larvae of the Noctuidae (Lepidoptera) [J]. *Trans R Ent Soc Lond.* 1948, **99**: 291—318.
- [2] Grimes L R, Neunzig H H. Morphological survey of the Maxillae in last stage larvae of the suborder Ditrysia (Lepidoptera): palpi [J]. *Am Ent Soc Amer.* 1986 a, **79**: 489—509.
- [3] Grimes L R, Neunzig H H. Morphological survey of the Maxillae in last stage larvae of the suborder Ditrysia (Lepidoptera): mesal lobes (Laciniogaleae) [J]. *Am Ent Soc Amer.* 1986 a, **79**: 501—526.
- [4] Heinrich C. On the taxonomic value of some larval characters in the Lepidoptera [J]. *Pro Ent Soc.* 1916, **18**: 154—164.
- [5] Hinton H E. On the homology and nomenclature of the setae of Lepidoptera larvae, with some notes on the phylogeny of the Lepidoptera [J]. *Trans R Ent Soc Lond.* 1946 **97**: 1—37.

## 韩国 2 种夜蛾幼虫形态记述 (鳞翅目)

朴美花<sup>1</sup>, 李灿镛<sup>2</sup>, 方志刚<sup>1</sup>

(1. 中国计量学院 生命科学学院, 浙江 杭州 310018; 2. 江原大学校山林科学大学 森林资源保护学科, 江原 春川 200-701)

**摘要:** 记述了韩国夜蛾科重要害虫灰长须夜蛾 *Hermiona tarsicrinalis* (Knoch) 和希饰夜蛾 *Pseudoips stylpha* (Butler) 老熟幼虫的形态特征, 并提供了形态特征图。所有标本均保存在韩国江原大学校森林资源保护学科昆虫标本室。图 2 参 5

**关键词:** 昆虫学; 幼虫形态; 夜蛾科; 鳞翅目; 韩国