

## Larval description of two species of Amphipyrrinae (Lepidoptera: Noctuidae) from China

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**Abstract:** The last-instar larval external morphologies of *Spodoptera exigua* (Hübner) and *Seasamia inferens* (Walker) of Amphipyrrinae is described and illustrated. [En, 2 fig. 9 ref.]

**Key words:** entomology; larval morphology; Amphipyrrinae; Noctuidae; Lepidoptera; China

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## 杂夜蛾亚科 2 种幼虫形态记述(鳞翅目: 夜蛾科)

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**摘要:** 详细记述了中国甜菜夜蛾 *Spodoptera exigua*(Hübner) 和稻蛀茎夜蛾 *Seasamia inferens* (Walker) 幼虫的形态特征, 并提供了形态特征图。图 2 参 9

**关键词:** 昆虫学; 幼虫形态; 杂夜蛾亚科; 夜蛾科; 鳞翅目; 中国

A mature larva of Amphipyrrinae is small to medium. The head is rounded; the distance from stemmata 3 to 4 is shorter than others or the distance from stemmata 1 to 2 is shorter than others. The first abdomen segment has two subvental setae (SV); the subdorsal seta (SD) is dorsal, anterodorsal or anteral to spiracle on the eighth abdomen segment. Cuticle is smooth or bearing granules or spinules. Body is concolorous, marked with chevrons or triangles, or longitudinally striped. The larvae have four pairs of abdominal prolegs in addition to a pair of caudal prolegs those bear crochets in homoideous mesoseries. The larval color and major features of *Seasamia inferens* (Walker) and others Noctuidae larvae have been presented by Gardner<sup>[1]</sup>. The larval brief morphology, distribution and food plant of *Laphygma exigua* (Hbn.) and others 164 species of Amphipyrrinae have been studied by Crumb<sup>[2]</sup>. The larval color pattern, mandible, head and body chaetotaxy of *Laphygma exigus* (Hbn.), *Scolecampa liburna* Geyer and others 57 species of Phalaenidae have been described by Peterson<sup>[3]</sup>. The larval color pattern, mandible, spiracle, labrum and body chaetotaxy of *Laphygma exigua* (Hübner), *Seasamia inferens* (Walker) and others 7 species of Acronyctinae have been described by Zhu *et al.*<sup>[4]</sup>. The larval color, distribution and host plants of *Spodoptera exigua* (Hübner) and others 7 species of Amphipyrrinae have been published by Brown<sup>[5]</sup>. This paper provides detailed descriptions and illustrations of larvae of *Spodoptera exigua* (Hübner) and *seasamia inferens* (Walker).

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## 1 Materials and Methods

The collected larvae were reared to the last stage for morphological examination. About 1/3 of the last stage larvae were preserved in 70% alcohol, and the left were reared with host plant to obtain adults.

The morphological features of the bodies of mature larvae in alcohol were examined. They were cleared in  $10.0 \text{ g} \cdot \text{L}^{-1}$  KOH for several minutes and dissected under stereoscopic microscope ( $40\times$ ).

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 ( $100\times$  or  $150\times$ ).

The nomenclature of larval setae and puncture follows Hinton<sup>[6]</sup>, and the terminology of the labrum maxillary lobe, and palpi follows Heinrich<sup>[7]</sup>, and Grimes and Neunzig<sup>[8-9]</sup>.

## 2 Descriptions

### 2.1 *Spodoptera exigua* (Hübner) (Figure 1)

**2.1.1 General** Length 13.0 – 28.0 mm; width 1.2 – 1.8 mm. Body color usually changeful, from pale green to brown; head yellowish brown with brown irregular reticulation, dorsal side with brown or dark brown irregular markings, dorsal lines brown, subdorsal lines grayish white, spiracular lines dark brown, subspiracular lines gray, ventral side light; thoracic shield and anal shield indistinct; spiracular posterodorsal area with one suborbicular white spot on A1-8; thoracic legs and prolegs with brown spots; spiracles yellowish brown with brown peritremes.

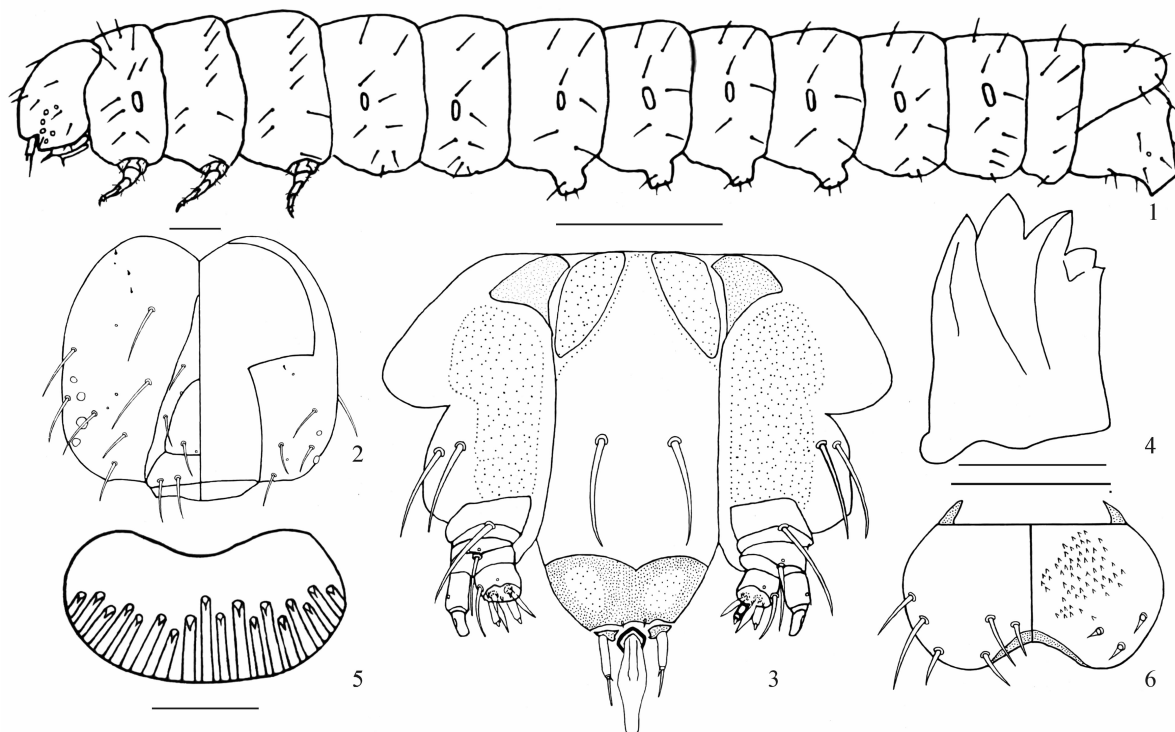


Figure 1 *Spodoptera exigua* (Hübner)

1. larva; 2. head [frontal (left) and ventral (right) view]; 3. maxillae and labium; 4. mandible (ventral view); 5. crochets of A3-6; 6. labrum (left) and epipharynx (right). scales: 0.5 mm

**2.1.2 Head** The adfrontal suture not reaching epicranial notch, the distance from apex of adfrontal sutures

to apex of frons sutures about 2.5 times the distance from vertical triangle to apex of adfrontal sutures, the frons extends half of the distance to the vertical triangle. Seta A2 closer to A1 than to A3.

**2.1.3 Mouthparts** Labrum emargination about one-fifth deep, forming a normal arc; M2 laterodorsal to M1; L1 laterodorsal to L2. 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; spinneret apical rounded, about 4 times as long as median breadth, and longer than tip of seta on apical segment of labial palpi. Maxillae: cardo mostly membranous, with hook-like sclerites basally; stipes with two setae; palpus: basal segment with a maxillary lobe and one seta, on the lobe with two sensilla styloconica, three sensilla trichodea (two knives setae), two sensilla basiconica, median segment longer than apical segment.

**2.1.4 Thorax** T1: D1 closer to XD1 than to D2; XD2, SD1 and SD2 forming an obtuse angle at SD1; L group bisetose; SV1 and SV2 present above leg. T2 and T3: D1, D2, SD2 and SD1 arranged a straight vertical line; L1, L2 and L3 present; SV group unisetose.

**2.1.5 Abdomen** On A1-8, D1 anterodorsal to D2; SD1 dorsal to spiracle; L1 caudal to spiracle; L2 straight below from spiracle in A1-7, anteroventral to spiracle in A8; L3 posteroventral to L2. SV group trisetose on A3-6, bisetose on A1-2 and A7-8. On A9, D1 anteroventral to D2; D2, SD1 and L almost forming straight line; L group unisetose. Prolegs on A3-6 and A10, the crochets biordinal, arranged in homoideous mesoserries.

**2.1.6 Materials** Examined mature larvae collected from leaves of *Glycine max* at Zaozhuang City, Shangdong Province, 2008-08-30.

## 2.2 *Seasamia inferens* (Walker) (Figure 2)

**2.2.1 General** Length 20.0 – 30.0 mm; width 1.5 – 2.1 mm. Body usually thick-short, blush, and without pattern, the spiracular line wider and brown on A1-8; head reddish brown, with inconspicuous markings; thoracic shield and anal shield pale yellow; thoracic legs yellowish brown with brown claws, anal legs yellowish brown; pinaculum indistinct; spiracles yellowish brown with brown peritremes.

**2.2.2 Head** The adfrontal suture not reaching epicranial notch, the distance from vertical triangle to apex of adfrontal sutures about 3 times the distance from apex of adfrontal sutures to apex of frons sutures, the frons

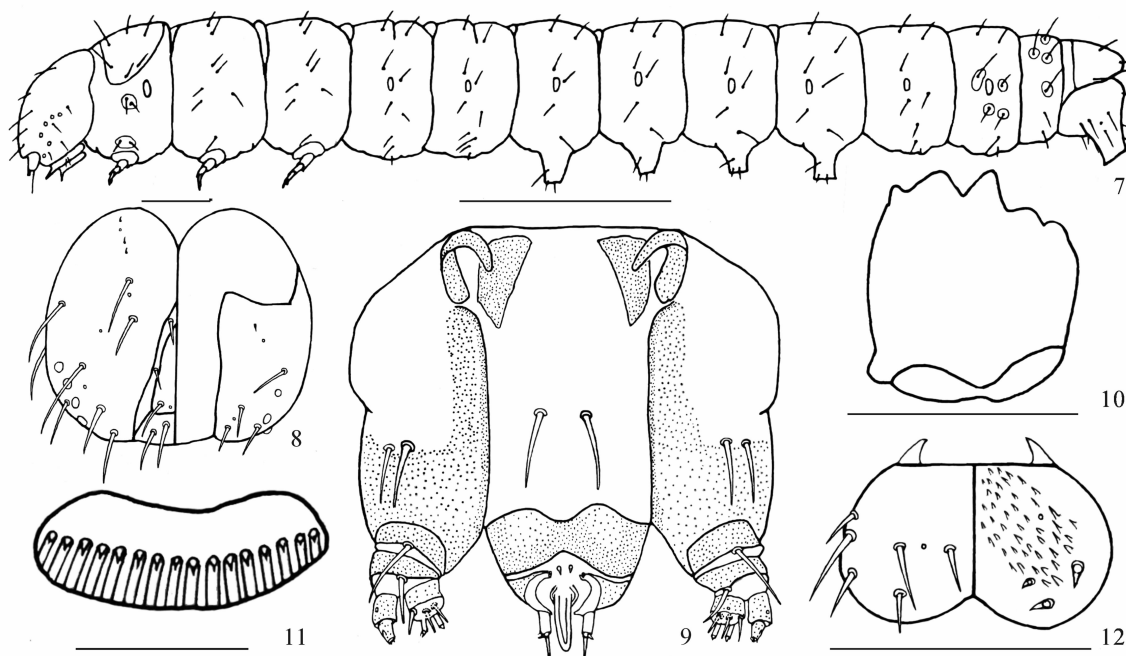


Figure 2 *Seasamia inferens* (Walker)

7. larva; 8. head [frontal (left) and ventral (right) view]; 9. maxillae and labium; 10. mandible (ventral view); 11. crochets of A3-6; 12. labrum (left) and epipharynx (right). scales: 0.5 mm

extends three-fifths of the distance to the vertical triangle. Seta A2 closer to A1 than to A3.

**2.2.3 Mouthparts** Labrum emargination one-sixth deep, forming an obtuse angle; M2 slightly laterodorsal to M1; L1 dorsal to L2. 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; the spinneret apical rounded, about 5 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 with dark sclerite and two setae; palpus: basal segment with a maxillary lobe and one seta, on the lobe with two sensilla styloconica, three sensilla trichodea, two sensilla basiconica; median segment longer than apical segment.

**2.2.4 Thorax** T1: D1 closer to D2 than to XD1; XD2, SD1 and SD2 forming an obtuse angle at SD1; L group and SV group bisetose. T2 and T3: D1 and D2, SD2 and SD1 closely approximate, respectively; L1, L2 and L3 present; SV group unisetose.

**2.2.5 Abdomen** On A1-8, D1 anterodorsal to D2; SD1 dorsal to spiracle On A1-7, anterodorsal to spiracle on A8; L1 caudal to spiracle in A1-6 and A8, posterocaudal to spiracle in A7; L2 straight below from spiracle; L3 posteroventral to L2; SV group trisetose on A2-6, bisetose on A1, unisetose on A7-8. On A9, D1 anteroventral to D2; D2, SD1 and L almost forming straight line; L group unisetose. Prolegs on A3-6 and A10, the crochets uniordinal, arranged in homoideous mesoserries.

**2.2.6 Materials** Examined mature larvae collected from leaves of *Oryza sativa* Linanaeus at Jingjiang City, Jiangsu Province, 2009-08-26.

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