

# Morphology of mature larvae of two species injurious to rice from China (Lepidoptera: Pyralidae)

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**Abstract:** The larval external morphology of *Chilo suppressalis* (Walker) and *Tryporyza incertulas* (Walker) of Pyralidae (Lepidoptera) are described and illustrated. All specimens are deposited in the Insect Collection of College of Life Sciences, China Jiliang University, China. [En, 2 fig. 7 ref.]

**Key words:** entomology; larval morphology; Lepidoptera; Pyralidae; China

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The moths of *Chilo suppressalis* (Walker) and *Tryporyza incertulas* (Walker) are of wide distribution in China. Their larvae bore in stems, roots and leaves of rice, and are important rice pests throughout Asia. Detailed descriptions and illustrations of larvae of *Chilo suppressalis* (Walker), and *Tryporyza incertulas* (Walker) are provided. Rothschild (1966)<sup>[1]</sup> briefly described color pattern and chaetotaxy of *Chilo suppressalis* (Walker), *Tryporyza incertulas* (Walker) and *Sesamia inferens* (Walker) of larvae and pupae Neunzig (1987)<sup>[2]</sup> reported *Chilo suppressalis* (Walker), *Chilo psgadellus* Zincken and 6 other Pyralidae species. Meijerman and Ulenbergh (1996)<sup>[3]</sup> published the larval morphology, host plants and distribution of *Chilo* Zincken and 4 other genera larvae (Pyralidae).

## 1 Materials and Methods

The morphological features of the body of larvae in 70% alcohol were examined. They were macerated in 100 g·kg<sup>-1</sup> 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

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

The nomenclature of larvae setae and puncture follows Hinton (1946)<sup>[4]</sup>, and the terminology of labrum, maxillary lobe, and palpi follows Heinrich (1916)<sup>[5]</sup>, and Grimes and Neunzig (1986a, b)<sup>[6,7]</sup>.

## 2 Description

### 2.1 *Chilo suppressalis* (Walker) (Figure 1)

Body usually brownish yellow; head pale brown with brown maculations, thoracic shield and anal shield brown; thoracic legs brown; pinacula distinct and light brown; spiracles yellow with dark brown peritremes.

**Head:** Ocelli area darker pigmented. The distance from vertical triangle to apex of adfrontal sutures slightly longer than the distance from apex of adfrontal sutures to apex of frontal sutures, the front extends four-sevenths of the distance to the vertical triangle. A1, A2 and A3 forming an obtuse angle at A2.

**Mouthparts:** Labrum emargination about one fourth deep, forming a normal arc; M2 laterodorsal to M1; L1 and L2 not closely approximate, L1 laterodorsal to L2. Epipharynx with small spines. Mandible with six apical teeth on cutting edge, inner surface with one internal tooth at base of first tooth. Labium having membranous postmentum, with two conspicuous setae; mentum sclerotized; prementum with median spinneret distally and labial palpi laterally; spinneret rounded apically, 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 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, three sensilla basiconica and one puncture; median segment longer than apical segment, stout, and with one puncture; apical segment with eight small sensilla basiconica distally.

**Thorax T1:** D1 equidistance from D2 and XD1; XD2, SD1 and SD2 forming a right angle at SD1; L group bisetose; SV1 and SV2 present above leg. **T2 and T3:** D1 and D2, SD2 and SD1 on the same pinaculum, respectively; L1, L2 and L3 present; SV group bisetose. Thoracic leg: coxa with seven setae; femur with two setae; tibia with six setae and one puncture; tarsus with four small setae.

**Abdomen:** on A1—A8, D1 anterodorsal to D2; SD1 dorsal to spiracle except for A8 (SD1 anteral to spiracle), SD2 anterodorsal to spiracle except for A8 (SD2 anteral to spiracle); L1 and L2 adjacent and ventral to spiracle, L3 lateroventral to L1—L2; D1—D1, D2—D2 on the same pinaculum in A8. On A9, D2 pinaculum fused from dorsum; SD1 postroventral to D1; L1 group unisetose. Anal shield rounded posteriorly; anal legs with nine setae and one puncture. SV group on abdominal segments 1, 2, 7, 8 and 9 usually 3:3:2:1:1. The crochets of A3—A6 prolegs triordinal, arranged in a circle. All spiracles oval, those on T1 and A8 of about the same size, larger than the others.

**Larva length:** 25—32 mm. **Head width:** 1.6—1.8 mm.

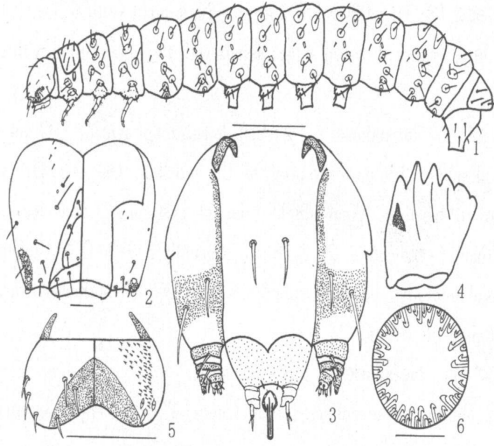
**Materials examined:** Mature larvae collected from leaves of *Oryza sativa* L. in Jinhua City, Zhejiang Province, 2005-06-29.

**Number of larvae examined:** 8.

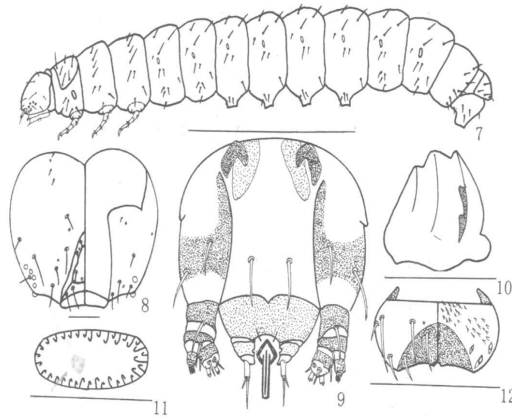
This species is characterized by the labrum emargination forming a normal arc, seta L1 and L2 not closely approximate, L1 laterodorsal to L2; ocelli area darker pigmented; mandible with six apical teeth, inner surface with one internal tooth at base of first tooth; SV group bisetose on T2 and T3; SV group of abdominal segments 1, 2, 7, 8 and 9 usually 3:3:2:1:1.

### 2.2 *Tryporyza incertulas* (Walker) (Figure 2)

Body usually pale yellow; head brown with brown maculations; thoracic shield brown; anal shield yellow; thoracic legs light brown; pinacula indistinct; spiracles yellow with brown peritremes.

Figure 1 *Chilo suppressalis* (Walker)

1. larva; 2. head (dorsal and ventral view); 3. maxillae and labium; 4. mandible (ventral view); 5. labrum and epipharynx; 6. crochets of A3—A6. scales: 0.25 mm

Figure 2 *Tryporyza incertulas* (Walker)

7. larva; 8. head (dorsal and ventral view); 9. maxillae and labium; 10. mandible (ventral view); 11. crochets of A3—A6; 12. labrum and epipharynx. scales: 0.25 mm

**Head:** The adfrontal suture not reaching epicranial notch, the distance from vertical triangle to apex of adfrontal sutures longer than the distance from apex of adfrontal sutures to apex of frontal sutures, the frons extends five-twelfths of the distance to the vertical triangle. A1, A2 and A3 forming an obtuse angle at A2.

**Mouthparts:** Labrum emargination one-eleventh deep, forming an acute angle; M2 laterodorsal to M1; L1 and L2 closely approximate, L1 slightly lateroventral to L2. Epipharynx with small spines. Mandible with three apical teeth on cutting edge, inner surface with two internal teeth at base of first tooth. Labium having membranous postmentum with two conspicuous setae; mentum sclerotized; prementum with the median spinneret distally and the labial palpi laterally; the spinneret apical rounded, about 6 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 mostly membranous, with dark sclerites and two setae. **Palpus:** basal segment with a maxillary lobe and one seta on the lobe with three sensilla trichodea, two sensilla styloconica, and two sensilla basiconica and one puncture; median segment longer than apical segment and with one puncture; apical segment with eight small sensilla basiconica distally.

**Thorax T1:** D1 equidistance from D2 and XD1; XD2, SD1 and SD2 forming an acute angle at SD1; L group

and SV group bisetose. T2 and T3: D1, D2 and SD2 arranged a straight vertical line; L1, L2 and L3 present; SV group unisetose. Thoracic leg: coxa with seven setae; femur with two setae; tibia with six setae; tarsus with four small setae.

**Abdomen:** On A1—A8, D1 anterodorsal to D2; SD1 dorsal to spiracle 7, SD2 anterodorsal to spiracle except for A8 (SD2 anterior to spiracle); L3 posteroventral to L1 and L2. On A9, D1 anteroventral to D2, SD1 posteroventral to D1; L group bisetose. Anal shield rounded posteriorly, anal legs with nine setae and one puncture. SV group of abdominal segments 1, 2, 7, 8 and 9 usually 3:3:3:1:1. Crochets of A3—A6 in circles, crochets small and uniorbital laterally, becoming biorbital laterally. All spiracles oval, those on T1 and A8 of about the same size, larger than the others.

**Larva length:** 19—24 mm. **Head width:** 1.8—2.3 mm.

**Materials examined:** Mature larvae collected from leaves of *Oryza sativa* L. in Songyang City, Zhejiang Province, 2003-07-20.

**Number of larvae examined:** 8.

This species is characteristic in having the labrum seta L1 and L2 closely approximate, L1 slightly lateroventral to L2; Mandible with three apical teeth on cutting edge, inner surface with two internal teeth at base of first tooth; SV group of abdominal segments 1, 2, 7, 8 and 9 usually 3:3:3:1:1.

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## 中国 2 种螟蛾科幼虫的形态记述(鳞翅目)

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**摘要:** 详细记述了中国螟蛾科二化螟 *Chilo suppressalis* (Walker) 和三化螟 *Tryporyza incertulas* (Walker) 幼虫的形态特征, 并提供了形态特征图。所有标本均保存在中国计量学院生命科学学院标本室。图 2 参 7

**关键词:** 昆虫学; 幼虫形态; 螟蛾科; 鳞翅目; 中国