

Immature stages of *Polymixis aphrodite* Fibiger, 1997 (Lepidoptera: Noctuidae)

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The egg, larva and pupa of *Polymixis aphrodite* Fibiger, 1997 are described and illustrated based on material collected in Cyprus in December 1999. Immature stages of this species are close to those of *Polymixis trisignata* (Ménétriés, 1847), which also occurs on the island. Comparative notes and differences between both species are given.

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1. Introduction

Adult specimens of *Polymixis aphrodite* Fibiger, 1997 were collected during a trip to Cyprus between 20.–27.XII.1999 on the southern slopes of the Troodos Mountains and on the coast from Limassol eastwards to Cape Greko. Several females of *Polymixis aphrodite* Fibiger, 1997, an endemic species recently discovered (Ahola 1998) and described (Fibiger 1997, 1998, 1999) from the island of Cyprus were collected with sugar baits. Six females laid eggs in plastic jars provided with soft paper. Larvae fed on lettuce leaves (*Lactuca sativa*) and on cabbage (*Brassica pekinensis*) in rearings.

2. Material and methods

Six females collected alive as follows: one female from village Laneia, labelled Cyprus-South, Laneia, 600 m, 21.XI.1999 and five females from Cape Greko, labelled Cyprus-South, Cape Greko, about 10 m, 23.XI.1999. All females laid a number of eggs and rearing was carried out at Reisjärvi, Finland. 20 larvae were preserved in alcohol and 4–10 larvae of each female were inflated and dried up.

Figures and colours were documented before preparation by writing them down after careful observation and by taking photographs. Hinton's (1946) nomenclature for chaetotaxy of larva is used and description of ornaments follows Beck (1974, 1999). Terminology of pupae is according to Patocka (1995) and that of eggs follows Döring (1955).

3. Egg

Eggs were laid in small groups. They are pale grey or whitish with rather large dark brown spots in the micropyle area and in a narrow zone around the bottom part of the egg (Fig. 1).

4. Larva

Mouthparts (Figs. 2–6): spinneret long, exceeding length of labial palpi, more than five times length of Lps1 and about four times its width, dorsoventrally flattened with one dorsal groove, dorsal and ventral lips smooth. Lps1 of labial palpus rather short, less than twice its width, seta Lp1 slightly longer than Lps2, seta Lp2 about as

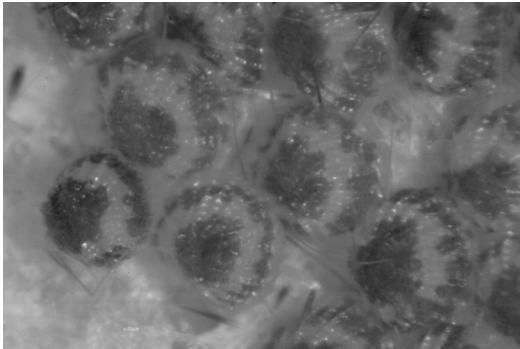


Fig. 1. Eggs of *Polymixis aphrodite*.

long as Lps1 and 3–4 times as long as Lp1. Stipular setae longer than Lp1 but about 1/3 Lp2. Distal region of hypopharynx spiny to base of labial palpi, anterior distal spines (Da) slightly shorter than medial (Dm) and posterior (Dp) distal spines but about 1/4 of length of stout lateral distal spines (DI). Posterior region of hypopharynx with a row of 6–9 stout lateral teeth (PI), with very short dorso-lateral spines (Pdl), with weak posterior spines (Pp) but without medial spines (Pm). Galeal lobe of maxilla short, of equal length of stout sensilla styloconica. Second maxillary palpus slightly longer than its width. Rather large, granulate stipital sack present on dorsal surface of stipes. Mandible with stout inner teeth on first ridge, with all three inner ridges present terminating on strong processes before cutting margin and with six teeth on cutting margin. Labrum about 1.6 times as broad as long with distinct labral notch.

Colour of larvae varies from green to brown. In the following description of ornaments of last instar larva, different colour forms are given in parentheses (green or brown). All young larvae were green; differentiation began after the third moult.

Head pale beige without stripes (green) or greyish brown with sharp, grey brown stripes (brown). Coronal stripe rather broad including P1 and P2 setae becoming narrower caudally from P2, two pale fields present on ceP1. Frontal stripe begins at level of A1 seta and joins to coronal stripe and to supraocellar stripe. Supraocellar stripe runs through setae A3 and L1 to pore La becoming broader cephalically from A3 and joining to frontal stripe. Ocellar stripe narrow, reaching neck. Five reticulation groups are present,

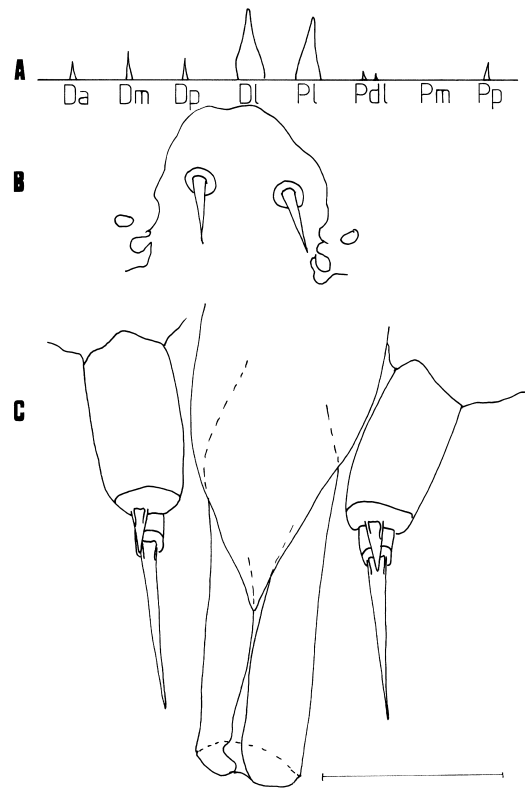


Fig. 2. *Polymixis aphrodite*; spinneret, stipular setae and spines of hypopharynx. — A. Scheme of hypopharyngeal spines. — B. Stipular setae in dorsal view. — C. Spinneret and labial palpi in dorsal view. Abbreviations of hypopharynx: Da = anterior distal spines, Dm = medial distal spines, Dp = posterior distal spines, DI = lateral distal spines, PI = proximolateral teeth, Pdl = proximolateral spines dorsally from lateral teeth, Pm = medial spines of posterior region, Pp = posterior spines of proximolateral part. Scale 0.1 mm.

weakly (green) or sharply (brown) visible. Reticulation bands beige (green) or greyish-brown (brown), fields pale yellowish-brown. Reticulation groups (GR1–GR5): GR1 with two rows of rather large fields on both sides of coronal suture on vertex, GR2 with irregular rows of fields, bands narrow, GR3 with two rows of fields between ocellar and supraocellar stripes, GR4 with two rows of fields and GR5 with one field. Frons pale beige (green) or greyish-brown medially and pale grey laterally (brown). Adfrons pale grey in all forms. Anterior zone pale grey between antennae and seta A2. Ocellar zone narrowly pale grey or pale yellowish-grey above stemmata. Gena pale

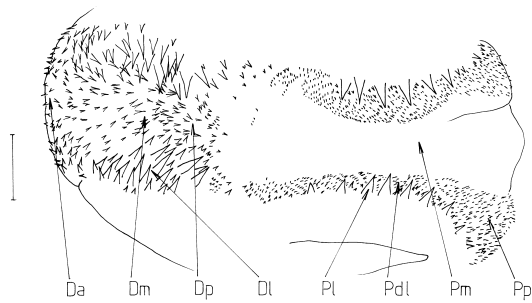


Fig. 3. *Polymixis aphrodite*, hypopharynx in dorsal view. Arrows show different spiny areas. Scale 0.1 mm.

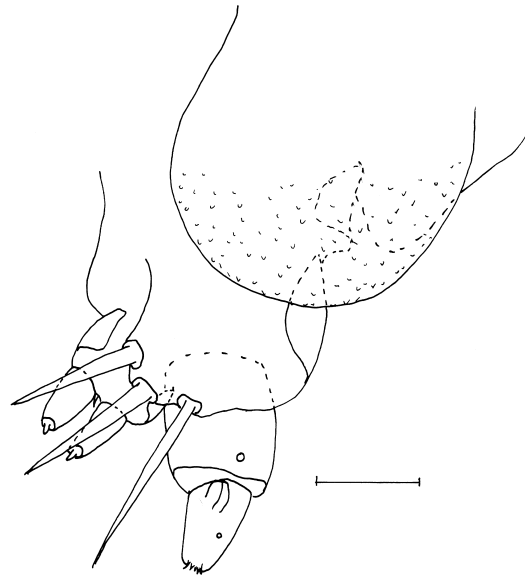


Fig. 4. *Polymixis aphrodite*; left maxillary palpus in dorsal view. Scale 0.1 mm.



Fig. 5. *Polymixis aphrodite*; inner surface of left mandible. Scale 0.1 mm.

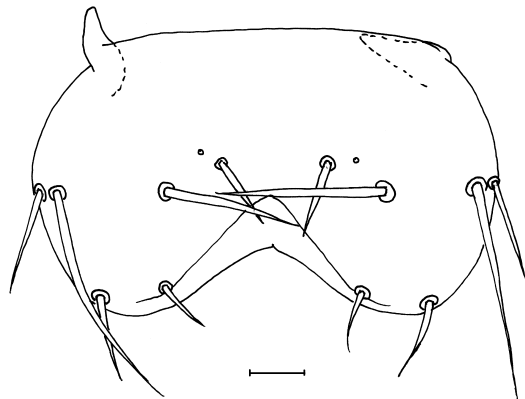


Fig. 6. *Polymixis aphrodite*; labrum in frontal view. Scale 0.1 mm.

yellowish-brown, plain (green) or with specific dark and pale areas (brown) as follows: dark brown spot around GR5 from veSO3 to ocelli bordering pale grey stripe from base of antenna between setae SO2 and SO3 to seta O3. Antennal segments are pale yellowish-brown.

Cervical shield of prothorax greenish-grey (green), pale brownish-grey or dark brown (brown), always with darker anterior margin.

Black fleck present on subdorsal zone. Middorsal line of shield whitish grey, narrow or absent, often broken to spot on anterior margin, subdorsal line of shield broken to rather large white spot on anterior margin. All setal bases and pores pure white, that of D1 larger, that of MXD1 present. Tonofibrillary platelets colourless (green) or pale brown (brown) in four transverse rows in middle and one longitudinal row laterally between D2 and XD2 setae on shield. Anal shield greenish (green) or pale greyish-brown (brown) with weak, narrow, pale grey middorsal line and obscure sub-

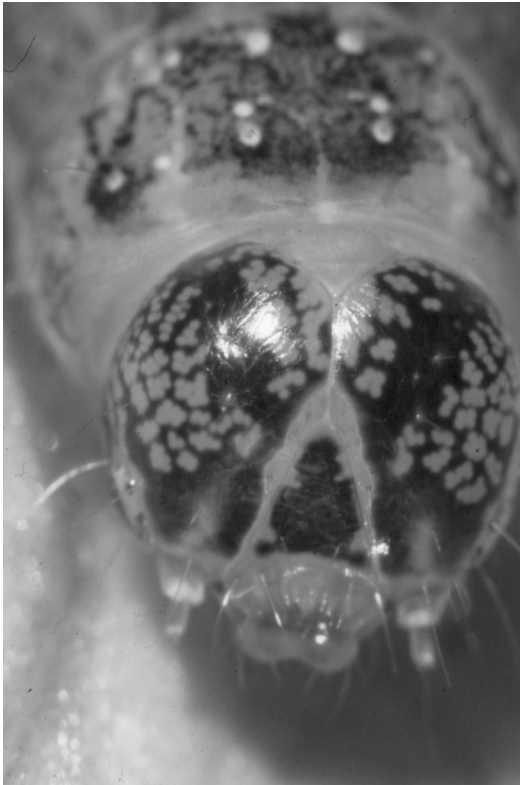


Fig. 7. *Polymixis aphrodite*; head of larva in frontal view.

dorsal line. Dorsal zone between D1 setae dark brown (brown). Setal punctures pale with white base-spots. Tonofibrillary platelets colourless.

Colour of body varies from green (green) to dark brown (brown). Middorsal line absent or narrow, whitish, broken to spots, dark greenish-grey (green) or dark grey or blackish brown borderline always present and rather broad. Subdorsal line white, narrow, always broken to spots, often visible only on intersegments caudally from D2, bordered dorsally and ventrally by narrow dark greenish-grey (green), brownish- or blackish-grey (brown) margins. Segmental series of strong black or blackish-grey wedge-shaped longitudinal flecks occur from mesothorax to 8th abdominal segment on dorsal margin of subdorsal line between setae MD1 and D2 and narrow projection of fleck from D2 to intersegment. These flecks are most prominent on 1st and 2nd abdominal segments. This figure is sharp in brown larvae, but visible in most green larvae as well. Dorsal region green (green), pale reddish-brown or



Fig. 8. Larva of *Polymixis aphrodite*.

pale yellowish-brown (brown) with small, white, dot-like and dark, greyish-brown longitudinal colour elements. Dark elements form segmental series of diamond-shaped flecks in middorsum from 1st to 8th abdominal segments. Bases of setae D1, D2, SD1 and L1 are pure white or pale grey. Dark elements of subdorsal zone form narrow dorsal border of spiracular line and small dark fleck cephalically from SD1 seta. Supraspiracular line absent. Spiracular line broad but weak with white narrow dorsal and ventral margins mottled with white and dark greenish- or reddish-grey colour elements medially. Spiracles yellowish-white with black rims. Ventral region greenish-grey (green) or pale reddish-brown (brown) with white dot-like and in dark forms also dark brown or blackish longitudinal colour elements. Abdominal prolegs are greenish-grey (green) or reddish-grey (brown) with darker grey cuff. Thoracic legs yellowish-brown in all forms (Figs. 7–8).

5. Pupa

Pupa dark reddish-brown with black swelling of postclypeus; setae weak, frons with two pairs and clypeus with one pair of setae. D1 and D2 setae present on thorax and first segment of abdomen, also SD1 and L1 present on 2nd–4th and 8th abdominal segments, setae L2 and L3 occur on 5th–7th abdominal segments, L2 caudally from spiracle, setae absent on 9th–10th segments except strongly developed, lyre-shaped D2s on cremaster.

Labium and labial palpi visible. Base of labium rather narrow, suture between labium and

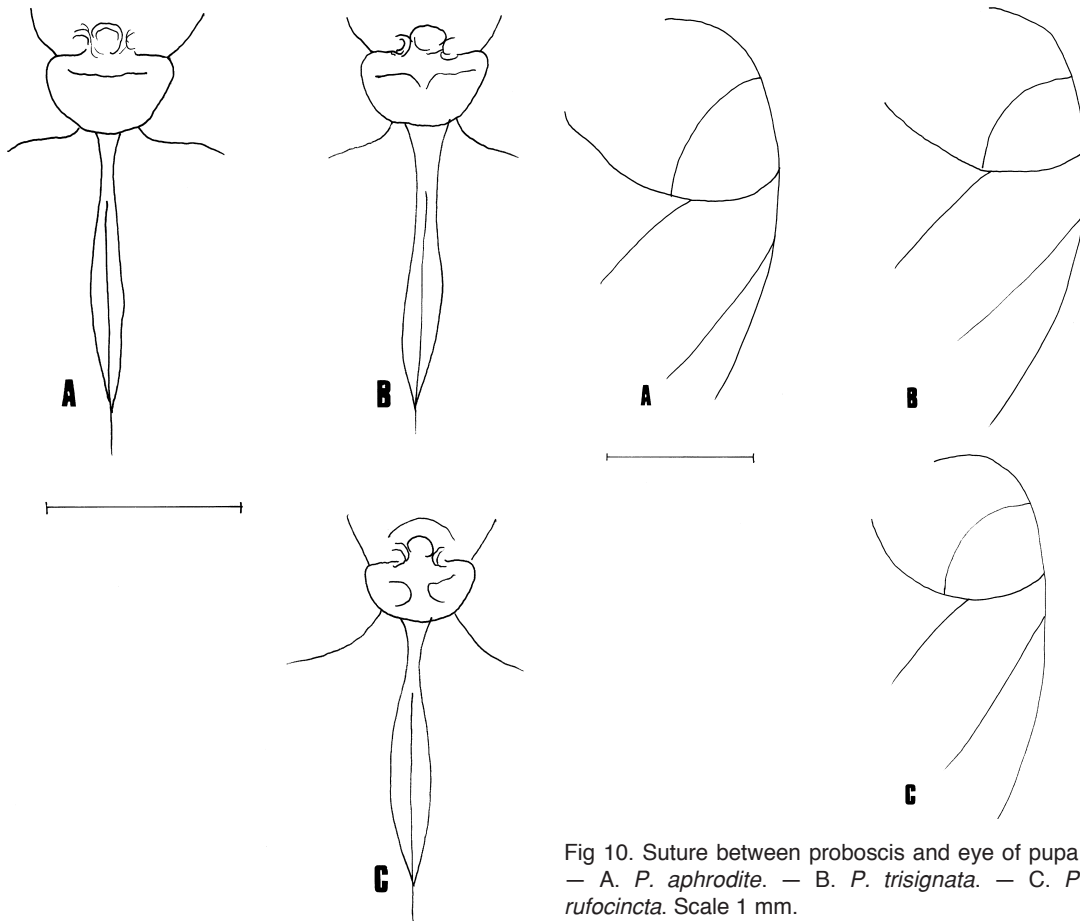


Fig. 9. Labium of pupa. — A. *Polymixis aphrodite*. — B. *Polymixis trisignata*. — C. *Polymixis rufocincta*. Scale 1 mm.

Fig. 10. Suture between proboscis and eye of pupa. — A. *P. aphrodite*. — B. *P. trisignata*. — C. *P. rufocincta*. Scale 1 mm.

labrum about equal length of suture between proboscis and labrum. Labrum rounded, postclypeus with slow, black swelling on posterior part, head rounded with one pair of eyes. Base of thoracic forelegs bordered by eye and antenna. Length of proboscis is about same as forewing, not reaching to 5th abdominal segment. Suture between proboscis and eye is short, about same as base of labium. Thoracic legs are shorter than proboscis, fore-femora narrowly visible between proboscis and foreleg, hind-leg not visible. Antennae are shorter than proboscis and thoracic mid-legs. Skin of thorax without pits but with short transverse grooves dorsally. Abdomen without protuberances except well-developed cremaster; skin of 2nd–7th segments covered by small pits on anterior half.

Skin of cremaster with strong folds, only base of D2 setae smooth; D2 setae thick, touching each other on apex and bending outside on tip forming a lyre-shaped structure. Length of D2 setae equal than that of cremaster. Cremaster shorter than broad, irregularly wrinkled (Figs. 9–11).

6. Discussion

The immature stages of *P. aphrodite* resemble those of *P. trisignata* (Ménétriés, 1847). The colour of the egg is the same but the dark micropyle area of *P. aphrodite* is larger and the band around the egg broader. Both species lay eggs in clusters. The eggs of *Ammoconia aholai* Fibiger, 1996 also resemble those of *P. aphrodite* (Ahola 1998), but in *A. aholai* the pale areas are yellowish and the dark zones narrower.

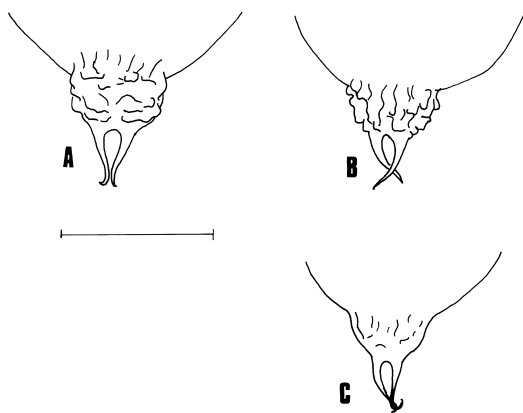


Fig. 11. Cremaster of pupa in ventral view. — A. *P. aphrodite*. — B. *P. trisignata*. — C. *P. rufocincta*. Scale 1 mm.

Larvae of both species occur in two forms, green and brown. Last instar larva of *P. aphrodite* is quite easy to identify by its habitus: colour patterns of the head are sharper and present on green forms; pale area of the anterior zone of the head is much narrower (brown forms) or larger but visible (green forms); the adfrons of the head is pale on top; the prothoracic plate has pure white setal base-spots and a black subdorsal fleck; the segmental series of dorsal wedge-shaped flecks are sharp, not rounded dorsally from D2 setae and are also present on green larvae; especially dark and visible are the wedge-shaped patterns on the first and second abdominal segments. The mouthparts of both species resemble each other; the first segment of labial palpi of *P. aphrodite*, however, seems to be relatively shorter and seta Lp1 longer than those of *P. trisignata*.

The pupae of both species differ in three ways: the base of labium of *P. aphrodite* is narrower,

the suture between the proboscis and the eye is longer in *P. aphrodite* and the cremaster of the pupa of *P. aphrodite* has transverse grooves at its base and a relatively straight D2 setae.

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