

EARLY STAGES OF THE "CERACIDAE" (LEPIDOTERA), WITH REMARKS ON THE TRUE POSITION OF THE GROUP

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The superfamily Tortricioidea, the so-called leaf-rollers, contains a group of exceptionally large and conspicuously coloured species, forming the chiefly Central Asiatic *Cerace* group. Superficially these species do not resemble other leaf-rollers very closely. Consequently several authors placed them incorrectly: Butler (1881), Warren (1888) and Cotes (1889) in the Lithosiidae, Snellen (1903) in the Tineidae, Meyrick (1907) originally in the Plutellidae. But Walker (1863) and also Moore (1888) recognised their Tortricoid character and later also Meyrick (1908) came to the same conclusion.

However, the true systematic position of the *Cerace* group within the superfamily Tortricioidea appeared to be even more puzzling, and subject to considerable controversy. So Meyrick (1908) established the tortricoid family Ceracidae but soon abandoned this idea and in 1912 placed the species known at that time in the family Tortricidae. The present author (Diakonoff) originally followed the last solution but later (1939) separated the *Cerace* group as a subfamily under a less fortunately chosen name, Ceracidi. However, after a revision of the group with the aid of more extensive and rare material at the British Museum (Diakonoff, 1950), he was convinced of its independence, and resurrected Meyrick's family Ceracidae. At about the same time Obraztsov (1949) relegated the taxon to the status of a tribe, "Ceraciini", deriving his conclusion, however, from the study of a rather limited material.

So far our entire knowledge of the Ceracinae has been based on the characters of the adults, no information on the early stages being available. For a long time nothing was known about the larvae or the host plants of the genera *Cerace* and *Pentacithrotus*. It is true that a Javanese species, *Bathypluta triphaenella* (Snellen) was reported to be a minor pest of the tea shrub and the *Cinchona* tree in that island. The larva of *B. triphaenella* even has been figured once on a coloured poster of the former Institute for Plant Diseases and Pests of Buitenzorg (Bogor), but neither a de-

scription nor a figure have ever been published. After World War II, the present author tried to locate material or figures of the larva at that Institute but in vain.

Recently, however, he had the good fortune to receive a number of larvae and pupae of a Far Eastern species, *Eurydoxa advena* Filipjev, through the kindness of Mr. Toshiio Oku, Sapporo, Japan, who also permitted him to study and describe the material. A preliminary report was submitted at the XIth International Congress of Entomology, held in 1960 in Vienna (Diakonoff, 1961). In the present paper figures and a more extensive and slightly corrected description of the last larval instar and of the pupa of this species are presented and comments on the true position of the group are made.

DESCRIPTION OF THE LARVA

The larva of *Eurydoxa advena* Filipjev is robust, with four pairs of prolegs and one pair of anal legs. It fed on needles of *Picea jezoënsis* Maxim.

H e a d (fig. 1) hypognath, with adfrontals reaching to the vertex. Frons rather broad, reaching beyond the middle of the epicranial suture. Epistoma with four setae. Frons with punctures and one seta, Fa. Adfrontals with two setae, AF1 and AF2; AFa intermediate. Coronal suture considerably longer than the adfrontals are wide. Epicranial setae and punctures are thus: A2 craniad and slightly laterad from A1, Aa strongly mediad from A2, A3 much laterad, and also craniad from A2; L1 slightly closer to A3 than A3 to A2; Pa absent; P1 not much longer than A3; much closer to AF2 than to Fa; P2 moderate, craniad from P1, Pb intermediate and in a line with P1 and P2; La absent; Va puncture absent. V1-V3 almost in a line with P1-P2 which is little oblique. Ocelli (pl. IX fig. 1) arranged in an ellipse, I-III of equal size, moderate, IV slightly more distant from others, V largest, more remote, VI as large as I-III, but more distant. Seta O2 close to ocellus VI, O1 about equidistant to III, IV and V.

The second joint of the maxillary palpus twice as long as the first. Spinneret short, about 3 times as long as wide, very slightly attenuated from middle, but extreme top rounded (pl. IX fig. 1).

L e g s normal. Anterior coxae separate. Prolegs on segments 3-6 and 10 narrowed distad, without a manchette. Crochets (pl. IX fig. 2) in a complete circle, somewhat irregularly uniserial, of three different sizes.

B o d y with primary setae (pl. IX fig. 2). Prothorax with a moderately coloured shield with irregular darker spots posteriorly (fig. 2). Stigma oval. Anterior edge of shield with strong setae XD1, XD2, and SD1, the first with

puncture XD6 close behind and slightly below seta XD1; XD2 remote from preceding, puncture XDa between these setae, but closer to XD2 and only little shifted more caudad than the latter seta. SD1 closer to the lower edge of the thoracic shield than to its anterior edge. D1 and D2 above each other and far beyond middle of shield, SD2 remote from D2, about median; L1, L2, and L3 free from thoracic shield, together on an oval sclerite, dark and dentate along its upper edge; L1 closer to L2 and slightly shifted ventrad;

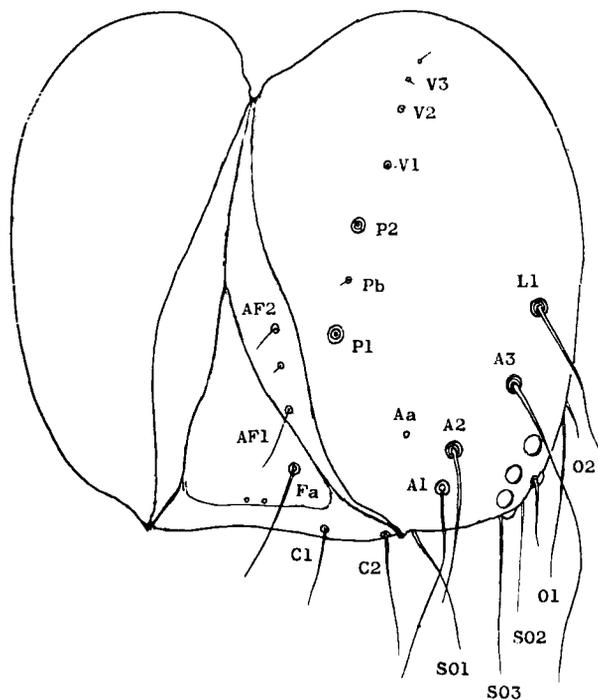


Fig. 1. *Eurydoxa advena* Filipjev, larval head capsule.

L3 closer to stigma than to L1. SV1 and SV2 also on a large, irregular sclerite, dark and dentate along its extended part above SV1. MV2 a trifle more rostrad than MV3, V1 present on each segment of the abdomen. Mesothorax similar, but D1 and D2 much more approximated, in a vertical series; SD1 and SD2 in an approximated, vertical pair, their joint pinnaculum rostrad from the connecting line between D1 + D2 and L1 + L2. L1 and L2 approximated, in an oblique pair, L1 more rostrad and ventrad. L3 remote, dorsad from L2. SV1 present. Metathorax slightly differing from mesothorax by the pair of D1 + D2 being more oblique, L1 + L2

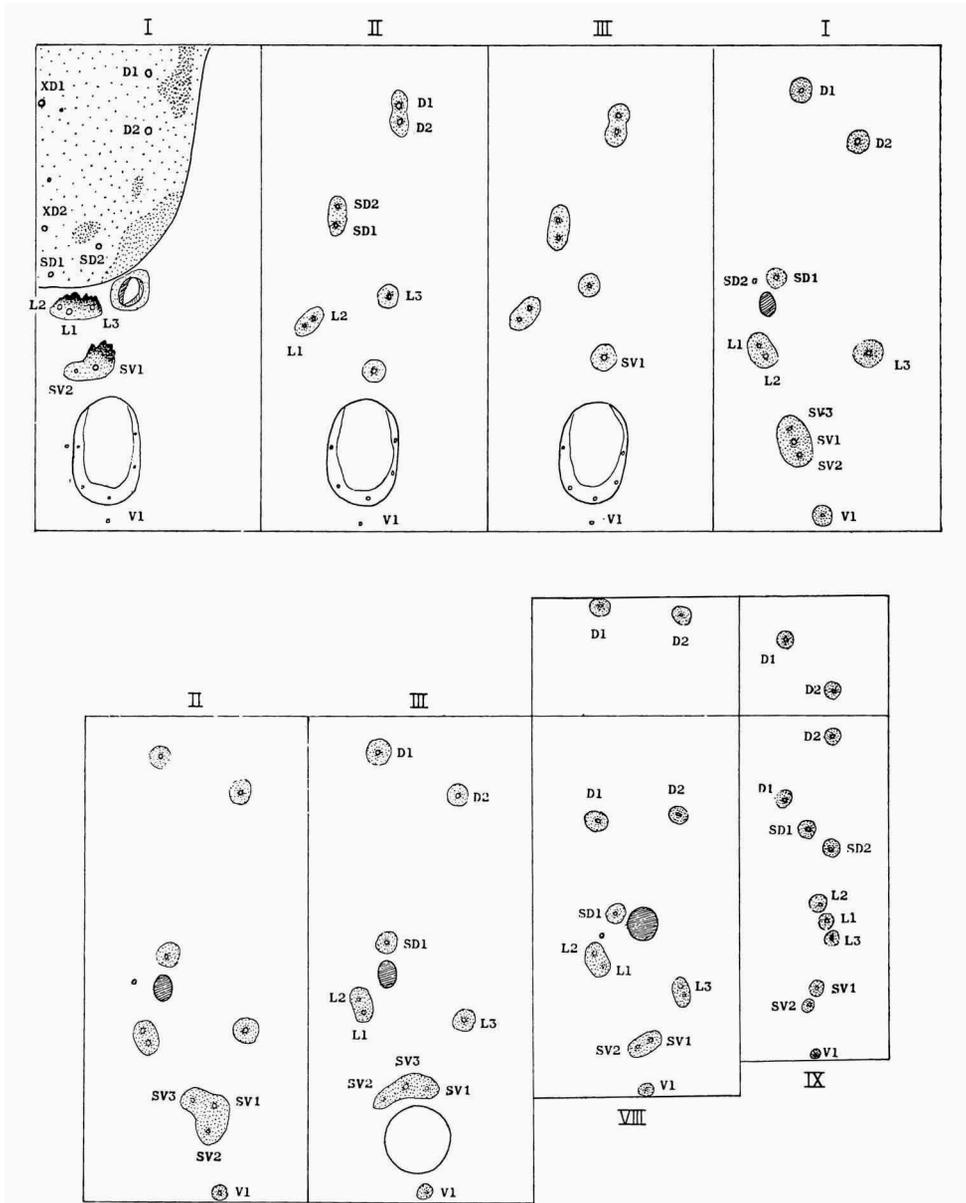


Fig. 2. *Eurydoxa advena* Filipjev, larval chaetotaxy.

and L3 being more approximated; SV₁ present. Prepodal setae Mv absent on both meso and metathorax.

Abdominal segment I. Stigma oval. Seta SD₁ closer to stigma than its

diameter. Seta SD₂ on a separate pinnaculum, rather remote. Setae D₁ and D₂ considerably laterad of D₁. SD₁ rather close over stigma; L₁ + L₂ on a joint pinnaculum in an inwards-oblique substigmal pair, L₁ being more dorsad and rostrad than L₂; L₃ remote, as high as L₂; SV group complete, arranged on a joint oval pinnaculum in a straight, inwards-oblique series.

Abdominal segments II-VII with D₁ and D₂ more distant; SD₁ dorsad of the stigma; seta SD₂ present on every segment, anterad of stigma and approximately as far from it as from SD₁; L group slightly shifted rostrad of the stigma. SV group arranged in segment II in a triangle, SV₃ rostrad, SV₂ ventrad of SV₁; in segments III-VII these setae arranged in an oval, with SV₂ rostrad and ventrad, SV₁ caudad from SV₃. Abdominal segment VIII similar, but with L group more approximated to the stigma; SV group arranged subhorizontally, SV₂ rostrad and slightly ventrad of SV₁, SV₃ absent; D₂ slightly more dorsad than D₁, SD₁ shifted rostradorsad of the stigma, L₃ double, more ventrad. Abdominal segment IX with D₂ on separate pinnaculi, distinctly closer to each other than setae D₂ on segment VIII; SD₁ rostrad of SD₂; D₂, D₁, SD₁ and SD₂ almost in line, oblique; L₂, L₁, and L₃ close together in a straight and oblique line, SV₁ and SV₂ approximated, SV₂ more ventrad and rostrad.

Anal shield with 8 setae, 4 ventral, 3 lateral, 2 caudal. Anal pecten with distinctly dilated bases, thorns straight.

DESCRIPTION OF THE PUPA

The pupa of *Eurydoxa advena* Filipjev (fig. 3) is free, robust, and thick, slightly flattened dorso-ventrally with the thoracic half of the body rather wider than the abdominal half. Each abdominal segment with the usual pattern of bristly whitish setae.

Head without distinct sutures. Vertex with slight dorso-ventral elevations at the sides; frons smooth, with faint clypeal sutures separating paraclypei. Labrum small, triangular. Labial palpi very slender and short, labium not perceptible. Maxillae and maxillary palpi united, the former strongly attenuated and not reaching to middle of antennae. Antennae arranged along basal half of costal edge, thence shifted mesiad and not quite touching the edge of fore wings. Maxillae moderate, remaining in the background, as long as coxae of anterior legs which are strongly prominent and thick. Anterior coxae and anterior tibiae of equal length. Median leg well-developed, tarsus not reaching tip of antenna. A single median process reaching beyond the antennae must be the united posterior tarsi. Labial palpi not perceptible.

Summing up, the following characters seem to be most important.

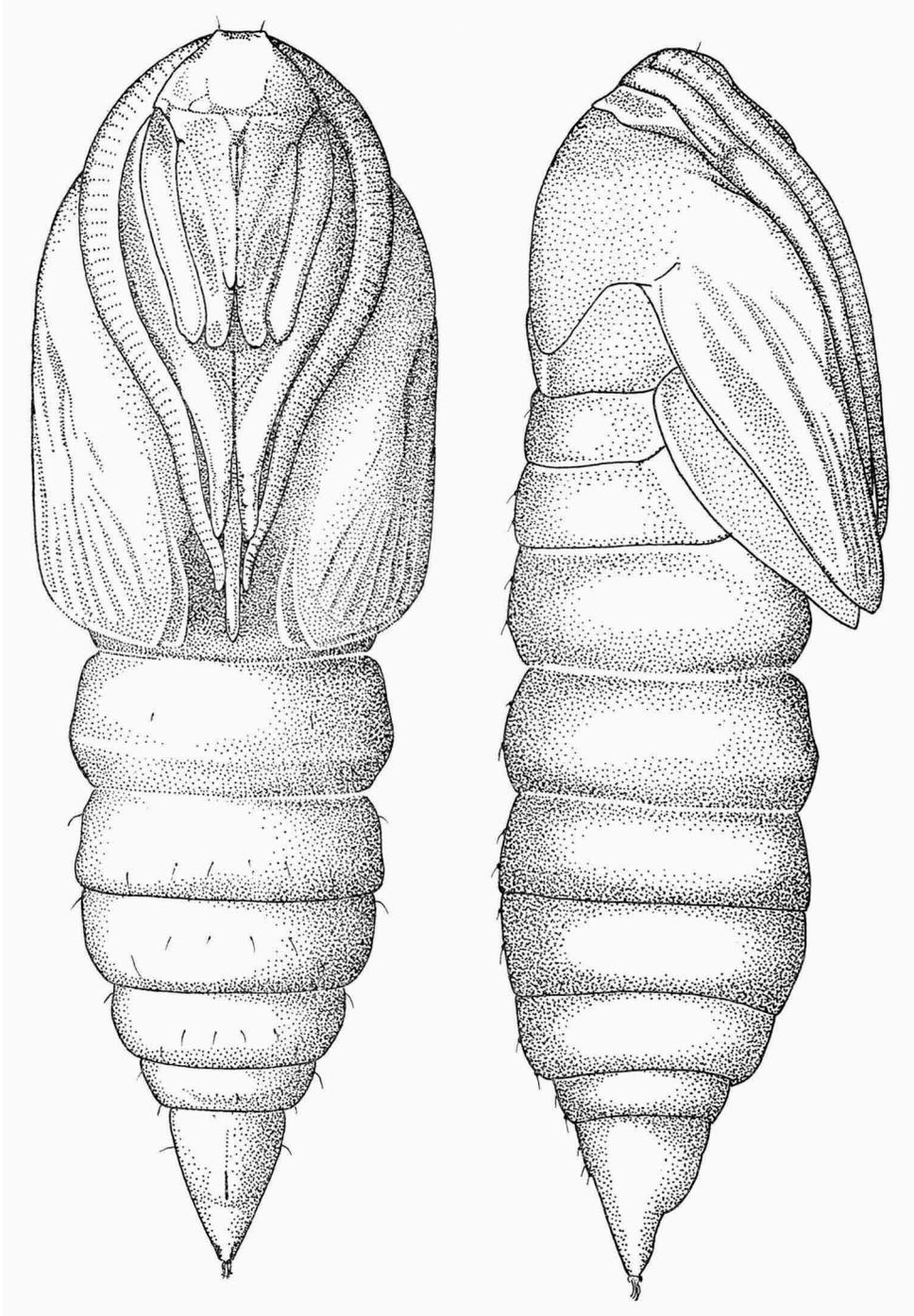


Fig. 3. *Eurydoxa advena* Filipjev, pupa; left, frontal, right, lateral aspect.

The prestigmal shield of the prothorax has three setae. There are two setae of the SV group on the prothorax, none on the meso- and two on the metathorax.

The setae L₁ and L₂ on all abdominal segments are arranged upon a joint pinnaculum, except on segment IX where they are separate.

The segment IX has setae D₂ nearer together than the setae D₁ are on segment VIII. The setae D₂ on the segment IX are not on a joint pinnaculum.

This shows that there are few differences from the larvae of the Tortricinae, where SV setae are similarly arranged, viz., prothorax 2, mesothorax 1, metathorax 1. Only the genus *Tortricodes* has an exceptional arrangement, viz., 2, 2, 2. However, the setae SD₁ and SD₂ on the meso- and metathorax in *Eurydoxa* are arranged in a vertical series, as in the tribe Cnephasiini, instead of SD₂ being shifted dorsocaudad, as in other Tortricinae.

On the other hand there is an affinity towards a part of the tribe Archipini, because of the second joint of the maxillary palpus being twice as long as the first; and also because there are three setae of the SV group on segment VII.

The spinneret is narrowed along its posterior part which is different in the Tortricinae, but its top is rounded in a similar way.

Finally, also the important seta SD₂, present on the abdominal segments I-VIII is similar in position to that in the Tortricinae.

It seems likely, therefore, that the later opinion of Meyrick and the conception of Obratzsov both must be right, viz., that the *Cerace* group belongs in the Tortricini after all, in spite of its peculiar characters and probably day-flying habits. With the use of the new character indicated by Miss Mackay (1962), the position of seta SD₂ on the abdominal segments, we now also can ascertain a closer affinity of *Eurydoxa* to the older tribe, Tortricini (confirming the old conception of Meyrick), than to more advanced tribes of the Tortricinae.

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Fig. 1. *Eurydoxa advena* Filipjev. Oral region of the larval head capsule.

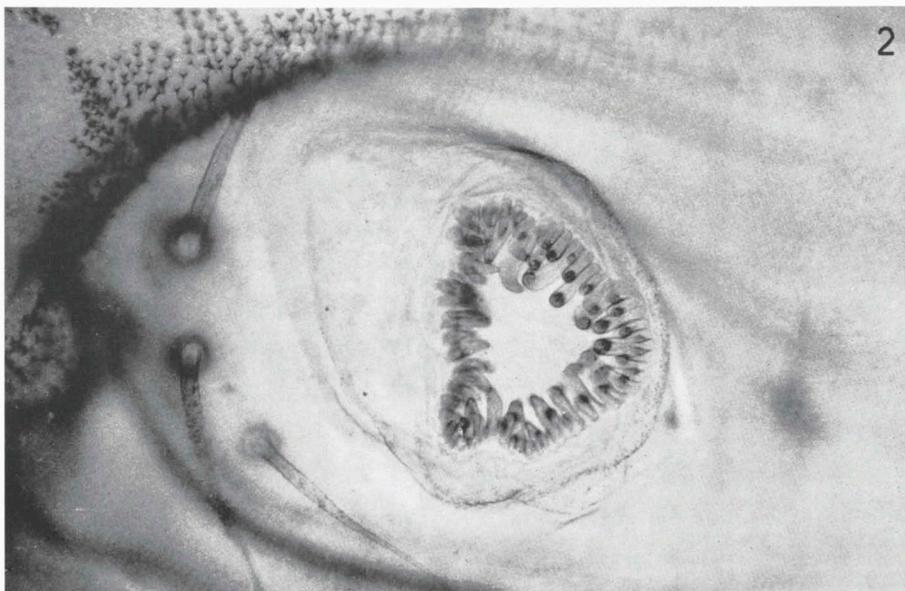


Fig. 2. *Eurydoxa advena* Filipjev. Left proleg of the second abdominal segment, with the circle of crochets, SV group of setae, and primary setae.