Larvae of apneustic-type detected in *Leptocybe invasa* Fisher & La Salle (Hymenoptera Chalcidoidea)

Note 18 (Chalcidoidea-Eulophidae), released by Luigi De Marzo on March 2013 – The extremely reduced respiratory system of this invasive gall-inducer of eucalypts. l.demarzo@alice.it www.luigidemarzo.eu

SUBJECTS

• Referring to "presence/absence" and "number" of the respiratory spiracles, larvae of Hymenoptera can be termed as be follows (Viggiani, 1994):
- olopneustic, when provided with 8-10 pairs of spiracles;
- oligopneustic, when bear only 4 pairs of spiracles;
- metapneustic, when bear a single pair of spiracles at the abdomen end;
- apneustic, when they lack either functional or abortive spiracles.

• An instance of apneustic larva is reported in this note, referring to invasive gall-inducer eulophid of eucalypts, *Leptocybe invasa* Fisher & La Salle (Mendel et al., 2004).

MATERIAL AND METHODS

• Material was collected in Southern Italy (Apulia, Bari province) on adult trees of *Eucalyptus camaldulensis* Dehnh.,
• where galls of *Leptocybe invasa* occurred on both stems and main nerve or leaf peduncles (Fig. 1.A).
• After gall had been engraved by a bistoury, larvae were extracted with a needle and preliminarily examined on a slide in water.
• Some specimens were preserved in ethanol 70% and mounted then on slides in glycerol to appreciate minute morphological details.

RESULTS

• Larvae of *Leptocybe invasa* widely vary in size, as diameter of their body ranges from 0,1 to 0,5 mm, and occupy an ellipsoid cavity just a little larger.
• This cavity is lined by a soft plant tissue as a skin and is filled by a milk-like fluid (Fig. 1.B).
• Body is trendily globose and shows only slight traces of the segmentation;

• it lacks structures undoubtedly related with antennae and mouth-parts; anyhow, it exhibits at one side two unpaired orifices, which do seemingly correspond to mouth and anus (Fig. 1.D).
• A unpaired X-shaped sclerite associates internally to this supposed mouth (Fig. 1.E) and possibly relates with the cibarial sclerite.
• Neither spiracles nor traces of tracheal trunks were detected.
• Because of the poor presence of sclerotized structures, no evidence was obtained about occurrence of more than one larval instar.

CONCLUDING REMARKS

• A previous view of the respiratory system of gall-inducing eulophids of eucalypts has been given by Laudonia & Viggiani (2004), who studied the typical species, *Ophelimus maskelli* (Ashmead).
• These workers found only two pairs of spiracles in the full-grown larvae of this species (Fig. 2) and assigned them to the oligopneustic type, in agreement with the term assigned in the literature to Insect in general (Gordh, 2000; Maggenti, 2005),
• and supposed this reduced number of spiracles to be related with the endophytic environment.
• Actually, this supposed adaptation can be recognized in the larvae of *Leptocybe invasa* because of the lack of any trace of respiratory system.

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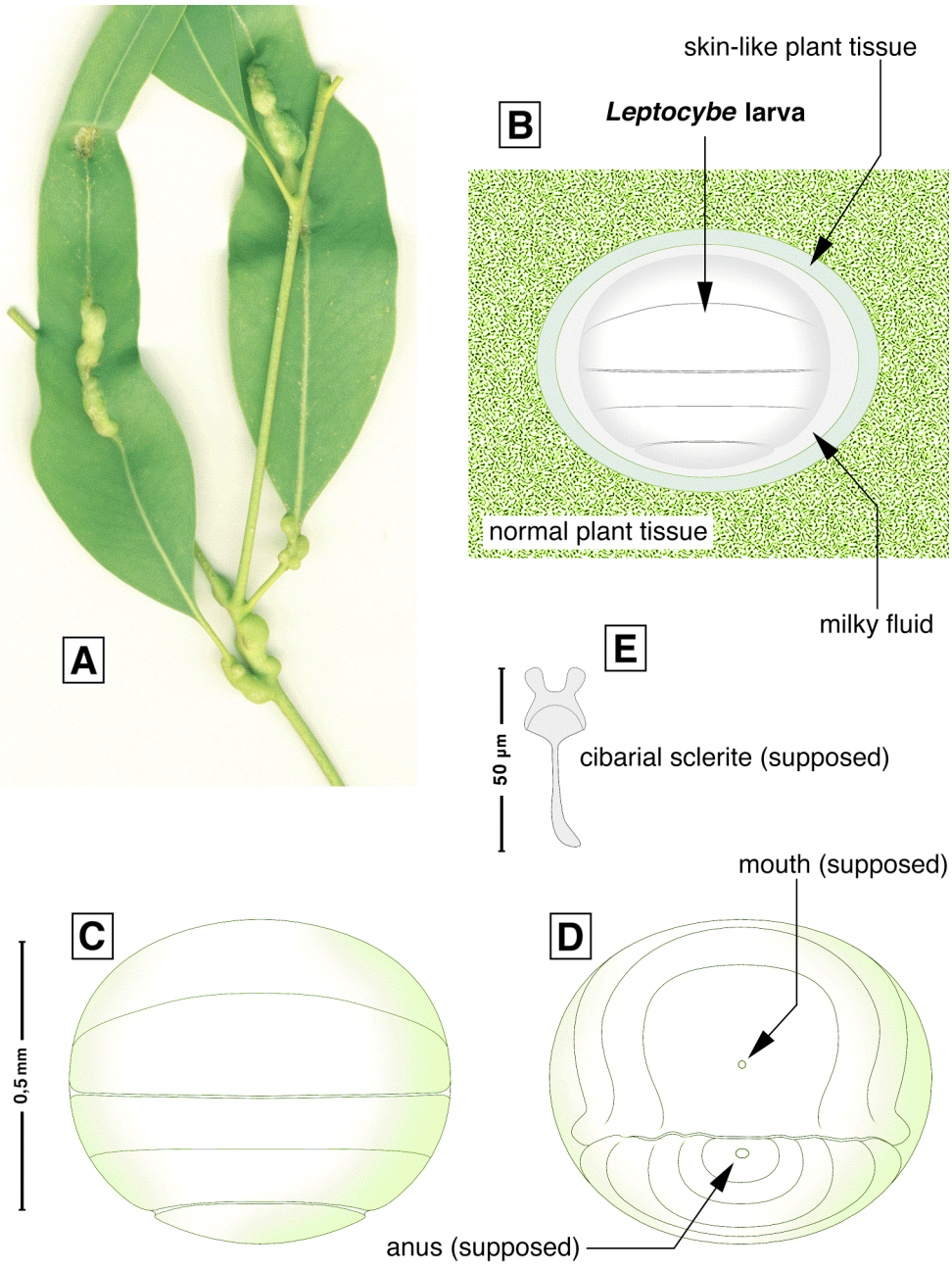

Fig. 1 – *Leptocybe invasa* Fisher & La Salle: A, series of galls scattered along an eucalypt top; B, scheme of one gall; C-D, larval body drawn from two opposite sides; E, sclerite associated with the supposed mouth.

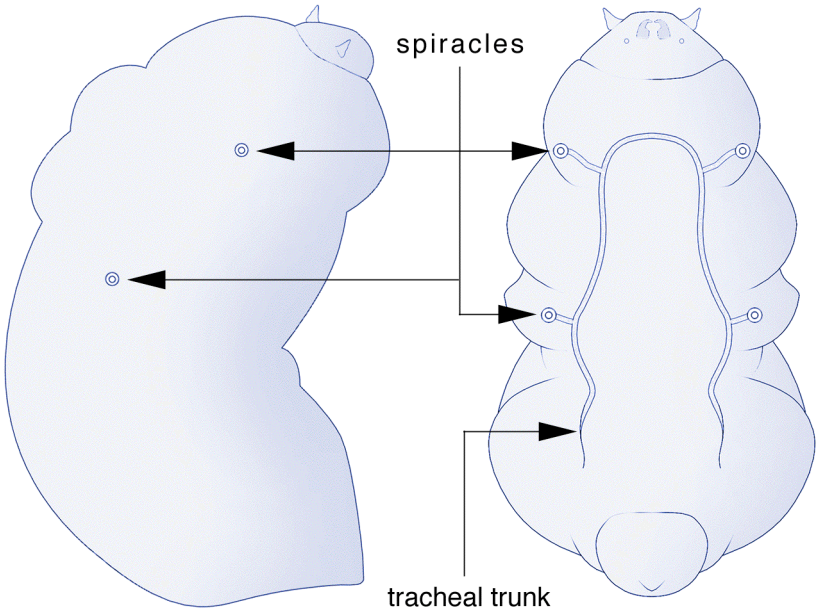

Fig. 2 – Outlines of the respiratory system
in a full-grown larva of *Ophelimus maskelli* (Ashmead).