Anatomical diversity of the female internal genitalia analyzed for some eulophids (Hymenoptera Chalcidoidea Eulophidae)

Note 10 (Chalcidoidea), released by Luigi De Marzo on November 2012 – An integration to a previous report. l.demarzo@alice.it www.luigidemarzo.eu

SUBJECTS

• Copland & King (1971) stated that *anatomical outlines of the female internal genitalia of eulophids do agree with the general condition in Chalcidoidea, except for some minor differences*.
• Consistency of these differences has been previously evaluated by comparing three species commonly occurring on eucalypts in Southern Italy (De Marzo, 2008a)
• and is inspected here through the study of further two species, *Leprosa milga* Kim & La Salle (Tetrastichinae) and *Pnigalio agraules* (Walker) (Eulophinae).

MATERIAL AND METHODS

• Females of *Leprosa milga* were collected in July by shacking flowering branches of *Eucalyptus camaldulensis* Dehnh. in Southern Italy (Apulia, Bari province).
• Adults of *Pnigalio agraules* emerged in autumn from samples of olive fruits attacked by the Olive fly.
• Genitalia were studied on slides in salt solution (NaCl 0,9%).

RESULTS

----- *Leprosa milga* Kim & La Salle (Tetrastichinae)
• This uniparental eulophid does develop inside eucalypt capsules (Kim & La Salle, 2008; De Marzo, 2008b, 2009) and is seemingly phytophagous.
• Females produce 20-30 eggs of the "pedunculate type" in each ovary;
• they are equipped with a paired, sack-like "oviduct gland", which connects at the base of each lateral oviduct;
• moreover, they are provided with two unpaired "ovipositor glands".
• These are very different in shape:
• the "type A" gland is tubular and is provided with a basal reservoir;
• the "type B" gland is sack-like and lacks reservoir.

• Spermatheca exhibits three parts as usual in Chalcidoidea (e.g., in Braconidae-Aphidiinae: De Marzo, 2001): (i) a spherical receptacle, (ii) a short duct and (iii) a gland connected to this duct.

----- *Pnigalio agraules* (Walker) (Eulophinae)
• According to Viggiani (1994), this is an "ectophagous solitary parasitic" species, which attacks larvae of both the Olive-fly and different leaf-mining Lepidoptera.
• Each ovary includes 3 ovarioles.
• Oviduct gland is lacking.
• Ovipositor is provided with two unpaired glands of very different shape:
• the "type A" gland is tubular and provided with a basal reservoir;
• the "type B" gland is sack-like and lacks reservoir.
• Spermatheca exhibits the same outlines described above.

CONCLUSIVE REMARKS

• Some statements of Copland & King (l.c.) on eulophid in general are commented in the following Table A.

Tab. A – Statements in the literature compared with the results of new observations.

according to Copland & King (1971)	new observations
egg shape always "hymenopteroid"	shape includes the "pedunculate type"
low number of ovarioles in the solitary parasitoids	lconfirmed for the solitary parasitoid, *Pnigalio agraules*
high number of ovarioles in the gregarious parasitoids	several ovarioles do occur in phytophagous eulophids as well
oviduct gland: always present	both *Ophelimus maskelli* and *Pnigalio agraules* lack oviduct gland
ovipositor glands: two unpaired units always present	ovipositor glands are lacking in *Leptocybe invasa* only one ovipositor gland is occurring in *Quadrastichodella nova*

• The following Table B allows to realize that the diversity of the female glandular equipment of the studied eulophids doesn't depend upon the subfamily.

Tab. B – Glandular equipment of the female genitalia in the eulophids studied by the author.

t a x a	oviduct gland	ovipositor glands
EULOPHINAE		
Ophelimus maskelli	absent	only one unpaired unit
Pnigalio agraules	absent	two unpaired units
TETRASTICHINAE		
Leptocybe invasa	one paired unit	absent
Quadrastichodella nova	one paired unit	one unpaired unit only
Leprosa milga	one paired unit	two unpaired units

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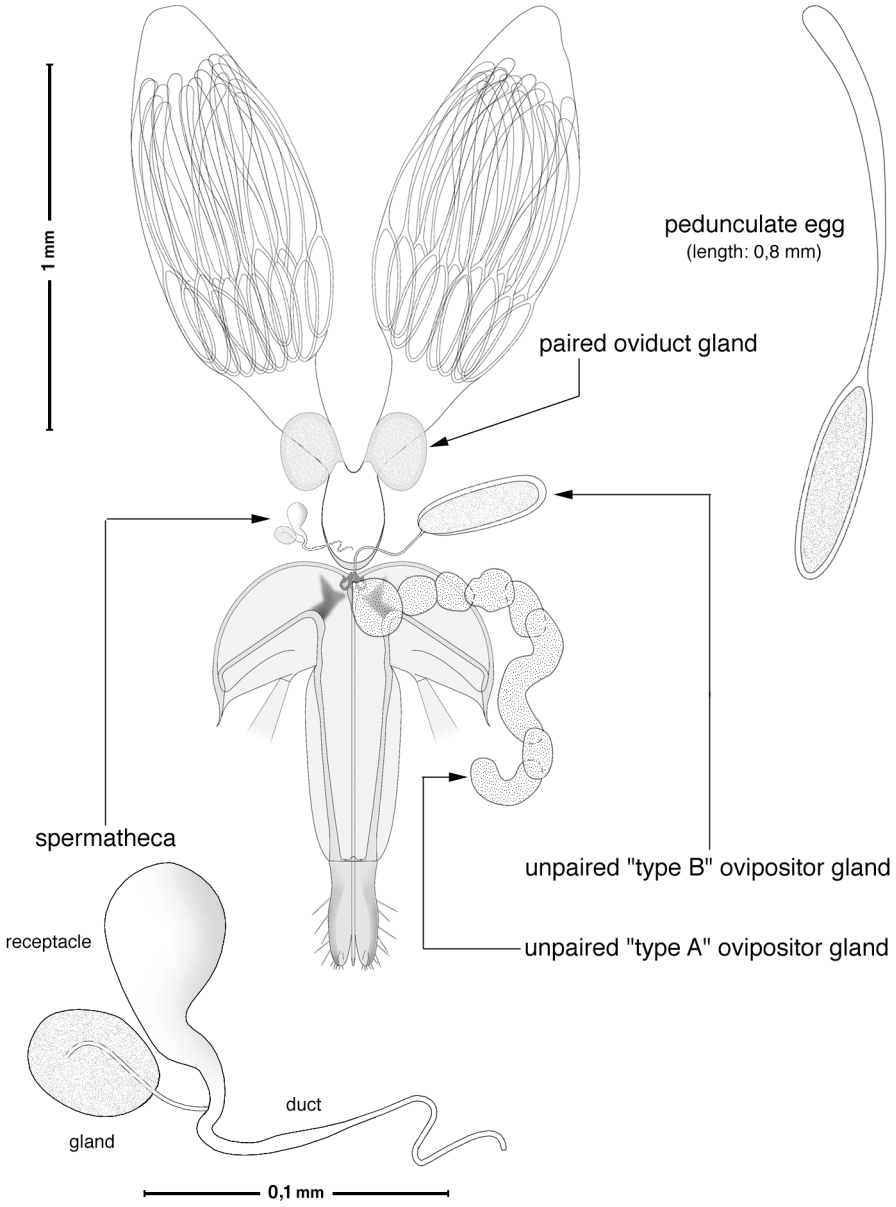

Fig. 1 - *Leprosa milga* Kim & La Salle: anatomical outlines of the female genitalia.

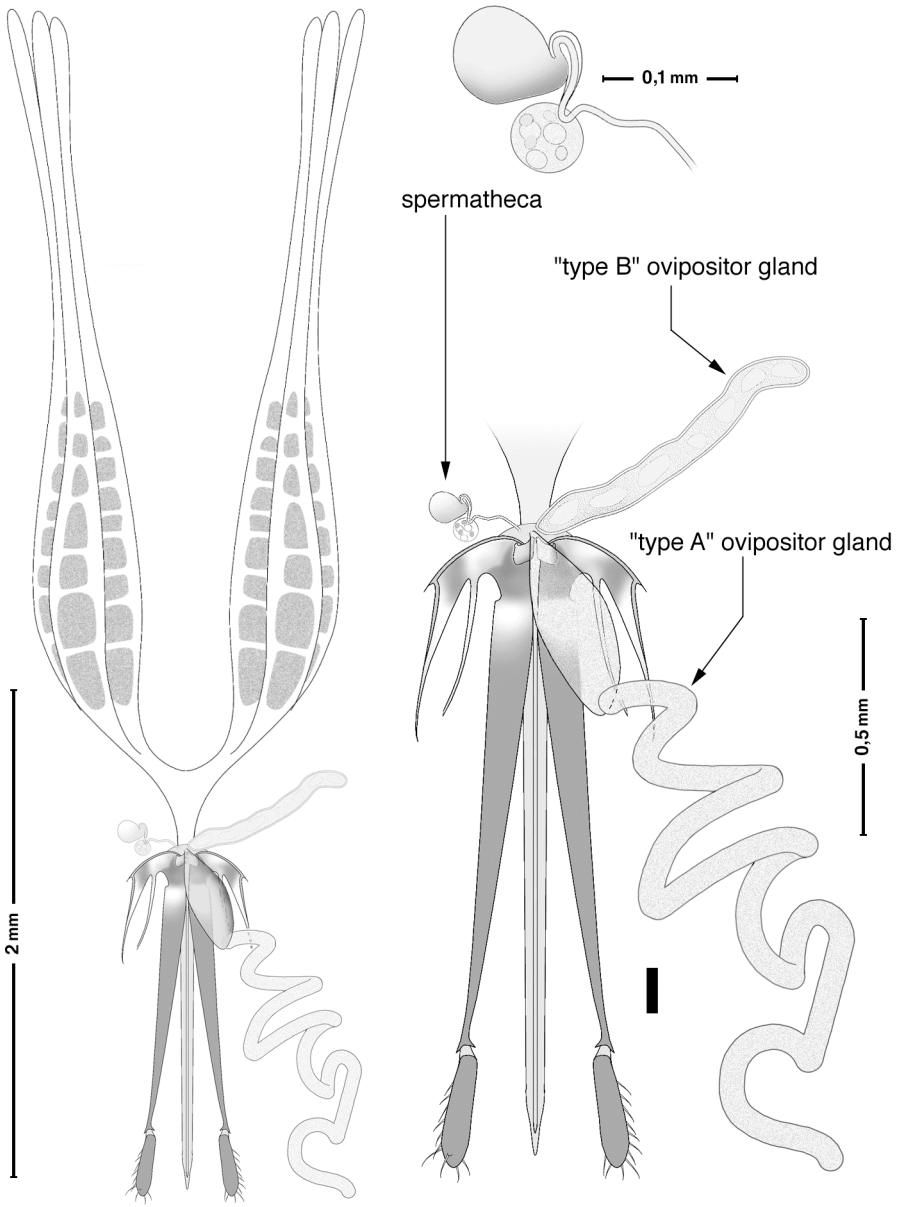

Fig. 2 - *Pnigalio agraules* (Walker): anatomical outlines of the female genitalia.