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## **Anatomical diversity of the female genitalia of the Paederinae referring to the accessory glands (Coleoptera Staphylinidae)**

### ABSTRACT

Female accessory glands were found in 4 species of Paederinae out of 7 examined throughout. In the instance of *Paederus fuscipes* Curtis, their content strictly resembles the dense bacterial flora previously recorded for the closely related species, *Paederidus rubrothoracicus* (Goeze). Although content is granular as well, no compelling evidence in the same direction arose for the same organs of *Leptobium gracile* (Gravenhorst), *Ochtheophilum collare* (Reitter) and *Pseudolatbra lusitanica* (Erichson). The presence of flagellate bacteria in the gland reservoirs of *Ochtheophilum collare* is suspected.

Key words: gland shape, reservoir content, *Paederus*, bacterial symbiosis.

### INTRODUCTION

Presence of female accessory glands in a member of the subfamily Paederinae has been already reported for *Paederidus rubrothoracicus* (Goeze), where these organs are ascertainedly engaged in harbouring a dense bacterial flora (DE MARZO, 1991). Further seven species of the same subfamily are examined here about the presence/absence and shape of the same organs.

This note is dedicated to the memory of the clever entomologist, Prof. Ermenegildo Tremblay, who greatly contributed to the knowledge of the symbiotic relationships between Insects and microorganisms (TREMBLAY, 1969: 1989; 1990) and courteously revised the above paper of mine. Identification of most species is due to the courtesy of Dr. Adriano Zanetti (Verona Museum, Italy).

### MATERIAL AND METHODS

Names of the examined species are reported in the following chapter and agree with the checklist of SMETANA (2004). Genitalia were studied in fresh preparations in salt solution (NaCl 0,9%) after they had been separated from female previously killed with ethyl-acetate vapours. Content of the reservoirs was inspected with a 40x phase-contrast lens after glands had been squashed on slides in the above solution. Four females at least were examined for each species.

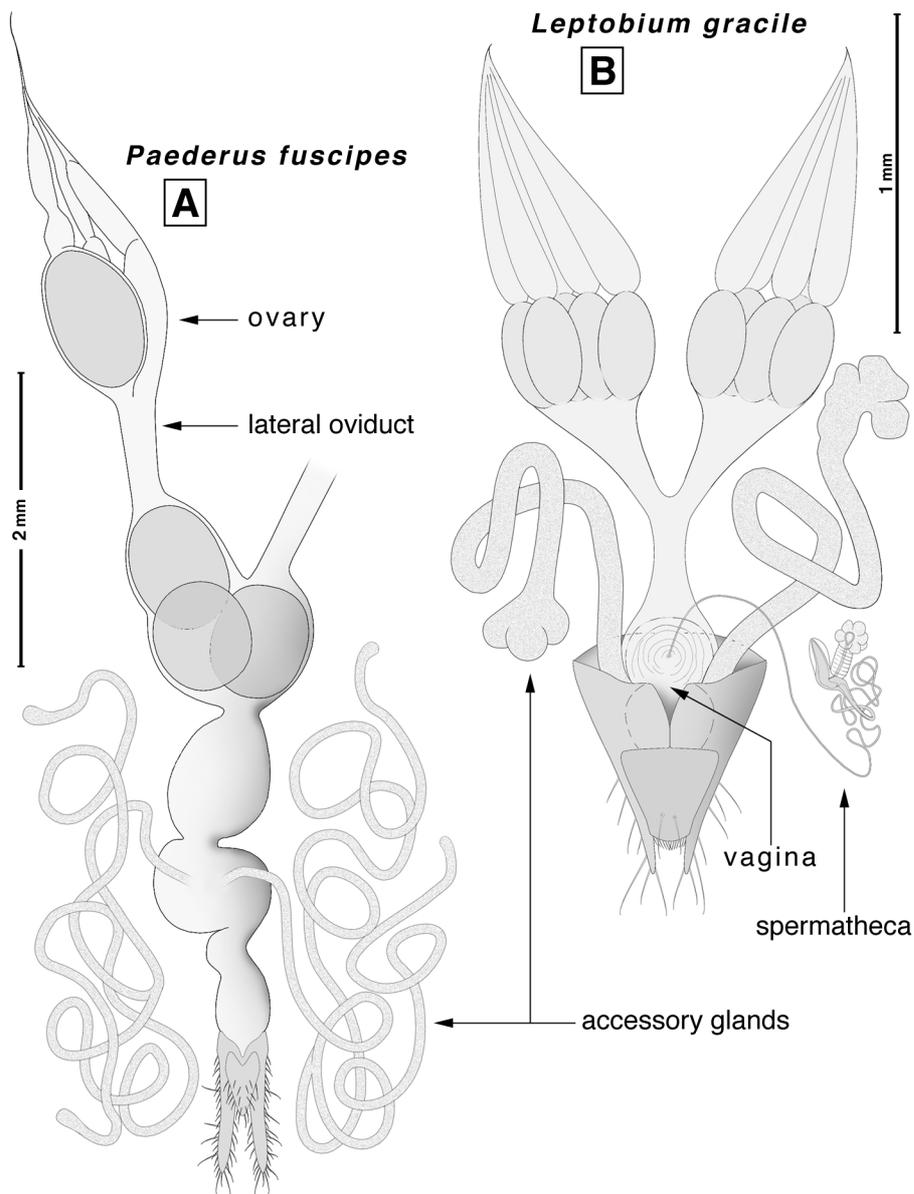


Fig. 1 - Female genitalia provided with accessory glands in two species of the subfamily Paederinae.

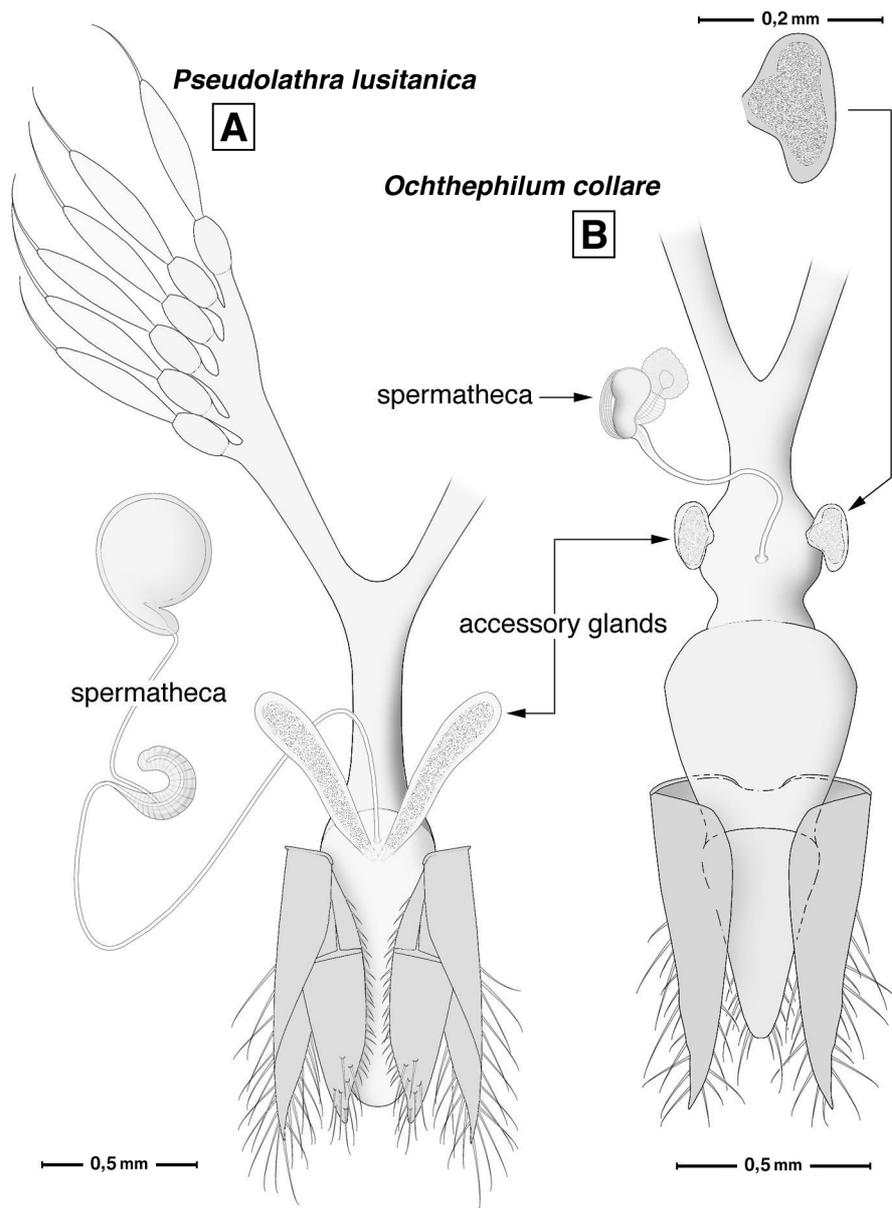


Fig. 2 - Female genitalia provided with accessory glands in further two species of the subfamily Paederinae.

## RESULTS

Presence of the accessory glands was verified for the following species: *Leptobium gracile* (Gravenhorst), *Ochtheophilum collare* (Reitter), *Paederus fuscipes* Curtis and *Pseudolathra lusitanica* (Erichson). Although greatly differing in both shape and size, the accessory glands were recognized from their position at each side of the vagina (Figs 1-2). Female genital apparatus of *Astenus thoracicus* (Baudi), *Litbocharis ochracea* (Gravenhorst) and *Rugilus orbiculatus* (Paykull) was found to be lacking in accessory glands.

According to species, glands was either tubular or sack-like in shape. Glands were tubular, very long and branched in the member of the nominal genus, *Paederus fuscipes* (Fig. 1.A); although tubular as well, they were comparatively short in *Leptobium gracile* and lack branches (Fig. 1.B). Glands of sack-like shape were very small; they were 600  $\mu\text{m}$  long in *Pseudolathra lusitanica* (fig. 2.A) and about 200  $\mu\text{m}$  in diameter in *Ochtheophilum collare* (fig. 2.B).

Content of the reservoirs appeared to be granular in every species, as it included a myriad of corpuscles, which were submitted to Brownian movements when dispersed in the saline solution. Corpuscles showed the following morphological outlines:

(a) in *Paederus fuscipes* they were rod-like, 1-2  $\mu\text{m}$  long, and arranged into couples in a exceeding rate;

(b) in *Leptobium gracile* and *Pseudolathra lusitanica* they were rod-like as well, 1  $\mu\text{m}$  long, but not arranged in couples;

(c) in *Ochtheophilum collare* they were too small to be measured with the used lens.

In two specimens of *Ochtheophilum collare* (out of six examined) the mass of corpuscles inside the reservoir was found to be placed in rotation. When dispersed in the salt solution, corpuscles of this species didn't show the usual Brownian movements, but were seemingly able to move freely and speedily.

## CONCLUDING REMARKS

Although the examined species are all included into a single tribe (Paederini, *sensu* COIFFART, 1978; 1982; 1984), their female genital apparatus exhibit a very wide diversity referring to both the presence/absence of the female accessory glands and the shape of this organs.

Referring to function, there is no doubt that gland reservoirs of *Paederus fuscus* are engaged in harbouring a bacterial flora as in the closely related species, *Paederidus rubrothoracicus* (DE MARZO, l.c.). On the contrary, no compelling evidence in the same direction has been acquired for the other species. Anyhow, a suspect about a content of flagellate bacteria arose for the glands of *Ochtheophilum collare*.

## RIASSUNTO

DIVERSITÀ ANATOMICA DELL'APPARATO GENITALE FEMMINILE NELLE PEDERINE IN RIFERIMENTO ALLE  
GHIANDOLE ACCESSORIE (COLEOPTERA STAPHYLINIDAE)

Benché tutte appartenenti ad una singola tribù (Paederini), le 7 specie qui esaminate presentano ampia diversità anatomica nell'apparato genitale femminile, in merito alla presenza o meno e alla forma delle ghiandole accessorie. Queste sono state trovate in 4 specie: *Leptobium gracile* (Gravenhorst), *Ocbtheophilum collare* (Reitter), *Paederus fuscipes* Curtis e *Pseudolathra lusitanica* (Erichson); ma risultano mancanti in *Astenus thoracicus* (Baudi), *Lithocharis ochracea* (Gravenhorst) e *Rugilus orbiculatus* (Paykull). Nel caso di *Paederus fuscipes*, il loro serbatoio è adibito a contenere una miriade di corpuscoli bacilliformi in gran parte riuniti a coppie, riferibile ad una densa flora batterica per analogia con quanto è stato già verificato nell'affine *Paederidus rubrothoracicus* (Goeze). Nelle altre tre specie, il contenuto dei serbatoi ha ugualmente un aspetto granuloso, ma non è altrettanto chiaramente interpretabile come flora batterica. Tuttavia, una parte degli individui di *Ocbtheophilum collare* contenevano nei serbatoi ghiandolari una massa di corpuscoli dotati di movimenti propri e, in via presunta, riconoscibili quali batteri flagellati.

La nota è dedicata alla memoria dell'eminente entomologo Ermenegildo Tremblay.

## REFERENCES

- COIFFAIT H., 1978 - Coléoptères Staphylinidae de la Région paléarctique occidentale. III. Sous familles Staphylininae, Tribu Quediini, Sous famille Paederinae, Tribu Pinophilini. *Nouv. Rev. Entomol.*, Toulouse, suppl. vol. 8, 364 pages.
- COIFFAIT H., 1982 - Coléoptères Staphylinidae de la Région paléarctique occidentale. IV. Sous famille Paederinae, Tribu Pederini 1 (Paederi, Lathrobii). *Nouv. Rev. Entomol.*, Toulouse, suppl. vol. 12, 440 pages.
- COIFFAIT H., 1984 - Coléoptères Staphylinidae de la Région paléarctique occidentale. V. Sous famille Paederinae, Tribu Pederini 2, Sous famille Euasthetinae. *Nouv. Rev. Entomol.*, Toulouse, suppl. vol. 13, 424 pages.
- DE MARZO L., 1991 - Endosimbiosi batterica in *Paederus rubrothoracicus* Goeze (Coleoptera, Staphylinidae). *Entomologica Bari*, 24: 145-150 (1989).
- SMETANA A., 2004 - Staphylinoidea. In: LÖBL I. & SMETANA A. (eds), *Catalogue of Palaearctic Coleoptera*, vol. 2, Apollo Books, 942 pages.
- TREMBLAY E., 1969 - I casi di macrotrasmissione ereditaria dell'endosimbiosi negli insetti. *Mem. Soc. entomol. ital.*, Genova, 48: 17-24.
- TREMBLAY E., 1989 - Coccoidea endocytobiosis. In "Insect endocytobiosis: morphology, physiology, genetics, evolution", Schwemmler & Gassner (eds.), CRC Press Inc., Florida, pages 145-173.
- TREMBLAY E., 1990 - Endosymbionts. In: D. Rosen ed., *The Armored Scale Insects*, Elsevier Sc. Publ., Amsterdam, vol. I, pages 275-283.