Improved equipment of genital glands detected in males of *Megalinus glabratus* (Gravenhorst) (Coleoptera Staphylinidae Staphylininae)

Note 11 (Staphylinoidea), released by Luigi De Marzo on December 2012 – A further illustrated report on male genitalia of staphylinids. l.demarzo@alice.it www.luigidemarzo.eu

SUBJECTS

- Male internal genitalia in Staphylinidae (s.l.) has been recently submitted to an anatomical review, which included members of the subfamilies Aleocharinae, Leptotyphlinae, Paederinae, Pselaphinae and Proteininae (De Marzo, unpublished Note 09);
- according to species, they either include 1-2 pairs of accessory glands or lack any glandular device, as reported in Table A.
- An inspection on further species leads to realize that: (i) a third pair of accessory glands can occur, (ii) an additional pair can separately connect to the ejaculatory duct.
- The case (ii) has been detected in a common member of the tribe Xantholinini, *Megalinus glabratus* (Gravenhorst).

MATERIAL AND METHODS

New examined species – Aleocharinae: *Aleochara bipustulata* (Linnaeus), *Atheta aeneicollis* (Sharp), *Atheta elongatula* (Gravenhorst), *Thecturota marchii* (Dodero). Omaliinae: *Paraphloeostiba gayndahensis* (Macleay). Oxytelinae: *Oxytelus piceus* (Linnaeus). Paederinae: *Astenus melanurus* (Küster), *Lithocharis ochracea* (Gravenhorst), *Luzea nigritula* (Erichson), *Ochthephilum collare* (Reitter), *Paederus fuscipes* Curtis, *Pseudolathra lusitanica* (Erichson). Proteininae: *Proteinus atomarius* Erichson. Staphylininae-Philonthini: *Cafius xantholoma* (Gravenhorst), *Gabronthus maritimus* (Motschulsky), *Philonthus concinnus* (Gravenhorst). Staphylininae-Staphylinini: *Ocypus olens* (O. Müller), *Staphylinus medioximus* Fairmaire. Staphylininae-Xantholinini: *Leptacinus pusillus* (Stephens), *Megalinus glabratus* (Gravenhorst). Tachyporinae: *Tachinus flavolimbatus* Pandellé, *Tachyporus nitidulus* (Fabricius).

RESULTS

----- Aleocharinae

• Two pairs of accessory glands have been detected in a member of the nominal genus, *Aleochara bipustulata* (Fig. 1.A).

• Two pairs do occur in both examined *Atheta* (Fig. 1.B) as well as in the small-sized *Thecturota marchii* (Fig. 1.C).

• Therefore, an equipment of two pairs of accessory glands is confirmed as a rule in the Aleocharinae,

• where a single pair of glands was previously recorded only for the very small-sized species, *Oligota parva* Kraatz.

----- Omaliinae

• An additional pair of accessory glands has been detected in the single examined species of this subfamily, *Paraphloeostiba gayndahensis* (Fig. 2.A).

----- Oxytelinae

• The usual equipment of two pairs of accessory glands has been found for a member of the nominal genus, *Oxytelus piceus* (Fig. 2.B).

----- Paederinae

• Either two or three pairs of accessory glands have been recorded in this subfamily.

• Two pairs do occur in most examined species of this subfamily (Figs. 3, 4.A), as previously found in *Rugilus orbiculatus* (Paykull).

• A third pair of accessory glands was detected only in a member of the nominal genus, *Paederus fuscipes* (Fig. 4.B).

----- Proteininae

• The small-sized *Proteinus atomarius* (Fig. 5.A) exhibits the two pairs of accessory glands as another member of the subfamily Proteininae, *Megarthrus affinis* Miller (De Marzo, unpublished Note 09).

• Anyhow, glands of *Proteinus* don't exhibit the asymmetric condition previously described for *Megarthrus*.

----- Tachyporinae

• Both *Tachyporus nitidulus* and *Tachinus flavolimbatus* are equipped with two pairs of accessory glands (Fig. 5.B-C).

----- Staphylininae

• Examined species of this subfamily include:

• for the tribe Staphylinini (Fig. 6), both a member of the nominal genus, *Staphylinus medioximus*, and another large-sized species, *Ocypus olens*;

- for the tribe Philonthini (Fig. 7), *Cafius xantholoma*, *Gabronthus maritimus* and *Philonthus concinnus*;
- for the tribe Xantholinini (Fig. 8-9), two species of very different size.
- Every species exhibits the usual equipment of two pairs of accessory glands.
- Anyhow, the larger species of the tribe Xantholinini, *Megalinus glabratus*, exhibits a further pair of glands.
- Although this additional pair connects to the ejaculatory duct as well, its connection locates very far from the end of the same duct.

CONCLUDING REMARKS

- Either two of three pairs of glandular units have been recorded for males of the subfamily Staphylininae so far.
- Referring to insect in general, Snodgrass (1935, on page 573) states that the male accessory glands are usually engaged in secreting a mucous or viscid substance,
- which can be either discharged as a liquid together with the spermatozoa or do harden to form a spermatophore;
- furthermore, Snodgrass states that the accessory glands generally arise from the anterior end of the ejaculatory duct or from short divergent anterior branches of the duct
- and proposes the term “preputial glands” for those structures, which associate with the external opening of the ejaculatory duct.
- Seemingly, accessory glands of male staphylinids are generally engaged in sperm production,
- as it was evident for the single hypersized gland of *Megarthrus affinis* (De Marzo, unpublished Note 9);
- otherwise, they are probably engaged into the production of spermatophore in the case of *Aleochara bipustulata* (De Marzo, 2011).
- The separate pair of *Megalinus glabratus* might be considered as preputial glands if we admit the possibility that its secretion acts as a lubricant to enabling the eversion of the very long endophallus.

REFERENCES

De Marzo L., 2011 - Due eminenti Entomologi: Giorgio Fiori e Vincenzo Lupo. Atti Accademia Nazionale Italiana di Entomologia, Firenze, anno LVIII, (2010): 29-41.

De Marzo L., on November 2012 - Unpublished Note 09 (Staphylinoidea): An anatomical detail of the male internal genitalia of *Megarthrus affinis* Miller (Coleoptera Staphylinidae Proteininae). www.luigidemarzo.eu

Snodgrass R.E., 1935 - The principles of Insect morphology. McGraw-Hill Book Co. Inc., New York, London, 667 pp.

Table A – Pairs of male accessory glands occurring in Staphylinidae (s.l.) according to the reported references.

taxa	references	number of pairs
ALEOCHARINAE		
Atheta inquinula (Gravenhorst)	De Marzo, 2011	2
Cordalia obscura (Gravenhorst)	De Marzo, 2008	2
Drusilla italica (Bernhauer)	ib.	2
Heterota plumbea (Waterhouse)	De Marzo, 2011	
Myrmecopora uvida (Erichson)	De Marzo, 2008	2
Nehemitropia lividipennis (Mannerheim)	ib.	2
Oligota parva Kraatz	ib.	1
LEPTOTYPHLINAE		
Allotyphlus bericiensis Coiffait	Pace, 1996	2
Allotyphlus pacei Coiffait	ib.	2
Cyrtotyphlus winkleri Breit	ib.	1
Leptotyphlus lessinicus Pace	ib.	1
PAEDERINAE		
Rugilus orbiculatus (Paykull)	De Marzo, 2010	2
PROTEININAE		
Megarthrus affinis Miller	De Marzo, 2012	2
PSELAPHINAE		
Batrisodes oculatus (Aubé)	De Marzo, 1991	1
Brachygluta abrupta Dodero	ib.	2
Bryaxis pedator (Reitter)	ib.	1
Pselaphus heisei Karaman	ib.	2
Euplectus bonvouloiri Reitter	ib.	2
Pseudozibus crassipes (Raffray)	ib.	0
Rybaxis longicornis (Leach)	ib.	2
Trimium brevicorne (Reichenbach)	ib.	1
Trissemus olivieri (Raffray)	ib.	1

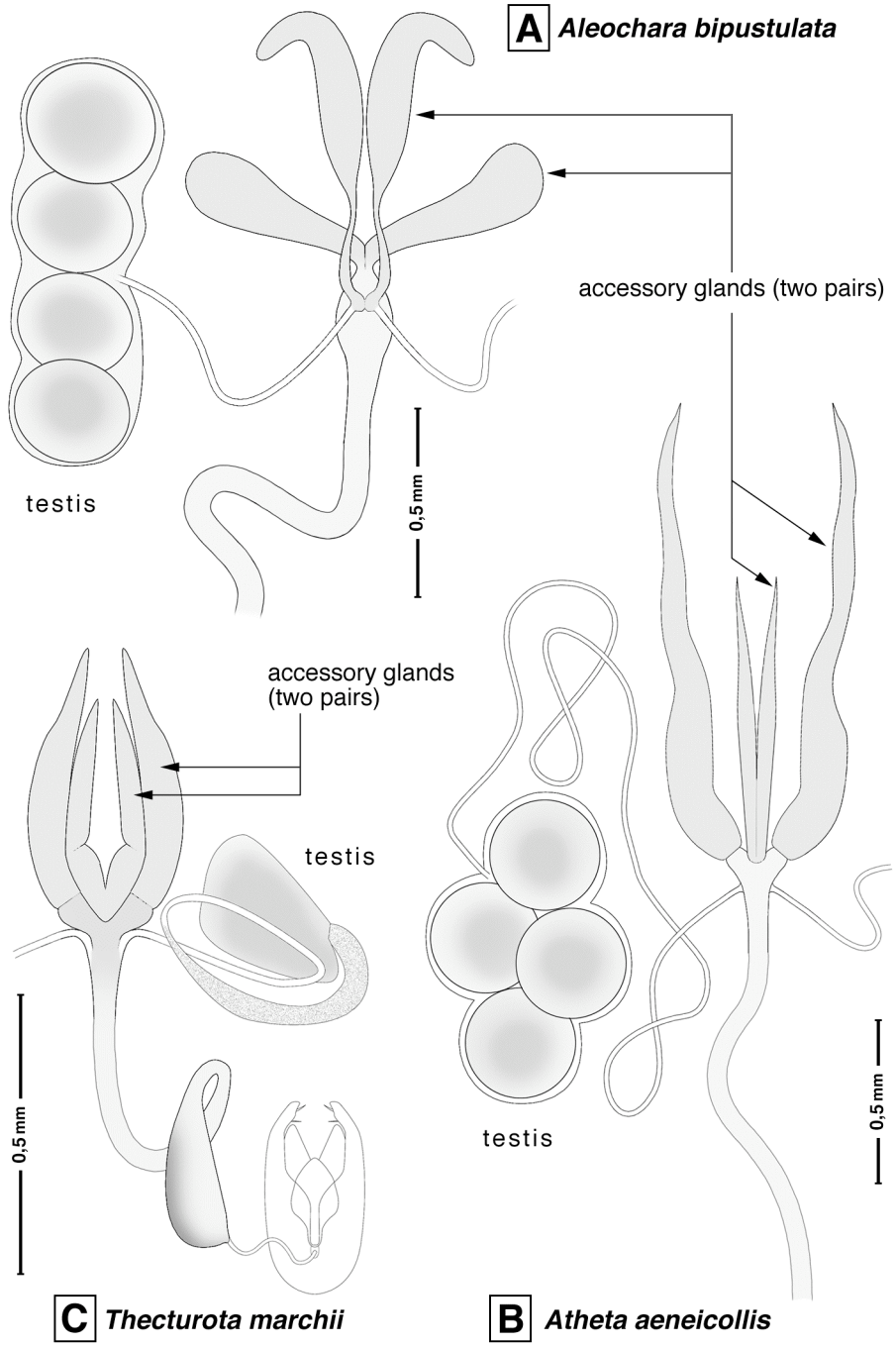

Fig. 1 – Subfamily Aleocharinae: male genitalia of reported species.

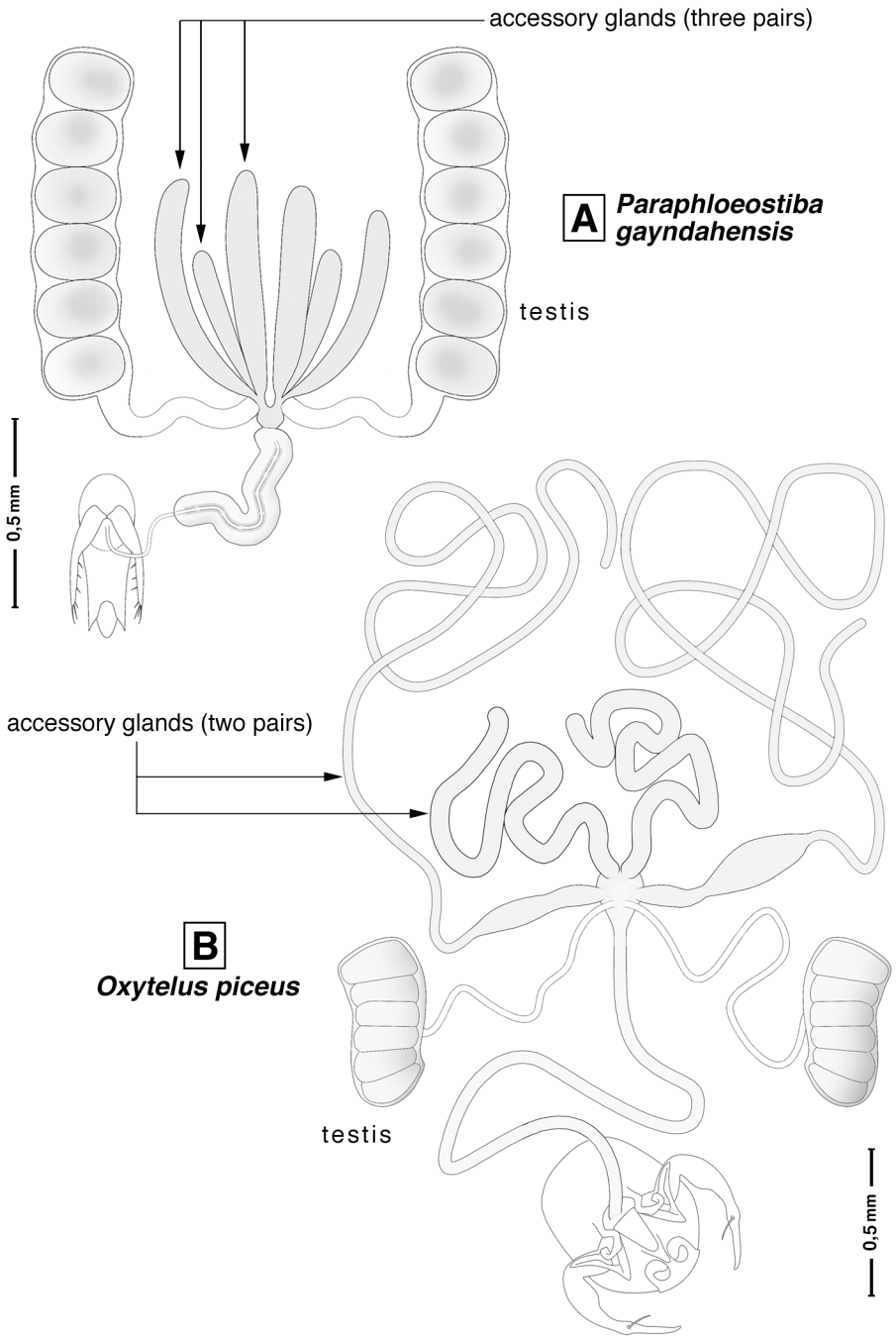

Fig. 2 – Subfamilies Omaliinae and Oxytelinae: male genitalia of the reported species.

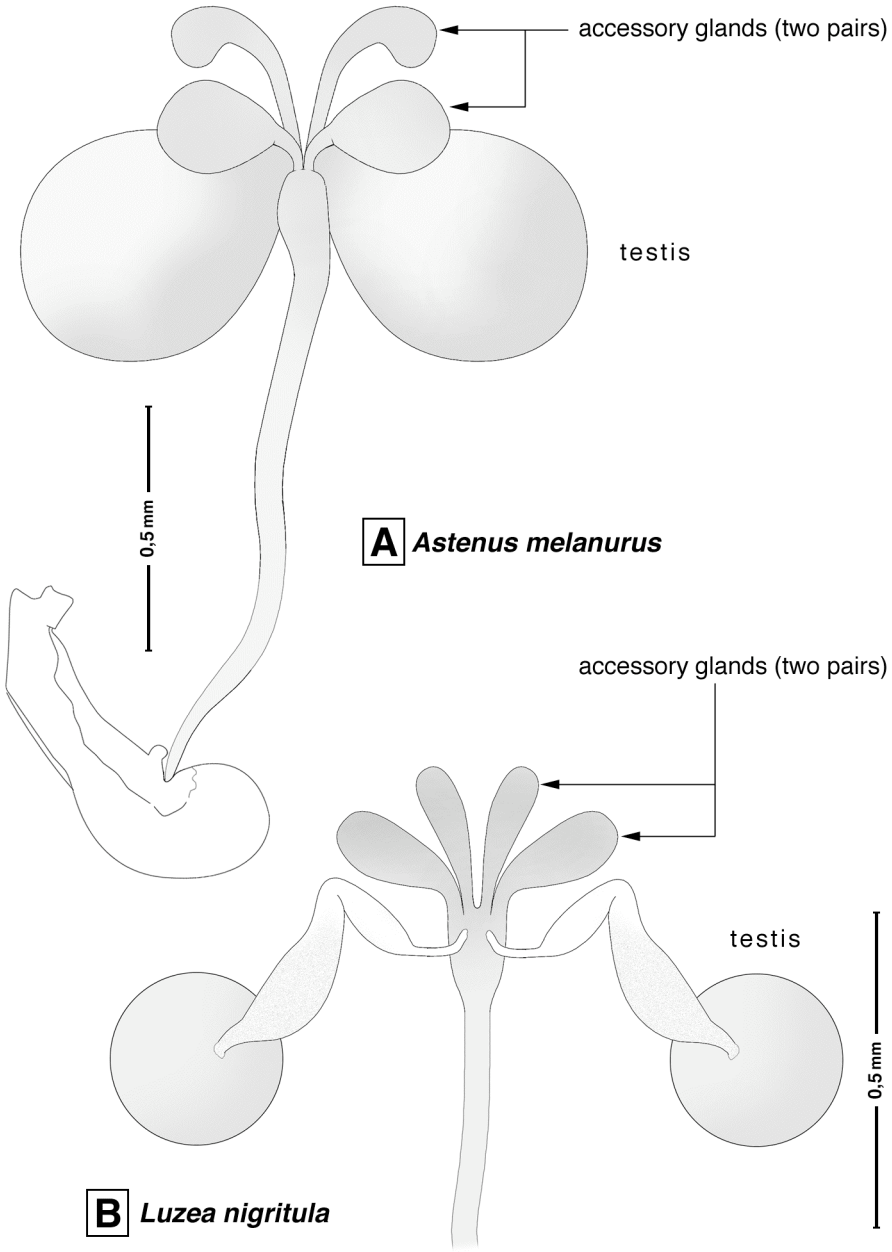

Fig. 3 – Subfamily Paederinae: male genitalia of the reported species.

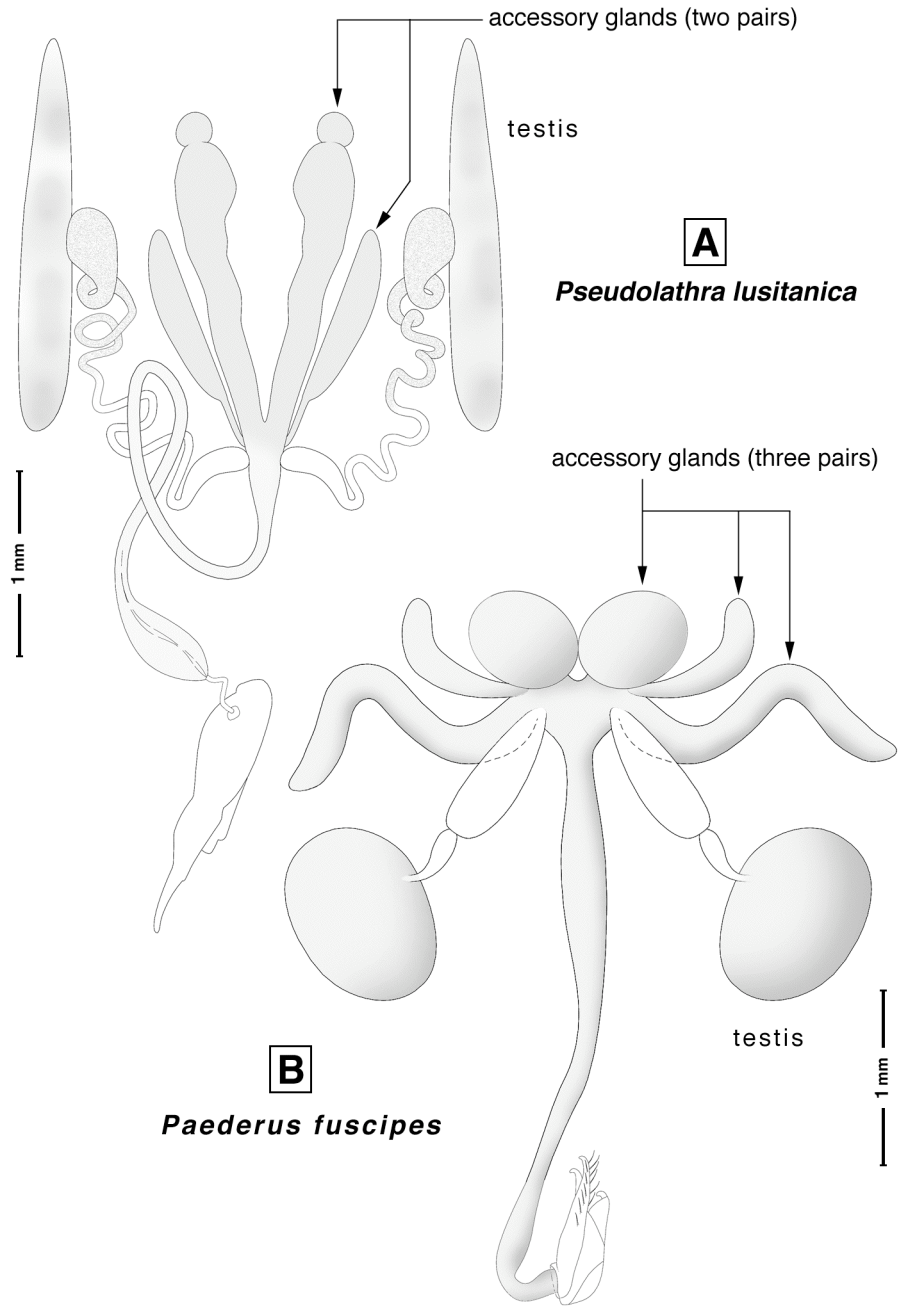

Fig. 4 – Subfamily Paederinae: male genitalia of further two species.

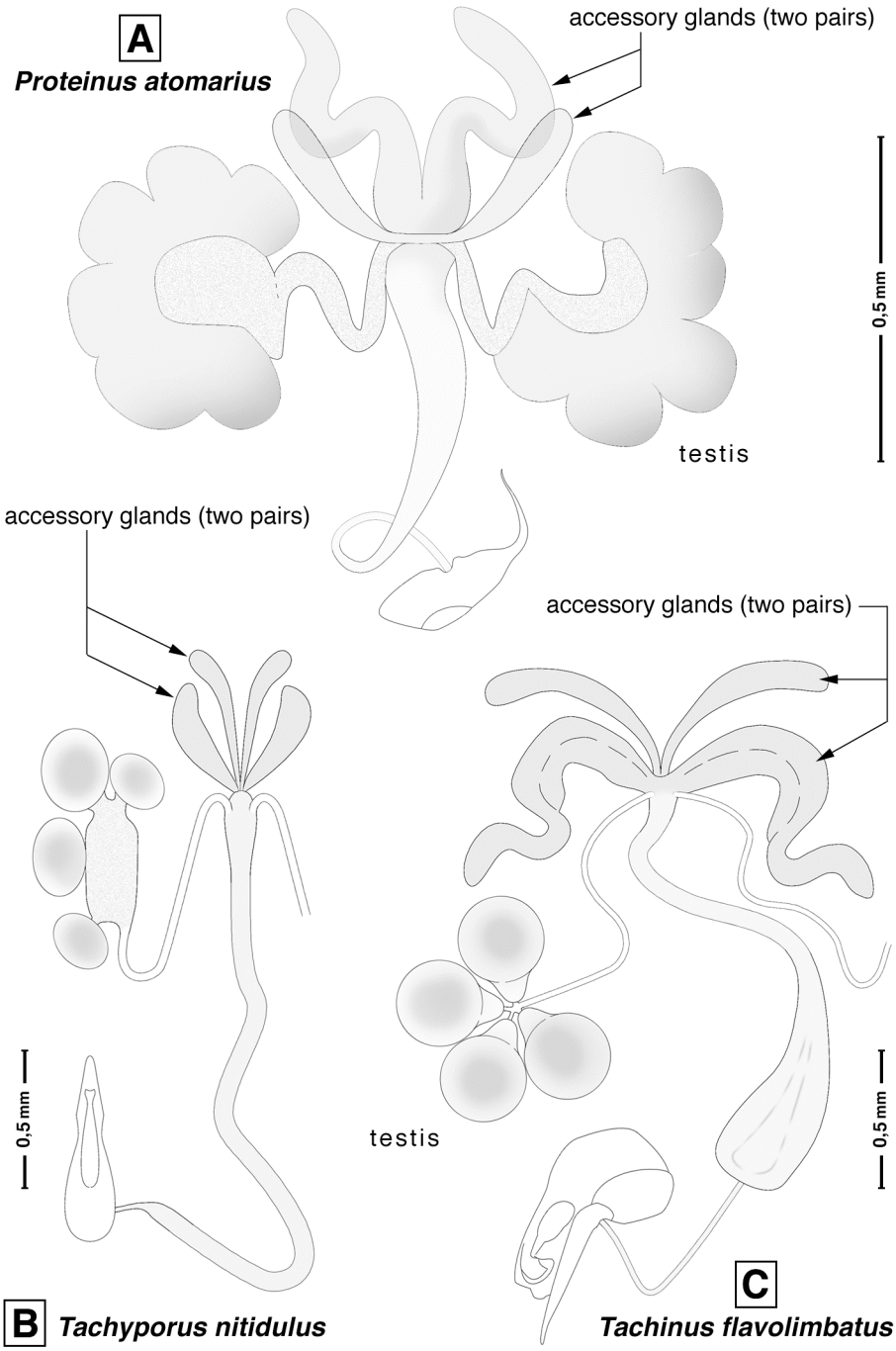

Fig. 5 – Subfamilies Proteininae and Tachyporinae: male genitalia of the reported species.

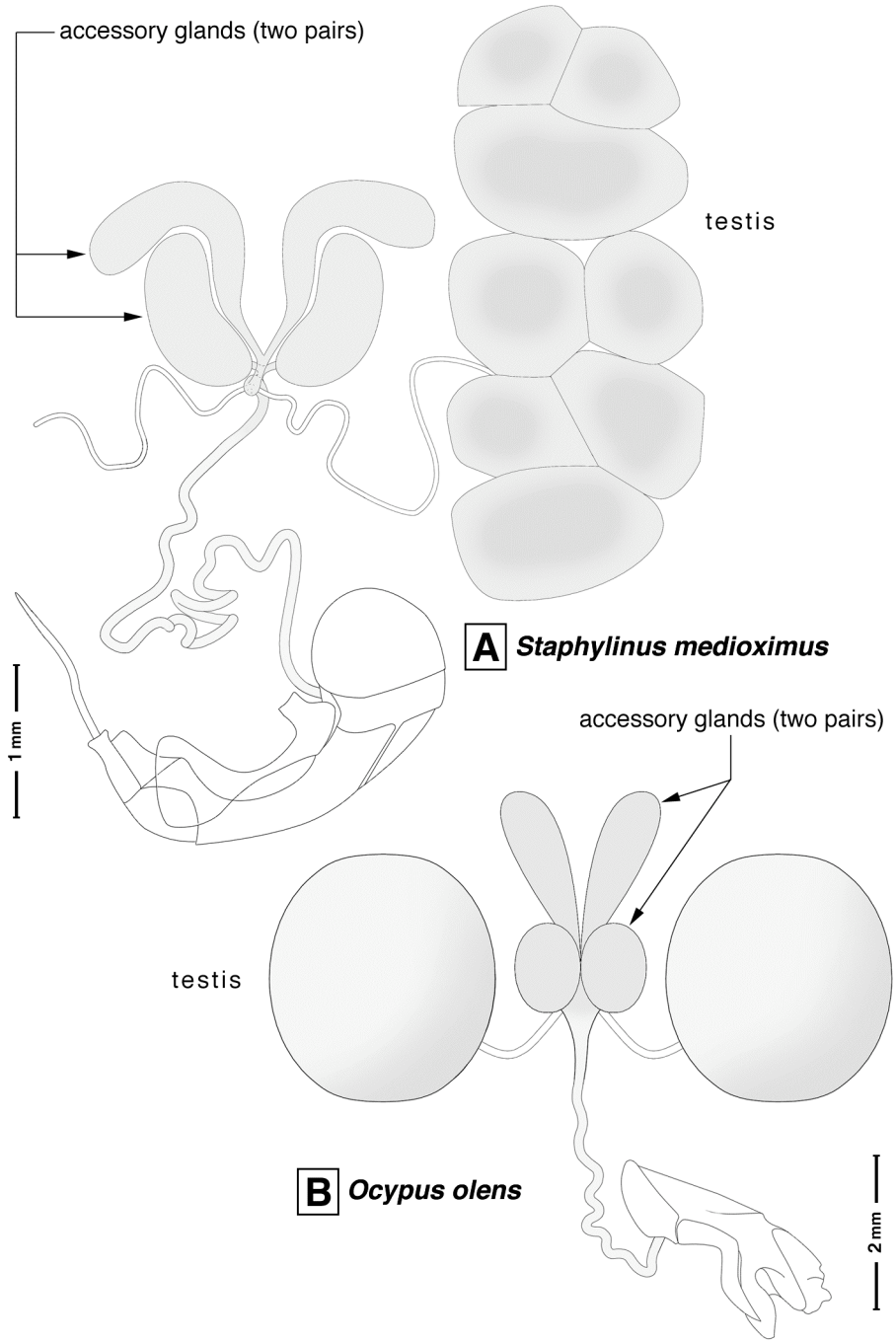

Fig. 6 – Subfamily Staphylininae, tribe Staphylinini: male genitalia of the reported species.

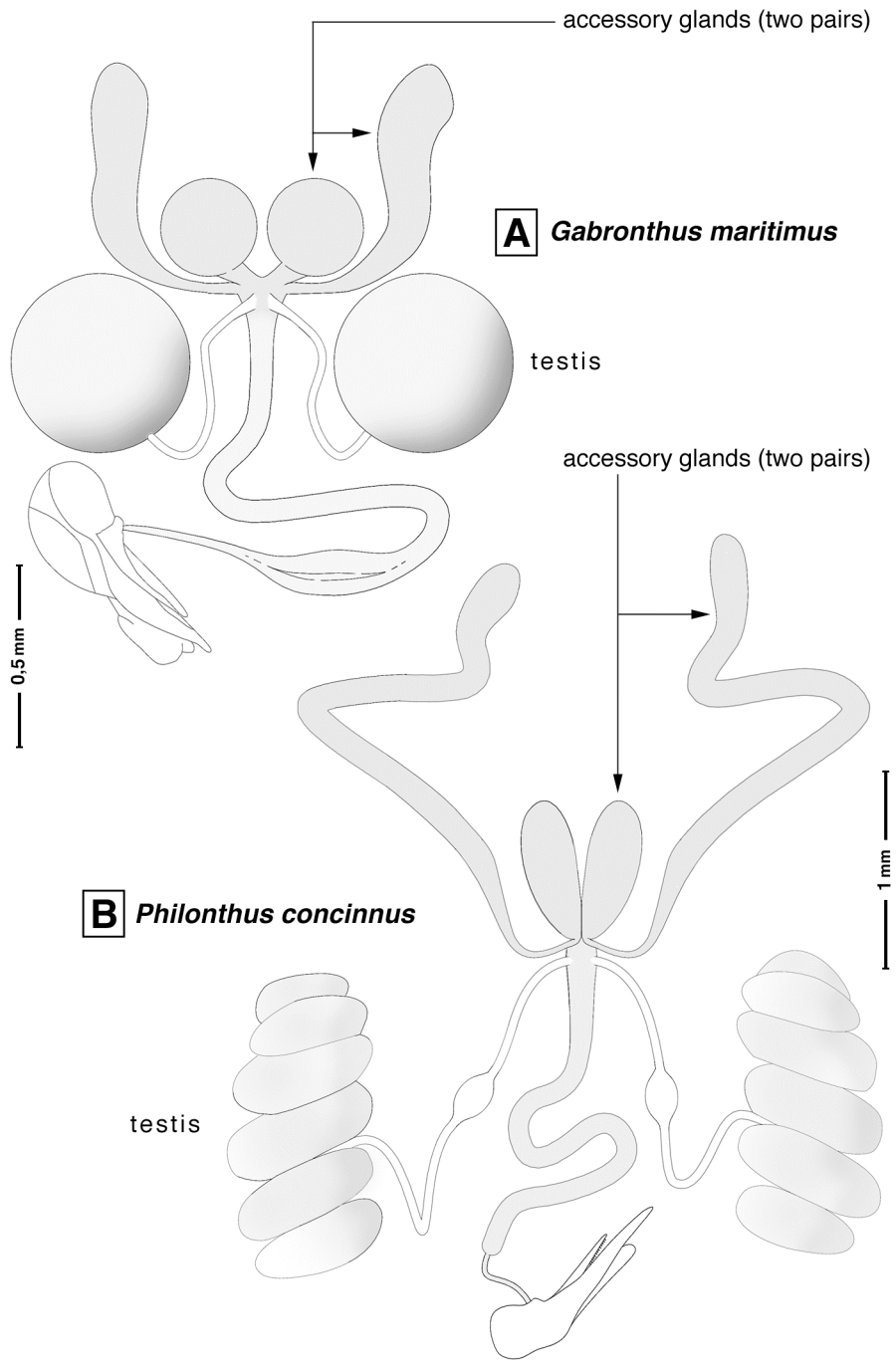

Fig. 7 – Subfamily Staphylininae, tribe Philonthini: male genitalia of the reported species.

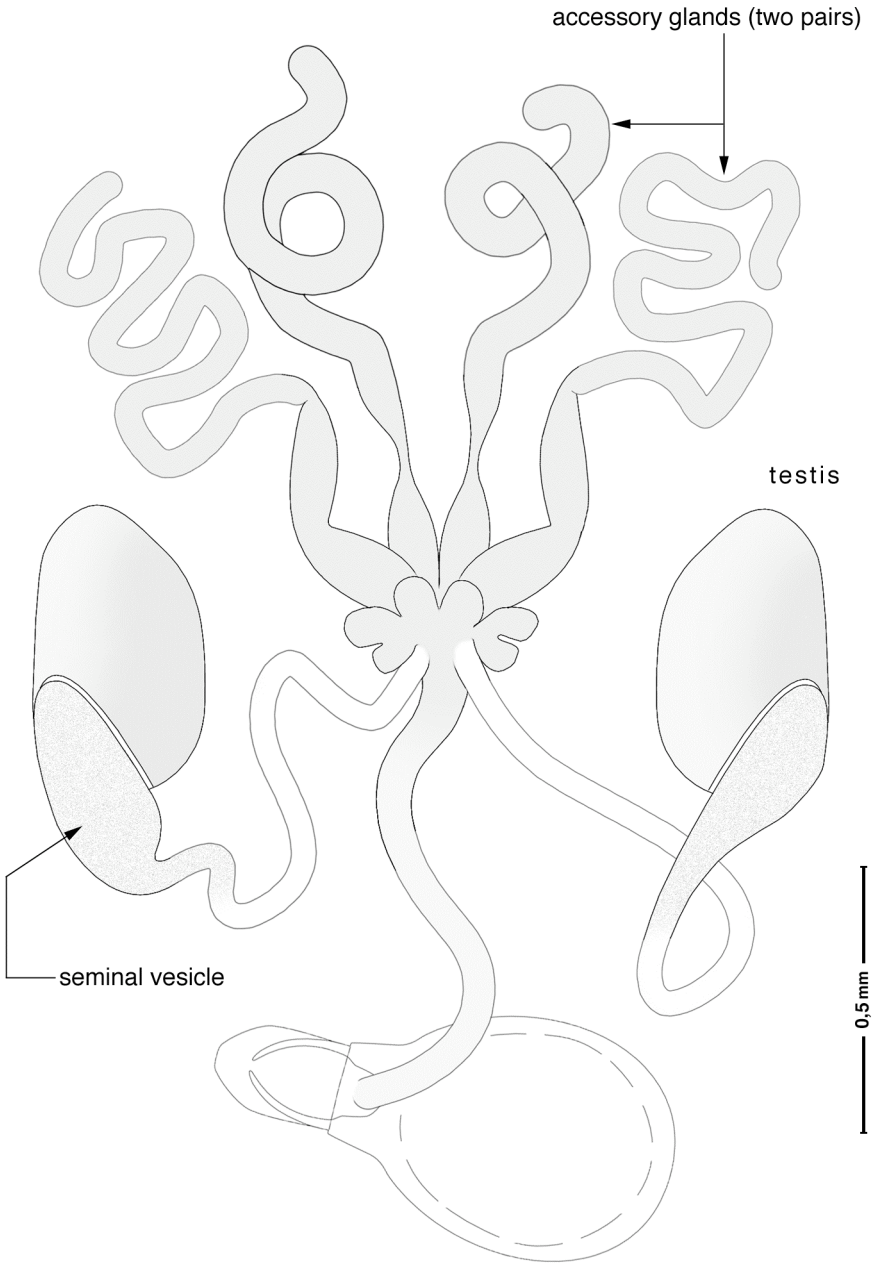

Fig. 8 – Subfamily Staphylininae, tribe Xantholinini: male genitalia of *Leptacinus pusillus* (Stephens).

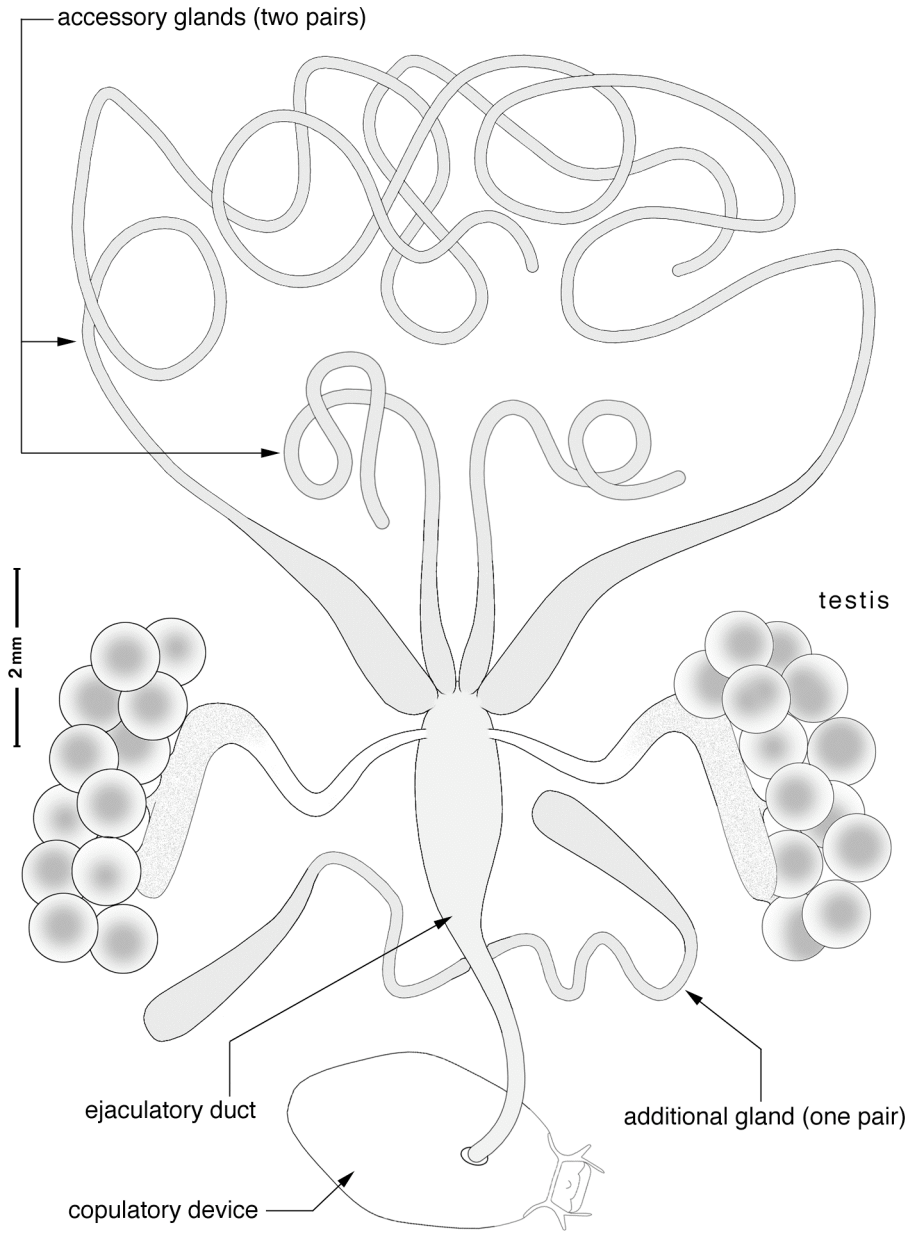

Fig. 9 – Subfamily Staphylininae, tribe Xantholinini: male genitalia of *Megalinus glabratus* (Gravenhorst).