

Morphology of the pupal instar described for some Ptiliidae (Coleoptera)

Note 05 (Staphylinoidea), released by Luigi De Marzo on August 2012 –
Outlines of interspecific variability detected in this stage.
l.demarzo@alice.it

SUBJECTS

- Literature on the featherwing beetles includes the description of the pupal stage for two species: (I) *Acrotrichis fascicularis* (Herbst) by Hinton (1941), (II) *Ptinella mekura* Kubota by De Marzo (1991).
- New descriptions are reported in this Note.

MATERIAL AND METHODS

- Examined species (in agreement with Smetana, 2004): *Acrotrichis grandicollis* (Mannerheim), *Acr. sanctaehelenae* Johnson, *Acr. sericans* (Heer), *Actidium coarctatum* (Haliday), *Actinopteryx fucicola* (Allibert), *Microptilium pulchellum* (Allibert), *Nephanes titan* (Newman), *Pteryx suturalis* (Heer), *Ptenidium pusillum* (Gyllenhal), *Ptiliolium fuscum* (Erichson), *Ptinella aptera* (Guérin-Ménéville), *P. denticollis* (Fairmaire), *P. mekura* Kubota.
- Most species were identified on females specimens, looking at the shape of their spermatheca, which was reported by both Besuchet & Sundt (1971) and Mlynarski (1984).
- Pupae were obtained from larvae in laboratory jars of the figured type (Fig. 1.A).
- Larvae of both *Actinopteryx fucicola* and *Actidium coarctatum* were selected from their natural substrate, i.e., from masses of plant debris on seashores (De Marzo, 2002).
- Larvae of the other species developed from eggs.
- Ovipositing females included those of the parthenogenetic species, *Ptinella mekura* (De Marzo, 1997; 2009).
- Drawings were made at the light-chamber on specimens killed in ethanol 70% and temporarily mounted on slides in water.

RESULTS

----- General features

- According to Hinton's (l.c.) description, the pupa of *Acrotrichis fascicularis* is of the obtect type, pale brownish-testaceous in color, with cuticle shining and densely punctate.
- In dorsal view, its head is either completely concealed by pronotum or exhibits only its vertex.
- Its dorsal surface exhibits 9 pairs of "stout spines" distributed as follows: 7 pairs on pronotum, 1 pair at mesonotum and 1 pair at metanotum.
- A pair of spiracles is located at the posterior margin of the metanotum and supposedly corresponds to that occurring on the first abdominal segment of adults.

----- Interspecific variability: number of setal thecae

- Properly, the Hinton's "stout spines" may be regarded as "setal thecae".
- Nine pairs of them were found in both *Acrotrichis grandicollis* (Fig. 1.A) and *Ptenidium pusillum* (Fig. 3) and are distributed in agreement with the Hinton's scheme of *Acrotrichis fascicularis*.
- One pair of these setal thecae lacks in both the congeneric species, *Acr. sanctaehelenae* and *Acr. sericans*, as well as in *Actinopteryx fucicola*.
- Further numbers of setal thecae include the values 7, 6 and 4 and are listed behind (Table A).

 Table A – Pairs of "setal thecae" detected in the examined species.

pairs	examined species
9	<i>Acrotrichis grandicollis</i> , <i>Ptenidium pusillum</i>
8	<i>Acrotrichis sanctaehelenae</i> , <i>Acr. sericans</i> , <i>Actinopteryx fucicola</i>
7	<i>Actidium coarctatum</i> , <i>Nephanes titan</i> , <i>Pteryx suturalis</i> , <i>Ptinella denticollis</i> , <i>Ptinella aptera</i>
6	<i>Microptilium pulchellum</i> , <i>Ptinella mekura</i>
4	<i>Ptiliolium fuscum</i>

----- Interspecific variability: shape of setal thecae

- The “stout spines” reported by Hinton widely vary in shape even in a single species.
- Besides the type really short and stout, they include units either forked or trifold at apex, as well as
- the very long units of *Actidium coarctatum* and the butterfly-like metanotal theca of *Nephanes titan* (Fig. 2).
- Furthermore, there are two pairs of very short pronotal thecae (Fig. 4) in both *Pteryx suturalis* and all examined *Ptinella*.

----- Interspecific variability: shape of spiracles

- Lack of spiracles was recorded only for *Actidium coarctatum*.
- Elsewhere, the spiracles occupy the position reported by Hinton (l.c.) for *Acrotrichis fascicularis*, i.e., at the border between the metanotum and the first abdominal segment.
- Usually, each spiracle exhibits a simply ring-like reinforcement, as in *Ptenidium pusillum* and *Ptinella denticollis* (Figs. 3 and 4);
- otherwise, they bear a spine-like production in both *Acrotrichis sanctaehelenae* (Fig. 1) and *Pteryx suturalis* (Fig. 4).
- Moreover, we must record the very particular spiracles of *Ptiliolium fuscum*, where a mulberry-like production conceals the respiratory orifice (Fig. 3).

CONCLUDING REMARKS

- Interspecific variability of the examined pupae does concern: (a) length/number/shape of the setal thecae; (b) presence/absence/shape of the spiracles.
- *Actidium coarctatum* sets apart because of both its very long setal thecae and the lack of spiracles.
- A interspecific variability in the number of the setal thecae has been observed within the genus *Acrotrichis*,
- and *Acrotrichis grandicollis* shares the number of setal thecae with *Ptenidium pusillum*.
- *Ptiliolium fuscum* exhibits both a unique type of spiracle and the lower number of setal thecae (4 pairs).

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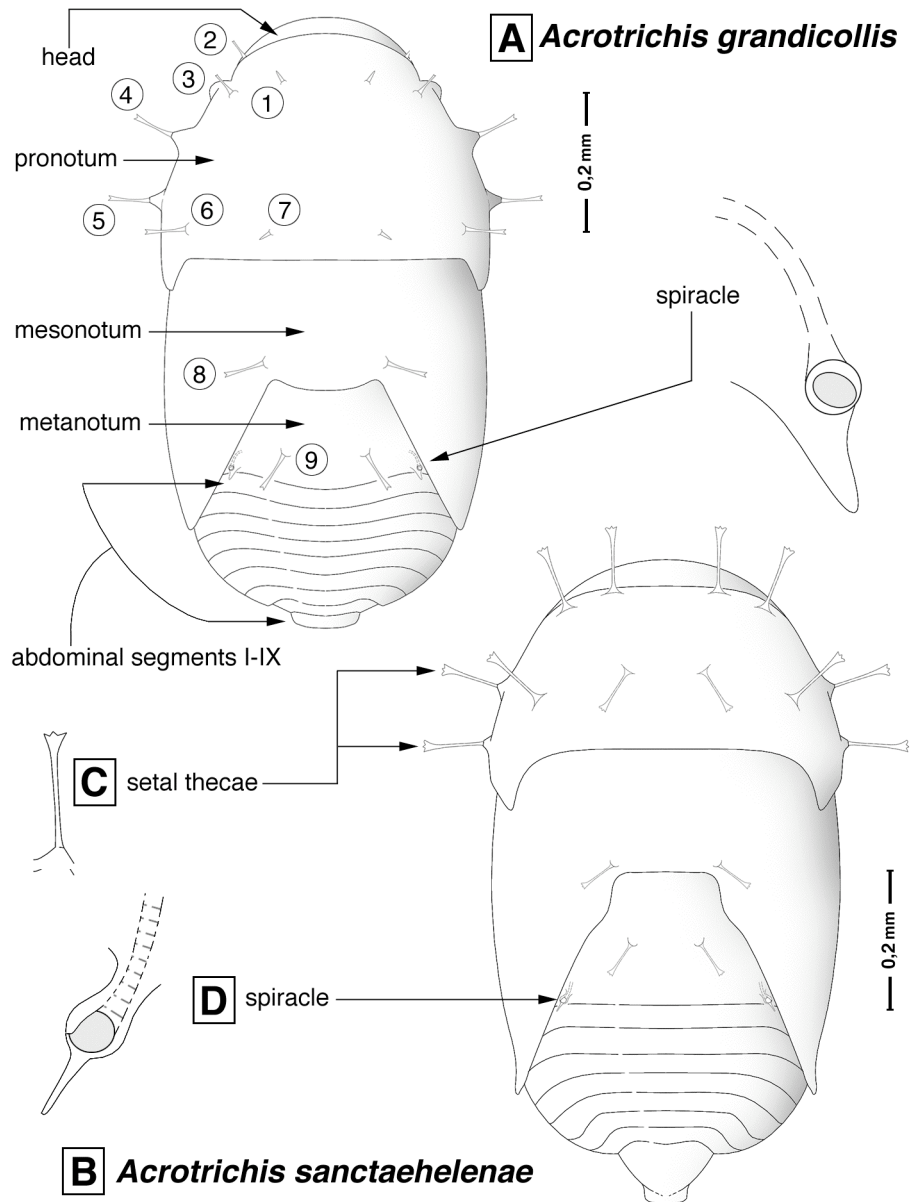
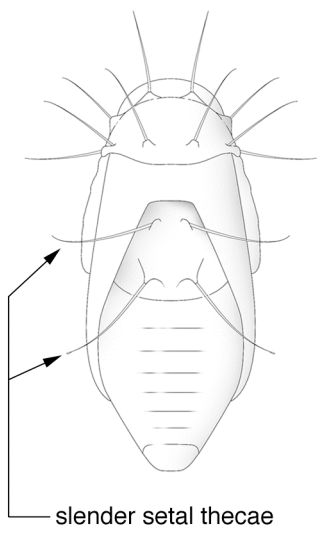
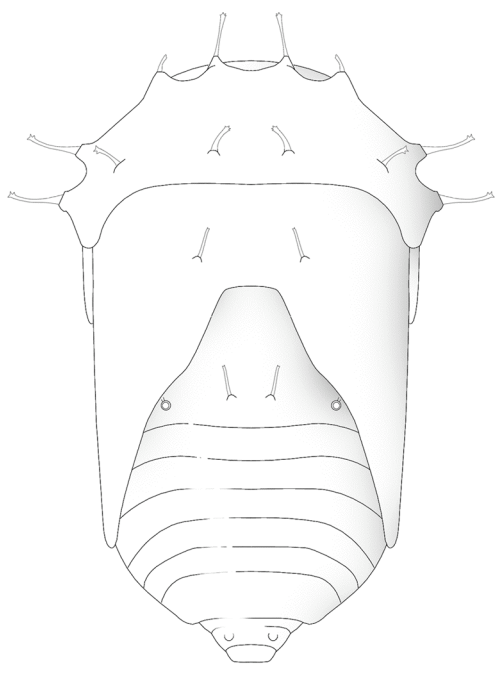


Fig. 1 - Pupae (dorsal view) of the reported species. Numeration refers to setal thecae.

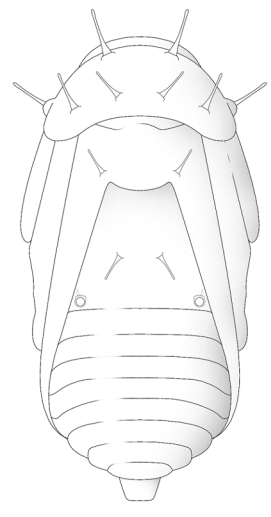
Actidium coarctatum



Actinopteryx fucicola



Microptilium pulchellum



Nephanes titan

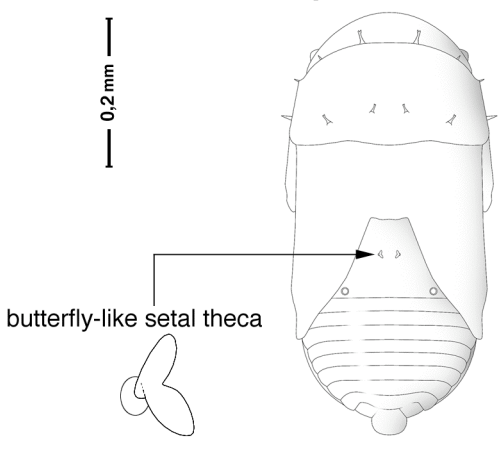


Fig. 2 - Pupae (dorsal view) of the reported species.

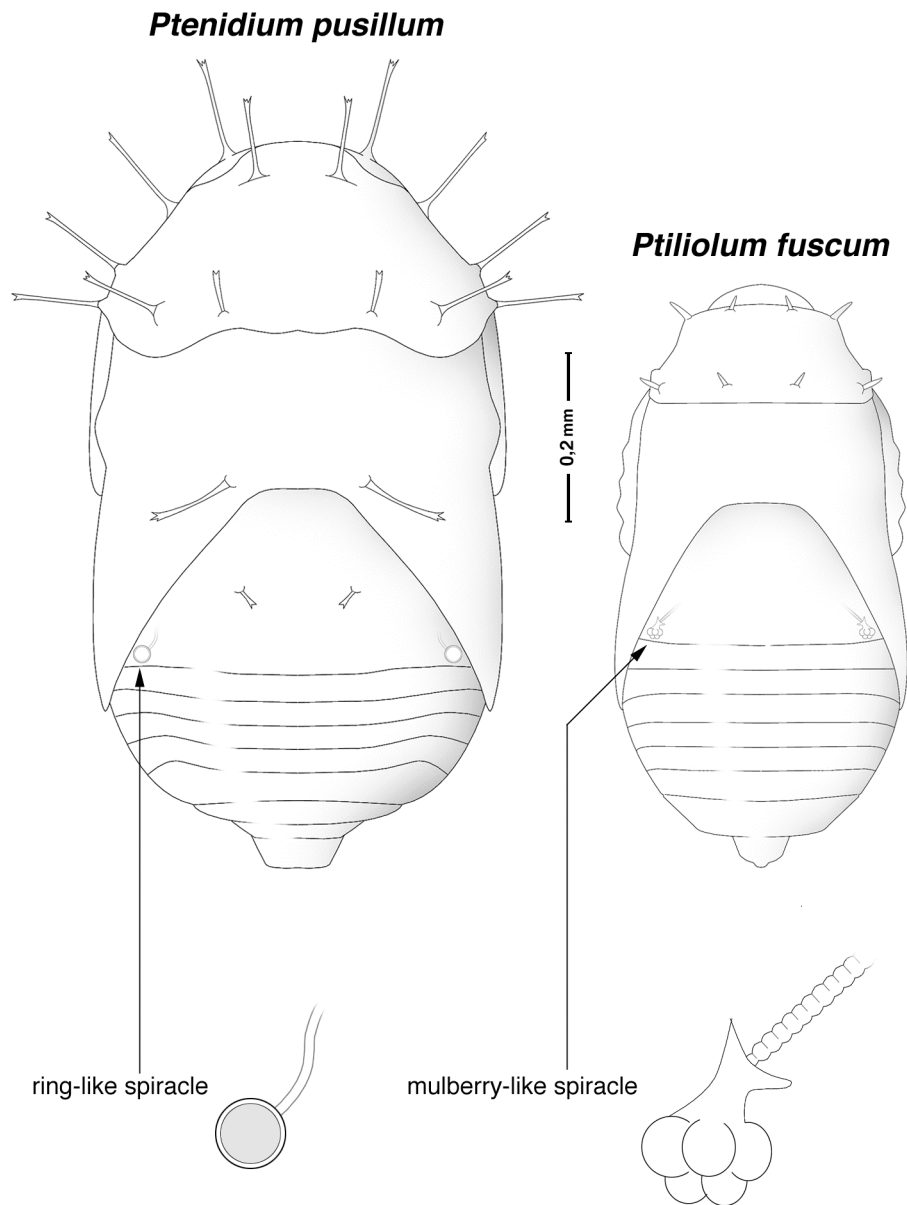


Fig. 3 – Pupae (dorsal view) of the reported species.

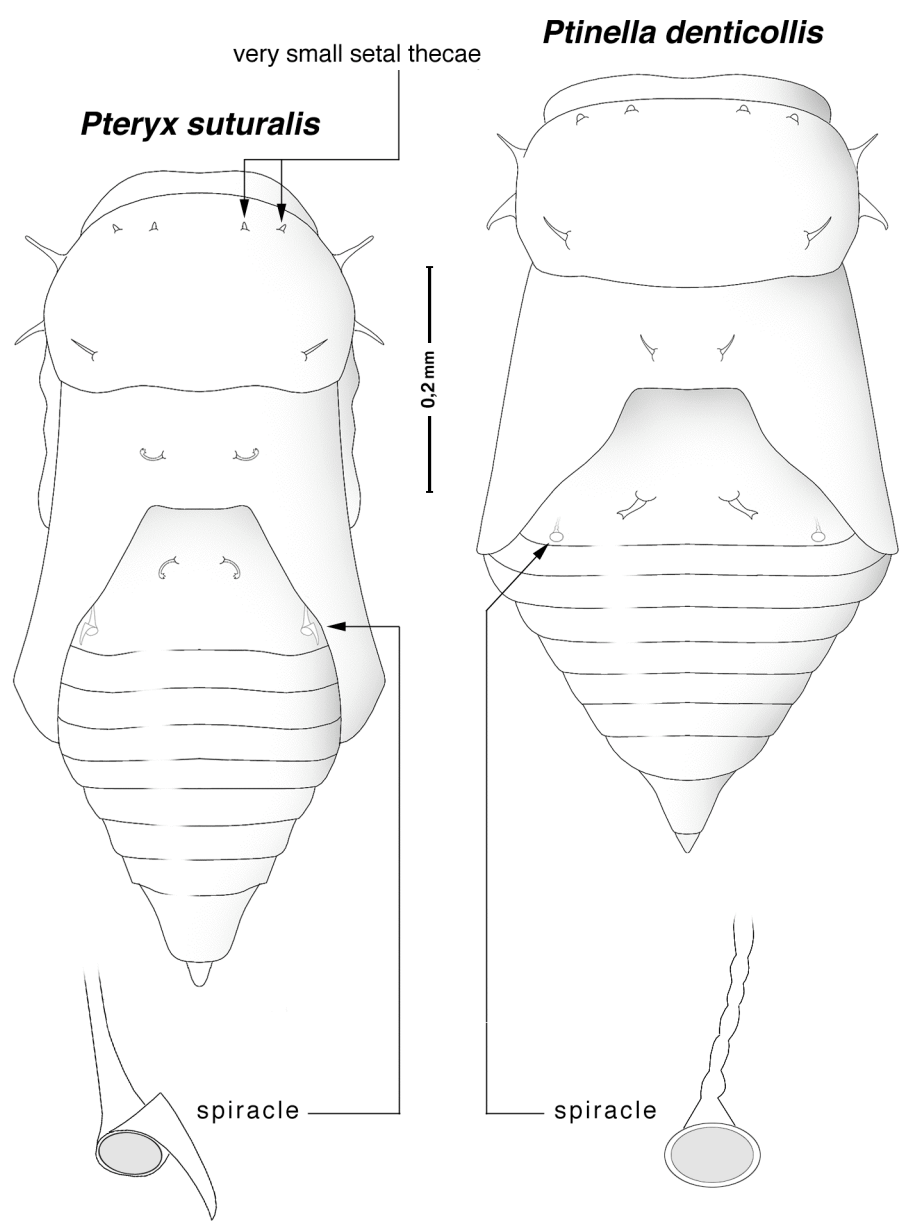


Fig. 4 - Pupae (dorsal view) of the reported species.