

Part 3

Coremata and structures of abdominal segment 8

In most species of most families the ventral plate of A8 has a different pattern of sclerotization compared with the other ventral abdominal plates. A common pattern that presumably provides some structural support to the genitalia is a simple strengthening and/or sculpturing of the posterior margin of the plate. More extreme modification is seen in some species. These modifications are covered in part 3. It is intended to eventually deal with all families here, in the same order that the main parts of the genitalia are presented, but for now families 70 to 74 only are covered.

Coremata (s. corema)

Eversible pouches associated with the male genitalia and usually containing bundles of hair scales.

Coremata are most often associated with ventral A8 or the A8/9 intersegmental membrane (ISM) but may be associated with the A7/8 ISM, the valvae or the saccus. Elaborate coremata may be associated with substantial sclerotised architecture. The coremata pouch may be midline but they are much more often paired. Some species have more than one pair of coremata.

Family: Noctuidae

In the Noctuidae the sclerotization of abdominal segment 8 (A8) is reduced and quite variable from species to species. The valvae are often covered in hair bundles arising on the external lamina, but significant modification of A8 and coremata are seen in a minority of species.



Several species in Tribe: Argyrogrammatini (Subfamily: Plusiinae) have a pair of coremata set in a midline pouch formed from a modification of the ventral plate of A8. In *Thysanoplusia orichalcea* (fig. 1) this plate is formed as a sclerotised ring with the coremata pouch formed from the hyaline membrane in the centre of the ring.

Figure 1: *Thysanoplusia orichalcea* (Slender Burnished Brass) ventral plate of A8 with coremata

Spodoptera species (fig. 2) (Subfamily: Xyleniinae, Tribe: Prodeniini) have coremata in the external lamina of the sacculus.



Figure 2: *Spodoptera littoralis* (Mediterranean Brocade) left – genital capsule with coremata in situ; centre – same with partial separation of coremata bundles; right – saem with hair bundles removed to reveal eversible pouches in the saccular bases

Family Notodontidae

No species has coremata. The posterior margin of the ventral plate of A8 is broadly strengthened in subfamily Notodontinae (fig. 4). In *Stauropus fagi* (subfamily Dicranurinae) (fig. 3) the ventral plate of A8 shows extreme modification forming a strongly sclerotised plate extending anteriorly as a long narrow process and posteriorly as a pair of processes with a sinuate lateral margin and a deep median cleft between them. The A8/9 ISM is attached to the dorsal surface of the plate at the base of the posterior processes and also anteriorly at the base of the anterior process and is sclerotised in the midline between these two attachments. A long strong process extends posterodorsally from this anterior attachment, with its bilobed, spatulate apex naturally resting between the valvae. Lateral to its posterior attachments the ISM has a pair of patches of dense fine spines on its internal surface. From its anterior attachment the ISM folds dorsally to form a hyaline pouch the posterior edge of which attaches to the vinculum (the spatulate process passes posteriorly inside this pouch).



Figure 3: *Stauropus fagi* (Lobster Moth) left to right – genital capsule, lateral view (natural) with ventral A8 in situ; ventral A8 and A8/9 ISM, dorsal view; same with hyaline membranes removed; ventral plate of A8; sclerotised layer of A8/9 ISM with spatulate process (dorsal view)



Figure 4: ventral plates of A8. Left – *Drymonia dodonaea* (Marbled Brown), right – *Notodonta ziczac* (Pebble Prominent)

Family Erebiidae

Many species in subfamily Arctiinae, tribe Arctiini have significant coremata architecture associated with ventral A8 which is expanded and folded to form a midline pouch containing the coremata. The ventral wall of the pouch is hyaline apart from a narrow sinuate sclerotised line marking the anatomical anterior border of ventral A8 and the natural posterior-ventral support of the coremata architecture. This line is broken in the ventral midline but may be continuous with the anterior border of dorsal A8 (eg *Spilosoma lubricipeda*, fig. 5). The dorsal wall of the pouch is formed from the remainder of ventral A8 and is supported by a midline sclerotisation ranging from a narrow “T” (eg *Euplagia quadripunctata*, fig. 6) to a broad plate (eg *Spilosoma lubricipeda*).

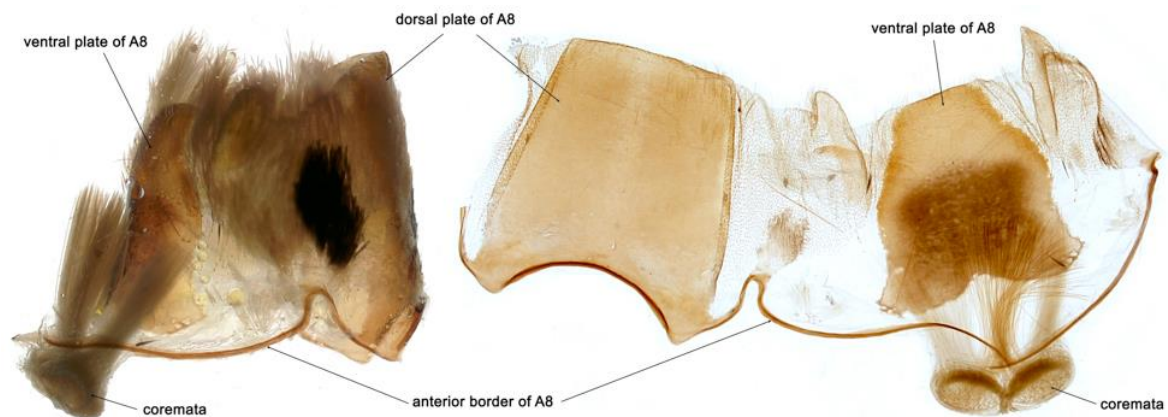


Figure 5: *Spilosoma lubricipeda* (White Ermine) - coremata. Left - genital capsule with A8 in situ, lateral view (natural). Right – A8 with the sclerotised ring at the anterior border of A8 broken on one side (set)

In *Euplagia quadripunctata* the coremata scales are unusually short and broad and sit cushion-like over the ventral surface of the genitalia.



Figure 6: *Euplagia quadripunctata* (Jersey Tiger) – coremata

In subfamily Arctiinae tribe Lithosiini some *Eilema* species (e.g. *Eilema complana*, fig. 7) also have a strengthened border to ventral A8 that appears to contribute to coremata architecture, but the coremata are associated with the saccus not A8. In *Eilema caniola* (fig. 8) the framework provided by A8 is particularly strong, although the coremata are relatively inconspicuous.

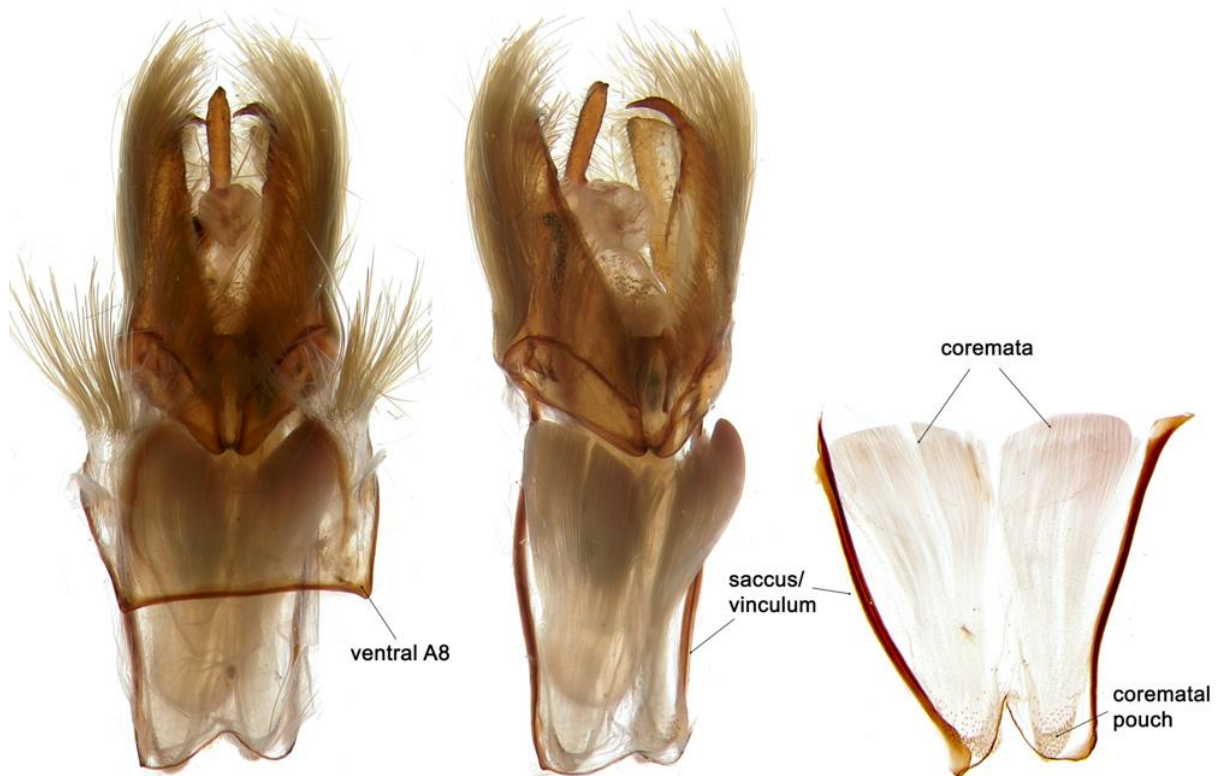


Figure 7: *Eilema complana* (Scarce Footman) left – genital capsule with A8 in situ (natural), centre – same with A8 removed, right – saccus with coremata (set)



Figure 8: *Eilema caniola* (Hoary Footman) left to right – genital capsule with A8 in situ (natural), A8 ventral view (set), A8 lateral view (natural), A8 dorsal view (natural)

Other subfamilies of the Erebidae lack substantial modification of A8 and either have rudimentary coremata (eg *Rivula sericealis*) or none.

Family Nolidae

Some species lack coremata.

Pseudoips prasina (fig. 9) has the saccular bases modified to house coremata.



Figure 9: *Pseudoips prasina*- right valva (set)

In *Nycteola revayana* (fig. 10) the sclerotization of the anterior end of the tegumen broadens such that the dorsomedial margin band forms the tegumenal component of the vinculum-tegumen articulation and the broader ventrolateral band forms a coremata attachment.



Figure 10: *Nycteola revayana* (Oak Nycteoline) left – genitalia with A8 plates in situ, centre – VT-ring, right – VT articulation

Family: Geometridae

Some accessory structures only found in Family: Geometridae are an important means of confirming the identity of some species. These structures have acquired their own terminology.

Cerata: Paired elongate processes arising from the lateral margins of the ventral plate of A8 in *Scopula* species, in which they are of diagnostic significance.

The structure of the plate is also modified: the apical portion, posterior to the origin of the cerata, forms a pouch, closed posteriorly. The anterior margin of the dorsal lamina of the pouch appears to be supported by the cerata and is continuous with the A8/9 ISM (at the upper green line in fig. 11). The anterior border of the plate is folded ventrally for a short distance, such that the attachment of the A7/8 ISM is slightly posterior to the anterior edge of A8 (the lower green line in fig). The right ceratum is usually longer than the left but in *S.imitaria* the left is longer.



Figure 11: *Scopula imitaria* (Small Blood-vein) ventral plate of A8. Left – ventral view (set), centre and right – dorsal view (natural)



Octavals: Short protrusions from the posterior margin of the ventral plate of A8, usually paired. These are of diagnostic significance in the identification of *Epirrita* species (fig. 12).

Figure 12: *Epirrita dilutata* (November Moth) ventral plate of A8

In *Eupithecia* species the shape of the sclerotization of the ventral plate of A8 is of diagnostic significance (fig. 13).



Figure 13: A selection of ventral plates of A8 from various *Eupithecia* species (with ventral A7 in the top left image)

Geometrid coremata

Subfamily: Sterrhinae



Some *Scopula* species (fig. 14) have coremata attached to the bases of the sacculi. This attachment is examined in more detail in part 4.2 dealing with the Geometrid valvae

Figure 14: *Scopula imitaria* (Small Blood-vein) male genitalia

Subfamily: Larentiinae

In Tribe: Xanthorhoini (fig. 15) the plates of A7 & 8 are much modified in association with, and in support of, a pair of large coremata pouches that emerge in the A7/8 ISM and whose anterior ends naturally extend well into A6. A7 is narrow and its plates are reduced to a sclerotised line, slightly broader dorsally. Ventral A8 is also reduced to a narrow sclerotised line, but dorsal A8 has a more standard plate attached to an anterior sclerotised line. These pouches contain a bundle of hairs. When the pouches are everted it can be seen that these hairs are loosely set all along the membrane of the pouch and they are fairly readily shed. In *Epirrhoe galiata* as well as this large bundle of hairs there is a more standard pair of coremata, more firmly set into the pouch membrane, on its dorsal side near its base.

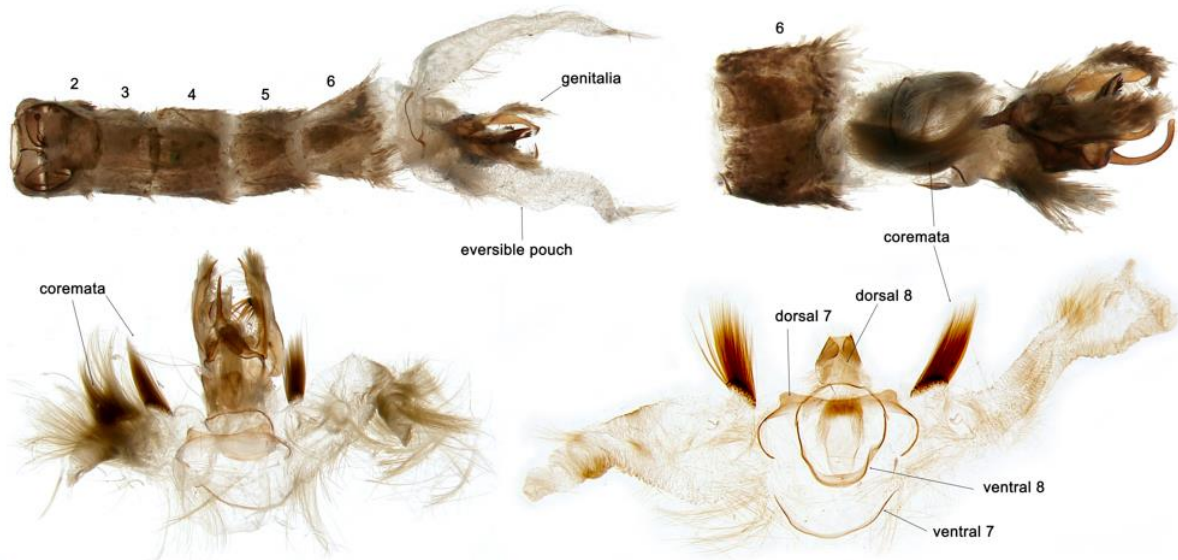


Figure 15: Top - *Xanthorhoe spadicearia* (red Twin-spot Carpet) left – abdomen with coremata pouches everted and coremata hairs shed; right – apex of abdomen with genitalia distracted and coremata pouches uneverted. Bottom – *Epirrhoe galiata* (Galium Carpet) left – apex of abdomen detached at the A6/7 ISM with coremata pouches everted; right – same preparation set with genitalia removed.

Some species in Tribe: Cidariini have coremata associated with several intersegmental membranes. *Electrophaes corylata* has pairs of coremata at the A4/5 A5/6 and A6/7 ISMs. *Ecliptopera silaceata* (fig. 16) has pairs of coremata at the A5/6 A6/7 and A8/9 ISMs.

Some species in Tribe: Eupitheciini also have coremata. *Gymnoscelis rufifasciata* (fig. 16) has a pair of coremata associated with the A8/9 ISM that sit in a (non-eversible) pocket that appears as a sclerotised modification of the ventral lamina of the saccus. *Eupithecia vulgata* (fig. 16) has a similar pair of coremata associated with the A8/9 ISM without modification of the saccus.

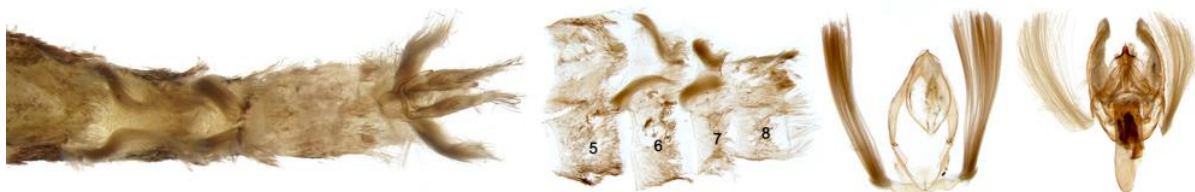


Figure 16: Left two images - *Ecliptopera silaceata* (Small Phoenix); right two images - *Gymnoscelis rufifasciata* (Double-striped Pug) and *Eupithecia vulgata* (Common Pug)

Subfamily: Ennominae

Most species in Subfamily: Ennominae lack coremata. *Epione* species (fig. 17), *Selenia lunularia* (fig. 17) and *Lomographa* species have a pair of coremata set in eversible pouches in the external lamina of the valva. In *Epione* these are supported by a strengthened concave anterior margin of the saccus and a median sclerotised band along the line of fusion of the saccular bases. In other *Selenia* species coremata are present but the coremata pouches are rudimentary.



Figure 17: Coremata pouches associated with the external lamina of the valva in subfamily Ennominae. Left - *Epione repandaria* (Bordered Beauty) genitalia, aedeagus removed (set). Right - *Selenia lunularia* (Lunar Thorn) dorsal view of valvae and diaphragm (VT-ring and aedeagus removed)