THE TERMINOLOGY OF THE MALE GENITALIA OF THE NOCTUIDÆ

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The terminology used to describe the male genital armature of the Noctuidæ is involved and does not apply in all cases to other families of Lepidoptera. With this in mind is it considered valuable to present in this paper the more important structures of the male genitalia that are used in the taxonomy of this group.

In the past there has been a great deal of confusion connected with the terminology of these organs. Pierce (1909) used names for his structures that did not conform in all cases with those of older workers, and where necessary invented new names. McDunnough (1911) set up a standard of priority for the nomenclature in question. Present workers as Busck and Heinrich in their work on North American Lepidoptera are inclined to follow Pierce. In 1914, Pierce changed a few of his names to conform to McDunnough's suggestions.

For purposes of this paper it has been deemed best to follow priority, that is, where an investigator has used a suitable name for a structure. The name applied to the various parts of the valves are after Pierce (1909).

A. The External Genitalia.

I. The tenth segment.

Uncus (L.uncus, a drag-hook), Gosse, 1883.

The uncus is the dorsal projection of the tenth segment and together with the socii forms the armature of the anus. It is usually seen as a projection, hook-like in nature, above the anus, but may be modified to assume various shapes. In the Noctuidæ it is usually well developed.

Socii (L.socii, a companion), Pierce, 1914.

The socii are a pair of hairy pads at the base of the uncus, one found on either side. They are not found in the Noctuidæ.

Side Lobe, Buchanan White, 1878.

This term refers to a structure located on each side of the tegumen near its apex, and is very variable in different groups. It is a conspicuous organ in the Papilionidæ.

Gnathos (Gr. gnathos, the lower jaw), Pierce, 1914; = subscaphium, Pierce, 1909.

The gnathos is a paired organ and when developed in its

entirety consists of two lateral arms and a ventral plate. It lies ventral to the anus near the base of the uncus and below the socii, if the latter are present. It is subject to great variation, and the ventral plate may be reduced or absent. The *scaphium*, as used in the Papilios by Gosse (1883) according to Pierce (1914) has no connection with the gnathos, but Eyer (1924) and others are wrong in considering it synonymous with the gnathos of Pierce.

Scaphium (Gr. skaphe, a boat), Gosse, 1883.

The scaphium as used by Gosse referred to "the mass of shining white tissue apparently in organic union with the lower surface of the uncus near its origin." As has been pointed out by Chapman (1911) and Mehta (1933), the scaphium is not sub-anal, but supra-anal and is not synonymous with the sub-anal gnathos of Pierce (1909). A supra-anal process in certain Noctuidæ, especially in the Catocalinæ has been confused with the scaphium of Gosse, whereas in reality the former is but a chitinous shield usually attached to the dorsal surface of the anal tube. The term *subuncus* is used by some workers for this structure.

Anus.

The gnathos in the noctuids often forms a tube through which the anal tube passes. As shown by Zander (1903) and emphasized by McDunnough (1911), the anal opening passes between the uncus and the gnathos and does not pass ventral to the gnathos as stated by Pierce. Underlying the anal tube is often a plate or hook-like structure called the *subscaphium* by Pierce.

II. The ninth segment.

Tegumen (L. tegumen, a cover), Buchanan White, 1878.

The term tegumen was first applied to the entire ninth segment by Buchanan White, and was synonymous with the *upper organ* of Scudder and Burgess (1870). Present day workers restrict this term to apply to the dorsal, chitinized part of the ninth segment which articulates with the vinculum at its lower extremities, and from which the uncus, socii and gnathos arise. (Busck and Heinrich, 1921).

Peniculus (L. peniculus, a little tail or brush), Pierce, 1909.

The peniculus is a lobiform basal process, densely clothed with hair, situated on either side of the tegumen below the uncus.

Vinculum (L. a band), Pierce, 1909; = saccus, in part, Bethune Baker, 1891.

This is the ventral chitinized band representing the sternite of the ninth segment which articulates with the tegumen at its lateral margins. In 1891 Baker described the internal invagination of the vinculum as the *saccus*, but most workers apply the term vinculum to the entire structure, whether produced into a saccus or not.

Transtilla (L. transtilla, a small cross-beam), Pierce, 1914.

The transtilla is a cross-bar or band-like bridge connecting the valves at their inner costal edges. It is greatly modified in some families, and in the Noctuidæ is lacking entirely.

Valves (L. valva, a folding door), Burmeister, 1832; = harpe, Pierce, 1909.

The valves (valvæ) refer to the paired clasping organs which are hinged below the articulation of the tegumen, and basally articulate with the vinculum. Pierce refers to the valves in his work on the Noctuidæ as the harpes, a name already having been applied to another organ by Gosse (1883).

Pierce has given various names to the different organs connected with the valves. The distal part is the *cucullus* which is usually separated by a fold or groove from the rest of the valve. The basal portion is the *sacculus*, and there may be present from within the base of the sacculus a small, variously formed organ, the *clavus*. The term *furca* refers to a forked organ arising below the juxta. The central portion is called the *valvula*. The *costa* refers to the margin of the cucullus, and it may have a series of incurved spines to which the term *corona* is applied. The *anal angle* is the outer margin of the cucullus, and may have an *anal spine*. A thumb-like process on the outer margin of the valves is termed the *pollex*, and the *digitus* is a small, projecting papilla in the inner side of the cucullus. The central portion of the valves finds a complicated prehensile structure, the *harpe*, which is usually present, but can be reduced or absent. The harpe as used by Gosse (1883) referred in the Papilionidæ to the prehensile centrally located structure and can be applied in the Noctuidæ to the same structure. Pierce divides the harpe into the *clasper* and *ampulla;* the former referring to the outer projecting organ, and the latter to the organ arising from the inner side of the central area.

III. The eighth segment.

Rami, (L. ramus-i, a branch), Poljanec, 1902; = cerata Pierce, 1914.

The rami refer to the distal projections from the eighth abdominal sternite. They are usually asymmetrical.

Mappa (L. mappa, a napkin), Pierce, 1914.

The loose semicircular flaps covering the cerata and covered with long, narrow scales were called mappa by Pierce (1914).

IV. The seventh segment.

Coremata (Gr. corema, a brush), Pierce (1914).

This is an organ found on the seventh segment of the abdomen in the Geometridæ and consists of an extensile pouch or bag, clothed with hairs.

B. The internal genitalia.

Penis, Gosse, 1883; = vesica, in part, Pierce, 1914.

The penis as used by Pierce (1914) referred to the entire intromittent organ, consisting of a chitinous tube, the ædeagus, and a sleeve-like eversible membranous tube surrounding the ædeagus, the *manica*. Within the ædeagus lies the *ductus ejaculatorius*, the distal end of which is eversible and was called the *vesica* by Pierce.

Ringwall, Zander, 1903; = anellus and juxta, Pierce, 1909, 1914.

This structure as used by Zander referred rather indefinitely to the membrane surrounding the penis. It refers at the present time to the cone-like tube or a triangular plate basally supported by the vinculum and laterally by the valves, and serves as the supporting structure for the ædeagus. It is synonymous with Pierce's *anellus* and *juxta*. The anellus may be extended into lateral processes, the *anellus lobes*, as in certain Pyralidæ, or it may be united to form a single arm, the *calcar*, as in certain Geometridæ. The juxta of Pierce (1909) refers to a band-like sheath through which the penis is protruded, or in other words, it is the plate on the ventral surface of the anellus. The juxta may be decorated on either side by a pad covered with hairs and scales and called the *cristæ* (Pierce).

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ACMÆODERA HEPBURNI VAR. LATIFLAVA Fall

An interesting record of this Buprestid was obtained by Prof. E. O. Essig and Dr. J. F. Lamiman from two year old flower stalks of *Yucca mohavensis* Sargent. The yucca was collected at the mouth of Big Tejunga Canyon northwest of San Fernando, California, February 26, 1935. A single specimen was obtained when the yucca was cut into pinning blocks. Quite a number of the stalks showed the larval galleries and one other specimen was destroyed by the saw.—J. C. Lindahl.