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## The genitalia of *Eudasychira* Möschler; morphology and evolution (Lepidoptera, Lymantriidae)

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#### Summary

A revision of the genus *Eudasychira* Möschler was undertaken in 1983. At that time it was noted that the male genitalia offer many good diagnostic features at the species level. The evolutionary significance of the complex structure of the male genitalia has now been investigated. The studied characters have been interactively analysed with the HENNIG program. The resulting 17 trees showed that there were not too many discrepancies between the characters, but a well-marked infrageneric classification could not be proposed. The problems in the nomenclature of the different parts of the male genitalia are explained and a few data concerning the distribution of the species is also mentioned.

The male genitalia of the taxa recognized as belonging to the genus Eudasychira are very complex (DALL'ASTA, 1983). Thorough examination showed that these genitalia possess a unique feature within the Lymantriidae : a peculiar form and position of the saccus. Instead of being a tubular structure extending midventrally below the valvae, the saccus extends above the valvae. This is most easily seen in E. quinquepunctata (Fig. 1), the type species of the genus, where the valvae join ventrally and their ventral edges bend dorsally back cephalad forming the subrectangular saccus on which the penis can slide. Describing this character in another way, it can be said that the attachment point of the valvae to the saccus is situated below instead of above, and that consequently the saccus is suspended between these valvae. This peculiar feature of the saccus transforms quite a few other parts of the genitalia and the transformations of the valvae themselves are the most striking. Instead of being flattened sacs, they are semi-circularly bent in order to leave space medially for the saccus. This peculiar form of saccus and valvae can be considered a unique apomorphic character to distinguish taxa belonging to the genus Eudasychira from all other Lymantriidae.

Examining all preparations of Lymantriidae available proved that this genus only occurs in the Afrotropical region. In some species the saccus situated



Fig. 1. Male genitalia of *Eudasychira quinquepunctata* Möschler. do.va. : dorsal portion of valva ; pe : penis ; sa : saccus ; sa.ha.pro : saccus hairy process ; un : uncus ; va : valva ; ve.va : ventral portion of valva. Scale : 1 mm.

above the ventral portion of the valvae can be rather small; the valvae are then attached to its lateral edges and remain flattened. Including the species with these flattened valvae, a total of 33 species can now be recognized in the genus *Eudasychira*.

The unique forms of saccus and valvae are not the only peculiarities of the genus. The male genitalia of the taxa of the genus *Eudasychira* possess at least three other distinct structures not present in any other Lymantriidae, and for which no nomenclature exists in the literature on the morphology

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of male genitalia of Lepidoptera in general. One of these are the two hairy processes within the saccus (Fig. 1, sa.ha.pro). These hairy processess occur also in other species where they are situated on the edge of the rim saccusvalvae; in this case these hairy processes are protruding outside the genitalia instead of being situated within the saccus. In some species, more sclerotized processess can occur in the same place as where the hairy processess of E. quinquepunctata are situated. Due to the fact that they are more sclerotized, never hairy and always situated at the same position, they cannot be considered homologous to the hairy processes, which are always elongate. These sclerotized processes on the other hand can display quite different forms (characteristic for the species) and can even transform into paired hooks protruding outside the genitalia from within the saccus. These two kinds of processes occur only in species with circularly bent valvae, as in E. quinauepunctata. In some species with flattened valvae on the other hand (and also in a species with forceps-like valvae) a long ventral ribbon (having at least the length of half of the genitalia) can be attached to the distal portion of the saccus. This ribbon can be simple or divided and is also a character unique within the Lymantriidae.

Apart from these characters, some species of *Eudasychira* display other peculiar structures characteristic of a limited number of its species. Some of these characters can only be considered transformations of parts of the valvae or other 'recognisable' parts of 'classic' types of genitalia (uncus, vinculum, etc.). But it should be borne in mind that the male genitalia of species of *Eudasychira* can be of very different forms and that sometimes single species can display some peculiar processes or forms of valvae unique within the Lymantriidae.

The above findings once again raise the question of the use of a "nomenclature of convenience" for naming the different parts of the genitalia in Lepidoptera (KLOTS, 1970 : 116). If distinct names have to be given to all new structures of the genitalia, in the genus *Eudasychira* alone this would mean the introduction of at least three new names. Therefore, together with the pertinent remarks of SIBATANI (1972) on Klots' paper the nomenclature and glossaries of terms to be used in describing male genitalia of Lepidoptera should be considered established by those two papers. One should avoid proposing new names as Weller (1990) has done for a group of nystaleine Notodontidae.

To gain some insight into the evolutionary trends of the different characters within the species, all characters of all species have been coded and this data analysed with the HENNIG 86 program. The resulting 17 trees showed that there were not too many discrepancies between the characters, but a well-marked infrageneric classification could not be proposed. Many of the taxa were isolated, or in pairs, sister groups of the rest of the tree (a kind of chaining), but in all trees the species with flattened valvae are situated near the root of the tree and the species group with the large saccus and the bent valvae always clusters at the end. This could show a trend, i.e. saccus becoming larger when more apomorphic characters are present, which was also subjectively felt at the moment of coding.

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