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THE TRIBE BENNINI - A MONOPHYLETIC GROUP WITHIN THE CIXIIDAE ?[1]

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ABSTRACT

The cixiid tribe Bennini refers to taxa displaying lateral abdominal processes with so far unknown function. Within these taxa three different groups could be recognized: one with plate-shaped processes of the fourth and fifth abdominal segments and complex sense organs, one with similar plate-shaped processes but less complex sensory structures. These two groups are found only in South America while the third group, displaying long, slender appendages which are not homologous to the plate-shaped processes, is widespread with many species in South-East Asia and the Western Pacific.

KEY WORDS

Benna, Bennarella, Amazobenna.

Metcalf (1938) erected the tribe Bennini for a group of South American taxa characterized by steeply tectiform wings and processes of the fourth and fifth abdominal segments. These lateral processes are plate-shaped and bent dorsally embracing the coastal field of the forewing which in this part is slightly incised. The structure is highly specialized: anterior process with three, posterior process with two sensory pits, each of which possesses a T-shaped seta (Penny, 1980). This structure is so far found only in the genera *Bennarella* Muir (Guyana, Brazil) and *Amazobenna* Penny (Brazil).

The examination of cixiid specimens from Peru (coll. L.B. O'Brien, Tallahassee, Florida) revealed the existence of a species belonging to a yet undescribed genus in which the fourth and fifth abdominal segments are also provided with lateral processes. These processes, however, differ in their special structure considerably from those found in *Bennarella* and *Amazobenna*: the sensory pits are not as differenciated, and the corresponding setae are not T-shaped but semicircularly bent.

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Nast (1950) erroneously assumed that Metcalf (1938) - who in fact established this tribe for South American taxa only - had introduced "Bennini" for the Old World genera *Benna* Walker and *Bennaria* Melichar (these two genera have been synonymized: Fennah, 1970). *Benna* is widely distributed over South-East Asia (Malaysia, Borneo, Philippines, New Guinea) and the Western Pacific (W. Caroline Islands, Solomon Islands).

In the Old World taxa the processes are not plate-shaped but developed as long appendages deriving from the third and fourth abdominal segments. Distally they are provided with a cup-like structure which in life is filled with a wax cone. At the margin of this cup a single seta originates which is usually hidden within the wax. A mebraneous joint is developed at the base of each appendage and thus enables its active movement. This appendage is of completely different morphological origin and therefore is not homologous with the structure displayed by the South American taxa.

Unfortunately the function of the abdominal processes of neither Old World nor New World taxa is understood. Its complexity indicates that it might serve an essential purpose either in intraspecific communication or in the ecological context of the species (e.g. host-plant recognition, predator detection).

Phylogenetically these morphological results prove that abdominal processes have been evolved independantly in Old and New World cixiid taxa. The special configuration of the appendage displayed by the Old World *Benna* species, however, is considered a synapomorphy for this group. In South America where two different types of abdominal processes are found, the situation is slightly more complicated. Although the taxa displaying the complex sense organs with T-shaped setae most likely form a monophyletic group, it is still uncertain whether the taxon from Peru (with the more simple processes) represents the plesiomorphic configuration or a completely different evolutionary line. If the latter case can be proved, the tribe Bennini *sensu* Metcalf would be polyphyletic.

Further phylogenetic studies by means of a cladistic analysis *sensu* Hennig will not only provide clues to understand the evolution of these groups but may also contribute to a basis upon which the history of colonization of areas where extensive speciation has occured (e.g. Philippines, Solomon Islands) can be reconstructed.

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