Biodiversity surveys

Review of the horseflies (Tabanidae) of Madagascar

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The horseflies (Tabanidae) of Madagascar are reviewed. This review is primary based on the largest number of horseflies ever collected thanks to recent programs (more than 4000 specimens). All material in the musea of Berlin, London and Paris was studied, including the types for most species from Madagascar.

So far, 75 species of Tabanidae had been reported from Madagascar. This study adds about 21 species, all new to science, and 1 revised status. Nearly all species are endemic to Madagascar. More than one-third belong to the endemic (sub)genus *Triclida*. Another large genus is *Tabanocella*, represented by at least 17 species. Both genera are associated with forests. The subfamily Pangoniinae is recorded from Madagascar for the first time.

Special attention is given to the tribe Rhinomyizini, which has 'being weird' as a synapomorphy This tribe occurs in the Afrotropical region both on the mainland of Africa and on Madagascar. Recent authors have introduced several new genera based on features known to be plastic. Oldroyd, on the other hand, used broader concepts of genera, though he separated the genera *Thriambeutes* from the mainland and *Orgizomyia* from Madagascar mainly on geographical basis.

In the present study I performed a phylogenetic analysis of the Rhynomyzini of Madagascar for the first time in order to gain a better understanding of the relations at the generic level. In this analysis, I introduce several new characters and include two very interesting new species (in the genera *Orgizomyia* and *Seguytabanus*). The results suggest that the genera *Orgizomyia* and *Thriambeutes* are closely related and can be united. *Thaumastocera* is likely to be their sister-group. A new interpretation of the weird shape of the third antennal segment in *Orgizomyia* supports this view. The genera *Tabanocella* and *Jashinea* may be paraphyletic, although no basis was found for the splitting suggested by recent authors.

Applied Dipterology

Root flies - a nightmare for vegetable growers

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Root flies, especially the cabbage root fly *Delia radicum* (Linnaeus, 1758) (Anthomyiidae) and the carrot fly *Chamaepsila rosae* (Fabricius, 1794) (Psilidae), belong to the most important insect pests damaging vegetable crops. Larvae of the cabbage root fly feed mainly on the roots of cruciferous crops like cabbage and radish. Losses of up to 100 % can occur when infestation takes place in young plants or when the marketable product itself has been attacked. In Germany, *D. radicum* completes 3 to 4 partly overlapping generations per year. By contrast, *C. rosae* usually completes two separate generations per year in Germany. Larvae of the carrot fly feed on the roots of several umbelliferous plants. Attacked carrots become unmarketable, which can result in high income losses for vegetable growers. Currently, chemical control methods are widely used by farmers to control both pests. Some alternative control methods such as net covers are available, but purchase and handling are more expensive than application of insecticides. Further non chemical methods, such as applying microbial antagonists, releasing natural enemies, or use of push-pull strategies, and a proper site selection are under investigation.