Unravelling a hotchpotch

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Hoverflies of the subfamily Microdontinae have a reputation for causing confusion. The adult flies differ so much from other hoverflies that according to some they should be placed in a family of their own. Their diversity in shape and size is astonishing: from large, furry-haired species and convincing wasp-mimics to tiny, unsightly creatures, easily mistaken for something uninteresting. The larvae of Microdontinae resemble slugs so much that biologists have described them as molluscs on several occasions. These larvae live as predators in ant nests and seem to exhibit strong host specifity.

Over two centuries, more than 400 species of Microdontinae have been described worldwide. Most of them live in tropical regions and have not been found again since their description. Most of the old descriptions are brief and lack illustrations, which makes it almost impossible to find out how the species can be distinguished from each other. Over 300 of the species were classified into a single genus, *Microdon*, despite obvious morphological differences. So far, there has been no comprehensive attempt to unravel this hotchpotch of names.

This thesis examines the phylogenetic relationships of Microdontinae based on morphological and molecular characters, in order to construct a new classification of the subfamily. A total number of 51 (sub)genera (11 new) are recognized, in which 472 valid species (49 new) are classified, resulting in many new combinations.

The newly proposed classification facilitates species level taxonomy. In addition, it should provide the necessary framework for further research on these flies. Because of their huge morphological diversity, their worldwide distribution and their highly specialized biology, Microdontinae offer a wide scope for research on biogeography, speciation and evolution of host specialization. This thesis takes a first shot at some of these subjects by exploring the taxonomy of Neotropical Microdontinae that mimic stingless bees, reviewing and evaluating the associations of these flies with ants, and speculating on their historical biogeography.

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Phylogeny and classification of the Microdontinae (Diptera: Syrphidae)

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