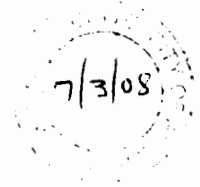


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Systematics and Biology of *Hemigenia* R.Br. and *Microcorys* R.Br. .

(Lamiaceae)

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Submitted June 2006 for the Degree of Doctor of Philosophy in

Science

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## Abstract

The genera *Hemigenia* R.Br. and *Microcorys* R.Br. (Lamiaceae, tribe Westringieae) have not been revised since 1870 and the existing taxonomy is inadequate. The current generic classification requires re-evaluation in light of more detailed knowledge of comparative morphology. The generic status of the related genera *Hemiandra* R.Br. and *Westringia* Sm. also needs to be tested, as these genera share morphological characters with *Hemigenia* and *Microcorys*.

Microcharacters were examined in over 60 species using SEM. The external morphology of mericarps (shape, attachment scar type, sculpturing, exocarp cell shape and presence of trichomes) provided significant cladistic data. A pilot study revealed that microcharacters of leaf surfaces were either invariable at this level or showed too much variation for systematic use.

The floral biology of the genera was studied since floral characters, particularly of the stamens, are used in the current classification. The stamens of *Hemigenia* and *Microcorys* have elongated anther connective tissue which bears one or two thecae, and the modified anthers are typically mobile on the filament. Field observations showed that insect visitors lever the anthers onto their bodies whilst accessing nectar. Bearding on the sterile end of the anthers catches adjacent stamens and levers them in unison. In the abaxial stamens of *Microcorys*, the anthers are reduced to sterile lobes, and these staminodes guide pollinators into the flower. Identical staminodes are present in *Westringia* and *Hemigenia cuneifolia*. The presence of a second theca on the abaxial stamens in *Hemigenia* was used by Bentham in the infrageneric classification. However, SEM revealed that the distinction was false and that Bentham's proposed pattern for this character is erroneous.

A taxonomic revision of *Hemigenia* section *Malleantha* G.R.Guerin sect. nov was carried out, and the treatment included 26 species, including 13 new species. A cladistic dataset was compiled based on morphology, including floral and mericarp characters. A molecular dataset was constructed using the *trnT-F* region of the chloroplast genome. The two datasets were analysed both separately and combined using PAUP. The resulting phylogenies show both genera are polyphyletic. Evidence supports previous assertions that *Prostanthera* is sister to the other genera of the Westringieae.

A new classification is discussed, but further data are required before this can be finalised. In particular, multiple DNA markers (including nuclear regions) need to be sequenced with a slightly larger sample of species.