

**Systematic Studies in Abildgaardieae
(Cyperaceae)**

Kerri Lyn Clarke

B.Sc.Hons
University of New England

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Declaration

I certify that the substance of this thesis has not already been submitted for any degree and is not currently being submitted for any other degree of qualification

I certify that any help received in preparing this thesis, and all sources used, have been acknowledged in this thesis.



Kerri Lyn Clarke

Prologue

Format

The format of this thesis follows broadly the Australian Systematic Botany format and recommendations as outlined in the Style Guide of the University of New England (<http://www.une.edu.au/tlc/styleguide/>).

Thesis structure

The thesis has been broken down into separate smaller studies to emphasise the Australian taxa and to provide a basis where each chapter may be prepared as separate papers for publication.

Nomenclature

Names for Australian species follow the Australian Plant name index, with the exception of species assigned to *Abildgaardia* by Goetghebeur (1986) i.e. *F. oxystachya*, *F. macrantha* and *F. pachyptera*, which are included in this thesis under *Abildgaardia*. All other species names, and authorities, were obtained from Index Kewensis and the more recent World Checklist of Monocotyledons (2004).

Provisional names have been included within the thesis for some species, however, these new names and combinations are not validly published here (Article 29 of the International Code of Botanical Nomenclature).

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The work in this thesis is entirely my own except where specifically indicated to the contrary.

Kerri Clarke

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Abstract

The tribe Abildgaardieae Lye is composed of 5-7 genera: *Crosslandia*, *Fimbristylis*, *Abildgaardia* (= *Fimbristylis* section *Abildgaardia*), *Bulbostylis*, *Nemum*, *Nelmesia* and *Tylocarya* (= *Fimbristylis nelmesii*). There has been little disagreement about the general boundaries of the tribe. However, limits of the main genera are disputed and unresolved. Some species and generic boundaries of *Crosslandia*, *Abildgaardia* and Australian *Bulbostylis* require assessment across their morphological and geographical range of distribution.

The general aim of this thesis is to test monophyly of and within the tribe Abildgaardieae. To address the aim, the limits for *Crosslandia*, *Abildgaardia* and Australian *Bulbostylis* are assessed to determine the species and generic limits on a global level.

Data from morphology, vegetative anatomy and embryo morphology were used in phenetic and cladistic analyses. Phenetic analyses of morphological data were used to test and set species limits. Additional characters from morphology, vegetative anatomy and embryo morphology were used in cladistic analyses to test monophyly of the tribe and previous classifications. Representative samples from *Fimbristylis*, *Nemum*, and the monotypic genera *Nelmesia* and *Tylocarya* (= *Fimbristylis nelmesii*) were added to those species defined in phenetic analyses. Data were polarised using the outgroup method; with outgroup taxa selected from the provisional Arthrostylideae, *Schoenoplectus* and *Schoenoplectiella*.

Cladistic analysis revealed that the tribe Abildgaardieae is not monophyletic when *Nemum*, *Nelmesia* and *Tylocarya* are included. Members of 'Arthrostylideae' violated monophyly of Abildgaardieae. The limits of *Crosslandia* and *Abildgaardia*

are revised: *Crosslandia* 4 spp., all endemic to Australia and *Abildgaardia* 11 spp., 9 in Australia, 8 endemic. The limits for Australian species of *Bulbostylis* remain unresolved, with further testing of a wider sample of overseas species needed. A new species of *Bulbostylis*, *B. kakadu* ined., is recognised. Species of *Nemum* are not monophyletic and *Nelmesia* rendered *Abildgaardia* non-monophyletic in the full tribal analysis. *Tylocarya* formed a clade with *Fimbristylis depauperata*. Species of *Fimbristylis* did not form a monophyletic group. Suggestions for further work are given.