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Taxonomy of selected families including legumes, grasses and lilies

Plant Science and Herbarium

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Project Team	granted
Program Leader	granted
Directorate	granted

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Context

Successful conservation of the flora requires that the conservation units equate to properly defined, described and named taxa. There are numerous known and suspected unnamed taxa in the grass, legume and “lily” (now Asparagaceae, Hemerocallidaceae) families, as well as numerous cases where keying problems or anomalous distributions indicate that taxonomic review is required. This is true of various parts of the families but the main current focus is on *Lepilaena*, *Thysanotus*, *Wurmbea*, *Lomandra*, *Neurachne* and *Trithuria*.

Aims

- Identify plant groups where there are taxonomic issues that need to be resolved, including apparently new species to be described and unsatisfactory taxonomy that requires clarification.
- Carry out taxonomic revisions using fieldwork, herbarium collections and laboratory work, resulting in published journal articles.

Progress

- *Lepilaena*(Potamogetonaceae; to be re-named *Althenia*): a genus of aquatic plants that has been difficult to identify has been studied from all Australian herbarium specimen holdings and species boundaries have been defined. Paper for one new Western Australia species has been submitted. Presentations on pollen structure and variation, and the morphology of the plants were given at a conference. Work has continued on specimen study and field work for a revision of the genus. Preliminary results of DNA analysis for a phylogeny have been obtained.
- *Wurmbea* (Colchicaceae): Paper preparation for describing thirty new species continued. A paper was published in *Phytotaxa* on the status of a species in New Zealand.
- Hydatellaceae: paper prepared on molecular phylogeny and genetic variation in *Trithuria australis,* but knowledge gaps identified require further field work. Morphological variation is being studied in *T. bibracteata*.
- Poaceae: continuing research collaboration on *Neurachne* and the evolution of C_4 photosynthesis. Paper published in *Plant Physiology* on chloroplast enzyme evolution in *Neurachne* species. Paper in preparation reporting the discovery of an unusual virus genetic signature in *N. minor*.
- *Thysanotus*(Asparagaceae): Review of the taxonomy of the twining species, the *T. patersonii* group, continued, with further field work that revealed two previously unknown species. Species definition continued using collections and photos made during the project, and preliminary results were obtained from the DNA analysis. A paper was published in *Nuytsia*transferring *Murchisonia* to *Thysanotus*.
- *Lomandra* (Asparagaceae): paper being drafted on *L. suaveolens* group.
- Asparagales: paper on a neglected taxonomically useful flower feature in several plant families is in press. Collaboration has commenced on a wider, Melbourne-based, phylogenetic study of the Asparagales order of families. Discussions and plant samples have been contributed.

Management implications

Identification of species known or suspected to have a restricted distribution will enable re-assessment of the conservation status and improve management effectiveness. Improved identification tools will enable more effective identification of species and the subsequent assessment of their conservation status.

Future directions

- Complete and submit papers describing new species of *Wurmbea*, *Thysanotus, Lepilaena* and *Lomandra*. Conduct appropriate field searches for species or populations that are insufficiently known.
- Continue to revise plant groups and investigate via field and herbarium studies various putatively new species in order to improve knowledge of the flora, provide stable plant names, and provide a means of identifying species in *Rytidosperma* (Poaceae) and reviewing the *T. patersonii* group, *Arthropodium* and *Lepilaena* in Western Australia.
- Publish information on selected plant groups for general audiences.