



Understanding Mulga

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Background

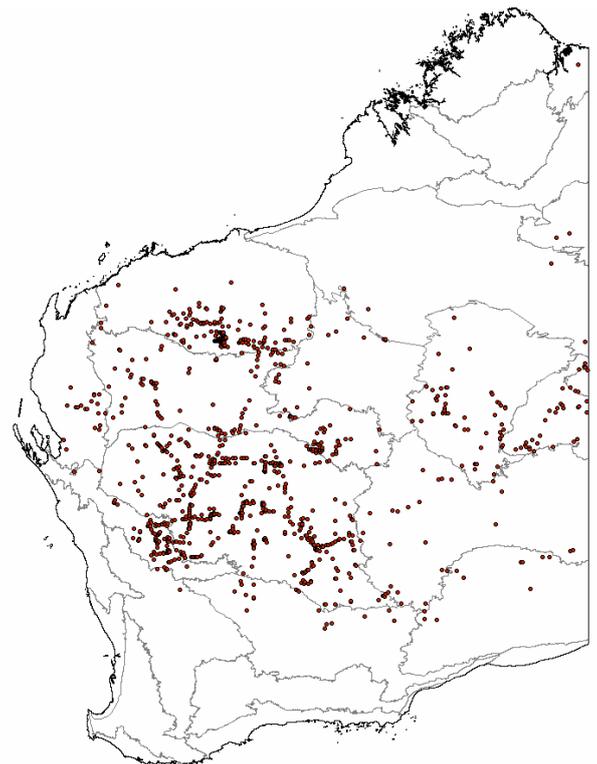
Mulga is the name most commonly applied to the large, woody, perennial, arid zone species *A. aneura* and its close relatives, but the name also denotes the vegetation type that is dominated by these species. Mulga occupies about 20 per cent of arid Australia and is a 'keystone' group that occupies a large portion of the Western Australian rangelands. Mulga communities are repositories of significant productivity and biodiversity, they are resource 'hotspots' because of their ability to capture, retain and cycle precious sediments, nutrients and water. Therefore, the effective management of Mulga is critically important for sustainable land use planning and natural resource management, particularly in areas where land use interests (such as pastoral and mining) may compete with biodiversity interests. However, a major constraint to the development of management actions that will deliver beneficial outcomes to the rangelands is the lack of taxonomic clarity in respect to Mulga.

As traditionally defined Mulga comprises five species with one, *A. aneura*, containing 10 varieties. Many of these entities are notoriously variable, their taxonomic boundaries are vague and identification of the different types is extremely difficult. The situation is further complicated by the existence of numerous hybrids and many entities of unknown taxonomic status. The variation observed in Mulga occurs both within and between populations and often results in a very complex mosaic of mixed Mulga communities across the landscape, with the factors responsible for causing and maintaining this variation poorly understood.

In July 2006 a four year collaborative project entitled *Understanding Mulga* was commenced. This project has adopted a multi-disciplinary, collaborative approach to achieve its objectives and is utilizing the most modern genetic, anatomical and taxonomic methodologies and technologies to provide critical new data on this invaluable biological resource.

The Understanding Mulga project aims to elucidate and document the patterns of variation in Western Australian species of Mulga, and to provide a reliable means of identifying them. Specifically the project will;

- Develop an improved understanding of morphological variability within and among Mulga populations.
- Develop an improved understanding of genetic and developmental variability within and among Mulga populations.
- Clearly define and classify the Mulga entities, including new ones, and provide comprehensive descriptions for all.
- Produce scientific papers, an interactive, electronic identification key and a 'Mulga Manual' field guide. These resources will be produced in hardcopy and web-based and will be made available to the whole community.



Distribution of *A. aneura* and its close relatives throughout Australia

Findings

Understanding Mulga is an ongoing project which is expected to be completed at the end of 2010; findings/achievements to date include:

- A new classification of Mulga is under development through a re-assessment of the traditionally defined entities, and descriptions of new entities.
- A broad conceptual framework for understanding Mulga in Western Australia has been established namely through the recognition of four large alliances that contain the entities which are now recognised. These alliances are supported through both the taxonomic and genetic (chloroplast DNA and microsatellite) data.
- Mulga in Western Australia is now considered to comprise at least 15 species, many of which will be newly described as a result of this project, additionally, there are a number of entities of uncertain taxonomic status that need yet to be clarified.
- A number of the previously recognized varieties of *A. aneura* have been shown not to be good taxonomic entities and have therefore been eliminated from the classification.
- Work has commenced on production of the Mulga Manual which will comprehensively describe, discuss and illustrate the different Mulga entities; and the user friendly, electronic identification key which will enable the Mulga types to be easily and reliably named.
- Chloroplast sequence data (from five chloroplast genes) has been generated in over 350 plants chosen to cover the entire range of morphological variation within Mulga. This data supports the morphological findings of four large alliances and can also be used to assign a plant to a taxonomic grouping at the Alliance level.
- Specific analysis of microsatellite DNA sequence data within each Alliance is currently helping to verify new entities recognised through morphological work.



Management Implications

The underlying rationale is that in the absence of appropriately circumscribed and named entities, the information that is assembled and disseminated about Mulga entities and communities has the potential of being meaningless, or its value significantly diminished. Furthermore, without a sound classification and a reliable identification key, it is impossible to make comparisons or generalization about Mulga across the rangelands.

Therefore understanding the variation in Mulga will enable these species and communities to be better-protected from environmental perturbations, to be more effectively managed and sustainably utilized and will also facilitate the identification of high priority areas for conservation together with other land uses. This in turn will lead to significant capacity-building within rangeland user communities that will have numerous benefits.

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For more information on the project please visit: <http://www.worldwidewattle.com/infogallery/projects/mulga.php>

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