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Resolving the systematics and taxonomy of *Tephrosia* in Western Australia

Plant Science and Herbarium

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Project Team	granted
Program Leader	granted
Directorate	granted

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Context

Tephrosia is a large, pantropical legume genus comprising *c.* 400 species of herbs and shrubs. Sixty-two taxa are currently recognised in the Eremaean and Northern Botanical Provinces of Western Australia; including 29 phrase-named taxa, with a number of species complexes requiring further study. *Tephrosia* specimens are frequently collected during vegetation surveys for proposed mining developments in northern Western Australia; however, many of them cannot be adequately identified as they belong to poorly-known, undescribed taxa or to species complexes. Their identification is further hindered by the absence of up-to-date taxonomic keys and of comparable specimens, as many species of *Tephrosia* grow in remote areas and are poorly collected. Identification difficulties inhibit the accurate assessment of each taxon's distribution and hence its conservation status.

Aims

- Resolve the taxonomy of *Tephrosia* in Western Australia using morphological and molecular approaches.
- Assess the conservation status of all Western Australian taxa.
- Prepare identification tools, including an electronic key to the genus.

Progress

- A new species was recognised from North West Cape and was added to WACensus as a phrase name.
- A paper providing a conspectus of *Tephrosia* in the Eremaean Botanical Province, including descriptions for 15 to 20 undescribed taxa, is in preparation.
- All *Tephrosia* specimens submitted to the Western Australian Herbarium by external stakeholders were examined and had their identifications confirmed or corrected, thus maintaining the accuracy of *FloraBase*.
- A final report is in preparation that provides a taxonomic key to all *Tephrosia* in WA as well as diagnostic descriptions for all informally named taxa, and taxa reinstated or re-circumscribed as a result of this research for which descriptions are currently unavailable or incorrect.

Management implications

Providing names, scientific descriptions, illustrations and identification tools for the various *Tephrosia* in Western Australia will enable industry and conservation practioners to accurately identify taxa, thereby improving their management and the assessment of their conservation status. If it is found that the individual *Tephrosia* taxa can be identified through DNA barcoding, this method will enable sterile or poor specimens, often collected during botanical surveys, to be accurately identified.

Future directions

- Conduct further studies on poorly collected and taxonomically difficult species groups.
- Analyse *Tephrosia* DNA barcoding sequences in conjunction with researchers at the University of Guelph, to assess intra- and inter-specific variation and taxon relationships.
- Continue with the construction of written and electronic identification tools.
- Publish taxonomic papers describing new species endemic to Western Australia's Northern Botanical Province (Kimberley region).
- Collaborate with specialists in the Northern Territory and Queensland to resolve and describe new taxa occurring across Australia's monsoon tropics.