A TAXONOMIC ANALYSIS OF A MIDDLE CRETACEOUS MEGAFOSIL PLANT ASSEMBLAGE FROM QUEENSLAND, AUSTRALIA

by

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ABSTRACT

This thesis is a taxonomic analysis of a recently discovered megafossil flora from the middle Cretaceous of central Queensland, now called the Winton Fossil Plant Assemblage, representation of Australian (or indeed world) floras of this age is extremely poor.

The fossil material consists of silicified wood, shoots, cones, fruits and seeds, enmeshed in matrices of variable composition. Specimens in silica-matrix rocks have been anatomically studied by means of thin-sectioning techniques. Plant organs embedded within carbonate-matrix rocks have been removed intact by dissolution of the matrix in acid.

As wood forms a significant part of the deposit, a first consideration was an assessment of the value of wood anatomy in taxonomy. It is concluded that incomplete description and illustration of fossil woods leads to erroneous interpretations. Of the 5 wood taxa identified in the Assemblage, 4 show positive familial affiliations, all to the anatomically conservative Araucariaceae. This family is the best represented of the predominantly coniferous flora, the most common single taxon, *Araucaria microcarpa* sp. nov., being an atypically small but mature ovulate structure from the generic Section Eurach. The only other fossil member of this section to provide any detailed anatomical data is from the Jurassic of Yorkshire.

The Podocarpaceae is also common in the deposit. The female cone *Fecunditrostbus* gen. nov., is most closely allied to the extinct *Mehtalia* from the Indian Jurassic. *Lepidothamnus australis* sp. nov. is the first fossil crassulaceous member of this living genus to be found in Australia.

The new predominantly Northern Hemisphere family, the Taxodiaceae, is represented by 2 common taxa of female strobili in the Winton Assemblage, *Huayaenites wintonensis* Peters and Christophel, and *Wintonia* gen. nov., appear to be distinctive new members of the family from the Southern Hemisphere. Surprisingly, the Cupressaceae, now populous in Australia, has only one taxon in the Assemblage—a new species of *Callitris*, the oldest member of the genus to be found in Australia.

The angiosperms are predictably rare in the Assemblage, with occasional leaf fragments and one taxon of primitive fruits. Other rare groups in the flora include foliage structures related possibly to the Ginkgoales, pteridosperms and ferns.

A total of 31 taxa are described from the deposit, which appears to represent a unique and therefore significant component of the Australian palaeoenvironment. It provides megafossil support for a period, which up until now, has almost solely been interpreted by micropalaeontological evidence.