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**TERTIARY  
FOSSIL WOOD  
IN  
SOUTH EASTERN AUSTRALIA**

**Jane O'Brien**

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## ABSTRACT

Palaeobotany illuminates past environments by relating the fossilised species to the existing geological conditions. This has previously been done with fossilised leaves and spores but not with fossilised wood.

The recovery of a significant quantity of wood from an area of Tertiary sediments in New South Wales, enabled the use of fossilised wood as a palaeoenvironmental tool. Tertiary sedimentary deposits of south eastern Australia are diverse lithologically, occupy distinct areas and are limited in vertical and horizontal extent. However, samples in museum collections together with samples from field work and descriptions of fossil wood from previous researchers enabled an analysis of the fossil wood.

The geological and palaeontological aspects of the fossil wood were considered for each specimen. Only specimens with precise information concerning location and description of the sedimentary deposits in which the specimens were found were investigated. Lithology, sedimentary structures and the relationship with surrounding geological units were also considered.

The samples were then classified and identified. It was possible to identify fossil wood to Family level by comparison with existing taxa. In the majority of cases, identification to species level was not possible due to the lack of detail in the specimen and because features such as colour cannot be used with fossilised specimens. With Australian fossilised wood, a systematic nomenclature based on structure observed within the palaeotaxa, would be more relevant. Comparisons of cell structures with previous work on palaeoenvironmental indicators was found to be possible.

Fossil wood has two uses. Firstly, as a local environmental indicator, usually in conjunction with sedimentological data, assessing the rate and direction of water flow, types of depositional environments and localised floral assemblages. Secondly, as an indicator of regional climate. Within any one particular time period, comparisons between the cellular structures of wood found in different parts of south eastern Australia show gross changes in cell size, mean growth ring size and vessel size, which enabled generalisations about climate for each epoch in the Tertiary.

Palaeoclimatic indicators from the wood concurred with previous climatic interpretations based on palynology and sedimentology. Cool conditions during the Palaeocene were clearly indicated by small cells and small growth rings which gradually increased throughout the remainder of the Tertiary. Several areas e.g., Dargo High Plains, where cold conditions existed in isolation could be clearly distinguished. This corresponds with the gradual northward movement of the Australian plate with consequent increasing temperatures on the mainland.

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## Appendix 1

Descriptive palaeontology