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Plant Fossils from the
Cape Vogel Basin, East Papua

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by

Mary E. White

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Summary:

An assemblage of Dicotyledonous leaves with a Conifer and seeds may indicate Eocene age for the plant horizon.

Introduction:

Plant fossils were collected at a locality in East Papua by Hugh Davis and Ian Smith in 1968. (Davies et al 1968). The sample, no. 68522404, is of fine-grained sandstone specimens containing impressions of leaves, some with carbon on the impression surface.

Locality:

Sample 68522404 was collected at a locality situated at latitude $9^{\circ}37'$, Longitude $149^{\circ}35'$. The sandstone containing the fossils is from a sedimentary sequence consisting of cycles of conglomerate, sandstone and siltstone. The sequence is part of the Cape Vogel Basin.

General note on Tertiary plants of Australia

The Tertiary epoch is characterised by a flora of great diversity comprising a large number of genera. Classification of detached Dicotyledonous leaves, particularly when preservation is imperfect, is a task which any self-respecting Systematic botanist would be reluctant to undertake.

Ettinghausen, in his classic first documentation of Australian Tertiary plants, named leaves by comparison with European Tertiary plants, emphasising their resemblance to forms in the supposedly world-wide community of plants. If instead he had endeavoured to equate them to leaf types in the modern Australasian floras he might have come up with a very different list of names possibly no less applicable to the specimens.

I have recently had the opportunity to examine some of the original collections reported on in "Contributions to the Tertiary Flora of Australia" by Ettinghausen (Memoirs Geological Survey of N.S.W., 1888) held by the Mining Museum in Sydney, and some of the Type material from this collection now housed in the Australian Museum, as well as other Tertiary material in the Museum collection. It is at once obvious that nothing short of a complete study of Australian Tertiary plants by a competent systematist with a great deal of experience in classification of local and overseas modern plants is needed to clarify the situation. No worth while contribution could be made by examination of isolated specimens unless some tissue is preserved for study or fruiting bodies or seeds present in a state of preservation which would allow full determination of affinities.

There may be some limited value in matching specimens to the type material in the classical study by Ettinghausen as a start to be able to say at least that specimens closely resemble those present in the Eocene strata at Vegetable Creek, for instance. This has been the approach in the study of collection 68522404. Any conclusion reached on the probable age of the plant horizon by this method should be regarded as tentative.

Plant Fossils in Sample 68522404

Specimens F 23288 - 23292 illustrated.

Specimen F 23288

Figure 1 shows two large leaves and fragments of others referred to Bombax sturtii Ett. (Bombacaceae, Malvales). This species was described from Dalton, near Gunning, from an Eocene horizon.

Specimen F 23289

Figure 2, Magnified X 3, shows a small conifer twig with pointed scale leaves. This is a conifer similar to present day Cupressus. The small scale leaves are set at right angles to the stem. In the collection from Vegetable Creek there are fragmentary conifer twigs, but these have closely adpressed leaves and are referable to Heterocladiscos thujoides.

Figure 1

Specimen F 23288. Natural size. Neg. F/5615.

Bombax sturtii Ett.



Figure 2

Specimen F 23289. Magn. X 3. Neg. F/5619.

Conifer twig.



Specimen F 23290

On one side of this specimen is part of a large leaf, poorly preserved, which is referable to Artocarpidium stuartii Ett. It is not suitable for photography. On the same side of the specimen is a fine axis with branches off one side only. This is illustrated in Figure 3. On first appearance this might be thought to be a root which could have run along the soil surface giving off rootlets on the lower side. Closer examination shows what appear to be buds in the axils of the lateral projections. This suggests a stem nature for the axis.

Figure 3

Specimen F 23290. Natural size. Neg. F/5620



On the other side of the specimen is part of a leaf with undulating margin. It is illustrated in Figure 4. Although it is incomplete, it appears to be referable to Elaeocarpus muelleri Ett. which is also a component of the Vegetable Creek flora.

Figure 4

Specimen F 23290. Natural size. Neg. F/5618. Elaeocarpus muelleri Ett.



Specimen F 23291

Figure 5, magnification X 2, shows three seeds. Two of them are of Carpolithes type. They are elongated oval with a small stalk. The third is part of a woody fruit or seed with ridges on its surface. It is similar to a fruit of Fagus sp.

Figure 5

Specimen F 23291. Neg. F/5617. Seeds. Magn. X 3.



Specimen F 23292

Illustrated in Figure 6 is a small bunch of Conifer foliage. The scale leaves are set at right angles to the stems.

Figure 6

Specimen F 23292. Magnification X 3. Neg. F/5616. Conifer



Conclusions: The plants identified - Bombax, Artocarpidium and Elaeocarpus associated with a Conifer probably referable to Cupressaceae, show affinity with the assemblage of Eocene plants described from Vegetable Creek. The rock unit from which these plant fossils were collected overlies the "Upper Arenaceous Group" of Papp and Nason-Jones (1928). Shell fragments collected from this Group suggested a Mio-Pliocene age. It is possible however, that the plant horizon at 68522404 is as old as Eocene and is not of the Pliocene age considered likely in the field.

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