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A MESOZOIC ANGIOSPERM LEAF FROM THE YANGERY NO.1 BORE, KOROIT, VICTORIA.

By J.G.DOUGLAS.

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Abstract

A dicotyledonous leaf, hitherto unrecorded from Australia, is described from Mesozoic sediments in the Western District of Victoria.

Introduction

Angiosperm leaves have been described (Medwell 1954) from only one locality in the Victorian Mesozoic, namely from outcrops on the banks of the Glenelg River near Casterton. These leaves lacked cuticular remains, and were not generically determined, but were assigned on form characteristics to the Angiospermophyta.

Recent drilling at Koroit (Yangery No.1 bore) some 70 miles to the southeast has yielded a core with plant impressions in the 4320' - 4330' region. These consist of two types, namely numerous specimens with leaves in various stages of preservation determined as Phyllopteroides dentata Medwell, and a single specimen with the impressions of at least five leaves. These are preserved as black carbonaceous impressions in a blue grey sandstone with finer mudstone bands. The largest and best preserved of these five leaves is described below.

Angiospermophyta
Dicotyledoneae
Hydrocotylophyllum lusitanicum Teixeira
Pl.....figs.1 - 6
Reg.No.Geol.Sur.Vic.57 29, 57828 (counterpart)

Description

Small fan shaped stipulate leaf, lamina with basal margins entire from point of attachment of long slender petiole to crenate periphery. Four diverging primary veins are connected by a network of secondaries which sometimes form fairly prominent semi polygonal areas.

Dimensions

Length of lamina: 16 mm (the extremity of the leaf has been cut off during coring)
Length of petiole (lamina-base of stipule): 10 mm
Width of lamina: 18 mm
Length of crenulation (max.): 2 mm.

Remarks

This leaf is complete except for portion of the lamina cut away during coring, and the counterpart is also preserved (Pl.....figs.5, 6). Close examination of the structures on the petiole (Pl.....figs.1, 5) indicate that these are the remains of stipules. These and the anastomosing venation provide the best evidence for classification in the Dicotyledonae.

As mentioned this is but one of five leaves, connection between three of which is visible, and all five of which are almost certainly part of one plant. The other leaves provide additional information. One (Pl....fig.4) a little smaller than that described above, is of importance in that it closely compares with the majority of previously figured H.lusitanicum specimens. Although the venation is obscure, the peltate-cordate leaf form is highly characteristic of the genus. Another leaf, (Pl...fig.3 and just below the stipules of leaf illustrated in fig.1) gives a misleading impression of leaf form, as only half the lamina is preserved. Whilst H.lusitanicum corresponds with the Yangery specimens in many features, the following differences must be noted.

1. Venation:

Teixeira (1948) describes the leaf as having a median vein with weaker veins radiating from the base of the lamina. The Yangery leaf described above does not obviously possess a median vein, but the central primary vein (Pl...figs.2, 6) may be of this type. In any case many specimens figured by Teixeira show no sign of a median vein; most have venation of the type shown by the Yangery specimen in Pl....fig.4

2. Marginal Crenation:

Some Portuguese specimens (Teixeira 1948 Pl.XXXI fig.1) show margins more finely crenate than the Yangery specimens.

3. Stipules:

These are not clearly evident in Teixeira's figures, but in most cases the petiole is obscured. Hydrocotyle asiatica the present day species from which Teixeira derived the generic name of the fossil is a stipulate species. In both the Portuguese and Yangery assemblages there is great variation of form between individual leaves. Taking this into account the evidence certainly indicates no generic difference, and the small variations indicated do not justify separate specific identity without anatomical evidence.

Cuticle is either absent, or as appears more likely from repeated attempts at isolation, too tenuous for extraction using methods short of efforts which would result in the destruction of the specimen.

Leaf form does not preclude the possibility of an aquatic habit as suggested by Teixeira.

Certain broad leaved genera, e.g. Menispermites Lesquereux show some similarities of leaf form, but on close examination do not correspond with the Yangery material.

Age of Sediments

Medwell (1954) dated the upper mudstone bed of the Runnymede Formation (Angiosperms) at Killara as Lower Cretacecus. However, none of these specimens compares closely to Hydrocotylophyllum (one cordate leaf shows no further resemblance) and Phyllopteriodes dentata associated at Yangery is recorded rather from the older Mocomboro mudstone at Killara, which Medwell placed in the Upper Jurassic.

Recent microfossil studies (Cookson and Eisenack 1961), (Douglas 1961) indicate an Upper Cretaceous age for marine sediments above the Hydrocotylephyllum beds which are broadly designated "pre Upper Cretaceous non marine" beds in this latter paper.

Cookson and Dettman (1958) dated many Victorian Mesozoic non marine beds (including Western District samples) as Albian and Aptian stages of the Lower Cretaceous. Teixeira (1948) considered the beds containing Hydrocotylophyllum at Cercal, Portugal, to be also of Aptian - Albian age. Hence a Lower Cretaceous age for the Yangery Hydrocotylophyllum beds appears to be well substantiated.

Note. It is not known whether Teixeira (1947 "Not. rech. et rev. de la Flore de Cercal" Broteria V. XVI) designated any of the Cercal impressions as a holotype, as this paper has been unavailable. In this paper the generic name was spelt Hydrocotylophyllum not Hydrocotylephyllum as in Teixeira(1948) The former spelling is used in this paper and also by Andrews (1955).

References

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Explanation of Plate

Fig.1 Hydrocotylophyllum lusitanicum Teixeira
Reg.No.57829, x3 Single leaf.

Fig.2 Hydrocotylophyllum lusitanicum Teixeira
Reg.No.57829 x3 Line drawing of leaf (fig.1) showing venation.

Fig.3 Hydrocotylophyllum lusitanicum Teixeira
Reg.No.57829 x2
Portions of four leaves.

Fig.4 Hydrocotylophyllum lusitanicum Teixeira
Reg.No.57829 x3 Single leaf
Line drawing showing arrangement of primary venation.

Fig.5 Hydrocotylophyllum lusitanicum Teixeira Reg.No.57828 x3 Counterpart of leaf (fig.1) with both stipules.

Fig.6 Hydrocotylophyllum lusitanicum Teixeira Reg.No.57828 x3 Line drawing of leaf (fig.5) showing venation.