A large fossil leaf from the Middlemarch diatomite

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The Middlemarch diatomite is a lacustrine deposit lying within the Foulden Hills, eastern Otago. The finely laminated unit is formed of the siliceous tests of fossil diatoms. Fossil leaves are numerous on the bedding planes of the diatomite and often have the cuticle preserved. The age of the diatomite is not clear, but is probably close to the age of the surrounding Foulden Hill volcanics. These have not yet been radiometrically dated, but their age is almost certainly older than the Taranaki (Late Miocene) to Waitotaran (Piocene) age of the diatomite suggested by Couper (in Coombs et al 1960) on the basis of palynology, an earlier Miocene age being more likely (D.S. Coombs pers. comm. 1990).

Leaves were collected by Cecilia Travis in 1965 and by Alex Lowe, Chuck Landis and myself in 1988. All leaf remains found to date have been angiosperms, no conifers or ferns have been located. The macroflora is not closely similar to assemblages from the Miocene Manuherikia Group of Central Otago (Pole 1989). In general it seems to be very diverse and a large number of taxa is expected on further collecting. I suspect that there may not be a large time difference between the Manuherikia and Middlemarch leaves and the differences may be due to soil richness. The Manuherikia communities grew largely on nutrient poor deeply weathered schist or in peat swamps, while the Middlemarch community may have grown on nutrient rich basaltic soil. This is reminiscent of the situation in the Atherton Tableland of northern Queensland today, where relatively taxa-poor rainforest growing on granitic soil sharply contrasts with richer rainforest growing on basaltic soil surrounding crater lakes in which some diatomite has accumulated.

Most taxa at Middlemarch remain unidentified, however a number of asymmetric laminae are present which are very similar to leaflets of Dysoxylum (Meliaceae).

The large leaf, illustrated here and now in the Middlemarch Museum, was found by Neville Peat and Bill Thompson in 1988 while Neville Peat was researching a novel, set in the Strath Taieri. The venation and large size of the leaf is suggestive of a number of families, including Euphorbiaceae and Sterculiaceae, but further study is in progress.

REFERENCES

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