## XIII. PALEOPALYNOLOGY OF PAPUA

Khan, A.M.: Palynology of Tertiary sediments from Papua-New Guinea. Ph.D. thesis submitted to the School of Biological Sciences, Sydney, Canberra, A-C-T., March 1971.

This thesis (promotor: Prof. A.R.H. Martin) consists of a pioneer study of Tertiary palynology of Papua; 107 spp. (including 36 Pteridophytes, 10 Gymnosperms, 52 Angiosperms and 9 spp. microplankton) are described; 8 new genera, 29 new spp. are distinguished (2 gen., 9 spp. in Pteridophytes, 1 sp. in Gymnosperms, 6 new gen., 19 new spp. in Angiosperms). Application is made in establishing boundaries between Upper Miocene/Lower Pliocene, Lower/Upper Pliocene, and Upper Pliocene/Pleistocene. All material is derived from 16 core samples (over a depth of c. 2300 m thick sediment) from Iyiri No.1 Well in the Fly River delta, at 144°45' E and 7°6' S, where the earliest Tertiary sediments are Upper Miocene, the transgression having taken place over the peneplainisation of the whole Cretaceous surface in Turonian-Senonian time.

Our knowledge of New Guinean palaeo-palynology was scant. Ancient groups of wide distribution, often relict-disjunct were not earlier recorded than from the Pliocene. That this was a fictitious picture, merely due to inadequate factual knowledge, was clear to synthetic plantgeographers. It is pleasant to find this here corroborated. Nothofagus, Dacrydium and Podocarpus § Dacrycarpus belonged to this group and are now all recorded from the Upper Miocene. A fascinating record is pollen similar to that of Microcachrys or Microstrobos. Microcachrys is a monotypic genus of conifers which is now endemic to Tasmania, but held to be represent a relict by Florin. Microstrobos is a monotypic endemic conifer from New South Wales.

Surveying the Upper Miocene to Pliocene records, the overall impression is that the flora of New Guinea has not changed to any degree since the Upper Miocene. The presence of pollen similar to that of various groups which are still important: Rubiaceae, Thespesia and other Malvaceae, Rhizophoraceae, Antidesma, Brownlowia, Metroxylon, Sonneratia, Sapindaceae, Loranthaceae, Myrtaceae, Proteaceae, Planchonia, Vaccinium, Engelhardia, Casuarina, Gunnera, Araucaria, Dacrydium, Podocarpus, and Nothofagus is sufficient proof for this conclusion. The record includes both lowland and montane groups, as could be expected. An interesting point is a Hakea-similar pollen, a genus confined to Australia.

Couper (1960) had concluded from the occurrence of the Nothofagus brassii pollen, then only known from the Pliocene, that this ancient group of Nothofagus which is now one of the most important montane forest constituents was driven

northwards and migrated from Australia to lower latitudes due to the Pleistocene glaciation. The author correctly reduces this opinion to a myth, born from the interpretation of inadequate factual information. He found several species plenty in the Upper Miocene. I may add that as our knowledge increases the future record will show it to occur in New Guinea certainly as low down as the early Tertiary or even to my expectation to the Upper Cretaceous, as this would precisely fit in the scheme of Nothofagus phylogeny I have outlined in Blumea 19 (1971) 65-98.

A remarkable flaw in the conclusion of the author is that he says that "the presence of fossil pollen of plants of the mixed forest type such as Proteaceae and Malvaceae, and of the savanna type of vegetation such as Eucalyptus and Casuarina, though the pollen of Gramineae is rare, indicate a subtropical climate." A subtropical climate is of course impossible, as the four groups mentioned grow all in the present truly lowland tropical vegetation of the Fly River delta. But the author may have confused the concepts sub-tropical and seasonal tropical and may have meant to say that there was besides rain-forest also savanna forest, as there is today, and with that I can agree.

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