

THE IDENTITY OF PSILATRICOLPORITES AND PELLICIERA

T. A. WIJMSTRA

Hugo de Vries-laboratorium, Universiteit van Amsterdam

ABSTRACT

The probable identity of the fossil pollen of Oligocene to Miocene age described as *Psilatricolporites crassus* Hammen & Wijmstra and that of the recent Theacea *Pelliciera rhizophorae* Planch. & Triana has been established. The occurrence in the past is compared with the recent distribution of *Pelliciera*.

During recent studies of fossil pollen floras and of the stratigraphical distribution of various pollen types in the Guiana basin of northern South-America, a sporomorph was repeatedly encountered which was described as *Psilatricolporites crassus* Hammen & Wijmstra (1964). In this basin the stratigraphically oldest specimens date from the Oligocene and up to now no material of an origin younger than the Miocene has been recorded. The same type of pollen grain has been found in the Marajo basin in Brazil in deposits of Miocene age (DE BOER c.s. 1965), and it is also known from a Miocene pollen flora in Venezuela (L. BALSEIRO, priv. comm.). So far its upper limit of occurrence in Venezuela has not been established. In the meantime *Ps. crassus* was discovered in Miocene sediments in Colombia (VAN DER HAMMEN, oral comm.). For the time being nothing can be said with certainty about its occurrence in the Pliocene of Colombia, because the palynological investigation of these deposits has hardly begun, but for reasons which will soon become obvious a more recent fossil occurrence in this region may be anticipated.

During my more detailed studies of the fossil pollen floras of the Guiana basin (WIJMSTRA 1968, in the press) I could establish that the sporomorph described as *Psilatricolporites crassus* shows a very close relationship to the theaceous species *Pelliciera rhizophorae* Planch. & Triana and, as far as the evidence goes, represents fossil pollen of this recent species or of its immediate Tertiary precursor. The fossil and the recent pollen grains show the same structural features of the exine layer: they both have a perforate tectum and possess costae transversales parallel to the longitudinal axis of the transverse furrows. Their overall dimensions are likewise in good agreement (compare fig. 1). *Pelliciera rhizophorae* pollen has meanwhile been reported as an element of a pollen flora of Oligocene to Miocene age from Chiapas, Mexico (LANGENHEIM c.s. 1967), so that at one time the species occurred as far north as the southernmost part of North America.

Germane to the question of the taxonomic identity of *Ps. crassus* and *Pelliciera* are the environmental conditions prevailing in their natural habitats during the Mid-Tertiary and the recent time, respectively. Slides containing

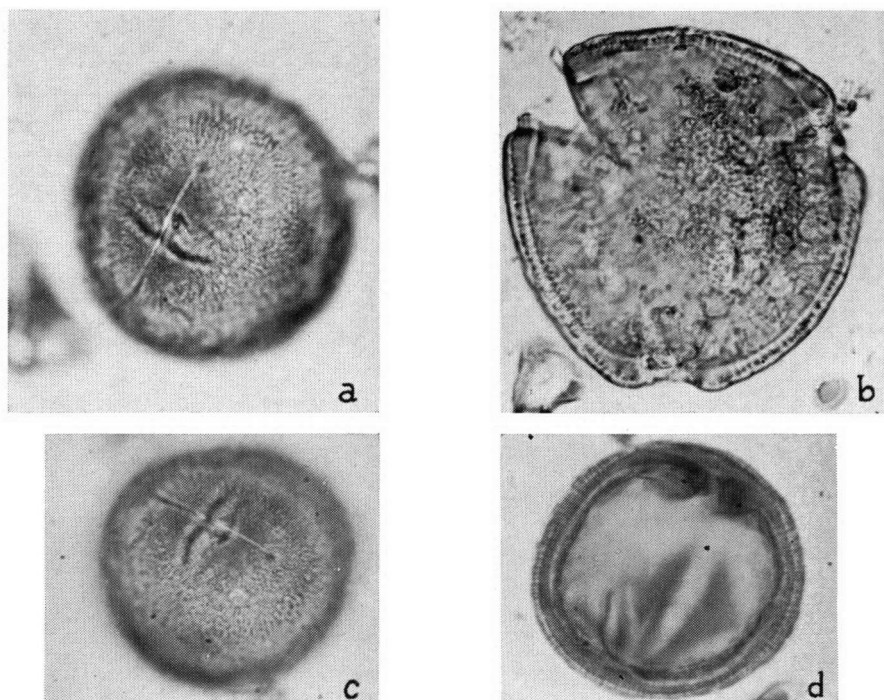


Fig. 1. *a* en *b*: fossil material (= *Psilatricolporites crassus*), obtained from sediment by KOH + bromoform separation (Surinam, Alliance T 28 drill hole, Miocene); *a* $\times 750$, *b* $\times 1000$; *c* and *d*: *Pelliciera rhizophorae* (recent pollen, acetolysed), both $\times 750$.

the fossil *Ps. crassus* invariably contain a high percentage of *Rhizophora* pollen (between 60 and 90 per cent.) and, furthermore, in such slides *Verrutricolporites rotundiporus* is frequently encountered. The latter occurs in the pollen diagrams at a level comparable to that of *Avicennia* in younger, similar deposits (WIJSTRA 1968, in the press). Determinations of the borium content of sediments containing these grains (PORRENGA 1966) indicate that their deposition took place in a meso- to euryhaline environment. This is considered to be cogent evidence of the *in situ* occurrence of the fossil plants in mangrove vegetation and, hence, of the one-time presence of *Pelliciera* in an oligocenic to miocenic mangrove belt extending along the Atlantic and the Pacific coasts from what is now tropical South America to Southern Mexico. Nowadays *Pelliciera rhizophorae* is restricted in its distribution to a narrow coastal strip along the Pacific Ocean between Colombia and Costa Rica (JOHNSTON 1949, p. 207), where it still occurs in mangrove forests.

The accumulated evidence enables the reconstruction of the ancient (Oligocene to Miocene) area of distribution, which can thus be compared with its present occurrence on the Pacific coast (fig. 2). The distribution map shows

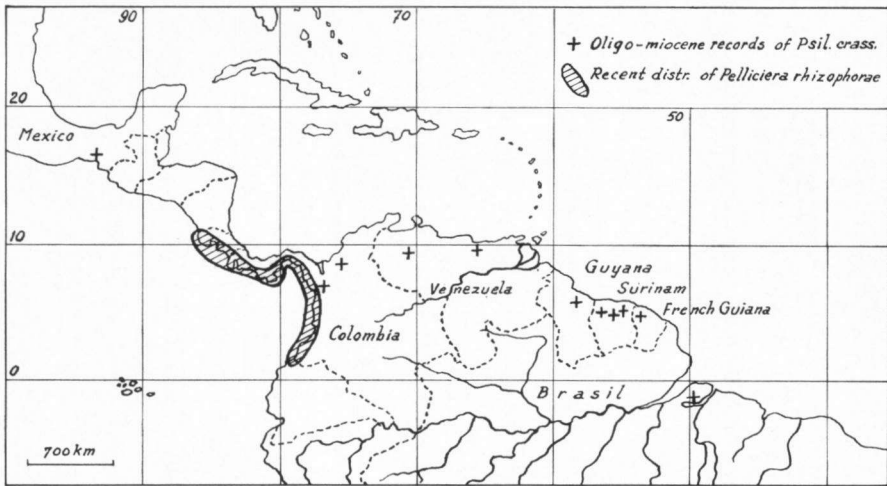


Fig. 2.

quite clearly that the area has appreciably diminished since the Miocene, and also that originally *Pelliciera* occurred along both the former Atlantic and Pacific shore lines.

The present case provides another example of the importance of fossil evidence in phytogeographical inquiry and shows once more how deceptive recent distributional data can be.

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