

A First Report of Fossil Fern-like Pteropsida from Costa Rica

by

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Several fragments of rock containing prints of the foliage of fern-like Pteropsida were found in a non-technical private collection of rocks and minerals of Costa Rica. The rocks were collected in the Río General valley by personnel of Aluminium Corporation of America (ALCOA) in 1967, in an area some twelve kilometers southeast of San Isidro, province of San José.

The matrix proved to be a dark gray lutite belonging to the Térraba Formation. Lutites are among the commonest rocks in the area mentioned and form large deposits along the Río General banks. This formation has been placed by various authors in different strata of the Tertiary. HENNINGSEN (4) and CASTILLO (1) agree in considering the Térraba Formation as extending from Lower Miocene to Oligocene, while DENGO (2, 3) places it entirely in the Oligocene.

Spectrographic analysis of the rock samples revealed: Al_2O_3 5-7 %; SiO_2 approx. 63 %; Fe_2O_3 1.5-2.5 %; CaO 8-10 %; MgO 3.5-4.5 % MnO less than 0.01 %; TiO_2 2-3 %; K_2O not determined; Na_2O not found.

Our lutite contains two types of foliage, which are described below.

Sample number one (Fig. 1) shows a part of a tripinnate frond, one pinna obliquely attached to the stem, measuring 100 mm from base to apex. Pinnules oblique to rachis, 7-10 mm long and 4-5 mm wide, with a central costa from which simple costules depart to reach the margins. Pinnules oblong, base somewhat cordate-truncate, inferior and upper bases subequal; apex rounded. Margins entire. The rachis to which pinna is attached presents a thick wing-like expansion on both sides. No fertile structures have been detected.

The second sample (Fig. 2) shows a fragment of a pinna and the impression of a pinnule. Venation is simple. No definite costa present but several (3-4) running into rachis, reminding one of *Mixoneura*. Pinnules attached to

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rachis by a short petiole, oblique to rachis. Base subcordate. Pinnules 10 mm long and 7 mm wide. Margins entire. Apex rounded and somewhat curved toward apex of pinna. The apical segment with cuneate base, sessile, and of larger dimensions than medial segments.

Reviewing the literature dealing with fossil plants from Costa Rica, this appears to be the first report of fossil fern-like Pteropsida from the country. Morphological observations reveal a certain resemblance to some Palaeozoic pteridosperms, namely the genera *Pecopteris* (Fig. 1) and *Mixoneura*. Since the specimens belong to a well established Tertiary deposit, I find the taxonomic position to be complex and deserving careful examination. It is possible that modern genera living today in Costa Rica are represented; for example, the habit shown in Fig. 2 is reminiscent of certain Thelypteroid ferns, such as the bipinnately segmented species of *Thelypteris*.

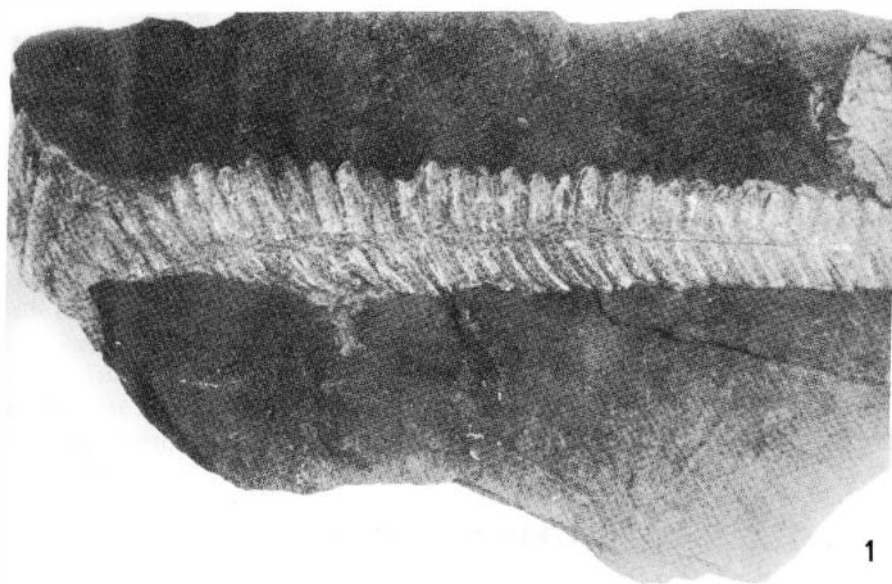
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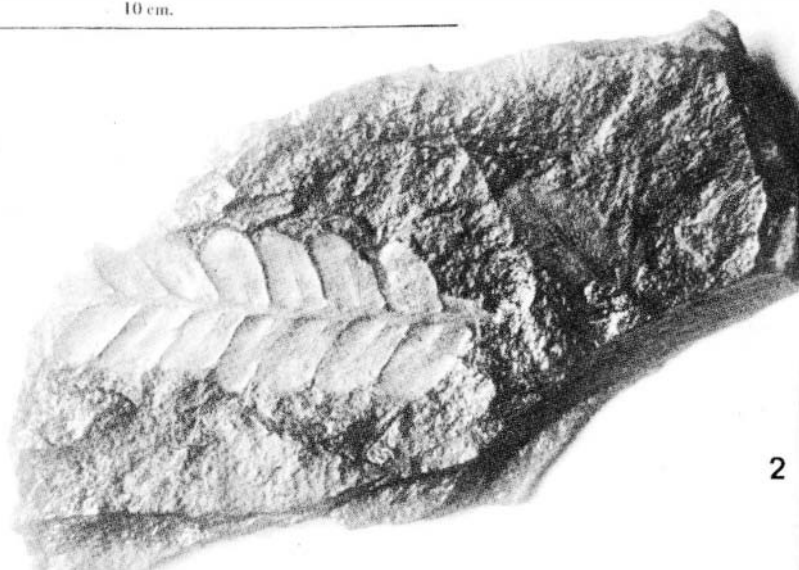
SUMMARY

Fossil fern-like Pteropsida are reported, apparently as the first record for the country, from Middle or Upper Tertiary deposits of the central-southwestern region of Costa Rica. The specimens are described as resembling the *Pecopteris* and *Mixoneura* types of the Palaeozoic and some contemporary species of *Thelypteris*.

Figs. 1 and 2. Lutite fragments from the Terraba Formation of Costa Rica showing fern-like fossils.



10 cm.



RESUMEN

Se comunica en forma preliminar el hallazgo de pterópsidas filicoides en los depósitos del Terciario Medio o Superior de la región sudoeste central de Costa Rica. Se describen con detalle las formas estudiadas y, aunque no se discute en el presente estudio la posición taxonómica de las plantas involucradas, se notan ciertas afinidades con los géneros *Pecopteris* y *Mixoneura* del Paleozoico y las especies bipinadas del género *Thelypteris* actuales, en el caso de uno de los fósiles. La investigación bibliográfica indica que se trata de un primer hallazgo de este tipo en el territorio costarricense.

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