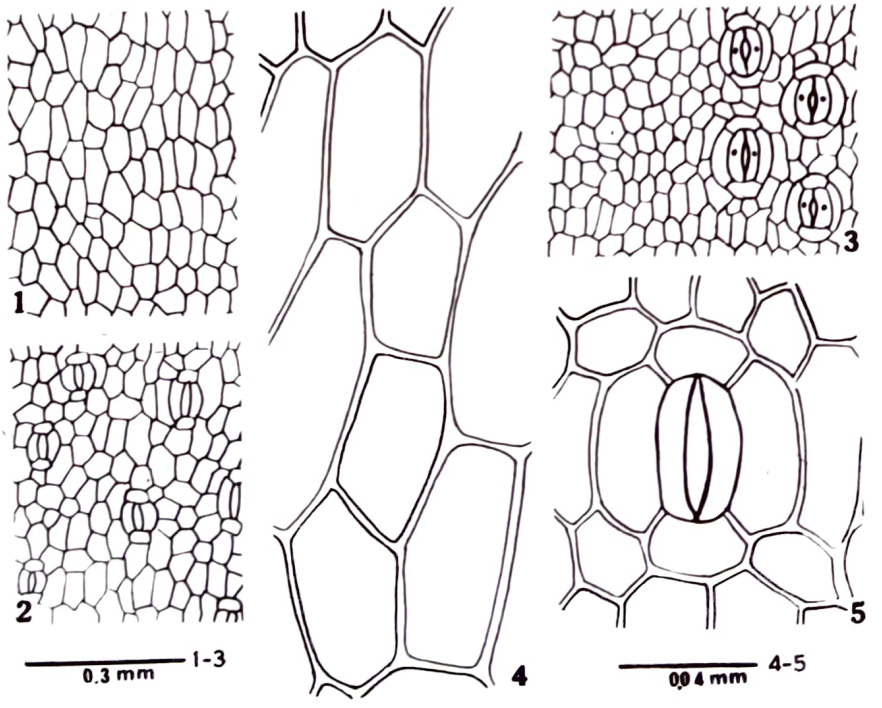
PALM CUTICLE FROM NEYVELI LIGNITE, SOUTH INDIA

Cuticular studies of angiospermic leaves have received little attention from the Neyveli lignite deposits and so for only a few preliminary reports have been made. Jacob and Jacob (1954) reported the leaves and leaf cuticles of angiosperms and placed some of them in the family Oleaceae. Srivastava (1984) reported a dicotyledonous leaf cuticle belonging to *Litsea* of the family Lauraceae. Dalvi and Kulkarni (1982) reported angiospermous cuticle resembling *Nothopegia* (Anacardiaceae), *Garcinia* (Guttiferae), *Alangium* (Alangiaceae) and *Diospyros* (Ebenaceae) from lignite of Satnagiri, Maharashtra. There are a few reports among the monocotyledons. Chatterjee and Bhattacharya (1965) described crown of leaves and barks which resemble palm-like tree. Ambwani (1982) reported an axis with leaf-bases showing affinity with *Dracaena* (Agavaceae). Cuticles of *Nypa* have been described by Kulkarni and Phadtare (1980) from Ratnagiri lignites. The present paper reports a palm cuticle resembling *Phoenix*-like palm from the Neyveli lignite.

Leaves dorsiventral; upper epidermal cells uniform rectangular or elongated, straight walls (Text-fig. 1). Lower epidermis with costal and intercostal regions, cells in costal region narrow, elongated or rectangular, intercostal region with longitudinally extended cells (Text-fig, 4); stomata somewhat in distinct files, confined to intercostal regions, paratetracytic (Text-fig. 2), terminal (polar) subsidiary cells, short, round or slightly transversely extended, overarching guard cells, lateral subsidiary cells narrow, thin-walled (Text-fig. 5), guard cells with thickened walls; trichomes absent.



Text-fig. 1, Upper epidermis of fossil showing epidermal cells; 2, lower epidermis of fossil showing stomata in files; 3, lower epidermis of *Phoenix* showing stomata and epidermal cells; 4, cells of intercostal region enlarged; and 5, a stoma of fossil cuticle enlarged to show guard cells and four subsidiary cells.

Fossil cuticle shows characters such as hypostomatic leaves, uniform adaxial cells, differentiation of costal and intercostal regions on the lower surface, stomata paratetracytic (Dilcher, 1974), confined to intercostal region, short terminal subsidiary cells and absence of trichomes. All these features show that the fosssil cuticle belongs to palms (Palmae). Within the palms the present fossil cuticle resembles *Livistona* and *Phoenix*. Trichomes which are the characteristic of palms, are absent in both the genera, but occasionally present on the lower surface with sclerotic bases in *Livistona*. Further, epidermal cells in *Livistona* are sinuate walls. Due to this important character the affinity of fossil cuticle with *Livistona* is ruled out. The diagnostic features of *Phoenix* epidermis (Tomlinson, 1961) are : (1) adaxial epidermal cells uniform, (ii) abaxial surface differentiated into costal and intercostal regions, (iii) cells straight-walled, (iv) stomata in files confined to intercostal regions (Text-fig. 3), (v) terminal subsidiary cells slightly overarching the guard cells, and (vi) absence of trichomes. All these characters are shared by the present fossil cuticle. Detailed comparison, therefore, clearly reveals that the fossil cuticle belongs to *Phoenix* (Phoenicoid group of palm).

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Nirmala Upadhyay & C. L. Verma

Botany Department, Lucknow University, Lucknow 226 007