

Botanical affinities of *Jacobipollenites* (Ramanujam) Singh & Misra

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THE genus *Jacobipollenites* (*J. magnificus*), a characteristic monoporate pollen, was originally recorded from the Neyveli lignite deposit in South Arcot district, Tamil Nadu (Ramanujam, 1966). Subsequently another species of this taxon, *J. arthungalensis* has been described from the subsurface Eocene sediments of Kerala (Rao, 1990). Later on, Singh and Misra (1991) provided a detailed study of *Jacobipollenites*, emended its generic diagnosis and documented three more species viz., *J. magniporosus*, *J. distinctus* and *J. crassimurus* from the Neyveli lignite deposit. The tentative comparison of this pollen type with *Sparganium*, earlier made by Ramanujam (1966) is not convincing. The botanical affinities of this monoporate pollen type, therefore, remained unknown to date.

The authors are currently analysing fossil palm pollen from the Tertiary sediments of various basins in southern India and in this context attempts are being made to unravel the botanical affinities of the diverse fossil palm pollen types, to the extent possible, by comparing them critically with the modern pollen. This study, incidentally, brought to light the remarkable similarity of the pollen of *Borassodendron* Becc. of the tribe Borasseae in the sub-family Coryphoideae with the fossil taxon *Jacobipollenites*.

Jacobipollenites

(Based on Ramanujam 1966; Rao 1990;
Singh & Misra 1991)
Pl. 1, Figs 1-5

Pollen grains mostly in monads (occasionally in dyads or tetrads), amb spherical to sub-spherical, 40 - 100 μm in diam. (in different species), monoporate,

pore large 10-25 μm in diam, generally circular, sometimes slightly elongated, appearing as rugged cavity in the sculptured wall, annulate, exine considerably thick, subtectate, structural elements of sexine (pila) well spaced, surface prominently reticulate to retipilate, homo - to heterobrochate, muri usually simplipilate, lumina subcircular or irregular with or without free processes.

The illustrated species is *Jacobipollenites distinctus* from a borewell in Jayamkondam block, Cauvery basin, Tamil Nadu. Of the five species known, *J. crassimurus* (80-95 μm) and *J. magniporosus* (50-100 μm) are the larger ones (Singh & Misra 1991).

Borassodendron

(Based on Thanikaimoni 1966, 1970; Fergusson *et al.*, 1986 & Author's observations)
Pl. 1, Figs 6, 7

Pollen grains mostly in monads (occasionally in dyads), amb circular to sub-circular, 70-95 μm in diam., monosulcate or monoporate, when sulcate sulcus short; pore large upto 19 μm in diam. (12-19 μm), circular to slightly elongated, with a smooth annulus upto 5 μm broad; exine considerably thick, subtectate, columella (pila) well spaced, surface prominently reticulate, generally heterobrochate, sometimes homobrochate, muri simpli-columellate, lumina subcircular, or irregular, locally with free process.

The illustrated species is *Borassodendron machadonis*. Of the two species of *Borassodendron*, the pollen of *B. borneense* is brevisulcate or almost porate and *B. machadonis* is monoporate, pore being occasionally slightly elongated.

Among the various species of *Jacobipollenites*, *J.*

distinctus (Pl. IV, figs 1, 2 of Singh & Misra 1991; Pl. 1, figs 1-5 of the present study) though marginally smaller agrees with the pollen of *B. machadonis* (Pl. 1, figs 6, 7) in the details of aperture and sculpturing. The pollen of *J. magniporosus* and *J. crassimurus* are also closely comparable with *B. machadonis* in their size and overall nature of sculpturing.

We are of the strong opinion that the above morphographic characters of the pollen of both *Jacobipollenites* and *Borrassodendron* clearly highlight their overwhelming relationship. Both the species of *Borrassodendron* are presently confined exclusively to Malaysia. *B. machadonis* is seen in southern Thailand and northern Malay peninsula and *B. borneense* is exclusive to Borneo (Fergusson *et al.* 1986; Uhl & Dransfield 1987).

The occurrence of fossil pollen unequivocally related to the modern pollen of *Borrassodendron* in the Tertiary deposits of Kerala along the west coast and Cauvery basin on the east coast of southern India clearly indicates that *Borrassodendron* enjoyed a more extensive geographical distribution during the Tertiary period compared to its highly circumscribed present day spread. *Borrassodendron* is a palm of rain forest vegetational complex (Moore 1973) and accordingly the occurrence of its fossil representative as *Jacobipollenites* in the Tertiary deposits of southern India is of some palaeoecological significance.

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PLATE 1

Figs. 1-5. *Jacobipollenites distinctus* from a borewell in Jayamkondam block, Cauvery basin.

1. Monoporate, reticulate pollen with rounded annulate pore. x 500
2. Monoporate, reticulate pollen with pore elongated. x 500
3. Part of a dyad enlarged. x 850.
4. One of the grains in a tetrad enlarged. x 750.

5. Pollen grain enlarged to show details of aperture and ornamentation. x 720.

Figs. 6, 7 *Borrassodendron machadonis*

6. Monoporate, reticulate pollen. Note circular, annulate pore. x 600.
7. Another specimen with pore slightly elongated. x 600.

