OCCURRENCE OF THE GENUS YABEIella ÓISHI IN THE JABALPUR FORMATION

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ABSTRACT

Leaf fragments described earlier by Bose and Sukh-Dev (1960) as Nipaniophyllum hirsutum (Pentoxyleae) from Bansa (Lower Cretaceous) are now identified as leaves of the genus Yabeiella Óishi on finding a better specimen with venation and cuticle. Thus, as had been reported, the Pentoxyleae is not yet found in the Jabalpur Formation.

The diagnosis of the genus Yabeiella is also emended here. The genus resembles most with the leaflets of Stangeria paradoxa (a living Cycad) in venation and some other characters. However, its systematic position is still open.

Key-words — Yabeiella, Stangeria, Jabalpur Formation (India).

INTRODUCTION

The genus Yabeiella was instituted by Óishi (1931) for the spatulate or oblong-lanceolate leaves in which the lateral veins show anastomosis and are joined near the margin of leaf with a distinct marginal vein. These leaves were first reported from the Triassic of Argentina (Geinitz, 1876; Kurtz, 1921; Wieland, 1929; Óishi, 1931). Since then they have been found in the Triassic formations of Australia (Walkom, 1917; Jones & de Jersey, 1947; Andrews, 1961), South Africa (du Toit, 1927; Óishi, 1931) and Japan (Óishi, 1931a). Óishi (1931) provisionally included the Indian Rajmahal specimens of Feistmantel (1877), Macrotaeniopteris crassinervis, in his genus. But I express no opinion about this determination until I examine them.

I collected a fossil leaf in 1960 from the same Bansa beds (Lower Cretaceous) which agrees in venation pattern with the generic diagnosis of Yabeiella. However, it possesses the cuticular structure of Nipaniophyllum hirsutum Bose & Sukh-Dev (1960).

In the genus Nipaniophyllum there is no marginal vein. Moreover, Bose and Sukh-Dev’s specimens are very small fragments without the leaf margin and hence, do not show their characteristic venation. On finding the above specimen I have transferred their species to the genus Yabeiella.

Óishi (1931) clearly described the venation of these leaves, but his diagnosis lacks
cuticular details which are added here. He mentioned minute pittings on the midrib in his diagnosis but I consider them only of specific value.

**DESCRIPTION**

*Genus — Yabeiella* Ōishi, 1931

**Emended Diagnosis** — Leaf bifacial, spatulate or oblong-lanceolate. Base of leaf tapering to a very short stalk. Lamina arising from the sides of midrib. Midrib strong, persisting up to the apex; lateral veins simple or forked and occasionally two adjacent ones joining or connected with cross bars; at their outer extremities lateral veins joining to form a distinct marginal vein.

Stomata present over the whole of lower surface of lamina and both sides of midrib. Usually 4-6 subsidiary cells surrounding the sunken guard cells. Guard cells having most of their outer surface exposed and sharing a thick cuticular ridge between them and subsidiary cells.

*Type Species* — *Taeniopteris marayesica* Geinitz, 1876.

**Comparison & Discussion** — Among fossil plants *Doratophyllum* Harris (1932) and *Nipaniophyllum* Sahni (emend. Vishnu-Mitre, 1958) of Mesozoic and *Rhabdo­ctaenia* Pant (1958) of the Palaeozoic have haplocheilic stomata, similar leaf form and forked or unforked lateral veins. But the veins in these genera do not unite near the margin of leaf to form a marginal vein as they do in *Yabeiella*.

Among the living gymnosperm *Yabeiella*, especially *Y. hirsuta*, greatly resembles the leaflets of *Stangeria paradoxa* in their form and venation. Both show similar distribution of variably orientated haplocheilic stomata, with rather exposed guard cells and sinuous epidermal walls on the upper side. But in *Stangeria* the leaves are pinnate and the leaflets do not abscess from the leaf, whereas in *Yabeiella* the leaves are probably simple. Stomatal structure similar to *Yabeiella* is also seen in certain conifers, cycads and Ginkgoales but their leaves are altogether different in form and venation.

The systematic position of *Yabeiella* is entirely open.
TEXT-FIG. 1A-K — Yabeiella hirsuta (Bose & Sukh-Dev) n. comb. A. Part of leaf, specimen no. 33759 x 1. B. Stoma and adjacent cells, slide no. 2807 x 400. C. Venation, specimen no. 33759 x 8. D. Cells of lower surface over lateral veins, slide no. 2809 x 400. E. Stoma and epidermal cells, slide no. 2807 x 800. F. Part of a cell of upper surface between the lateral veins, slide no. 2806 x 800. G. Trichome-base on a group of 4 thickly cutinised cells of lower surface, slide no. 2807 x 400. H. Reconstructed transverse section of stoma of the fig. E along the line denoted by arrow. I. Part of leaf magnified showing a marginal vein on the right hand side, slide no. 2806 x 30. J. Cuticle from upper surface between the veins, slide no. 2806 x 200. K. Stoma and epidermal cells, slide no. 2806 x 400 (all slides prepared from specimen no. 33759 from the Marwar Ghat, Bansa).
outer surface. A thick cutinized ridge present between the guard cells and lateral subsidiary cells.

Stomata common on upper surface of midrib, but a few present on the lower surface, irregularly distributed but longitudinally orientated. Epidermal cells on both surfaces elongated, narrow, rectangular or irregular in shape, mostly in series. Anticlinal walls sinuous.

Holotype — Specimen no. 30156, figured by Bose and Sukh-Dev (1960, pl. 3, fig. 16).

Locality — Marwar Ghat about 3/4 km north-east of Bansa, Shahdol District, Madhya Pradesh.

Horizon & Age — Jabalpur Formation, Lower Cretaceous.

Comparison & Discussion — The present species was compared with Nipaniophyllum raoi by Bose and Sukh-Dev (1960). On the strength of similarities in the then known venation characters, distribution of stomata, sunken guard cells and sinuosity in the walls of the upper surface, they included the present species in the organ-genus Nipaniophyllum. The present species, as is now known, differs in venation pattern generically from Nipaniophyllum but agrees with Yabeiella due to the presence of marginal vein.

Y. hirsuta closely resembles Y. mareyesiaca (Geinitz) Oishi in the size of the leaf and in venation, but Y. mareyesiaca is not fully known.

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REFERENCES


