

GINKGOITES RAJMAHALENSIS SP. NOV. FROM THE RAJMAHAL HILLS, BIHAR, INDIA

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ABSTRACT

In *Ginkgoites rajmahalensis* sp. nov., the leaves are characterized by their much divided lamina, with fewer veins which are generally simple, sometimes forked once or twice at varied levels and run almost parallel to one another, slightly converging towards the apex.

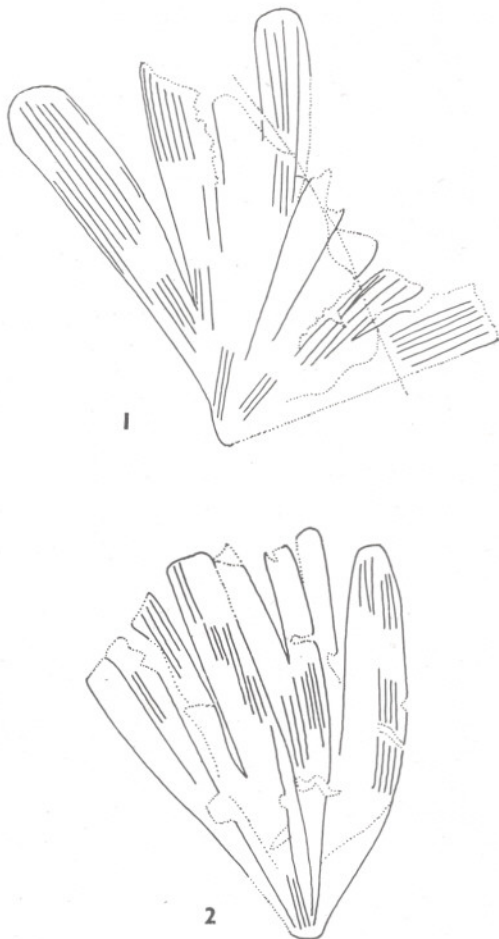
range of variation in their form and size, merging with one another in one character or the other. In aggregate characters, however, they show considerable similarity and hence all are referred to a single species.

INTRODUCTION

ALTHOUGH the Ginkgoales attained their developmental climax during the Mesozoic period, their record in the Indian Mesozoic sedimentary rocks is comparatively meagre. Of the three species recorded from India, viz., *Ginkgoites lobata* (FEISTM.) Seward (1919) from Satpura basin, *G. crassipes* (FEISTM.) Seward (1919) from Sripematur beds of the East Coast and *G. feistmantelii* Bose & Dev (1958) from the Jabalpur beds of Chandia (M.P.), the first two species are based on incomplete specimens while *G. feistmantelii* is based upon morphological as well as cuticular characters. Apart from these a few ginkgoalean fragmentary forms referable to *Ginkgoites* sp. and *Baiera* sp. have been recorded by Sah (1952,53) and Mehta & Sud (1953) from the Rajmahal Hills. Some fragmentary specimens referred to as ? *Baiera* sp. have been reported by Bose (1957) from the Jabalpur Series of Narsinghpur. From the Indian Triassic the only record is by Lele (1961) from the South Rewa Gondwana basin.

The specimens described in this paper were collected during several field excursions to the Rajmahal Hills during 1951-1956.

Except for a single petrified leaf from Basko (PL. 1, FIG. 9), all the Rajmahal ginkgoalean fossils are found merely as iron stained impressions in a fragile arenaceous shale, collected from the fragile shale bed at Sakrigalighat and Sagarbhanga (about 3 miles W.S.W. of Tinpahar railway station). These Rajmahal specimens show a great



TEXT-FIGS. 1-2 — Photo tracings of specimens shown in Pl. 1, Figs. 289. (Text-fig. 2 enlarged $\times 2$, other natural size).

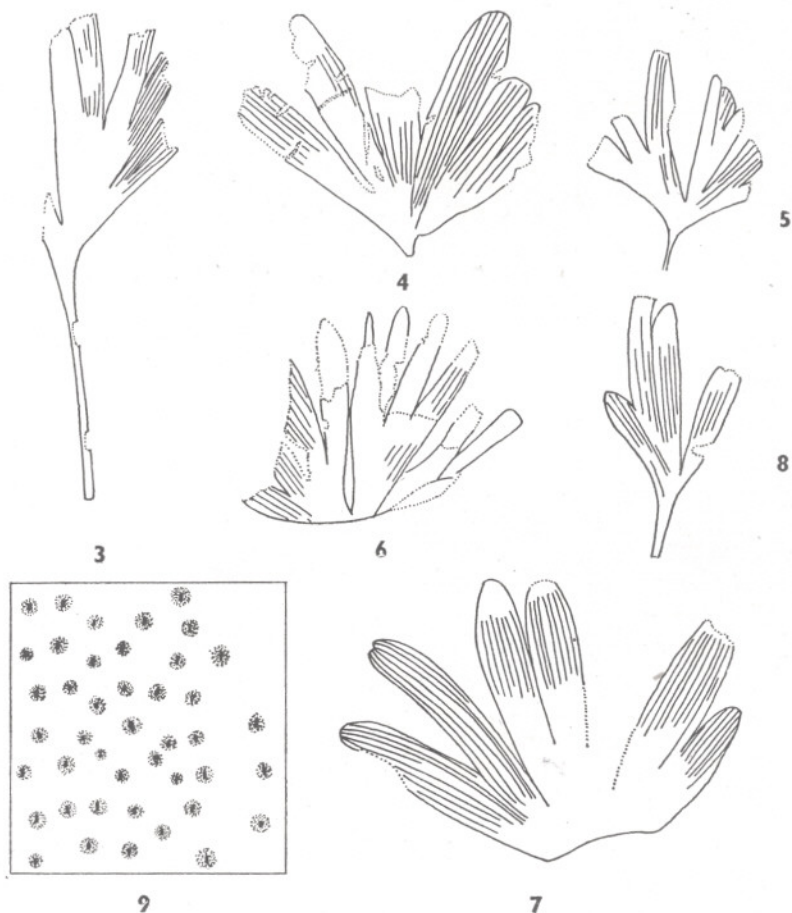
Ginkgoites rajmahalensis sp. nov.

Pl. 1, Figs. 1-13; Text-figs. 1-9

1952 — *Ginkgoites*, Sah, pp. 129-130, figs. 1-2.1953 — *Ginkgoites* spp., 1-3, Sah, pp. 55-58, pl. 1, figs. 1-11; text-figs. 1-11.1953 — ? *Ginkgoites* sp., Mehta & Sud, pp. 51-54, pl. 1, figs. 2-3.1953 — ? *Baiera* sp., Mehta & Sud, pp. 51-53, pl. 1, fig. 1.

Diagnosis — Lamina attached to a long cylindrical petiole, 2.3 cm. in length. Leaves variable in size and form. Size ranging from 2 to 5 cm. in length and 2.5 cm. in width. Lamina divided into a number of segments by deep primary incisions. Second-

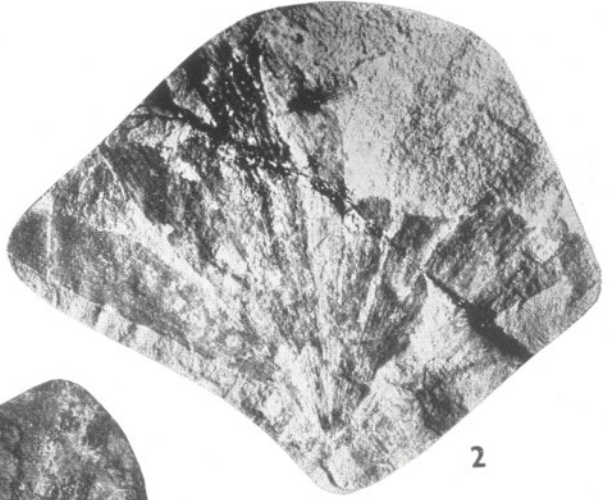
dary incisions present or absent. If present may be deep or as mere notches, shape and size of these ultimate segments also variable but mostly linear, oblong or club-shaped with obtusely rounded apex and entire margins. Veins 8-12, parallel, fine or coarse, simple or dichotomizing only once or twice, slightly converging at the apex. Epidermal cells small and irregular in shape. Two distinct alternating stomatiferous and non-stomatiferous zones present. The former composed of epidermal cells with irregularly distributed black spots showing the distribution of the stomata (TEXT-FIG. 9). These spots appear very much like stomata but the details are not sufficiently clear to correctly define their shape and nature. The vascular



TEXT-FIGS. 3-9 — 3-7, phototracing of specimens shown in Pl. 1, Figs. 12, 10, 8, 11 & 1. All $\times 1.8$, No. 4910. $\times 1$. 9, Showing the distribution of stomata represented by the black spots. $\times 250$. No. 28036-1.



1



2



3



4



6



5



7



8



9



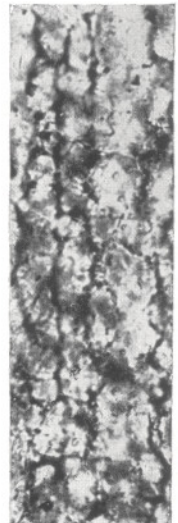
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11



12



13

region represented by non-stomatiferous zones composed of longer than broad cells with slightly wavy margins (PL. 1, FIG. 13). Anatomical details not preserved.

Locality—Sakrighat, Maharajpur, Basko and Segarbhanga, Rajmahal Hills, Bihar.

Horizon—Jurassic (Rajmahal Series).

Collection—Holotype No. 28036; Isotype No. 2044, Birbal Sahni Institute of Palaeobotany Museum, Lucknow.

Comparison—All the Rajmahal specimens of *Ginkgoites* figured so far (including those of SAH, *l.c.* & MEHTA & SUD, *l.c.*) differ from *Ginkgoites lobata* (FEISTM.) Seward, *G. crassipes* (FEISTM.) Seward and *G. feistmantelii* Bose & Dev essentially in the character of venation and also somewhat in the form of the lamina. The veins in the above three species are more in number and show the characteristic repeated dichotomy while in the Rajmahal specimens the veins are comparatively fewer in number, usually \pm parallel and fork only once or twice. The second point of difference is the much divided lamina of the present specimens.

A comparison with the other known Jurassic and Wealden species is rather difficult as some of the forms seem to compare with one or the other species viz., the specimen in (PL. 1, FIG. 1) appear very similar to *G. obrutschewi* Seward (1919, FIG. 642), *G. minuta* Harris (1935, FIG. 5c) is comparable to the specimen in (PL. 1, FIG. 3) in its smaller size. Similarly some of the specimens show resemblance to *G. digitata* which has a wide range of distribution and variation in size and form; while *G. digitata* var. *huttoni* Jacob & Shukla (1955, PL. 12, FIG. 98), described from Afganistan also show much resemblance but differs mainly in having numerous forked veins. However, they appear to differ from all in the character of venation. This character of venation is constant in all the specimens collected from the Rajmahal Hills and, therefore, may constitute an important diagnostic feature. The uniformity of this character alone separates it from the other species and so all the Rajmahal forms are referred to this species.

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EXPLANATION OF PLATE 1

1-2. *Ginkgoites rajmahalensis* sp. nov., showing club shaped lobes with deep primary notching and simple parallel veins. $\times 1$. Nos. 4913 & 4895.

3. *G. rajmahalensis* sp. nov., note the varying degree of notching. $\times 1$. No. 4904.

4-5. *G. rajmahalensis* sp. nov., showing a small petiole and divided lamina. $\times 1$. Nos. 16691 & 4895.

6-8. *G. rajmahalensis* sp. nov., note the notching and simple parallel venation. All $\times 1$. Nos. 32888, 32889 & 4898 respectively.

9. *G. rajmahalensis* sp. nov., A petrified specimen. $\times 1$. No. 28036.

10-11. *G. rajmahalensis* sp. nov., showing deep notching and simple venation. $\times 1$. Nos. 4907 & 16690.

12. *G. rajmahalensis* sp. nov., specimen with a long petiol $\times 1$. No. 32890.

13. *G. rajmahalensis* sp. nov., a portion of non-stomatiferous zone showing epidermal cells with wavy margins. $\times 500$. No. 28036-1.