STUDIES IN THE GLOSSOPTERIS FLORA OF INDIA — 17. ON THE GENUS *RUBIDGEA* TATE

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ABSTRACT

The little known Glossopteridean genus *Rubidgea* Tate is described from the Karharbari beds, Giridih Coalfield. Two new species, *R. obovata* and *R. lanceolatus* have been instituted. The generic diagnosis has been emended on the basis of the Giridih specimens.

INTRODUCTION

THE generic name *Rubidgea* was first instituted by Tate (1867) for the two South African specimens collected from the Karroo beds with the following diagnosis:

" Frond oblong, obovate, rounded and obtuse at apex; secondary veins very slender, very much crowded, dichotomous, oblique. There is no indication of anastomosis of veins ".

This diagnosis was based upon the collection and diagram made by Dr. Rubidge from Bloemkop, near Sunday's river, Groaf Reinet and Mr. M'Kay from East London, at the mouth of Buffalo River, South Africa.

Feistmantel (1889: 47) in his remarks on Tate's specimen agrees with the original diagnosis and expresses that the leaf is oval or spathulate and has evidently no midrib, but numerous nerves arise from median region simulating a midrib and arch out steeply towards the margin; they dichotomise but do not form any meshes.

Eversince these leaves were first described in 1867 there has been no further addition to our knowledge of this genus. In view of this and lack of a photograph of the original specimen, Arber (1905: 54) regarded its identity as uncertain. Seward (1907) included it under *Glossopteris indica* on the basis of the specimens sent by M'Kay labelled *Rubidgea* from the South African Museum and considered Tate's drawing inaccurate. Eversince the genus has been described, no one has seen the original specimen of Tate which is apparently misplaced (SEWARD, 1907). Evidently, the opinions of Arber (*l.c.*) and Seward (*l.c.*) on *Rubidgea* are not free from doubts.

That *Rubidgea* constitutes a new type of leaf among Glossopteridales is now definitely confirmed by the findings of some specimens from the Karharbari beds of the Giridih Coalfield, which essentially agrees with the diagnosis of Tate (*l.c.*) and the observations of Feistmantel (*l.c.*). The generic diagnosis of *Rubidgea* by Tate (*l.c.*) circumscribes a particular form of a leaf, hence the diagnosis is redefined here on the basis of present Karharbari specimens.

DESCRIPTION

Rubidgea Tate, Emend.

Emended Diagnosis — Leaf obovate, ovate, spathulate, oblanceolate in shape, apex acute or obtuse, base tapering; devoid of midrib, numerous veins arising from the median longitudinal position of the frond, occasionally simulating a false midrib. Secondary veins more or less arched, dichotomous, devoid of anastomoses.

Genotype — *Rubidgea mackayi* Tate, 1867, p. 14; Pl. 5, Fig. 8.

Locality — Blomkop, near the Sunday's River, Groaf Einet, South Africa.

Horizon — Karroo beds (Permian).

Comparison and Discussion — The occurrence of *Rubidgea* was hitherto confined to the Lower Permian Gondwana beds of South Africa. The present new finds of *Rubidgea* from Srirampur Colliery in the Karharbari beds demonstrates the presence of this genus in nearly contemporaneous strata of the Lower Gondwanas of India as well. The most distinguishing characters of *Rubidgea* leaves are (i) the absence of midrib, (ii) absence of meshes, (iii) presence of arched secondary veins.

The genus *Glossopteris* (Brong.) Sternberg differs by the presence of a midrib and meshes. *Gangamopteris* McCoy (1847) agrees in the absence of midrib, but is distinguished by presence of meshes. *Rhabdotaenia* Pant (1958) agrees in the absence of meshes but it has a distinct midrib and

the veins emerge nearly at right angles from the midrib. *Palaeovittaria* Feistmantel is closely comparable to *Rubidgea*, but in the former a midrib is evident in the basal part of the frond which becomes evanescent in the apical part. *Noeggerathiopsis* Feistmantel (1879) and *Euryphyllum* Feistmantel (*l.c.*) are characterized by more or less parallel running straight dichotomising veins from base to apex. It may be added that the leaves of *Petschiria* Zalessky (1933) from the Angara flora exhibit characters allied to *Rubidgea*. However, in the lack of our present knowledge about the relationship between the two floras it will be appropriate for the present to keep *Rubidgea* separate from the Angara form.

Rubidgea obovata sp. nov.

Pl. 1, Figs. 1-3; Text-fig. 1

Diagnosis — Leaf obovate, with broadly obtuse apex and tapering base. Midrib absent, median region occupied by few parallel running veins. Secondary veins arise from the median veins, flexuous, broadly arching, dichotomising, meshes absent.

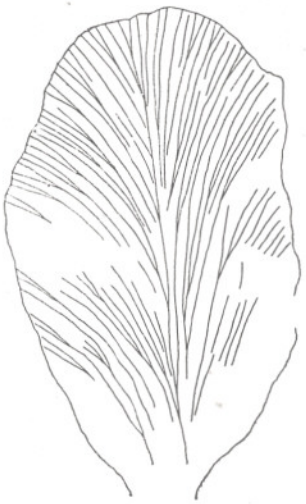
Holotype — 31383/424, Birbal Sahni Institute of Palaeobotany Collection.

Isotype — 32729/499 & 32793/604, Birbal Sahni Institute of Palaeobotany Collection.

Locality — Central pit, Srirampur Colliery, Giridih Coalfield, Bihar.

Horizon — Karharbari Stage (Lr. Permian).

Description — Only three specimens are in the collection. Two of them are nearly complete, except for their basal part. The one measure 3·5 × 1·7 cm. (Pl. 1, Fig. 1) and the other 2·7 × 1·7 cm. (Pl. 1, Fig. 4). The third specimen (Pl. 1, Figs. 1, 3) is 5·6 × 3·6 cm. Irrespective of the size difference in the specimens, the venation character, density of veins and the apex is similar in all of them. The leave sare obovate in shape, with a broadly obtuse apex. In all the leaves the basal part is incomplete, but one of the more complete specimens (holotype) suggests that the leaves has a tapering base. The margin is entire. The median portion is occupied by a few parallel running veins. Secondary veins are fairly close (about 18-20 per cm.), broadly arched, flexuous, and dichotomise frequently. They never form any meshes (Pl. 1, Figs. 2, 4; Text-fig. 1).



Text-fig. 1 — *Rubidgea obovata*, the holotype magnified to show the flexuous, dichotomus veins. × 2.

Comparison and Discussion — The species differs from *Rubidgea mackayi* Tate (1867) in its broadly obtuse apex and flexuous secondary veins. Besides, in *R. mackayi* the median region has several subparallel veins, whereas in *R. obovata* there are only few veins.

Tate (*l.c.*) marked the presence of few elleptical bodis on the leaf of *R. mackayi* arranged in regular order coincident to margin which he regarded as the fructifications. Plumstead (1958: 71) considered them to be fungal spots. However, nothing can be categorically said at present without a reexamination of the original specimen.

Rubidgea lanceolatus sp. nov.

Pl. 1, Fig. 5

Diagnosis — Leaf oblanceolate, with acute apex and narrow tapering base; midrib absent, median region occupied by few subparallel veins; secondary veins arise from the median veins at acute angle, slightly arched towards margin, dichotomising frequently, meshes absent.

Holotype— 20405, Birbal Sahni Institute of Palaeobotany Collection.

Locality — Central pit, Srirampur Colliery, Giridih Coalfield, Bihar.

Horizon — Karharbari Stage (Lr. Permian).

Description — The solitary specimen measures 10·5 cm. in length and 2·8 cm. in breadth at the middle region. It has an acute apex, a narrow tapering base and an entire margin. Few median subparallel veins arise from the base and occupy the median portion of the leaf. Secondary veins emerge at acute angle from the median veins and run straight for most of their course but are slightly arched towards the margin. The veins increase in number due to dichotomy and average about 20-22 per cm.

Comparison and Discussion — *Rubidgea lanceolatus* is distinguished from the *Rubidgea obovata* in its shape, acute apex, straight veins and the density of veins. *Rubidgea mackayi* differs from the present species by the obovate shape of the leaf and roundly obtuse apex.

The leaf which bears *Lanceolatus palaeovittarius* Plumstead (1958, Pl. 16, Fig. 1; Pl. 17, Fig. 1), judged from its photograph, appears to be a *Rubidgea* because no midrib is evident in the illustrations, and the median region of leaf seems to be occupied by the subparallel veins. If it was so then Plumstead's specimen would stand very close to the *Rubidgea lanceolatus*. But, nothing can be said definitely till the original specimen is examined.

Carruthers (1869) described *Noeggerathia obovata*, an imperfectly preserved specimen from Rio Grando de Sul, Brazil. It was later considered to be a *Gangamopteris* by Arber (1905) and White (1898). On examination of the diagram of *N. obovata*, the specimen appears to show the characters of *Rubidgea*, i.e., the secondary arched veins emerge from median veins and do not form any meshes. The toxonomic position of *N. obovata* would remain undecided till the specimen of Carruthers is reexamined in the light of recent researches.

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EXPLANATION OF PLATE 1

1. *Rubidgea obovata* sp. nov., Holotype; specimen No. 31383/424; Central pit, Srirampur Colliery. × 2.

2. The holotype magnified to show the arrangement of the veins. × 4.

3. *Rubidgea obovata* sp. nov., the biggest specimen in the collection. Only the apical half is preserved. Specimen No. 32792/499; Central pit, Srirampur Colliery. × 1.

4. *Rubidgea obovata* sp. nov., Another small specimen showing the characteristic venation of *Rubidgea*. Specimen No. 32793/604; Central pit, Srirampur Colliery. × 2.

5. *Rubidgea lanceolatus* sp. nov., Holotype; Specimen No. 20405; Central pit, Srirampur Colliery. × 1.


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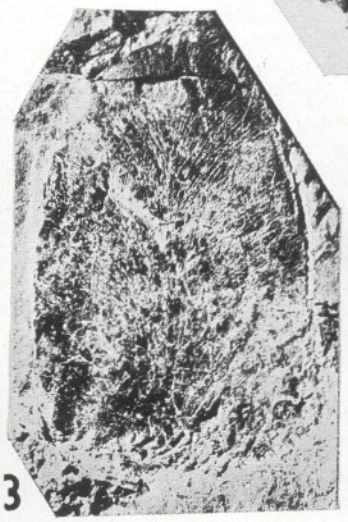
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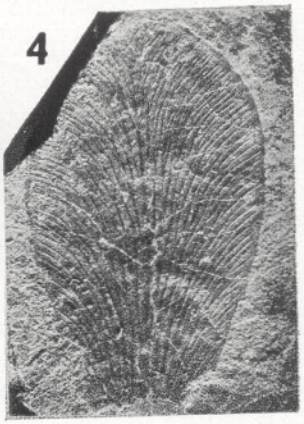
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