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Glossopteris chhindai, a new species of *Glossopteris* from Permotriassic beds of Kamthi stage, Perasia, district-Chhindwara India

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ABSTRACT

The Permian glacial deposits of S. Africa, Australia, S. America and Antarctica are succeeded by beds containing a flora very different from that of N. America and Europe. The flora of the south grew in a cold, wet climate, while that of the north existed under warm conditions. Plants with elongate, tongue-shaped leaves dominated the southern flora, with the genera Glossopteris and Gangamopteris being among the best known. Of these two, the genus Glossopteris gives its name to the flora. Glossopteris is characterized by a leaf with a fairly well defined midrib and a reticulate venation. The present specimen is from Chhinda open cast mine, Perasia of Permotriassic beds of Kamthi stage. It shows its close affinities with the Glossopteris leaf but differs from its species. Hence it is described under a new specific name *Glossopteris chhindai*. The specific name is given after the locality Chhinda open cast mine, Perasia.

Key words: Permia, *Glossopteris,* Permotriassic, Perasia, Reticulate.

INTRODUCTION

Glossopteris, the genus from which the group gets its name, is also the largest and best-known member of the Glossopteridales. More than 70 species of this genus have been recognized in India alone, with additional species from South America, Australia, Africa and Antarctica. Only a few fossils from the northern hemisphere have been considered as member of this group, but these are not identified with great certainty. The name *Glossopteris* was proposed by Brogniart in 1822 but Sternberg gave it a generic status. In 1828, Brogniart describe *G. browniana Var. indica and G. browniana Var. Australsia* from India and Australia respectively. The first Indian species of *Glossopteris* which Schimper (1869) changed into separate species *G. indica.* From India, several workers have described different *Glossopteris* species on the basis of morphological as well as cuticular characters from various localities.

The flora of Kamthi formation was earlier studied by Bunbury (1861), Oldham and Feistmantel (1881). Bunbury (1861) described three species of *Glossopteris* from Kamthi and Silewada, Nagpur which are *G. musaefolia*, *G. stricta, G. damudica and G. leptoneura.* In 1881 Feistmantel described *G. damudica, G. communis, G. musaefolia, G. stricta, G. indica* and *G. angustifolia* from Wardha Godavari valley of Kamthi group. Jacob (1950) reported *G. Indica* from Kawadsi, Khan (1969) reported seven species of *Glossopteris* from Kamthi stage and these are *G. angustifolia, G. browniana, and G. communis. G. conspicua, G. damudica, G. indica* and *G. retifera*. Shaila Chandra and Prasad (1981) recorded *G. arberi* (Shrivastava 1956), *G. musaefolia* (Bunbury 1861), and *G. Mohudensis* (Chandra and Surange 1979) from Bazargaon. *Glossopteris acutensis* (A. Yadav, S. Narkhede & M. Bhowal 2012). The present chapter is an additional contribution to the Gondwana species.

MATERIAL AND METHOD

The specimen for present study are collected from Chhinda open cast mine, Perasia, Dist. Chhindwara. This mines is 7 to 8 KM from Perasia. The material is preserved in the form of impression on black colored coal shale. The specimens are studied with the help of different magnifying lenses and binocular research microscope.

DESCRIPTION

The specimen shows an impression of spathulate leaf with an obtuse apex (Figure 1a & Text Figure 2a). The preserved leaf is of medium size, broad at apex and narrow at the base. The preserved length of lamina is 12 cm and it is 5.3 cm broad at the apex than the middle region. At the tip of the apex it is 2.6 cm broad. Middle region 4.5 cm broad and at the base it is slightly narrow 1.5 cm broad and at the extreme base it is 7 mm broad. The midrib is broad, prominent. Thick at the base and gradually tappers towards the apex. Midrib 3 mm broad at the middle, 1 mm at the apex and at the base it is comparatively much broader than the middle, that is 4 mm broad (Figure 1 & Text Figure 1). The L/B ration is 2:1. The secondary veins arises at an angle of 45^{o} to 50^{o} and taking graceful curve runs towards the margin. The secondary vein anastomise to form long narrow polygonal meshes of size 1 to 1.5 x 5 to 8.5 mm. (Figure 1b & Text Figure 2b).

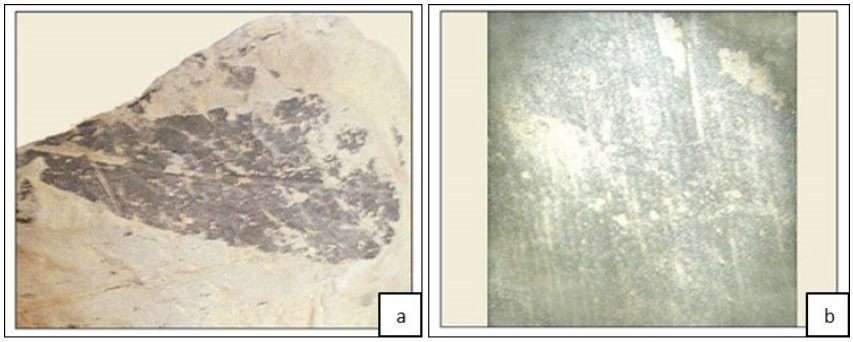

Figure 1: a, Leaf impression of *G. chhindai* showing lanceolate shape and angle of divergence of secondary vein. XN
b, A magnified views of *G. chhindai* showing venation pattern. X2.

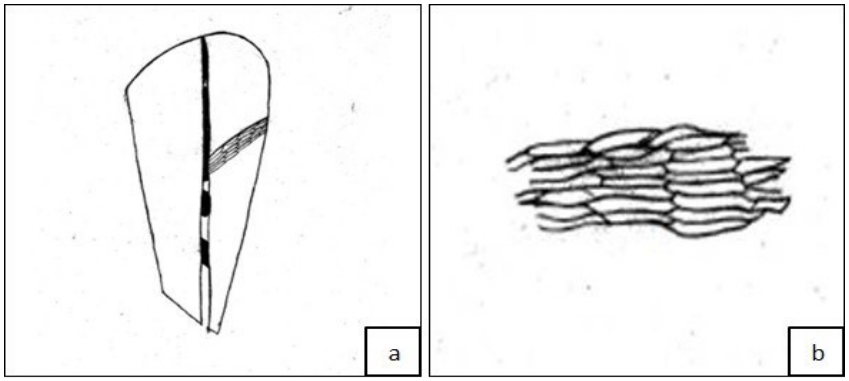

Figure 2: Explanation of text figure, a, Leaf impression of *G. chhindai* showing spathulate shape & angle of divergence of secondary vein. XN **b,** A magnified views of *G.chhindai* showing venation pattern X2.

IDENTIFICATION

Leaf shows Important morphological characters such as spathulate leaf with obtuse apex, Midrib broad, prominent and thick at base, L/B ratio is 2:1, Secondary lateral veins angle formation at 45^{o} to 50^{o}, Lateral veins take graceful curve and runs towards the margin and Polygonal meshes of sizes 1 to 1.5 x 5 to 8.5 mm.

COMPARISON

The present specimen can be compared with *G. gigas* (Pant and Singh 1971) is characterized by large and broad leaves which are elliptical with an acute to cuneate base. Midrib at an angle of less than 45^{0} to form long and narrow meshes. The similarities encountered are only in respect of obtuse apex and wide midrib.

The present specimen can be compared with *G. communis* (Feistmantel 1879) in venation pattern. In both the case meshes are long narrow however

in present specimen the leaf is of medium size and spathulate, whereas *G. communis* is long elliptical leaf forming an angle of less than 45°.

G. sastrii (Pant and Singh 1974) shows medium size leaf, apex obtuse, midrib prominent but strikingly differs in venation pattern and obtuse base.

The specimen can be compared with *G. major* (Pant and Singh 1971) in venation pattern as in both the leaf long narrow polygonal meshes are found but differ from each other in shape, margin and size etc.

The present specimen agree with *G. spathulata* (Pant and Singh 1971) in only long narrow meshes and arching of veins but not in angle of emergence of secondary veins. In present specimen angle formed at 45° to 50°.

Thus, present specimen does not agree with any recorded species of *Glossoperis* and it is also from a new locality. Hence, is described under the new species as *Glossopteris chhindai*, the specific name is given after the locality Chhinda open cast mine, perasia.

DIAGNOSIS

Leaf spathulate, broad at the apex and narrow at the base, obtuse apex, midrib prominent and thick at base, L/B ration 2:1, secondary veins arises at an angle of 45° to 50° taking graceful curve runs towards the margin, secondary veins anastomises to form long narrow polygonal meshes of sizes 1 to 1.5 x to 8.5 mm.

Holotype : AMY. /G-2. Department of Botany, Institute of Sicence, Nagpur.
Locality : Chhinda open cast mines, Perasia, Dist. Chhindwara, Madhya Pradesh, India.
Horizon : Lower Gondwana of India.
Age : Permotriassic.

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