



REPORT OF A DICOT ROOT FROM THE DECCAN INTERTRAPPEAN BEDS OF SHIBLA, M.S. INDIA

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ABSTRACT:

The present paper describes the study of another dicot root recorded for the first time from the fossiliferous locality Shibla (Lat. 19°58.141'N and Long. 78°40.838'E) a treasure of fossiliferous cherts containing organic material of Yeotmal district, M.S. India. The specimen was collected from the field near roadside of the village Shibla which is 20 Km. away from Pandharkawada on Wani road. From this locality so far monocot roots, dicot woods, *Sahnipushpam* flower, seeds of *Indovitis*, dicot fruits, *Graminocarpon* and other grains (Kapgate, 2012) are reported.

Keywords: Shibla, Treasure, *Indovitis* etc.

INTRODUCTION:

The present paper deals with a detailed investigation of specimen of fossil dicotyledonous root from the Deccan Intertraepen Beds of Maharashtra state. It is collected from the old but unexplored fossiliferous locality Shibla (Lat. 19°58.141' N and Long. 78°40.838'E) of Yeotmal district, M.S. India. The specimen was collected from the field near roadside of the village Shibla which is 20 K.m. away from Pandharkawada on Wani road.

From the Deccan Intertrappean Beds of India, very few dicot roots like *Dicotylirhizos sahnii* (Rao, 1957); *Aerorhizos harisii* (Chitaley, 1968); *Sonneratorhizos raoi* (Chitley, 1968); *Dicotylirhizos nautilii* (Saxena et al., 2003); *Dicotylirhizos herbatiales* (Kapgate, 2004) have been reported. The following paper gives additional contribution to the reported dicot roots.

METHOD AND MATERIAL:

The present materials have been found in the form of black Cherts. The specimens got exposed in T.S on breaking pieces of cherts. The material being well preserved was etched with hydrofluoric acid and after washing with water serial peel sections have been taken (Darrah, 1936) and mounted on DPX mountant. Photographs are also taken for further study.

DESCRIPTION:-

The present specimen is collected from a roadside of the locality of Shibla in the form of black cherts; after breaking it opens in a transverse plane and shows following characteristics –

The specimen measures 1.3 to 1.5 mm in diameter. Its stele is well preserved and shows primary and secondary xylem. The primary xylem is hexarch and secondary xylem is seen split by its broad rays. The details are as follows –

Pith :-

Small pith composed of a few thin walled parenchymatous cells is present in the centre of the root. There are 5 – 6 xylem elements each surrounded by thick walled cells (Plate fig. 4).

Primary Xylem :-

Outside the pith, there is well preserved primary xylem. The number of xylem ridges is consisting of two or more exarch protoxylem elements measure 30 to 40 mm and that of metaxylem 90 to 110 mm. The length of two septa of the protoxylem vessel element measures 122–128 mm and that of metaxylem 145 – 180 mm (Plate figs. 1 to 3).

Secondary Xylem :-

Outside the primary vascular region of secondary xylem consist of vessels, xylem parenchyma, xylem rays and fibers.

Vessels :-

Vessels are 6 to 10 per sq. mm, measuring 30 to 50 mm in diameter. They are mostly in multiples of 2 to 4, a few solitary. In transverse section, they are oval to round in shape measuring 5 to 10 mm radially (Plate fig. 3 and 4).

Xylem parenchyma :-

It is apotracheal diffuse type, composed of thin walled parenchymatous cells (Plate fig. 4).

Xylem rays :-

Six wide parenchymatous rays extend out from ridges of primary xylem divide the axial secondary xylem and are broader than the periphery. The medullary rays are radially banded and three to four

celled thick, sometimes made up of heterogenous broad parenchymatous cells. In transverse section they are flat; radial with 2 to 4 mm and length 110 to 350 mm. Pits of ray cells are not seen (Plate fig. 5).

Root fibres :-

These form the major mass of root. They are arranged in radial rows. In transverse section these are squarish to polygonal in shape. They are blunt at the end and are non-storied, moderately thick walled and 3 to 5 mm in thickness. Fibres are exclusively aseptate. The pitting of the fiber cells is not clearly seen (Plate figs. 4 and 5).

COMPARISION AND IDENTIFICATION

The root shows following anatomical characters, used to identify it –

- Small root with 1.3 mm to 1.5 mm in diameter.
- Small pith with few parenchyma cells.
- Primary xylem in six groups forming hexarch nature.
- Broad rays equal to a number of xylem.
- Secondary xylem containing a few solitary vessels.
- Vessels in radial multiples of 2 to 4.
- Xylem parenchyma apotracheal diffused type.
- Medullary rays are of primary and secondary type.
- Primary medullary rays are multiseriate.

It is evident from the above description that the present specimen is a dicot root showing primary as well as secondary growth. It is compared with the roots of modern taxa and reported fossil specimens.

Comparision with living taxa :-

From the above characters it is evident that the fossil root can be comparable with families like Ampelidaceae, Nepenthaceae and Compositae (Metcalf and Chalk, 1950) because of presence of xylem with six exarch arcs, but there are many generic differences from the present tiny root.

Comparision with fossil specimens :-

Fossil root *Sonneratorrhizos raoi* (Chitley, 1968) resembles the present fossil root having 4 to 6 xylem arcs, ray against primary xylem arcs but differs in having wide pith, uniseriate and homocellular medullary rays.

Fossil dicot root *Dicotylirhizos sahnii* (Rao, 1957 ; Chitley et al. 1970) resembles the fossil specimen in having small pith, 5 to 6 exarch primary xylem, 2 to 3 uniseriate medullary rays but widely differ in

solitary vessels, sparse fibers and presence of tyloses.

Fossil root is also compared with *Dicotylirhizos nautilii* (Saxena et al. 2003) is small dicot root with 6 xylem arcs, xylem exarch, 6 xylem rays against primary xylem are differ in having secondary growth.

Fossil root when compared with *Dicotylirhizos herbatiales* (Kapgate, 2005) shows close resemblance with the above root showing 6 xylem arcs, exarch in nature, pith small consisting of parenchymatous cells, 6 xylem rays each against primary xylem arc but shows difference by vessels 5 to 10 mm in diameter and axial xylem split into segments by wide parenchymatous rays.

As the root shows uncertain affinity it is kept under the same form genus *Dicotylirhizos* as per the suggestion of Rao (1957) and specific name as *shibalii* from the name of locality from where it is collected. Hence, *Dicotylirhizos shibalii* sp. nov.

DIAGNOSIS :-

Dicotylirhizos shibalii sp. nov.

Small dicotyledonous root with secondary growth; 1.3 mm to 1.5 mm in diameter, xylem arcs six (hexarch condition), exarch, protoxylem 30 to 40 mm in diameter and metaxylem 90 to 110 mm in diameter; secondary xylem with vessels which are 30 to 50 mm in diameter and 6 to 10 per sq. mm., six xylem rays against primary xylem arc. Xylem rays are heterogenous. Fibers are non-septate and non-storied.

RESULT AND DISCUSSION:

Although many petrified roots are described by various researchers from different localities of Deccan Intertrappean Beds, India; this root specimens is the first one from the unexplored but locality of Maharashtra, Shibla.

CONCLUSION

After detailed discussion and comparison with previous genera reported by various researchers a new species of root is made here i.e. *Dicotylirhizos shibalii* sp. nov.

Holotype :- MHW / Ang. Root 1/ Deposited at Botany Dept.

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Horizon :- Deccan Intertrappean Beds of Maharashtra state,

Locality :- Shibla (M.S.)

Age :- Uppermost Cretaceous.

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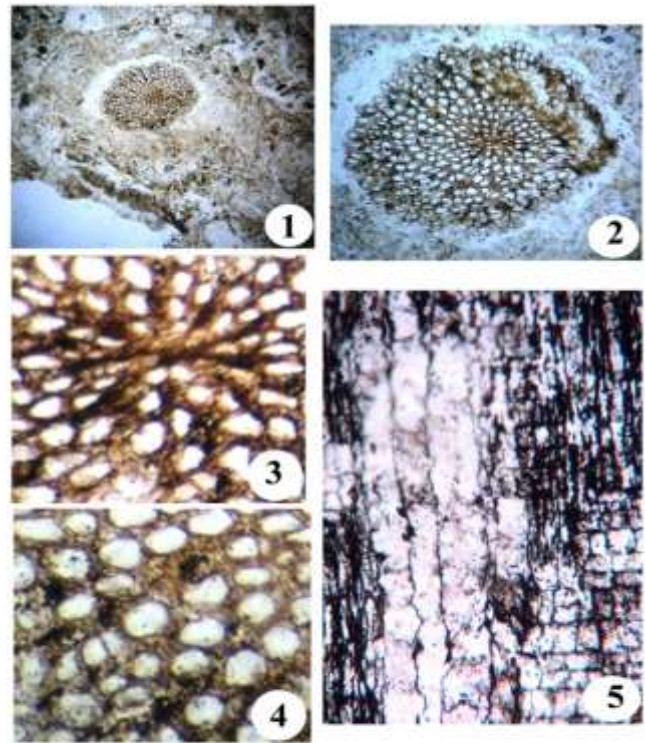


Plate figs. 1 to 5

Dicotylirhizos shiballi sp. nov. 1. Transversely exposed root on chert. 2. The root on chert enlarged. 3. Central portion of the root showing hexarch condition. 4. Details of root showing structure of vessels enclosing xylem parenchyma. 5. T.L.S. of root (magnified view)