

Petrified *Cladode Cladophylon dakshinensis* gen. et.sp.nov. from Intertrappean Beds of Mohgaonkalan, M.P., India

Paper ID	Ijifr/V5/ E1/ 018	Page No.	8746- 8750	Subject Area	Botany
Key Words	Angiosperm, Cladode, Monocot, Deccan, Mohgaonkalan				

M.B. Bobade

Associate Professor,
Department of Botany,
Mahatma Fule Arts, Commerce and Sitaramji
Choudhari Science Mahavidyalaya,
Warud- Amravati, Maharashtra

Abstract

The present investigation of petrified angiospermic *Cladode* has been described from Mohgaonkalan, (22° 1'N; 79° 11' E), the well known fossiliferous locality in Chhindawada district, M.P., India. The present fossil xerophytic angiospermic *Cladode* is being different from all known fossil monocot leaf and not satisfactorily resembling modern leaf, but shows similarities with *Asparagus cladode*, hence describe here.

I. INTRODUCTION

Mohgaonkalan is rich fossiliferous locality in Chhindawada district of M.P., India. Fossil cherts were collected from this locality. So far number of monocotyledonous petrified leaf described from Deccan Intertrappean beds of India. The earlier described, xerophytic plants are very rare from Mohgaonkalan. Showed a specimen, on its anatomical study similar with cladode of *Asparagus*. The present fossil specimen being different from known fossils, hence it has been described here.

II. MATERIAL AND METHOD

The petrified angiospermic cladode is collected from, Deccan Intertrappean beds of Mohgaonkalan, M.P., India, Which is uppermost Cretaceous period. The description of fossil cladode is based on one specimen only. The serial sections are taken by peel method for detail anatomical studies.



III. DESCRIPTION

Only one specimen of fossil fruit is studied. The present fossil specimen is exposed in transverse plane, measures about 1.35 mm in width, and 600-750 μ thick in middle region. It is flat in nature, slightly angular, monocotyledonous, angiospermic cladode. It shows single layered, upper and lower epidermis, with thick walled cells. Cellular details of both these layers not seen clearly. It is covered with thick cuticle (Text. fig. 1, Pl. fig.1). At some places, both the layers show, small openings, may represent stomatal openings.

Mesophyll region is not well preserved, shows at some places, thick walled, parenchymatous cells. Thickness of this region is not uniform but varies about 150-750 μ m. (Text. fig. 1, Pl. fig. 1).

Central region of cladode is occupied by single large vascular bundle, surrounded by large parenchymatous cells, may be bundle sheath cells. They are large in relation to xylem tissue, about 74-110 μ . Vascular bundle is conjoint, and collateral. Protoxylem elements, measure 20-37 μ in diameter are present at the center, and metaxylem approximately, 36-40 μ in diameter outside the protoxylem. There are thick walled cells between xylem elements may be xylem fibers. The phloem tissue is not preserved well but some thin walled cells, associated with xylem element, which might be represented by phloem elements (Text. fig. 1, Pl. fig.1). The present fossil specimen of cladode shows anatomical characters which resemble with anatomical features of *Asparagus*.

IV. DISCUSSION AND COMPARISON

The petrified monocotyledonous, angiospermic cladode is 1.35mm in width and 600 – 750 μ thick in midrib region, flat, angular, mesophyll region consists of thick walled parenchymatous cells, single vascular bundle in the center, surrounded by bundle sheath cells. On basis of these characters the cladode is compared with reported fossil monocotyledonous leaves as well as cladode of *Asparagus* of family *Liliaceae*.

COMPARISION WITH KNOWN FOSSIL LEAVES

- i. *Musophyllum indicum*, (Prakash, Bande, Ambwani, 1980), is the impression of fossil leaf, it does not show any similarity regarding anatomical details. Hence it is different from present fossil specimen.
- ii. It is also compared with *Carexophyllum mohgaonii* (Bhowal and Sheikh, 2003), is a single leaf, slightly V shaped, vascular bundles arranged in single row, while present fossil specimen is the cladode with single vascular bundle in the center. Hence *Carexophyllum* is differs from present specimen.
- iii. *Festucophyllites intertrappea* (Singh, 1977), is the petrified monocot leaf sheath, leaves are arranged in acropetal succession, which is totally different from present specimen. Thus the present fossil cladode specimen is totally different from reported fossil leaves.

- iv. On Comparison with cladode of *Asparagus* of *Liliaceae*, it shows close similarity with present fossil specimen.
- v. The similar characters between cladode of *Asparagus* & present fossil specimen is the angular shape of cladode, large parenchymatous bundle sheath round the vascular bundle in the center, thick cuticle on epidermis, these characters are similar in both the specimens.
- vi. The present fossil cladode differs, from cladode of *Asparagus* in not having mesophyll tissue differentiation, palisade like elongated cells below epidermis.
- vii. Thus after comparison with the reported fossil leaves and cladode of *Asparagus*, it comes to the conclusion that, the present fossil cladode, show close resemblance with the cladode of *Asparagus*, in having single vascular bundle in the center, surrounded by large parenchymatous bundle sheath. Hence the new genus is created as *Cladophylon dakshinensis* gen. et.sp. nov. The generic name is after cladode & specific name is after Dakshin.

V. DIAGNOSIS

Cladophylon dakshinensis gen.nov.

Petrified, monocotyledonous cladode, slightly angular, upper and lower epidermis with thick walled cells, mesophyll undifferentiated consist of thick walled parenchymatous cells, single vascular bundle in the center, surrounded by large parenchymatous bundle sheath cells, vascular bundle is conjoint, collateral. Protoxylem elements are in the center & metaxylem outside the protoxylem. Some thin walled cells associated with xylem elements represent phloem.

Cladophylon dakshinensis gen. et. sp. nov.

Petrified cladode, monocotyledonous, size, 1.35mm in width, 600-750 μ thick in middle region, upper and lower epidermis thick walled with cuticle, mesophyll region undifferentiated, consists of thick walled parenchymatous cells. Vascular bundle single is in the center, surrounded by bundle sheath cells. Protoxylem elements are about 20-37 μ , in diameter in the center, metaxylem elements are about 40-57 μ in diameter outside the protoxylem.

<i>Holotype</i>	–	<i>MOH/MBB/ MON A</i> <i>Department of Botany. S. S. College, Akola.</i>
<i>Locality</i>	–	<i>Mohgaonkalan, M.P., India.</i>
<i>Horizon</i>	–	<i>Deccan Intertrappean series of India.</i>
<i>Age</i>	–	<i>Uppermost Cretaceous.</i>

VI. EXPERIMENTAL OUTPUT

1. 2. Explanation of test: Figure 1

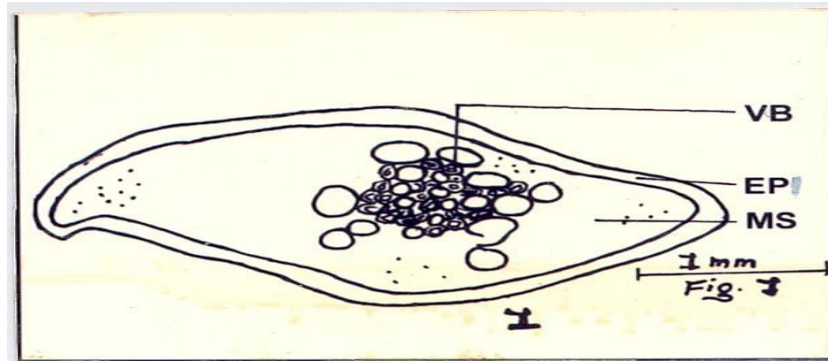


Figure: 1 T.S. of Cladode Showing Epidermis (EPI), Mesophyll (MS), Vascular Bundle (VB), with large Bundle Sheath Cells.

2. Explanation of Plate: Plate Figure 2 & Figure 3

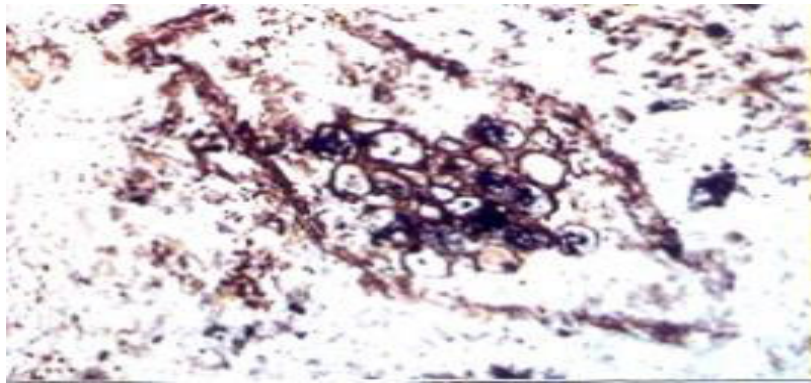


Figure 2: T.S. of cladode showing upper and lower epidermis, mesophyll with thick walled cells and vascular bundle, showing bundle sheath cells and xylem elements. X 40

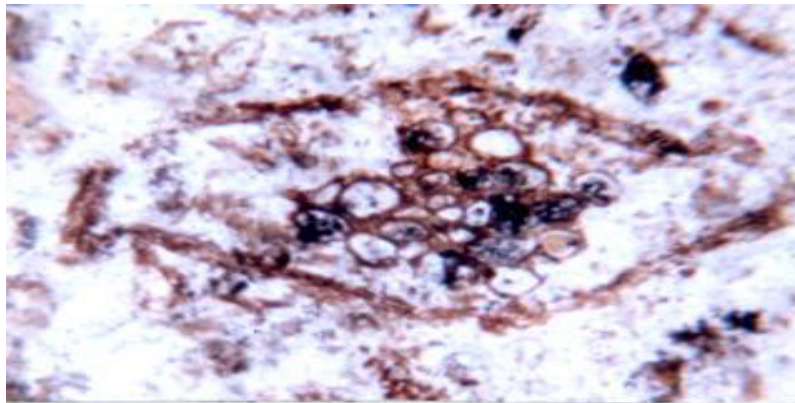


Figure 3: T.S. of entire Cladode x 20

VIII. CONCLUSION

During visit to Mohgaonkalan fossiliferous locality, I could not see the continuity of Intertrappean exposures and are seen in the form of patches. This is due to small lake in which sedimentation take place. The occurrence of Tricocites in Intertrappean beds of Mohgaonkalan is the indication of sea near Mohgaonkalan. This marine condition feature of Palaeogene. Same type of flora is seen in Eocene deposite near Barmer and Rajasthan. As the flora of Rajasthan and

Intertrappean beds of Mohgaonkalan correlate each other, some deposit Intertrappean beds of Mohgaonkalan might be Eocene age.

IX. REFERENCES

1. **Bande, M. B. & Prakash, U. (1982).** Paleoclimate and Paleogeography of central India during early tertiary. *Geophytology.*, 12: 152 – 165.
2. **Barlinge, S. G., (1980).** “Morphological investigation of flora of Deccan Intertrappean series of India.” Ph.D. Thesis, Nagpur University, Nagpur.
3. **Bhowal, M. and Sheikh, M.T. (2003).** *Carexophyllum mohgaonse* gen.et.sp.nov. A petrified monocot leaf from Mohgaonkalan, M.P., India. *Nat. Conf. On Recent Advances In Botany at Bhandara., (Abs):* 18.
4. **Chitale, S. D. and Patel, M. Z., (1970).** A petrified monocot leaf from Deccan Intertrappean cherts of India. *The Botanique.,* 1: 47.
5. **Chitaley, S. D. and Patil, G. V., (1970).** A petrified leaf from Deccan Intertrappean beds of India. *Bio. Soc.,* 13(2): 30 – 36.
6. **Diwedi, J. N., (1961).** Petrified monocotyledonous leaves from tertiary of M.P., India. *Curr. Sci.* 30.342 – 343.
7. **Jain, R.K. (1964).** Studies in *Musaceae*. *Musocaulon indicum* gen.et.sp.nov. A petrified pseudostem from Deccan Intertrappean series of India. *Palaeobotanist* 12 :115 - 120
8. **Kapgate, D.K., (1982).** Study of Mega & Micro fossil flora from Deccan Intertrappean series of India. Ph.D. Thesis, Nagpur University, Nagpur.
9. **Khuhalkar, N.V. (1982).** Petrified plants from Mohgaonkalan, beds of M.P. India. Ph.D. Thesis Nagpur University Nagpur.
10. **Prakash.U. Bande, M.P., Ambawani.(1980).** *Musophyllum indicum* sp.nov. A leaf impression resembling banana leaf from Deccan Intertrappean series of India. *Palaeobotanist.* 26(2):175-179.
11. **Singh, R.B., (1977).** Contribution to knowledge of fossil flora from Deccan Intertrappean beds of India. . Ph.D. Thesis Nagpur University Nagpur.
12. **Upadhye, E.V. (1979).** Morphological studies of the Deccan Intertrappean flora of Mohgaonkalan, M.P., India. Ph.D. Thesis Nagpur University Nagpur

TO CITE THIS PAPER

Bobade, M.B. (2017) :: “Petrified Cladode *Cladophylon dakshinensis* gen. et.sp.nov. from Intertrappean Beds of Mohgaonkalan, M.P., India” *International Journal of Informative & Futuristic Research (ISSN: 2347-1697)*, Vol. (5) No. (1), September 2017, pp. 8746-8750, Paper ID: IJIFR/V5/E1/018.

Available online through- <http://www.ijifr.com/searchjournal.aspx>