



Report of A New Petrified Bryophytic Thallus From The Deccan Intertrappean Beds of Mohgaonkalan, M.P, India

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Abstract

The present paper deals with a report of fossil bryophytic thallus from the Deccan Intertrappean beds of Mohagaonkalan, Chhindwara District, M.P., India. A Bryophytic thallus *Anthoceroites deccanii* described here is dorsiventral thalloid like body tapering towards both ends. Thallus is homogenous in nature. The dorsal surface of thallus shows presence of mucilaginous canals. Scales and Rhizoids are totally absent. On comparison it shows close affinities with the genus *Anthoceros* of family Anthocerotaceae. The entire thallus measures 2833µm in length and 666µm in width.

Keyword: -Deccan intertrappean, Bryophytic thallus

Introduction:

The Deccan Intertrappean flora of Mohgaonkalan has yielded quite a large number of well preserved plant fossils from the major groups of plant kingdom. But few Bryophytic specimens are reported from this horizon because of their fragile nature.

Shuklanities deccanii (Singhai 1964), *Notothylietes Nirulai* (Chitale and Yawale, 1980), *Bharadwajia Mohgaonse* (Yawale, 1975), *Nagpurites Jungermanii* (Sheikh and Kapgate, 1998) and *Andreaeaites ramanujamii* (Kapgate 1986) are few Bryophytic sporogonium (Capsule) investigated from this region.

As well as, some Bryophytic thallus also reported so far from this same horizon are *Riccia Chitaleyi* (Sheikh & Kapgate 1982), *Preissia deccanensis* (Adhao 1986) and *Hepaticites kashyapi* (Sukundarwar 1987). The present fossil specimen is considered as new one and it gives additional information to the knowledge of Bryophytic thallus from the Deccan Intertrappean flora of India. **Material and method**

The material was collected from Mohgaonkalan, M.P. It is nicely preserved in a hard silicified chert. After breaking and itching the chert, the specimen appeared as elongated mass of cell. Serial peel sections were taken. The photographs of specimen were taken & camera lucida sketches were drawn.

Description

The present fossil specimen was collected from Deccan Intertrappean bed of Mohgaonkalan, M. P. The longitudinal section reveals following details of the specimen.

The present fossil specimen is long, dorsiventral thalloid body tapering towards both the ends. The entire thallus is devoid of distinct midrib. The dorsal surface of thallus shows presence of mucilaginous canal and the ventral surface of the

thallus is devoid of Scales and Rhizoids. (Plate I, Figs. 1, 2, 3 Text Figs. 1/1,2/2,3/3.)

Internally the thallus is homogenous and consists of soft uniform parenchymatous cells without any differentiation i.e. Not differentiated into Assimilatory & Storage zone. The entire thallus measures 2833µm in length & 666µm in width (Plate I, Fig. 1. Text Fig, 13). Cells of the outermost layer on both the dorsal & the ventral surface of the thallus are similar, each cell made up of thick walled parenchymatous tissue and measure 49µm to 83.3µm in size. (Text Fig. 14.) The thallus tissue is thickest in the middle portion and narrow towards both the end (Text Fig 4/4,5/5,6/6,7/7,8/8,9/9,10/10,11/11)

In the middle, the thallus is 9 to 12 celled in thickness. Each homogenous parenchymatous cell is polygonal in shape and made up of double walled and it measures 83µm to 116µm in size. (Plate I, Figs. 4 & 5. Text Fig. 15). A characteristic feature of the present fossil thallus is presence of Mucilaginous canals (Plate I Fig. 4. Text Fig. 16.) Single canal measure 133µm to 199µm in size and Scales & Rhizoids are not seen. Usually, bryophytic thallus cells contain Chloroplast & Pyrenoids, they are not seen clearly may be because of their ill preservations.

Identification & discussion

The description of the present fossil thallus reveals the following outstanding characteristics. Thallus is long, dorsiventral and devoid of distinct midrib.

Thallus is homogenous in nature i.e. not differentiated into Assimilatory & Storage zone. Cells of outermost limiting layer of thallus made up of thick walled parenchymatous tissue. Homogenous parenchymatous cells are polygonal in shape and are double walled. Presence of small mucilaginous

canals. Scales are absent. Rhizoids (Smooth walled & tuberculated) are absent.

Thus, the outstanding characters of the present fossil thallus conclude its Bryophytic nature. Hence it is compared with earlier reported Bryophytic thallus from the same locality, for its identification.

Sheikh & Kapgata (1982) reported bryophytic thallus *Riccia Chitaleyii* from the same locality, which vary from the present fossil thallus in having Rosette type of thallus (Dichotomously branched) and thallus is differentiated into Dorsal assimilatory zone and Ventral storage zone, which is totally absent in present one.

Preissia Deccanensis (Adhao 1986) shows resemblance in possessing mucilage canal. But vary greatly, in respect of presence of Assimilatory zone & Storage zone, and presence of Scales & Rhizoids (both smooth and tuberculated).

Comparison with *Hepaticites Kashyapi* (Sukundarwar 1987) shows resemblance in possessing homogenous thallus, i.e. not differentiated into Photosynthetic zone and storage zone. But the difference encountered in having dichotomously branched thallus and presence of both smooth walled & tuberculated rhizoids.

Thus, no close affinities were observed between earlier reported fossil thallus with the present one. Now, affinities are traced with modern (Living) families of Bryophytes.

Bryophytes are divided into three classes

- 1) *Hepaticopsida*.
- 2) *Bryopsida*.
- 3) *Anthocertopsida*.

The class *Hepaticopsida* shows its peculiar characteristic feature: - Plant body is prostrate, dichotomously branched thallus or leaf structure. Usually thallus is differentiated into upper Photosynthetic zone and lower Storage zone. Presence of both simple and tuberculated rhizoids. All these characters differ in present fossil thallus, Hence not comparable.

The class *Bryopsida* shows its peculiar characteristic features, Plant body leafy, erect and radially symmetrical. It has an axis which is attached to the substratum by means of rhizoids and bears spirally arranged leaves. Rhizoids multicellular, branched & septate. All these characters varies from the present fossil thallus, Hence not comparable.

The class *Anthocerotopsida* shows its peculiar characteristic features, Plant body dorsiventral, prostrate and dichotomously branched thallus. Thallus internally homogenous i.e., (No tissue differentiation)

Rhizoids are present and Scales are absent. All these above characters, shows similarity with the present fossil specimen. But the only difference encountered in Rhizoids i.e., Rhizoids are totally absent in the present fossil thallus.

Thus, from the above comparison the present fossil thallus shows close affinities with the class *Anthocerotopsida*. The class *Anthocerotopsida* includes only one order *Anthocerotales*. And two families: - *Notothylaceae* (Genus - *Notothylas*): - *Anthocerotaceae* (Genus - *Anthoceros*) (Muller, 1940; Proskauer, J. 1948 and Smith, 1988)

An attempt is made for further comparison of the present fossil one with the living genera of *Notothylaceae* and *Anthocerotaceae*. Both *Notothylas* and *Anthoceros* resemble in having undifferentiated homogenous thallus. But difference occurred in having smooth walled rhizoids and mucilaginous cavities contains Nostoc colonies.

Hence, The present fossil thallus is not fully matched with any of the living Bryophytic genera. At present it is included under the form genus *Anthoceros* to which it shows close affinities and thus it is named as *Anthoceroites deccani* sp. nov. The specific name is given after the Deccan Trap.

Diagnosis

SPECIFIC DIAGNOSIS:-

Anthoceroites deccani sp. nov

Thallus long, dorsiventral tapering towards both the end. The whole thallus devoid of distinct midrib, homogenous and consist of soft uniform parenchymatous cells without any differentiation. The whole thallus measures 2833µm in length & 666µm in width. Cells of both the surface of thallus similar and made up of thick walled parenchymatous tissue and each cell measure 49µm to 83.3µm in size. In the middle, the thallus is 9 to 12 celled in thickness. Each homogenous parenchymatous cells are polygonal in shape and made up of double walled and it measures 83µm to 116µm in size. Presence of Muciligenous cavities and each cavities measure 133µm to 199µm in size. Scales & Rhizoids are totally absent.

Holotype: APS. / Thallus-1. Department of Botany, Institute of Science, Nagpur.

Locality : Mohgaonkaln, M.P.

Horizon : Deccan Intertrappean Series of India.

Age : ? Upper Cretaceous.

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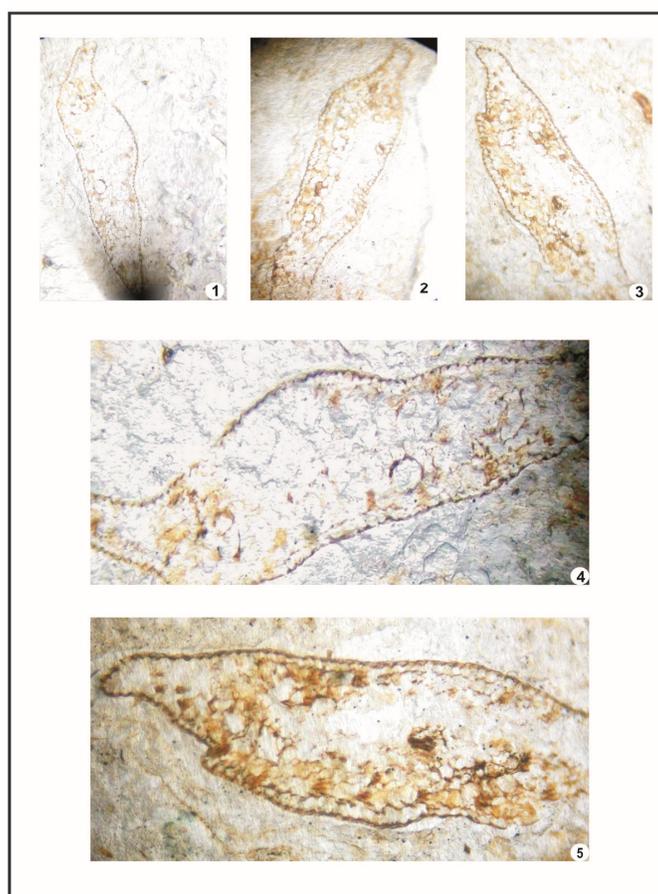
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PLATE-I

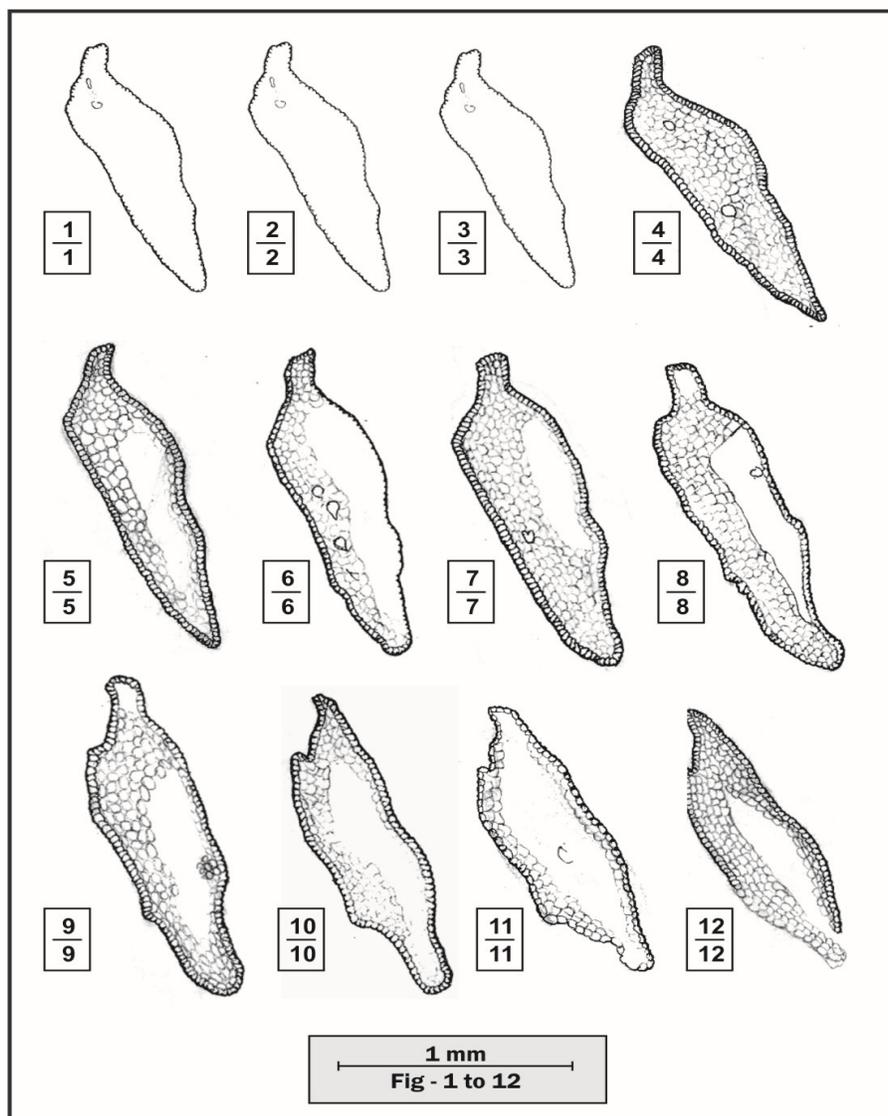


***Anthoceroites deccanii* sp. Nov**

EXPLANATION OF PLATE-I, FIGS.1 To 5

- Figs. 1, 2.** : L.S. of thallus showing long, dorsiventral surface with tapering ends. 50X
- Fig. 3** : L.S of thallus is devoid of Rhizoids & Scale. 50X
- Fig. 4** : L.S of thallus showing Mucilage canal. 100X
- Fig. 5** : L.S of thallus showing homogenous nature of thallus. 100X

TEXT FIGS. - 1 TO 12



Anthoceroites deccanensis p.nov

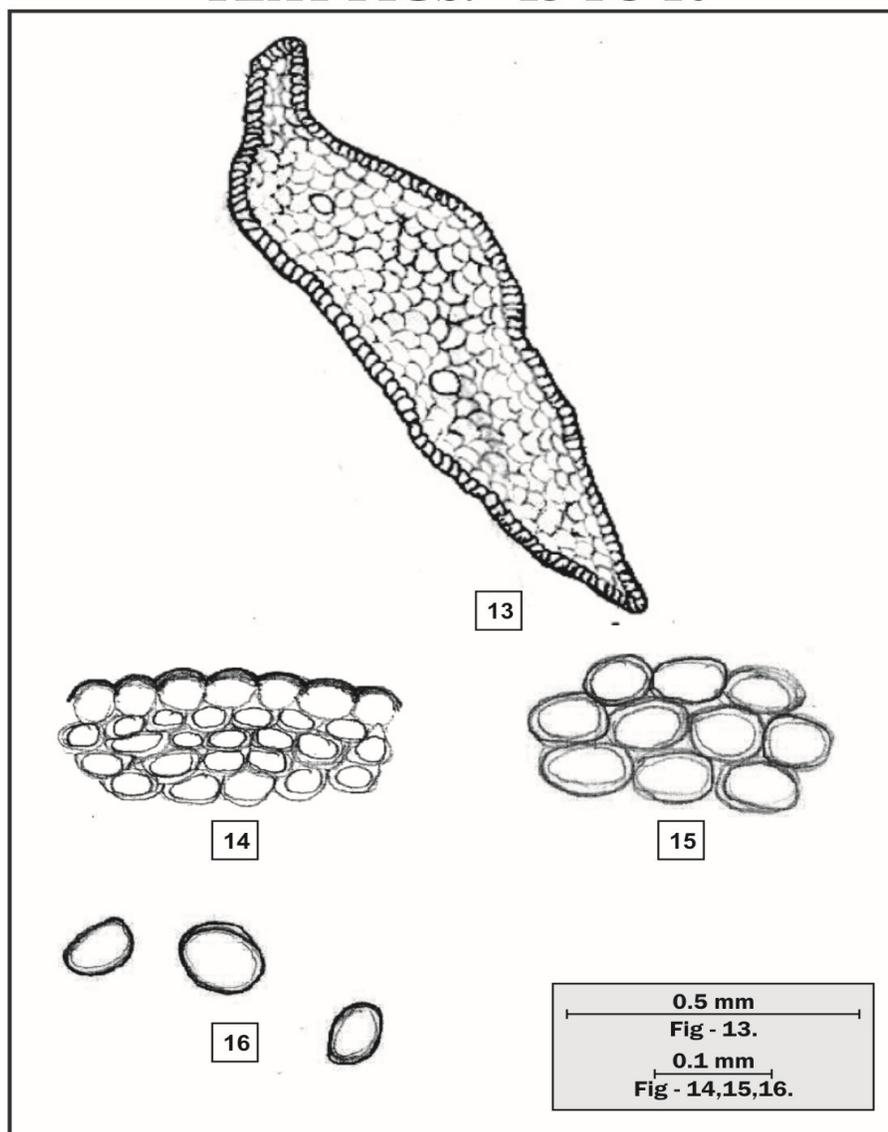
EXPLANATION OF TEXT FIGS. 1 To 12

[The numerator indicates the serial number of text fig and denominator indicates peel number]

Figs. 1/1 to 3/3 :Long, dorsiventral thallus with tapering to **3/3** ends.

Figs. 4/4 to 12/12 : Serial section of thallus showing different to **12/12** stage of the thallus cut in longitudinal section.

TEXT FIGS. - 13 TO 16



EXPLANATION OF TEXT FIGS. 13 To 16

Fig. 13 : Enlarged entire thallus.

Fig. 14 : Portion of thallus showing outer most layer made up of thick walled parenchymatous tissue.

Fig. 15 : Homogenous parenchymatous cells made up of double walled.

Fig. 16 : Enlarged mucilage cannal.