



***Sellaginella* Remains from the Deccan Intertrappean Beds of Patan, Chandrapur District (M.S.), India.**

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Abstract:

The present paper deals with two specimens of *Sellaginella* which was collected from the Deccan Intertrappean Beds of Patan (Lat. N 19° 32.166, Long. E 079° 07.521); a small village 100 km away from Chandrapur, Maharashtra; and both are present near to each other. In its morphology it shows well preserved central axis on which sporophylls are born, but sporangium (Megaspore and Microspore) are underdeveloped. On the basis of external and internal morphology and comparison with the modern *Sellaginella* and due to close affinity it is named as *Sellaginella homeophyllii*.

Keywords:

Sellaginella, Sporangium, Vegetative part, Strobilus, Pteridophyta.

Introcutio:

The present fossil pteridophyte sporocarps are collected from Patan locality of Maharashtra. Fossil sporocarps of different pteridophytic types are well known from Deccan Intertrappean exposures of India. However, vegetative parts are equally unknown. The present paper deals with vegetative part (Apical meristem of *Sellaginella* strobilus) of plant material. The Pteridophytic remains are very common in the Deccan Intertrappean Series of India; the well-known specimens are *Azolla intertrappea* (Sahni, 1941), *Rodeites dakshini* (Sahni, 1943), *Surangea mohgaonse* (Chitley and Sheikh, 1971), *Salvinia intertrappea* (Mahabale, 1950; Paradkar and Barlinge, 1979), *Rhizomites dakshini* (Paradkar, 1971), *Sellaginella chitlei* (Kapgate and Sheikh, 1998), *Phlicorachionites mahabalei* (Mahajan and Sheikh, 1998) and *Acrostichum intertrappeum* (Bonde and Kumaran, 2002).

Material and methods:

The petrified pteridophytic material under study was found preserved in a piece of dark black chert. On breaking the chert the specimen was exposed in its longitudinal plane. Both part and counterpart were available and the preservation of the material was good. For the further study the cherts was etched with Hydrofluoric acid (HF) and washed thoroughly in water. The peels have been made by cellulose acetate peel method (Galtier and Phillips, 1999). The peels are mounted on DPX mountant. Camera lucida diagrams and Photographs of the specimen will be taken for the study of morphology and anatomy of plant material.

Description





The longitudinally exposed specimens measures 4 mm in length and 1mm Broad as both specimens are nearly of same size. The long vertical axis contains two rows of sporophylls. The sporophylls which are present towards the basal position are comparatively smaller than that of apical sporophylls; but much broader in girth and supplied with vascular tissues than that of apical sporophylls. In some cases towards the basesporophylls have signs of developmental stages of sporangium, but fully developed sporangia are not found. All the leaves are nearly of same size; which confirms the sub-genus homeophyllum of *Sellaginella*.

Structure of the axis

The plant material contains well preserved axis. It is centrally placed part of the plant and made up of long, elongated cells. The outer region of axis is somewhat lighter in colour than the middle region, because of the epidermal and cortical cells, while the middle of the axis is dark and contains vascular cells. Towards the apical region of the axis apical meristem is present surrounded by sporophylls.

Structure of sporophylls

The sporophylls are eyebrow like in shape and appear broad towards base and pointed towards apex as they cut in longitudinal plane and observed in *sellaginella* arranged on both sides of the axis in spiral manner. The sporophylls are few cells in thickness and have well developed vascular tissues in middle position. The vascular tissues are not going up to the apex and ends in the middle of the leaves. In some cases, at the basal position some sporophylls have sign of sporangium development as that of *sellaginella* showing bulbous base. The sporophylls are ligulate and the ligules are present in between sporophyll and the developing sporangium. The ligule is small, papillate, pointed tongue-like outgrowth. At the base of the ligule glossopodium is also present which consist of large, thin walled cells. At the apical region many sporophylls are gathered near each other forming a close structure having many sporophylls at the same position showing immaturity of the specimen and giving protection to the apical meristem.

Result and Discussion:

The above described specimen revealed following important details for its identification.

1. The erect axis bears pair of leaves which are arranged in spiral manner.
2. All the leaves are nearly of same size.
3. Presence of ligule in between Sporophyll and developing sporangia.
4. In vertical section possesses two regions; faint coloured cortical region while dark coloured vascular region.
5. Sporophyll shows absence of lateral veins.





Comparison with the reported pteridophytic materials

The present specimen is compared with the previously reported pteridophytic plant materials such as *Azolla intertrappea* (Sahni, 1941), *Rodeites dakshini* (Sahni, 1943), *Surangea mohgaonse* (Chitley and Sheikh, 1971), *Salvinia intertrappea* (Mahabale, 1950; Paradkar and Barlinge, 1979), *Rhizomites dakshini* (Paradkar, 1971), *Sellaginella chitlei* (Kapgata and Sheikh, 1998), *Phlicorachionites mahabalei* (Mahajan and Sheikh, 1998), *Acrostichum intertrappeum* (Bonde and Kumaran, 2002); But they are different as they bear reproductive organs or fruiting bodies of the plants and vegetative organs are not so much described.

Comparison with the modern taxa

The present specimen is also compared with living pteridophytes such as *Lycopodium*, *Sellaginella*, *Equisetum*, *Marsilea* and some members of order filicales. But, characters of the specimen resemble much closure to *Sellaginella* and not to other pteridophytes.

Diagnosis

***Sellaginella* gen. nov.**

The plant contains a long axis on which leaves arranged in spiral manner. The axis contains well preserved vascular tissues as well as cortical tissues. The apical region contains a crown of leaves as compared to the basal region and is nearly of same size, sporophylls are ligulate.

***Sellaginella homeophyllii* gen. et sp. nov.**

The specimen is well preserved apical portion of the plant, 4 mm in length and 1 mm broad. In the middle region is present central axis on which leaves are arranged in spiral manner. Axis differentiated into outer cortical region and inner vascular region. Leaves are well vascularized and midrib goes upto middle of the leaf only. Apical meristem is protected by crown of leaves. Ligules are present in between sporophyll and developing sporangium, provided by basal glossopodium confirms *Sellaginella*.

Holotype:- MHW/Pte. 1/Deposited at Botany Dept.

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Horizon :- Deccan Intertrappean Beds of Maharashtra state,

Locality:- Patan , Chandrapur district (M.S.)

Age :- Uppermost Cretaceous.



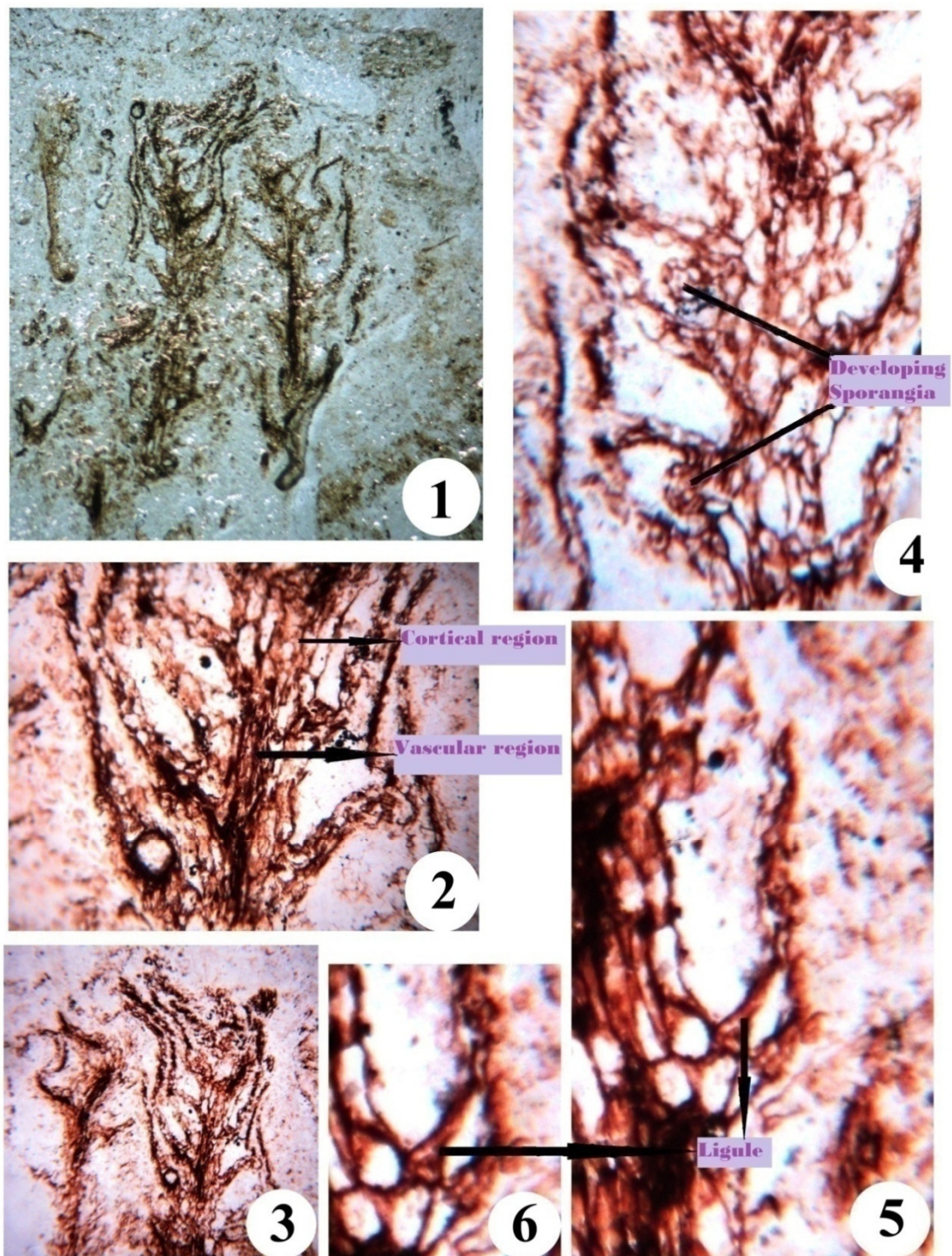


Figure. -

1. Pteridophytic plant material as exposed on chert in longitudinal section.
2. Specimen enlarged from the middle position showing middle vascular region and outer cortical region and origin of sporophyll.
3. Apical portion of the specimen showing crown of leaves.
4. Cellular detail of the axis with developing sporangia.
5. Position of ligule on axis.
6. Ligule enlarged.



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