

Nodal anatomy of *Petrea volubilis* L. Verbenaceae

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Abstract:

In this study of nodal anatomy of *Petrea volubilis* the aim is to investigate the nodal characters of *Petrea volubilis*. As a result of the study, it was discovered that the node is unilacunar one traced. The large number of sclerenchymatous patches along with numerous sclereids enclosing with the vascular tissue extend through internode and nodal region. The sclerenchymatous patches and sclereids also extend into the petiole. The study investigates nodal characters which could help in authentication of the plant. Moreover, it could be used also for further scientific investigation of the plant.

Keywords: Nodal characters, Unilacunar one traced, *Petrea volubilis*, Verbenaceae.

Introduction

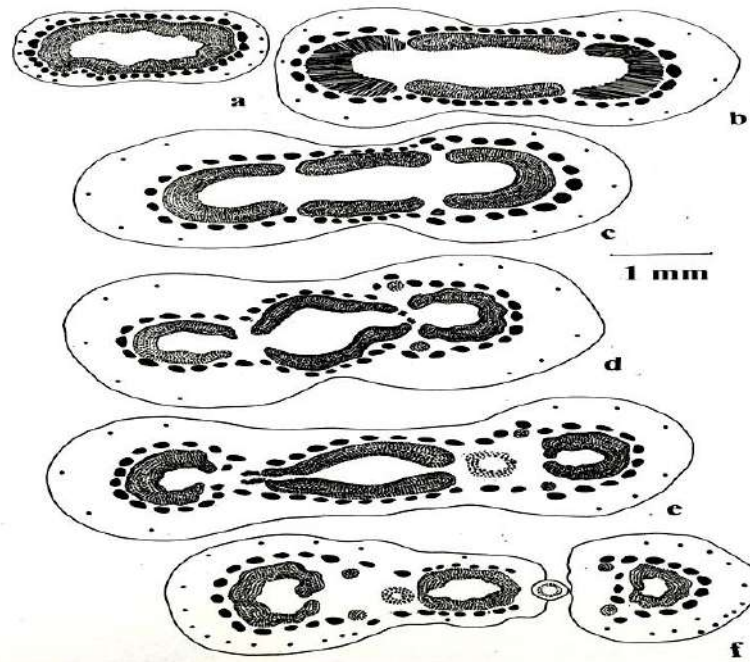
The family Verbenaceae consists of about 100 genera and 2600 species of Pantropical distribution; only a limited number of species occur in temperate regions (Cronquist, 1981) Sinnott (1914) has emphasized the importance of the leaf trace and leaf gap in the systematic of angiosperms. He recorded unilacunar one traced nodal structure for the Verbenaceae. The node shows only a single major category-unilocular. *Petrea volubilis* is one of the members of family Verbenaceae, commonly known as Purple wreath, Queen's wreath or Nilmani lata. Native to Central America. It is an evergreen flowering vine. It is a very lovely small climber with drooping long racemes of delicate violet-purple star-like flowers. It is a semi-climber and the small wooden trunk develops artistic curves over the years. It grows best in sunshine. It flowers in spring and in some areas also in Novembers. The flowers come in raceme reaching over one foot long. The true flower, which is purple, lasts a couple of days but the blue bracts remain much longer, slowly turning gray.

Materials and Methods

The Plant material of *Petrea volubilis* L. Was collected from Botanical Garden of Dr. Babasaheb Ambedkar Marathwada university Aurangabad, and serial sections of node and inter nodal region were taken. Sections were stained in safranin (1%) and fast green (1%) and mounted in Canada balsam after the customary dehydration. Some of the hand sections were also examined in glycerin. Sudan IV was used to demarcate the cuticle. Phloroglucinol and aniline sulphate tests were carried out for the lignified tissues.

Observations

The vascular cylinder at the base of node sends off the large median trace for a leaf leaving behind a gap. This broad median arc like trace then gives two smaller traces. The vascular tissue for axillary bud is next derived. The two ends of an arc unite and form a cylinder and along with two cortical bundles enter into the petiole. The node is unilacunar one traced. Large number of sclerenchymatous patches along with numerous sclereids enclosing with the vascular tissue extend through internode and nodal region. The sclerenchymatous patches and sclereids also extend into the petiole.



T. S. of Node of *Petrea volubilis*

Discussion

In this family, the leaf is generally simple. The leaves of *Petrea volubilis* are usually opposite, rarely alternate and exstipulate.

The node shows only a single major category i.e. unilacunar. The unilacunar node with an arc shaped trace occurs in *Petrea*. In *Petrea* the branching of arc strand is evident near the leaf gap.

The mechanical tissue in the form of sclerenchyma extends around the vasculature in the majority of the taxa. It forms distinct patches in *Petrea*. The occurrence and variations of sclerenchyma may be looked upon from the point of view of the requirement of rigidity or mechanical strength. The increase in the size and number of patches of sclerenchyma in these plants appear to be related to the habit of the plants and size of the leaves.

In the survey of the nodal organization in angiosperms, Sinnott (1914) has opined that the Verbenaceae possess a unilacunar single traced node. Marsden and Bailey (1955) reported unilacunar two trace condition of node in *Clerodendrum*. Esau (1965) has also shown unilacunar two trace condition of node in this genus. According to Shah et al. (1972) the unilacunar node is with one, two or many traces condition in this family and in the species of *Clerodendrum*. Cronquist (1981) also indicated unilacunar nodes with 2-many traces for Verbenaceae.

While studying a large number of taxa of the angiosperms, Sinnott (1914) emphasized the significance of the leaf trace and leaf gap in the systematics of the angiosperms. Conflicting views have been expressed by different workers with regard to the evolutionary conception of vegetative node the flowering plants suggesting both reduction and/or amplification of vascular tissue during the course of specialization.

Sinnott (1914) reported three basic types of nodes for angiosperms and of three he considered trilacunar three traced condition as primitive and lacunar and multilacunar types as derived from it by reduction or amplification of the original bundles and their gaps.

Ozenda (1949) on the basis of nodal anatomy of the Magnoliales considered the multilacunar node as primitive type and the trilacunar and unilacunar derived from it by reduction.

Meeuse (1966) also advocated the primitive nature of the multilacunar node.

In a retrospect of nodal anatomy, Pant and Mehra (1964) have pointed out that on the basis of existing evidences, it is difficult to regard the unilacunar double trace node as primitive for all pteropsida. Shah et al. (1969) on the basis of observation on nodal anatomy of *Clerodendrum* has indicated that all unilacunar nodes do not appear to be homologous.

Takhtajan (1969) postulated a fifth type of node i.e. trimultilacunar type with a double trace at the median gap as the primitive nodal type. From this on one hand, he derived trilacunar node with three traces leading to unilacunar node with one trace and on the other multilacunar node with many traces, he derived unilacunar node with double trace from trimultilacunar type, the former to have given rise to unilacunar node with one or three traces.

The present study reveals that the majority of the taxa show unilacunar single traced nodal structure. Few have single bilobed trace.

On the basis of present study on various taxa of the family, it may be presumed that either the arc is the result of fusion of the several traces into one broad arc or it get amplified to give many branches.

Canrigh (1955), Philipson and Philipson (1968) are of the opinion that the arc is derived as a result of ontogenetic and phylogenetic fusion of several traces.

The occurrence of the axillary bud is noted in all the taxa investigated.

The nodal characters like branching of the solitary strand, additional bundles, and occurrence of sclerenchymatous patches can be utilized as adjuncts in the delineation of the taxa studied.

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