



A Study on Petiole and Petiolule anatomy of *Vitex negundo*. L (Verbenaceae)

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ABSTRACT

Anatomy of the petiole of *Vitex negundo* is investigated. It is naturally distributed in many parts of Maharashtra and Marathwada. In this study the aim was to investigate the anatomical characters of rachis and petiole of this economical important plant species. As a result of study, it was discovered that the mechanical tissue in the form collenchyma or sclerenchyma occurs in petiole and Petiolule. The xylem elements are additionally mechanical in function. The vascular tissue in the form of distinct bundles or an arc shaped strand is observed.

Keywords: Anatomy, Petiole, Petiolule, Mechanical tissue, *Vitex negundo*

INTRODUCTION

The leaves of *Vitex negundo* are aromatic, Vermifuge and are efficacious in dispelling inflammatory swellings of the glands, in acute rheumatism and sprained joints. The vasculature of petiole has long been of considerable importance in systematic investigation. Grew (1675) was the first botanist to recognize the different patterns of vascular bundles in a petiole. Earlier work on the structure of the petiole in certain members of the Verbenaceae are mainly Solereder (1908) exhibited a variation in the vasculature of petiole. Metcalfe and Chalk (1950), and Hufford (1992). Since the petiole anatomy in the family has received little attention. The present account deals with such a study on petiole and Petiolule of *Vitex negundo* of family Verbenaceae.

MATERIALS AND METHODS

The Plant material of *Vitex negundo*. L. was locally collected and serial sections of petiole and Petiolule 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.

RESULTS

T.S of Rachis, Petiole : (Figure 1)

It is more or less circular in outline and concave adaxially. The epidermis is of large thick walled cells with thick cuticle. The trichomes are variable. Stomata are few. The epidermis is followed by 2to5 layered collenchyma and then parenchymatous tissue. The sclerenchyma surrounds the prominent arc shaped vascular tissue. Two cortical bundles occur adaxially and these are also capped by sclerenchyma. Figure 1.

T.S. of Petiolule (Figure 2)

It is more or less circular in outline with short wings developed adaxially forming a shallow channel. The epidermis is of large thick walled cells with cuticle and few stomata. The trichomes are variable. The epidermis is followed by 2 to 3 layered collenchyma and then parenchymatous cortex. The sclerenchyma surrounds the prominent arc vascular tissue. Many accessory bundles occur adaxially and cortical bundles are capped by sclerenchyma. A group of two bundles is located in each wing and two are seen in the centre surrounded by an arc.

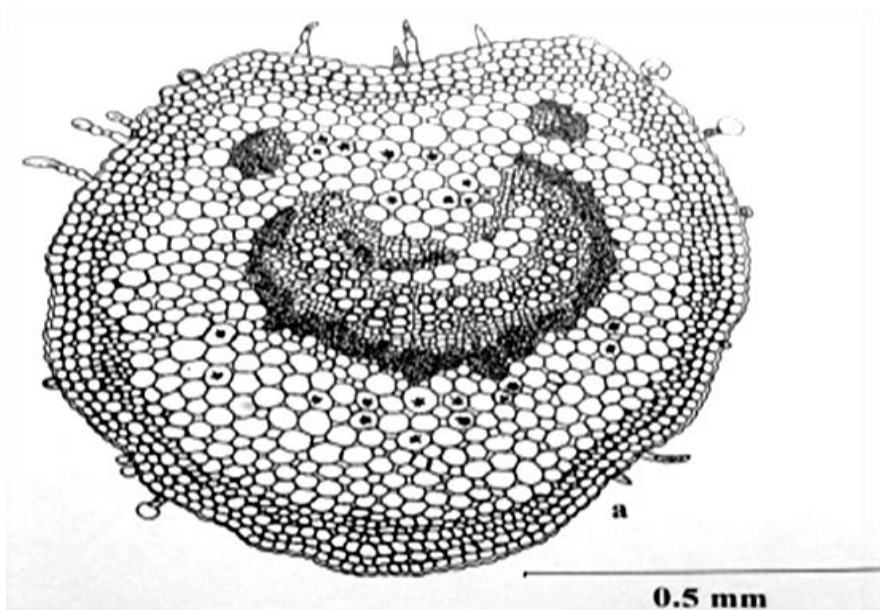


Figure 1: T.S of Rachis, Petiole :-

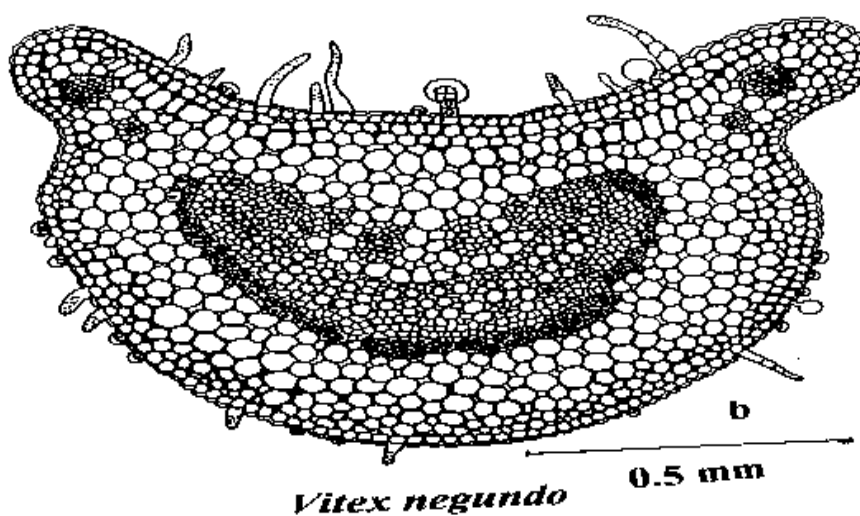


Figure 2: T.S. of Petiolule

DISCUSSION

The Petiole is short, medium in length. Two lateral Petiolule shorter and terminal one is always longer. In transverse section, the petiole shows various shapes like circular, oval, flat, triangular lobed and concave or convex adaxially. The petiole structure may easily be compared with the primary tissue of the stem. There is a close similarity between the petiole and the stem, Petiolule, the rachis and the stem in regard to the structure of epidermis. The ground parenchyma of the petiole is like that of the stem cortex in arrangement of cells.

The mechanical tissue in the form of collenchyma and sclerenchyma are distinct in the leaf axis of presently investigated taxa. The xylem elements are additionally mechanical in function. Sometimes parenchymatous cells become thick walled and collenchymatous and thus it becomes difficult to distinguish between two tissues. The distribution of collenchyma is significant. Generally, a continuous ring of collenchyma in hypodermal region is recorded. Adaxial and abaxial side exhibit more amount of it. Continuous sclerenchyma develops close to the arc shaped vascular strand. The vascular tissue is an arc shaped. The development of cortical and medullary bundles is significant. Two cortical bundles are observed.

The present study indicates that petiole has principal vascular tissue and accessory vascular bundles – cortical and /or medullary. The cortical bundles are reported in both Petiole and Petiolule. The cortical bundles are invariably developed adaxially. Mathew and Shah (1987) reported internal phloem in *Avicennia* and *Tectona* Petiole.

Howard (1963) regards that the vascular structure of the petiole of certain families of Dicotyledons can be profitably used in description and taxonomic delineations of plant taxa. The variation in petiolar structure and also of rachis and petiolule is not only of vascular but also in other parameters are found taxonomically useful in Scrophulariaceae and Meliaceae (Sutar and Vaikos, 1997; Bhadane and Vaikos, 1999). Such studies can also be employed in pharmacognosy to detect adulterant in the leaf drugs. Hubert (1921), Perrot and Hubert (1922, 1923) made detailed study on medullary bundles in the leaf axis of the family

Earlier Bangar (2018) reported Anatomy of petiole in some Verbenaceae.

Conflicts of Interest: The author declares no conflict of interest

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