RESEARCH ARTICLE

ROLE OF MICROSCOPIC PARAMETERS IN ESTABLISHING BOTANICAL IDENTITY OF THE HERB– GENDARUSSA VULGARIS NEES (ACANTHACEAE) USED AS A POTENTIAL DRUG

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ABSTRACT

Justicia gendarussa Burm. f. of the family Acanthaceae, is known as Karunochi in Tamil as per the botanical literature (Henry et al; 1987). The valid name of this taxon is said to be Gendarussa vulgaris Nees, the previous name is synonym. As per the pharmacological literature G.vulgaris Nees is attributed medicinal properties such as refrifuge, emetic, emmanegogue, diaphoretic, breathing internal haemorrhage, oedamia, beriberi and rheumatism. (Yoganarasimhan, 2000). The regional floras provide the morphological features for identification the plant. When the plant samples are in fragmentary condition, it poses difficulty in identification of the herbal. So one has to opt for microscopic parameters of various parts of the plant. The present study provides detailed description of anatomical structure of both aerial and underground organs of G. vulgaris Nees supplemented with these photomicrographs at different magnifications studies of the herbal drugs may help for botanical diagnosis and to overcome the menae of adulteration and substitution of the drugs.

INTRODUCTION

Gendarussa vulgaris Nees (= Justicia gendarussa Burm. f.) of Acanthaceae (Synonym: Justicia Gendarussa Burm. f.) is popularly known as Karunochi in Tamil as per the most of the local Floras (Gamble, 1921; Mathew, 1983; Henry et al; 1987). The Tamil equalant for this plant seems to be controversial. However G. vulgaris is credited with many medicinal properties both in Indian systems of medicine as well as folklore claim. In many taxonomic books, the external features provided for identification of this herb is present. But microscopic parameters are not available to supplement the morphological features and to diagnose the botanical identity of fragmentary samples of the plant. With a view to fill up the lacuna in the botanical studies and throw lighter an anatomical diagnostic features of G. vulgaris Nees, the present study was attempted.

MATERIAL AND METHODS

G. vulgaris Nees is grown as fence plant or an ornamental plant. The specimens for the present study were procured from the Plant Anatomy Research Center, Tambaram. Leaf, stem, root and flowers were cut and removed from healthy plants. The specimens were trimmed in proper plane and fixed in FAA, dehydrated with TBA (Tertiary Butyl Alcohol) series and infiltrated with paraffin wax (58-60°C melting point) and cast into blocks for rotary microtome sectioning. The entire procedure is as per the methods givenly Sass, 1940. Serial sections of 10µm thickness were prepared; after dewaxing, the section were stained with Toluidine blue O (O’Brien et al; 1964). Photomicrographs of the sections were prepared using Nikon microscope and Nikon digital camera.

Observation

Morphological Overview of the Plant: The plant is a shrub, with cylindrical stem, oblong lanceolate leaves, spike type of inflorescence, lanceolate bracts; two lipped corolla, white with purple lines; stamens 4, 2 celled ovaries, fruit loculicidal capsule, seeds orbicular, spinulose. (Fig.1)

Microscopic features

Leaf: Leaf is distinctly dorsiventral; midrib consists of adaxial semicircular hump, and abaxial hemispherical part and bowl shaped collateral vascular bundles. (Fig. 2, 3)
**Lamina:** Lamina is heteromorphic and dorsiventral. Adaxial epidermis is thick with prominent cuticle; mesophyll is tissue differentiated into adaxial thick zone of palisade cells and abaxial loosely arranged spongy parenchyma. Some of the epidermal cells are modified into wide lithocysts, possessing cylindrical cystoliths. (Fig. 4, 5)

**Stomata and Trichome:** Adaxial epidermis is apostomatic (Fig. 6). Abaxial epidermis bears diacytic stomata (Fig. 7). Peltate type glandular trichomes are common on the lamina. (Fig. 8, 9)

**Venation:** Venation is densely reticulate; vein islets are wide and polygonal. Vein terminations are dendroid. (Fig. 10, 11, 12)

**Petiole:** Proximal petiole is semicircular with abaxial depression. Distal petiole is semicircular with short lateral wings. Vascular strand bowl shaped and collateral. (Fig. 13, 14)
**Stem:** Stem is circular in sectional view. Cortex is heterogeneous. Vascular cylinder is hollow and collateral. Pith is wide and parenchymatous. (Fig. 15, 16, 17)

**Root:** Periderm is thin and superficial; cortex is aerenchymatous: vascular cylinder consists of several radial files of vessels with sclerenchymatous ground tissue. (Fig. 18, 19)

**DISCUSSION**

*Gendarussa vulgaris* exhibits certain microscopic characters common to the member of Acanthaceae. For example, presence of cylindrical Cystoliths and Diacytic stomata are shared by most of the members of the family and these features can be employed for identification of the family. Characters specific to *G. vulgaris* are peltate type glandular Trichomes, Aerenchymatous cortex in the root. Radial distribution of vessels in the xylem cylinder of the root and bowl shaped vascular bundle of the petiole. It may be concluded that the findings that of the present studies offer microscopic protocol for Botanical diagnosis of *G. vulgaris*. The protocol will provide indelible clues to anyone who wants check the genuineness of the plant.

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**References**


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