



Pharmacognostical studies on *Rivea ornata* (Roxb.) leaves

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ABSTRACT

Rivea ornata (Roxb.) is a potential medicinal plant used topically in haemorrhagic diseases and piles. It also possess to contain antiinflammatory activity. The leaves are given after parturition. Owing to its medicinal and industrial importance, the macroscopic and microscopic characters of the leaves were studied. These could serve useful in the identification of this plant species.

Keywords: *Rivea ornata*, convulvulaceae, leaves, macroscopy, microscopy.

INTRODUCTION

Rivea ornata (Roxb.) belonging to the family *Convolvulaceae* is distributed throughout southern part of India. In Tamil, it is known as 'Machuttai' and in folklore it is well known as 'Baravat' and 'Phaang'. The leaves are given after parturition. In folklore it is used topically in haemorrhagic diseases and piles [1]. The aerial parts possess antiinflammatory activity [2]. *Rivea ornata* is a woody climber branchless stout, white-tomentose. Leaves of *Rivea ornata* are ovate-cordate 3-5 in. diameter often broader than long, glabrous above, white silky-tomentose beneath while young; petiole 1-2 in. Flowers large, white in short, mostly 3-fid. Peduncles; bracts 1/2 in. Fruit 2/3 in. diam., indehiscent, globose, shining, yellow-brown, nearly dries [3]. *Rivea ornata* seed oil was found to contain 12, 13-epoxy-octadec-cis-9-enoic acid (vernolic acid, 22.0%) along with the other normal fatty acids like palmitic acid (24.2%), stearic acid (8.9%), oleic acid (17.1%) and linoleic acid (27.8%) [4]. The plant is not studied for its pharmacognostic attributes. As the plant is reported to have various medicinal and industrial uses, the authors have attempted to study the pharmacognosy of the leaves.

EXPERIMENTAL SECTION

Plant Collection and Identification

Fresh leaves of *Rivea ornata* were collected from Nallamala region of Kurnool district, Andhra Pradesh, India and their macro- and microscopic studies were carried out in addition to their quantitative analysis. The collected plant material was authenticated by Taxonomist Dr.S.Vadavathi at Herbal Folklore Research Center, Tirupati, India.

Macroscopic and microscopic examination

Macroscopic examination of the leaf was carried out according to the standard procedures [5-8]. Fresh leaf was selected for the microscopical studies. Secitons were cut on microtome and by free hand sectioning. Numerous temporary and permanent mounts of the microscopical sections of the leaf specimen were made and examined using microscope.

Physicochemical parameters

Quantitative values of the leaves of *Rivea ornata* were determined by using standard procedures. The percentage of total ash, water soluble ash, acid insoluble ash, water soluble extract, alcohol soluble extractive, chloroform soluble

extractive, benzene soluble extractive and petroleum ether soluble extractive were established. The palisade ratio stomatal number, stomatal index and vein islet number were calculated and photomicrographs of the microscopical sections were captured with the help of photomicroscope [9, 10].

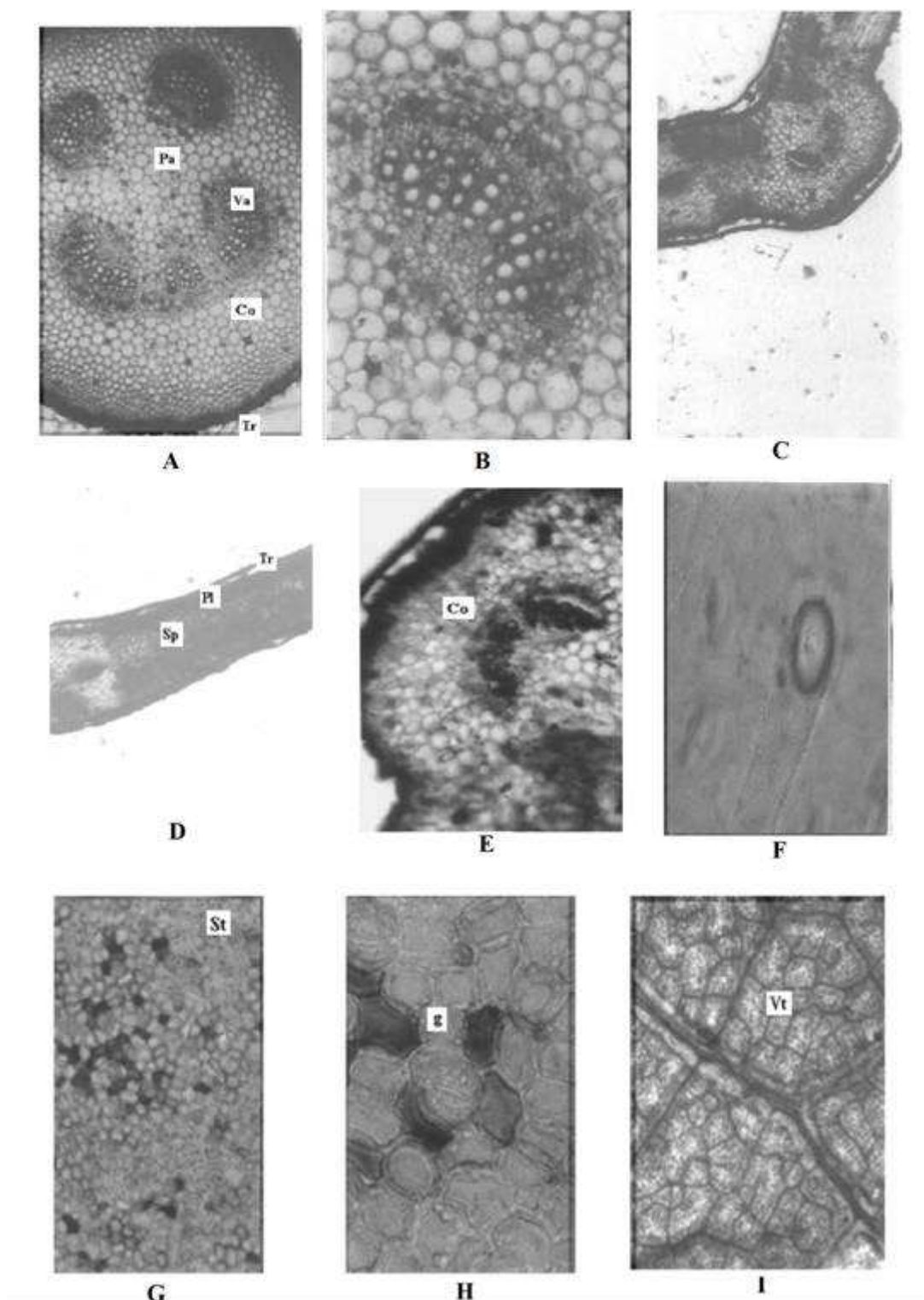


Fig. 1

A – T.S. of Petiole (40 x), B – Vascular bundles of Petiole (100 x), C – T.S. of leaflet (40x), D – T.S. of Lamina (40 x), E – T.S. of Midrib (100 x), F – Simple trichome (400 x), G – Epidermal cells (100 x), H – Epidermal cells with stomata (400 x), I – Veinlets and Vein islets (100 x), Co – Collenchyma, g – Guard cells, Pa – Parenchyma, Pl – Palisade cells, Sp – Spongy parenchyma, St – Stoma, Tr – Trichomes, Va – Vascular bundles, Vt – Vein islet termination.

RESULTS AND DISCUSSION

Macroscopy

Leaves are simple, alternate, petiolate and exstipulate and reniform-ovate, cordate in shape with a shortly acuminate, or caudate to 4x5 cm, orbicular with a long petiole. Leaves are sparsely grey in color and usually silky beneath.

Microscopy

T.S. of the petiole is nearly circular in outline. (Fig.1-A). The epidermis is replaced by the periderm, with unicellular outgrowths and cells are angular in outer sides. Secondary growth is seen. Cortex is parenchymatous and hypodermis is collenchymatous. Limited number of vascular bundles is present in the stellar region. (Fig.1-B). Medulla is made up of parenchymatous tissue.

T.S. of lamina reveals isobilateral constructions. (Fig.1-D). The adaxial epidermis is composed of single layered, straight walled rectangular cells and covered with cuticle. Unicellular, conical, covering trichomes and paracytic stomata are numerous on the adaxial epidermis. The upper palisade layer consists of single layered compactly arranged elongated narrow thin walled parenchymatous cells. The spongy parenchymatous cells are thin walled, loosely arranged with large intercellular spaces. Lower palisade layer comprises of loosely arranged wavy cells and are smaller than upper palisade cells. T.S. of the midrib shows collenchymatous cells between the adaxial and abaxial epidermis, semilunar vascular bundles are present. (Fig.1-E). Both the adaxial and abaxial epidermis have numerous unicellular, conical covering trichomes (Fig.1-F) and paracytic or rubiaceous stomata. (Fig.1-G).

Quantitative Values

Quantitative values of the leaves of *Rivea ornata* indicate palisade ratio 2.1-2.8, Stomatal number 15-32, 20-42, Stomatal index 14.2-18.4-20.2, 29.5-31.7-34.1, Vein islet number 10.1-14.5. Total ash value 7% w/w, Water soluble ash 12% w/w, Acid insoluble ash 1.5 % w/w, Water soluble extractive not less than 18.1%w/w, Alcohol soluble extractive not less than 8.38% w/w, Chloroform soluble extractive not less than 2.21%w/w, Benzene soluble extractive not less than 1.31%w/w, Petroleum ether soluble extractive not less than 1.02%w/w [8, 9].

CONCLUSION

In this present investigation various pharmacognostical standardization parameters such as macroscopy, microscopy and quantitative values were carried out which could be helpful in authentication of *Rivea ornata* (Roxb.). The result of the present study will also serve as a reference material in the preparation of herbal monograph.

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