

Pharmacognostical studies on the aerial parts of *Cocculus hirsutus* (Linn.)

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ABSTRACT

Cocculus hirsutus (Linn.) is a medicinal plant used in various alternative systems of medicine for its hypoglycemic, analgesic and anti-inflammatory activities. Systematic and scientific study of plant drugs may be done by Pharmacognostical, Chemical and Pharmacological studies for the standardization of the herbal plants. In this paper, the aerial parts of *Cocculus hirsutus* were studied for its macroscopic and microscopic characters which will be a support for the standardization of *Cocculus hirsutus*.

Key words: *Cocculus hirsutus*, Pharmacognostical, Standardization, Microscopical characters

INTRODUCTION

Cocculus hirsutus (Linn.) belongs to family Menispermaceae is found tropical and subtropical India from the foot of the Himalayas to South India and Ceylon. In Tamil, it is known as “Kattudodi” and in Hindi it is known as “Patalagarudi” or “Jaljamin”. Traditionally this plant is useful in the treatment of eczema¹ and for the various activities like hypoglycemic², analgesic and anti-inflammatory³. Various Isoquinoline type of alkaloids, proteins, gums, mucilage, carbohydrates and phytosterols were reported. Because of its wider usage, an attempt to study its pharmacognosy was undertaken. In this paper a thorough study about the histological characters of the aerial parts of *Cocculus hirsutus* were done.

MATERIAL AND METHODS

Leaf and petiole of *Cocculus hirsutus* were collected from Kalakadu Hills of Tirunelveli District. The materials were fixed in the field of fixative mixture which consists of 70% Ethyl alcohol, Acetic acid and Formalin in the ratio of 90ml, 5ml, 5ml

respectively. The materials were left in the fixative for a minimum period of 48 hours. Dehydration of the materials was carried out employing tertiary butyl alcohol (TBA) in graded series. Serial microtome sections at 10-12µm thickness were prepared with Rotary Microtome. The sections were stained with Toluidine blue as per the schedule suggested by O'Brien et al (1964). Sections were photographed under NIKON Labphot – 2 Photographic unit under different magnifications.

RESULTS AND DISCUSSION

Macroscopy

C. hirsutus is a scandent shrub with soft villous young parts. Leaves are 3.8-6.3 by 1.3-3.8cm., 3-5 nerved, ovate-oblong, subdeltoid, obtuse, subacute, apiculate, subcordate or truncate at the base. Male flowers are in small axillary cymose panicles; pedicels slender; bracts minute, subulate and hairy. Petals are thinly membranous, obovate, emarginated, embracing the stamens, smaller than the petals of the female flowers. Female flowers are in axillary clusters, 2-3 together, rarely racemose. Petals are thick and fleshy, divided at

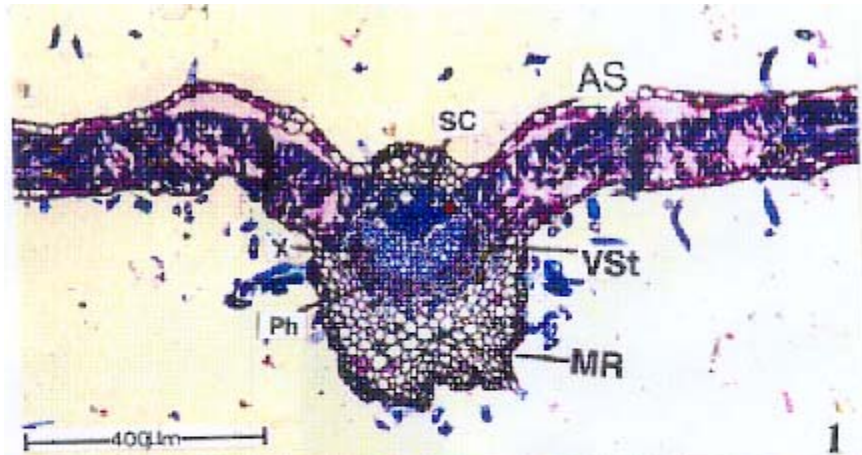


Fig. 1.1: T.S. of Leaf pssing through midrib

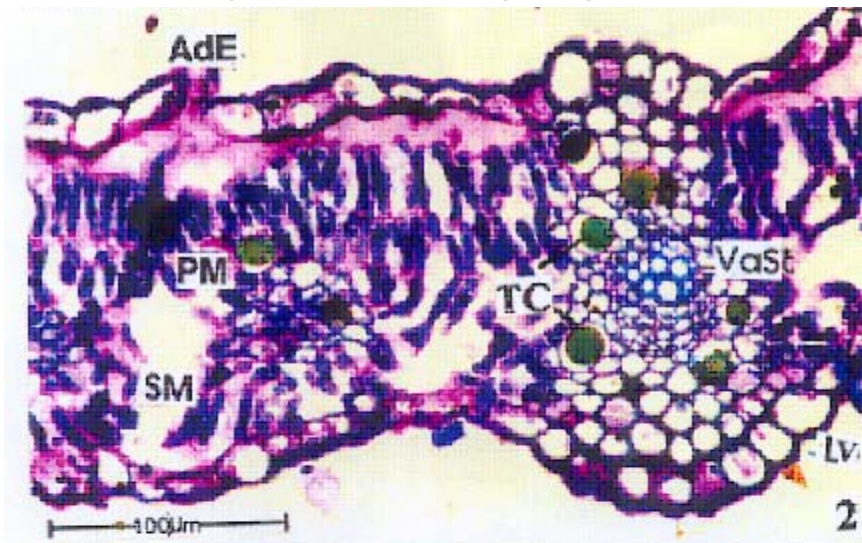


Fig. 1.2: T.S. of Lamina and lateral vein

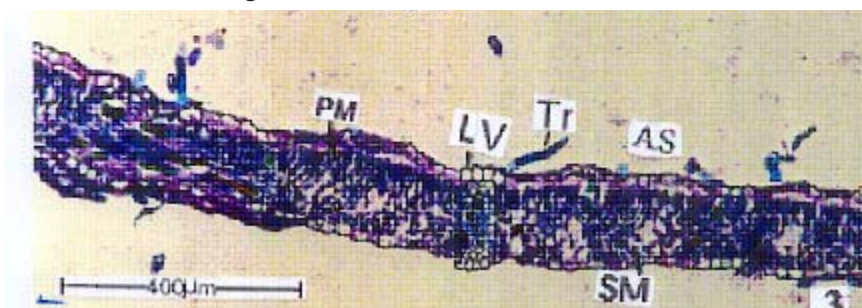


Fig. 1.3: T.S. of Lamina

Fig. 1: T. S of Leaf AdE – Adaxial epidermis, AS – Adaxial side, LV – Lateral Vein, MR – Midrib, Ph – Phloem, PM – Palisade Mesophyll, SC – Sclerenchyma, SM – Spongymesophyll, TC – Tanniferous cells, Tr – Trichome, VSt – Vascular strand, X – Mylem



Fig. 2.1: Trichomes scraped from the leaf and photographed under polarized light

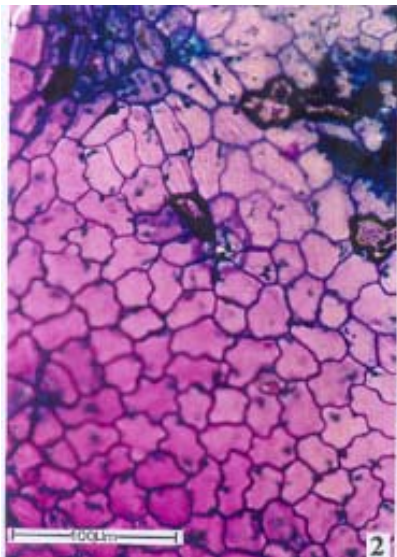


Fig. 2.2: Adaxial Epidermis in Surface View

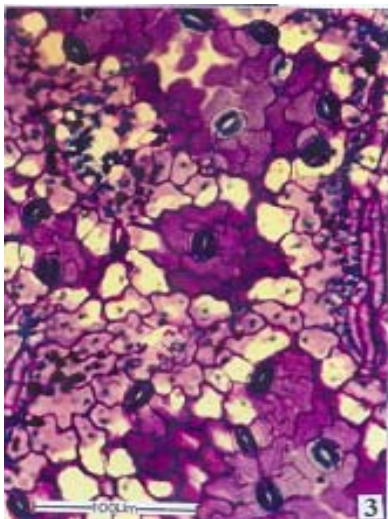


Fig. 2.3: Adaxial Epidermis with Stomata

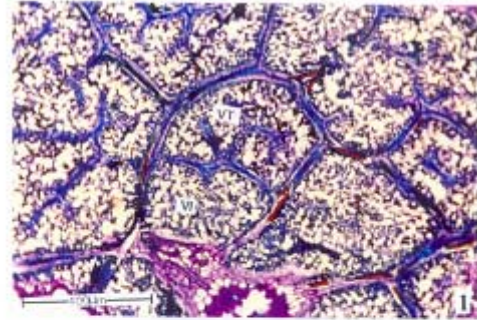


Fig. 3.1: Paradermal section of Lamina

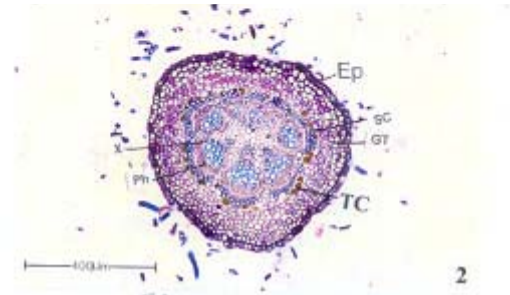


Fig. 3.2: T.S of Petiole

Ep – Epidermis, Gt – Ground tissue, Ph – Phloem, Sc – Sclerenchyma, TC – Tanniferous cells, X – Xylem

the apex into two triangular lobes with swollen bases. There are 3 smooth ovaries present. Stigma are terete, thick reflexed. Drupe size of a small pea, keeled, transversely rugose.

Analytical parameters

Extractive values like alcohol soluble extractive -8.1% w/w; water soluble extractive 9.2% w/w; physical constants like total ash – 8.6%w/w; acid insoluble ash – 7.4%w/w; water soluble ash – 9.2% w/w and loss on drying – 1.5% w/w were calculated as per standard procedures^{4,5}.

Phytochemical tests

Ethanollic extractcs of the *C. hirsutus* when subjected to qualitative chemical tests showed the presence of isoquinoline alkaloids, proteins, gums, mucilage, carbohydrates and phytosterols.

Microscopy

The bright field was used for observation of the T.S of the leaf and stem^{6,7}. For the study of

trichomes polarized light was used in which, they appeared bright against dark background.

Leaf (Fig.1-3)

The leaf is mesomorphic with thin lamina. Prominent midrib and conspicuous lateral veins. The midrib is 60µm thick in vertical plane; the abaxial part is projecting into a large hemispherical part with undulate outline; the adaxial part is slightly projecting above the surface (Fig 1.1). The ground tissue of the midrib is parenchymatous with small circular compact cells. The epidermal cells are small and thick walled. The vascular strand is single and arc-shaped with collateral position of xylem and phloem. There is a triangular mass of sclerenchyma cells abutting the concavity of the vascular arc (Fig. 1.1). tannin filled cells are frequently seen around the vascular strand. The major lateral veins are also of the basic structure as the midrib (fig 1.2). A single, collateral top-shaped vascular bundle is placed in the middle of the lamina. It is surrounded by large parenchyma cells which extend upto the adaxial and abaxial epidermal cells. The Lamina is 20µm thick and exhibits bilateral symmetry and mesomorphic

structure. The mesophyll tissue is differentiated into upper narrow cylindrical cells and lower spongy tissue. The leaf surface is densely tomentose; the epidermal trichomes are mostly unicellular, unbranched, thick walled, flexuose, pointed and smooth surfaced (Fig. 2.1).

Petiole (Fig.3.2)

Petiole is more or less circular or slightly planoconvex with flat adaxial side. The outer ground tissue is homogeneous, compact, circular and parenchymatous. The vascular system consists of about seven discrete collateral top-shaped vascular bundle forming a narrow ring with a central core of parenchymatous tissue. A thin continuous sclerenchyma cylinder encircles the vascular bundle..

CONCLUSION

The present study on pharmacognostical characters of *Cocculus hirsutus* may be useful to supplement information in regard to its identification and authentication of the plant and powdered sample of leaves.

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