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Macroscopic and Microscopic Evaluation of *Gnetum edule* Leaf

			
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ABSTRACT

Medicinal plants are important for health care of human beings in respect to ancient medicine system. Most of the traditional medicine are based on herbs, which are used almost by 80% of world's populations. *Gnetum edule* is an important medicinal plants belonging to the family of gnetaceae. Many gnetum species are edible with the seeds being roasted, and the foliage used as a leaf vegetable. The plants from the family of gnetaceae have been used as traditional medicines for many years. The plant is harvested from the wild for local use as a food, medicine and source of oil. The present work has been designed to describe the macroscopic and microscopic characters of *Gnetum edule* leaf. The morphological features of leaf are simple, opposite, decussate, petiolate, exstipulate, elliptic-ovate, length up to 17.5cm by 8.5cm breadth. Petiole is 1.5cm long and apex is acute. It is commonly seen in evergreen forests and sacred grooves. In present study an effort has been made to describe the histological characters of the plant with its morphological characters this will serve as a valuable tool in drug identification.



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1. INTRODUCTION

Ayurveda is an ancient health system of India, thought to have originated in the Vedic times around 5000 years ago. It includes diet and herbal remedies, while emphasizing the body, mind and spirit in disease prevention and treatment since time immemorial plants are used for healing purposes in various systems of folk medicines and still 50% of the population in developing countries relies largely on plant based drugs for their health care needs.

Medicinal plants are considered as a rich resources of ingredients which can be used in drug development either pharmacopoeial, non pharmacopoeial or synthetic drugs. Medicinal plants have been used in health care since time immemorial. Studies have been carried out globally to verify their efficacy and some of the findings have led to the production of plant based medicines.

Traditionally, pharmacognosy was recognized as a vital part of drug development process and pharmacy education. Recently many scientists are now recognizing that indigenous knowledge about the medicinal virtue of many plants should never be lost, as it offers great insight in to the development of new drugs. Due to innumerability of plant species, many plant drugs were not recorded in classical treatise though they have the medicinal properties of such undocumented drugs are known as anukta dravya.

Ayurvedic pharmacological principles of drugs i.e., rasa, guna, virya, vipaka etc. are not evaluated and no classical guideline is directly available which provides the evaluation method of such kind unexplored drugs. So stepwise methods should be adopted for correct authentication, identification of microscopic and macroscopic characters and determination of its rasapanchaka to bring out the exact nature of particular herb. These can be utilized in therapeutics and documented by incorporating it in to ayurvedic materia medica for further reference.

In the family of gnetaceae, *G. edule* is a large, evergreen climbing plant with woody, twinning stems. Commonly known as monkey's bridge, joint fir. It is distributed at evergreen and semi evergreen forest and also in sacred groves in the plains. Their leaves are rich in bioactive compounds such as flavonoids and stilbenes, flowering and fruiting season of plant is from march-April onwards. Many gnetum species are edible with the seeds being roasted and foliage used as leaf vegetable. The plant is harvested from the wild for local use as food, medicine and source of oil. The plant is considered as the "least concern" in the IUCN red list

of threatened species¹.The current study aimed to present the macroscopic and microscopic evaluation of *G. edule* which helps in identifying and authenticating the plant.

2. MATERIALS AND METHODS

2.1 Sample collection: Plant material is obtained from herbal garden of Mannam ayurveda cooperative medical college pandalam. The sample was authenticated for its botanical identity.

2.2 Macroscopic studies: The macroscopic study is the morphological description of the plant which is carried out by a naked eye.

2.3 Microscopic studies: The microscopic study is the anatomical study which is done by taking appropriate transverse section of the plant leaf where treated with safranin stain and the slides are covered by cover slip,were observed under compound microscope.

3. RESULTS AND DISCUSSION

Botanical name : *Gnetum edule*

Family : Gnetaceae

Commonly known as monkey's bridge, joint fir.

Habitat: Evergreen and semi evergreen forests, also in sacred grooves in the plains².

Distribution: Peninsular India

Vernacular names

- **Kannada:** navuru katte, kodkamballi
- **Malayalam:**karuththa ootal, oolan valli,sunamaki
- **Marathi:** umbli • **Tamil:** anapendu, peiodal
- **Telugu:** apajuttili, kaloi, loluga tige, luliti



Gnetum edule

3.1 Morphological description





Dioecious liane. leaves:simple, opposite, decussate, elliptic-ovate, or broadly elliptic ,6-12 by 3-8 cm, base rounded, apex acute, coriaceous, strobili axillary from the axils of a pairs of basal, opposite bracts, collars cupular. male strobilus:4-5 cm long,stalked,20-30 in a ring, exerted at maturity ;stamens 1,microsporangia 2 .female strobilus with.+8 ovules around a node. Fruit drupaceous, ellipsoid³.

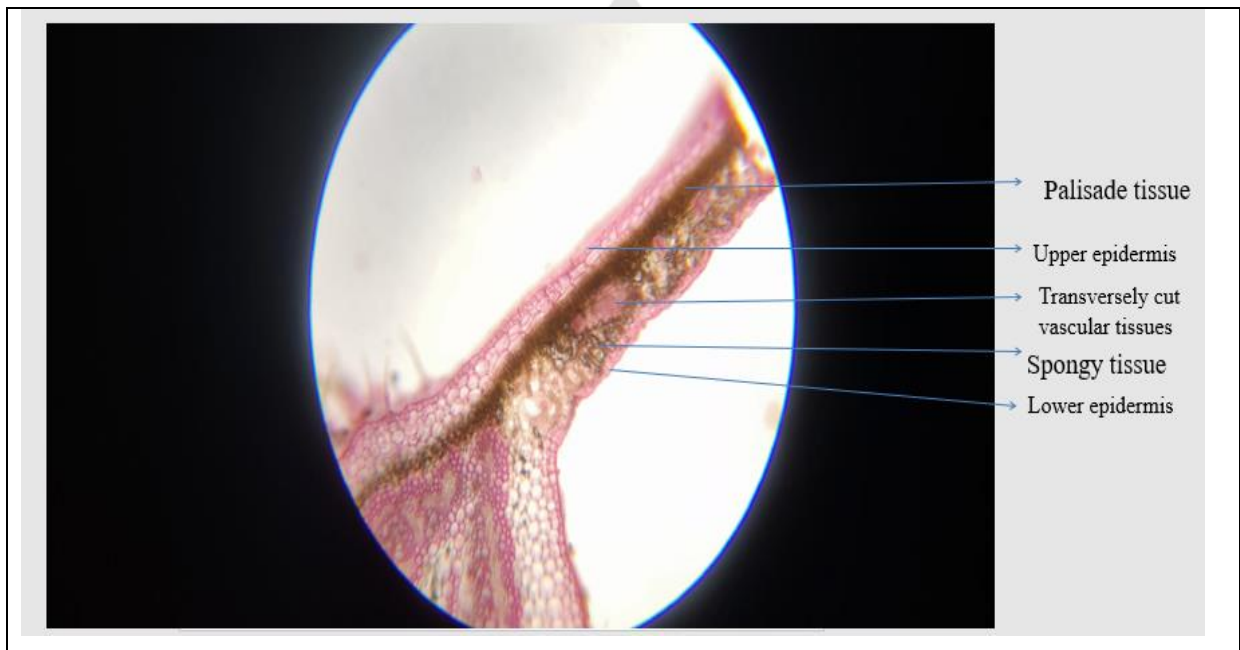
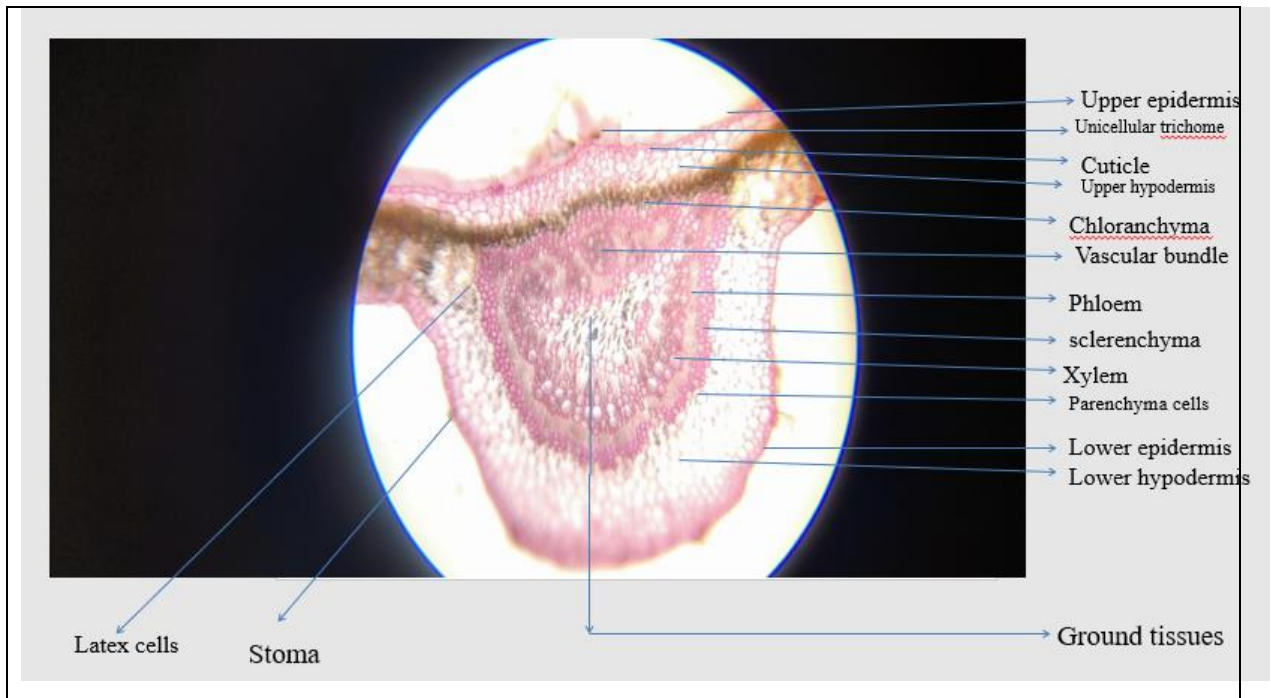


Flower of *Gnetum edule*



Fruit of *Gnetum edule*

Histology of *Gnetum edule* leaf



3.2 Anatomy of *Gnetum edule* leaf (T.S)

Microscopic evaluation of *Gnetum edule* leaf can be divided into Epidermis, Mesophyll tissue and Vascular bundles.

Epidermis: Epidermis is differentiated into upper and lower epidermis. unicellular layer of trichomes are present in the upper epidermal layer. it possess a well-developed cuticle upon its upper side. Upper hypodermis consists of 3-4 layered parenchymatous cells. A chloranchymatous layer is present just beneath the hypodermis.

Vascular bundles: Vascular bundles in the midrib region are arranged in horse-shoe shape. followed by patches of stone cells in their lower side. The bundles are conjoint, collateral and endarch. protoxylem towards upper side. A layer of phloem fibres surrounding the xylem towards its periphery. A 3-4 layered sclerenchymatous ring covering the vascular bundles.

Mesophyll tissue: The mesophyll tissue is differentiated into upper palisade and lower spongy tissue. The palisade is 1-2 layered is pale or yellowish green in colour and cylindrical in shape. The spongy tissue loosely arranged 5-6 layered polygonal to rectangular cells.

4. CONCLUSION

Medicinal plants are of great value in the field of treatment and cure of disease. To maintain a frequent supply of medicinal plants measures to be taken are conservation, cultivation, and addition of plants to the existing *Materia medica*. Added drugs are thoroughly examined for quality and authenticate by utilizes the standardized parameters described for it.

The conservation and sustainable use of medicinal plants have been studied extensively. Various sets of recommendations have been compiled regarding their conservation, including the establishment of systems for species inventorying and status monitoring, and the need for coordinated conservation practices based on both in situ and ex situ strategies. For medicinal plants with increasingly limited supplies, sustainable use of wild resources can be an effective conservation alternative. A pharmacognostic evaluation based on macroscopic and microscopic characters is required for the authentication and quality assessment. Various medicinal plants are described in ayurveda and most of them are well documented. But growing civilization, industrialization and urbanization threatened the wealth of plant species. Many important species are declared endangered now. Scientific study and documentation of folklore and exotic plants of medicinal importance becomes need of hour not only to eradicate the scarcity of this problem but also to get a deeper insight of their knowledge. It will be a boon to *Materia medica* of ayurveda when the *anukta dravya* will be documented after having sufficient knowledge about their pharmacological properties. This will help our

science to be made up to date and try to lessen the gap between oriental knowledge and new advanced knowledge of herbs.

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