International Journal of Advance and Applied Research
www.ijaar.co.in
ISSN – 2347-7075 Impact Factor – 8.141
Peer Reviewed Bi-Monthly
Vol.12 No.4 March – April 2025

Morphological Study on *Terminalia arjuna* in Amravati Region (Vidharbh, Maharashtra)

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DOI - 10.5281/zenodo.15661187

Abstract:

Medicinal plants have been a major source of therapeutic agents to cure human diseases, since ancient time. Terminalia arjuna one kind of widely used medicinal plant used in various indigenous systemofmedicine like Ayurved, siddha, Unani. Plants have beenused as medicines for thousands of year all over the world. As per World Health Organization (WHO) 80% ofworld population still depend on medicinal plants. Mostly developed countries still rely on plant based medicines for primary care WHO 1978.Arjuna is generally non – controversial drug. Arjuna has also manily two varieties now a days i.e. Terminalia arjuna and Terminalia tomentosa .Among them, Terminalia arjuna is accepted all over as Arjuna. To authenticate that the stem bark which have been used in study is original and not adulterated or confused with any other drug, so that morphological study is undertaken in Amravati region.

Keywords: Tree, Shrubs, Leaves, Flowers, Fruits, Bark.

Introduction:

Terminalia arjuna, commonly known as Arjun, is a large tree belonging to the family combretaceae, which is distributed throughout the South Asia. *T.arjuna*is widely used in traditional medicine due to its known properties like astringent, antidiarrheal, antipyretic, lithrotriptic, hypolipidemic, and cardioprotective effects. It has been used in the treatment of various diseases in humans such as cardiomyopathy, ischemia, atherosclerosis, anemia, and degenerative diseases.

Terminalia arjuna (T.arjuna) is a deciduous large sized fluted tree to 30 m tall and 2-2.5m diameter at breast height, with an often buttressed trunk. This tree is usually an evergreen tree with new leaves appearing in the hot season (February to April) before leaf fall. This tree is an exotic tree in India.It is one of the most versatile medicinal plants having a wide spectrum of biological activity.

In most of the traditional systems of treatment, the use of medicinal plant include the fresh or dried part of seeds, berries, leaves, bark, root or flowers of any

plant, whole, chopped, powdered and extracted with different solvents like hot water, ethanol. Such plant extracts play a major role in treating many diseases that affects animals and human being. T. arjuna has been widely used in Ayurvedic medicine for the treatment of cancer, dermatological and gynaecological complaints, heart diseases and urinary disorders. The bark is acrid, an astringent and tonic, and is useful in treatment of high blood pressure and ulcers. The cancer cell growth inhibitory constituent (luteolin) has been isolated from bark, stem and leaves of T. arjuna. Luteolin has also been show into have specific anti-bacterial activity against Neisseria gonorrhoea. It can also be used as alexiteric, styptic, tonic and anthelmintic and it is useful in fractures, inflammation and wounds and ulcers.

The sapwood is pinkish-white and the heartwood is brown to dark-brown, very hard, lustrous, strong and heavy (specific gravity 0.74; weight 816-865 kg/mn). The odourless, coarse-textured wood is streaked with dark lines and has irregularly inter-locked grains. Timber is locally used for carts, agricultural implements, water troughs, traps, boat building, house building, electric poles, tool-handles and jetty-piles. It also provides satisfactory rayon-grade pulp in mixture with other woods.

Review of Literature:

Plants have been used traditionally for many centuries for preventing diseases, and recent scientific studies have shown that the existence of a good correlation between traditional or folkloric application of some of these plants further strengthens the search for pharmacologically active compounds from plants (Jacob et al., 2018). The bark decoction of T. arjuna is used in the Indian subcontinent for anginal pain, hypertension, congestive heart failure, and dyslipidemia, based on the observations of ancient physicians for centuries (Dwivedi & Chopra, 2014). Recent scientific studies have showed that T. arjuna posses good safety profile when used with other conventional drugs (Amalraj & Gopi, 2016).

Terminalia arjuna has various therapeutic uses such as, diuretic, aphrodisiac, antiurolithic, immunomodulatory, antidiabetic, absorption enhancing, hypolipidemic, cardiotonic, central nervous system, hepatoprotective, anti-inflammatory, analgesic, antispasmodic, anticancer, antibacterial, anthelmintic, larvicidal, and anticariogenic activities (Chhatre et al., 2014). For the last few decades or so, extensive research work has been done to prove its biological activities and the pharmacology of its extracts (Chhatre et al., 2014).

Plant-based natural products have a long history of use in traditional medicine. Plants contain various primary and secondary metabolites, including carbohydrates, lipids, proteins, phenolics, flavonoids, tannins, and alkaloids (Chanda et al., 2020). T. arjuna is recognized as a crucial source of life-saving medications for a substantial portion of the global

population (Khandelwal et al., 2014).

Ethnobotanical studies reveal the extensive utilization of diverse plant species for various purposes, including medicine, food, ornamentation, and construction (Ijaz et al., 2017). Notably, numerous ethnic groups retain unique knowledge regarding medicinal plants that flourish in natural forest environments (Vinoth &Manivasagaperumal, 2014).

Map 1: Amravati District

Map 2: Showing the site of *Terminalia arjuna*

Aims and Objectives of Morphological Study:

To study morphological features of stem, bark, root, leaf, flower and fruit.

Study Area:

Pohra-Malkhed reserve forest is located at 2054’9.75”N 7753’24.31”E.The area under this work covers the region of Pohara-Malkhed reserve forest including peripheral area of Amravati city. The area consist of Chirodi, Bhankheda and Pohara villages which are part of Chandur railway taluka, Amravati, Maharashtra, India (refer maps 1 and map2).The present studywas carried out during April- May.

Terminalia arjuna is a deciduous large –sized fluted tree to 30m tall and 2-2.5m dbh, with an often buttressed trunk. Its superficial, shallow root system spreads radially along stream banks.The large, spreading crown produces drooping branches. Bark grey or pinkish green, thick, smooth and exfoliating in thin irregular sheets.

Leaves simple, opposite to sub-opposite,5-25 x4-9 cm, olong or elliptic oblong, glabrous, hard, often inequilateral, margin often crenulate, apex obtuse or sub-acute, base rounded or sometimes cordate.The petiole is short(2-4cm long),sericeous, with 2(or 1) prominent two glands at petiole apex.

Bark Smooth, grey outside, flesh coloured inside flaking off in large flat thin pieces. Heart wood dark brown,very hard,variegated with dark coloured streaks.

Inflorescences are short axillary spikes or small terminal panicles,9-13cm long with 2.5-6cm long branches.The rachis short,white and pubescent. Lower

receptacle 0.8-1.5mm long,short sericeous,upper receptacle 1.5-1.75mm long, glabrous except at a base where slightly pubescent. Flowers are small, cupshaped, regular, sessile, polygamous, white, creamy or greenish – white and strongly honey-scented.

Terminalia arjuna (single flower)

Bracteoles-Linear-Lanceolate,shorter than the flowers,cauducous.

Calyx-Glavrous,teeth,triangular,nearly glabrous both within and without.

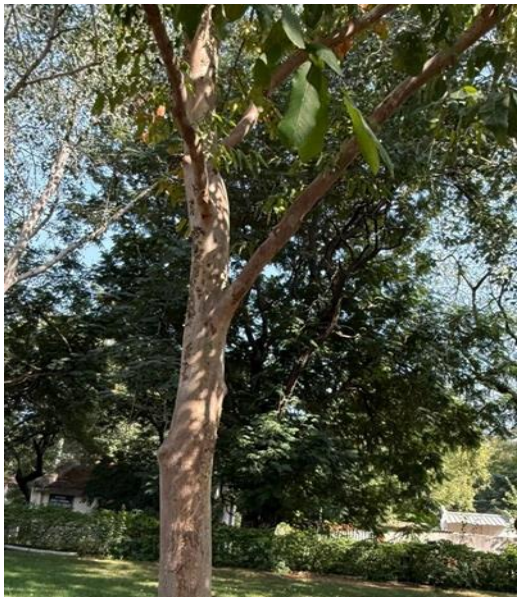
Ovary-Quite glabrous,disk clothed with yellowish or reddish hairs.

Young ovary-vary short,covered with crisoed brown or rufous

Fruit-2.5cm, ovoid or obovoid-oblong fibrous-woody, glabrous, dark brown with5-7 hard projecting wings striated with numerous curved wings .

Tree(Terminalia arjuna)

PLATE NO:1



Stem of *Terminalia arjuna*

PLATE NO: 2

Bark of *Terminalia arjuna* **Root of *Terminalia arjuna***

PLATE NO: 3

Leaf of *Terminalia arjuna*

PLATENO: 4

Flower of *Terminalia arjuna*

PLATE NO: 5

Fruit of *Terminalia arjuna*

PLATE NO:6

Conclusion:

The present study on *Terminalia arjuna* is a very important plant for its large number of phytochemical and pharmacological properties as well as medicinally important chemicals. Terminalia arjuna is a wide spread medicinal plant. The different parts of *Terminalia arjuna* like bark,leaves,fruits etc.,have different medicinal values and are used to cure various diseases. T. Arjuna bark is considered as main part

used in ayurveda as well as in Allopathy for curing various diseases. T.Arjuna bark powder is used to treat asthma and also helps to treat Acne vulgaris when applied as a paste mixed with honey. Leaves also used to cure ulcers and sores.The different phytochemical constituents isolated from Terminalia arjuna were flavonoids, glycosides, tannins etc. these phytochemical constituents are responsible for various pharmacological activities like anticancer activity, anti bacterial activity etc.Thus the plant Terminalia arjuna have enormous medicinal properties and is very useful for mankind.

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