

Taxonomical description of *Alchornea mollis* (Benth.) Müll.Arg.

Divya. K¹, Dr. P. Ashok² and Prof.Dr. S.B. Padal³

1,2 Research scholar, 3. Professor

Department of Botany, Andhrauniversity, Visakhapatnam, 533446.

Abstract

The present paper deals with traditional uses of *Alchornea mollis* (Benth.) Müll.Arg belonging to Euphorbiaceae family along with correct botanical identification, local name, parts used and mode of administration in respect to different diseases. *Alchornea mollis* (Benth.) Müll.Arg. is a deciduous, rambling shrub or a small tree, up to 10m in height with a maximum girth of 1m, which grows in the wild. The common diseases treated using medicinal plants are abortifacient, Skin disease, Ring worm, Wounds etc., The present study is therefore an effect to give a detailed survey on its pharmacognosy, phytochemistry, traditional and pharmacological uses. These are reported for the first time in this species.

Keywords: *Alchornea mollis* (Benth.) Müll.Arg, Pharmacognosy.

Introduction

Herbalism is a traditional medicinal or folk medicine practice based on the use of plants and plant extracts. Herbalism is also known as botanical medicine, medical herbalism, herbal medicine, herbology, and phytotherapy. India has a rich flora that is widely distributed throughout the country. Herbal medicines have been the basis of treatment and cure for various diseases and physiological conditions in traditional methods practiced such as Ayurveda, Unani and Siddha.

India ranks sixth among the 12 mega biodiversity centers of the world, and is home for an unusually large number of endemic species. It supports 15,000 species of flowering plants 5,000 of them exclusively providing shelter to 317 species of mammals [WCMC; 1992] Information on folk medicinal uses of the plants has recently become of renewed interest in the search for the therapeutic agents. India possesses large number tribal communities, amongst those few tribal communities live in Andhra Pradesh. In Andhra Pradesh district wise forest areas shows that Khammam- 52.2%, Adilabad-43.9%, Visakhapatnam- 39.3%, Kadapha- 32.6%, Chittor -29.9, Warngal- 28.8%, East Godavari - 29.9% districts have higher percentage of forest cover. The remaining 13 districts have lower forest cover than that is the state average.

In Visakhapatnam district tropical semi evergreen forest type occur in a localized manner in small pockets in valley near the banks of perennial strains and hills at about at about 800m where the climatic conditions are favorable with plenty of humus and moisture in the soil.

In the present investigation *Alchornea mollis* (Benth.) Müll.Arg was selected on account of their medicinal importance, edible values and aromatic nature and is based primarily on the literature screening along with their several uses in day to day life of people *A. mollis* belongs to the family Euphorbiaceae. It is used in the indigenous system of medicine. *Alchornea mollis* is an important medicinal plant in African traditional medicine and much pharmacological research has been carried out into its antibacterial, antifungal and anti protozoal properties, as well as its anti-inflammatory activities, with significant positive results. However, the link between activity and particular compounds is often not clear, although the flavonoids and tannins seem to play a major role. More research is needed to elucidate these relations.

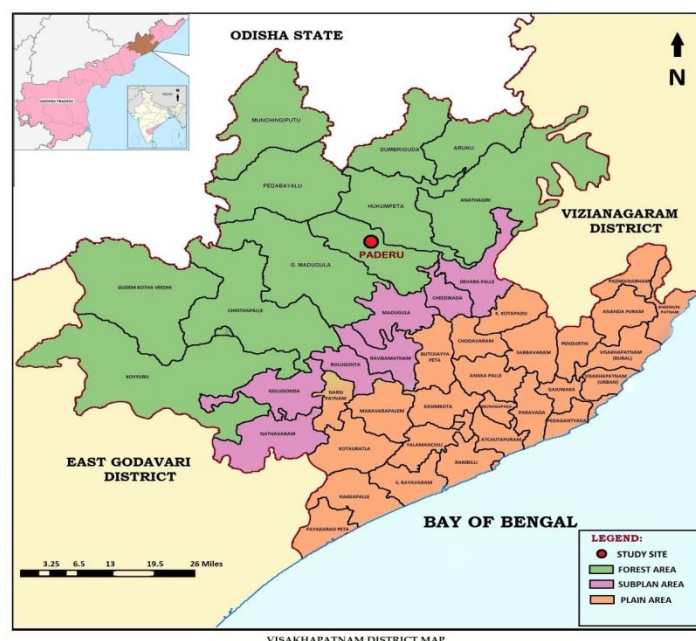
Materials and methods

Plant collection:

The plants (*Alchornea mollis*) were collected at Paderu division, Andhra Pradesh, India, during the month December, 2010. The authentication of the plant was done by Rtd. Prof. M. Venkaih, and Prof. Dr. S. B. Padal, Taxonomists, Department of Botany, Andhra University, Visakhapatnam.

Study area

The study sites are located in the hukumpet, paderu division, Visakhapatnam district of Andhra Pradesh, India, which are part of the EG of northern Andhra Pradesh. The study area lies between 18.41 latitude and 82.61 longitude. The data were collected from hukumpeta and uppa mandal in paderu division. The temperature of the paderu division low temperatures and high Rainfall is considerably more in the high areas. Geologically, rocks are the oldest, belonging to the Archean system, with gneiss being the most common rock in the hills.



Interview with traditional healers

Adopting the methods of Jain, ethnomedicinal data were collected through general conversations with the informants. The questionnaires were used to obtain information on medicinal plants with their local names, parts used, mode of preparation and administration. A total of 100 informants, comprising males and females were identified between the ages of 48 and 74. They were selected based on their knowledge of medicinal plants either for self-medication or for treating others. Informants were asked to come to field and show the plants with local name; the species mentioned by the informants were taxonomically identified.

Plant description

Alchornea mollis (Benth.) Müll.Arg. belongs to Euphorbiaceae family. *A. mollis* leaf, bark and root are widely used in traditional medicine. As per the latest APG classification *Alchornea mollis* (Benth.) Müll.Arg belongs to euphorbiaceae. The nomenclature, brief description and ethnobotanical uses of all the *A. mollis* is describing below.

Result

Technical description

The present chapter describe about taxonomical characters of *A. mollis*. Euphorbiaceae family of Angiosperms was recorded in Paderu division, Visakhapatnam district, Andhra Pradesh. These plant species were used by tribal's as food and as herbal medicines. This tradition knowledge was learned from their forefathers. The tribal people use a wide range of herbal medicines for curing various ailments. The knowledge of these medicinal herbs was learned from their fore fathers from generation to generation. There are some herbal medicines which are not well tapped by the other local people. Information on plant species regarding botanical name, local name, family, diseases and medicinal dosages are presented in the below. Among the different plan parts used for the preparation of medicine the stem bark were the most important and frequently used and majority of the remedies reported in the present study.



Whole plant



Leaf



Inflorescence

CLASSIFICATION

Kingdom Plantae – Plants

Subkingdom Tracheobionta – Vascular plants

Superdivision Spermatophyta – Seed plants

Division Magnoliophyta – Flowering plants

Class Magnoliopsida – Dicotyledons

Subclass Rosidae

Order Euphorbiales

Family Euphorbiaceae – Spurge

Genus – Alchornea

Species -mollis

**BOTANICAL DESCRIPTION**

Botanical name: *Alchornea mollis* (Benth.) Muell. Arg.

Synonyms: *Stipellaria mollis* Benth.

Sapium cardifolium Roxb.

Common name Badiki (telugu)

Habit

Shrub or small tree, Branches, white-tomentose. 3-5 m tall, dioecious.

Habitat: Valleys, streamside forests; 1200-1900 m.

Root: tap root system.

Stem: aerial, branched, dioecious or monoecious; indumentum of simple hairs.

Leaves: The leaves are alternate, up to 17x 16.2cm; broadly ovate, cuspidate or acuminate glandulose-denticulate, sub truncate- cordata at base, membranous, pubescent on both sides when young, ultimately glabrescent; stipules at base of leaf up to 0.2cm long, subulate, pubescent, persistent; petioles up to 11 cm long, tomentose when young, ultimately glabrescent; stipules up to 0.4 cm long, subulate, pubescent.

In the present study we collected plants randomly and observed the morphological characters of *A. mollis*.

Table: 1. vegetative characters of *A. mollis*

S. no	Leaf area (in cm)	Plant height (in meters)
1.	11	4.0
2.	12	4.1
3.	15	3.9
4.	15	3.8
5.	12	3.8
6.	13	3.7
7.	12	3.6
8.	13	4.1
9.	11	3.6
10.	13	3.8
Average	12.7±1.41	3.84 ± 0.18

Inflorescence: Inflorescences simple or paniced spikes or racemes. Inflorescences terminal and/or axillary, branched or unbranched, male often axillary, female and bisexual terminal; male inflorescence cauliflorous or at leafless node, unbranched, or if terminal then bisexual.

Male inflorescences 1–3 at leafless node, unbranched, puberulent; bracts triangular, 1–2 mm. Male flowers 9–11 per bract; pedicel ca. 1.5 mm; sepals 3, ovate, ca. 1.5 mm, subglabrous; stamens 8. Female inflorescences terminal, unbranched, 6–8 cm, puberulent; bracts lanceolate, 3–5 mm. Female flowers: pedicel ca. 2 mm; sepals 5 or 6, lanceolate, 2.5–3 mm, puberulent, one with basal gland; ovary globose, tomentulose; styles 3, filiform, 6–8 mm, connate for ca. 1 mm. Capsule subglobose, ca. 10 mm in diam., tomentulose. Seeds compressed-ovoid, ca. 7 mm, rugose.

Flower: flowers dioecious or rarely monoecious. Male flower in clusters forming lax, pubescent, slender racemes up to 14.1cm long; bracts up to 0.05 cm long, deltoid, pubescent, subtending 3-5 flowers; pedicels up to 0.1cm long, minutely pubescent. Flowers up to 0.3 cm across. Tepals 4, up to 0.2 x 0.12 cm. broadly ovate, acute, minutely pubescent without, reflexed in fully grown flowers. Flowers few, scattered; bracts up to 0.3cm long, lanceolate, acute, chocklet-brown, pubescent without, eglandular, subtending a single flower, persistent; bracteoles up to 0.15 cm long similar to bracts, persistent. Tepals 5-6, unequal, up to 0.2cm long, lanceolate, acute, chocklet-brown, pubescent without, ciliate, persistent, reflexed in fruit.

Stamens: stamens 6, free; filaments up to 0.08 cm long; anthers up to 0.1 cm long, dehiscing longitudinally, female racemes up to 14 cm long, pubescent;

Ovary: ovary up to 0.2 x 0.2 cm, globose, densely white- velvety; styles 3, up to 1 cm long, entire, chocklet-brown, minutely white pubescent, erect, bent or curled, connate at base up to 0.1 cm long, white velvety.

Fruit: capsules up to 0.9 x 1 cm, subglobose, white-tomentose, smooth; stalk up to 0.4 cm long, white- tomentose. Fruits 3-lobed, 3-valved, 3-seeded.

Seed: Seeds up to 0.7 x 0.7 cm, regulose, dorsally compressed. Seeds subglobose; testa crustaceous; Endosperm fleshy; cotyledons flat.

Table: 2. floral characters of *A. mollis*

S.no	No. of Inflorescence	No. of florets	No. of fruits	No. of seeds
1.	20	58	25	75
2.	17	55	30	90
3.	25	60	27	81
4.	22	55	26	78
5.	20	62	25	75
6.	18	57	28	84
7.	24	60	25	75
8.	15	55	26	78
9.	20	61	25	75
10.	22	70	23	69
Average	20.3 ± 3.093003	59.3± 4.57	26 ± 1.94	78 ± 5.830

Flowering and fruiting: May- August.

Location: common in moist valleys with high rainfall; Minumulure towards modakondammagudi, near gorapur Railway Station and vankachinta gedda, hukumpeta .

Distribution: India: E. Himalayas, Sikkim, Assam and N. Circars; Nepal .

Medicinal imporatance:

- ❖ The leaves are the main part used, but the stem bark, stem pith, leafy stems, root bark, roots and fruits are also employed. In addition to the properties listed above, the leaves or leafy stems are also believed to be abortifacient, antispasmodic, blood purifier, diuretic, emetic (in large doses), emmenagogue, oxytotic, purgative, sedative and tonic. In addition to the properties listed above, the leaves or leafy stems are also believed to be abortifacient, antispasmodic, blood purifier, diuretic, emetic (in large doses), emmenagogue, oxytotic, purgative, sedative and tonic.
- ❖ Powder of stem bark and leaves have been taken in water or as food for piles (folklore).
- ❖ The juice from the leaves and stem bark is used to treat ringworm and other skin disease.

- ❖ Bark constituent the drug. It is stimulating and hallucinogenic, due to alkaloid, Mainly Alchornein. Alchornein titrate has a strong anticholinergics, vagolytic and peristaltic inhibition effect.
- ❖ The indigenous people of the amagon have used the bark and root of *A. mollis* (Benth.) Müll.Arg for different purpose for several years. One of the more popular preparations is an alcoholic bark tincture used to treat rheumatism, arthritis, cold and muscle pains.

Information on the use of medicinal plants was collected for one year (2016) with the help of rural community. During this period, door-to-door visits were made in order to attempt to identify local people with a specialized knowledge of medicinal plant use of *A. mollis*.

Table:3. Ethanomedicinal important parts of *A. mollis*

S.no.	Disease	Useful plant part	No. of persons used in study area
1.	Piles	Stem bark	20
2.	Skin diseases	Leaves	80
3.	Rheumatism	Bark	25
4.	Arthritis	Bark	20
5.	Cold and muscle pains	Bark	82
6.	Abortifacient	Leaves or leafy stem	10

Propagation

- *A. mollis* is widely since it is a wild plant; Acidic soil of pH 5.6 to 6 is more preferable for the growth of *A. mollis*.
- *A. mollis* grow on hilly areas, plant required low temperature, shade, rainfall and rich in humus.
- Propagation: Seed - germination takes 3 - 12 weeks when directly planted in moist soil. Plants are most easily propagated from stem cuttings.
- Pollination through insects.

A. mollis use as medicine for several diseases and the plant have medicinal values so the present study investigation conducted on preliminary Phytochemical analysis and antimicrobial activity of *A. mollis* Leaf, Bark and root. It is rare endemic species contain medicinal importance and secondary metabolites. The plant grows only low temperature, high rainfall and shade areas. Seed germination and propagation takes long time so the present study investigation on *exsitu* conservation of *A. mollis* (by using *in vitro* propagation).

Conclusion

A. mollis (Benth.) Muell. Arg. (Euphorbiaceae) is a rare shrub or small tree rare species in India. It is also reported to be found in the marginal forest in Paderu division in A.P. It is found in the evergreen and semi-evergreen forests under the shade of trees. The distribution of *A. mollis* is E. Himalayas and paderu division, Andhra Pradesh. An

endangered species is a native species that faces a significant risk of extinction in the near future throughout all or a significant portion of its range. The conservation of the wild medicinal plants or any other such threatened species can be tackled by scientific techniques. There are basically two scientific techniques of conservation of genetic diversity of these plants. That is in-situ conservation, Ex-situ conservation.

Acknowledgement

I express my deepest sense of gratitude and sincere thanks to my research supervisor **Prof. S. B Padal** for his guidance, constant encouragement, and help throughout the period of my research work. I would sincerely like to express my special heartfelt thanks to **Dr. V. Ravi Sankar Ummidi and Dr. P. Ashok**, for his keen interest and cooperation in carrying out my research work. I am deeply thankful to **The Management, MicGene Laboratory (TRIMS)** for providing the lab facilities to complete my work. I enjoyed working in the laboratory.

Reference

Adeshina GO, Onaolapo JA, Ehinmidu JO, Odama LE, Kunle OF. (2007). Phytochemical and toxicologic activity of the leaf extracts of *Alchornea cordifolia* (Schum and Thonn) Muell. Arg. (Euphorbiaceae). *Nig. J. Pharm. Res.* Vol. 6(1): 19-24.

Adesokan AA, Akanji MA, Yakubu MT. (2007). Antibacterial potentials of aqueous extract of *Enantia chlorantha* stem bark. *Afr. J. Biotechnol.* 6(22): 2502-2505.

Adewole AA. (1993). Personal communication with Local traditional medical practitioner in Ibadan, Nigeria. 12. C. A. Hiruma-Lima, C. Akiko, T.R. Calvo, C.M. Rodrigues, F.D.P. Andrade, W.Vilegas, A.R.M.S. Brito. (2006). Antiulcerogenic activity of *Alchornea castaneaefolia*: effects on somatostatin, gastrin and prostaglandin. *Journal of Ethnopharmacology*, Vol. 1004 pp. 215-224

Agbor, CA. Leopold, T. Jeanne, NY. (2004). The antidiarrhoeal activity of *Alchornea cordifolia* leaf extract. *Phytother. Res.* 18(11): 873-876.

Agrawal, RK and Baslas, RK. (1981). Chemical investigation of Aerial parts of *Euphorbia thymifolia*. *Indian J. of pharmaceutical sciences.* Vol. 43(9). 182-183.

Balandrin, MF. Klocke, JA. Wurtele ES, Bollinger, WH. (1985). Natural plant chemicals: sources of industrial and medicinal materials. *Science.* 228(4704):1154-60.

F.B.C. Okoyea, P.O. Osadebea, C.S. Nworub, N.N. Okoyec, E.O. Omejea and C.O. Esimone. (2011). Topical anti-inflammatory constituents of lipophilic leaf fractions of *Alchornea floribunda* and *Alchornea cordifolia*. *Natural Product Research*, 1-9.

Farombi, EO. Ogundipe, OO. Uhunwagho, ES. Adeyanju, MA. Moody, JO. (2003). Antioxidant properties of extracts from *Alchornea laxiflora* (benth) Pax and Hoffman. *Phytotherapy Res.* Vol. 7: 713-716.

Gbonjubola Olusesan Adeshina, Josiah Ademola Onaolapo, Joseph Olorunmola Ehinmidu, Lilian Emiola Odama.

(2010). Phytochemical and antimicrobial studies of the ethyl acetate extract of *Alchornea cordifolia* leaf found in Abuja, Nigeria. *Journal of Medicinal Plants Research* Vol. 4(8), pp. 649-658.

Jaideep Mathur. (1992). In vitro morphogenesis in *Nardostachys jatamansi* Dc. Shoot regeneration from callus derived roots. *Annals of Bot.* Vol. 70: 419- 422.

Jain SK, Rao RR: *A handbook of field and herbarium methods*. Today and tomorrow printers and publishers. New Delhi; 1976.

Lamikanra A, Ogundaini AO, Ogungbamila FO. (1990). Antibacterial constituents of *Alchornea cordifolia* leaves. *Phytotherapy Research*. Vol. 4:198–200.

Calvo T. R., D. Demarco, F. V. Santos, H. P. Moraes, T. M. Bauab, E. A. Varanda, I. M. Cólus and W. Vilegas. (2010). Phenolic compounds in leaves of *Alchornea triplinervia*: anatomical localization, mutagenicity, and antibacterial activity, *Nat. Prod. Commun.* Vol. 5, 1225-1232

