



Review Article

***Chonemorpha Fragrans*, An Endangered Medicinal Plant: A Review**

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In the present review, an attempt has been made to congregate the botanical, morphological phytochemical, ethnomedicinal and pharmacological information on *chonemorpha fragrans*(Moon)Alston, a medicinal herb used in the indigenous system of medicine. It has been adored in almost all ancient ayurvedic texts for its extraordinary medicinal properties. It is sweet and astringent in taste. The roots of chonemorpha possess several medicinal properties. Ayurvedic texts categorise chonemorpha is used as carminative, anthelmintic and digestive. While alleviating kapha and vata, it aggravates pitta. *chonemorpha fragrans*(Moon)Alston has a variety of biological / pharmacological activities such as antiamebic, antipyretic, antidiabetic, anti parasitic, anthelmintic, anticancer, HIV disorder, skeletal muscle relaxant and gynaecological disorder . This review will definitely help for the researchers as well as clinicians dealing with *chonemorpha fragran* to know its proper usage as this herb is seemed to be highly valuable, possessing many pharmacological / medicinal properties.

Keywords: Medicinal properties, Ayurved, *chonemorpha fragran*, herb, Pharmacological activities

INTRODUCTION:

Chonemorpha fragrans (Moon), Alston (Apocynaceae) syn *Chonemorpha grandiflora*, (Roth) M.R. and S.M. Almeida has been included in the list of an endangered medicinal plants.¹

Part of plants used in medicine: Entire plant, roots and root bark are used for fever and stomach disorders. The plant is useful in treatment of skin diseases and inflammations.¹

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MORPHOLOGICAL CHARACTER:

Chonemorpha fragrans is a stout spreading laticiferous shrub with soft greyish to rusty-brown bark which yields fibre of good quality; leaves simple, opposite, large, orbicular, fulvous tomentose beneath, prominently veined; flowers large, whitish to cream-yellow, fragrant, in terminal or pseudo-axillary cymose panicle; fruits long, straight, woody, parallel, follicular mericarps; seeds many, flat, shortly beaked with long white silky coma.²

SYNONYMS²

Sanskrit : Murva, Morata



Hindi : Garbhedaro
Kannada : Manjinaru
Telgu : Chaga
Malayalam : Perunkurumpa

SCIENTIFIC CLASSIFICATION OF CHONEMORPHA FRAGRANS:³

Kingdom : Plantae
Phylum : Division
Class : Angiospermae
Order : Gentianales
Family : Apocynaceae
Genus : *Chonemorpha*
Species : *Chonemorpha fragrans*

It is commonly known as “Garbhedaro” in Hindi, and “Murva&Morata” in Sanskrit.² It is medicinal plants, which has been assigned endangered in the Kerala states. It is used in different preparation sudarsansavam, kumaryasavam used in Kerala ayurvedic system.⁴

TRADITIONAL USES:

The roots are are sweet, bitter, astringent, laxative, thermogenic, depurative, carminative, anthelmintic, digestive, antiscorbutic, anodyne, expectorant and febrifuge. They are useful in vitiated conditions of vata and kapha, skin

diseases, leprosy, scabies, dyspepsia ,colic, constipation hyperacidity ,cardiac debility, diabetes, jaundice, cough, bronchitis and intermittent fevers.

Murva is used in diseases like anaemia (*pandu*), fever (*jwara*), diabetes (*prameha*), stomach disorders (*udara roga*), typhoid (*visama jwara*), urinary infections (*asmari*) and cough (*ksaya*).⁵ It is also used in the treatment of diarrhea, polyuria, boils, leprosy, eye diseases, vomiting and poisoning.⁶

ETHANOPHARMACOLOGY:

Chonemorpha fragrans is a medicinal plant found in the western ghats of Maharashtra. The leaves, roots, bark-stem are used in Ayurvedic system of medicines. Leaves are used in the form of churna /extract or in combination with the other plant materials in their formulation. It is administered orally. Metal analysis of leaves shows a high percentage of metals like, calcium, iron, copper and manganese along with the other metals. These results may help in development of new drug formulations.⁷

The plants are propagated by the seeds, which are produced abundantly. It is suitable for cultivation in the open on a long trlislis trees.The powdered root and stem are credited with laxative anti-bilious properties and given for stomach disorder, chest disease and rheumatism.⁸

PHYTOCHEMICAL ANALYSIS:

The rootbark contain 3.03 % of total alkaloids present are japindine, N-formylchonemorphin, N-methyl chonemorphin. Chonemorphin dihydrochloride is an anti-amoebic principal and show in vitro activity against parasites entamoeba histolytica (25µg/ml) trichomonas vaginalis (200µg/ml) and in vitro activity against hepatic amoebiasis in golden hamster and intestinal amoebiasis in wealing wistar rats. Presence of fats, octacosanol, ceryl alcohol, β -sitosterol and taraxasterol is reported. The leaves and twig contain baurenolacetate and β -sitosterol. The stem yields latex. It is purgative. Analysis of dried latex from Assam gave:

Moisture: 19.8

Protein: 0.83

Rubber: 77.1

Resin: 1.4

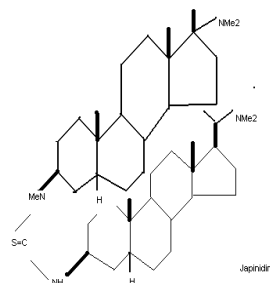
Ash: 0.5%

The rubber obtain is tough, elastic and of good quality. The bark yields a fiber, resistance to fresh and salt water and used fishing nets and ropes (Mattews, 343:Uphof,127: Misra,loc.cit.).⁸

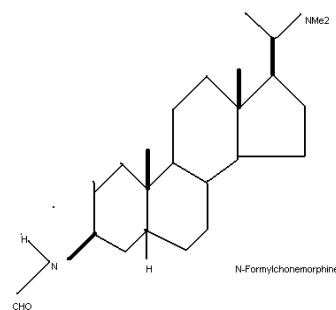
In Ayurveda, it is used as an emetic (Med Arom Plant Abstr.,1996,18,1148).⁹

Funtamafrine C, mp168⁰ from roots identical with deaminochonemorphinone (Indian J. Chem. 1972,10,1197); Two new

steroids alkaloids-Japindine and N-formylchonemorphine isolated from root bark and characterized; their structure confirmed by synthesis (Indian J Chem.1973,11,1056; ibid 1978,16B,346); Baurenol acetate and β -sitosterol from leaves (Indian J. Chem.1978,16B,346).¹⁰

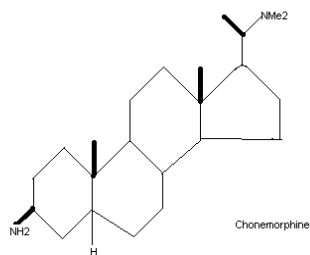


A steroidal alkaloids-Chonemorphine, mp 144 –from roots characterized by spectral and chemical studies (Chem.Ind. 1960,290; ibid 1959,1445; Indian J Chem. 1967,5,146).¹¹

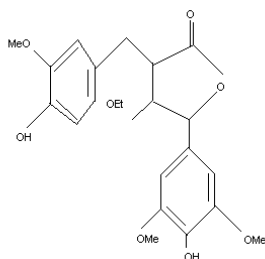


Root bark contained lipids (0.54%) as glycerides of lauric(11.9), stearic(13.3), arachidic(17.0), myristic(20.2), palmitic(10.4), oleic(9.6), linolenic(11.8) and ricineoleic acids(5.2%), octacosanol: ceryl alcohol, β -sitosterol and taraxasterol also isolated (J.

Inst.Chemists,Calcutta 1984,56,140;Chem Abstr. 1984,101,147840m).¹²



A lignan derivative (I) Isolated from stem (Jpn.5, 194,464(1991) Sep. 25; Chem. Abstr. 1993,119,167720x).¹³



PHARMACOLOGICAL ACTIVITY:

Antidiabetic activity:

Alcoholic extract of *Chonemorpha fragrans* root (CF.alc.extract) showed antidiabetic activity when administered orally at dose 100 mg/kg and 200mg/kg in different condition such as normal, glucose over loaded in normal rats, and alloxan induced diabetic rats. At dose 200 mg/kg per oral (p.o.) was produce significantly reduce blood glucose level in fasted normal rat and against glucose over loaded rats and alloxan induced diabetic rats at single dose as well as twelve day treatment. Histopathology studies on

pancreas alloxan induced diabetic rats inflammatory changes were detected in pancreatic islets results from selectively destroy of insulin producing β -cells. These changes are dose-dependently inhibited by CF.alc.extract and gliclazide.¹⁴

Antiamoebic activity:

In a bioassay-directed screening programme of plants for the identification of active constituents the steroid "Chonemorphine" was isolated and identified as the antiamoebic and anti-trichomonad principle of *Chonemorpha fragrans*.¹⁵

Antipyretic activity:

Murva is one of the controversial drugs used in Ayurvedic medicine. In the present study two botanical sources of Murva, viz. *Wattakaka volubilis* and *Maerua oblongifolia*, were tested for antipyretic activity by yeast-induced pyrexia in Wistar albino rats. Alcohol and aqueous extracts of both species significantly reduced the elevated rectal temperature in febrile rats within 30 min of their administration. The results of these studies support the traditional use of these two botanical sources of the drug Murva in the treatment of fever.¹⁶

Anti-parasitic agent:

Chonemorphins, a steroidal alkaloid isolated from *Chonemorpha fragrans* Moon (Apocyanaceae) was identified as an



antimoebic principle during the course of a screening programme for novel antiparasitic agents from plant sources. At a dosage of 100 mg/kg x 4 chonemorphine led to a 100% cure of experimental hepatic infection in golden hamsters and cleared 90% of the intestinal infection in weanling Wistar rats at 200 mg/kg (x4) dosages. The discovery of chonemorphine as an antiamoebic agent is an addition to the few known plant amoebicides such as emetine and conessine.¹⁷

Skeletal muscle relaxant:

Skeletal muscle relaxant property of *Chonemorpha macrophylla* (CM). The skeletal muscle relaxant effect of the alcoholic extract of CM was studied on isolated frog rectus abdominis muscle, isolated rat phrenic nerve diaphragm muscle preparation and in intact young chicks. The parameter studied in the isolated muscle or isolated nerve muscle preparations was the extent of inhibition of acetylcholine or electrically-induced contraction of skeletal muscles. In intact chicks, the drug was administered i.v. in wing veins and the onset, duration and nature of paralysis were recorded. In all the experiments, the effect of the drug was compared with that of gallamine and succinylcholine. The alcoholic extract of CM reduced the acetylcholine-induced contraction of isolated frog rectus

abdominis and electrically stimulated contractions of rat phrenic nerve diaphragm in a dose-dependent manner. In unanaesthetized chicks, it produced spastic type of paralysis with extension of the neck and limbs. The effects were similar to the effects of succinylcholine but different from those of gallamine. The alcoholic extract of CM possesses skeletal muscle relaxant property. It produces depolarizing type of muscle paralysis similar to that produced by succinylcholine.¹⁸

Anthelmintic activity:

Roots of *Chonemorpha fragrans* belonging to family Apocynaceae showed the anthelmintic activity.¹⁹

Anticancer activity:

Camptothecins are one of the most important anticancer alkaloids of the 21st century because of their clinical applications against cancer²⁰, HIV.²¹

Gynaecological disorder:

In Mizoram, the plant is used for treatment of gynaecological disorders.²² *C. grandiflora*, has been included in the list of threatened medicinal plants.²³

REFERENCE:

1. Kulkarni AV, Patwardhan AA, Upadhye AS and Malpathak NP, Pharmacognostic evaluation of *chonemorpha grandiflora*, an endangered medicinal plant, International Journal of Pharmaceutical Science and



Research,2011;2(10):2690-2693.

1. Arya Vaidya Sala, Indian Medicinal Plants a Compendium of 500 species, Orient Longman ,Volume-II, Orient Longman Ltd.,Madras,1995-1997:67-9

2. Classification of Species: *Chonemorpha fragrans*, National Biodiversity Centre: National Biodiversity Centre Plinian Core Resource

3. Kulkarni AV,Patwardhan AA,Lele U, Malpathak NP, Production of camptothecin in cultures of *chonemorpha grandiflora*,Pharmacognosy Research,September 2010;2(5):296-299.

4. Kolammal M. ,Pharmacognosy of Ayurvedic Drugs Series-1. Trivandrum: Ayurveda Research Institute, 1978: 1.

5. Yoganarasimhan SN. ,Medicinal Plants of India, Vol 2,Tamil Nadu. Bangalore: Cybermedia, 2000: 346.

6. Chandrachood, P. S., Kamble, G. S.,Manik Kulkarni, Deshpande, N. R.,Kashalkar, R. V.,Identification of metals found in the leaves of *Chonemorpha fragrance*. , Biosciences, Biotechnology Research Asia ,2009 ; 6 (2): 811-815

7. The Wealth of India ,A dictionary of Indian raw materials and industrial products, the wealth of india, raw materials Volume-3: Ca-Ci, Revised Edition, Publication and Information

Directorate, Council of Scientific and Industrial Research ,New Dehli,India-1992 :486

8. The Wealth of India, A Dictionary of Indian Raw Material and Industrial Products, second Supplement Series (Raw Materials),Volume-I:A-F, National Institute of Science Communication and Information Resources, Council of Scientific and Industrial Research ,New Dehli,India-1976-2009 :174

9. Ram P. Rastogi and B. N. Mehrotra, Compendium of Indian Medicinal Plants, Volume-II, National Institute of Science Communication and Information Resources, Council of Scientific and Industrial Research, New Dehli,India-1970-1979:178

10. Ram P. Rastogi and B. N. Mehrotra, Compendium of Indian Medicinal Plants, Volume-I, National Institute of Science Communication and Information Resources, Council of Scientific and Industrial Research, New Dehli,India-1960-1969:99

11. Ram P. Rastogi and B.N. Mehrotra, Compendium of Indian Medicinal Plants, Volume-III, National Institute of Science Communication and Information Resources, Council of Scientific and Industrial Research, New Dehli,India-1980-1984:166

12. Ram P. Rastogi and B.N. Mehrotra,



- Compendium of Indian Medicinal Plants, Volume-V, National Institute of Science Communication and Information Resources, Council of Scientific and Industrial Research, New Dehli, India-1990-1994:201
13. Shende VS, Sawant VA, Turuskar AO, Chatap VK, Vijaya C, Evaluation of hypoglycemic and antihyperglycemic effects of alcoholic extract of *Chonemorpha fragrans* root in normal and alloxan induced diabetic rats, *Pharmacognosy Magazine*, 2009; 5(19):36-41.
 14. Shah VC, D'Sa AS, de Souza NJ, Chonemorpha, stigmasterol, and ecdysterone: steroids isolated through bioassay-directed plant screening programs., Centre for Basic Research, Hoechst India Limited, Bombay, *Steroids*, March-May 1989; 53(3-5):559-65.
 15. Madhavan V, Amit Kumar Shukla, Anita Murali, Usha M, Yoganarasimhan SN, Antipyretic activity studies of two botanical sources of the drug Murva, *Asian Journal of Traditional Medicines*, 2010; 5(5):171-180
 16. Chatterjee DK, Iyer N, Ganguli BN, Antiamoebic activity of chonemorpha, a steroidal alkaloid, in experimental models, *Parasitol Research*, 1987; 74(1):30-3
 17. Roy Ranendra Kumar, Ray NM., Das AK, Skeletal muscle relaxant effect of *Chonemorpha macrophylla* in experimental animals, *Indian Journal of Pharmacology*, March-April, 2005; 37(2): 116-119
 18. Vinay Jaiswal, Sandeep Gupta, Anuj kumar, Saher Jafer, Swati Mittal, Overview on medicinal plant used in anthelmintic, *Drug Invention Today* 2011; 3(5), 57-61
 19. Potsmesil, M. Camptothecins: From Bench Research to Hospital Wards Cancer Research 1994; 54:1431-1439
 20. Priel, SD. Showalter, D.G. Blair. Inhibition of human immunodeficiency virus (HIV-1) replication *in vitro* by non-cytotoxic doses of camptothecin. A topoisomerase inhibitor. *Aids Res. Human Retrovirus* 1991; 7: 65-68
 21. Rai P K and H. Lalramnghinglova. Ethnomedicinal plant Resources of Mizoram, India: Implication of traditional knowledge in health care system. *Ethnobotanical Leaflets* 2010; 14: 274-305.
 22. Sarah Khan, N. Mohan Karnat, Darshan Shankar. India's foundation for revitalization of local health traditions, pioneering *In Situ* conservation strategies for medicinal plants and local cultures. *Herbalgram*, 2005; 68: 34-45.