Available online www.jocpr.com

Journal of Chemical and Pharmaceutical Research

ISSN No: 0975-7384
CODEN(USA): JCPRC5

J. Chem. Pharm. Res., 2011, 3(6):759-765

Standardization and phytochemical screening of *Chonemorpha Fragrans root* powder

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ABSTRACT

Standardization of plant powder is essential in order to assess the quality and purity of drugs, based on the concentration of their active principles, physical and chemical standards. This article reports on standardization of Chonemorpha fragrans root powder. Chonemorpha fragrans root powder has been standardized on the basis of organoleptic properties, physical characteristics, and physico□chemical properties.

Key words: Standardization, Morphological, Organoleptic, Physico-chemical.

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 plant. 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]**

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]**

SYNONYMES [2]

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 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]**

EXPERIMENTAL SECTION

The roots of *Chonemorpha fragrans* was collected from the Ayurvedic shop,Dehli and same was authenticated by Dr, Seema Bhadhuaria, R.B.S. College , Agra, shade dried and powdered from 40#size.This powder was used for standardization of plant material.

Standardization parameters:

Organoleptic evaluation

The organoleptic character of the sample was evaluated based on the method described by Siddiqui *et al*. Organoleptic evaluation refers to evaluation of the powder by color, odor, taste and texture etc**. [7]**

Physicochemical investigations

Physico-chemical studies like total ash, water soluble ash, acid insoluble ash, water and alcohol soluble extract, loss on drying at 105°C and extractive values by maceration extraction method were carried out as per the WHO guide lines **.[8],[9],[10],[11]** Physico-chemical investigations

of powder of plants was carried out were the determination of Loss on Drying , extractive values and ash values**.[12]**

Loss on Drying [9]
About 5 g of powder was accurately weighed, placed in petridish and dried in hot-air oven at 110^0C for four hours. After cooling, it was placed in a dessicator, later the loss in weight was recorded, and procedure was repeated till constant weight was obtained.

$$\text{Loss on Drying} = \frac{\text{Loss in weight}}{W} \times 100$$

W = Weight of the crude drug in grams

Ash Value [10]
About 2g of crude drug powder was accurately weighed in a tared and previously ignited silica crucible. Incinerated gradually by increasing the heat, not exceeding dull red heat, until free from carbon, cooled and weighed. The percentage of ash was calculated with reference to the air dried drug.

a) Acid Insoluble Ash
The ash from the above step was boiled for 10 min with 25 ml of dilute hydrochloric acid, and the insoluble matter was collected in a silica crucible (previously ignited and weighed). The percentage of acid-insoluble ash was calculated with reference to the air-dried drug.

b) Water Soluble Ash
The total ash was boiled for 5 min with 25 ml of water. The insoluble matter was collected in a crucible, washed with hot water, ignited and weighed. The percentage of water soluble ash was calculated with reference to air-dried drug.

Determination of Extractable Matter (Cold Maceration)[10],[11]
1. About 5 g of the powdered drug was weighed in a weighing bottle and transferred to a dry 250 ml conical flask.
2. 100 ml graduated flask was filled with the solvent 90% alcohol/water. The contents of weighing bottle was treated with solvent was transferred to a conical flasks and washed with the solvent.
3. Cork the flask and set aside for 24 hr, shaking frequently.
4. The contents were filtered into a 50 ml cylinder, when sufficient filtrate was collected, then 25 ml of the filtrate was transferred to a weighed thin porcelain dish.
5. The solvent was evaporated to dryness on a water-bath and dried in an oven at 105^0C for 6 hrs.
6. It was cooled in desiccators for 30 min and weighed without delay.
7. The content of extractable matter was calculated in mg/gm of dried material (w/w).
8. The percentage w/w of extractive was expressed with reference to the air-dried drug.

Total solid content [9]
About 5-6 g of extract was accurately weighed in a Petridish and kept in a hot-air oven maintained at 110^0C for four hours. After cooling in a desiccator, the loss in weight was

recorded. This procedure was repeated till constant weight was obtained. Found out total solid content.

Determination of pH

1% solution of powder was prepared in distilled water and pH was determined using pH meter SYSTRONICS DIGITAL pH METER, MK VI.

Fluorescence analysis Fluorescence Analysis [11]

Many crude drugs show the fluorescence when the sample is exposed to ultraviolet radiation. Evaluation of crude drugs based on fluorescence in daylight is not much used, as it is usually unreliable due to the weakness of the fluorescence effect. Fluorescence lamps are fitted with suitable filters, which eliminate visible radiation from the lamp and transmit ultraviolet radiation of definite wavelength. Several crude drugs show characteristic fluorescence useful for their evaluation.

Table – 1 Results of Physicochemical Evaluation of Roots of *Chonemorpha fragrans*

Sl. No.	Name of the Test	Result
1.	Physical tests a. Nature b. Colour c. Odour d. Taste	 Fibrous powder Yellowish Characteristic Astringent and sweet
2.	Loss on drying	5.2% w/w
3.	Ash values a. Total ash b. Acid insoluble ash c. Water soluble ash	 4.5% 3.00% 1.55%
4.	Extractable Matter a. Alcohol soluble extractive b. Water soluble extractive	 13.50% 11.50%
5.	Fluorescence analysis	Green fluorescence
6.	Total solid content	80%

Table – 2 Physical Tests and Quantity of Extract of Roots of *Chonemorpha fragrans*

Sl. No.	Name of the Extract/ Fraction	Nature	Colour	Odour	Taste	Quantity in gms	Percentage Yield
1.	Petrolium ether	Solid	Brownish yellow	Characteristic	Tasteless	1.00 (for 100g)	1.0%
2.	Chloroform	Solid	Yellowish brown	Sweet	Bitter	3.5 (for 100g)	3.5%
3.	Alcohol	Solid	Reddish brown	Characteristic	Strongly bitter	13.50 (for 100g)	13.50%
4.	Chloroform water	Solid	Reddish brown	Sweet	Bitter	11.50 (for 100g)	11.50%

Preliminary Phytochemical analysis

Preliminary phytochemical tests were performed as per the standard methods. **[13]** Before the preliminary phytochemical investigation all the extract of powder drug was carried out according to the Pandey et al.Eight hundred grams roots of *Chonemorpha fragrans* was extracted

individually with 1500 ml chloroform water, alcohol,petroleum ether,benzene.by the maceration process and evaporate to dryness. The extract was filtered using a muslin cloth and concentrated. The fine powder was stored in desiccators until use. Preliminary qualitative phytochemical analysis of all the extracts was carried out by employing standard conventional protocols**. [14-16]**

Table – 3 Results of Phytochemical Investigation of Roots of *Chonemorpha Fragrans*

Sl. No.	*Name of the Test*	Water Extract	Alcoholic Extract	Chloroform Extract	Petroleum ether Extract
1.	**Test for sterols**				
	a. Test solution + Sulphur (Sulphur powder test)	-	+	+	+
	b. Salkowisky	-	+	+	+
	b. Libermann Reaction	-	+	+	+
2.	**Test for glycosides**				
	a. Keller – Killaini Test	+	+	-	-
	c. Baljet test	+	+	-	-
3.	**Test for saponins**				
	a. Haemolytic test	+	+	-	-
	b. Foam test	+	+	-	-
4.	**Tests for proteins**				
	a. Xanthoprotein test	+	+	-	-
	b. Millon's test	+	+	-	-
	c. Biuret test	+	+	-	-
	d. Ninhydrin test	+	+	-	-
5.	**Test for tannins**				
	a. Ferric chloride test	+	+	-	-
	b. Lead acetate test	+	+	-	-
	c. Dil HNO_3 test	+	+	-	-
6.	**Test for alkaloids**				
	a. Dragendroff's test	-	+	-	-
	b. Mayer's test	-	+	-	-
	c. Hager's test	-	+	-	-
	d. Wagner's test	-	+	-	-
7.	**Test for carbohydrates**				
	a. Molisch's test	+	+	+	-
	b. Barford's test	-	-	-	-
	c. Benedict's test	+	+	-	-
8.	**Test for Triterpenoids**				
	a. Libermann Burchardt's Test	+	-	+	+
	b. Salkowaski Test	+	-	+	+
9.	**Test for flavonoids**				
	a. Shinoda test	+	-	-	-
	b. Alkaline reagent test	+	-	-	-
	c. Lead acetate test	+	-	-	-

'+' - Positive, '-' - Negative

RESULTS AND DISCUSSION

Botanical parameters revealed that yellowish in color, with a characteristic odor, astringent and sweet taste, and fibrous texture [Table 1].

Results of quantitative analysis for Total ash (4.55%), Acid insoluble ash (3 .00%) , Water soluble ash (1.55%), Alcohol soluble extractives (13 .00%), Water soluble extractive (11.00%), , Chloroform soluble extractive (3.5%), PET soluble extractive (1.00%), Loss on drying at 105º C was found to be (5.2%w/w) . Ash value is useful in determining authenticity and purity of drug and also these values are important quantitative standards16. Percent weight loss on drying or moisture content was found to be 5.2% w/w. The less value of moisture content could prevent bacterial, fungal or yeast growth21 [Table No. 1, 2].The results of preliminary phytochemical investigation are shown in [Table No.3].

CONCLUSION

The powder of chonemorpha fragrans was screened for various standardization parameters as per auurvedic pharmacopoeial standards. The research out comings of the standardization parameters may be used for evaluating the quality and purity of the powder.

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