

**PHYSICOCHEMICAL EVALUATION AND ETHNOMEDICINAL USES OF
MICHELIA CHAMPACA LINN.**

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ABSTRACT

Michelia champaca L. is a medicinal and ornamental plant cultivated in home gardens and near temples for its scented, attractive and massive pale colored flowers. Beside, being an ornamental plant, its various parts are medicinally used in the treatment of different human ailments. The present work was done to evaluate the physicochemical parameters viz., total ash, acid insoluble ash, water soluble ash, moisture content and FOM of leaves of the plant and to enumerate the ethnomedicinal uses of the herb.

Key words: *Michelia champaca* L., Physicochemical parameters, Ethnomedicinal uses

INTRODUCTION

Plants have always been integral to the traditional healthcare system all over the world. In India, from ancient times, different parts of medicinal plants have been used to cure specific ailments (Dwivedi *et al.*, 2008). Today, there is widespread interest in drugs derived from plants. This interest primarily stems from the belief that green medicine is safe and dependable, compared with costly synthetic drugs that have adverse effects. The shortcomings of the drugs available today, propel the discovery of new pharmacotherapeutic agents in medicinal plants (Stiffness, 1982; Baker, 1995).

Michelia champaca L. (Magnoliaceae) commonly known as Champa wild in the eastern sub-Himalayan tract and lower hills up to 3,000 ft. and found in Assam, Burma, South India. (Chopra *et al.*, 2005). The plant is a handsome, evergreen shrub. Leaves 15-25 by 5-9 cm., lanceolate, acute, entire, glabrous; petioles 18-25mm long. Flowers about 5-6.2 cm. diameter, very fragrant, greyish yellow pubescent. Sepals and petals 15 or more deep yellow or orange. Grey or brownish bark. Seeds 1-12, brown, polished, variously angled, rounded on the back (Kritikar & Basu, 1975; Nandakarni, 1995).

During the field studies authors have documented some interesting information on ethnomedicinal uses of the species. An obvious advantage of the present study is to create awareness towards the less known uses and enumerate their traditional uses along with the evaluation of physicochemical parameters.

MATERIAL AND METHODS

As a part of research work on medicinal plant wealth of Madhya Pradesh, authors have collected the plant from various study sites of Madhya Pradesh during January 2009 - July 2009, authenticated by Department of Botany, Janata PG College, APS University, Rewa, M.P.-India and the voucher specimen (No. M-307) has been deposited in the department. The leaves were collected during summer season and were later air-dried, powdered with mess size 40 and stored in an air-tight container for further use. The dried and stored leaf powder of the plant was subjected to standard procedure for the determination of various physicochemical parameters (Ayurvedic Pharmacopoeia, 2001; Kokate *et al.*, 2007).

PHYSICO-CHEMICAL EVALUATION

Determination of Ash

The determination of ash is meant for detecting low-grade products, exhausted drugs and sandy or earthy matter. It can also be utilized as a mean of detecting the chemical constituents by making use of water-soluble ash and acid insoluble ash.

Total ash

Accurately about 3gm of air dried powder of leaves of *M. champaca* Linn. was weighed in a tared silica crucible and incinerated at a temperature not exceeding 450⁰C until free from carbon, cooled and weighed and then the percentage of total ash with reference to the air dried powdered drug was calculated.

Acid insoluble ash

The ash obtained in the above method was boiled for 5 minutes with 25ml of dilute HCl. The residue was collected on ash less filter paper and washed with hot water, ignited and weighed. The percentage of acid insoluble ash was calculated with reference to the air dried drug.

Water soluble ash

The ash obtained in total ash was boiled for 5 minutes with 25 ml of water. The insoluble matter was collected on an ash less filter paper, washed with hot water and ignited to constant weight at a low temperature. The weight of insoluble matter was subtracted from the weight of the ash. The difference in weights represents the water soluble ash. The percentage of water soluble ash with reference to the air dried drug was calculated.

Moisture content (Loss on drying)

Place about 10 g of drug (without preliminary drying) after accurately weighing in a tared evaporating dish and kept in oven at 105⁰ C for 5 hours and weigh. The percentage loss on drying with reference to the air dried drug was calculated.

Foreign Organic Matter (FOM)

Accurately weighed 100 g of the drug sample and spread it out in a thin layer. The foreign matter should be detected by inspection with the unaided eye or by the use of a lens (6X). Separate and weigh it and calculate the percentage present.

ETHNOMEDICINAL USES

During the course of present work authors have documented various ethnomedicinal uses of the species used in treatment of human ailments.

Roots

- Dried roots powder and root bark (10 gm: 10 gm) have been mixed and taken in night after meal by the tribal and rural people as a safe purgative.
- Also, the same (dried roots powder and root bark) mixed with curdle milk to form a thick paste and applied externally in abscesses.

Leaves

- Leaves juice (10 ml) along with equal amount of honey is recommended by the tribal physicians in the treatment of colic and other gastrointestinal disorders.
- Two- three leaves along with chameli (*Jasminum humile*) leaves have been chewed by the rural people to cure oral ulcers.

Flowers and fruits

- Flowers and fruits are soak in fresh water for an overnight and used to wash wounds and ulcers by the natives, as it is act as an antiseptic.
- The flowers powdered and about 10 gm with water is prescribed by rural vaidhyas in the treatment of nausea and dyspepsia, nausea
- The extract (10 ml) of fresh fruit is an excellent remedy to reduce the body temperature.
- The dried powder of flowers is used by the rural ladies as safe cosmetics. It is also used in prickly heat.

Oil

- Oils obtained from flowers are used by the inhabitants in the treatment of ophthalmic disorders.
- It is also externally applied in joint disorders viz., gout, rheumatism and sciatica.

Seeds

- Dried seeds powdered mixed with fresh fruits made into thick paste, used for healing cracks in feet.



Michelia champaca L.: A Twig



Michelia champaca L.: Flower

RESULTS AND CONCLUSION

It has been observed that *Michelia champaca* L. is effective in the treatment of various human ailments viz., abscesses, purgative, colic, oral ulcer, gonorrhoea, antiseptic, dyspepsia, nausea, ophthalmia, fever and healing cracks in feet. Moreover, anti-inflammatory and anti pyretic activities of methanolic extract of flowers (Vimala *et al.*, 1997) and antimicrobial activity of methanolic extract of leaves (Khan, 2002) were investigated. Although, the plant is ornamental and flowers are used for its fragrance, the species posse's great medicinal utility as described by the natives of study area. The species occurrence in study area is cultivated. The physicochemical evaluation of powdered leaves was carried out. In this study ash values (total ash, acid insoluble ash and water soluble ash), moisture content and foreign organic matter were determined. The total ash value was found to be 6.12 % w/w indicating the considerable presence of inorganic radicals. The acid insoluble ash value was found to be 2.03 % w/w, water soluble ash value was found out to be 1.24 % w/w, moisture content was found to be 2.32% w/w and FOM was found to be 0.9 % w/w. A very little attention has been made by the workers towards its phytochemical and biological screening. Therefore, it requires detailed documentation and standardization for the formulation of valuable drugs of therapeutic importance.

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REFERENCES

1. Baker, J. T.; Borris, R. P. and Carte, B. (1995). Natural product drug discovery and development: New perspective on international collaboration. *J Nat Prod*, **58**: 1325-1357.
2. Chopra, R. N., Nayar, S. L. and Chopra, I. C. (2005). *Glossary of Indian Medicinal Plants*, National Institute of Science Communication (NISCOM) Council of Scientific and Industrial Research (CSIR), New Delhi.
3. Dwivedi, Sumeet, Dwivedi, Abhishek and Dwivedi, S. N. (2008). Folklore uses of some plants by the tribals of Madhya Pradesh with special reference to their conservation. *Ethno. Leaflets*, **12**:763-771.
4. Dwivedi, Sumeet (2009). Status survey of medicinal plants wealth of Malwa region of Madhya Pradesh with special reference to conservation of vulnerable and endangered species. *J. Econ. Taxon. Bot.*, **33(2)**: 443-452.
5. Khan, M. R. (2002). Antimicrobial activity of methanolic extract of *Michelia champaca*. *Fitoterapia*, **73(7-8)**: 744-748.
6. Kritikar, K. R. and Basu, B. D. (1975). *The Indian Medicinal Plants*, Vol. I, 55-57.

7. Kokate, C. K. Purohit, A. P. and Gokhale, S. B. (2007). *A Text Book of Pharmacognosy*, Nirali Prakashan, New Delhi.
8. Nandakarni, A. K. (1995). *Indian Materia Medica*, Vol. I, Bombay Popular Prakashan, 715-716.
9. Stuffness, M. and Douros, J. (1982). Current status of the NCI plant and animal product program. *J Nat Prod*, **45**: 1-14.
10. The Ayurvedic Pharmacopoeia of India (2001). First ed., Volume First, The controller publication Govt. of India, New Delhi.
11. Vimala R, Nagarajan S. and Joy S. 1997, Anti-inflammatory and antipyretic activities of *Michelia champaca* Linn., *Ind. Jou. Exp. Biol.*, **35(12)**, 1310-1314.