Vol 3 | Issue 1| 2012 | 32-34.

e - ISSN 2249-7544
Print ISSN 2229-7464

INTERNATIONAL JOURNAL
OF
PHYTOPHARMACY RESEARCH
www.phytopharmacyresearch.com

REVIEW ON *MICHELIA CHAMPACA* LINN.

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ABSTRACT

Michelia champaca Linn. belonging to the family Magnoliaceae is commonly used by many traditional healers Leela Vilasam Siddha Varma Vaidyasalai, Karungal, Tamil Nadu) in most of the herbal preparations for diabetes and kidney diseases. The active constituents reported in this plant are alkaloids, saponins, tannins, sterols, flavonoids and triterpenoids. This review focused on biological activities of the *Michelia champaca* Linn. by various methods.

Key words: *Michelia champaca* Linn, Antidiabetic activity, anti-ulcer activity, Magnoliaceae.

INTRODUCTION

Michelia champaca Linn. belonging to the family Magnoliaceae is commonly used by many traditional healers Leela Vilasam Siddha Varma Vaidyasalai, Karungal, Tamil Nadu) in most of the herbal preparations for diabetes and kidney diseases. Traditionally, it is being used in fever, colic, leprosy, post partum protection and in eye disorders. *Michelia champaca Linn* [1-4] (Magnoliaceae) is a taxon of dicotyledonous flowering trees. The tree bears large cup shaped orange flowers with fragrant aroma. The plant is a very good source of esters of benzoic acid, benzaldehyde, benzyl alcohol, isoeugenol and sesquiterpene lactones. A rapid progress in the field of gastroenterology had led to the identification of several potential supportive drugs from phytomedicine that are becoming part of integrative health care system of industrialized nations. In our current search for phytomedicine, we found that various parts of *Michelia champaca Linn* have been widely used for anti-inflammatory, anti-pyretic, anti-microbial, cardiotonic, purgative, diaphoretic, stimulant, diuretic and anti-leprotic properties. Literature survey revealed that *Michelia champaca Linn* has been reported to contain michelia - A, liriodenine, parthenolide and guaianolides [5-10]. The results of preliminary phytochemical studies revealed the presence of flavonoids suggesting its anti-oxidant property. This property could contribute to the observed anti-ulcer effect by *Michelia champaca Linn* [11].

Biological Activities of Michelia champaca L.

Anti- ulcer activity

The anti-ulcer assays were performed using nonsteroidal anti-inflammatory drug (NSAID)- aspirin induced ulcer. The effects of the extracts on gastric content volume, pH, total acidity, ulcer index and stomach using the pylorus ligated model were evaluated at a dose of 300mg/kg. In the aspirin induced ulcer model, it was observed that the treatment with *Michelia champaca Linn* extracts significantly reduced the gastric juice, total acidity, ulcer index and elevation in gastric pH. The results were comparable with the positive control cimetidine 50mg/kg. Further the results were confirmed using histopathological studies of the stomach. These results showed the anti-ulcerogenic property of *Michelia champaca Linn* extracts. The maximum efficacy was shown by the flower aqueous extract followed by leaf alcoholic, flower alcoholic and leaf aqueous extracts [12].

Anti-hyperglycemic activity

Michelia champaca Linn extracts were tested for antihyperglycemic activity in glucose overloaded hyperglycemic rats. The effective antihyperglycemic extract was tested for its hypoglycemic activity at two-dose levels, 200 and 400 mg/kg respectively. To confirm its utility in the higher model, the effective extract of *Michelia champaca* was subjected to antidiabetic study in alloxan induced diabetic model at two dose levels, 200 and 400 mg/kg respectively. The biochemical parameters, glucose, urea, creatinine, serum cholesterol, serum triglyceride, high density lipoprotein, low density lipoprotein, hemoglobin and glycosylated hemoglobin were also assessed in the experimental animals. The ethanolic extract of *Michelia champaca* exhibited significant antihyperglycemic activity but did not produce hypoglycemia in fasted normal rats. Apart from

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this extract, the crude aqueous and petroleum ether extracts were found active only at the end of the first hour. Treatment of diabetic rats with ethanolic extract of this plant restored the elevated biochemical parameters significantly ($P<0.05$) ($P<0.01$) and the activity was found dose dependent. This study supports the traditional claim and the ethanolic extract of this plant could be added in traditional preparations for the ailment of various diabetes-associated complications [13].

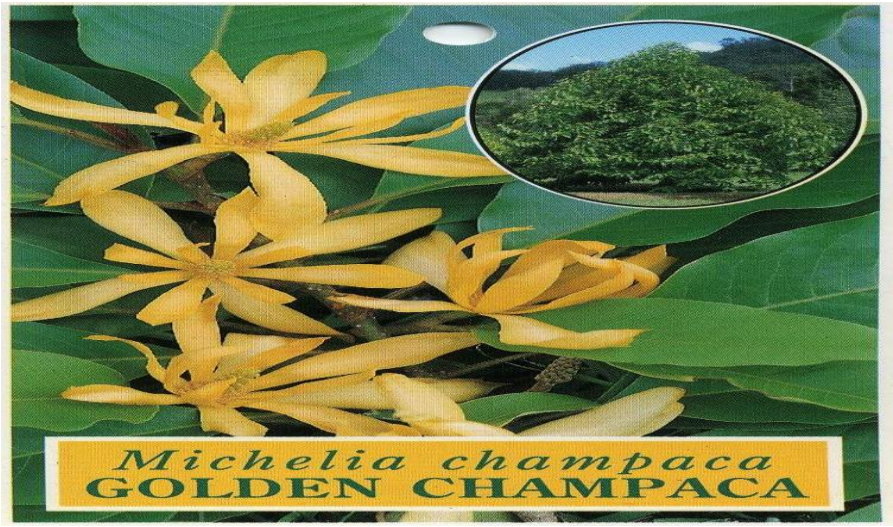
Antioxidant and Antimicrobial activities

The antioxidant activity (reducing powers, 2, 2-diphenyl-1-picrylhydrazyl (DPPH) scavenging activities) total flavonoid concentration and antimicrobial activities of pet. Ether, benzene, chloroform, ethanol, methanol and aqueous extracts of *Michelia champaca* Linn flowers. The antioxidant activity of extracts increases with increase in amount of extract (5-20mg). DPPH free radical-scavenging activity of methanol, ethanol and aqueous extracts of *Michelia champaca Linn* flowers, gallic and ascorbic acid standards were found to be 80.56, 90.20, 81.32, 91.34 and 93.64% respectively, at a concentration of 200µg/ ml and total flavonoid were in the range of 20.4 ± 0.22 g/100 g, 12.2 ± 0.12 g/100 g, 14.4 ± 0.22 g/100 g, crude extract of Champaca, respectively determined by using aluminum nitrate colorimetric method. *Michelia champaca* showed narrow antibacterial activity against Gram-negative bacteria and Gram-negative bacteria tested. The crude extract exhibited high anti-candidal activity on Candida albicans [14].

Other Uses

In traditional medicine, an infusion or decoction of flowers is given in dyspepsia, nausea and fevers; also for preventing scalding in renal disease. Flowers, macerated in oil, are applied externally in cephalalgia, opthalmia, nasal infections, sinus, rheumatism, gout and vertigo. While yellow colored flower also use for high fever by boiling the flower. It also use as anti inflammatory and antipyretic. Juice leaves is given with honey in colic. Leaves are also applied in andolent swellings. Leave of champaka were include in a vagina pessary recommended for treating vaginal foul smell and infections. *Michelia champaca* Linn [15].

Fig 1. *Michelia champaca* Plant



DISCUSSION AND CONCLUSION

Michelia champaca is a multi-use plant species. Its wood is used for building materials and furniture. Its flowers are for perfumes and essential oils ingredients. *Michelia champaca* oil has high economic value and the original *Michelia champaca* oil is very difficult to obtain. However, in Jawa planting *Michelia champaca* is not yet popular, *Michelia champaca* is planted in the yard only to pick its flowers. Wood taken for building materials are usually derived from trees that do not produce flower anymore. In West Jawa, *Michelia champaca* is planted through reforestation program on land affected by erosion.

In South Sumatra, *Michelia champaca* was already widely cultivated. In the village of Muara Payang, Lahat District, *Michelia champaca* has been cultivated by the society since 1960 althought still in a small area. Recently *Michelia champaca* has been cultivated by local community with an area of 0.5 hectares or an average of 100 trees for every family in the form of a mixture of coffee plantations (as shade coffee plants). Seeding is done by the community and has been distributed/marketed outside of South Sumatra Province, among others, to Jambi, Riau and Bangka Belitung.

At the age of 30 years, it had reached a diameter of 60 cm and the timber production reached ± 5 m3/tree. People like to plant *Michelia champaca* in their own property because it is fast growing, easy to maintain and high wood prices. In 2008 Farmer Group Purnomo has won National Champion in the field of conservation of this type of *Michelia champaca*. The spread of *Michelia champaca* in Lahat District was almost in all sub-districts and villages (75%).

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