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A Review on Pharmacological and Phytochemical profile of *Abelmoschus moschatus* Medik.

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Abstract

Abelmoschus moschatus Medik. is an aromatic and medicinal plant in the Malvaceae family, which is native to India. It is an erect hispid herbaceous trailing herb that grows up to 1.5m tall with a long slender tap root. Leaves are alternate, rough, hairy and heart-shaped. They have 3 to 5 lobes and can grow to 15cm long. Flowers resemble those of the hibiscus and are usually watermelon pink, although they are sometimes white or cream in colour. They last for only one day and their flowering depends on the timing of the wet season. Seeds are contained within hairy capsules up to 8 cm long, which are tough but papery. The seeds have a sweet, flowery, heavy fragrance similar to that of musk. The present paper deals with review on pharmacological and phytochemical profile of *Abelmoschus moschatus* Medik.

Key-words: *Abelmoschus moschatus*, Pharmacological, Phytochemical

Introduction

Medicinal plants are living and irreparable resources that is exhaustible if over used and sustainable if used with care and wisdom. The importance of medicinal plants has been mentioned since ancient time. However, at present medicinal plants are looked upon not only as a source of health care but also as a source of income (Dwivedi *et al*., 2007). These plants generated commercial demand for pharmacopoeial drugs and their products in India (Dwivedi S., 2014). Efforts have been made in recent years to introduce many of these drug plants to common people.

Abelmoschus moschatus Medik. is an aromatic and medicinal plant in the Malvaceae family, which is native to India. It is an erect hispid herbaceous trailing herb that grows up to 1.5m tall with a long slender tap root.

The plant is used in the treatment of various diseases as described in traditional and folk remedies. Every part of this medicinal plant is used in one or the other way. Seeds are effective aphrodisiac and antispasmodic, and used in tonics. They check vomiting and are useful in treating intestinal disorders, urinary discharge, nervous disorders, hysteria, skin diseases etc. The mucilaginous seeds are emollients and demulcents.

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Flower infusion is contraceptive. Different parts of the plant have uses in traditional and complementary medicine, not all of which have been scientifically proven. It is used externally to relieve spasms of the digestive tract, cramp, poor circulation and aching joints. It is also considered an insecticide and an aphrodisiac.

In India, roots, leaves (rarely), and seeds of ambrette are considered valuable traditional medicines. The bitter, sweet, acrid, aromatic seeds are used as a tonic and are considered cooling, aphrodisiac, opthalmic, cardiotonic, digestive, stomachic, constipating, carminative, pectoral, diuretic, stimulant, antispasmodic, deodorant, and effective against kapha and vata, intestinal complaints, stomatitis; and diseases of the heart. According to Unani system of medicine seeds allay thirst, cure stomatitis, dyspepsia, urinary discharge, gonorrhea, leucoderma and itch. Roots and leaves are cures for gonorrhea (Orwa *et al*.,; Jain, 1991).

The present paper deals with studies on pharmacological and phytochemical profile of the selected medicinal plant.

Review on Pharmacological and Phytochemical Profile of *Abelmoschus moschatus* Medik.

A comprehensive review of literature was done to study the work done in the selected species and it was found that, several authors reported on pharmacological and phytochemical profile of selected

species. Chatterjee *et al*., (2005) studied emollient and antipruritic effect of itch cream in dermatological disorders: A randomized controlled trial. Liu *et al*., (2005) investigated myricetin as the active principle of *Abelmoschus moschatus* to lower plasma glucose in streptozotocin-induced diabetic rats. Liu *et al.,* (2006) studied mediation of β-endorphin by myricetin to lower plasma glucose in streptozotocin-induced diabetic rats. Krishnaraju (2006) did the biological screening of medicinal plants collected from Eastern Ghats of India using *Artemia salina* (brine shrimp test). Ngoc *et al*., (2008) investigated hypolipidemic effect of extracts from *Abelmoschus esculentus* L. (Malvaceae) on Tyloxapol-Induced hyperlipidemia in Mice. Liu *et al*., (2007) investigated improvement of insulin sensitivity in obese Zucker rats by myricetin extracted from *Abelmoschus moschatus.* Liu *et al*., (2009) studied *Abelmoschus moschatus* (Malvaceae), an aromatic plant, suitable for medical or food uses to improve insulin sensitivity. Maheshwari *et al.* (2009) investigated antimicrobial activity of *Abelmoschus moschatus* leaf extracts. Rival *et al*., (2009) studied *Hibiscus abelmoschus* seed extract as a protective active ingredient to favour FGF-2 activity in skin. Singh *et al.,* (2012) studied evaluation of hepatoprotective activity of *Abelmoschus moschatus* seed in paracetamol induced hepatotoxicity on rat. Christina and Muthumani (2012) reported phytochemical investigation and diuretic activity of *Abelmoschus moschatus* Medikus Christina and Muthumani (2013) reported phytochemical investigation and anti lithiatic activity of *Abelmoschus moschatus* Medik.**Nee *et al.,* (**1986**) investigated the** seed coat components of *Hibiscus abelmoschus*. Camciuc *et al*., (1998) studied volatile components in okra seed coat. Blunden *et al*., (2001) studied betaine distribution in the Malvaceae. Holser *et al.* (2002) determined the extraction of lipid components from seeds of *Hibiscus* species by supercritical carbon dioxide. Cravo *et al*., (2006) studied the chemical composition of the essential oil, oleoresin and its volatile product obtained from ambrette (*Abelmoschus moschatus* moench) seeds. Liu *et. al*., (2007) studied myricetin, a naturally occurring flavonol, ameliorates insulin resistance induced by a high-fructose diet in rats. Du *et al*. (2008) estimated the volatile organic nitrogen-containing constituents in ambrette *Abelmoschus moschatus* Medik (Malvaceaae). Adelakun *et al*., (2009) studied chemical composition and the anti-oxidative properties of Nigerian Okra Seed (*Abelmoschus moschatus* M.) Flour.

Plant Profile

Botanical Name : *Abelmoschus moschatus* Medik.
Family : Malvaceae
Synonyms : *Hibiscus abelmoschus* Linn.(Nadkarni, 1927).

Taxonomic classification

Kingdom : Plantae
- Phyllum : Angiosperms
- Class : Eudicots
- Sub-Class : Rosids
- Order : Malvales
- Family : Malvaceae
- Genus : *Abelmoschus*
- Species : *moschatus*

Vernacular Names
- English : Muskmallow, Ambrette
- Sanskrit : Latakasturika, Gandapura
- Hindi : Mushkdana, kasturi bendi, Kasturidana
- Marathi : Kasthuri bhendi
- Tamil : Varttilaikasturi
- Telugu : Kasturi benda
- Kannada: Kasturi bende
- Assamese : Gorukhiakorai
- Gujarati : Mushkdana
- Malyalam : Kasthurivenda
- French : Ambretta semi
- German : Musk Okra (Nadkarni, 1927).

Part used : Seed, flower, root, leaves

Distribution

It is native of India and is cultivated widely as an oil seed crop in India, Southern China, Vietnam, Nepal, Tropical Asia, South East Asia and some parts of the Pacific.

Description

Abelmoschus moschatus Medik. is an aromatic and medicinal plant in the Malvaceae family, which is native to India. It is an erect hispid herbaceous trailing herb that grows up to 1.5m tall with a long slender tap root. Leaves are alternate, rough, hairy and heart-shaped. They have 3 to 5 lobes and can grow to 15cm long. Flowers resemble those of the hibiscus and are usually watermelon pink, although they are sometimes white or cream in colour. They last for only one day and their flowering depends on the timing of the wet season. Seeds are contained within hairy capsules up to 8 cm long, which are tough but papery. The seeds have a sweet, flowery, heavy fragrance similar to that of musk. It can be grown in varied climate under tropical and subtropical conditions. It can be grown both as a rain fed crop and as an irrigated crop. It grows on well-drained loamy and sandy loam soils. Loamy soils with neutral pH and plenty of organic matter are ideal

for its cultivation (Purohit *et al.*, 2004) It is propagated through seeds. The optimum time of sowing is June-July with pre-monsoon showers. Seeds are soaked in water before sowing for 24 hours. It takes 5-7 days for proper germination.

Chemical constituents

The seeds are valied for the volatile oil present in the seeds. Seed analysis report 6% mucilage, 11.1 % moisture, 31.5 % crude fiber, 14.5 % lipids, 13.4 % starch, 2.3% protein, 5% resins and 0.2 to 0.6% volatile oil. Analysis of volatile oil report myricetin-3-glucoside, glycoside cynadin, beta-sistosterol and beta-D-glucoside (Orwa *et al.*, 2009). The other principle components identified are farnesyl acetate (70%), 7(Z)-hexadecan-16-olide, 9(Z)-octadecen-18-olide (14%), ambretolide, farnesol, dodecyl acetate and decyl acetate (Rout, 2001). A detailed investigation of the basic fraction of a CO_2 extract of seeds revealed a total of 58 nitrogen containing volatile constituents. Among these are 27 pyrazine derivatives, 12 pyridins and 7 thiazoles including four natural compounds i.e., 1-(6-ethyl-3-hydroxypyridin-2-yl) ethanone, 1-(3-hydroxy-5,6-methylpyridin-2-yl) ethanone, 1-(3-hydroxy-6-methylpyridin-2-yl) ethanone and 1-(3-hydroxy-5-methylpyridin-2-yl) ethanone (Du *et al.*, 2008). The fatty oil of seeds contains the phospholipids: 2 - cephalin, phosphatidylserine and its plasmalogen and phosphatidyl choline plasmalogen. Absolute contains farnesol and ambrettolic acid lactone. b- sitosterol and its b- d - glucosides are isolated from leaves. Petals contain b-sitosterol, flavonoid myricetin and its glucoside. Anthocyanins like cyanidin - 3 - sambubioside and cyanidin - 3 - glucoside are present in the flowers (Chopra *et al.*, 2005). The oil from the seeds is rich in linoleic acid and contains a-cephalin, phosphatidylserine, its plasmalogen and phosphatidylcholine plasmalogen. The characteristic musk-like odor of the seed oil is mainly due to the presence of a ketone, ambrettelide, a lactone of ambrettolic acid (Rout, 2001; Wealth of India, 2001).

Medicinal uses

Every part of this medicinal plant is used in one or the other way. Seeds are effective aphrodisiac and antispasmodic, and used in tonics. They check vomiting and are useful in treating intestinal disorders, urinary discharge, nervous disorders, hysteria, skin diseases etc. The mucilaginous seeds are emollients and demulcents. Flower infusion is contraceptive. Different parts of the plant have uses in traditional and complementary medicine, not all of which have been scientifically proven. It is used externally to relieve spasms of the digestive tract, cramp, poor circulation and aching joints. It is also considered an insecticide and an aphrodisiac. In India, roots, leaves (rarely), and seeds of ambrette are considered valuable traditional medicines. The bitter, sweet, acrid, aromatic seeds are used as a tonic and are considered cooling, aphrodisiac, opthalmic, cardiotonic, digestive, stomachic, constipating, carminative, pectoral, diuretic, stimulant, antispasmodic, deodorant, and effective against kapha and vata, intestinal complaints, stomatitis; and diseases of the heart. According to Unani system of medicine seeds allay thirst, cure stomatitis, dyspepsia, urinary discharge, gonorrhea, leucoderma and itch. Roots and leaves are cures for gonorrhea (Orwa *et al.*,; Jain, 1991).

Fig. 1 *Abelmoschus moschatus* Medik: Flowers, Fruits and Seeds

Conclusion

Abelmoschus moschatus Medik. commonly known as Kasturibhendi (Hindi), Musk mallow (English) belongs to family Malvaceae and is medicinally important plant. Several pharmacological and phytochemical studies were reported by several authors.

References

1. Dwivedi S. N., Dwivedi Sangeeta and Patel Prakash Chandra. (2007). Status and conservation of threatened medicinal herbs, In Indian folk medicine Ed. P. C. Trivedi, Pointer publication, Jaipur, 313-314.
2. Dwivedi Sumeet (2014). Development of Standardisation Parameters of *Guizotia abyssinica* (L.f.) Cass. with Special Reference to its Pharmacological Approaches. Ph.D Thesis Submitted to SGVU, Jaipur, RJ.
3. The wealth of India, A dictionary of Indian Raw materials and Industrial products, Vol-I, Published and printed by National Institute of science communication (NISCOM) Council of Scientific and Industrial Research (CSIR), New Delhi,
4. Orwa C., Mutua R., Jamnadass R. and Anthony S. (2009). Agroforestree database: a tree reference and selection guide version 4.0.
5. Jain S. K. (1991). *Dictionary of Indian folk medicine and ethnobotany*, Deep publications, New Delhi
6. Nadkarni K.M. (1927). *Indian Materia Medica*, Vol-I, Bombay Popular Prakashan, Second edition, reprint 1995,627.
7. Purohit S. S. and Vyas S. P. (2004). *Medicinal plant cultivation: A scientific approach*, 1st edition, Agrobios India, Jodhpur, 1-9.
8. Rout P.K (2001). Extraction and composition of the essential oil of ambrette (*Abelmoschus moschatus*) seeds. *Journal of Essential Oil Research* (Published online).
9. Du Z., Clery R. A. and Hammond C. J. (2008). Volatile organic nitrogen-containing constituents in ambrette seed *Abelmoschus moschatus* Medik (Malvaceae), *J. Agri. Food Chem*., **56(16)**: 7388-7392.
10. Chopra R. N., Nayar, S. L. and Chopra I. C. (2005). *Glossary of Indian medicinal plants*, Published and printed by National Institute of science communication (NISCOM) Council of Scientific and Industrial Research (CSIR), New Delhi, 128.

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