



## Phytochemical Studies on *Myristica fragrance* Essential Oil

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**ABSTRACT:** In the present study of phytochemical screening of the seed extract of *Myristica fragrance* essential oil using standard method of photochemical analysis. The solvents used for extraction of essential oil were methanol, dichloromethane, hexane and chloroform. The preliminary phytochemical investigation showed that *Myristica fragrance* essential oil to contain some secondary metabolites such as of alkaloids, steroids, tannins, flavonoids, phenolics and glycosides. The result justified the use of plant in medicine to treat various infectious diseases.

**Key words:** Phytochemical, *Myristica fragrance*, Plant, Essential oil, Solvent.

### INTRODUCTION

Higher and aromatic plants have been used traditionally in folk medicine as well as to extend the shelf life of foods, showing inhibition against bacteria, fungi and yeasts. Biologically active compounds from natural sources have always been a great interest for scientists working on infectious diseases (Perumal, 2000).

The essential oils known as volatile oils evaporate in contact with air and possess a pleasant fragrance. Chemically the essential oils are very complex. They are found in many different species of plants of various families. All aromatic plants contain essential oils. Generally the oils are secreted in oils glands (Yousef, 1980).

World health organization (WHO) more than 80% of the world population relies on traditional medicine for their primary health care needs. The medicinal value of plants in some chemical substance that produce a definite physiologic action on the human body (Theis, 2003). The most important of these bioactive compounds of plants are alkaloids, flavonoids, tannins, phenolics, glycosides, steroids etc. compound. The phytochemical research based on ethnopharmacological information is generally considered an effective approach in the discovery of new anti infective agents from higher plants. (Gundidza *et al.*, 2009)

The most common commercial species is *Myristica fragrance* an evergreen tree indigenous to the Banda Island. The *Myristica fragrance* oil is used heavily in the perfumery and pharmaceutical industries. The oil is colourless or light yellow it contain numerous components of interest to the oleochemical industry and is used as a natural food

flavorings in baked good, syrups, beverages and sweets. In traditional medicine nutmeg and nutmeg oil were used for illnesses related to the nervous and digestive system. (Jaiswal, 2009).

In present study is based on the different solvents of seed extract of *Myristica fragrance* were subjected to for preliminary phytochemical screening the presence of different secondary metabolites such as alkaloids, steroids, phenolics, tannins, glycosides, saponins, flavonoids.

### MATERIAL AND METHODS

**Plant material:** Fresh seed of *Myristica fragrance* was collected from Bhopal. Plant sample was washed and shade dried at room temperature. The dried and ground plant part extracted with different solvents (hexane, dichloromethane, methanol and chloroform) by steam distillation.

**Extraction of essential oil:** Raw plant material consists of seeds are put into distillation apparatus using Soxhlet apparatus. Weight of plant material was taken before loading in the Soxhlet apparatus and water is heated so that the steam passes through the plant material vaporizing the volatile compounds. The vapour flows through a coil where they condense back to liquid which is then collected in the receiving vessel.

**Phytochemical Analysis:** Phytochemical analysis for major phytoconstituents of the plant extract was undertaken using standard qualitative methods as described by Rizk and Bashir (1980), Harbrone (1973). The plant extract were screened for the presence of biologically active compounds like alkaloids, steroids, tannins, flavonoids, saponins, glycosides and phenolics.

**Identification test:** The tests were done to find the presence of the active chemical constituents such as glycosides, phenolics, alkaloids, tannins, flavonoids, saponins and steroids by the following procedure.

**Test for alkaloids:** 2ml filtrate was mixed with 2ml of HCl and about 6 drops of Mayor's reagents. A creamish or pale yellow precipitate indicated the presence of alkaloids.

**Test for steroids:** 1ml of the solvent extract was dissolved in 2 ml of acetic anhydride was added to 2 ml of H<sub>2</sub>SO<sub>4</sub>. The color changed from violet to blue or green in some samples indicating the presence of steroids.

**Test for tannins:** 1 ml of the solvent extract was treated with few drops of 1% ferric chloride and observed for brownish green or a blue-black coloration.

**Test for flavonoids:** 4ml of filtrate was added to 5-6 drops of conc. HCl and 1.5 ml of methanol

solution. Pink-tomato red color indicated the presence of flavonoids.

**Test for glycosides:** Mix 2 ml solvent extract with 2 ml chloroform. Add 2 ml acetic anhydride and 2 drop Conc. H<sub>2</sub>SO<sub>4</sub> from the side of test tube. First red, then blue and finally green color appears.

**Test for Phenolics:** 2ml ethanol was added to the test solution and few drops of ferric chloride solution. Blue coloration indicates the presence of phenolics.

**Test for saponins:** Froth test for saponins was used. 2ml of distilled water was added to 2ml of the test solution and shaken well and observed for frothing.

## RESULTS AND DISCUSSION

**Phytochemical screening of seed extracts:** The preliminary phytochemical screening of the seed extract using different solvents was reported (Table 1).

**Table 1: Preliminary phytochemical analysis of *Myristica fragrance* seed extracted with different solvents.**

Source	Solvent	Alkaloids	Steroids	Tannins	Flavonoids	Saponins	Phenolics	Glycosides
<i>Myristica fragrance</i>	Methanol	+	+	-	-	-	-	+
	Dichloromethane	-	+	+	-	-	+	-
	Hexane	-	+	+	+	-	-	-
	Chloroform	+	-	+	-	-	-	-

+= Present, - = Absent

Data presented in the table 1 showed results of methanol solvent seed extract of *Myristica fragrance* essential oil showed the presence of alkaloids, steroids and glycosides. The dichloromethane solvent seed extract of *Myristica fragrance* essential oil showed the presence of steroids, tannins and phenolics. The hexane solvent seed extract of *Myristica fragrance* essential oil was found to have steroids, tannins and flavonoids. The chloroform solvent seed extract of *Myristica fragrance* essential oil was observed for the presence of alkaloids and tannins.

Phytochemical is a natural bioactive compound found in plants such as vegetables, fruits, medicinal plants, flowers, leaves and roots that work with nutrients and fibers to act as an defense system against disease or more accurately, to protect against disease. Photochemical are

divided into two groups which are primary and secondary constituents; according to their functions in plant metabolism. Primary constituents comprise common sugars, amino acids, proteins and chlorophyll while secondary constituents consists of alkaloids, terpenoids and phenolic compounds (Krishnaiah *et al.*, 2007) and many more such as flavonoids, tannins and so on.

The potential of higher plants as source for new drugs is still largely unexplored. Among the estimated 250,000-500,000 plant species only a smaller percentage has been investigated phytochemically and the fraction submitted to biological or pharmacological screening as tool in discovering new biologically active molecule has been most protective in the area of antibiotics (Kroschwitz *et al.*, 1992).

Many medicinal plants have been found effective in the cure of bacterial diseases. Due to increasing antibiotic resistance in microorganisms and side effect of synthetic antibiotics medicinal plants are now gaining popularity in the treatment of bacterial infection. Medicinal plants are considered as clinically effective and safer alternative to the synthetic antibiotics (Pandy, 2010).

As plants and their products are known to possess various secondary metabolites and also possess several lead phytochemical constituents such as alkaloids, steroids, tannins, flavonoids, saponins, phenolics and glycosides were identified from the plants. Plants based natural constituents can be derived from any part of the plants like bark, leaves, flowers, roots, seed etc. The use of plant extracts and phytochemical both with known antimicrobial properties can be of great significance in therapeutic treatments.

Nutmeg is a small package with several big benefits. It's used for prevention and healing of many known conditions. Here are some most common uses of nutmeg:

Medically, nutmeg has strong antibacterial properties. It is effective in killing a number of cavity-causing bacteria in the mouth. Like cloves; nutmeg contains eugenol, a compound that may benefit the heart. Myristicin found in nutmeg has been shown to inhibit an enzyme in the brain that contributes to Alzheimer's disease and is used to improve memory. It is used in small dosages to reduce flatulence [excessive stomach or intestinal gas], aid digestion and improve appetite. Nutmeg can help to combat asthma. It is also used to relax muscles. Nutmeg contains 10 per cent essential oil which is a colourless or light yellow liquid. The oil is obtained by the steam distillation of ground nutmeg. Besides being used in toothpastes, cough syrups, perfumes and cosmetic industry, externally Nutmeg oil is mixed with almond oil and is used to relieve rheumatic pain.

Nutmeg oil is used to treat toothaches. Drops of essential oil are put on cotton swab and applied to the gums around an aching tooth, sometimes also used to control bad breath. Drops of nutmeg oil can also be mixed with honey to treat nausea, gastroenteritis, chronic, diarrhoea and indigestion. In homoeopathy, nutmeg is used to treat anxiety and depression. In Chinese medicine, it is used to treat impotence and liver disease.

Essential oils have been found useful in the various infectious diseases. Essential oils are rich source of antimicrobial agent. The therapeutic use of essential oils is becoming popular because of their lesser side effects and low resistance in

microorganisms. In present study showed that the *Myristica fragrance* essential oil scientifically which have been used in traditional medicine to improve the quality of healthcare.

## CONCLUSION

Phytochemical analysis showed the presence of effective biological compound like alkaloids, steroids, tannins, flavonoids, phenolics, glycosides in *Myristica fragrance* essential oil thus providing knowledge of the phytochemical metabolites. However, the present investigation showed that most of the studied plants are potentially a good source of traditional medicine.

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