



**ANTIDIARRHOEAL AND SEDATIVE EFFECTS OF
MYRISTICA FRAGRANS ON ALBINO RATS**

DR. RAJENDRA GUPTA*

**MBBS, MD, Associate Prof. Dept. of Pharmacology, Chirayu Medical College, Bhopal, India.*

ABSTRACT

Myristica fragrans (Nutmeg) had been reported to have various effects on different organs. This work was therefore conducted to evaluate the antidiarrheal and sedative effects of Myristica fragrans (Nutmeg) an herbal medicine in albino rats. The antidiarrheal effect of Myristica fragrans evaluated by the comparison of total count of feces discharged during 5 hours after castor oil administration in different groups of albino rats. The sedative effect of Myristica fragrans evaluated by the observation of righting reflex and the duration of hypnosis after administration of pentobarbitone in different groups of albino rats. The results of our study indicate that Nutmeg have antidiarrhoeal and some sedative effects.

KEYWORDS: Nutmeg, Myristica fragrans, Diarrhoea.

*Corresponding author



DR. RAJENDRA GUPTA
MBBS, MD, Associate Prof. Dept. of Pharmacology,
Chirayu Medical College, Bhopal, India.

INTRODUCTION

In traditional medicine, nutmeg and nutmeg oil were used for illnesses related to the nervous and digestive systems. Recurrent diarrhoea is prevalent in developing countries, particularly in tropical regions. A natural based antidiarrheal home remedy can serve as an ideal health tool to limit diarrhoea-related morbidity and mortality (1,2). Nutmeg seed is widely used as a spice. In India it is mainly cultivated in South India particularly in certain pockets of Kerala, Tamil Nadu and Karnataka. It has a characteristic pleasant fragrance and slightly warm taste. It is used to flavour many kinds of baked goods, confections, puddings, meats, sausages, saucers, vegetables, and beverages (3). Nutmeg is the dried seed kernel of *Myristica fragrans* belongs to the family Myristicaceae. It is commonly known as Jaiphal and Javitri in India (4,5). In the traditional Indian medical science of Ayurveda, nutmeg is one such plant said to possess antidiarrheal activity (6). It is used as an active ingredient of most of the ayurvedic antidiarrhoeal formulations. The use of *Myristica fragrans* as an anti-anxiety and sedative agent has been mentioned in the Ayurveda but still no study has been reported (7). A study was therefore planned to assess the effects of nutmeg.

MATERIALS & METHODS

In this study, we investigated the antidiarrhoeal and sedative properties of Nutmeg (*Myristica fragrans*), by observing the effect of Nutmeg on rat models. This study was done in the department of pharmacology at Gandhi Medical College, Bhopal, MP.

Crude Nutmeg Suspension (Triturated)

Four gram of Nutmeg (freshly powder) was taken. This coarse powder was triturated with a known amount of water to make a thick paste of uniform consistency. The volume was finally made to 100 ml. Thus each ml of the suspension contained 40 mg nutmeg.

Experimental Animals

The animals used in this study were Albino rats weighing approximately 200g. The animals were used after 2 weeks of adaptation

period while being fed with solid feed and ample water. The experiments were conducted at $24\pm 2^\circ\text{C}$ Celcius.

Experiments on Antidiarrhoeal Effects by Castor oil test

The castor oil test in the rat has been used extensively in laboratories as a basic pharmacological test to screen and evaluate antidiarrhoeal drugs. Ricinoleic acid, the active component of castor oil produces the intestinal stimulant effect. Total 18 albino rats were included in this study. They were divided equally into 3 groups. Group 1 (control group) received no protecting drug before castor oil challenge, group II received Nutmeg crude suspension in the dose of 100mg/kg orally and group III received Nutmeg crude suspension in the dose of 200 mg/kg orally. After 3 hours, 45% castor oil (solvent: olive oil) 0.1ml/10gm was administered orally. Each rat was kept separately in a case, the bottom of which was covered by thick white paper. The cages were examined and the observations were tabulated after castor oil challenge.

Experiments on Sedative Effects

Righting reflex test has been used extensively as a basic pharmacological test to screen and evaluate sedative drugs. Total 12 albino rats were included in this study. They were divided equally into 4 groups. One group was kept as control, the other 3 groups received nutmeg as crude suspension in the dose of 100 mg/kg, 200 mg/kg and 400 mg/kg respectively. Two hours after the administration of nutmeg crud suspension the mice were given pentobarbitone 40mg/kg intraperitoneal. Then rats were watched for the absence of righting reflex and the duration of hypnosis was noted. Finally using the data, percentage change in hypnotic time was calculated.

OBSERVATION & RESULTS

The effects of the test solution on castor oil-induced diarrhoea were observed as shown in Table 1. The test solution 100 mg/kg group showed a slight decrease in diarrhoea score and the test solution 200 mg/kg group showed marked decrease in diarrhoea. The total

count of feces discharged during 5 hours after castor oil administration showed a decrease in

both the test solution 100 mg/kg and 200 mg/kg groups.

Table 1
Effect of *Myristica fragrans* (Nutmeg) on diarrhoea induced by Castor oil in rats.

Group	Dose	No. of Rats	Number of faces in 5 hour	
			Total no. of faces	Average no. of feces per rat
Group I	----	6	76	12.66
Group II	Nutmeg crude suspension 100 mg/kg	6	55	9.16
Group III	Nutmeg crude suspension 200 mg/kg	6	49	8.16

The effects of test solution on righting reflex were observed as shown in Table -2. Observation indicate that nutmeg produced significant prolongation of pentobarbitone sleeping time after oral administration.

Table 2
Effect of *Myristica fragrans* (nutmeg) crude suspension on pentobarbitone sleeping time in Rats (Righting reflex).

S. No.	Group	Mean Sleeping time (minute)	Percentage increase
1.	Control	58	Nil
2.	Nutmeg crude suspension 100 mg/ kg	72	24%
3.	Nutmeg crude suspension 200 mg/ kg	84	44%
4.	Nutmeg crude suspension 400 mg/ kg	90	55%

DISCUSSION & CONCLUSION

Diarrhoea is a common condition frequently seen in clinical practice. Strict definition of diarrhoea is difficult due to the individual differences in defecating habits, but it is generally defined as: frequent defecation more than 3 times a day, loose and formless stool, or an abnormal increase in the total amount and water content of stool. Diarrhoea can include gastrointestinal complications such as fever, abdominal pain, or vomiting. It is related to an imbalance in the regulation of absorption and secretion in the intestine, and its causes are diverse (8,9,10). There are many causes of diarrhoea: endotoxins from bacterial infection, viral infection, mucosal damage from food, food intolerance such as lactose intolerance, drugs such as antibiotics and hypertension medication, gastrointestinal disorders such as inflammatory bowel disease, irritable bowel syndrome, etc.(8,9,10). Severe diarrhoea can cause loss of water and minerals, and can result in grave complications such as spasms, central nerve

system stimulation, or malnutrition, thus the use of antidiarrhoeals is important. Antidiarrhoeals refer to drugs which act on the intestines and stop the diarrhoea, and can be classified to antimotility agents, antibiotics, absorbents, astringents, and bacterial replacements(8,9). Many herbal prescriptions are being used in the treatment of diarrhoea, and there have been experimental studies of the antidiarrhoeal effect of herbal medicine using animal models. In the traditional Indian medical science of Ayurveda, nutmeg is one such plant said to possess antidiarrheal activity. The results of our study indicate that Nutmeg possesses antidiarrhoeal effect may be due to its antimotility and antiseretory effect and thus its use in traditional medicine is justified. Antimotility and antiseretory effect of Nutmeg may be due to the presence of different phytochemicals. Pharmacological effects of Ligroin extract of *Myristica fragrans* were evaluated in chicks. The extract caused a significant increase in the duration of light

and deep sleep. It was suggested that trimyristin present in the extract alters intensity and duration of sleep induced by *Myristica*

fragrans (11). Further study is required to find out the active constituents responsible for its antidiarrhoeal and sedative effects.

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