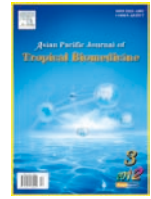




Contents lists available at ScienceDirect

Asian Pacific Journal of Tropical Biomedicine

journal homepage: www.elsevier.com/locate/apjtb

Document heading

doi:

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Aphrodisiac activity of ethanolic extract of *Pedalium murex* Linn fruit

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ARTICLE INFO

Article history:

Received 5 October 2012

Received in revised form 13 October 2012

Accepted 2 November 2012

Available online 28 December 2012

Keywords:

Pedalium murex
aphrodisiac

ABSTRACT

Objective: The study represents an interesting case report for a very good aphrodisiac activity observed during an oral glucose tolerance test performed while evaluating the antidiabetic potential of *Pedalium murex* Linn. fruit. **Methods:** Ethanolic extract of *Pedalium murex* at a dose of 125, 250 and 500 mg/kg p.o. was given to the rats followed by administration of 2 g/kg p.o. of glucose 30 min after the administration of extract. **Results:** Pregnancy was observed in the treated groups after 20–25 days of treatment in females which resulted in birth of pups ranging upto ten in some females (more significant in case of 500 mg/kg p.o.). The observation also showed a significant increase in weights of pups along with a normal behavior pattern. The increased pregnancy rate in the drug treated groups may be due to the healthy viable sperm and enhancement of sexual desire of the rats. **Conclusion:** From the results it may be concluded that the fruits of the plant may be used as a good aphrodisiac agent to promote fertility rate.

1. Introduction

Abnormalities in male reproductive system like impotency, erectile dysfunction and vice versa are one of the main problems that lead to infertility. Aphrodisiac is a substance that increases sexual desire. There are two main preparative types of aphrodisiacs, one is psychophysiological stimuli (visual, tactile, olfactory and aural) preparations and the other is the internal preparations (food, alcoholic drinks and love potion) [1]. Erectile dysfunction (ED) is considered as one of the most important public health problem, since it affects higher percentage of men. Despite the increasing availability of effective conventional medical treatments, plant-derived and herbal remedies continue to provide a popular alternative for men seeking to improve their sexual life. Generally elevated testosterone levels enhance the sexual behavior in humans. Moreover, drugs inducing changes in neurotransmitter levels or their action at the cellular level could also change the sexual behavior. Extensive research has been going on to search a better aphrodisiac agent, by which one can treat such class of complications both through preclinical as well

as clinical studies on animals and in humans [2].

Pedalium murex Linn (PM) belonging to the family Pedaliaceae is a herb found in the sea coast of Southern India and in other part of world like Mexico, and tropical Africa [3]. Fruits, leaves and stems produced milky mucilage when agitated with water, and is popularly used to treat gonorrhoea [4]. An infusion or extract made from leaves is diuretic and demulcent and used to treat ardor urine, dysuria, spermatorrhoea, and incontinence of urine. Juice obtain from the plant is used in puerperal diseases as an emmenagogue and also to promote lochial discharge [5]. The mucilage of the leaves and young shoots is used in seminal debility [6]. The petroleum ether extract of PM shows significance effect against Japanese encephalitis vector culex [7]. Besides the aqueous extract of the whole plant is also having an analgesic and anti-inflammatory property [8,9].

An information on the petroleum ether extract of PM plant were also report to increase aphrodisiac activity and to cure ethanol induced germ cell damage and infertility in male albino rats. The study reveals that different doses level of 200 and 400 mg/kg; p.o. of PM showed a positive significant increase in mating, mounting behavior, total body weight, percentage of pregnancy, sperm motility, litter size as compared with the ethanol-treated group. Moreover, the total protein, total cholesterol and testosterone were also reported to have increased significantly. A report on histopathological study of the testes of animals treated with

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400 mg/kg PM reveals that it exhibits a significant restoration and recovery of germinal cells and the luminal spermatozoa. The effects of the non polar fraction of PM make this natural herb ideal as an aphrodisiac and a potent fertility enhancing drug [9]. The present study reveals a case report suggesting a very good aphrodisiac activity of fruits of *Pedalium murex* Linn. which was observed during a oral glucose tolerance test for evaluation of its antidiabetic activity.

2. Material and methods

2.1. Preparation of plant extract

The plant material (fruit) was procured from market (herbal vendors) from Varanasi, and identified by Professor S. D. Dubey, Department of Dravyaguna, Institute of Medical Science, Banaras Hindu University, Varanasi, India and the voucher specimen (COG/PM/01/08) were kept for further reference at our Laboratory herbarium, Department of Pharmaceutics, Institute of Technology, Banaras Hindu University, Varanasi. The powdered material (1 Kg) of air-dried fruit was extracted using 95% ethanol in a Soxhlet apparatus for 24 hour (8 hours per day for 3 days). After filtration of the solvent, the filtrate was concentrated to dryness under a vacuum evaporator. The ethanol extracts thus obtained and kept in desicator for further use.

2.2. Experimental Animals

Charles foster rats of both sexes (100–140 g) were used for this study. They were housed in polypropylene cages under standard laboratory conditions (12 h light/12 h darkness, 21 ± 2°C). The animals were given standard pellets diet (Mona laboratoty animal feed) and water ad libitum throughout the experimental period. The experimental study was approved by the Institutional Animal Ethical Committee of Institute of Medical Sciences, Banaras Hindu University, Varanasi, India.

2.3. Preparation of the test samples

Ethanollic Extract of *P. murex* was suspended in 0.5% carboxymethylcellulose (CMC) prior to oral administration to the experimental animals.

2.4. Experimental protocol

Oral glucose tolerance test (OGTT) and normoglycemic study was done for determination of hypoglycemic activity of the ethanollic extract of fruit of PM in Charles foster rats of both sexes. Rats were administered with 10 mg/kg glibenclamide and dose of 125, 250, 500 mg/kg; p.o. of PM extract in the respective group of OGTT. Glucose solution 2 g/kg was administered 30 min after the administration of

the extract in case of the OGTT study. Blood samples were withdrawn from retro-orbital at intervals of 30, 60 and 120 min of glucose administration and the animals were finally kept for several days without any treatment in order to wash out the effect of drug from rat body. Amazingly after 20–25 days of the study, pregnancy was seen with maximum number of the female rats which can be monitored by increase in body weight which is the main indication for pregnancy. The female rats were separated from the male, placed on separated cages and were fed with standard pellet diet and water ad libitum daily.

3. Results

In the present investigation, it was found that number of birth takes place with almost every separated female rat, of which in some cases the number of pups reaches up to ten (Table 1). All the pups were observed to be in normal health and there was no abnormality found in any group. Body weight of all the pups was monitored at a specific interval from the first day to 30th day. The data was calculated in the form of the average weight of pups ± SEM. Each group contains six pups and their average body weight was taken for calculation, moreover four groups were taken in this study. The data was presented in the figure 1 and the photograph of the pups was given in the figure 2. During our OGTT study we have monitored that there were no pregnancy that occurs with the control group (PM extract untreated group). Besides the treated group that received the dose of 500mg/kg; p.o. showed the most significant effect which gave more number of pups.

Table 1. Effect of PM extract on pregnancy in experimental rats

Group	Dose treatment	Number of rats			Average no. of pups
		Total animal	Number of female	Pregnant rats	
I	500mg/kg	6	4	4	8
II	250mg/kg	6	4	4	6
III	125mg/kg	6	3	2	7
IV	Control	6	3	0	0

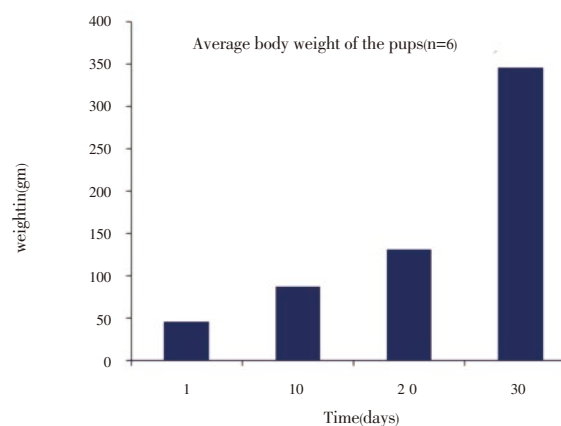


Figure 1. Values are mean ± SEM of 6 animals in each group and average of 4 groups.



Figure 2. Pups at different time interval (in days).

4. Discussion

As mentioned earlier it is known that aphrodisiac in human and animals induces veneral desire that increases pleasure and performance. Herbal medicine and plant products even though their mode of action are unknown but they still comprise of a huge number of medicinal properties and use by medical practitioner and some local people of different areas of the country. In nature various plants were known to have aphrodisiac properties that modulate the sexual desire in men [10]. From our research findings we have also qualitatively screened the extract for the presence of various phytochemical on PM and the result shows that the extract contains steroidal components, flavonoid, phenolic and moderate concentrations of glycosides, alkaloids, proteins, terpenes, carbohydrates [11]. Various research literatures reveals that steroidal constituents found in the plants possess fertility potentiating properties, and they have been found to be useful in the treatment of impotency [6]. This further strengthening our research findings of which our case report was found to be absolutely true. Moreover, the sexual behavior in human beings is mainly due to the elevated testosterone levels and it might also be due to

certain changes in neurotransmitter level or their action at the cellular stage that could alter their sexual activities [12]. Ultimately our case report shows that the percentage of pregnancy level was found to be more in the female group mated and treated with 500 mg/kg PM compare to the other treated dose level (250 mg/kg and 125 mg/kg). The total body weight was found to increase significantly in the group treated with PM extract compare to normal control group. The increased pregnancy rate in the drug treated group may be due to the healthy viable sperm and enhancement of sexual desire of the rats. All the pups of drug treated group were normal and healthier, indicating the safety of the drug and the lack of any teratogenic inequity. The overall observation of our results suggests a dose dependent manner which is seen to be highly significant when the rats were treated with 500 mg/kg PM extract orally.

From our overall findings we have monitored for the first time the aphrodisiac effect of PM fruit extract pre-clinically on the experimental rats and eventually since our studies deals with the safety of using herbal extract, it makes easy for the researchers as well for the manufacturers to further explore the effect of this plant by performing a deep study on experimental models for aphrodisiac activity. The search for natural supplement from medicinal plants is being intensified probably because of its reduced side

effects, its ready availability and reduced cost. More over we have extend our research investigation by isolating a phytoconstituents from this plant that might be responsible for such kind of activity.

Conflict of interest statement

We declare that we have no conflict of interest.

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