Academic Sciences International Journal of Pharmacy and Pharmaceutical Sciences

ISSN- 0975-1491 Vol 4, Issue 2, 2012

Research Article

EVALUATION OF ANTIFERTILITY POTENTIAL OF AQUEOUS EXTRACT OF *SIDA CARDIFOLIA* LINN. PLANT IN SWISS ALBINO MICE

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Received: 12 Aug 2011, Revised and Accepted: 19 Oct 2011

ABSTRACT

Now a day's fertility control finds a great significance because of rapid population growth and needs a check on it. Plants products have attracted the attention of many scientists as a primary source of naturally occurring fertility regulating agents because of their little or no side effects various plant extract are reported as antifertility agents. So family planning has been promoted through several methods of contraception. A wide synthetic agents are available but these cannot be used continuously due to their side effects. Thus the present study was to evaluate the effect of *Sida cardifolia* on fertility of female mice. Swiss Albino mice were orally administered with aqueous crude extract on reproductive organs and fertility was investigated. The treatment caused decrease in weight of ovaries and uterus and histological examination was done.

Keywords: Antifertility, Sida cardifolia, Uterus, Ovaries

INTRODUCTION

Control of population growth is very important in populated countries. Control is an issue and national public health concern. Current methods of contraception result in an unacceptable rate of unwanted pregnancies and having side effects also. Thus there is a need of replace these agents by plants. Many plant extracts have been used as without producing apparent toxic effects[1-5]. As part of this research, we present in this paper antifertility efficacy of whole plant of *Sida cardifolia*.

Sida cardifolia (family Malvaceae) commonly known as Bala, which grows well throughout the plains of India, especially, in damp climate[6]. *Sida cordifolia* contains an alkaloid, a fatty oil, phytosterol, mucin, resin, resin acids and potassium nitrate. The root contains alkaloid- ephedrine, pseudo-ephedrine, beta-phenethylamine, carboxylated tryptamines and hypaahorine, quinazoline alkaloids-vasicinone, vasicine and vasicinol. Choline and betaine have been isolated[7]. Analgesic, anti-inflammatory and antipyretic activities[8,9], Antimicrobial Activity[10,11], Weight Loss Activity[12,13], Antioxidant Activity[14,15], Anticancer activity[16,17] activities of *Sida cardifolia* have been evaluated.

MATERIALS AND METHODS

Plant material

Sida cordifolia powder of this material was purchased from local market. Powdered plant was concentrated under reduced pressure and then dissolved in distilled water for administration to mice.

Animals

Adult (age 12-14 weeks) Swiss albino mice weighing 30 g were used in the investigations. Mice were maintained under hygienic conditions in well ventilated room with 12 h photoperiod (8 am to 8 pm) temperature maintained at 25±2 º. All the animals were fed twice a day with animal pellet feed (Hindustan lever limited, Mumbai) and also supplemented with bread. Tap water was provided *ad libitum*. Animals in each group were housed in polypropylene cages. General body weight of the animals was monitored regularly during the entire of the experiment. Animals were maintained according to the guidelines of Institutional animal ethics committee (06/00809)

Experimental protocol

The animals were randomly selected for investigation. Mice were selected for the study, divided into three groups. Aqueous extract of *Sida cardifolia* was suspended in sterile distilled water orally with the help of oral feeding needles. Control receives an equivalent volume of sterile distilled water in similar manner. The dose of *S. Cardifolia* selected on the basis of a pilot study. After recording final body weight at the end of treatment animals were sacrificed. Blood was collected and serum was prepared and stored at -20 º until further use.

Body weight and Organ weight

Body weight recorded before and after treatment. Ovary, fallopian tubes were dissected out, bottled free of blood, adhering tissues were removed and weighed.

Evaluation of female fertility potential

The animals were divided into following groups of one control and two treated groups of animals. Treated group received crude drug sample by gavage using stomach tube in the doses of 500 mg/kg and 1000 mg/kg for 30 days. The animals were weighed after every three days for 30 days. After 30 days, treated female mice were into four groups each containing three mice. One control male mice was added into each group and observed the mice for fertilization. At the end of the experiment, animals were sacrificed by using terminal anaesthesia. The following organs were collected for microscopic analysis : Organs- Ovaries, uterus and fallopian tubes[18].

Histological studies

For histological studies ovary, uterus and fallopian tubes were randomly selected from left or right sides of the mice in each group. Portion of the ovary, uterus and fallopian tubes were fixed in bouin's fixative. These were dehydrated graded ethanol series. Cleared in benzene and embedded in paraffin. Then these were sectioned at 5 µ using rotatory microtome. Then stained with haematoxylin –eosin, examined and photographed (X200).

Statistical Analysis

All the grouped data were statistically evaluated using Graph pad prism software. The values were expressed as mean ± S.D. The results were analysed for statistical significance of Dunnet Multiple Comparison

RESULTS

Oral administration of aqueous extract of *Sida cardifolia* plant in treated mice revealed the effect on gonads of female albino mice.

Genital organ weights

In the first phase of study, the evaluation of body weight and weight of gonads were done in both control and treated groups, after 30 days of treatment.

Table 1 : Effect of *Sida cardifolia* phole plant on body weight and ovaries weight of female albino mice

Group (n=6)	Treatment	Body weight	Reproductive organ weight (Ovaries with uterus in grams)
1.	Control	34.83 ±0.302	0.526±0.281
2.	500 mg/kg	28.33±0.892	0.500±0.332
3.	1000 mg/kg	24.00±0.577	0.421±0.095

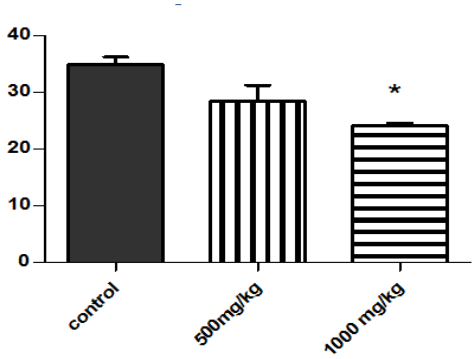


Fig. 1: Effect of *Sida cordifolia* after 30 days on female mice (whole body weight)

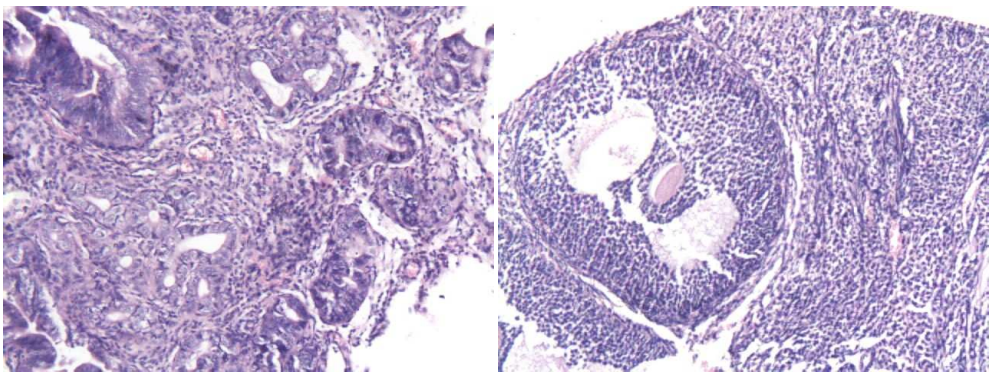
Female Fertility Potential

It was observed that with 500 mg/kg, one female mouse delivered pups but other five females did not showed effect on fertility. The mice which did deliver pups were subjected for histopathology of ovaries, uterus and fallopian tube. Also two female mice from the dose 1000 mg/kg delivered pups. Pups were observed for gross and macroscopic abnormalities. The remaining four mice not fertilized they were subjected for histopathology study of ovaries, uterus and fallopian tubes. The % Fertility was calculated by formula,

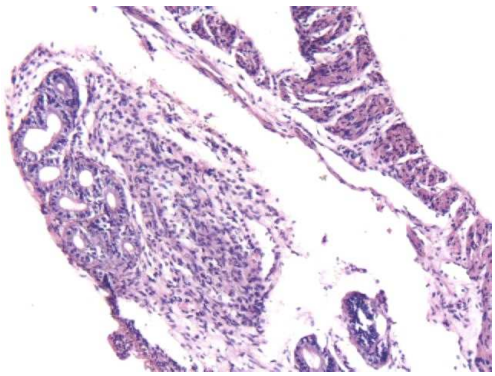
$$\% \text{ Fertility} = \frac{\text{No. of females delivered} \times 100}{\text{No. of females exposed to mating}}$$

Histological studies

In the last phase of study, histological slides of ovary and fallopian tubes were prepared. The histological examination of slides revealed that females mice showed graphion follicles had abnormal cell growth in antrum with 1000 mg/kg. No abnormalities were seen with 500 mg/kg dose. The sizes of the fallopian tubes were decreased for both 500 and 1000 mg/kg dose. However there was no abnormality detected in uterus.

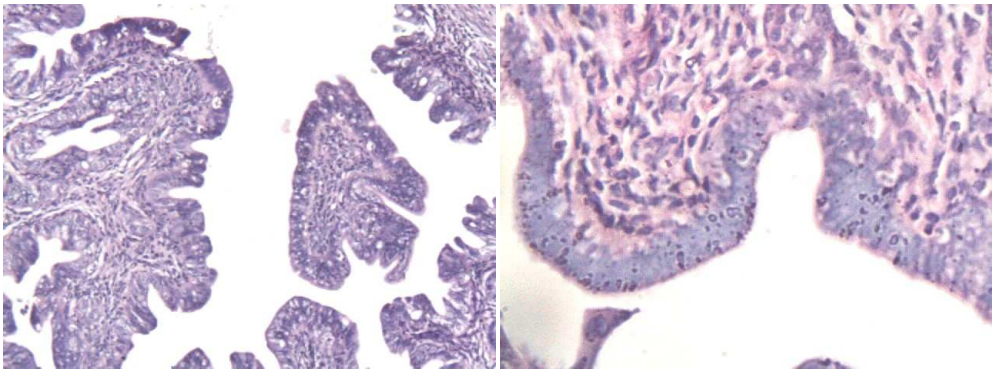


(a) T.S. of Ovaries with uterus of Control **(b) T.S. of Ovaries with uterus of 500 mg/kg**

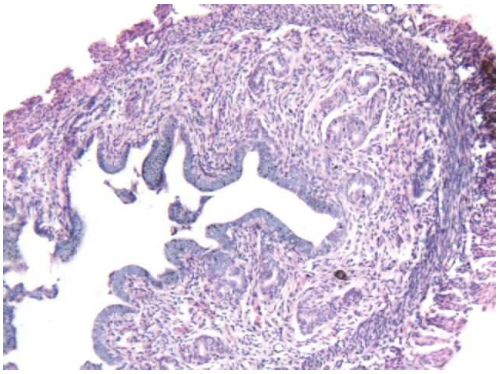


(c) Histopathology of Ovaries with uterus (1000 mg/kg)

Fig 2: Cross sections of ovaries and uterus of control and treated mice (a) T.S of Ovaries with uterus of control (b) T.S of Ovaries with uterus of 500 mg/kg (c) T.S of Ovaries with uterus of 1000 mg/kg

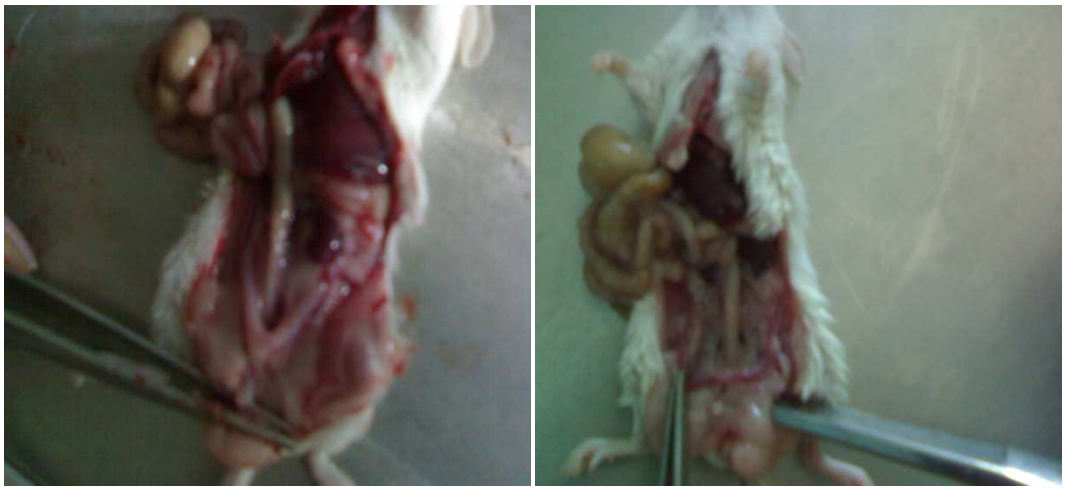


(a) T.S. of Fallopian Tube (Control) (b) T.S. of Fallopian tubes (500 mg/kg)



(c) T.S. of Fallopian tubes (1000 mg/kg)

Fig 3: Cross sections of fallopian tubes of control and treated mice (a) T.S of fallopian tubes of control (b) T.S of Ovaries with uterus of 500 mg/kg (c) T.S of fallopian tubes of 1000 mg/kg



(a) Uterus with fallopian tubes of control mice (b) Uterus with fallopian tubes for Test Female mice (1000 mg/kg)

Fig 4: Macroscopic changes in fallopian tubes were observed in treated mice compared with control

DISCUSSION

In past, many suggested the use of plant extract affecting the reproductive physiology of the animals. Much interest, however, has been shown in recent years, to control male fertility by using plants[19,20]. Therefore, several plants have been evaluated for their antifertility potential in the hope of developing a contraceptive for use in men and womens[21,22]. Some of the plants like Hibiscus rosa sinensis, Allium cepa and Ocimum sanctum possesing antidiabetic properties affect the reproduction of males [23,24] and females [25,26] . It is suggested that crude extract of plants is more beneficial as compared to the isolated ingredient[27]. For Antifertility activity, the % fertility on female mice for control, 500 mg/kg and 1000 mg/kg were 100%, 20 % and 33.33% respectively. Histopathology study showed abnormality effects on ovaries for higher dose concentration and size decrease effects on fallopian tubes which are responsible for antiimplantation. These results indicates that *S. Cardifolia* produced mainly abortifacient activity and antiimplantation activity. However, further experiments including oestrogenic evaluation are required to elucidate its mechanism of action.

ACKNOWLEDGEMENT

The authors are thankful to the Management and Dean, NMIMS University, Shirpur for providing necessary facilities to conduct the work.

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