

# Antifertility Activity of Dried Flowers of *Woodfordia fruticosa* Kurz

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**The study aims at preliminary phytochemical investigation and antifertility activity of dried flowers of *Woodfordia fruticosa* Kurz. The dried flowers were extracted successively with various solvents and individually with water and aqueous alcohol (50:50). The extracts were evaluated for phytochemical studies, including qualitative tests and high performance thin layer chromatography (HPTLC) analysis. Antifertility activity of successive alcoholic, individual aqueous and individual hydroalcoholic extracts was studied in female albino rats. The results revealed that the alcoholic extract showed significant abortifacient activity, whereas aqueous and hydroalcoholic extracts showed moderate activity as compared to the control. Thus, the successive alcoholic extract showed promising abortifacient activity at 100 mg/kg body weight.**

The rise in population in the developing world is overwhelming and this intensifies the need for effective birth control measures. The synthetic agents available today for fertility control produce severe side effects, such as hormonal imbalance, hypertension, increased risk of cancer and weight gain<sup>1</sup>. Thus there is a need to replace these agents by safe and effective agents such as plant-based contraceptive agents. Many plant(s)/ plant extracts have been used as antifertility agents in folklore and traditional medicines. One such plant is *Woodfordia fruticosa* Kurz (family: Lythraceae)<sup>2</sup>. The dried flowers of *Woodfordia fruticosa* have been also used as an astringent tonic in disorders of mucous membranes, haemorrhoids and in derangements of the liver<sup>3</sup>. The present study aims at preliminary phytochemical investigation and antifertility activity of *Woodfordia fruticosa* flowers.

The dried flowers of *Woodfordia fruticosa* were procured from the local market, Mumbai and authenticated at Blatter Herbarium, St. Xavier's College, Mumbai. The ethanol extract (extract 1) of the powder of dried flowers was prepared by extracting successively with petroleum ether (60-80°), benzene, chloroform and ethanol. The dried flowers were also extracted individually with 50% aqueous alcohol (extract 2) and water (extract 3). All the three extracts were evaporated under reduced pressure. Further, these extracts were evaluated quantitatively for the presence

of various phytoconstituents.

High performance thin layer chromatography (HPTLC) analysis of all the three extracts was carried out by using Camag Linomat IV applicator and Camag Scanner III with Cats 4 software. The stationary phase used was silica gel 60 F<sub>254</sub> and the mobile phase used was toluene: chloroform: ethyl acetate: formic acid (1:3:3:1). The plates were sprayed with 5% alcoholic ferric chloride reagent.

Proven fertile male and female Wistar rats (150-200 g) were used for the study. The protocol was approved by the IAEC (No. CUSCP/IAEC/02/2002-2003). The rats were maintained at room temperature with natural daylight and given a standard pellet diet with water *ad libitum*. Female rats were divided into the following four groups: Group I - control group - received distilled water orally. Group II - received successive alcoholic extract (100 mg/kg body weight). Group III - received 50% hydroalcoholic extract (100 mg/kg body weight). Group IV - received water extract (100 mg/kg body weight).

Vaginal smears of each female rat were checked daily and paired with males in 2:1 ratio. Mating of the animals was confirmed by observing the presence of sperms in the vaginal smear and the day sperms were seen was considered day 1 of pregnancy. Extracts were administered from day 1 to day 7 of pregnancy. On the 12<sup>th</sup> day of pregnancy, the female rat was anaesthetized and a small incision was given in the lower abdomen. The number of implantation sites was counted and the sizes of each were measured. The incision was sutured and the

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**TABLE 1: ABORTIFACIENT ACTIVITY OF THE EXTRACTS OF *WOODFORDIA FRUTICOSA***

Animal groups	No. of animals pregnant/ no. of animals taken	Average number of implantation sites $\pm$ SEM	Average size of the implantation sites (mm)	Average number of litters delivered $\pm$ SEM	Percent Abortifacient activity
Group I	5/5	9.8 $\pm$ 0.734	7.84 $\times$ 6.40	9.8 $\pm$ 0.734	0
Group II	3/5	7.0 $\pm$ 2.88	7.73 $\times$ 7.37	4.0 $\pm$ 2.25	43*
Group III	4/5	6.2 $\pm$ 2.37	8.42 $\times$ 6.84	5.0 $\pm$ 2.19	20
Group IV	4/5	7.0 $\pm$ 2.16	7.91 $\times$ 6.20	6.2 $\pm$ 1.85	12

Group I is control group; Group II received successive alcoholic extract (100 mg/kg body weight); Group III received 50% hydroalcoholic extract (100 mg/kg body weight); and Group IV received water extract (100 mg/kg body weight). \* $P < 0.05$ , data is expressed as mean  $\pm$  SEM (n = 5)

rat was allowed to deliver normally<sup>4</sup>. The average number of implantation sites, average number of litters delivered and percent abortifacient activity was calculated. Data was analyzed by students 't' test for statistical significance at 95% probability level.

The extracts of *Woodfordia fruticosa* flowers showed the presence of carbohydrates, gums, flavonoids, sterols and phenolic compounds/tannins. HPTLC studies of extract 1 at 254 nm showed the presence of four spots (with Rf of 0.04, 0.19, 0.32, 0.40), extract 2 showed the presence five spots (with Rf of 0.06, 0.20, 0.32, 0.40, 0.56), extract 3 showed the presence six spots (with Rf of 0.06, 0.19, 0.32, 0.40, 0.57, 0.67). The plates were sprayed with 5% alcoholic FeCl<sub>3</sub> reagent to check the presence of tannins. Extract 1 showed three blue-black spots at Rf of 0.05, 0.19, 0.34; extract 2 and extract 3 each showed two blue-black spots at Rf of 0.21, 0.34, indicating the presence of tannins.

The average number of implantation sites for all the treatment groups was lower as compared to the control. This is an indication of antifertility activity. There was no significant difference in the average size of implantation sites for control and all the treatment group animals. For extract 1, which was successive alcoholic extract, the average number of implantation sites was 7.0, but the average number of litters delivered was 4.0. This decrease in number of implantation sites may be due to resorption of foetus. This is a strong indication of abortifacient activity. For individual hydroalcoholic extract (extract 2) and individual aqueous extract (extract 3), the average number of implantation sites was 6.2 and 7.0 respectively, but the average number of litters delivered

was 5.0 and 6.2 respectively. Among all the three extracts tested, successive alcoholic extract showed maximum abortifacient activity of 43%, which was found to be statistically significant ( $P < 0.05$ ) (Table 1). Individual aqueous and individual hydroalcoholic extract, though, showed moderate activity of 12 and 20%; however, it was not statistically significant (Table 1).

In conclusion, our data suggest significant abortifacient activity of alcoholic extract of the dried flowers of *Woodfordia fruticosa* Kurz.

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