

ANTI-IMPLANTATION ACTIVITY OF THE METHANOLIC ROOT EXTRACT OF *TINOSPORA CORDIFOLIA* (willd.) IN FEMALE RATS

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Summary

To evaluate the effect of *Tinospora cordifolia* (Willd) Miers (Menispermaceae) on female fertility, 70% methanolic (hot & cold) extract of its root was administered orally to fertile female albino rats at the dose level of 100 mg/kg body weight for 5 days. Fertility was decreased in this treatment in *T. cordifolia* treated rats. The results revealed that *T.cordifolia* root exhibit antifertility activity. The hot methanol extract showed more significant antifertility activity than that of the cold methanol extract.

Keywords: *Tinospora cordifolia*, antifertility, hot and cold methanol extract, ethinyl oestradiol.

Introduction

Tinospora cordifolia (Willd) Miers (Menispermaceae) is a common climbing shrub, found throughout India in forests. It is one of the most valuable Traditional Indian medicinal herbs and has been used in Ayurvedic preparations for the treatment of various ailments throughout the centuries (1). *Tinospora cordifolia* is reported to possess antispasmodic, anti-inflammatory, antiallergic and anti-diabetic properties. It is generally prescribed in general debility, diabetes, fever, jaundice, skin diseases, rheumatism, urinary diseases, dyspepsia, gout, gonorrhoea and leucorrhoea (2). A decoction of the stems, leaves and roots is used to treat fever, cholera, diabetes, rheumatism and snake-bites, an infusion of the stem is drunk as a vermifuge, a decoction of the stem is used for washing sore eyes and syphilitic sores. The stem is registered in the Thailand Pharmacopoeia, and commonly use in hospital to treat diabetes (3). The stem decoction is considered antipyretic, useful as an anti-malarial and a wash for skin ulcers.

Traditionally an infusion is used to treat fever due to malaria and also in cases of jaundice and for use against intestinal worms (4). A decoction of the fresh root mixed with pepper and goat's milk is given for rheumatism, where the dose is half a pint every morning. The leaves are given for the cure of gonorrhoea and is said to soothe the smarting and scalding. It is also used externally as a cooling and soothing application in prurigo, eczema, impetigo, etc (5). The methanolic stem extract of *Tinospora cordifolia* possesses antifertility activity, which might be exploited to prevent unwanted pregnancy and control the ever increasing population explosion (6). Decoction of the root in combination with ginger and sugar is given in cases of bilious dyspepsia and in cases of fevers with other bitters and aromatics. Roots rubbed with bonduc nuts in water are given for stomachache, especially in children. They can also be used to treat stomachache and jaundice. The infusion is also useful in fevers caused by smallpox and cholera. Another popular use of this infusion is in a mixture for treating indigestion. The leaves are beaten with honey and applied to ulcers. Stem, root, whole plant is used in the treatment of wound, anthrax, pneumonia, asthma, and cough (7). The root of this plant is known for its anti-stress, anti-leprotic and anti-malarial activities (8). The stem of *Tinospora cordifolia* is one of the constituents of several Ayurvedic preparations used in general debility, dyspepsia, fever and urinary diseases (9, 10). Above cited literature prompted us to carry out work on the antifertility activity of *Tinospora cordifolia* root in female albino rats. So, in this article, we wish to report the antifertility effect of the *Tinospora cordifolia* methanolic extract of root in female albino rats.

Materials and Methods

Plantcollection, Authentication & Extract Preparation:

The species for the proposed study that is *Tinospora cordifolia* (Willd) Miers, roots were collected in the month of August- 2007 from the campus of Birla Institute of Technology, Mesra, Ranchi. The plant was authenticated by Birsa Agricultural University, Kanke, Ranchi; ref.no.686/Hort.,Kanke. The shade dried coarse powder of the *Tinospora cordifolia* root was extracted with methanol at 48 hrs by hot continuous and cold maceration method. Both the extract was filtered and concentrated on Rotary evaporator.

Experimental Model used

Female Albino rats weighing 150-200 g were used for the present investigation. Animals were housed in standard rat cages and maintained under standard condition (12-h light/dark cycle: 25±3°C; 35-60 relative humidity), water and food (commercial diet) were available *ad libitum*. Drug and/or vehicle was administered to all animals by oral intubations.

Chemicals Used:

Hot Methanolic Extract of *Tinospora cordifolia* root.
Cold Methanolic Extract of *Tinospora cordifolia* root.
Ethinyl oestradiol —Standard Drug.
Distilled water.

Fertility Test

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 when sperms were seen was considered day 1 of pregnancy.

Experiment Design

The rats were divided in to 4 Groups containing 10 animals in each.

Group I : Control Group receiving Vehicle only (distilled water 2 ml/day/rat) (Fig. 1)

Group II : Treatment Group receiving hot methanolic extract at a dose of 100 mg/kg-body weight. (Fig. 2)

Group III : Treatment Group receiving cold methanolic extract at a dose of 100 mg/kg-body weight. (Fig. 3)

Group IV : Standard Group receiving ethinyl oestradiol (1mg/kg/rat/day). (Fig. 4)

The above treatments were given from day 1 to 5 of pregnancy and on day 10, laparotomy was performed under light ether anesthesia using sterile conditions. The uteri were examined to determine the number of implantation sites.

The anti-implantation and anti-fertility activities of each sample were calculated using the following formula(11).

$$\text{Anti-implantation Activity} = \frac{\text{No. implants in control} - \text{No. of implants in test group}}{\text{No. of implants in control group}} \times 100$$

$$\text{Anti-fertility activity} = \frac{\text{No. of animals showing no implantation}}{\text{Total No. of animals}} \times 100$$

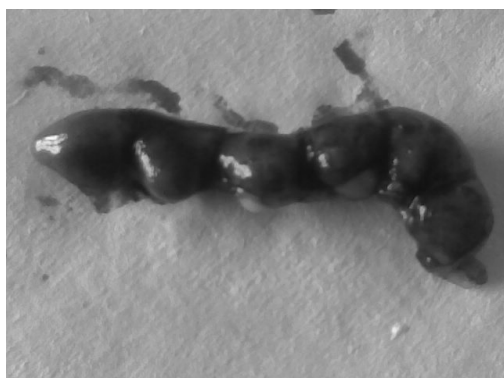


Fig 1 Control group



Fig 2 Hot Methanol Extract group



Fig 3 Cold Methanol Extract group



Fig 4 Standard group

Statistical Analysis

The mean and standard error of mean (SEM) were calculated by using Student's *t*-test.

Results and Discussion

This is a Preliminary report on the antifertility activity of *Tinospora cordifolia* root in female rats. The hot methanol extract showed more significant antifertility activity than that of the cold methanol extract. Table 1 reveals that the hot methanolic extract possesses inhibited pregnancy 2/3 rats with a mean no. 3.0 ± 1.92 However, the cold methanol extract also stated to be good inhibitor of pregnancy.

Table 1. Anti-implantation activity of *Tinospora cordifolia* root extracts in female rats

Group Treatment (day 1-5day)	No. rats having no Implantation sites on day 10	Mean no. implants (\pm S.E.M)	% of rats having no implantation sites on day 10
I Control (Distilled water) (2ml/rat/day)	Nil	11.0 ± 0.46	Nil
II Hot Methanol Extract (100mg/kg/rat/day)	2	3.0 ± 1.92	66.66 %
III Cold Methanol Extract (100mg/kg/rat)	1	2.0 ± 1.23	33.33 %
IV Ethinyl oestradiol (1mg/kg/rat/day)	2	3.0 ± 1.87	66.66 %

S.E.M – Standard error mean

Conclusion

The results obtained in this study suggests that the methanolic roots extracts of *Tinospora cordifolia* possesses antifertility activity , which might be exploited to prevent unwanted pregnancy and control the ever-increasing population explosion. This is a Preliminary report on the antifertility activity of *Tinospora cordifolia* root in female rats.

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