

# A Review Study on Antifertility Effect of Some Very Common Kitchen Herbs

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## ABSTRACT

The ancient Indian physicians were well aware of the use of herbs as an abortifacient and contraceptive. Various medicinal plant extracts have been investigated in both male and female animal models for antifertility effects. The profiles of very common kitchen herbs with antifertility activity reported in the literature from 20 year past to very recent are included in this review study. The profiles presented include information about the scientific name, common name, the degree of antifertility activity and the active agents. Totally 10 very common kitchen herbs are listed in the present review.

**KEYWORDS:** *Anti-implantation, Antifertility, Antiovulation, Hormones, Kitchen herbs, Sperm count*

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## INTRODUCTION

Life has two ends: birth and death. Man can't stop death, but he can stop birth. The world's growing human population, particularly in developing and undeveloped areas, is wreaking havoc on the planet's life support system (Gupta & Sharma, 2006). Through the biological mechanisms, the potential of an effective check on human fertility may be realized shortly. The world's population has exploded due to a gradual increase in birth rates and a gradual fall in mortality rates. As a result, the basic premise of many population control and family welfare programs is the prevention of limits. The world's population is now odd on to grow even higher for the rest of the century, preventing growth differences for food supplies, health care & social. Contraceptive is considered to be a key owner to this. Fertility control, which includes contraception and infertility care, is an important aspect of reproductive health (Allag & Rangari). Though significant progress has been achieved in the creation of highly effective, acceptable, and reversible contraceptive methods for women, male advancement and options are still gradual and limited (Gupta & Sharma, 2006).

Antifertility agents, which are taken orally also known as Oral Contraceptives, are fertility-controlling medications (Dalia & Latin, 2012). In females, these medicines affect the menstrual cycle and ovulation. It inhibits spermatogenesis in males, inhabits testosterone, and has an effect on the organ's grad utrophin or sperm mortality.

## Methodology

Bibliographic research was conducted, which included a review of classic text and reference books, journals, and peer-reviewed papers, as well as a thorough search of internationally recognized scientific databases. A systematic search of the PubMed, Sciencedirect, Cochrane, SCOPUS, and CINAHL databases was conducted. We used keywords like "antifertility," "anti-implantation," "antiovulation," "plants with lactogenic and anti-lactogenic activities and "antispermatogenic" activities of plants.

### 1. *Allium Sativum* (Garlic)

Garlic is probably one of the earliest known medicinal plants, which used from ancient time to

cure different disease conditions in human (Londhe et al., 2011). It is one of the plants used as a therapeutic agent in many cultures. *Allium Sativum* contains at least 33 Sulphur compounds, several enzymes. 17 amino acid & minerals such as Selenium, germanium. The Sulfur compounds are responsible for both for garlics pungent order & many of its medicinal effects. Scientific reports revealed that the bulb extracts of *Allium Sativum* has abortifacient, antilipemic, antihypertensive, anti-atherosclerotic, antifertility, spasmolytic etc. activities. Chakrabarti and Bhattacharyya, 2003 reported Sperm immobilization activity of *Allium sativum*. In the study of Parvez et al., 2015, the antifertility effect of methanol bulb extract of *Allium sativum* L. was discovered at various concentrations in Swiss albino mice. Lower doses of methanol bulb extract of *Allium sativum* (500 mg/kg/BW) were found to have temporary anti-fertility action. However, the greater dose (1000 mg/kg/BW) had a longer-lasting anti-fertility effect. The methanol bulb extract of *Allium sativum* was thought to cause a highly significant drop in testicular sperm count and daily sperm production in all test groups when compared to the control group. Hammami et al., 2008 reported that crude garlic consumption for 1 month reduced testosterone secretion and altered spermatogenesis at 10%, 15%, and 30% doses. Raji et al., 2012 studied the effects of aqueous extract of *Allium sativum* on some aspects of reproduction in the female albino rat (Wistar Strain).

## 2. *Curcuma Longa* (Turmeric)

*Curcuma longa*, a ginger family member (Zingiberaceae), has underground rhizomes. *Curcuma longa* has been used in traditional Indian and folk medicine for thousands of years to treat a wide range of ailments, including inflammation, infectious diseases, and gastric, hepatic, and blood abnormalities. It possesses a variety of pharmacological properties, including antioxidant, anti-inflammatory, antibacterial, anticancer, and hepatoprotective actions (Tung et al., 2019). Mishra & Singh, 2009 studied the reversible antifertility effect of aqueous rhizome extract of *Curcuma longa* L. in male laboratory mice. The results show that in P mice *C. longa* treatment causes reversible suppression of spermatogenesis and fertility.

Female albino rats showed strong antifertility action after oral treatment of varied dosages of aqueous and ethanolic extracts of *Carum carvi* and *Curcuma longa*. (Mishra & Singh, 2009) (Thakur et al., 2009).

The petroleum ether, alcoholic and aqueous extracts of the rhizome of *Curcuma longa* have been tested by Garg 1974 for their antifertility activity in female albino rats and rabbits. Results showed 100%

antifertility activity at a dose of 200mg/kg body weight.

## 3. *Ocimum Sanctum* (Tulsi)

It is commonly known as holy basil or tulsi. It is an aromatic perennial plant in the family Lamiaceae. The leaves, seeds and roots of this plant have been used in Ayurvedic medicine. With a large margin of safety, *Ocimum sanctum* exhibits anti-stress, antioxidant, hepatoprotective, immunomodulating, antibacterial, antiviral, antifungal, antipyretic, antidiuretic, antidiabetic, antifertility, antimalarial, and hypolipidemic activities. (Vittalrao et al., 2011). The benzene extract of *Ocimum sanctum* leaves when administered to male rats at a dose of 250mg per kg body weight for 48 days was reported to decrease sperm count, motility and the forward velocity of the sperm. The effects were found to be reversible upon withdrawal of treatment for 2 weeks.

The serum levels of the hormones tested were not affected by *O. gratissimum*. Sperm count and motility, on the other hand, were reduced, while the percentages of defective sperm cells, sperm debris, and primordial cells rose dosage and time-dependently (Obianime, 2010).

Sethi, 2010 showed effect of tulsi (*Ocimum Sanctum* Linn.) on sperm count and reproductive hormones in male albino rabbits. In this study, a significant decrease in sperm count was observed in rabbits fed on OS leaves as compared to control animals. A marked increase in serum testosterone level was observed in OS-treated rabbits as compared to control.

## 4. *Carica papaya* (Papaya)

*Carica papaya* is recognized since ancient times for its medicinal properties. The contraceptive characteristics of papaya seed extracts have been reported in the 1970s. Degeneration of germs cells & germinal epithelium, reduction in the number of and Leydig cells & presence of vacuoles in the seminiferous tubules were observed when crude ripe seeds of papaya were administered orally to male wistar rats at a certain dose.

Infertility and abnormal oestrous cycles are caused by aqueous extracts and benzene extracts administered orally to female rats. Sperm motility, testis bulk, and sperm count are all reduced by ethanol seed extract. Male rats' fertility was similarly reduced in studies using aqueous seed extracts (Chinoy, 1997).

## 5. *Mentha arvensis* (Pudina)

*Mentha* is also known as pudina which is a genus of plants in the Lamiaceae. *Mentha* is a very common kitchen herb and used for various purposes. When

supplied orally to male albino mice at doses of 10 and 20 mg/mouse per day for 20, 40, and 60 days, the petroleum ether extract of the leaves of *Mentha arvensis* L. revealed a dose and duration-dependent reduction in the number of progeny of the treated male mated with normal females. After 60 days of treatment, both dosage regimens had negative fertility. In male mice, a petroleum ether extract of *M. arvensis* leaves has reversible antifertility properties without causing toxicity (Shrama, 2001).

#### 6. *Allium cepa* (Onion)

The onion, also known as the bulb onion or common onion, is a vegetable that belongs to the genus *Allium* and is the most extensively farmed species. Onion bulb is used as both vegetable and flavoring. The onion is high in numerous phytonutrients that are recognized as vital components of the Mediterranean diet, but it has also been studied for its biological qualities and possible use in the treatment and prevention of a variety of ailments (Lim et al., 2015).

In a study at a concentration of 300 mg/kg, the ethanolic extract of *Allium cepa* demonstrated a considerable antifertility effect, and pre-treatment with the extract indicated significant suppression of the number of implant sites. Because there was no change in ovulation, the antifertility effect of *Allium cepa* in this study can be attributable mostly to its antiimplantation activity (Vishnu et al., 2003). Kadam & Gaykar, 2015 reported antiimplantation activity of *Allium cepa*.

#### 7. *Trigonella foenum graecum* (Fenugreek)

Fenugreek is a herb that has been utilized in alternative medicine for a long time. It's a staple in Indian cuisine and is frequently used as a supplement. This herb has numerous health benefits.

After fenugreek treatment, the biochemical parameters protein, sialic acid, glycogen, and ascorbic acid were reduced in the ovary and uterus; nevertheless, the concentration of cholesterol was elevated in the ovary and uterus. In female rats. *T.foenum graecum* seeds extract has antiestrogenic and antifertility properties.

Kassem et al. studied the potential antifertility effect of fenugreek seeds in male and female rabbits and the result clearly demonstrates an antifertility effect of fenugreek seeds in the female rabbits and more of a toxicity effect in the male rabbits. In males, testis weight was reduced, with evident damage to the seminiferous tubules and interstitial tissue.

#### 8. *Piper nigrum* (Black pepper)

Black pepper (*Piper nigrum*) is a flowering vine in the Piperaceae family that is grown for its peppercorn-like fruit, which is dried and used as a spice and

condiment. Degenerative alterations were seen in all tubules of testis of mice when 100mg dosage was given for 90 days. Intraepithelial vacuolation, loosening of the germinal epithelium, presence of large cells, and mixing of spermatids from different stages of spermatogenesis were all observed in affected seminiferous tubules; in severe cases, the tubules were primarily lined by a layer of sertoli cells. The therapy had a negative impact on sperm parameters, sialic acid and fructose levels, and litter size (Mishra & Singh, 2009).

#### 9. *Cuminum cyminum* (Cumin)

Cumin is a spice that comes from the *Cuminum cyminum*. Cumin is a common spice in a variety of cuisines, including Mexican, Indian, African, and Asian cuisines. Cumin has recently piqued people's curiosity, as current research begins to back up some of its purported health benefits.

Venkatesh et al, 2002 designed a experiment in which seed extracts of *Cuminum cyminum*, fruit extracts of *S. emarginatus*, *T. belerica* and *Allium cepa* (50mg/day/rat) were fed orally to male albino rats for 60 days. The weight of the reproductive organs was reduced, but the weight of the body was not affected. Sperm motility and sperm count in the cauda epididymis and testis both decreased dramatically, resulting in a negative fertility test. Protein, sialic acid, fructose, and ascorbic acid, all of which are androgen-dependent, were reduced, indicating a decrease in circulating androgen.

#### 10. *Trichosanthes cucumerina* (Snake gourd)

In south India, it is one of the most widely consumed veggies. The regular oestrous cycle was modified by the ethanol extract of *T. cucumerina* at doses of 200 and 400 mg/kg body weight, with a significant increase in estrus and metestrus phases and a decrease in diestrus and proestrus phases. The extract also decreased the number of healthy follicles and corpora lutea while considerably increasing the number of regressing follicles. In the treated group, serum FSH and LH levels were considerably lower. In an acute toxicity test, the treated groups showed no signs of death, behavioural changes, or other physiological activity. There was no mortality in chronic toxicity trials, and there were no significant variations in body and organ weights between controls and treated rats (Devendra et al, 2009).

#### Conclusion

Researchers and practitioners alike will benefit from the list of very common and easily available kitchen herbs used as antifertility drugs offered in this review. This list should only be used as a starting point for identifying suspected antifertility herbs, not as a definitive or comprehensive list.



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