Journal of Advances and Scholarly Researches in Allied Education
Vol. XIV, Issue No. 3, (Special Issue) February-2018, ISSN 2230-7540

A Study on Medicinal Plants Containing Anti-Fertility Activity

Amrish Kumar*

Associate Professor, Department of Pharmacy, Galgotias University, Greater Noida, Uttar Pradesh, India

Abstract – Ancient Indian physicians were well aware of the use of plants as anti-implantation, abortifacients, and contraceptives. This article contains up-to-date research on medicinal plants that are anti-fertility. The aim of this analysis is to illustrate plant-based anti-fertility studies. Herbs may offer solutions for women who are reluctant to utilize current means of contraception due to side effects or other factors, and lowering fertility is superior to using other contraceptives. Researchers will be able to use this report to help them classify medicinal plants with anti-fertility properties.

Keywords – Plants, Meditational Plants, Anti-Fertility, Herbal Plants, Anti-Implantation

- X -

INTRODUCTION

Medicinal plants are a common term that everyone can say, and they are useful in treating that are not treatable by allopathic medicine. Among them, birth control and, at the same time, increasing human fertility have both become major issues in recent years. Fertility control is a main public health concern on a global and national scale. The world's ever-increasing human population, particularly in developing and underdeveloped countries, has unavoidable consequences for the planet's life-sustaining resources, as well as negative consequences for all aspects of development, including employment, education, housing, health care, sanitation, and the environment. The world's population was estimated to be 6.5 billion in 2005 G.C. Over the after 45 years, the number is expected to rise by 2.5 billion, to 6.5 billion to 9 billion in 2050. (1).

The developing world absorbed 95 percent of all population growth, while the developed world contributed only 5%. According to the 2005 census, India's population is increasing at a rapid rate over the previous ten years was around 1.5 percent. Around 18 million people are added to our total population every year, putting additional strain on the community and ultimately contributing to poverty and pollution in developing countries (2).

Because of both of these negative effects, fertility control, which involves abortion and infertility treatment, is an important part of sexual wellbeing for both males and females. Obesity, cholethiasis, gastric trouble, breast and cervix carcinoma, asthma, and thromboembolism are some of the side effects of chemical approaches, which reduce their popularity and utility among women. Cancer has also been attributed to hormonal contraception. Because of their minimal to non-existent side effects, plant products are now gaining the interest of many scientists as a primary source of naturally occurring fertility controlling agents. Increased contraceptive use is a direct indicator of women's empowerment, population growth, and health. Several herbal plants have various antifertility properties (3).

Females' menstrual cycles and ovulation are affected and influenced by these drugs. When an antifertility substance prevents fertilization, ovulation, implantation, destroys the zygote, or causes abortion in females, it is considered active. It stimulates testosterone, inhibits spermatogenesis, and has an impact on organ gonadotrophin or sperm mortality in males. Population growth is currently regulated in several developed countries. Oxyphenbutazone, indomethacin, and acetyl salicylic acid block prostaglandin synthesis and have antifertility implications in albino male and female rabbits. Indomethacin and oxyphenbutazone affect the reproduction mechanism in male rabbits. Many plants have also been discovered to have spermicidal activity. Medicinal plants are a wonderful gift from nature that can be used to treat a wide range of human ailments. Various South Asian institutes have long had a tradition of cultivating the younger generation's faculties in the emerging field of science and technology. Many scientists in that area are actively working to educate and prepare the next generation of scientists in order to foster further growth and development in the field, as well as partnering with venture capitalists and the private sector to increase their research opportunities. Modern empirical study has shown the therapeutic importance of medicinal plants, which goes without saying. However, the widespread usage of medicinal plants has only lately started to achieve recognition in the broader foreign arena. Before their full market potential can be realized, certain bottlenecks in the process must be overcome, including but not limited to a lack of quality control and toxicological studies, the need to increase product shelf life, and compliance with international regulatory standards.

Medicinal plants with significant anti fertility activity

Herbal contraceptives have also been developed, but their potential for human use is limited. People are now looking for herbal medicines to treat various diseases and control fertility as a result of these issues (4).

Modern medicine has provided a number of contraceptive methods for prevention and correction, none of which are particularly safe or free of serious side effects. Synthetic or chemical-based medications may cause hormonal, cognitive, developmental, and metabolic side effects by disrupting the endocrine system. These compounds can interfere with natural hormone synthesis, secretion, transport, and activity. They interfere with natural hormone levels by inhibiting hormone synthesis and metabolism or preventing hormonal activity. As a result of these factors, a fully herbal medicine with high effectiveness and no adverse effects on the reproductive system is needed. In different human communities around the globe, over 35,000 plant species are used for medicinal purposes. Nearly 80% of the world's population depends on conventional drugs for primary health treatment, the bulk of which require the usage of plant extracts (5).

From the beginning of time, plants have been used to cure infections and relieve physical discomfort. Due to improved societal acceptability and compliance with the human body, many alternative drugs are now recognised as successful and have less adverse effects. It has been discovered that there is a need for certain herbal contraceptives that are both healthy and reliable. Primitive cultures of ancient societies used herbal contraception to regulate fertility and discourage conception. While traditional medicine has discovered some effective anti-fertility agents (Contraceptives) for females, their popularity and usefulness among women is limited due to some undesirable and bothersome side effects. Obesity, cholelithiasis, gastro esophageal reflux disease, breast and cervix cancer, asthma, and venous thromboembolism are all common side effects (6).

As a result, medical professionals are looking for herbal contraceptive agents that are both safe and effective. Many plants have been scientifically proven to have anti-fertility properties. These

plants could be a good source of natural contraception for both men and women. Because of their few or no side effects, plant products have piqued the interest of many scientists as a primary source of naturally occurring fertility regulating agents. Antifertility properties have been reported for a variety of plant extracts. Men who are eager to participate in the responsibilities of family planning have less opportunities for safe, reversible, non-irritating, and extremely predictable contraceptives than women. Few herbs have also been found to inhibit natural sperm development and mobility. Since each herb is used, it's crucial to understand how they're used (or could be used). Orthodox sterilization approaches focused on natural remedies, such as abortion in the first few weeks, avoiding pregnancy, or rendering either spouse sterile, are used to monitor population development. A analysis of the literature showed that enough work has been performed on different medicinal aspects of plants in this field, except for gynecological conditions, abortifacient herbals, and plants used to cause abortion. Several plant extracts have been shown to reduce male and female fertility, suggesting that they may be used as contraceptives in the future. Despite the fact that more indigenous plants have been found to prevent conception, only a handful have been evaluated for anti-fertility activity. Various herbal plant extracts have been evaluated for anti-fertility function in both male and female subjects. Any of these plants were spermicidal and had abnormal hormone levels. A global initiative is currently underway to assess the effectiveness of herbal contraception drugs (7).

Synthetic medicines are losing ground to plant-based goods. It was only lately attributed to their low toxicity and long history of exposure to these drugs in ethnic medicine systems such as Ayurveda. In order to minimize adverse effects and increase effectiveness, the proportions and forms of certain additives have improved over time. Infertility in women may be caused by medicinal plants in a number of ways. They may affect the ovary, uterus, hormone synthesis, hormonal suppression, implantation, and sperm penetration, among other things. To avoid fertilization, some of them shape a protective shell around an embryo. Plants may be categorized into various groups depending on their behaviors. Antifertility plants are drugs that interact with the fertilization process by preventing gametes from developing. Antiovulatory plants stop women from ovulating. These drugs may be used orally or by injection (8).

Anti-implantation plants are those that prevent fertilized ovum from attaching to or penetrating the uterus. Abortifacients are substances that prevent a woman from having an abortion. Plants cause the foetus to be expelled prematurely. According to a literature review, there are approximately 121 medicinal plants that have antifertility activity in females, which are listed in Table 1 along with the plant, its parts, and its activities (9).

Male infertility through plants

Traditional medicine and modern therapies are used to treat these couples. Traditional medicine, particularly medicinal plants, is often the first line of defense for infertile couples in developing countries due to their accessibility, availability, and affordability. Many of these plants' biological activities have been confirmed in vitro and/or in vivo animal studies, as well as in humans (10).

► **Plants and sexual desire (libido)**

• **In humans**

The administration of L. meyenii (Maca) at doses of 1.5 and 3 g per person for 4, 8, and 12 weeks increased men's sexual appetite. When taken three times every day, a 1,000 mg capsule of Korean Red Ginseng enhanced erection in 66.6 percent of impotent men with erectile dysfunction (11).

- **In rodents**

After being given an ethanolic extract of Trichopus zeylanicus at a dosage of 200 mg/kg for 1, 2, and 3 hours, as well as for 6 days, male mice bred higher. The ethanolic extract of Vanda tessellata flowers, provided at doses of 50 and 200 mg/kg to male mice, had a comparable impact 1 and 3 hours later. The lipidic extract from Lepidium meyenii increased sexual performance in normal mice, as shown by an improvement in total intromissions and the amount of sperm-positive females, as well as a reduction in the latent time of erection in erectile dysfunction male rats (12).

Medicinal plants and sperm abnormalities

- **In humans**

Aqueous extracts of Astragalus membranaceus and Acanthopanacis senticosi (10 mg/ml) improved motility and viability of infertile male sperm in vitro. In vitro, decoctions of Semen cuscutae, Rhizoma curculiginis, and Radix morindae officinalis increased sperm motility and sperm membrane stability, implying that herbal decoctions could be useful in promoting sperm activity for IUI and IVF (13, 14).

Effect of medicinal herbs on testosterone level and steroidogenesis

Corchorus depressus is a corchorus genus. Linn discovered that providing standard male rats the chloroform fraction of methanolic extract increased serum testosterone levels significantly. In a sample, two classes of sexually active male rats, one extremely active and the other moderately active, were given Cyperus esculentus L. (Family Cyperaceae). The first party got "1 and 2 g kg1 day1" of C. esculentus for 30 days, while the second got "2 g kg1 day1" of C. esculentus. According to the researchers, both classes had a substantial rise in serum testosterone levels (15).

Effect of medicinal herbs on sperm and prostate parameters

Oligospermia is the most prevalent source of infertility in males. According to WHO guidelines, oligospermia is characterized as a sperm count of less than 12 million per milliliter of blood (16). Reactive oxygen species (ROS) are needed for normal sexual activity in men; however, a rise in ROS may result in tissue injury and cell death, as well as a decrease in sperm content and male infertility. Medicinal herbs boost sperm parameters by antioxidant, anti-inflammatory, anti-oedematous, and venotonic action, to name a few pathways. They can also produce sperm-production precursors and raise serum testosterone levels (17).

Nigella sativa var. sativa is a variety of Nigella sativa var. sativa var. sativa var. sativa In male albino rats, an aqueous extract of its seeds increased sperm motility and amount in the cauda epididymides and testicular ducts. Another research, on the other side, discovered no substantial differences in sperm motility or viability but a significant positive impact on other sperm parameters. Furthermore, the antioxidant thymoquinone from N. sativa has been shown to shield male mice from the morphine-induced toxicity caused by oxidative stress, whilst also enhancing spermatogenesis, sperm motility, and viability (18).

A form of withania is Withania somnifera. Its sources were used for "three months" and were shown to have a beneficial effect on sperm parameters. The increased semen content was determined to be due to the antioxidant activity of W. somnifera core. The stem of W. somnifera, on the other side, had spermicidal and antifertility properties. The most significant active compounds present in the root are alkaloids and flavonoids. The key free radical scavenging enzymes have been shown to be reactivated by flavonoids and certain alkaloids (19, 20).

CONCLUSION:

Anti-fertility effects can be used in a variety of therapeutic plant extracts. To make the antifertility medication work, either one or a mixture of pathways may be used. These involve accelerated removal of fertilized ova from the fallopian tube or tube locking; as a blastocyst-toxic agent; inhibition of implantation due to a disruption of estrogenprogesterone balance; or foetal absorption or miscarriage, likely due to a loss of nutrients to the uterus and hence to the embryo in both females and males.

REFERENCES:

1. Gupta RS and Sharma R (2006). A review on medicinal plants exhibiting antifertility activity in males. Natural product radiance; 5: pp. 389-410.

2. Mamatha A, Elumalai A, Eswaraiah MC, Mathangi N (2012). An updated review on antifertility plants-2012. International Journal of Pharmacotherapy; 2: pp. 4-6.

3. Thakur DS, Kumar P, Kujur A, Kumar P & Kumar R (2010). Contribution of Male Contraception in World Population. J Pharm Sci & Res; 2(7): pp. 384- 93.

4. Zukerman Z, Weiss DB & Orvieto R (2009). Does Pre ejaculatory Penile Secretion Originating from Cowper's Gland Contain Sperm. Journal of Assisted Reproduction and Genetic; 20(4): pp. 157–59.

5. Tatman J, Silphium A. Ancient Egyptian Midwifery and Childbirth. Minnesota State University, John jeneck, 2005; 404-06.

6. Kumud Bala, Mahima Arya & Deepshikha Pandey Katare (2014). Herbal Contraceptive: An Overview. World Journal of Pharmacy and Pharmaceutical Sciences; 3(8): pp. 1305-26.

7. Dehghan MH, Martin T & Dehghanan R (2005). Antifertility effect of Iranian neem seed alcoholic extract on epididymal sperm of mice. Iranian Journal of Reproductive Medicine; 3(2): pp. 83-89.

8. Gupta RS & Sharma R (2006). A review on medicinal plants exhibiting antifertility activity in males. Natural Product Radiance; 5(5): pp. 389-10

9. Hoesla CE, Saadb F, Pöppela M & Altwein JE (2005). Reversible, Non-Barrier Male Contraception: Status and Prospects. Eur Urol; 48(5): pp. 712-22.

10. Dyer SJ, Abrahams N, Mokoena NE, van der Spuy ZM (2004). "You are a man because you have children": experiences reproductive health knowledge and treatment-seeking behaviour among men suffering from couple infertility in South Africa. Hum Reprod.19: pp. 960–7

11. Subramoniam A, Madhavachandran V, Rajasekharan S, Pushpangadan A (1997). Aphrodisiac properties of Trichopus zeylanius extract in male mice. J Ethnopharmacol.57: pp. 21–7

12. Kumar SKP, Subramoniam A, Pushpangadan P (2000) Aphrodisiac activity of Vanda tessellata (roxb.) Hook. Ex don extract in male mice. Indian J Pharmacol 32: pp. 300–4

13. Zheng BL, He K, Kim CH, et. al. (2000). Effect of a lipidic extract from Lepidium meyenii on sexual behavior in mice and rats. Urology 55: pp. 598–602

14. Arletti R, Benelli A, Cavazzuti E, et. al. (1999). Stimulating property of Turnera diffusa and Pfaffia paniculata extracts on the sexual behaviour of male rats. Psychopharmacology 143: pp. 15–9

15. Herfindal ET, Gourley DR (2000). Text Book of Therapeutics, Drug and Disease Management. 7th ed. Philadelphia: Lippincott Williams and Wilkins; pp. 2019-25.

16. Lobo R, Prabhu K, Shirwaikar A, Shirwaikar A, Ballal M (2011). Formulation and evaluation of antiseptic activity of the herbal cream containing Curcuma longa and tea tree oil. J Biol Active Prod Nat.; 1: pp. 27-32.

17. Bernard GT, Esteban P, Christopher JS (1982). Turmerones: Isolation from turmeric and their structure determination. Chem Commun.; 6: pp. 363.

18. Pattanayak SP, Mazumder PM (2009). Effect of Dendrophthoe falcata (L.f.) Ettingsh on female reproductive system in Wistar rats: A focus on antifertility efficacy. Contraception; 80: pp. 314-20.

19. Mutreja A, Agarwal M, Kushwaha S, Chauhan A (2008). Effect of Nelumbo nucifera seeds on the reproductive organs of female rats. Iran J Reprod Med.; 6: pp. 7-11.

20. Gebrie E, Makonnen E, Debella A, Zerihun L (2005). Phytochemical screening and pharmacological evaluations for the antifertility effect of the methanolic root extract of Rumex steudelii. J Ethnopharmacol.; 96: pp. 139-43.

Corresponding Author

Amrish Kumar*

Associate Professor, Department of Pharmacy, Galgotias University, Greater Noida, Uttar Pradesh, India