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## Medicinal Plants with Potential Antifertility Activity

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The Nature has been a source of medicinal agents for thousands of years and an impressive number of modern drugs have been isolated from natural sources. Plants as abortifacient and as contraceptive were well known to the ancient physicians of India. Various medicinal plant extracts have been tested for their antifertility activity both in male and female animal models activity and the active agents. Numerous herbs have been used historically to reduce fertility, and modern scientific research has confirmed anti-fertility effects in at least some of the herbs tested. Herbal contraception may never reach the level of contraceptive protection as the pill, but it offers alternatives for women who have difficulty with modern contraceptive options or who just want to try a different way. Very little is known about many of the herbs, or about long term side effects or safety concerns. Many herbal methods were tried with mixed results. People who are not interested in getting pregnant are usually not interested in mixed results." With any method of contraception, there is some risk of pregnancy. Each woman has to decide how much of a risk is too much. Most modern forms of birth control are 70% to 99% effective depending on the method chosen. For women who can't use modern forms of contraception, herbs can offer alternatives, and reducing fertility would be better than no birth control. Some herbal contraceptives have a cumulative effect in the body, they need to be taken regularly to maintain the contraceptive effect. Often needing a period of time to establish effectiveness, so a barrier method should be employed.

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**1. Introduction:** In the United States, 158 million of the adult population use complementary medicines and according to the USA Commission for Alternative and Complementary medicines, US \$17 billion was spent on traditional remedies in 2000. In the United Kingdom, annual expenditure on alternative medicine is US\$ 230 million. The global market for herbal medicines currently stands at over US \$ 60 billion annually and is

growing steadily. Population explosion is the greatest single problem India is facing today. Modern medicine has provided several preventive and corrective methods of contraceptives none of which is very safe and without any serious side effects. Over population is one of the serious problems in the developing countries like India and that would be increased about 9.2 billion by the year 2050. The census of 2005 showed that the growth rate of population in India during the

previous ten years was about 1.5% . In each year around 18 million people are adding to our total population. This increment imposes an extra burden on the community and it is also one of the leading causes of poverty and pollution in developing countries. Many countries have already banned the use of hormonal contraceptives because of its carcinogenic effects. The discovery of some herbal contraceptives, safe and sure is the need of the hour. Herbal contraceptives were used even by the primitive people of ancient civilizations to control fertility and prevent pregnancy. Though, the conventional medicine has discovered some important anti-fertility agents (Contraceptive) for female, their popularity and utility among women is restricted due to some unwanted and troublesome effects. The common side effects include obesity, cholelithiasis, gastric trouble and carcinoma of breast and cervix, asthma and venous thromboembolism. The medical persons are in search of safe and active contraceptive agents of synthetic or herbal origin. Thorough review literature survey of ancient and modern herbal pharmacology reveals that there are many plants having scientifically proved anti-fertility activity. These plants may be valuable source of herbal contraceptive for women. Now a days fertility control finds a great significance because of rapid population growth and needs a check on it. Plant 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 extracts are reported as antifertility agents. Although no antifertility screening programs involving large number of plants have been reported in the literature, scattered laboratory evidence exists suggesting this area as a fruitful one for development. The discovery of an orally effective non-synthetic antifertility agent, occurring free in nature could possibly be an acceptable answer to the question of population control. The World Health Organization suggested that effective, locally available plants be used as substitutes for drugs. Since the population explosion is a leading cause of poverty and pollution in developing countries, they created a population control

programme, which includes studies of traditional medical practices. Fertility Control is an issue of global and national public health concern. Current methods of contraceptive result in an unacceptable rate of unintended pregnancies. Approximately 50% of all pregnancies are unintended at conception; 50% of those occur in the 94% of sexually active couples who report using some method of contraception. Medicinal plants in India have been screened for contraceptive potential and anti-fertility effects, since the country has always been concerned about population explosion. Higher use of contraceptive methods is a direct indicator of health, population, development and women's empowerment. It also serves as a proxy measure to access the reproductive health services that are essential for meeting many of the millennium development goals, especially for those concerned with child mortality, maternal health, HIV/AIDS, and gender equality. The female contraceptive methods were always on higher priority and men willing to share in the responsibilities of family planning have fewer options of contraceptions which are effective, reversible, non-irritating and highly expectable. A survey conducted by WHO showed that 61% of the males using contraceptive were motivated by problems of the female partner, including 35% who had experienced a contraceptive failure, or by the desire to share responsibility.

## 2. Herbal Contraception

Numerous herbs have been used historically to reduce fertility, and modern scientific research has confirmed anti-fertility effects in at least some of the herbs tested. Herbal contraception may never reach the level of contraceptive protection as the pill, but it offers alternatives for women who have difficulty with modern contraceptive options or who just want to try a different way. Very little is known about many of the herbs, or about long term side effects or safety concerns. Most herbalists I've spoken with don't recommend herbs for contraception, because of their potential unreliability. Michael Tierra wrote in his response to questions about herbal contraception and abortion on his website "I lived

and explored communally with a number of women herbal methods for contraception or inducing menstruation at within two weeks of its due time. Many herbal methods were tried with mixed results. People who are not interested in getting pregnant are usually not interested in mixed results." With any method of contraception, there is some risk of pregnancy. Each woman has to decide how much of a risk is too much. Most modern forms of birth control are 70% to 99% effective depending on the method chosen. For women who can't use modern forms of contraception, herbs can offer alternatives, and reducing fertility would be better than no birth control at all. Before experimenting with herbal contraceptives, I think it's important to spend some time learning to tell, with accuracy, when you are fertile each cycle. Once ovulation occurs, menstruation should follow in about 14 days. If you can identify when fertility passes each cycle, you'll know when to expect menstruation - based on signals your body has given you, rather than an estimated guess (calendar methods). This way - you know if and when menstruation is late. The date ovulation occurs can vary from cycle to cycle, even if we cycle very regularly, our bodies can do the unexpected. There's not a lot of information available on using herbs for contraception, but there are historical references with clues to what ancient women did, and the scientific community has published some studies, mostly on animals, showing some of the herbs do seem to have contraceptive effects. There have also been informal studies where the herbs were tested by women for contraception. If you try any of these herbs, know that you are experimenting on yourself. Consider beforehand what you would do if the herbs were to fail. For those of us who want to minimize the risk of getting pregnant, herbs may not be the best option for our primary method of birth control. Each herb has its own way of being taken, some are taken daily, while others are used on an as needed bases, after potential exposure to sperm during a fertile time. Generally, herbs that are taken on a daily basis need some time to take effect, an alternative method of birth control should be used during the waiting period to provide protection. So it's

important to know how they are used, when to take them, and how much to use. I will supply as much information as I can, but for many of the herbs there's not a lot of information available. I've created pages for most of the herbs, you'll find links below with more information. If you choose to use herbal contraceptives you do so at your own risk, be sure to follow any instructions to the letter. Know what you will do if they fail. I'd be interested to know of any experimentations, your experiences add to our collective body of knowledge. I can be reached by email, and I love details!! Some may wonder why I have not experimented with these alternatives any more than I have, to put it quite simply, I'm at a point in my life where I'm not willing to take any chances of getting pregnant. My contraceptive method (fertility awareness) works just fine for me. I believe women should know about all possible options and make the choice for themselves. Herbal contraceptives is a catch all category for herbs that have an anti-fertility effect. There are many different ways in which herbs can impair fertility. Some herbs may affect the ovary, while others act upon the uterus, affect normal hormone production or block certain hormones, and others we don't really understand their action, or how they got their reputation. Some herbs have the ability to interfere with implantation, these herbs can be taken on an as needed basis, and are useful as an emergency contraceptive. There are also some herbs that have been found to interfere with normal sperm production, or mobility. Each herb is used in its own way, so it's important to have some idea of how they are used, or could be used. Let's further define the possible avenues of actions.

### 3. Daily Herbal Contraceptives

Some herbal contraceptives have a cumulative effect in the body, they need to be taken regularly (usually daily) to maintain the contraceptive effect. Often needing a period of time to establish effectiveness, so a barrier method should be employed. Examples are, wild yam and neem.

#### 4. Wild Yam

It is a good example of a typical herbal contraceptive, taken daily, needing a period of time to establish effectiveness, and mixed results reported. The herbalists I have spoken to however don't have a lot of faith in this herb's ability to prevent pregnancy. Bridgette Mars did an informal study (I never did find out the details) which concluded that the wild yam was not an effective form of contraception. I've also received reports through the grapevine of women who used wild yam, I've heard of both success and failure, I've heard of women using it successfully for a time, then something happens and pregnancy occurs. Another possibility to consider to increase wild yam's reliability, and to bring your partner into the realm of birth control responsibility, recently, an oral herbal contraceptive for men has come to my attention. Again, I can't verify its effectiveness or safety, but, there has been successful human experimentation conducted in India. And one final thought to help increase wild yam's reliability, is to ask your lover to withdraw before ejaculation. This way the number of sperm released is considerably less or none, and if there's ever a slip up, you'll be covered. It all depends on how much of a risk you are willing to take when choosing your method of contraception, it can't hurt to do everything possible to minimize the risk.

#### 5. Neem Oil

Neem oil is a tree from India, with numerous uses, used for just about anything and everything. Quite a bit of scientific research is available about this herb, for both general uses as well as contraceptive uses. Most of the research has been conducted in India, the tree's native home. There are commercial preparations available that can be used for contraception for both men and women. For women it is used vaginally as a spermicide, and men use it orally as a daily contraceptive to induce temporary sterility. I can't vouch for its effectiveness or safety. I encourage you to do your own research.

#### 6. Pomegranate (*Punica Granatum*)

A fruit used by ancient women to prevent conception. This is more for historical interest. Rudolf Fritz Weiss notes the seeds contain an oestrone identical to the genuine hormone [estrogen] and states Punica seeds are the best source of plant oestrone to date.

#### 7. Implantation Inhibitors:

Some herbal contraceptives have the ability to interfere with implantation, the actual effect in the body can vary from herb to herb, but the end result makes it difficult for the egg to implant or maintain its grip on the uterine wall. Implantation occurs about 6 days after the egg has been fertilized. If the egg is unable to get a grip on the uterine wall, it cannot survive, it begins to break down, and menstruation will arrive as usual.

#### 8. Queen Anne's Lace Seeds (*Daucus carota*)

It also known as Wild Carrot, the seeds seem to have the best reputation for contraception. Women from the Appalachian Mountains to India have used the flower heads and mature seeds to prevent conception. This herb is in use today, and has some documentation to it's effectiveness, both in scientific studies and through individuals who've used it. I tend to put more faith in this herb than any other contraceptive herb that I know about to date. It works best as a morning after type contraceptive, the big advantage to this is that it can be used on an as needed basis. The first dose taken within 8 hours of being exposed to sperm, followed by another dose or two as needed. It can also be used in tincture form, which eliminates the need to chew the seeds, which for those of us have tried it, know its pretty yucky. Using the herb as a tincture also eliminates the occasional symptoms of vaginal dryness.

#### 9. Rutin

This is found at local health food markets, it is also known as Vitamin P. Susun Weed writes it can be used to prevent pregnancy, when taken in tablet form in doses of at least 500 mg daily for several days preceding and following ovulation,

or when taken after fertilizing intercourse and continue until menstruation begins.

### 10. Neem Oil

It has also been found to prevent implantation. Testing so far has involved rats; the implantation inhibitory effects were seen in as many as 10

days after fertilizing intercourse occurred, although it was most effective if used within 3 days of fertilizing intercourse. At this time, I really have no idea what a safe human dosage would be. Its more thoroughly researched uses include a spermicide and oral contraception for men.

**Table 1:** List of Anti-fertility plants

| Botanical name                         | Family          | Parts used   | Solvents used                                               | Chemical constituents                         | References                         |
|----------------------------------------|-----------------|--------------|-------------------------------------------------------------|-----------------------------------------------|------------------------------------|
| <i>Abrus precatorius</i> Linn          | Fabaceae        | Whole plant  | Ethanol                                                     | Alkaloids, steroids, fixed oils, anthocyanins | Abu et al [7]                      |
| <i>Acacia leucophloea</i> Roxb         | Fabaceae        | Roots        | Alcohol                                                     | Tannins, phenols, proteins                    | Dheeraj ahirwar [8]                |
| <i>Aegle marmelos</i> Linn             | Rutaceae        | Leaves       | Aqueous & alcohol                                           | Alkaloids, terpenes, steroids                 | Satheesh et al [9]                 |
| <i>Butea monosperma</i> Lam            | Fabaceae        | Whole plant  | Methanol                                                    | Stigmasterol flavonoids, amino acids          | Ashish mishra et al [10]           |
| <i>Careya arborea</i> Roxb             | Lecythydaceae   | Roots        | Methanol                                                    | Phyto-estrogens, Sito-sterol                  | A.K.haloi et al [11]               |
| <i>Cissampelos pareira</i> Linn        | Manispermaceae  | Whole plant  | Ethanol                                                     | Alkaloids, chalcone flavone                   | Samanthajhuma et al [12]           |
| <i>Citrus medica</i> Linn              | Rutaceae        | Fruit peel   | Ethanol & chloroform                                        | Citroflavonoids, glucosides, triterpenoids    | Monica kachroo et al [13]          |
| <i>Curcuma longa</i> Linn              | Zingiberaceae   | Rhizomes     | Ether<br>Alcohol<br>Propylene glycol, water                 | Curcumin<br>Flavonoids                        | Amit kumar ghosh et al [14]        |
| <i>Dodonea viscosa</i> Linn            | Sapindaceae     | Whole plant  | Methanol                                                    | Alkaloids, phytosterols, poly phenols         | R.ramya et al [15]                 |
| <i>Hymenocardia acida</i> Tul          | Euphorbiaceae   | Stem bark    | Ethanol                                                     | Triterpenoids, glycosides                     | Abu et al [16]                     |
| <i>Madhuca indica</i> Linn             | Sapotaceae      | Leaves       | Alcohol                                                     | Triterpenoids                                 | Shivabasavaiah et al [17]          |
| <i>Ocimum gratissimum</i> Linn         | Caesalpiniaceae | Stems        | Acetone                                                     | Anthraquinones, flavanoids,                   | Yuvaraj et al [18]                 |
| <i>Plumbago rosea</i> Linn             | Plumbasinaceae  | Leaves       | Petroleum ether<br>Chloroform<br>Ethanol<br>Acetone & water | Sitosterol glycosides, tannins, fatty alcohol | Sheeja et al [19]                  |
| <i>Raphanus sativus</i> Linn           | Brassicaceae    | Roots        | Water                                                       | Raphan alkaloids                              | Mishra et al [20]                  |
| <i>Tabernaemontana divaricata</i> Linn | Apocynaceae     | Flowers      | Methanol<br>Petroleum ether<br>Water                        | Steroids, tannins<br>Flavonoids, aminoacids   | Mohd.azeemuddin nukhram et al [21] |
| <i>Trachysperm ammi</i> Linn           | Umbelliferae    | Fruits       | Ethanol                                                     | Tannins, saponins, flavonoids, glycosides     | Surendra kumar et al [22]          |
| <i>Tragia involucrata</i> Linn         | Euphorbiaceae   | Aerial parts | Hexane ethanol                                              | Flavonoids, terpenoids                        | Chandrashekhar et al [23]          |



## 11. Anti Fertility Foods

Believe it or not the food you eat has a huge impact on your fertility. I know, like women need another reason to go on a diet!:) But keep in mind that you are not “dieting” for weight loss, you are simply adopting a healthier way of eating. Most of the items on this list however are self-explanatory, things that you shouldn’t eat or drink anyways. The items on this list have been found to affect fertility in one way or the other, whether it is directly or in directly the consumption of any of these items is a “no-no”.

### a. Avoid Caffeine

Avoiding caffeine is an important step as it has long been associated with problems when consumed by pregnant women. However, multiple studies have directly linked excessive caffeine use to an increased instance of miscarriage and increase in estrogen. If you must drink caffeine your intake needs to be limited to a 1 cup a day, replace this something healthy such as water, herbal tea, or fruit smoothie.

### b. Conventional Meats

Conventional meats directly affect fertility because of the amount of synthetic hormones that can be found in the meat. When you ingest this meat you are ingesting the hormones as well, and this can disrupt your normal reproductive cycle. This can be resolved by eating organic meat, often referred to as free range or grass fed.

### c. Conventional Dairy

Conventional dairy too has all the added hormones and antibiotics as conventional meats. So best to go organic here as well.

### d. Soda/sugar

Many women rely on sugar for their daily boost however this sugar dependence is very unhealthy. Soda should be avoided because it is FULL of refined sugar as well as artificial flavorings, colors, and caffeine. Water is always a wonderful replacement for these or fresh fruit juice. Although be careful to avoid processed fruit juice such as that you find in your grocers juice

department as it too contains tons of concentrated sugars, which can have negative effects on your immune system.

### e. Alcohol

Do I even have to explain why to avoid this one? Alcohol is a definite NO-NO while pregnant but consumption of alcohol when trying to conceive is a bad idea because of the amounts of sugar in it. Also, men should avoid alcohol as well, because consuming alcohol may lead to poor sperm quality.

### f. Processed Soy Foods

Soy has been connected to several different hormonal problems, including but limited to breast cancer, because of its ability to mimic estrogen. Soy products can cause a disturbance in the normal hormonal balance which in turn can cause ovulatory problems, as well as many other reproductive health issues if you are already estrogen dominant.

### g. Cigarettes

Cigarettes are bad for every system and function in your body including the reproductive. Eating organically to prevent the ingestion of harmful toxins and chemicals will do no good if you are taking in harmful toxins and chemicals emitted by a cigarette. Cigarette smoking, as well as second hand smoke exposure, has been linked to fertility problems. It is best to stop smoking before conception because smoking while pregnant can lead to premature, low birth weight babies.

### h. White Carbohydrates

Refined carbs such as white flour, white bread, white rice, and pasta turn into sugar, feed yeast, and do not provide much nutritional value. Opting for the whole wheat counterpart is a much better idea because of the amount of fiber, and other nutrients it possess. Be sure to replace refined carbohydrate with the whole grain ones such as brown rice, wheat bread, whole wheat pasta, and so on.

### i. Fat Free Diet Foods

Fat free/diet food lacks the nutritional value of whole foods, not to mention all the added artificial flavorings, and artificial sugars added...basically chemicals placed in the food to make it appear as though it has taste. Getting rid of this diet way of thinking is a good idea, the way to a healthier, slimmer you is to eat whole nutritious foods full of fiber, nutrients, and antioxidants.

### j. Hydrogenated Oils

Hydrogenated oils are full of Trans fats that are so unhealthy for a number of reasons. A great alternative to this is coconut oil! Trust me it does not taste like coconut, it is a wonderful alternative to the dangerous fatty oils and it is super healthy...especially for reproductive health! So now you are probably wondering what you should be eating to boost your fertility. Just grab some of these fertility recipes and follow the natural fertility diet and you will be on the right path.

## 12. Conclusion

Population explosion is leading cause of poverty and pollution in developing countries. Rising human population throughout the world more particularly in developing and underdeveloped countries has detrimental effects on the life supporting system on earth. The possibility of an effective check on human fertility may soon be realized through biological means. Several potential approaches for induction of infertility have been investigated over a long period. Herbal contraceptives offer alternatives for women who have problems with or lack access to modern contraceptives options particularly women living in the rural areas in developing nations with very high population like India, China, Africa (Nigeria) and Bangladesh. Studying the potency and toxicity of local plants that are reputed for birth control in the folkloric medicine of these countries may generate greater confidence in and wider acceptance of herbal contraceptives. However, the search for an orally active, safe and effective plant preparation or its compound is yet

to be needed for fertility regulation due to incomplete inhibition of fertility or side effects.

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