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*Full Length Research Paper*

# Observations on antifertility and abortifacient herbal drugs

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**This communication presents first hand information gathered on 36 medicinal plants belonging to 23 families traditionally used by the tribal and rural women of northern areas of North West Frontier Province (NWFP), Pakistan for birth control. Study provides information on local names, mode of administration and dosages as `practiced by rural and tribal women. Most effective plant species to induce abortion include: *Artemisia maritime* L., *Boerhavaia diffusa* Auct. Plur., *Buddleja asiatica* Lour, *Chrysanthemum parthenium* (L.) Bernh, *Justacia adhatod* L., *Ricinus communis* L., *Zingiber officinale* Roscol., *Daucus crota* L., *Momordica charantia* L., *Plumbago zeylanica* L., *Sapindus mukorossi* Gaertn., *Plantago ovata* Forssk, *Tanacetum vulgare* and *Arctium lappa* L. The most widely used contraceptives are: *Amaranthus viridis* L., *Achyranthes aspera* L., *Ricinus communis* L., *Mentha arvensis* L., *Nepeta cataria* L., *Cuscuta reflexa* Roxb., *Curcuma longa* L., *Foeniculum vulgare* Miller., *Butea monosperma* (Lam.) O. Kze., *Albizia lebbeck* (L.) Bth., *Ficus religosa* L. and *Mentha longifolia* (L.) Huds. The tribal population of the region primarily depends upon these plants for family planning. They use herbal drugs to induce abortion and as contraceptives. Further studies on chemical and pharmacological actions are suggested to validate the claims.**

**Key words:** Phytotherapeutic claims, abortifacients, contraceptives.

## INTRODUCTION

Since ancient times, mankind has used plants to cure diseases and relieve physical sufferings. Because of better cultural acceptability, better compatibility with the human body, lesser side effects and effectiveness of many traditional medicines is now an accepted fact. More than 35,000 plant species are being used in various human cultures around the world for medicinal purposes (Lewington, 1993). Nearly 80% of the world populations rely on traditional medicines for primary health care, most of which involve the use of plant extracts (Sandhya et al., 2006).

Pakistan possesses the rich and perhaps most varied flora of all other countries of a similar size on the surface of globe. Hundreds of tribal communities and 70% of population living in rural and far-flung areas also inhibit the country. The flora of Pakistan is very rich due to the nations diverse climatic, and soil conditions and multiple ecological regions. About 6000 species of flowering plants have been reported to occur in Pakistan, of which about 400- 600 are considered to be medicinally important (Nasir and Ali, 1972; Hamayun et al; 2005).

The population problem is one of the biggest problems facing the country, with its inevitable consequences on all aspects of development, especially employment, educa-tion, housing, health care, sanitation and environment. According to National Institute of Population studies Islamabad (2006), Pakistan with a total population of 156.26 Millions is the 6th larges country in the population ranking order after China, India, USA, Indonesia and Brazil having super passed Japan, Bangladesh, Nigeria, Russia etc. Pakistan is one of the pioneer countries to adopt National Family Planning Program. However despite huge inputs, progress has not been satisfactory. Poor performance is mainly due to focus on sterilization,

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**Figure 1.** Study area.

operation and contraceptives; anti- fertility measures were totally neglected. Contraceptive prevalence rate in Pakistan is the lowest 36% among the Muslim countries, which is 58, 59, 60, 74, 55 and 71% in Bangladesh, Egypt, Indonesia, Iran, Malaysia and Turkey respectively. Moreover major population of the country lives in rural areas and those people have not approach to the modern methods of family planning. Traditional sterilization method based on herbal medicines is used to control population growth rate; including abortion at initial weeks, preventing conception or making the either member of the couple sterile. Perusal of literature revealed that enough work has been done on different medicinal aspects of plants of this area except for gynecological disorders, abortifacient herbals and plants used to induce abortion. A perusal of literature (Jones, 1941; Morelli, 1983; Jackson, 1989; Jain, 1996; Howard, 1997; Rashid et al., 1997; Ashfaque and Zaidi, 1998; Shinwari and Khan, 1998; Siddiqui et al., 1998; Ayaz, 1999; Khan, 2000; Shinwari and Gillani, 2003; Sher, 2002; Ahmed, 2003; Hamayun et al., 2003; Iqbal and Hamayun, 2004; Mukherjee, 2004; Shah and Khan, 2006; Shah, 2006; Hussain et al; 2006; Aftab et al; 2007) . Thus, the systematic documentation of indigenous knowledge about the use of these plant resources by the local people and their chemical and biological examination would be useful for the discovery of new therapeutic agents. Keeping in view, the present investigation has been taken. The present study being the first reference envisages the documentation of traditional knowledge on medicinal plants used as anti-fertility herbal drugs and abortifacients.

## METHODS

### Study area

The study was conducted in the Moist Temperate Himalayan region of North West Frontier Province (NWFP) of Pakistan. Main target sites were Siran Valley (Hilkot), Gallies (Ayubia National Park) and Kaghan Valley, (Figure 1). The forests in the Moist Temperate Himalaya form a zone between 1450-3500 m depending upon the aspect, configuration, habitat and soil conditions. The forests are predominately coniferous with some broad-leaved species. The mean annual temperature is 54$^{o}$F with a mean monthly maximum of 73°F.The total annual rainfall has been recorded from 75 cm (30 inches) to 150 (60 inches) mainly received during monsoon season. Snow is the primary form of precipitation during winter season Moist Temperate Himalayas, as a major ecological zone of Pakistan possesses rich plant biodiversity as well as traditional culture and deserves special attention to the conservation of environment and sustainable development of natural resources. The study area lies between 33° 50 to 34$^{o}$ 23$^{/}$ N latitude and 72° 35$^{/}$ to 73$^{o}$ 31$^{/}$ E longitude. The main tribes of the tract are Abbasies, Gujars, Karlals, Tanolis, Swatis, Syeds and Awans. The people of the area are mostly poor and depend on forests for food, shelter and medicine.

### Collection of Information about abortifacient and antifertility herbal drugs

The data presented in this paper are the outcome of intensive studies conducted among local community, to investigate local people and knowledgeable persons. Local herbal informants were selected and interviewed extensively. The women chieftains are accorded a significant role in discussions since they possess more

cognizances about the utility of local herbal products in curing various diseases especially antifertility herbals. Information on plants used as antifertility herbals and abortifacients was gathered by quantitative and qualitative elicitations method (Martin, 1995; Jain, 1989) . About 200 informants have been interviewed on random basis. The data were compared with (Day, 1896; Kirtikar and Basu, 1935; Nadkarni, 1954; Agrawal, 1987; Choudhari, 1993; Hosagoudar and Henery, 1993; Sing et al., 1996; Amita and Anjali, 2005).

**Identification and preservation of plant specimens and herbal drugs**

The respective voucher specimens and crude samples of each preparation were collected from different areas for their correct identification through the available literature (Hooker, 1872- 1897; Stewart, 1972; Nasir and Ali, 1971-1991). The collected data were verified by cross verification or triangulation (Cochran and Cornfield, 1951; Martin, 1995). The voucher specimens were deposited in the Herbarium, Department of Botany, Government Post Graduate College, Abbottabad, as reference specimens for future work.

## RESULTS AND DISCUSSION

The present studies show that the rural and tribal women are well acquainted with the wild resources around them. They seem to depend on plants for curing various diseases including abortion, sterility, conception disorders, menstrual troubles, leucorrhoea etc prevailing among them. However many of the uses of plants as abortifacient and antifertility herbals documented from the area, have also been reported from other areas of Pakistan and other countries by various researchers

In the present investigation, 36 medicinal plants have been reported which are used to induce abortion, to stop conception and to make the man sterile. Some of the important used to induce abortion by the tribal and rural women of the area are *Aloe barbadensis* Mill, *Artemisia maritima* Linn, *Boerhavaia diffusa, Buddleja asiatica* Lour, Linn*, Chrysanthemum parthenium, Justacia adhatoda* Linn, *Ricinus communis* Linn, *Zingiber officinale* Rosc, *Daucus crota* Linn, *Nasturtium ofiicinalis* R.Br., *Chenopodium ambrosioides* Linn, *Cytisus scoparius* Linn, *Momordica charantia* Linn, *Plumbago zeylanica, Sapindus mukorossi* Gaertn, *Plantago ovata* Forsk, *Tanacetum vulgare* Linn and *Arctium lappa* Linn (Table 1). Similarly species like *Amaranthus viridis* Linn. *Achyranthes aspera* Linn, *Ricinus communis* Linn, *Mentha arvensis* Linn, *Nepeta cataria* Linn, *Cuscuta reflexa* (R.), *Curcuma longa* Linn, *Foeniculum vulgare* (Mill.), *Butea monosperma* (Palash.), *Albizia lebbeck* (Linn.) Benth. *Ficus religosa* Linn, *Mentha longifolia* Linn, are used as contraceptives to stop conception. To bring sterility in man species like *Vitex negundo* Linn, *Coriandrum sativum* Linn, *Bombax ceiba* Linn (Table 1).

Among them 56.75% are abortificent, 35.13% are contraceptive and 8.1% causes sterility in man (Figure 2). The above mentioned plant species although have many other medicinal uses also, but their abortifacient and antifertility properties of some of the species have also

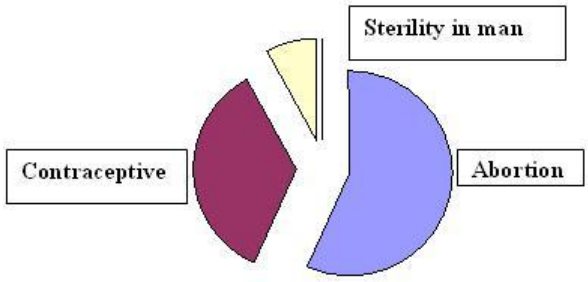


**Figure 2.** Pie-chart showing mode of action of plants.

been reported from other areas and countries. Saini (1996) reported that root paste of *B. diffusa* is taken with cow's milk to induce abortion in Central India. Similarly *B. ceiba, F. vulgare, R. communis are* used to make the women sterile, *A. aspera* to induce abortion and *V. negundo* to make the man sterile in the Chattarpur District of India (Amita and Anjali, 2005). Chawla et al. (1995) reported that that Neem oil is an effective oral antifertility agent, but its effect decreases as the pregnancy advances. *Z. officinale* is also used as an abortifacient with Black pepper (Chopra et al; 1969). Leaves of *P. zeylanica* are used for abortion (Asolkar et al., 1992).

Although the rural and tribal people use the plants for the diseases they suffer, it is very difficult to judge the effectiveness of traditional medicines. Further research on these medicinal plants is necessary to judge and improve the quality and effectiveness of these ethnomedicines. At the same time the complications caused by some of the medicines prescribed by the traditional healers should also be taken into consideration. The investigation of traditional therapies should be intensified with the objective of increased efficiency by taking advantage of technical progress. Risk could be reduced through the analysis of unknown or insufficiently known secondary and long- term effects. From hitherto prevailing empiricism the path followed will have to lead to stan-dardized experiments in clinical pharmacology. Tests should be undertaken to increase the content of desired components in plants though breeding, selection and intensive cultivation or through the improvement of production, processing and marketing. At all events, it is important to ensure the survival of valuable species in their natural habitat ("*in situ*" gene conservation). The highly interesting findings for birth control by using herbal drugs require further research, while the efficacy of the various indigenous practices will need to be subjected to pharmacological validation.

### Conclusion

In the present study, 36 medicinal plants used for family planning are recorded and documented. In spite of rapid

**Table 1.** Antifertility and abortifacient herbal drugs.

| Botanical name | Local Name | Part use | Mode of use | Preparation and use |
|---|---|---|---|---|
| *A. lappa* Linn. ASTERACEAE | | L | Abortion | Tea made from leaves and roots possesses abortifacient properties |
| *A. maritima* Linn. ASTERACEAE | Dack Chau | L | Abortion | Boiled and steeped leaves are applied on the abdomen to induce abortion. |
| *A. lebbeck* (Linn.) Benth. LEGUMINOSAE | Sharin | B | Contraceptive | The aqueous extract of bark is used (2 tea spoon daily for one week before menses) against conception in women. |
| *A. barbadensis* Mill. LILIACEAE | Kanwar Ghandal | L | Abortion | Pulp of leaves with black salt is taken (1g daily) for. Abortion |
| *Azadirachta indica* A. Juss MELIACEAE | Ddarek | FR | Contraceptive | Kernel oil known, as oil of Argos on Neen oil possesses antifertility properties. (1 teaspoon is taken after menses before copulation) make the women sterile. Some time oil is also inserted into vagina before copulation. |
| *A. aspera* Linn AMARANTHACEAE | Puthkanda | R | Contraceptive | The roots are boiled an decoction is given (One tea cup thrice a day) after menstruation to induce sterility in women |
| *A. viridis* Linn. AMARANTHACEAE | Chalvera | R | Contraceptive | Fresh root (10 g ) is eaten women before two days copulation antifertility agent |
| *B. ceiba* Linn BOMBACACEAE | Sambal | FR | Sterility in man | 5-10 capsules apocarps after grinding with raw sugar taken thrice daily for 10 days) . Induces sterility in man. |
| *B. diffusa* Linn. NYCTIAGINACEAE | Kindiiari | R | Abortion | Roots are dried and made into powder and 2 g is given to pregnant women abortion |
| *B. asiatica* Lour. BUDDLEJACEAE | Bui | R | Abortion | Decoction of root bark is used (one tea cup daily) for premature abortion. |
| B.monosperma *(Palash.)* LEGUMINOSAE | Chamkat | F | Contraceptive | Inflorescence is dried and taken(3 g daily for 15 days) possess contraceptive properties |
| *C. sativum* Linn. APIACEAE | Dhania | S | Sterility in man | Seeds powder (95-10g daily) taken with water reduces sexual desire and make the man sterile. |
| *C. longa* Linn. ZINGIBERACEAE | Haldi | RH | Contraceptive | Powder of turmeric (10-15 g taken with water after menses for 5 days) induces sterility in women. |
| *C. reflexa* (R.). CUSCUTACEAE | Akash Bail | S | Contraceptive | Seeds of the plant are given (3 g after menses) to induce sterility in women. |
| *C. scoparius* Linn LEGUMINOSAE | Chambeli | L | Abortion | Leaves are boiled and given to induce abortion. |
| *C. parthenium* ASTRACEAE | Gul-e-daudy | L | Abortion | Decoction of leaves if taken early in the morning by pregnant women causes |
| *D. crota* Linn. APIACEAE | Gajar | S | Abortion | Seeds are made into powder form and is given (2 g twice a day) to induce abortion |
| F. vulgare *(Mill.)* APIACEAE | Sanuf | FR | Contraceptive | Powder of fruits given with water (20 g twice daily for 7 days) after menses induces sterility in women. |
| *F. religosa* Linn. MORACEAE | Peeple | F | Contraceptive | 5-10 receptacles are grinded wit sugar and taken before one week of menses make the women sterile. |
| *J. adhatoda* Linn. ACANTHACEAE | Behakar | R | Abortion | Dried root are made into powder given (1g twice a day) to women t o induce abortion |

**Table 1.** Contd.

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|---|---|---|---|---|
| *M. arvensis Linn.* LAMIACEAE | Pudin | WH | Contraceptive | Whole plant is dried in shade and then made into a powder. Ten grams of powder is taken before intercourse for antifertility. |
| *M. longifolia* Linn. LAMIACEAE | Junglee Pudina | L | Contraceptive | Dried leaves are grinded and mixed with sugar and given (5-10 g for a week) after menses to induce sterility. |
| *M. charantia* Linn. CUCURBITACEAE | Kaeraila | R | Abortion | Dried roots are made into powder form and given (2 g daily for one week) as abortifacients. |
| *N. ofiicinalis* R.Br. CRUCIFERAE | Tara Mira | W | Abortion | Fresh plant iscollected and cookedas vegetable and eaten. It may causes temporary sterility and cause abortion also. |
| *N. cataria* Linn. LAMIACEAE | Badbudar | WH | Contraceptive | Decoction of the plant may cause temporary sterility in women. |
| *Nerium indicum* Mill APOCYNACEAE | kaner | R | Abortion | The roots of the plant are procured for abortion and internal administration. |
| *Papaver somniferum* Linn. | post | FR | Abortion | The milk from the fresh PAPAVERACEAE capsule has sedative effect and causes abortion. |
| *P. ovata* Forsk. PLANTAGINACEAE | Ispaghol | S | Abortion | Seed and husk mucilage (5 g daily early in the morning) is taken orally for the termination of pregnancy. |
| P. zeylanica PLUMBAGINACEAE | Chitrak | R | Abortion | Dried root is taken (3 g) to induce abortion daily. |
| *R. communis* Linn. EUPHORBIACEAE | Arand | S | Contraceptive | The seeds are grinded into powder form and one g is given to women before intercourse as contraceptive. Two-tea spoons oil is given to women to induce abortion. powder is taken before intercourse for antifertility. |
| *Taxus wallichiana* TAXACEAE | Barmi | L | Abortion | Fresh leaves if used in the doses of 5-10 g daily induce abortion. |
| *T. vulgare* Linn ASTERACEAE | | F | Abortion | Tea made from flowering tops possesses abortifacient properties |
| *V. negundo* Linn. VERBINACEAE | Marvani | S | Sterility in man | Seeds powder (10 g thrice a day for 15 days) makes the man sterile. |
| Z. officinale *Rosc.* ZINGIBERACEAE | Adrak | R | Abortion | The powder of ginger in the doses of 2 g daily is given to women as abortifacients. powder. Ten grams of |
| Ziziphus nummularia RHAMNACEAE | Berry | R | Abortion | Root bark powder mixed with candy sugar is taken with milk (3-5 g twice a day) induces abortion. |

progress and spread of modern medicine and surgery, faith in and popularity of traditional methods has not decreased. Recently the importance of these traditional medicines has been realized worldwide as some of them proved to be very effective and some other prescriptions of these traditional healers may be of benefit to human kind when thorough scientific analysis is conducted into their properties. There is an urgent need for the detailed scientific studies and also necessary steps should be taken to conserve the threatened species. Plant drugs used in the tribal and rural areas deserves detailed studies. The efficacy and safety of most of the traditional remedies of the tribal and rural people are required to be subjected to scientific verification particularly in chemical investigations.

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