

PROSPECTING FOR TRADITIONAL DRUGS USED IN FERTILITY REGULATION FROM RAJASTHAN

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ABSTRACT: *Ethnobotanical investigations by various workers including the senior author during the present decade have revealed fifteen antifertility drugs employed by different tribes of Rajasthan. Ten have been reported from the southern region alone. The lower plants are represented by a single fern *Actiniopteres radiate*. Most drugs comprise single species and are orally administered. While some drugs offer permanent contraception, other are effective for a definite period only. Likewise, drugs are effectively used in early, advanced or late pregnancy. Some of the drugs used in Rajasthan are similarly used in adjoining States also. The antifertility activity of some has been pharmacologically established.*

INTRODUCTION

The search for safer and more effective herbal drugs from indigenous medicinal practices which can replace the synthetic ones in fertility regulations is of vital significance today. The urgency for researchers of this nature needs no emphasis.

Nearly one-thirds of all pharmaceutical are of plant origin and if bacteria and fungi are included in the fold, drugs from plants constitute sixty percent of all drugs in current usage (Kapoor and Mitra, 1979). Though in the last quarter of a century not much progress has been made in medicinal plant research, Tyler (1988) opines that, “definitely the most productive period of medicinal plants research lies ahead of us”. Obviously the traditional medicinal systems prevalent in the different regions and the medicinal usage of plants in primitive

aboriginal societies offers a vast repertoire with great potential for such research.

Traditional medicine and antifertility agents

Michael (1976) reviewing the history of birth-control considers the contraceptive mentioned in Egyptian Ebers Papyrus, as the oldest on record today. At a thousand year of old Loaiska site near Denver, seeds of *Lithospermum ruderales* were discovered which even in modern time are used in contraception by the American Indian (Schultes, 1962).

Since ages, *Acacia* tips smeared with honey have been used as contraceptive in India by inserting in vagina (Billore and Audichya, 1978).

Infact, the necessity of contraception has been realized right since antiquity and abortion, killing infants, etc. have been known in many societies – often covered with rituals, magico religion and maciomen.

Increasing populations, particularly in developing countries have directed research towards traditional methods of contraception. In modern times, the report of Schultes (1963) on three such plants in aboriginal usage from the amazon region seems to be the first. Ethnobotanical research the world over has been instrumental in bringing forth a great wealth of useful information's hitherto unknown on medicinal plants of aboriginal societies in which antifertility plants also figure.

Seeing potential in studies on traditional plant usage in fertility regulation the World Health Organizations has initiated its special programme of Research Development and Research training in Human reproduction aiming to find new and effective fertility regulating agents from plants.

Antifertility drugs and Abortifacients

Obviously, the properties sought in an antifertility drug are: affectivity, Potency, safety (agent must be non-toxic and with minimum side-effects), specificity (must not interfere with sexual activity / libido/orgasm) and rapid reversibility (Mier, 1959).

Though the reproductive system is complex and many mechanisms may be involved – the commonly reported compounds responsible for antifertility activity are alkaloids, hydroquinoes, sterols, acids, saponins, etc.

The mechanisms of action understood so far of antifertility agents are (Gourley *et al.*, 1964).

1. Male : (i) Interfering with hormonal control (ii) direct inhibition or destruction of spermatogenic cells and (iii) not hindering spermatogenesis but inducing infertile spermatozoa production.
2. Female: (i) Interfering with hormonal control especially the pituitary gonadotropin secretion maintaining ovary (ii) direct inhabitation and destruction of ova at any stage and (iii) chemical interference with gestation or pregnancy (interfering with stages preparatory to implantation, toxic action on developing placenta or foetus).

In other words it may be anti-ovulatory anti-zygotic, anti-implantation or early abobortifacient.

The Rajasthan Scenario

Most of the tribals in Rajasthan State are restricted on the wooded Aravalli Ranges especially Southern Rajasthan. The main tribes are the Bhils, Garasias, Damors, Kthodias and Meenas.

A through literature screening and personal observation of the authors have revealed that nearly fifteen antifertility drugs are employed by the different tribes of Rajasthan. However, a through scrutiny of conventional and contemporary literature on floristics, medicine, publications on ethnobotany and recent pharmacological and clinical researchers reveals that over fifty plants with known antifertility claims occur in the flora of the State (Khan *et al.*, 1988; and singh and Pandey, 1980, 1981 and 1982).

The State thus offers ample scope of discovery of potential antifertility drugs for wider usage with greater affectively potency, safety, specificity and choice than those available today.

Present status of knowledge about antifertility drugs in Tribal Areas of Rajasthan.

Fourteen angiosperms and one fern reported to be used by the various tribals of Rajasthan are enumerated here. The information's presented includes plant, family, local names, tribes (if specified in literature), district or region where used, part and mode of use and finally the source of information.

Angiosperms

Abrus precatorius L. Fabaceae

- (i) Chirmi, Charmoli (Bhils) Banswara
Seeds used for abortion
(Khan *et al.*, 1988; Vyas, 1982)
- (ii) Safed Chirami (Rural)
(White seeded variety) Jhalawar

Five ten seeds orally taken with water at the time of menstruation prevents conception in a lady forever. An effective contraceptive (Billore and Audichya, 1978)

Acais leucophloea Fabaceae (Roxb.) Wild

Rujua, Rijol (Kathodias) Udaipur

Stem bark (roughly 100 grams) is crushed and smeared on the region below navel. The smeared part is covered by warmed broad leaves as of *Butea monosperma* (Lam) taub. Or *Ficus benghalensis* L. Leaves this

treatment is effective for abortion up to 3 – 4 months after conception (Joshi, 1989).

Annona squamosa L. Annonaceae

Sitaphal, Sharifa Eastern Rajasthan Seeds in powdered form along with leaves of *Plumbago zeylanica* are used to cause abortion. (Singh and Pandey, 1980).

Butea monosperma Fabaceae

Khankro, Palas Udaipur

The gum (called KAMARKAS) administered from the fifty day of menstruation upto a weeks time dissolved in water stops conception for ever if roughly 50 grams is taken, and for an year if taken in a lesser quantity (roughly 10 grams). (Billore and Audichya, 1978).

Carica papaya L. Caricaceae

PAPITA (Bhils, Garasias) Sirohi Excessive intake of fruits in pregnancy would cause its termination as is believed. (Vyas, 1982).

Euphorbia neriifolia L. Euphorbiaceae

THUAR (Bhils) Dungarpur

Decoction prepared out of nearly 200 grams root in a litre of water is taken orally for abortion. (Joshi, 1989).

Euphorbia tirucalli L. Euphorbiaceae

ANGLI THUAR (Bhils) Banswara Probably the stem used as aborticide (Khan *et al.*, 1988).

Mangifera indica L. Anacardiaceae

AMBA (Bhils) Banswara

The stem bark together with the stem bark of *Syzygium cumini* and root bark of *Zizyphus nummularia* in mixture form is taken orally for abortion.

(Joshi. 1982).

Musa paradisiacal L. Musaceae

KELI (Bhils) Udaipur

Conception can permanently be prevented by oral administration of nearly 250 ml of fresh juice expressed from roots of this plant after the menstrual period once.

(Billore and Audichya, 1978).

Plumbago zeylanica L. Plumbaginaceae

Chitraval, Chitrak Eastern Rajasthan

N. B. See *Annona*
(Singh and Pandey, 1980).

Ricinus communis L. Euphorbiaceae

ERAND (Rural) Ajmer

Seeds contraceptive. Conception is prevented for up to one year by consumption of 4 – 5 of them during menstrual period. (Billore and Audichya, 1978).

Syzygium cumini (L.) Skeels Myrtaceae

JAMBUS (Bhils) Banswara

N. B. See *Manifera*
(Joshi, 1982)

Trachyspermum ammi Apiaceae (L) Sprague

AJWAIN Eastern Rajasthan

Fruits in decoction from are given for abortion.
(Singh and Pandey, 1980)

Zizipus nummularia Rhamnaceae (Burm. f.)

Wt. et. Arn
Bordi, Jharbor (Bhils) Banswara

N.B. : See *Mangifera*
(Joshi, 1982).

FERN

Actiniopteris radiata Actinopteridaceae
(Sartz.) Link

Morpankhi, Sanjeevani Ajmer, Sirohi
(Bhils)

Leaes (8 – 10) in paste from with nearly 250 ml curd is given for birth control (Conversely, approximately 2 – 3 gms of their ash in nearly 200 ml of fresh cow milk is given to a lady desiring an issue for a fortnight following menses) (Sharma and Vyas, 1987).

Discussion and Conclusions

Mode

Most of the drugs enumerated are used afresh, singly and in crude form. For abortions however, in two instances mixture are used viz.,

1. *Annona squamosa* (Seeds) and *Plumbago zeylanica* (roots).
2. *Mangifera indica* (Stem bark), *Syzygium cumini* (Stem Bark) and *Zizyphus nummularia* (root bark).

Lower Plants

Amongst the lower plants a single report on *Actiniopteris* is there. Rajasthan is rich in the lower plants and further probes may reveal more such plants with antifertility claims.

Antifertility drugs for the male

Surprisingly, there is not a single report on the usage of drugs by the male from the tribals of Rajasthan. In the adjoining regions of Gujarat, however, the stem bark of *Ficus racemosa L.* is reported to be used in decoction from (Billore and Audichya, 1978). There is every likelihood of discovering antifertility drugs used by males in Rajasthan also.

Adjoining Areas

Some of the antifertility drugs used by tribals of Rajasthan are used in some regions of the adjoining State of Madhya Pradesh exemplifying wider usage also e.g., *abrus precatorius* in Bastar, Raigarh and Sarguja districts (Anon., 186 – 87, Jain 1965 and Sahu, 1982); *Caricapapaya* in Bhopal (Oommachan and Khan, 1981), *Musa paradisiacal* in Jhansi district (Anon, 1986 – 87) and *Plumbago zeylanica* in Bhopal (Oommachan and Khan, 1981).

Tribal Antifertility drugs in Rajasthan in light of Pharmacological and clinical studies.

Some of the plants reported have established antifertility activity as proved by modern researches (of. Table 1).

TABLE 1

S. No.		Plant Comments
1	Arus precatorius	In mice and rats (Farnsworth <i>et al.</i> , 1975; Malhi and Trivedi, 1972)
2	Annona squamosa	Encouraging antifertility activity in rats, antiimplantation activity, (Farns worth <i>et al.</i> , 1975; Saluja and Dantani, 1984)
3	Carica papaya	(Bhargava, 1984, Chaudhari <i>et al.</i> , 1982; Farnsworth <i>et al.</i> , 1975; Malhi and Trivedi, 1972)
4	Ricinus communis	Post coital antifertility activity (Malhi and Trivedi, 1972)

It may thus be inferred that there is great potential of discovery of several more antifertility agents in vogue in the tribal areas of Rajasthan.

Ethnobotanists and pharmacologist have enough materials to work with on the tribal and rural folks and the ambient flora on which they yet depend, especially in the field of antifertility drugs.

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