Chapter – II

LITERATURE REVIEW
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In recent years population control has assumed great significance in many developing countries and attracted the attention of governmental and other agencies. So, there is tremendous importance for searching of harmless, inexpensive and effective oral agents for fertility control in human beings. Plants have been used for this purpose since ancient times.

In the past a number of reviews have been published on the subject. List of plants used in fertility control have been prepared from old materia medica, Ayurvedic and Unani literature and folklore medicine. Fransworth and Co-workers, (1975) have made a comprehensive survey of the potential value of plants as sources of new antifertility agents. The plants that have a reputation as a folklore or that have been tested for antifertility activity have been listed and their active constituents have been discussed. In their books Nadkarni (1954) Chopra and Co-Workers (1958) Kritikar and Basu (1935) and Chopra, Nayar and Chopra (1956)
mentioned along with other medicinal plants, the name of these plants which are traditionally believed to possess antifertility activity. Casey (1966) and Chaudhury (1966) have collected the material from above sources and compiled lists of 298 and 321 plants respectively with possible antifertility activity. Plants reported to have abortifacient and emolic properties have been listed by Badhwar et al., (1946), Saha, et al., (1961). Accounts of selected plant species with antifertility activity have been given by Malhi and Trivedi (1972) and Saxena (1973) Laszlo and Henshaw (1954) have mentioned 60 plants which are used in folk medicine as contraceptives. Brandeggao (1973) have compiled a list of 63 plant species, which should be investigated for their reported contraceptive effect. Agarwal et al., (1970) reported that petroleum ether, alcoholic extracts of the roots of *A. precatorius* prevented 100% nidation during post coitum in rats. The alcoholic extract of this plant at a dose of 2g/kg have been reported to have anti-estrogenic activity. Prakash and Mathur (1976), Desai and Rupwala (1966) and Bhadure et al., (1967) reported the antifertility activity of *A. precatorius* seed extract in albino mice and rats the post-coital antifertility of rats. Chopra (1933) reported that seeds of *A. precatorius* had been using to induce criminal abortion, even though the seeds are found to be poisonous. However Kritikar and Basu (1933) had reported that powdered seeds of *A. precatorius* when taken orally prevented conception in human females. Kholkute et al. (1978) reported the antifertility activity of indigenous plants like *Sida carpinifolia* and *Podocarpus brevifolia* in female rat. The methanolic extract of whole plant of *Sida carpinifolia* and chloroform extract of
P. brevifolia altered normal estrous cycle in female rats. Prakash et al. (1986) reported that 50% ethanolic extract of indigenous plants Dopatrum, Pueria tuberosa, Rubus ellipticus had 80-90% anti-implantation activity. Further it was reported that petroleum ether, alcoholic and aqueous extract of A. squamosa did not show implantation at a dose of 200 mg/kg. However, this extract had anti-ovulatory effect in rabbits. Rao et al. (1979) reported that the antifertility effect of the plant like A. squamosa, Beta vulgaris, Crotalaria juncea, M. olifera, Trianthemen protrulocostrum. The alcoholic extract of the seed of C. juncea at a dose of 300 mg/kg from days 1-7 of pregnancy showed 83.3% antifertility effect. But A. squamosa and C. replesa had encouraging antifertility activity at a dose of 200, 800 mg/kg indicating the effect of the plants was dose dependant.

Mishra et al. (1979) reported that A. squamosa at a dose of 100 mg/kg from days 1-5 had maximum antifertility activity while the aerial extracts of Ipomoea fistula at a dose of 100 mg/kg had shown 30% reduction in implantation sites. Shukla et al. (1989) reported the butanolic extract of P. tuberosa had more potent effect in rats of 7 days schedule but Mathur et al., (1988) reported antifertility activity of the butanolic extract of P. tuberosa had been distributed by hormonal properties. The mechanism and action of this plant had been reported in sprayed cyclic and pregnant rat by Shukla et al., (1987, 1992).
Kholkute et al. (1976) reported that flower of *H. rosa sinensis* disrupted estrous cycle in female rat and caused reduction in ovarian, uterine and pituitary weight. The extract produced follicular atresia in ovary and atrophic nature of the uterus. Kholkute and Udupa (1976) and Tewai (1974) reported that the benzene extract of *H. rosa sinensis* flower showed antifertility activity in albino rats and produced anti implantation effect in women. Gupta et al. (1978) reported that the effect of vasicine depends upon the priming of oestradiole in rabbits but it has no abortifacient effect in rabbits, rats, hamsters and guineapigs. With the effective dose as 2.5 to 10 mg/kg Nandkarni et al., (1985) reported that the seeds of *A. indica* had been used for various therapeutic purposes and Sinha et al. (1984a) reported the multiple intravaginal application of neem oil preventing pregnancy in rats. They had confirmed its antifertility activity in the spermatozoa of Rhesus monkey and human beings in Vitro and in *vivo* studies. Mateemuddin et al. (1984b) and Lal et al. (1986) had also reported neem oil for its significant antifertility activity.

Arora et al. (1971) reported that the aqueous extract of *E. ribes* when administered from day 1 to 7 of pregnancy at a daily dose of 100 mg/kg showed 85% post coital antifertility activity. But Radhakrishnan and Alam (1975) and Rathinam et al. (1976) reported significant anti-implantation activity at a dose of 60 and 120mg/kg from day 1 to 5 of pregnancy. Kholkute et al. (1979) reported that benzene extract of *Piper longum* showed 57% inhibitory effect while chloroform extract showed
50% activity. But the most potent effect was seen in *P. longum* when it is mixed with methanol extract of *Embelia ribes* in female rats. In ovariectomized rats when embelin was administered at the dose of 50mg/kg the glycogen and acid phosphatase content decreased significantly as compared to control group when the protein and alkaline phosphatase increased simultaneously as reported by Prakash *et al.* (1983).

Prakarshi *et al.* (1977) reported that when *A. indica* is treated conjointly with estrogen on day 1 of pregnancy in female mice, it showed anti-estrogenic potency as corroborated by the depletion of alkaline phosphatase activity, glycogen content of immature mouse uterus. Prakash *et al.* (1997) reported that benzene extract of *A. squamosa* at a dose of 50 mg/kg in rabbit showed 100% abortifacient activity but when the dose increase to 1000 mg/kg showed toxicity in female mice. Prakash *et al.* (1979) reported that the more significant effect of this plant was seen in the 30% ethanolic and benzene extract in the uterus of rat. Garg and Garg (1971), Saren *et al.* (1961), Bodhankar (1971) had reported 5 indigenous plants namely *Areca catechu*, *Carica papaya*, *Daucus carota* and *Polygonum hydropiper* to possess antifertility activity in rats and mice.

Garg *et al.* (1970) reported that the petroleum ether, alcoholic and aqueous extract of nuts of *Areca catecus* showed anti-implantation activity in albino rats while petroleum ether extract showed abortifacient activity in albino rats.

Khanna and Chaudhury (1969) reported that the aqueous extract of *Taxus baccata* leaves and *Uraria lagopoida* had encouraging anti-implanation activity but aqueous extract of *Abrus pricatorius* (seed), *Calotropis giganta* (roots), *Randia dumetorum* (fruits) showed anti-zygotic early abortifacient activity. Khanna et al. (1969) reported the aqueous extract of *Taxus baccata* leaves showed anti-implantation activity in albino rats while Chaudhury et al. (1970) reported the aqueous extract showed anti-ovulatory activity in rabbits. Khanna et al. (1969) reported that the aqueous extract of whole plants of *Uraria lagopodiodes* showed anti-implantation activity in albino rats.

Vohra et al. (1969) reported that alcoholic extract of *Ocimum sanctum* showed anti-implantation activity while Batta and Santhakumari (1971) reported the benzene extract of *O. sanctum* showed 80%
antifertility activity in female rats and petroleum ether extract showed 60% antifertility activity in female rats.

Prakashi et al. (1975) reported the benzene chloroform, alcoholic extracts of the plant Achyranthus aspera, Abruna angusta, Woodfordia fruticosa when administered at a dose of 50 mg/kg from day 1-6 of pregnancy showed abortifacient activity while petroleum ether extracts of Abruna angusta showed anti-implantation activity.

Prakashi et al. (1975), Tewari et al. (1976) reported the roots of A. angusta showed abortifacient and anti-implantation in mice and estrogenic activity in female albino rats.

Prakashi et al. (1975), Prakash and Bhattacharya (1977) reported the stem bark of A. Aspera showed abortifacient activity in mice while the benzene extract the A. aspera showed 100% abortifacient activity in rabbits. Prakashi et al. (1975) showed flowers of Woodfordia fruticos abortifacient activity in mice.