Phytochemical Investigation and Anthelmintic Screening Of Some Herbal Plants

1. INTRODUCTION

Helminthiasis:

In Helminthiasis a part of the body is infested with different worms viz. pinworm, roundworm or tapeworm etc. Generally, the worms reside in the gastrointestinal tract may also the liver and other organs. (Wikipedia.org/Helminthiasis). The infected people excrete helminth eggs in their feces, which then contaminate the soil in areas with inadequate sanitation. Other people can then be infected by ingesting eggs or larvae in contaminated food, or through penetration of the skin by infective larvae in the soil (hookworms). Infestation can cause morbidity, and sometimes death, by compromising nutritional status, affecting cognitive processes, inducing tissue reactions, such as granuloma, and provoking intestinal obstruction or rectal prolapse. Control of helminthiasis is based on drug treatment, improved sanitation and health education. (who: int/topics/helm/en/).

The present condition of disease shows an uneven pattern around the world. In developing countries, the affected population is 25-33%. Whereas in developed ones it is less than 1.5%. Thus it is a problem that mostly concerns developing countries, particularly in regions where poverty and poor sanitary conditions are dominant; under these conditions helminthiasis incidence rates reach 90%. Considerable research has shown that some plants not only add to the nutrition of animals, but also have anti-parasitic effects (Waghorn, at el., 2003). For example, oil of Chenopodium, frequently combined with a laxative which derived from Chenopodium ambrosioide, (De Bairacli Levy J., 1991) was used for many years in the United Kingdom and United States to treat nematode parasite infections in monogastric animals including humans (Gibson T. E. 1965).

Other than these plants there are also many plants available which are used traditionally as anti-parasitic but not investigated scientifically. The plants from Satpuda platue used by folklorist as anthelmintic are Erythrina indica, Casalpinia crista, Morianga concanensis, Mucuna prurience, Cucurbita maxima, Cassia fistula and Menthe viridis. (Maria D-Souza, 1998). The present study
is selected to explore traditionally used herbal medicines from Satpuda plateau for anthelmintic activity.

➢ PLANTS PROFILES

1. Erythrina indica (Leguminosae) Lam.

SYNONYMS:

Erythrina variegata orientalis, Erythrina variegata parcelli, Erythrina variegata picta.

VERNACULAR NAMES: (Vaidyaratnam P. S. et al., 2006)

English name: Indian coral tree, Tiger’s clow, Moochy wood tree, Sunshine tree.

Hindi: Dadap, Pharad, Ferrud.

Marathi: Pangara.

Sanskrit: Paribhadra.

Gujarati: Panarawas, Pararoo.

Bengali: Palidhar Palitu-Mudar.

Kannada: Varjipe, Harivana.

Tamil: Kalyan - Morangai.

Telugu: Bodita, Bodisa.

Malyali: Murukku, Mulmurukku.

Description:

Erythrina indica is small to medium-sized thorny tree of tropical Asia and northern Australia having dense clusters of scarlet or crimson flowers and black seeds. (webster-online-dictionary.org). The leaves are discutient, tree reaches up to 20 mts. with spiny branches and flowering before the leaves regrow. Leaves with 3 leaflets; each wide-oval, to 25x20 cm. Flowers clustered along a spike; main petal spathe-like, dark orange-red, 4cm. (Huxley A., 1992). Native from Africa to at least Fiji; probably native on some islands eastward to the societies; otherwise polynesian or recent introduction, grow on coastal coral soils. Formerly use to make fishing floats.
**Medicinal uses and chemistry of the plant:**

*Erythrina indica* has a reputation for medicinal properties in India, China and Southeast Asia. The bark and leaves are used in many traditional medicines, including *paribhadra*, an Indian preparation said to destroy pathogenic parasites and relieve joint pain. Juice from the leaves is mixed with honey and ingested to kill tapeworm, roundworm and threadworm. (Hegde N. et al., 1993). Women take this juice to stimulate lactation and menstruation. It is also commonly mixed with castor oil to cure dysentery. A warm poultice of the leaves is applied externally to relieve rheumatic joints. The bark is used as a laxative, diuretic and expectorant.

Different parts of plant are used in tradition medicine as nerve sedative, collyrium, in ophthalmia, anti-asthmatics, and antiepileptic, antiseptic and as an astringent. Bark is used in fever, liver ailment and rheumatism. The leaf juice used to heal wounds and sores. Leaf paste applied for muscular pain in cattle. Leaf extract possess nematicidal property. The root extract possess antimicrobial activity. (The Wealth of India 1959). Bark is astringent and used as febrifuge and anthelmintic. (Pullaiah T. et al., 2000)

Decoction of stem bark used as bitter, acrid, carminative, digestive, anthelmintic etc. A new 3-phenylcoumarin, indicanine A (1), has been isolated from the root bark of the African medicinal plant *Erythrina indica*, together with three known compounds, robustic acid (2), daidzein, and 8-prenyldaidzein. The structure of the new compound was characterized, as 4-hydroxy-5-methoxy-3-(4'-methoxyphenyl)-2"-(1-methylethenyl) dihydrofurano [4", 5":6, 7]coumarin by means of extensive spectroscopic analyses. (Nkengfack et al., 2000). Some properties of a D-galactose-binding leaf lectin from *Erythrina indica* are purified and further seed lectin is characterized (Konozy et al., 2002).
II. *Casalpinia crista* (Fabaceae)

SYNONYMS:

*Caesalpinia paniculata, Caesalpinia paniculata, Guilandina paniculata, Guilandina semina* Lour.

VERNACULAR NAMES: (Nadkarni A. K. et al., 1976)

**English name:** Teri pods, Fever nut.

**Hindi:** Katuk Ranja, Karanjava.

**Marathi:** Sagargoti, Gajra, kanchak.

**Sanskrit:** Putrakaranj.

**Gujarati:** Kanchaki, Kankachia.

**Bengali:** Lata Karancha.

**Kannada:** Gujugu, Gaduggu.

**Tamil:** Kalarkodi, Kalichikai.

**Telugu:** Guchepikka Kachkai, Gachakaya.

**Konkani:** Vakeri. (Arya Vaidya, 2002)

**Description:**

The plant is a prickly shrub or woody vine reaching a length of 10 m or more. Leaves are bi-pinnate, often nearly 1 m long, with the rachis armed with stout, sharp, recurved spines. The pinnae usually number about 10 pairs and are about 20 cm long with a pair of short, sharp spines at the point of attachment of each pair of leaflets. The leaflets also number 10 pairs and are oblong, 2 to 5 cm long and somewhat hairy. The Flowers are yellow, borne in axillary, simple or panicked raceme and about 1 cm long. The fruits are pods, oblong 5 to 7 cm in length, inflated and covered with slender spines and contain one or two seeds. The seeds are large, somewhat rounded or ovoid, hairy, grey and shiny. (Arya Vaidya Sala 2002).
Medicinal uses and chemistry of the plant:

Traditional utilities of this plant are many but it is not studied scientifically. The famous utility in Satpuda region among the Aadivasi people is anthelmic. The leaf is the part utilized, fresh 15-ml leaf extract is to be given orally in the morning for seven days and at eighth day a 15-ml of castor oil is to be given. (Maria D-Souza, 1998). The other mentioned utility of Casalpinia are the seeds, sometimes used in necklaces are considered febrifugal, periodic, tonic, and vesicant. They are used to treat colic, convulsions, leprosy, and palsy. The oil from the seeds is said to soften the skin and remove pimples. The bark is antiperiodic rubefacient and plant to counteract toothache. A leaf decoction is as collyrium (Sarota Cheenprach, et al., 2006).

The literature has revealed that seeds and leaves of plant contain around fourteen compounds. The structures of the isolated compounds cassane-and norcassane-type diterpenes. The stem part constituents and both of the root part constituents two novel peltogynoids, pulcherrimin and 6-methoxypulcherrimin, one novel homoisoflavonoid, 8-methoxybonducellin, and the known compounds bonducellin, 2,6-dimethoxybenzoquinone, 2′,4′,4-trihydroxychalcone and 2′,4-dihydroxy-4′-methoxychalcone (McPherson, et al., 1988).