

INTRODUCTION

The history of herbal medicines is as old as human civilization. Plant based drugs have been used globally for human healthcare. Around 80% of world's population still depends on medicinal plants for their primary health care needs especially where modern medicines are not available.

Indian history of medicinal plant is dated back to 3500 B.C. The curative properties of plants are mentioned in Sanskrit of Rig-Veda and Atharvaveda. Ayurveda has also described good number of plants with their therapeutic properties. The pharmacopoeia of Ayurveda consists of more than 8000 species made of natural drugs derived from herbal, mineral, animal sources. These drugs are used singular or in combinations i.e. in the form of decoctions, extraction juices, pills, tablets, syrups, medicated oils etc.

Infectious diseases are the major cause of death world-wide. The clinical efficacy of many existing antibiotics is being treated by the emergence of multi-drug resistant pathogens. There is a continuous and urgent need to discover new antibacterial compounds with diverse chemical structures and novel mechanisms of action for new and re-emerging infectious diseases. There is a consideration that many infectious diseases have been cured with herbal remedies. Therefore, researchers are attracted towards the folk medicine.

India is considered as garden of medicinal plants. It exhibits a wide range in topography and climate. In India, the indigenous system of medicine namely, Ayurveda, Siddha and Unani have been in existence for several centuries. The traditional system of medicine together with homeopathy and folklore medicine continue to play a significant role in the healthcare system of the population. The demands for medicinal plants made by the modern pharmaceutical industries have also increased. Thus medicinal plants become industrially important crops which may bring appreciable income to the country by way of export Ganesan *et al.*, (2006).

Ethnobotanists collect the information of traditional uses of medicinal plants from traditional healers, knowledgeable native rustics and tribal people. They collect medicinal plants and note their names in the local dialect, the parts used and what they are used for. This approach is proving particularly successful in uncovering evidence

that may lead in search of new drugs. Therefore, much more attention is required for the assessment of active compound of the crude drug Dubey, *et al.*, (2004).

There are number of geographical areas in Marathwada which are fruitful in vegetation and especially about medicinal plants. The tribal folk and the rustics of the area have been using various plants and their products as medicines. The use of the plants as medicine has been followed traditionally as trial and error and the effect of the plant medicine is being passed from generation to generation. But the uses of the plants for medicine have not been recorded

Pharmacognosy include the scientific and systematic study of structural, physical, chemical and biological characters of crude drugs with their history, cultivation, collection and packing for market with the recent development in science and technology. Several chemicals which were found in plants are synthesized because of the scarcity or non availability of natural drugs.

The crude drug may also contain various other constituents which are therapeutic in nature. The chemical tests are need for the qualitative chemical evaluation of the crude drug. Such phytochemical tests are for the identification of the powdered drug.

In the present study it was noticed that the rustics of the Marathwada region were using some plants as medicine which are wild in habitat. Therefore, it was decided to screen the phytochemicals and to assess their antibacterial efficacy. Taking into consideration the phytomedicinal importance of the following five plants they are selected for the study: *Pergularia daemia* (Forsk.) Chiov, *Cascabela thevetia* (L.) Lippold, *Wrightia tinctoria* (Roxb.) R.Br., *Cardiospermum halicacabum* Linn and *Soymida febrifuga* (Roxb.) A. Juss. The present study was undertaken with the following objectives.

- i) Selection and collection of medicinal plants
- ii) Pharmacognostic study
- iii) Preliminary screening of phytochemicals
- iv) High Performance Liquid Chromatography
- v) Antibacterial assay of selected plants.

MORPHOLOGY OF MEDICINAL PLANTS

Pergularia daemia (Forsk) Chiov.

Family: Asclepiadaceae

Common names- Utaran, Gutguti

Morphology:

The plant is hoary tomentose and twinning under shrub. The stem is terete and much branched. Leaves are opposite, reniform-ovate about 2.5 to 6.5 cm with deeply cordate base with rounded lobes and acuminate apex. The leaves are glabrous and pubescent beneath. The petiole is 2-3 cm long and pubescent. Flowers are arranged in drooping, corymbose cymes becoming racemes. The peduncles are up to 20 cm long, hairy. The pedicels are up to 2-2.5 cm long, filiform and villous. Bracts are lanceolate, acute, densely pubescent, 1.5-2 cm long. Sepals are ciliated, ovate-lanceolate, long, acute, about 2-2.5mm long. Corolla is dull greenish yellow or white, glabrous on outside and hairy within and about 10-12mm long. Corolla tube is half as long as the elliptic lobes. Corona staminal with outer five lobed membrane and inner laterally compressed lobes. The pollinia are oblong. The fruits are follicles, strongly reflexed, lanceolate about 5.8- 1-1.2 cm having long beak with soft spines, pubescent, ash grey colour and purplish tinge. Seeds are 6-7 mm long, densely pubescent, Silky white and 2.5-3cm long.

Medicinal uses

The whole plant of *Pergularia daemia* has medicinal value. The leaves are used to cure cough and used as an expectorant. The leaf is used to treat diarrhoea, rheumatic swelling, arthritis, tumours and cysts. The latex is used against sore eyes, toothache and as snake antidote.

***Cascabela thevetia* (L.) Lippold**

Family: Apocynaceae

Common Name: iwali kanher

Morphology:

The trees are evergreen with terete branches and 3-6 m tall. Leaves are linear, narrowed at both the ends and 8-12 x 0.4-0.8 cm. the upper leaf surface is shining green and lower surface is pale in colour. The petiole is very short. Flowers are in sub terminal cymes and are 5-6 cm long; pedicels are 2.5-5 cm long and are glabrous. Calyx is deeply divided with many glands at the base and 10-14 mm long; sepals are ovate- acuminate. Corolla is yellow or light orange in colour, about 6-7 cm long, narrow part of the corolla tube is greenish yellow, corolla lobes are obliquely obovate having scales near the throat. The anthers are free from the stigma. Disc is annular. The fruit is drupe, shining black, 4-5 cm in diameter.

Medicinal uses

The *Cascabela thevetia* has toxic compounds in the latex. The leaf is used to lose the bowels, also effective to cure the intermittent fevers. The bark and seeds are used as poison. Seed oil is used for skin infections, used as insecticides and used to treat Jaundice.

***Wrightia tinctoria* (Roxb) R. Br.**

Family: Apocynaceae

Common Names: Dudhi, Dahidudhani

Morphology

The plant is small deciduous tree about 5-8 m tall. The young parts are tomentose. The leaves are elliptic-oblong and about 6.15 x 3.6 cm with acute apex and rounded base, acuminate, tomentose on both surfaces. The petioles are about 3-4 mm long. Flowers are fragrant and arranged in lax terminal cymes. The peduncles and pedicels are slender, tomentose. The bracts are minute and ovate. Calyx is pubescent on outside and glandular inside. Teeths are oblong about 2-2.5 mm long with membranous margin and rounded at apex. The corolla is white about 2.5-3 mm long; the lobes are oblong and 6-8 mm long. Anthers are convenient around and adhering to the stigma exerted. Ovaries are distinct. Follicles are linear, cylindrical, glabrous,

striate and cohearing at the teeth only. The seeds are oblong, pointed at apex about 1.2-2 cm long.

Medicinal uses

Wrightia tinctoria contains the most useful parts like bark and its pods which are used to cure the piles and constipation. The bark is useful in the hyper tensions, fever and diarrhoea. The bark is effective for the treatment of psoriasis. Seeds are very useful in dysentery. The leaves are used to treat the toothache. The bark is used to treat the abdominal pain and also for healing wounds.

***Cardiospermum halicacabum* Linn.**

Family: Sapindaceae

Common Names: Kapalphuti, Futfuti

Morphology

The plants are annual or perennial, climbing, glabrous or pubescent herbs. Leaves are biternate; the upper most leaves are often trifoliate, the leaflets are lanceolate-oblong to ovate, about 1-6 x 0.5-3 cm long, incised- serrate to pinnatifid, ciliate with acute or obtuse base and mucronate apex. The upper leaf surface is glabrous and lower leaf surface is pubescent. The petioles are 0.5-5 cm long. Flowers are in umbellate signs on axillary peduncles. Peduncles are with 2 tendrils at the top, pedicels are slender 2-3 mm long. Sepals are distinct, sub orbicular, unequal and 1-1.5 mm across. Petals are white obovate-spathulate and 2.3-3 mm long. Stamens are 8 with filaments up to 1.5-2 mm long and hairy. Pistillode in male flowers is minute. The fruit is capsule, pubescent and bladdery, brown in colour. The fruit size is about 1.5-2 x 2-2.5 cm. Seeds are glabrous and smooth.

Medicinal uses

The oil obtained from the leaves used as hair tonic. The leaves are used against arthritis, painful conditions of the body, cold, fever and urinary tract infections etc. Leaves are edible. The roots are diuretic in nature. The whole plant is used to treat measles.

***Soymida febrifuga* (Roxb.) A. Juss.**

Family: Meliaceae

Common Name: Rohan, Rohini, Patranga.

Morphology

It is a glabrous tree about 10-12 m tall. Leaves are unipinnate, 20-40 cm long with 3-6 pairs of leaflets. The leaflets are elliptic-oblong, rounded and obtuse apex, glabrous with entire margin and about 5-15 x 3.5-9 cm. Petioles are 3-6 mm long. Flowers are in large axillary and terminal divaricated panicles often equalling the leaves. The pedicels are short. Bracts are minute and triangular acute. Sepals are almost distinct, broadly ovate-rounded with membranous margin. Petals are white in colour, obovate in shape and 5-6 mm long, clawed, often notched at apex. The staminal tube is 2-3 mm long. Ovary globose, glabrous, style is short with 5 angled stigmas. Fruits are capsule, obovoid, woody, glabrous, septifragal and 5-7.5 cm long with 5 valves. Seeds are compressed, brown in colour and winged at both ends.

Medicinal uses

Soymida febrifuga bark is used in vaginal infections, rheumatic pains and stomach pains. It is good to treat throat diseases also and also useful in cough and asthma. It is used to treat dysentery as a blood purifier. The bark used as general tonic. The bark also has wound healing properties.



Fig. 1.1: *Pergularia daemia*



Fig. 1.2: Fruit of *Pergularia daemia*



Fig. 1.3: *Cascabela thevetia*



Fig. 1.4: Flower and fruit of *Cascabela thevetia*



Fig. 1.5: *Wrightia tinctoria*

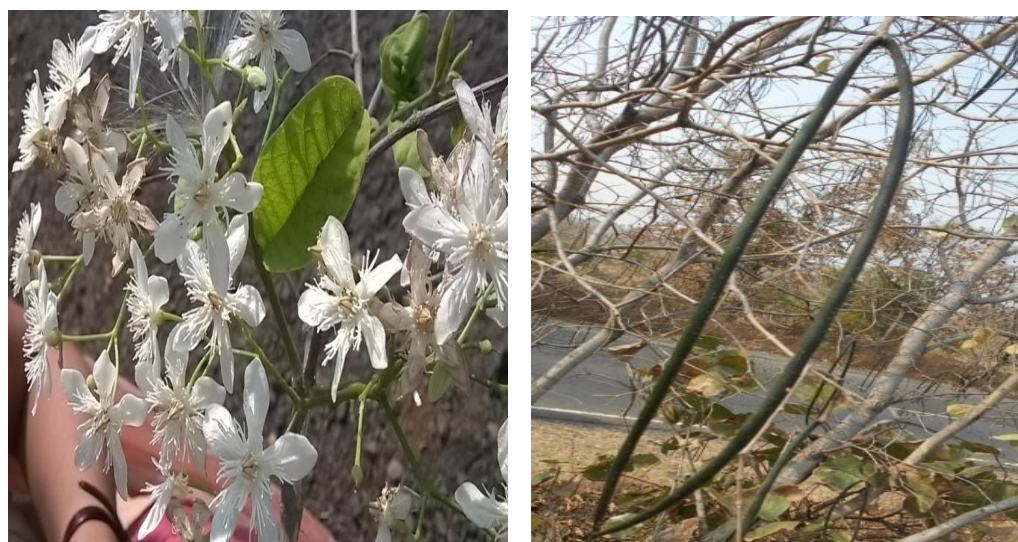


Fig. 1.6: Flower and fruit of *Wrightia tinctoria*



Fig. 1.7: *Cardiospermum halicacabum*



Fig. 1.8: Flower and fruit of *Cardiospermum halicacabum*



Fig. 1.9: *Soymida febrifuga*



Fig. 1.10: Flower and Fruit of *Soymida febrifuga*

Organization of thesis:

The thesis comprises 12 chapters:

Chapter 1 Introduction: It provides the general information of medicinal plants and selection of plants for the study.

Chapter 2 Review of literature: It represents earlier work done in this regards.

Chapter 3 Materials and methods: This chapter presents the methods adopted for anatomical study of selected plants, quantitative analysis of plant parts, antibacterial assays of tested bacteria and fungi, phytochemical and physico-chemical analysis of selected medicinal plants.

Chapter 4 Observations and results: This chapter deals the detail data about observation and results of the study.

Chapter 5 HPLC: In this chapter methodology, observation and results about HPLC are represented.

Chapter 6 Microbiological assays: It represent efficacy of antibacterial potential of plants in different solvents against tested microorganisms.

Chapter 7: Antioxidant activity: In this chapter methodology, observation and results about antioxidant activities are represented.

Chapter 8: Powder analysis: In this the microscopical studies and micro chemical tests of powered leaf, bark, pod, seed and root drug are cited.

Chapter 9 Discussion: In this chapter the findings of work was discussed with earlier reviewed literature.

Chapter 10: Summary and Conclusion: The summary of the investigation and conclusions drawn are cited.

Chapter 11 Prospects of Study: It narrates the future prospects and importance of the study.

Chapter12: Bibliography: The references used in the thesis are cited.