

Medicinal Use of Endangered Plant *Commiphora Wightii*

Mr. Qureshi Ikram and Chahar Om Prakash: JJT University, Jhunjhunu, Rajasthan

Abstract: - *Commiphora wightii* plant commonly also name is guggul. It is belong to family *Burseraceae* and class *magnoliopsida*. The guggul plant present in arid and semi arid region. It is distributed in Asia India, Pakistan and Bangladesh. In India it is found in Rajasthan, Gujarat, and Karnataka. Guggul plant is a shrub or small tree reaching maximum height of 3 to 3.5 meter. The guggul plant have lot of medicinal values and their medicine use in Arthritis, Rheumatism, Haemorrhoids, Urinary disorder, obesity, skin disease and high cholesterol. The guggul plant seed contains 10% oil content and this oil in oleo-gum resin. In Rajasthan and Gujarat enlisted the guggul plant in Red Data List of endangered species. Guggul plant is endangered because it slow growing nature and poor seed germination.

Keywords:-Guggul, Biodiversity and antimicrobial activity.

Introduction:-Guggul plant commonly known as *Commiphora wightii*. It is belong to family *Burseraceae* and Class-*magnoliopsida*.

Systematic position of *Commiphora wightii*

Kingdom-Plantae

Phylum-*Tracheophyta*

Class-*Magnoliopsida*

Order-*Sapindales*

Family-*Burseraceae*

Genus-*Commiphora*

Species-*Wightii*

Species Authority-(Arnott)Bhandari

Habit and Distribution: - The guggul plant present in arid and semi arid climate and it's tolerant of poor soil. The guggul plant mainly distributed in arid area of northern Africa to central Asia, but it most common in Rocky track of western India and Eastern Himalayas. In central Asia the guggul plant is distributed in arid areas of India, Bangladesh and Pakistan. In India it plant found in arid, Rocky tracts of Rajasthan, Gujarat and Karnataka. According to Ayurveda, there are five type of Guggul namely; Krishnan (black), Peet Varn (Yellow), Neel (blue), Kapish (light brown) and Rakt (blood red) (Goyal et al,2010). The guggul plant is a shrub or small tree. It is a slow growing plant and takes 8 to 10 years to reach to a height of 3 to 3.5 mtrs with thin paper bark and branch are thorny. Plant leaves are simple, 1-5 cm. long 0.5 to 2.5 cm. broad. The plant is dimorphic, one having bisexual and male flower and the other having female flower with staminodes. A third category of plant with only male flowers has also been reported. The fruits are green berry like drupe size of the fruit 6 to 8 mm in diameter. Fruit part exposed to sun develop pinkish tinge with four small petals. Fruit remain on the plant for several months. Seed shows polyembryonic nature. (Gupta et al, 1996), (Pareek and Pareek, 2012).

Medicinal Uses:-

The use of guggul plant in the treatment of diseases occupies an important place in ayurveda, the traditional medicine system of india. The Atharvaveda one of the four well known holy scriptures (Vedas) of the Hindus, the Atharvaveda is the earliest reference for its medicinal and therapeutic properties (Satyavati, 1991). Detailed description regarding its action, use and induction as well as the varieties of guggul have been described in numerous Ayurvedic treatises including Charaka samhita (1000 BC), Sushruta Samhita (600 BC and Vagbhata seventh century AD). In addition, various medical lexicons were written between twelfth and fourteenth centuries AD. It is responsible for reducing fat, indicated for healing Bone Fracture to inflammation, Arthritis, Atherosclerosis, Obesity, Hyperlipidemia, Rheumatism, Haemorrhoids, Urinary disorder, skin disease high cholesterol, neuro-degeneration, Parkinson's disease, mongolism and ageing process. (Sushruta, 1954) (Pareek and Pareek, 2012), (Chodhary 2012, Polterat 1997, Pareek and Pareek, 2012, Prior 2003 and Devasagayam et al 2004).

Guggul is a gum resin, historically used for antiseptic and deep penetrating action in the treatment of elevated blood cholesterol and Arthritis. Guggul is effective as weight loss and fat burning agent. It increases white blood cell count and possesses strong disinfecting properties. Used as a carrier and combined with other herbs to treat specific conditions (Pareek and Pareek, 2012, Dubey 2009, Nakayama and Yamada 1995).

Traditionally, guggul plant is given in the form of YOG, where guggul is mixed with other drugs along with castor oil or Indian clarified butter. The YOG could also be prepared by cooking the guggul with water, and other herbal drug powder. Popular Ayurvedic formulations containing guggul are: Yograj gugguluvati, Pachamrit ioh guggulu, Kaishore gugguluvayi, Triphla guggulu and Sinha gugguluvati. (Mishra, 1996).

Guggul has been a key component in ancient Indian Ayurvedic system of medicine and now widely used in modern medicine for treatment of heart ailments. But guggul (*Commiphora wightii*), as it is locally known, has become so scarce because of its overuse in its two habitats in India where it is found –Gujarat and Rajasthan. The extract, called guggulipid, comes from the guggul tree and has been used in Ayurvedic medicine, a traditional Hindu medicine, for nearly 3000 years in India. Today its existence is threatened because of low seed production in an adverse natural condition and recent environmental change due to rainfall pattern and increasing level of atmospheric pollution. This plant species is fighting for its survival in the natural habitat since a long time. Attempts have been made in this direction by a number of researchers including under present investigation towards its natural populations, germ-plasm collection, cultivation techniques, Phytosociology and regeneration potentialities etc. at different sites of Western Indian Thar desert. (Pareek and Pareek, 2012), (Vineet 2008).

The oleo-gum resin commonly known as “gum guggul” or “Indian Myrrh” is the economically important product of Indian bdellium. The oleo-gum is collected as exudates from woody stem. A plant generally takes 10 years to reach tapping maturity under the dry climate conditions. The thick branch is incised during the winter to extract the oleo-gum resin. Guggul gum is a mixture of 61% resin, and 29.3% gum, in addition to 6.1% water, 0.6% volatile oil and 3.2% foreign matter. (Goyal et al, 2010).

Biochemical Composition of Commiphora Wight II:-

The guggul plant seed contain 10% oil. The fatty acid composition and chemical properties of the extracted oil were determined. *Commiphora wightii* has become endangered because it slows growth nature poor seed setting and lack of cultivation, poor seed germination rate. (Pareek and Pareek, 2012), (Vineet 2008).

Present Status of Commiphora Wight II:-

Commiphora wightii has become an endangered species due to over exploitation for gum resin. Guggulsterones present in gum-resin are potent lipid and cholesterol lowering natural agent. Guggul plant drug currently used clinically in Indian and Europe. Guggul plants have major contributions on Biology, Chemistry, Pharmacology and Biotechnology. (Pareek and Pareek, 2012).

Plant Biodiversity:-

The Guggul plant as such region is poor in biodiversity. In Rajasthan state has large number of species (*commiphora wightii* and *commiphora mucul*) has become endangered because it slows growing nature, poor seed setting, and poor seed germination rate. Human causes the major of threat to species, site and habitats. These are interconnected for example-In Rajasthan slow growing nature associated with poor seed germination is also the major cause of endangerment of *commiphora wightii*. In tropical countries, there are several problems with production of quality plant stock of important plant species, such as irregularity of seed supply to irregular flowering and fruiting, short viability period of seed, poor quality seed and lack of seed storage and handling facilities. The plant *commiphora wightii* has become endangered because of it slow growing nature, poor seed setting and lack of cultivation, poor seed germination rate and excessive and unscientific tapping for it gum resin by the pharmaceutical industries *commiphora wightii*, stem cutting offer several advantage over seed. (Pareek and Pareek, 2012).

Biotechnological Approach to Save Guggul Plant:-

Guggul plant a highly valued endangered medicinal plant species using conventional in- vivo propagation methods. Plant in natural surrounding suffers from poor seed setting, poor seed viability and harsh arid conditions. (Ramawat et al, 1991).

The plant bear seed from April to May and August to October. The seed germination percentage is only 15-18 %. (Prakash et al, 2000). Rooting response of stem cutting was shown to be improved by application of plant growth regulator such as Indole butyric acid (Singh et al, 1998), by selection of cutting of suitable length and diameter. (Mertia et al 2000), (Puri et al, 1972) and treating them with potassium salts (Kshetrapal et al, 1993). Oleogum resin production was enhanced in *commiphora wightii* by improved tapping technique as reported. (Bhatt et al, 1989).

Propagation & Restoration of C.W. in natural habitats:-

In tropical countries some problem in production of quality planting in stock of important plant species irregularity seed supply, flowering & fruiting. It is very difficult the yield of quality seed & reforestation. The guggul plant unscientific tapping for gum resin by Pharma industries & religion purposes. In this case the guggul plant stem cutting offer several

Variorum Multi-Disciplinary e-Research Journal
Vol.,-04, Issue-I, August 2013

advantage over seed. Stem cutting are also inexpensive and easier to practice and other vegetative propagation method. It is tissue culture. Stem cutting and collected for mature plant of guggul. The Guggul plant is growing a natural habitat during March to April. First pretreated with different auxin (IBA and NAA) these cutting were planted in plastic bag contain soil and manure in the ratio of 1:3 & transfer in green- shade house. After one month plant develop from 0.7-09 mm diameter stem cutting. NAA (0.4 mg /L) and IBA (0.4mg/l) were founf to be most effective. In july –August the well developed plant were transfer in natural habitat. (Pareek and Pareek, 2012), (Kuldeep et al, 2012).

Reference:-

- Sushruta samhita, chapter 15, cerse 37-38 (chowkamba Sanskrit sirija, Varanasi) 1954,62.
- mishra S A, Bhaishjaya(surbharti pakashan,varanasi)1996,193.
- Ramawat KG, Bhardwaj L and Tewari M N. Ind rev life sci 1991; 11:3-27.
- Prakash J , Kasrea P K and chawan D D. Cur Sci 2000;78(10):1185-1187.
- Singh P, Sharma ML and Mukherjee S. Ind drugs 1998; 26 :515-516.
- Mertia RS and Nagrajan M Annuda of arid Zone 2000; 39 (1) : 87-88.
- Puri DN and Kaul RN INd forest 1972; 98; 252-257.
- Kshetrapal S and Sharma R Engl J ind Bot Soc 1993; 72:73-75.
- Bhatt JR, Nair MNB and Mohan Ram HY. CUR Sci 1989; 58 (7): 349-357.
- Gupta P., Shivanna K.R. and Mohanram H.Y.(1996), Apomixis and polyembryony in guggul plant, *Commiphora wightii*. Annals of Botany. 78: 67-72.
- Kuldeep Y, Narendra S and Sharuti V, 2012. Plant tissue culture: A biotechnological tool for solving the problem of propagation of multipurpose endangered medicinal plant in India, J. of agriculture technology, (1): 305-318.
- Pareek A and Pareek L K (2012). *Commiphora wightii* (Guggal) An Endangered Medicinal Plant of Rajasthan Needs Attention of Biotechnologists for Its Conservation. J. of Pharmaceutical, Biological and Chemical Sciences. 3(1), 83-89.
- Chaudhary (2012). Pharmacological Properties of *Commiphora wightii* Intern. J. of Pharma. and Pharmaceutical Sciences. 4(3), 73-75.
- Satyavati GV (1991). A promising hypolipidemic agent from gum guggul (*Commiphora wightii*). Econ. Med. Plant Res. 5, 47-82.
- Polterait O (1997). Antioxidants and free-radical Scavengers of Natural origin, *Current Org. Chem.* 1415-1440.
- Prior R L (2003). Fruit and vegetables in the prevention of cellular oxidative damage. American J. Clin. Nut. 78, 570-578.

Devasagayam T P, Tilak, J C and Bloor K K (2004). Free radicals and antioxidants in human health: Curr. Stat. Fut. Prosp. 52, 794-804.

Dubey D., Prashant K. and Jain S.K. (2009). *In-vitro* antioxidant activity of the ethyl acetate extract of gum guggul (*Commiphora mukul*) Biological Forum – An Interna. J. 1(1), 32-35.

Nakayama J and Yamada M.(1995). Suppression of active oxygen-induced cytotoxicity by flavonoids. Biochem. Pharmacol. 45, 265- 267.

Goyal P, Chauhan A and Kaushik P (2010). Assessment of *Commiphora wightii* (Arn.) Bhandari (Guggul) as potential source for antibacterial agent, J. of Medicine and Medical Sciences 1(3), 071-075.

Vineet S.(2008), In situ conservation of *Commiphora wightii* a red-listed medicinal plant species of Rajasthan state, India. Final project report of IUCN.