**Introduction:**

Medicinal plants and human being have been in a very old and common relationship in nature. Possibly, early human beings had learnt usefulness of medicinal herbs before they started practising agriculture. The traditions of medicinal use of plants, as understood by the earlier generations are carried forward. In present day situation, this wealth of knowledge about use of plants as a source of medicine is being preserved by traditional physicians and herbal practitioners of different ethnic societies based on the experience of many generations. The World Health Organization (WHO) has listed over 21,000 species (including synonyms) that have been reported for medicinal uses around the world (Chandel et al., 1996). Moreover, it estimates that more than 80% of the world’s population relies on traditional health care. It was also reported that 25% of modern drugs were derived from plant sources and many others in modern pharmacopoeia were actually synthetic analogues of the drugs isolated from plant species (Rao et al., 2004).

According to Kumar and Shankar (1982) Africa and Asia are the main centres of origin for Commiphora spp. In the early taxonomic works on flora of India, the target species was known as Balsamodendron wightii Arn. (1839) and B. mukul (Hook.ex stocks, 1849; Bennett, 1874). It was renamed as Commiphora mukul Engl. (1883 and 1918) and C. roxburghii by Santapau in 1962. Finally it was named as C. wightii (Arn.) Bhandari in 1964 (Bhandari, 1978).

Guggal (C. wightii (Arnott) Bhandari comb. nov.) is a bushy shrub or small tree endemic to the dryer western parts of India where it is distributed in Gujarat and Rajasthan. It is also found in Baluchisthan in West Pakistan (Bhandari, 1978). The plants grow wild in rocky, arid areas. It is variously known as Indian bdellium.

The plant is dimorphic, one having bisexual and male flowers and the other having female flowers with staminodes (Gupta et al., 1996). It reaches to max height of 2-3 m. with a bushy appearance due to
branching at ground level. The tree is thorny, shrubby and free of foliage during most part of the year with ash-colour bark that flakes off in a rough way.

This plant yields golden yellow to dark brown oleo-gum-resin also called “guggul”. It is a mixture of 61% resins and 29.3 % gum, in addition to 6.1% water, 0.6% volatile oil and 3.2% foreign matter (Soni, 2008). The oleo-gum-resin is located in the ducts. It is present in the phloem of the larger veins in the leaf and in the soft bast portion of the stem. After any type of incision or injury, the exudation occurs continuously till it is clogged by the gum. The gum-resin ducts are distributed in all parts of the plants. In primary and secondary phloem, gum-resin ducts are formed schizogenosly.

It is aromatic and traditionally used as incense, to make lacquers, varnishes, ointments and as a fixative in perfumes. The use of plants in the treatment of diseases occupies an important place in Ayurveda the traditional medicine of India. Sushruta Samhita (600 B.C.), a well-known Ayurvedic medical text, describes the usefulness of the oleo-gum-resin form the guggal tree for the treatment of a number of diseases (Murray, 1995).

Traditional (Indian) uses of guggal include anti-inflammatory, carminative, emmenagogue, hypoglycemic, antiseptic, apertif, astringent, sedative, stomachic, diaphoretic, diuretic, expectorant, antisuppurative, aperients, a thyroid stimulant, anthelmintic, depurative, vulnerary, demulcent, aphrodisiac, liver tonic, anti-spasmodic, hematinic and lithonotriptic (Watt, 1972).

Modern therapeutic uses of guggul is targeted against rheumatoid arthritis, nervous diseases, hypercholesterolemia (Nityananda and Kapoor, 1971) leprosy, muscle spasms, skin disorders, hypertension, urinary disorders, and as hypolipidemic and anti-oxidant. Gum reduced the stickiness of platelets, and Gugulipid® was shown to be an efficacious and cost effective treatment of hyper-lipoproteinemia. Recent research studies
showed that oleo-gum-resin is effective against aspects of cardiovascular disease and cancer (Xiao et al., 2008).

Gummosis disease is characterised by exudation of gum, usually from the trunk of the trees. Gum exudation in plants is induced by various stressors such as infection, insect attack, mechanical and chemical injuries etc. In many cases it is a symptom of disease, in other cases it is an indication of injury. The term gummosis, then, is used broadly to designate any disease or injury which is accompanied by a flow of gum. Gummosis diseases most commonly are caused by oomycetes (*Phytophthora citrophthora* in citrus, fungi (*Botryosphaeria dothidea* in Peach tree; Weaver, 1974) certain viruses (prune dwarf virus in stone fruit tree; Falton, 1981), etc. However, gummosis can also be associated with adverse growing sites, winter damage, herbicide damage and many other factors. Bacterial gummosis diseases are reported on few plants like pine (caused of *Pseudomonas fluorescens*), cherry and plum tree (caused by *Pseudomonas syringae* pv. *morspanorum*). The physiological role of gum in plants is not yet clearly understood. Gums may play a role in inhibiting the spread of pathogens within infected tissues and from infected tissues to healthy ones.

In guggal, gummosis is a useful phenomenon but harmful for the plant. The process yields the medicinally important oleo-gum-resin but the plant usually dies after exudation. Local people extract it by tapping. They make incisions on the stem and apply a paste which invariably contains oleo-gum-resin apart from other ingredients like urine of horse or wild ass, copper sulphate, etc (Dalal et al., 1995). Sometimes, natural gum oozing is also noticed from a plant which is not tapped. Gum oozes down from trunk or branches of the plant.

*C. wightii* is assigned to the DD (Data Deficient) category ver. 2.3 (1994) of the Red Data Book of IUCN in 2009, the Government of India has included it under RET (Rare, Endangered, Threatened) category. Soni (2008) identified the following reasons for dwindling population of the species: slow plant growth rate, poor seed germination, lack of cultivation,
poor seed germination rate and excessive and unscientific tapping for its gum resin.

Plant death after tapping/gum exudation indicates a causal relation between these two phenomena. Natural gum oozing and plant death also suggest involvement of pathogen(s) in causing gummosis disease in this species. Identification and characterisation of the pathogen(s) are foremost aspects which need attention. This not only helps in understanding the disease causing organism(s) but also, formulation of practical management strategies. Since the disease yield medicinally important oleo-gum-resin, selection of most virulent strain of the pathogen can be exploited to ensure successful tapping. Therefore, the present study was undertaken to establish host-pathogen relation and characterise the pathogenic strains collected from different locations with the two objectives.