



Natural gums - An insight into their pharmaceutical potentials



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Natural gums are highly heterogeneous polysaccharides of natural origin, probably the most extensively used and traded non-wood forest products, other than items consumed directly as food, fodder and medicine since time immemorial. These are plant exudations and different reasons are given for their production by plants, including such as products of normal plant metabolism, as a protective mechanism against apathological conditions afflicting the plants, and as a consequence of infection of the plant by microorganisms.

Natural gums are mostly used in food and cosmetic applications which calls for not only the desired standard quality but also the high degree of reliability and authenticity of commercially marketed produce. In the food industries, gums are used as stabilizers and thickening, emulsifying and gelling agents etc. These have found wonderful applications in

different pharmaceutical dosage forms like matrix controlled system, film coating agents, buccal films, microspheres, nanoparticles, viscous liquid formulations like ophthalmic solutions, suspensions, implants with proven efficacy, applicability and suitability. These have also been utilized as viscosity enhancers, stabilizers, disintegrants, solubilisers, emulsifiers, suspending agents, gelling agents, bio-adhesives and binders. The pharmaceutical applications of natural gums are quite attractive because of their relatively widespread availability, eco-friendliness, being economical, low-cost or even much cheaper, low toxicity, biocompatibility, chemical modification capability and potential biodegradability etc. Thus, these natural polysaccharides are amongst the richest renewable source for sustainable supply of cheaper pharmaceutical products.

India is among the World's major producers of natural gums with approximately 2, 24, 000 tons annually. The major gum producing states in India are Andhra Pradesh, Chhattisgarh, Gujarat, Haryana, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, Punjab and Rajasthan. The rest of the India produces very small amount. Though there are more than 30 commercially important species of gums in the country, the important ones with substantial production are rather small in number. Amongst the various species of gums, the important ones are Guar gum (*Cyamopsis tetragonoloba*), Karaya gum (*Sterculia urens*), Arabic gum (*Acacia senegal*), Babool gum (*Acacia nilotica*), Chironji/Piyar gum (*Buchanania lanzan*), Khair gum (*Acacia catechu*), Tragacanth gum (*Astragalus* species), Dhawara/Ghatti gum (*Anogeissus latifolia*), Katira gum (*Cochlospermum religiosum*), Palas gum (*Butea monosperma*), Moringa gum (*Moringa olifera*), Kondagogu gum (*Cochlospermum gossypium*) and Dikmali gum (*Gardenia gummifera*) etc. Collection of gums in India is mostly done during February to June, as best exudation is possible in the dry season. Collection is also done after the rains i.e. during September to October, as some trees exude in this season only. There are also trees, which exude during both the seasons. Gums inherently being 'low volume & high value produce' can be fruitfully processed to add value to the quality of the finished products fetching much higher returns. In some cases the value additions through primary processing alone bring in three-fold higher returns. Developing products of commercial use at appropriate scale would further augment the returns, provide employment to thousands and considerably increase export earnings for the country. Gujarat, Haryana, Punjab and Rajasthan form the heartland of guar production. Recent price spurt has kindled interest of other States to

take up guar production. China, which is a major importer of guar gum from India, has introduced import duty of 7% and 15% on guar splits and gum respectively. This might affect the Indian exports to that country.

Traditional system of medicine continues to be widely practiced practically all over the world for a number of reasons. Fast population-growth, inadequate supply of branded medicines to the ailing humanity, alarmingly prohibitive cost of modern treatment, adverse side-effects of several allopathic drugs and the ever-increasing resistance to current drugs for serious infectious diseases have led to growing emphasis on the use of plant-materials as a source of medicines for a wide variety of human ailments. However, a sustained time-bound and uninterrupted supply of the source-materials often becomes difficult due to various factors like environmental variations, local cultural practices, diverse geographical distribution, every day increasing labor-cost, non-selection/improper selection of the suitable plant-stock and prevalent exploitative practices of pharmaceutical industry.

A fully integrated approach for the cultivation, conservation and preservation of important plant-species through plant molecular biology, plant-tissue culture techniques, both extensive and intensive research on the rationality and methodology of Ayurvedic practices, isolation of the active constituents and their development into new therapeutics, standardization and validation of known herbal medicines and other related aspects need to be continuously focussed upon. In fact, the time has come when our medicinal discoveries must move in mighty leaps and bounds, if the human race is to be protected and saved from the onslaughts of continuously multiplying maladies. We are not living in a sterile bubble. If we luckily escape one outbreak, there is something new around the corner, waiting in wings.