INTRODUCTION

In order to achieve the best therapeutic effect in the human body, formulations research and development scientists design the suitable and appropriate dosage forms for pharmaceutically active ingredients. To formulate the dosage form, various materials other than the active ingredient, called excipients are necessary to fulfill the various desired characteristics of the final formulation.

Excipients are the fundamental requirements for the formulation scientists to achieve their objectives. Excipients, in brief, can be defined as “the components of a formulation other than the active drug”. International Pharmaceutical Excipients Council of America (IPEC) has defined the excipients as follows.

Pharmaceutical Excipient is any substance other than the active drug or prodrug, which has been approximately evaluated for safety and is included in a formulation system to,

(a) Aid processing of the system during manufacture.

(b) Support or enhance stability, bioavailability or patient acceptability.

(c) Assist in product identification.

(d) Enhance any other attribute of the overall safety and effectiveness of the drug product during storage or use.

The new excipients and modified preparations of existing excipients have been developed and introduced to the pharmaceutical field. These new excipients are found to be very useful for the formulation of various drug delivery systems. In the development of these drug delivery
systems, oral route is the most preferred route because of several advantages adhered to it like ease of manufacture, Patient compliance etc. Hence researchers concentrated their effort mainly on the development of new excipients in the design of oral drug delivery system.

1.1 Natural gums and its significance in the Pharmaceutical dosage forms:

During the last three decades, polymers that swell in an aqueous medium have often been used as excipients for the development of various pharmaceutical dosage forms\(^1\)\(^-\)\(^8\). The swellability of these polymers offers several advantages in designing pharmaceutical dosage forms. These polymers play an important role in the design of fast disintegrating tablets by their rapid swelling nature, causing fast disintegration. In the design of controlled release dosage forms, they retard the drug release by forming a thick retardant gel layer. Swellable polymers that are water insoluble are commonly called as hydrogels where as water soluble are called as hydrophilic polymers\(^9\).

Hydrophilic polymers are broadly divided into three groups\(^10\).

**Cellulose derivatives:** Methylcellulose, Hydroxypropylmethylcellulose, Sodium carboxymethylcellulose, etc.

**Non-cellulose derivatives:** Plant gums such as Karaya gum, Alginates, Chitosan, Agar-Agar and Modified Starch.

**Polymers of Acrylic acid:** Carbopol 934 etc.

Plant gums and mucilages have been known and are in use even from biological times and they seem to have been of commercial value for several centuries, especially in India. These polysaccharides have found wide use in food, textile, paper, paint, ink, cosmetic and
pharmaceutical industries. The natural products are finding their vast applications in the above mentioned industries due to their low cost and the important desirable properties, which they impact to the finished product\textsuperscript{11}.

The word ‘Gum’ was applied originally to plant exudates, which gets thickened and hardened on exposure to air. For this reasons, it had been applied to the water insoluble resins also, along with those, which dissolve in water. These molecules possess high molecular weight and they can either be hydrophobic or hydrophilic in nature\textsuperscript{12}. The hydrophobic gums are hydrocarbons, which include rubbers, synthetic polymers, gum balsam and myrrh, etc. Today, the accepted technical definition\textsuperscript{13} of ‘Gum’ most commonly used in industry refers to plant or microbial polysaccharide that can be dissolved or dispersed in water to give viscous or mucilaginous solution or dispersion. Commercial gums are used as thickeners, water retention agents, emulsifiers, emulsion stabilizers, suspending agents and viscosifying agents.

Gums may be classified according to their behavior towards water or based on their origin.

**1.2 Classification of gums basing their behavior towards water\textsuperscript{14}:**

1. Soluble gums including gum Arabic and Cherry gum, which dissolve in water forming transparent solutions.

2. Insoluble gums represented by Tragacanth, Karaya gum, which absorb the aqueous medium, swell in to a jelly, and finally on addition of sufficient water break down into very thick transparent solutions.
3. Half soluble gums like Persian insoluble gum are intermediate in their properties. They partially dissolve in water to form swollen jellies that on addition of more water also pass into solution.

The relationship between forestry and pharmaceutical industry is increasingly recognized. Indian forests are the potential wild source for a large number of non-wood forest products. Proper exploitation of these sources would certainly improve the economy of the country.

Natural gums are promising biodegradable polymeric materials. Many studies were carried out in fields including food technology and pharmaceuticals using gums and mucilages. It is clear that gums and mucilages have many advantages over synthetic materials. Various applications of gums and mucilages have been established in the field of pharmaceuticals. However, there is a need to develop other natural sources as well as with modifying existing natural materials for the formulation of novel drug delivery systems, biotechnological applications and other delivery systems. Therefore, there will be continued interest in natural gums and their modifications aimed at the development of better materials for drug delivery systems.