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CURRENT REVIEW ON HERBAL PHARMACEUTICAL BINDERS

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ABSTRACT

Binders are agents employed to impart cohesiveness to the granules. The researchers are trying to the new excipients for potential use binding agents in table formulation continue to the interest. They have natural binders like starches, gum, mucilage and dried fruits possess binding capacity as well as some other properties like disintegrant, filler, sustain release, modify performance of dosage form, and increase patient compliance. They are very important for the formulation of tablets.

Keywords*:* - Excipient, Binders, Natural and Synthetic Binders, Chitin, Agar, Tragacanth.

INTRODUCTION

The word excipient is derived from the Latin excipere, meaning to 'Except', which is simply explained as 'Other than' .pharmaceutical excipient are basically everything other than the Active Pharmaceutical Ingredient (API).[1]

Excipient	Function	Examples
Binders, compression Aids, Granulating agents	Bind the tablet ingredient together giving from and mechanical strength.	Mainly natural or synthetic polymers e.g. chitin, agar, tragacanth.

Binders:

A substance used to make other substances or materials stick or mix together. A binder or binding agent is any material or substances that holds or draws other materials together a form a cohesive whole mechanically, chemically by adhesion or cohesion. Binders are liquid or dough like substances that harden by a chemical physical or chemical processes and bind fibres, filler power and others particles added into it. Examples of mechanical binders are bond stones in machinery and tie beams in timber framing.

USES OF BINDERS:

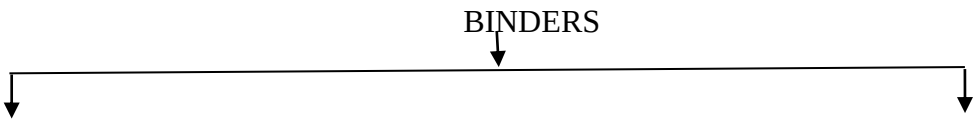
1. Binders are mainly used in painting.

2. Binders are used includes wax, linseed oil, gum Arabic, gum tragacanth, methylcellulose, gum or proteins such as egg white or casein.

3. Various edible thickening agents are used as binders.

4. Explosive, wax or polymers like polyisobutylene or styrene –butadiene rubber are often used in binders for plastic explosives.

- **TYPES OF BINDERS ACCORDING TO THE SOURCE**:



Natural sources

1. Animal source

E.g. Chitin, Chitosan

2. Marine source

E.g. Agar

3. Microbial source

E.g. Dextran, xanthan

4. Plant source

E.g. Tragacanth, Acacia

Synthetic sources

E.g. Methylcellulose,

Ethylcellulose

ADVANTAGES OF NATURAL BINDERS

1. Natural binders are low toxicity, biodegradable, availability and low cost.

2. They can also modify the release of drug, thereby influencing the absorption and subsequent bioavailability of the incorporated drug.

3. They have improve the organoleptic properties of the drugs where necessary in order to enhance patient adherence. [(2)]

4. These are increase stability, precision and accuracy of dosage form.

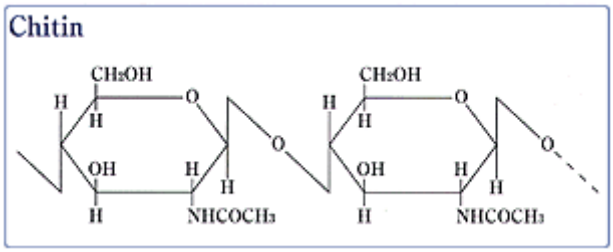
Sr. No.	Name of drug	Synonym	Family	Biological source	Use
1.	Chitin	Polyose, polysaccharide	–	Mycelia of penicillium	Agricultural and Industrial
2.	Agar	Agar-Agar	Gelidaceae	The genus gelidium	Emulsifying agent
3.	Tragacanth	Gum tragacanth	Leguminosae	Stem and branches of astra-galus gumifer	Demulcent, suspending agent

1. CHITIN

It is nitrogen containing polysaccharide which invariably occurs in certain fungi.

- **GEOGRAPHICAL SOURCE:** Arthopod shells are the most easily accessible source of chitin which contains 50% chitin in a dry state.

- **CHEMICAL STRUCTURE-**



- **PREPARATION:** The shells are made into fine powder and treated with 5% HCl for 24 hours to remove the impurities and calcium present in the shell. The above extract is then treated with proteolytic enzyme like pepsin for the remove of protein from the shell. The product is then bleached with acidified hydrogen peroxide for 4-6 hours it is then deactylated at 120^0C with a mixture containing two parts of potassium hydroxide, one part is ethyl alcohol and one part of ethyl glycol the process of deacetylation is continued, the test for acetalization gives report of minimum acetyl content. This deacetylated product is known as the chitosan,

- **CHEMICAL CONSTITUENTS:** Chitins mainly consist of the amino-sugar N-Acetyl glucosamine, which is partially deacetylated. The mostly deacetylated form of chitin is called

chitosan. Chitin is present in nature usually complexed with other polysaccharides and with proteins.

- **USES**

1. Therapeutically it is used in wound healing preparations.

2. When cellular defence mechanism are unable to deals with excessive generation of Ros, this oxidative stress has been reported to induce various pathogenic process incluiding aging, cancer, wrinkle formation, rheumatoid arthritis and inflammation.[4-8]

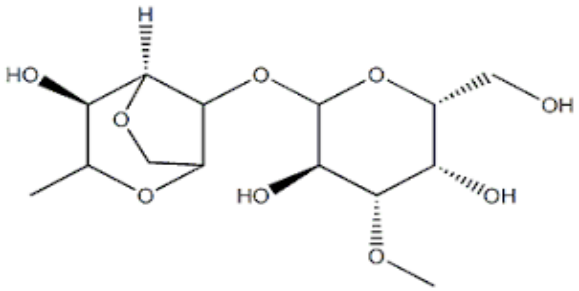
3. It is good inducer of plant defense mechanism for controlling disease.[9]

4. Chitin used in industry in many processes for eg. Potential uses of chemically modified chitin in food processing includes the formation of edible films and stabilize foods and food emulsion.[10-11]

2. AGAR

- **GEOGRAPHICAL SOURCE:** It is produced from Japan, Australia, Newzealand, India, China, Korea, South Africa and Indonesia.

- **CHEMICAL STRUCTURE:**



- **COLLECTION AND PREPARATION:** The algae are collected from May to October in Japan and manufacturing of agar is done in winter. The red algae are grown in the sea, and the supports of the poles on, which they develop. These poles are withdrawn algae is removed, daire, beaten and shaken to remove shell and sand. The algae are bleached by exposure to sunlight or washing with water.

The washing with water removes the associated salts. Then these boiled with acidulated water for few hours mucilaginous mass is filled while hot then cooled. The jelly is formed and cut into bars .these bars are forced through wire netting and strips are formed. These are dried in sunlight and freezing and thawing remove moisture. Finally, agar is dried at 35^0C.

- **CHEMICAL CONSTITUENTS**

1. Agarose (70%): A natural gelatos polymer. It is free from sulphate. The gel strength of agar is due to this component. Agarose are also called as agarobiose consisting alternate residues of 1,4- alpha linked 1,3- beta – D galactose and 3,6 – anhydro-L – galactose.

2. Agaropectine (30%): An acidic sulphonated component wherein 1,3 linked D- galactose and galactouronic acid are partly esterified with sulphuric acid. Aggaropectine comprises 90% and more of sulphur.

- **USES:**

1. It is used as bulk laxative and in chronic constipation.

2. To prepare nutrient media in bacteriological culture.

TRAGACANTH:

• **GEOGRAPHICAL SOURCE:** These are found in southern and eastern areas of Europe. These plants are widely distributed in iron, Afghanistan, Iraq, Syria and India. In India, few species of astragalus are available in Garhwal, Shimla and Kashmir.[9]

• **COLLECTION AND PREPARATION:** Tragacanth plant is small, branching, thorny shrub above 1m in height. Incisions are made on the stem of 2 or 2 year old plant; gum exudes and dried. The shape of gum may be flat, ribbon like or vermiform depending upon the type of incisions. Gum is produced by the transformation of medullary rays and cell wall pith and process is called gummosis. The gum is collected every week and new incisions are made, these gums are collected and packed.

• **CHEMICAL CONSTITUENT:** It contains complex polysaccharides carbohydrates.

1. Water-soluble tragacanthin (30-40%)

2. Water-insoluble bassorine (60-70%)

Tragacanth is turn consist of tragacanth acid (xylose+fructose+galacturonic acid+galactose) and Arabinogalactan+(arabinose+galactose+galactoronic+rhamnose in small quantities). It is also contain 3%starch and cellulose.

- **USES**

1. It is used as a demulcent in cough and cold preparation and to manage diarrhea.

2. It is used as a thickening ‘suspending and emulsifying agents.

3. It is used in adhesion and laxatives.

CONCLUSION

There are large number of natural polymers has been used in pharmaceutical preparation. They have mainly natural or synthetic type of binders can be used. Natural substances like gum, mucilage and dried fruits can be used as binding agent. These are main drugs are used in a binding agent for the formulation tablet.

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