

Seaweed polysaccharides – sources and uses

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Introduction

- Marine microalgae which are popularly termed as Seaweeds belong to the primitive group of non-flowering plants known as Thallophyta.
- Seaweeds are the only source for the manufacture of colloids like agar, algin and carrageenan, which are used in food, chemical and pharmaceutical industries.
- Seaweeds are rich in protein, vitamins, minerals and trace elements.
- They are also used as food, fodder, fertilizer and recently as a source of drugs and therapeutically Important substance.

Commercially important are

A. Agar

B. Alginic acid

C. Carageenan

Agar

- Agar is the major constituent of the cell-wall of certain red algae (*Rhodophyceae*), especially the members of families *Gelidiaceae*, *Gelidiellaceae* and *Gracilariaceae* (*Gracilaria edulis*).
- Uses:
 - a vegetarian gelatin substitute
 - a thickener for soups, in jellies, ice cream and as a clarifying agent in brewing.
 - In fish and meat processing industry, agar is applied for canned products, as a protective coating against the effect of metal containers and against shaking during transport of these products

- food technology agar is used for gelling and thickening in the confectionary and bakery industries, as stabilizer for the preparation of cheese and for salad dressings.
- Agar is also employed in paper and textile industries as finishing and sizing agents
- In cosmetic industry agar serves as a constituent of skin creams and ointments.
- agar is used as a laxative for chronic constipation, as drug vehicle and as a substratum for bacterial and fungal cultures

Alginic acid

- Sources: Alginic acid is obtained from brown seaweed species such as *Ecklonia*, *Macrocystis*, *Undaria*, *Laminaria* and *Duruillea* from temperate areas and *Turbinaria*, *Sargassum*, *Cystoseira* and *Harmophysa* from the tropical areas
- **Uses:**
- As a slimming agent, the alginate forms a jelly in the stomach which produces the feeling of saturation in stomach.
- An alginate gauze is used as a blood stopping plaster.
- In pharmaceutical industry alginic acid is used as emulsifiers in watery emulsions with fats, oils and waxes, as fillers in the manufacture of tablets, pills and as base of any ointments, alginate is extensively used.

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- In dental technology, alginates are used for making denture mouldings as well as denture fixatives
- Alginic acid is used in the food industry, for thickening soups and drinks, ice cream, tinned meats and jellies.
- Alginate absorbs water quickly, which makes it useful as an additive in dehydrated products such as slimming aids, and in the manufacture of paper and textiles is used commercially for toothpastes, soaps, fabric printing, and a host of other applications
- It is also used for waterproofing and fireproofing fabrics, as a gelling agent, and cosmetics, and as a detoxifier that can absorb poisonous metals from the blood

Carrageenan

- Carrageenan is a collective term for polysaccharides prepared by alkaline extraction (and modification) from Red seaweed (*Rhodophyceae*).
- *Chondrus crispus*, *Gigartina stellata*, *Iridaea* spp., *Eucheuma alvarezii*, *Kappaphycus* spp. and *Hypnea* spp. are the chief raw materials for extraction of carrageenan.

Uses:

- Carrageenan improves the quality of wheat flour in spaghetti and parotta making
- Carrageenan is used for clarification of beer, fruit juices and other beverages

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- Carrageenan is used for clarification of beer, fruit juices and other beverages.
- In food industry, carrageenan finds its use in bakery, confectionery and for cooking purposes especially in the preparation of condiment products, syrups, ice desserts, cheese etc.
- In cosmetics, carrageenan is applied as stabilizer and thickening agents in tooth- paste, skin ointments and solid air freshners
- It is used extensively in ulcer therapy and for diseases of blood vessels

- In pharmaceutical industry, carrageenan is used as emulsifiers in cod liver oil and emulsions as granulation and binding agents in tablets, cough syrups etc.
- They are widely used in the food and other industries as thickening and stabilizing agents

Thank You