Seaweed Hydrocolloid Production: An Update on Enzyme Assisted Extraction and Modification Technologies - DTU Orbit (13/12/2018)

Seaweed Hydrocolloid Production: An Update on Enzyme Assisted Extraction and Modification Technologies

Agar, alginate, and carrageenans are high-value seaweed hydrocolloids, which are used as gelation and thickening agents in different food, pharmaceutical, and biotechnological applications. The annual global production of these hydrocolloids has recently reached 100,000 tons with a gross market value just above US$ 1.1 billion. The techno-functional properties of the seaweed polysaccharides depend strictly on their unique structural make-up, notably degree and position of sulfation and presence of anhydro-bridges. Classical extraction techniques include hot alkali treatments, but recent research has shown promising results with enzymes. Current methods mainly involve use of commercially available enzyme mixtures developed for terrestrial plant material processing. Application of seaweed polysaccharide targeted enzymes allows for selective extraction at mild conditions as well as tailor-made modifications of the hydrocolloids to obtain specific functionalities. This review provides an update of the detailed structural features of κ-, ι-, λ-carrageenans, agars, and alginate, and a thorough discussion of enzyme assisted extraction and processing techniques for these hydrocolloids.

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