**Extraction and purification of seaweed polysaccharide degrading enzymes and their impact in the food industry.**

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Seaweed [polysaccharides](https://www.sciencedirect.com/topics/food-science/polysaccharides) such as carrageenans, alginates and agars, are the most economically important products utilized from seaweeds and are widely employed in the food, pharmaceutical, textile and cosmetics industries due to their role in gelation and viscosity enhancement. They are also renowned for their broad range of biological properties such as anti-oxidant, anti-coagulant, anti-immunomodulatory and antiviral activities (Xiao et al. 2018). Upon polysaccharide degradation, the produced oligosaccharides experience an enhancement of such activities, leading to efficient industrial applications (Howlader et al. 2021). Although there are several techniques available for polysaccharide degradation (e.g. acid hydrolysis, sonication, radiation and auto hydrolysis), enzymatic degradation is the most efficient technique owing to its considerable advantages as it is specific, rapid and more controllable (Muzyed et al. 2021). On the other hand, marine bacterial species have been serving as the primary source for the extraction and purification of marine polysaccharide-degrading enzymes. In this study, three different polysaccharide degrading enzymes (ι-carrageenase, porphyranase and funoranase) are extracted from *Cellulophaga baltica* and *Zobellia uliginosa*. The enzyme production was maximized by optimization of bacterial fermentation conditions using the one-factor-at-a-time technique, the optimal parameters are as follows: incubation time and temperature, sea salt concentration, and carbon and nitrogen source. The enzymes were purified using ultrafiltration, ammonium sulphate precipitation and anion-exchange chromatography, the molecular weights of purified enzymes are estimated to be around 31 – 41 kDa. Upon biochemical characterization of purified enzymes, an overview of bioactivities by enzymatically degraded polysaccharides (e.g. anti-oxidant, anti-coagulant and anti-bacterial activity) was evaluated to ensure their enhanced application in the food industry.

References

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