

# **Production of Lectins from Marine Algae: Current Status, Challenges, and Opportunities for Non-Destructive Extraction**

## **ABSTRACT**

Marine algae are an excellent source of novel lectins. The isolation of lectins from marine algae expands the diversity in structure and carbohydrate specificities of lectins isolated from other sources. Marine algal lectins have been reported to have antiviral, antitumor, and antibacterial activity. Lectins are typically isolated from marine algae by grinding the algal tissue with liquid nitrogen and extracting with buffer and alcohol. While this method produces higher yields, it may not be sustainable for large-scale production, because a large amount of biomass is required to produce a minute amount of compound, and a significant amount of waste is generated during the extraction process. Therefore, non-destructive extraction using algal culture water could be used to ensure a continuous supply of lectins without exclusively disrupting the marine algae. This review discusses the traditional and recent advancements in algal lectin extraction methods over the last decade, as well as the steps required for large-scale production. The challenges and prospects of various extraction methods (destructive and non-destructive) are also discussed.