

Carrageenan from *Kappaphycus alvarezii* (Rhodophyta, Solieriaceae): Metabolism, structure, production, and application

ABSTRACT

Carrageenan is a polysaccharide derived from red algae (seaweed) with enormous economic potential in a wide range of industries, including pharmaceuticals, food, cosmetics, printing, and textiles. Carrageenan is primarily produced through aquaculture-based seaweed farming, with *Eucheuma* and *Kappaphycus* species accounting for more than 90% of global output. There are three major types of carrageenan found in red algae: kappa (κ)-, iota (ι)-, and lambda (λ)-carrageenan. *Kappaphycus alvarezii* is the most common kappa-carrageenan source, and it is primarily farmed in Asian countries such as Indonesia, the Philippines, Vietnam, and Malaysia. Carrageenan extracted from *K. alvarezii* has recently received a lot of attention due to its economic potential in a wide range of applications. This review will discuss *K. alvarezii* carrageenan in terms of metabolic and physicochemical structure, extraction methods and factors affecting production yield, as well as current and future applications.