

Effect of epiphyte infection on physical and chemical properties of carrageenan produced by *Kappaphycus alvarezii* Doty (Soliericeae, Gigartinales, Rhodophyta)

Abstrak

Epiphytism of filamentous red algae is a serious problem in *Kappaphycus* farms in the Philippines, Indonesia, Malaysia, and Tanzania. The causative organism of epiphyte outbreak has been identified as *Neosiphonia apiculata* (Hollenberg) Masuda and Kogame, but its actual effect on carrageenan quality has not yet been established. Therefore, yield and quality of carrageenan from healthy and infected specimens were examined. Infected specimens showed 20.5 ± 2.5 % DW lower carrageenan yield compared with the healthy seaweed (65.5 ± 4.2 % DW). Infected specimens also had a higher phenolic and fatty acid content, compared with healthy specimens. The carrageenan from the infected seaweed showed 74.5 ± 2.8 % lower viscosity, 52.6 ± 3.6 % lower gel strength, 22.9 ± 1.5 % higher syneresis, and 5 °C higher melting temperature as compared with carrageenan from healthy specimens. FTIR and ¹³C-NMR analysis of carrageenan from infected seaweed did not show any differences in their functionality or carbon atom chemical shift as compared with healthy and standard k-carrageenan. However, size exclusion chromatography showed the infected carrageenan molecular size to be 80 kDa as compared with 800 kDa for the healthy and standard k-carrageenan. These findings prove that infection of *Kappaphycus* by the filamentous red algae epiphyte, *N. apiculata*, reduces carrageenan molecular size and affects the physical properties of the carrageenan.