

## **Effects of Improved Post harvest handling on the chemical constituents and quality of carrageenan in red algae, *Kappaphycus alvarezii* Doty**

### **Abstrak**

Red alga *Kappaphycus alvarezii* Doty is an important commercial species widely cultivated in southeast Asian countries for its polysaccharide, kappa-carrageenan. Common post-harvest handling technique involves sun-drying of harvested seaweed on platforms at the farms. Quantity and quality of carrageenan varies depending on the duration and care taken during the post-harvest handling of the raw seaweed. In this study, dynamics of moisture content, water activity index ( $a_w$ ), carrageenan yield, and carrageenan quality were investigated by subjecting the seaweed to three post-harvest methods: (1) freeze-drying (FD), (2) shade-drying (SD), and (3) direct sun-drying (DSD). Seaweed dried under FD and SD produced high yield (56–58 %), superior gel strength (1,454–1,424 g cm<sup>-2</sup>), high viscosity (57–58 cPs), and low syneresis (15–17 %). But, carrageenan extracted from DSD seaweed gave 28 % lower yield, 38 % lower gel strength, 27 % lower viscosity, and 8–9 % higher syneresis. In addition, gelling temperature and melting temperature of the DSD carrageenan were lower by 4 and 9 °C, respectively. Molecular size analyses of carrageenan extracted from seaweed dried under FD and SD contained carrageenan of 700 KDa (80 %) and 200 KDa (4–10 %). However, carrageenan extracted from DSD seaweed contained smaller carrageenan molecules, 460 KDa (55 %), 210 KDa (25 %), and <100 KDa (20 %). Further, scanning electron microscope images illustrated the severe effects of DSD on the morphology of seaweed cells. Therefore, SD technique was found to be the best post-harvest processing technique that gave quality carrageenan in a high quantity. Due to its simplicity and low cost, it is a practical approach to be practiced in southeast Asian countries.