

The Effectiveness of Sauna Technique on the Drying Period And Kinetics of Seaweed *Kappaphycus Alvarezii* Using Solar Drier

ABSTRACT

A sauna drying technique was designed and imposed. A V-Groove Hybrid Solar Drier (VGHSD) was constructed and tested for drying of seaweeds. Drying of sample seaweed in VGHSD reduced the moisture content from about 90.50% to 38% in 4 days at average solar radiation of about 600W/m² and mass flow rate about 0.056 kg/s. The seaweed moisture content was decreased around 50% within 2 days in the sauna. Kinetic curves of drying of seaweeds are known to use this system. The non-linear regression procedure was used to fit three different drying models. The models were compared with experimental data of red seaweed drying at the daily air temperature average of about 40°C. The fit quality of the models was evaluated using the coefficient of determination (R²), Mean Bias Error (MBE) and Root Mean Square Error (RMSE). The highest values of R² (0.9348), the lowest MBE (0.00131) and RMSE (0.01325) indicated that the Page model is the best mathematical model to describe the drying behavior of sauna dried seaweed. The saving time using this technique was calculated of 57.9% at the average solar radiation of about 500 W/m² and air flow rate of 0.056 kg/s.