ABSTRACT

Kappaphycus alvarezii is considered an important raw material for industrial practices producing high economic value of various derived products. However, the quality of this commodity may vary due to a number of factors, including the areas of cultivation. An analytical UV-Vis Spectrophotometry method coupled with chemometrics was proposed to standardize the red alga based on the level of phenolic compounds. The correlation between UV-Vis spectra and UPLC-PDA results, combined with multivariate calibration of *K. alvarezii* extracts, was analyzed. The extracts were prepared using an ultrasound-based technique and subsequently subjected to UV-Vis spectral measurements at 200-800 nm and UPLC-PDA at 260 and 330 nm. Chemometric techniques, partial least square (PLS), were applied to the acquired data to build a reliable analysis of phenolics in *K. alvarezii* extracts. The result showed that the wavelength combination of 690-600 and 450-380 nm also the wavelength range of 380-200 nm provided a valid method for quantitative analysis of the studied phenolics that belong to hydroxybenzoic acid, hydroxycinnamic acid, and flavonoid with a coefficient of determination (R^2) > 0.96 in calibration and validation models, along with RMSEC and RMSEP value < 8%. The method was then employed to analyze the *K. alvarezii* samples from 13 different cultivation areas. Principle component analysis (PCA) standardized *K. alvarezii* into some groups of geographic origin based on the composition and the level of phenolic compounds.

Keywords: *Eucheuma cottonii*, Method Development, Chemometrics, PLS, PCA.