

Effect of binder on compression characteristics of *Eucheuma cottonii* powder

ABSTRACT

The seaweed *Eucheuma cottonii* contains high levels of essential dietary minerals (Mg, Ca, K, I, Fe, Zn, Cu, Se), dietary fibre, amino acids, antioxidants and omega 3 fatty acids, which make it a good potential health supplement. Although seaweeds have been reported to provide various health benefits, their use in food is limited due to taste. The aim was to evaluate the compression characteristics of *E. cottonii* powder for preparation of tablets used as health supplements. The effects of various pressures applied and different levels of microcrystalline cellulose (MCC) as a binder on the compaction behaviour of *E. cottonii* powder were analysed using the Heckel and the Kawakita and Lüdde equations. The Heckel slope value showed that the mean yield pressure of the tablets decreased as the percentage of binder increased. Tablets with 70% MCC produced the highest tensile strength and the lowest yield pressure values, P_y , which indicated that these tablets deformed plastically and were most compressible. From the Kawakita and Lüdde equation, the tablets with 70% MCC exhibited the highest value for maximum volume reduction and the lowest reciprocal value of the inclination towards volume reduction, which further validated the higher compressibility of the tablets containing this formulation. This study reports the conditions and formulation for the successful development of seaweed tablet for use as health supplement.

Keyword: Tensile strength; *Eucheuma cottonii*; Binder; Compressibility; Powder; Heckel equation; Kawakita and Lüdde equation