ABSTRACT

Red fruit oil (*Pandanus conoideus* Lam.) is a great source of carotenoid pigment for its potential utilization as a coloring agent. In order to preserve carotenoids and improve its stability over storage, encapsulation using freeze drying was performed in this study by using two different carrier agents, maltodextrin (MD) and whey protein isolate (WPI), solely and in blends at different concentrations (1:3, 1:1, 3:1). The oil-in-water emulsion was prepared, subjected to a freeze dryer to form powder, then analyzed for its carotenoid content using spectrophotometry and color by digital image analysis over 4 weeks of storage. The results reported that emulsion-based encapsulation process and freeze drying did not negatively affect the carotenoid content of red fruit oil (RFO) powder. Moreover, no significant difference was observed in carotenoid content between powder samples from different ratios of carrier agents. The carotenoid stability during storage was only observed in freeze-dried RFO powders of MD, MD:WPI (1:3), and WPI. As a pigment, carotenoid concentration in freeze-dried RFO powder could be fairly predicted from its L*a*b* color values. Moderate positive correlation between carotenoid content and b* color coordinate were identified. Overall, this study demonstrates that freeze drying technique and utilization of RFO have a great potential for further production of natural food colorant.

Keywords: *Red fruit oil, natural food colorant, carotenoids pigment, freeze drying, maltodextrin, whey protein isolate, stability*