

## **Production and properties of spray dried *Clinacanthus nutans* using modified corn starch as drying agent**

### **ABSTRACT**

*Clinacanthus nutans* leaves is a medicinal plant with promising therapeutic effect. The objective of this study was to produce *C. nutans* powder using a spray dryer and to evaluate its physicochemical properties, followed by physical observation after 3 months of storage at room temperature ( $21\pm 1^\circ\text{C}$ ). *C. nutans* juice with and without the addition of 5% (w/v) of modified corn starch (MCS) was spray dried at a feed flow rate of 23 rpm, inlet air temperature of  $160^\circ\text{C}$  and outlet air temperature of  $100^\circ\text{C}$ . Results showed that significantly lower ( $p < 0.05$ ) values of water activity, moisture content, flowability, particle size, solubility, wettability and dispersibility times, while significantly higher ( $p < 0.05$ ) values of hygroscopicity, bulk and tapped densities were recorded as compared to the spray dried powder without the addition of MCS. These indicated that MCS as drying agent has significantly improved the powder properties and the physical appearance during storage. Furthermore, produced *C. nutans* powder had a significantly higher ( $p < 0.05$ )  $\text{IC}_{50}$  values, percentage of inhibition and total phenolics content. Also, a strong correlation was observed between total phenolic and antioxidant activity, indicated that encapsulation using MCS successfully protected the thermally sensitive compounds which contributed to high antioxidant activity.

**Keyword:** *Clinacanthus nutans*; Spray drying; Modified corn starch; Powder properties; Storage ability