

Evaluation of *Musa Paradisiaca* Linn. Powder as a Natural Superdisintegrating Agent in Fast Dissolving Oral Films

L.P.N.K. Lokupathirana, G.F. Zuha, H.A.S.J. Hapuarachchi, W.M.D.S.L. Marambe, N.T.B. Dias, S.L.A. Gunawardana*

Department of Pharmacy and Pharmaceutical Sciences, Faculty of Health Sciences, CINEC Campus, Malabe 10115, Sri Lanka.

**gunawardana.shehara@gmail.com*

Superdisintegrating agents are essential in fast-dissolving oral dosage forms to improve the disintegration and dissolution of a medicine. *Musa paradisiaca* Linn. is a natural excipient that has been used in several oral dosage forms for its interesting pharmaceutical properties. This study aimed to evaluate the potential of *M. paradisiaca* as a natural superdisintegrating agent in fast-dissolving oral films. *M. paradisiaca* plant was authenticated by the National Herbarium, Peradeniya. The peeled fresh fruits were sliced and were blended using an electric grinder with distilled water, then filtered through a muslin cloth. The filtrate was treated with citric acid (as the preservative) and allowed to settle overnight. The resulting sediment was filtered, dried at 45 °C for 24 hours and finally ground to obtain a fine powder. Phytochemical composition of this powder was assessed through preliminary screening tests. The pre-formulation studies were performed on this herbal powder according to the pharmacopeial methods. Then, a fast-dissolving oral film was formulated by using *M. paradisiaca* powder as the superdisintegrating agent with several other excipients. The disintegration time of this test formulation was recorded. The plant powder consisted of flavonoids, alkaloids, tannins, glycosides, steroids, glucosides, phenols, saponins, and carbohydrates. The powder particles exhibited a closely spherical shape in microscopic evaluation. The powder yielded bulk density of 0.54 g/cm³, tapped density of 0.79 g/cm³, Hausner's ratio of 0.68, Carr's index of 31.01%, angle of repose of 35.7°, hydration capacity of 1.05 g/cm³, moisture content of 11.75%, and swelling index of 7.14% whereas the sodium starch glycolate standard exhibited 1.25 g/cm³ of hydration capacity and 3.5% swelling index. The disintegration time of the test formulation was 20 ± 5 seconds, which was less than that of a commercially available oral film (86 ± 3 seconds). The study confirms that *M. paradisiaca* powder exhibits higher swelling capacity, lower hydration capacity, and poor compressibility, which makes it a promising natural superdisintegrating agent for fast dissolving oral film dosage forms.

Keywords: Superdisintegrants, oral film, *Musa paradisiaca*, pre-formulation studies