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Formulation and Release Profile of Theophylline Mucoadhesive Granules Using Sodium Alginate, Tragacanth and Combination with Sodium CMC

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ABSTRACT

Theophylline is one of the methylxanthines that possess bronchodilator properties. Medication with theophylline is generally administered every 4-6 hours a day orally. Theophylline is a methylxanthine group that has bronchodilator properties. Medication with theophylline is generally given every 4-6 hours orally. This is not simple for the patient due to the often administration of the drug daily. One strategy to overcome the problem was to make it into mucoadhesive granules. The goal of the research was to obtain mucoadhesive granules that possess mucoadhesive and good release characteristics. A wet granulation method was used to prepare the granules using sodium alginate and tragacanth in concentrations of 1%, 5%, 10%, 15%, and 20% for each concentration of polymer. The formula that possesses fine attachment to the mucous of goat then combined with sodium CMC 1%-10%. Granules evaluation consists of moisture content, wash-off, angle of repose and flowability test, density, porosity and compressibility test, drug content, and release test. The release kinetic profile was then determined. Three formula were obtained that possesses good adhesivity were obtained formula I, II, and III in combination with tragacanth: sodium CMC (15%:8%), sodium alginate: sodium CMC(10%:3%), sodium alginate: sodium CMC (20%:10%) respectively. Results showed that the three formula has good characteristics and release kinetic following Krosmeier-Peppas $n < 0.5$ which mean that the drug is release from the polymer matrices in the Fickian diffuse mechanism.

Keywords: Theophylline, Mucoadhesive granules, Fickian diffuse, CMC Sodium