Synthesis and Characterization of Capsule Shell Formulation Using Konjac Glucomannan as an Alternative Halal Binder

Ilham Ameera Azhar[1], Waheedah Abdul Hakeem[1], Mahani Mahadi[1], Shamima Abdul Rahman[1,*], Nazeefah Abdul Hamid[2], Suraiya Abdul Rahman[3]

[1]*Department of Pharmaceutical Sciences, Faculty of Pharmacy, University of Cyberjaya, Cyberjaya, Selangor, Malaysia*
[2]*Faculty of Medicine and Health Sciences, Universiti Sains Islam Malaysia, Nilai, Negeri Sembilan, Malaysia*
[3]*Halal Science Centre, Faculty of Pharmacy, University or Cyberjaya, Cyberjaya, Selangor, Malaysia*
[*]*Corresponding author: shamima@cyberjaya.edu.my*

Abstract. In accordance with cultural and religious restrictions, certain consumers, notably among Muslims, Hindus, Jews, and vegetarians around the world, are concerned when gelatine used in capsules is produced from animal sources, particularly porcine and bovine. Therefore, an effort to develop halal, plant-based pharmaceutical ingredients and excipients has been made to solve this issue. Less studies have been conducted on Konjac glucomannan in capsule shell production. This research was conducted to screen the antimicrobial property of Konjac glucomannan and to develop alternative plant-based capsule shells from through dipping method which can achieve and fulfill good properties of capsules according to standards. Kirby-Bauer Disk Diffusion method was used to observe the antimicrobial activities of Konjac glucomannan against E. coli and S. aureus. Hard capsule shells were made using formulations such as konjac powder, sorbitol, starch, lactose, and distilled water using a dipping method. The best formulation of capsules was selected and then they were tested using weight variation test, swelling degree test, water content analysis, disintegration test and dissolution test to evaluate their physicochemical properties. Antimicrobial synthetic konjac powder is very minimal and to get optimum results of antimicrobial, extraction of Konjac glucomannan from its plant is needed. There were nine formulations produced, however only three of the formulations were chosen which were formulations F_7, F_8 and F_9. Formulation F_8 was selected as the best formulation as its characterization results fulfill the standard requirement. In a nutshell, the usage of konjac glucomannan as an alternative binder is appropriate in production of capsules with addition of other polymers such as starch and lactose.

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