The Investigation of Pectin Extracted from Melon Rind Used in Capsule Production

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Capsules are a pharmaceutical product used mostly for convenient drug delivery. However, they are used with some restrictions, especially for cancer patients or vegans trying to avoid gelatinous capsule made from meat. Alternative materials are considered as gelatin replacements, but they are usually expensive. Our aim was to explore an inexpensive material that contains optimal properties for use as gelatin substitute. We found that pectin extracted from melon shells abundantly available in our community could effectively serve this purpose. The study contains three major experiments. One is the investigation of optimal conditions for effective pectin extraction from melon shell. we found that the optimal conditions were the use of hydrochloric acid at pH 3 and 80°C for 60 min with 5% SHMP (w/v). The second experiment is the investigation of the properties of extracted pectin including humidity, ash, methoxyl group, polygalactulonic acid, and other functional groups. We found that the produced pectin shared similar properties, specified by the JECFA, with the standard commercial pectin. The last experiment is the forming of capsules derived from pectin and investigation of their properties. We found that 7% pectin with glycerol was the most suitable concentration for capsule manufacture. The capsules were found to be soft, clear, and strong (based on tensile strength), and it can be easily moved from the molds. Most importantly, the capsule exhibited characteristics suitable for drug delivery. All the findings indicate that the extracted pectin can be effectively used for production of capsule used for medical purposes.