Compaction behaviour and mechanical characteristics of chewable binary tablet mixture containing lactose (Flowlac 100) and date (Phoenix dactylifera) powders

ABSTRACT

This study aimed to develop a formulation for a chewable tablet using date powder (DP) and Flowlac 100 utilizing a direct compression method. The powders were compacted as single and binary mixtures at five different formulations (DPL1, DPL2, DPL3, DPL4 and DPL5) to study their compaction behaviour. Stressor ranging from 15 to 74 MPa in a cylindrical die with flat face punches were introduced during the fabrication process, and the mechanical properties (plastic work, elastic work and tensile strength) of formed tablets were investigated. Findings of this study demonstrated that with a high percentage of DP in the formulation resulted in a high reading of plastic work, while a low amount of DP revealed low elastic work. Tensile strength of the tablet, on the other hand, varies with the percentage of DP present and applied pressure used. Formulation with 60% DP (DPL4) displayed the highest tensile strength compared to the other formulations, and it is coherent with industrial preferable tensile strength limit. In conclusion, the current findings could be useful in formulation and fabricating date chewable tablet which can be used as a food supplement by all categories of consumers since it is easy to be consumed by a wide range of age.

Keyword: Binary mixture; Compaction; Date powder; Elastic work; Flowlac 100; Plastic work