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Title:

Evaluation of Date Fruit (Phoenix dactylifera L.) Insoluble Dietary Fibers: Physicochemical, Functional Properties and Their Roles in Postprandial Blood Sugar and Cholesterol Regulation

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Abstract: (Your abstract must use **Normal style** and must fit in this box. Your abstract should be no longer than 300 words. The box will 'expand' over 2 pages as you add text into it.)

Preparation of Your Abstract

1. The title should be as brief as possible but long enough to indicate clearly the nature of the study. Capitalise the first letter of the first word ONLY (place names excluded). No full stop at the end.
2. Abstracts should state briefly and clearly the purpose, methods, results and conclusions of the work.

Introduction: Clearly state the purpose of the abstract
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Results: Present your results in a logical sequence
Discussion: Emphasize new and important aspects of the study and conclusions that are drawn from them

Recently, vast amounts of date fruit pomace, an underexploited by-product of date syrup industry, have been disposed of in landfills, causing environmental and health concerns. However, this pomace holds potential as a valuable source of Insoluble Fibers (IF). Utilizing this resource effectively aligns with sustainable production practices, therefore, a comparative study was conducted to extract and characterize the IF found in date pomace of three Emirati varieties of dates fruit from soft, semi-dry, and dry, i.e., Barhi, Shishi and Neghal, respectively, in comparison with mixed variety pomace using water-based extraction method. The IF yield varied according to the texture categories of date fruit, with Neghal having the highest yield (~10.86%) and Barhi the lowest (~3%). The fiber thermal properties also indicate similar findings, with Neghal exhibiting the highest endothermic temperature (~86°C) compared to the other varieties (~79 - 80°C). The dark fiber colour suggests the presence of pigments due to polyphenol content ranging from 43.9 to 72.3 mg GAE/ mL. Additionally, Neghal demonstrated superior antioxidant activities in both DPPH and ABTS assays, with average scavenging activities of 86.17% and 94.47%, respectively, highlighting its potential for health applications. The fiber was rich in protein (~7.22 to 10.91 g/100g) and exhibited a relatively high in water holding capacities (4.68 to 7.34 g water/g of IF), oil holding capacity (3.10 to 4.34 g oil/g of IF), and swelling capacity (263.99 to 1048.40 mL/g), demonstrating the potential use as a value-added food ingredient. Further analysis of IF efficacy in regulating blood glucose and cholesterol levels revealed that IF can adsorb both glucose and cholesterol, thereby inhibiting excessive adsorption of these substances. These findings highlight the potential of using date pomace as a sustainable source of insoluble fibers for health-promoting functional foods, particularly in regulating blood glucose and cholesterol levels.