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Fingerprints, Pharmaceutical and Radical Scavenging Activity Evaluation of an Alzheimer-Targeted Herbal Preparation

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Abstract

Background: As the most common form of dementia, Alzheimer disease is characterized by progressive loss of memory and deterioration of cognitive functions. It is predicted that about 75.63 million people would suffer from dementia by 2030. Apart from conventional remedies, the application of herbal medicines is on the rise. There are numerous natural medicaments reported in the traditional manuscript of Persian medicine. Accordingly, in the present study, the intended remedy was selected and an appropriate pharmacognostical and pharmaceutical evaluations were performed.

Methods: By searching through the traditional pharmaceutical manuscripts such as Qarabadeen-e-Salehi, Qarabadeen-e-Azam, Qarabadeen-e-Ghaderi and Canon of Medicine, a simple but proven compound remedy (frankincense and black pepper) was selected. A floating tablet was designed and formulated from those herbal components. Related pharmaceutical assessments such as weight variation, hardness, friability, and disintegration tests as well as pharmacognostical evaluations such as microscopic characterization, TLC, GC/MS, FT/IR fingerprints, and radical scavenging activity assessment (DPPH) were performed.

Results: The resulting formulation, as a floating tablet, included 60% of frankincense gum and 15% of black pepper along with appropriate pharmaceutical ingredients (weight variation: 0.219±0.004 g, hardness: 6.50±0.67, friability: 0.45%, disintegration time >30 min). Microscopic characterization demonstrated stone cells, calcium oxalate crystals, sclereids of endocarp and pitted cells of mesocarp of pepper fruits as well as oil drops of frankincense gum. TLC fingerprinting showed classes of secondary metabolites related to both components. GC/MS analysis revealed Acetyl acetate and trans-Caryophyllene as the main constituent. Moderate radical scavenging activity (IC_{50} >100 µg/ml) was calculated for the methanol extract of tablets.

Conclusion: Carrying out and validating a GC method for standardization of the formulated tablet, and having the structure for the effectiveness of these medicinal herbs in Alzheimer may be the horizon for a new Alzheimer-targeted medicine.

Keywords ● Alzheimer disease ● Frankincense ● Piper nigrum ● Medicine ● Traditional

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