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Investigation of Comparative Bioactivities of Modified Dosage Forms of an Ayurvedic Polyherbal Formulation

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Background: Balabilvashunti decoction (BD) is an ayurvedic polyherbal formulation comprised of three plant ingredients: rhizome of *Zingiber officinale*, whole plant of *Sida alnifolia*, and root bark of *Aegle marmelos*. BD is widely utilized within clinical practice, particularly for addressing geriatric diseases. However, despite its prevalence, patients encounter several limitations when BD is prescribed. These include the substantial time required for decoction preparation, difficulty in finding the correct raw materials due to adulteration and the short shelf-life of the prepared decoction.

Objective: To develop modified dosage forms derived from BD to overcome the existing limitations

Methods: BD was prepared according to the traditional decoction preparation method. From each raw material 20 g was mixed with 1920 mL of water and boiled to reduce the volume up to 240 mL. The resulting liquid is the traditionally prepared BD; it was separately freeze-dried (FD) and spray-dried (SD) to obtain FD powder and SD semisolid dosage forms respectively. Therefore, the three dosage forms were in the form of liquid-BD, powder-FD and semisolid-SD. The bioactivities of the BD were compared with SD and FD focusing on antioxidant activity assessed through 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging activity, and ferric iron reducing power assay (FRAP). Ascorbic acid was used as the standard for DPPH and FRAP assay.

Results: DPPH assay depicted IC_{50} values of 131.88±3.96 µg/mL, 190.23±2.22 µg/mL, 60.6±0.12 µg/mL and 1.17±0.05 µg/mL for FD, BD, SD and ascorbic acid respectively. In the FRAP assay 0.50 absorbance was recorded at concentrations of 2.33±0.24 mg/mL, 5.49±0.85 mg/mL, 3.59±0.40 mg/mL for the BD, SD, BD respectively when compared to ascorbic acid (81.44±7.62 µg/mL)**.**

Conclusions: BD, FD and SD possess significant ($p \leq 0.05$) antioxidant activity. Overall, it can conclude that the modified dosage forms FD and SD may have similar therapeutic effects as BD based on the antioxidant activity.

Keywords: *Antioxidant, Balabilvashunti, Decoction, Freeze-dry, Spray-dry*

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