

## Development and evaluation of herbal wine from fruit of *Punica granatum* (Pomegranate)

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The present study focuses on the formulation, development, and evaluation of herbal wine (HW) from *Punica granatum* (pomegranate) (Pg) fruit, aiming to enhance its nutraceutical potential, antioxidant properties, and fermentation efficiency, and to ensure product quality. HW was prepared using pomegranate as the main ingredient, and spices such as clove, cinnamon, cardamom, and mace as well as orange peel and lime as minor ingredients to enhance the flavor. Controlled fermentation with yeast occurred over 10 days at room temperature. After filtration, it was clarified for 21 days, then separated and aged for two weeks to enhance the flavour, stability, and remove unwanted residues. HW was evaluated for sensory qualities, pH at 27°C, specific gravity, alcohol content, acidity, alkalinity, Total Dissolve Solids (TDS), antioxidant activity determination by DPPH Assay and refractive index. Phytochemical screening and TLC confirmed the presence of bioactive compounds. Antibacterial activity was tested using well and disc diffusion methods against *E. coli* and *Staphylococcus aureus*. Yeast and mold counts were determined. Observations revealed a pH of 3.90 at 27°C, specific gravity of 1.0543, an alcohol content of 6.5% v/v, TDS of 30.06 g/L (9.96%), acidity of 4.16%, alkalinity of 0.015%, antioxidant activity with an IC<sub>50</sub> value of 0.0914 µg/mL. Refractive index value was not detected. Phytochemical screening test revealed the alkaloid, flavonoid, tannins, saponin, glycoside are positive. These findings support the development of nutraceutical herbal wine with therapeutic and commercial viability. Further studies on long-term stability, consumer acceptability, or clinical validation are recommended for broader application.

**Keywords:** *Punica granatum*, Herbal wine, Functional alcoholic beverage, Antioxidant