

Aromatic Profile and Phytochemical Analysis of Comprehensive Fractions in the Aromatic Extraction of Damask Rose

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ABSTRACT

Damask rose (*Rosa damascena* Mill.), the fragrance flower from the Rosaceae family, is renowned for its aromatic fraction, which has application in the cosmetic and medicinal industries. Nonetheless, during the extraction process, several by-products which are generally disposed to the environment. Mon Dang Prasert (MD), Mon Klai Kangwon (MK), and Bishop's Castle (BC) are the most grown varieties in Thailand with the commercial potent. In this work, their aromatic profile was described through SPME-GC-MS. The rose essential oil primarily consisted of phenylethyl alcohol, with concentrations of 1.03% for MD, 1.03% for BC, and 1.31% for MK. This compound is responsible for the characteristic flowery, sweet, rosey, and bready fragrance. Following this is furfural, a compound known for its unique sensory profile, featuring a fresh, fragrant, and almond fragrance. Followed by the conventional extraction process, three different fractions of by-products were produced, namely distilled water (D), hydrosol (H), and rose dreg (R) fractions. Subsequently, the antioxidant properties of these by-products were evaluated. The H fraction exhibited the highest total phenolic content with a value of 10.08, 10.28, and 8.14 mg GAE/g dried sample for MD, MK, and BC samples, respectively. The results were consistent with the total flavonoid content also being highest identified in the H fraction. The H and R fractions demonstrated positive antioxidant activity, as indicated by the results obtained from the DPPH, ABTS, and FRAB assays. The anti-microbial assay of these fractions against *Staphylococcus aureus*, *Propionibacterium acnes*, *S. epidermidis*, *Pseudomonas aeruginosa*, *Escherichia coli* and

Candida albicans illustrated no positive activity of all fractions. Consequently, MK flower provided the strongest intensity of floral fragrance. The antioxidant capacity of the by-product indicated that the H fraction contained significant advantages for antioxidants which rendering it suitable for utilization of such the intermediate material in the production of cosmetic and medicinal products.

Keywords: Antioxidant, Hydrosol, Hydro distillation, *Rosa damascena* Mill., Volatile organic compound