

Effects of Nutrient Source and Drying Methods on Physical and Phytochemical Criteria of Pot Marigold (*Calendula officinalis* L.) Flowers

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Abstract : In order to study the effect of plant nutrient source and different drying methods on physical and phytochemical characteristics of pot marigold (*Calendula officinalis* L., Asteraceae) flowers, a factorial experiment was conducted based on completely randomized design with three replications in Research Laboratory of University of Tehran in 2010. Different nutrient sources (vermicompost, municipal waste compost, cattle manure, mushroom compost and control) which were applied in a field experiment for flower production and different drying methods including microwave (300, 600 and 900 W), oven (60, 70 and 80°C) and natural-shade drying in room temperature, were tested. Criteria such as drying kinetic, antioxidant activity, total flavonoid content, total phenolic compounds and total carotenoid of flowers were evaluated. Results indicated that organic inputs as nutrient source for flowers had no significant effects on quality criteria of pot marigold except of total flavonoid content, while drying methods significantly affected phytochemical criteria. Application of microwave 300, 600 and 900 W resulted in the highest amount of total flavonoid content, total phenolic compounds and antioxidant activity, respectively, while oven drying caused the lowest amount of phytochemical criteria. Also, interaction effect of nutrient source and drying method significantly affected antioxidant activity in which the highest amount of antioxidant activity was obtained in combination of vermicompost and microwave 900 W. In addition, application of vermicompost combined with oven drying at 60°C caused the lowest amount of antioxidant activity. Based on results of drying trend, microwave drying showed a faster drying rate than those oven and natural-shade drying in which by increasing microwave power and oven temperature, time of flower drying decreased whereas slope of moisture content reduction curve showed accelerated trend.

Keywords : drying kinetic, medicinal plant, organic fertilizer, phytochemical criteria

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