

Antioxidants and Antibacterial Properties of Extracts from Leaves and Stem of Pink Flower *Impatiens Walleriana*

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Abstract. *Impatiens walleriana* is a vibrant and flowering plant sources cherished for its antioxidants and antimicrobial properties. This research aimed to evaluate the impact of three different drying treatments (microwave drying, oven drying, and air drying) on the antioxidant compounds of leaves and stems of pink flower *I. walleriana*. Besides, antibacterial efficacy of leaves extract against Gram-positive and Gram-negative bacteria were also evaluated. Microwave-dried leaves extract exhibited high phenolic (6.358 ± 0.18 mg GAE/100g), flavonoid (0.528 ± 0.005 mg QAE/100g) and caffeoylquinic acid contents (0.988 ± 0.012 mg CQCA/100g), followed by oven-dried and air dried. Stem extracts of *I. walleriana* showed relatively less phenolic compound as compared to leaves extract probably due to the plant's defense strategy against environmental stress. Besides, the leaves extract was chosen for antibacterial activity using Kirby-Bauer disc-diffusion method. The results revealed that *I. walleriana* able to suppress growth of both Gram-positive and Gram-negative bacteria. Nevertheless, *I. walleriana* had stronger inhibitory effect against *Escherichia coli* while least inhibitory effect against *Pseudomonas aeruginosa*, with inhibition zone of 6.6 mm and 1 mm, respectively. The antibacterial effect of *I. walleriana* also found superior to streptomycin especially against Gram-negative bacteria. The antibacterial effect of *I. walleriana* against *E. coli* was found to be two times stronger than the synthetic antibiotics. Hence, this indicates that *I. walleriana* had a good potential as an alternative source of antioxidant and antimicrobial and replacing the synthetic additives in current market.

INTRODUCTION

Ornamental flowers are decorative flowers that grow indoors and outdoors. Besides improving the environmental beauty, ornamental plants are also beneficial for a healthy lifestyle and economy. Traditionally, ornamental flowers are widely incorporated in the culinary to enhance flavor, taste and nutritional content of foods [1]. Similar to medicinal plants, some attractive plants including roses, calendula, hibiscus, and marigold are used for medicinal uses as well [2]. Bioactive compounds can exist in different plant segments and their extracts have a therapeutic effect. Nowadays, natural plant-derived metabolites have aroused considerable interest because of their potential beneficial properties and the desire to substitute synthetic additives due to toxicity.

Impatiens walleriana, generally known as "busy Lizzy" or balsam is a well-liked decorative flower. They belong to the family *Balsaminaceae* [3]. The species are native to tropical and subtropical regions such as Malaysia, Indonesia, China, and East Africa [4]. They bloom throughout the years and can be found propagated in moist and humid environments, sometimes along the roads. *I. walleriana* can be found in various shades including pink, red, white, purple, and orange [5]. This herbaceous vegetation can grow to a height of 6 to 24 inches with glabrous, broadly elliptical leaves of 4 to 12 cm long [4].