

**Development of Herbal Infusion and In-vitro Evaluation of Antioxidant and  
Antibacterial Properties Based on Passion (*Passiflora edulis*) Flower**

A dissertation submitted to the

Faculty of Animal Science and Export Agriculture

Uva Wellassa University

In partial fulfillment of the requirements for the award of

Bachelor of Science in Export Agriculture

By

**Yapa Mudiyanseelage Ama Kalana Yapa**

**Export Agriculture Degree Programme**

**Faculty of Animal Science and Export Agriculture**

**Uva Wellassa University of Sri Lanka**

**2019**

## ABSTRACT

Various plant extracts are used in preparation of functional food. Antioxidant and antibacterial properties of plant extracts render immense health benefits to human kind. Although tea made of passion (*Passiflora edulis*) flower is widely used in Asian countries like Japan and China, Passion fruit flower is less studied in the scope of developing products to give antibacterial and antioxidant properties.

This study was undertaken to evaluate the antibacterial and antioxidant properties of passion flower with the intension of including those properties in an herbal infusion so as to convey these properties in a convenient and delicious manner to consumers.

Passion flowers were dried at different combination of temperature (°C) and time (h); 40:08, 45:06 & 55:04 respectively. Optimum temperature and time duration combination for drying passion flowers was selected based on the microbiological properties of dried flowers. Infusion was obtained by brewing dried passion flowers (03) in 150 ml hot water (85°C) for 3 min followed by filtering through 0.45 µm filter under vacuum. Antioxidant activity and antibacterial activity of the infusion were analyzed by DPPH assay and well diffusion techniques respectively. Optimum temperature and duration for drying passion fruit flowers were found to be 55 °C and 4 h respectively. Applying this combination of time and temperature ensured the microbial quality of the product in terms of Total Plate Count, Yeast and Mold Count, *Salmonella enteritis*'s, Coliform and *Escherichia coli* tests. Antioxidant activity (% inhibition) of the passion flower was 91% at 300 ppm concentration.

Passion flower extract possessed intermediate antibacterial properties against *Staphylococcus aureus* and *Escherichia coli*, at high concentrations. ( $10^{-1}$ ,  $10^{-2}$ ) The developed passion flower infusion is rich with antibacterial and antioxidant properties.

Key words: *Passiflora edulis* Herbal infusion, antibacterial property, antioxidant property