

## **Waste Onion Leaves Utilization for Various Food Applications**

<sup>1</sup>Myra G. Borines, <sup>1</sup>Rona Joyce B. Landoy, <sup>1</sup>Rex B. Demafelis, <sup>2</sup>Wilson T. Tan, <sup>1</sup>Jewel A. Capunitan, <sup>1</sup>Lisa Stephanie H. Dizon and <sup>1</sup>Raymund C. Rodriguez

<sup>1</sup>*Department of Chemical Engineering, College of Engineering and Agro-Industrial Technology, University of the Philippines Los Baños, College, Laguna, Philippines 4031*

<sup>2</sup>*Institute of Food Science and Technology, University of the Philippines Los Baños, College, Laguna, Philippines 4031*

### **Abstract**

Onion is considered as one of the most important crops produced worldwide due to its indispensability as a culinary ingredient. In the Philippines, the production areas for onion are estimated to be 17,905 hectares in 2018. With this total area, the country registered a production of 172,666 metric tons of onion. Onion leaves are normally left in the field after harvest of onion bulbs and they are often discarded as waste contributing to the looming environmental crisis caused by agricultural wastes. Realizing the need to develop and expand its local production and provide solutions to specific problems on competitiveness for each stage in its value chain, producing high-value products from onion waste is targeted, thereby minimizing agricultural wastes in onion farming, and providing additional income for farmers. In this study, several packages of technology (POTs) were developed for the processing of waste onion leaves into different food products. Although drying is a preservation technique for herbs such as onions, it is often accompanied by loss of volatiles and bioactive compounds. Hence, the changes in bioactive components of onion leaves in terms of total phenolic content (TPC) and total flavonoid content (TFC), using various dehydration techniques were also evaluated. Results revealed that onion leaves possess flavour, aroma, and bioactive components like onion bulb, making it a potential alternative spice. It has a moisture content of  $92.58 \pm 1.00$  % while its bioactive components such as TPC and TFC were found to be  $633.99 \pm 4.90$  mg GAE per g dry weight and  $10.44 \pm 0.26$  mg Quercetin per g dry weight, respectively. Different dehydration techniques such as sun drying, convection drying, vacuum drying, and freeze drying were also found to have significant effects on preserving bioactive compounds. Since onion leaves are targeted for food applications, pesticide residues in leaves were also analysed. Findings revealed that pesticide traces were below the specified maximum residue level for cypermethrin and lambda-cyhalothrin in onions or shallots, which are 0.1 mg/kg and 0.2 mg/kg, respectively based on the European Union Pesticide Database. The POTs developed for the processing of onion leaves include drying, powdering, pickling, vacuum frying, and juicing. These POTs

produced different food products such as dehydrated leaves, powdered leaves, pickled leaves, vacuum-fried leaves, and onion leaves extract. Consequently, these products were further processed to produce onion leaves-flavoured pandesal (bread), kropek (cracker), noodles, tea, puree, juice, garnish, and seasoning. With the proven potential of onion leaves for food applications, not only the problems in agricultural waste disposal and sustainability are addressed but also its possible significant impact on the profitability of farmers and the onion industry in general.

**Keywords:** bioactives, dehydration/drying, food, waste onion leaves, flavour

### **References**

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