

# THESIS INFORMATION

## INTRODUCTION

Thesis title: **CHEMICAL COMPOSITION, FUNCTIONAL PROPERTIES, ANTIMICROBIAL MECHANISM AND EXTRACTION TECHNOLOGY OF ESSENTIAL OILS FROM *CITRUS* PEELS AND LEAVES**

Major: **FOOD TECHNOLOGY**

Major code: **62.54.01.01**

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## CONTENT

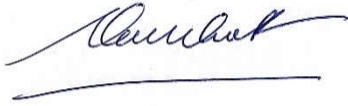
Nowadays, compounds based on natural sources with antimicrobial and antioxidant activities are studied and widely used in food processing and preservation because they are safe for consumers' health compared to synthetics. Having high antimicrobial and antioxidant activities, *Citrus* essential oils are applied in food industry for lengthen the food shelf life and avoid health-related problems. Vietnam is a tropical country with huge production of *Citrus* fruits. Each *Citrus* variety has different characteristics specific to each growing region. A considerable amount of study on the chemical composition and properties of *Citrus* essential oils have been done. However, there are no reports regarding the evaluation of mode of action of Vietnamese *Citrus* oils on bacteria and the evaluation of chemical composition, functional properties of essential oils of multiple *Citrus* varieties in the same study. In addition, the main antibacterial agents of *Citrus* essential oil have not been investigated. Furthermore, the conventional extraction methods of *Citrus* essential oil have some disadvantages that affect the quality of Citrus essential oils. Therefore, the objectives of this study are to study the chemical composition, functional properties, and modes of antibacterial action, to evaluate the main agents responsible for the antibacterial activity of Citrus essential oil in Vietnam, and to optimize extraction conditions to increase the yield with the minimum alterations of the quality of the essential oils.

The novel contributions of the thesis were:

- Providing the data on the composition and functional properties of Vietnamese *Citrus* peels and leaves essential oils systematically to help understanding the nature of the essential oils, thereby effectively using them.
- Definding the mode of action of *Citrus* essential oils on bacteria and the main antibacterial agents of the oils helping the scientists to research the application of *Citrus* essential oils in pharmaceutical industry and food technology, thereby enhancing the potential value of Vietnamese agricultural products.

- Optimizing the conditions of enzyme-assisted extraction of *Citrus* essential oil on a laboratory scale. The technology is considered an eco-friendly extraction technology, maintains the quality of essential oils, and increases extraction efficiency. The result sets up the basic data for further studies on a large scale.

**Scientific supervisors**



**Assoc.Prof.PhD.Pham Van Hung**



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