# KEY FINDINGS

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| **Thesis title:** | **Research on drying, extraction, and evaluation of biological activity of two medicinal plants *Salvia miltiorrhiza* Bunge and *Paris polyphylla* Smith for the application in the functional food development.** |
| **Major:** | Food Technology |
| **Major code:** | 9540101 |
| **PhD Student:** | Tran Thanh Giang |
| **Suervisors:** | Assoc. Prof. Dr. Nguyen Van Tang |
| | Assoc. Prof. Dr. Nguyen Van Hoa |
| **Institution:** | Nha Trang University |

**Key findings:**

1. The thesis identified the most suitable drying method for *Salvia miltiorrhiza* roots as microwave drying at 720 W and for *Paris polyphylla* Smith rhizomes as hot air drying at 60°C. The dried powders exhibited natural color, moisture content < 6.0%, and water activity < 0.5, with total saponin contents and DPPH radical-scavenging activity reaching 32.00 and 27.11 mg escin/g dry matter, and 17.72 and 1.47 mg trolox/g dry matter, respectively.
2. The thesis identified the optimal extraction conditions for *Salvia miltiorrhiza* roots as ultrasound-assisted extraction using 80% (v/v) ethanol, at 40°C for 27 min, with a material-to-solvent ratio of 1/88 (g/mL); and for *Paris polyphylla* rhizomes as microwave-assisted extraction using 80% (v/v) ethanol for 27 min with an irradiation time of 8 s/min. Under these optimal conditions, the total saponin contents and extraction yields reached 68.64 and 65.74 mg escin/g dry matter, corresponding to 86.07% and 82.44%, respectively.
3. The thesis identified the optimal microencapsulation conditions for concentrated extracts of *Salvia miltiorrhiza* root using a wall-material system of maltodextrin/gum arabic/modified corn starch/pectin at a ratio of 5/1/3/1, and of *Paris polyphylla* rhizome at 3/1/5/1, with an extract-to-wall material ratio of 40/60 (dry basis). The microencapsulated powders exhibited high thermal and chemical stability, uniform structure, and effective protection of bioactive compounds, showing strong antimicrobial activity (MIC 10-27.5 mg/mL for *S. miltiorrhiza* and 10-25 mg/mL for *P. polyphylla*) and potent anticancer activity, particularly against SKBR3 cells for *S. miltiorrhiza* ($GI_{50}$ 14.7 µg/mL) and MDA-MB-468 cells for *P. polyphylla* ($GI_{50}$ 6.33 µg/mL).

**Supervisors** **PhD candidate**

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