NEW FINDINGS OF THE DISSERTATION

Dissertation title: Study on chemical constituents and *in vitro* anticancer activity of *Curcuma zedoaroides* Chaveer. & Tanee, Zingiberaceae.

Specialty: Medicinal Materials - Traditional Pharmacy **Code number**: 9720206

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Summary of new findings

The findings of the thesis were published for the first time on *C. zedoaroides*.

1. Chemical Constituents

+ The content and chemical components of essential oils in the rhizome (**EOR**), pseudostem (**EOPS**), and leaf (**EOL**) of *C. zedoaroides* have been determined.
+ Fourteen compounds have been isolated and structurally elucidated from *C. zedoaroides*, including: Phaeocaulisin E (**R1**), (1*R*,4*S*,5*S*,10*R*)-zedoarondiol (**R2**), (1*S*,4*S*,5*S*,10*R*)-zedoarondiol (**R3**), isoprocurcumenol (**R4**), neoprocurcumenol (**R5**), procurcumenol (**R6**), 1-*epi*-procurcumenol (**R7**), aerugidiol (**R8**), curcumenol (**R9**), curcumenon (**R10**), curcuminol E (**R11**), zerumin A (**R12**), curdion (**AP1**), and *β*-sitosterol (**AP2**).
+ The volatile components in the *n*-hexane extracts of the rhizome (**RH**) and aerial parts (**APH**) of *C. zedoaroides* were identified.
+ The (1*R*,4*S*,5*S*,10*R*)-zedarondiol **(R2)** content ranged from 0.017 – 0.071% in the rhizome and aerial parts of *C. zedoaroides*, while curdion **(AP1)** content was 0.322 – 0.502%.

2. Anticancer Activity

+ The rhizome essential oil (**EOR**, IC_{50}: 23.14 – 83.67 µg/mL) and leaf essential oil (**EOL**, IC_{50}: 43.88 – 81.32 µg/mL) of *C. zedoaroides* exhibited weak cytotoxic activity against cancer cell lines *in vitro*.
+ The *n*-hexane extract of *C. zedoaroides* rhizome showed the strongest *in vitro* cytotoxic activity against cancer cell lines (**RH**, IC_{50}: 5.43 – 11.96 µg/mL), while the EtOAc (**RE**, IC_{50}: 7.61 – 11.96 µg/mL) and water extracts (**RW**, IC_{50}: 7.53 – 11.88

µg/mL) had similar activity. In contrast, the *n*-hexane extract from aerial parts was weaker (APH, IC_{50}: 49.76 – 86.30 µg/mL).

+ Ten compounds (**R1**–**R9**, **R11**, and **R12**) exhibited the strongest *in vitro* cytotoxic activity on the A549 cell line (IC_{50}: 3.13 – 13.54 µM). Furthermore, **R2** (IC_{50}: 3.64 – 11.91 µM), **R8** (IC_{50}: 7.22 – 12.03 µM), and **R11** (IC_{50}: 3.13 – 10.98 µM) displayed stronger activity.
+ Aerugidiol (**R8**) increased the expression of p53 and p21 proteins, with the effect on p53 rising with the tested concentration (0.3 – 1 µM). Additionally, aerugidiol (**R8**) showed strong binding affinities for both proteins EGFR (ΔG = -7.209 kcal/mol) and HER2 (ΔG = -8.613 kcal/mol).

Hanoi, October 29, 2024

THE SCIENTIFIC SUPERVISORS **Ph.D. CANDIDATE**

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