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Antioxidative and Antiproliferative Activities of *Lepisorus thunbergianus* (Kaulf.)

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Objectives

Lepisorus thunbergianus (Kaulf.) (LPT) is an evergreen fern on rocks and tree trunks, distributed in East and Southeast Asia (China, Korea, Japan, Taiwan, Indonesia and the Philippines). In this study, the methanol extract and fractions from LPT was investigated for its antioxidant properties and antiproliferative against human breast (MCF-7) and human colon (HCT-116) cancer cell lines.

Materials and Methods

○ Materials

The shade dried whole plant was powdered and extracted with 100% methanol. The crude extract was subfractionated into *n*-hexane, ethyl-acetate(EtOAc), *n*-butanol(BuOH; water saturated) and aqueous fractions. The fractions were then stored under refrigeration for further analysis. For cell studies, the fractions were dissolved in dimethyl sulfoxide (DMSO) as a 10 mg/ml stock solution and diluted as desired directly in the medium. 5-Fluorouracil was dissolved in double distilled water.

○ Methods

The total phenolic and flavonoid content, DPPH redical scaring, reducing power and antiproliferative against MCF-7 and HCT-116 cancer cell lines of LPT were investigated.

Results

In this study, results showed that ethyl-acetate fraction has a high total flavonoid and total phenolic value of 106.59 ± 2.86 mg QE/g and 275.74 ± 1.67 mg GAE/g, respectively. DPPH radical scavenging activity with an IC_{50} of 7.69 ± 0.09μg/ml and significant reducing power among all the extract and fraction, suggesting that LPT is an exceptional source of natural antioxidants. In addition, the antiproliferative activity of hexane fraction was higher than that of methanol extract and others fractions. The findings thus suggest the potential use of this plant as antitumor agent.

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Table 1. The total phenolic, flavonoid contnts and DPPH radical scavenging activity of extract and fractions from *Lepisorus thunbergianus* (Kaulf.)

Fraction	TPC[1)] (mg GAE/g)	TFC[2)] (mg QE/g)	DPPH radical Scavenging activity IC_{50} (μg/ml)
M	106.27±4.96	15.29±0.64	13.59±0.35
H	83.76±4.00	67.28±2.27	23.53±0.28
E	275.74±1.67	106.56±2.86	7.69±0.09
B	150.38±1.92	45.28±1.22	9.30±0.05
W	47.44±8.77	2.76±0.26	17.28±0.23
BHA			6.15±0.08
BHT			13.99± 0.30

1) Total phenolic contnts ; 2) Total flavonoid contnts

M; methanol extract, H; hexane fraction, E; ethyl acetate fraction, B; butanol fraction, W; water fraction

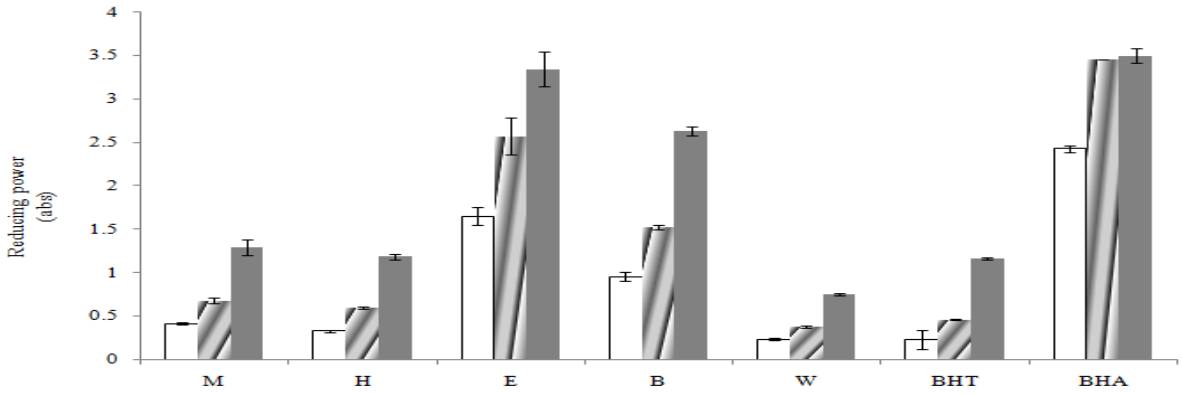

Fig. 1. Reducing power of extract and fractions from *Lepisorus thunbergianus* (Kaulf.). □;Concentration of 0.3 mg/ml, ▨;Concentration of 0.5 mg/ml, ■;Concentration of 1 mg/ml.

M; methanol extract, H; hexane fraction, E; ethyl acetate fraction, B; butanol fraction, W; water fraction

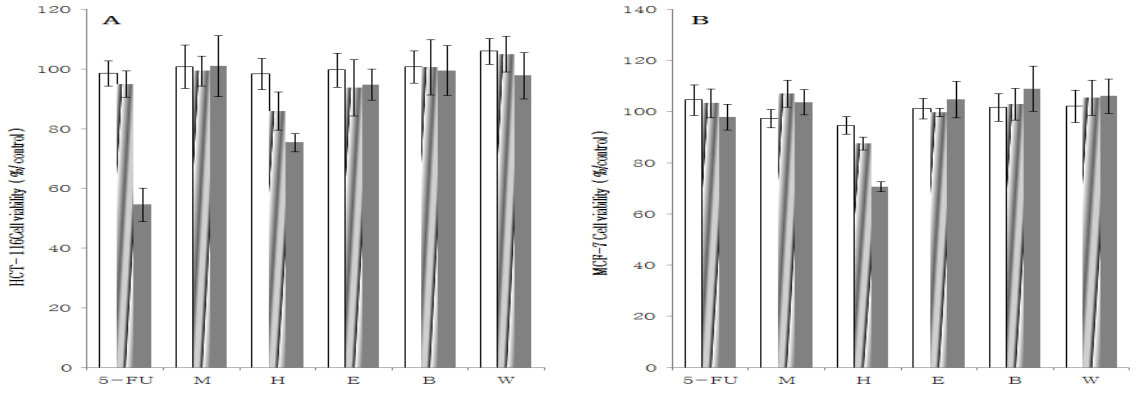

Fig. 2. Cancer cell viability from *Lepisorus thunbergianus* (Kaulf.)

A: HCT-116(Human colon cancer cell) Cell viability; B: MCF-7(Human breast cancer cell) Cell viability

□;Concentration of 10 ug/well, ▨;Concentration of 20 ug/well, ■;Concentration of 50 ug/well.

5-FU, 5-Fluorouracil (positive control), M; methanol extract, H; hexane fraction, E; ethyl acetate fraction, B; butanol fraction, W; water fraction