Title : Antiproliferative Effect of Crude Extract from *In Vitro*-Cultured *Physcomitrium eurystomum* Sendtn. on A549 Human Lung Cancer Cells

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ABSTRACT

Physcomitrium eurystomum Sendtn is a rare funariaceous moss distributed across Europe, India, and Southeast Asia; however, data on its pharmacological properties remain very limited. This study examined the phytochemical composition, antioxidant activity, and antiproliferative effects of a crude ethanol extract from in vitro-cultured *P. eurystomum* against A549 human lung cancer cells, in comparison with normal HEK293 cells.

Moss samples were cultivated in modified hydroponic (MH) medium supplemented with 3% (w/v) sucrose for two months, air-dried at 35 °C, and extracted with 80% ethanol. The extract was then concentrated under reduced pressure. Phytochemical profiling was conducted using LC–MS and HPLC. For HPLC, the mobile phase consisted of deionized water with 0.1% formic acid and acetonitrile with 0.1% formic acid, with detection at 260 nm. Total phenolic content (TPC) and total flavonoid content (TFC) were quantified using the Folin–Ciocalteu and $AlCl_3$ colorimetric assays, respectively. Antioxidant capacity was assessed by the DPPH radical scavenging assay (IC_{50} values), while antiproliferative activity was evaluated using the MTT assay, with doxorubicin as the reference compound. The extract contained diverse bioactive compounds and showed measurable levels of phenolics and flavonoids, together with strong

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antioxidant activity. Moreover, it exhibited dose-dependent antiproliferative effects on A549 cells, with favorable selectivity over HEK293 cells.

These results indicate that *P. eurystomum* extract has promising antioxidant and anticancer potential, justifying further studies on its active constituents and molecular mechanisms for possible applications in oncology and natural product development.

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