

Cytotoxic Activities of Ergosta-4,6,8(14), 22-tetraen-3-one from the Sclerotia of *Grifola umbellata* (Pers.) Pilát

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Grifola umbellata (also known as *Polyporus umbellatus*) is a mushroom that is used as a diuretic in Chinese medicine. Herein, we report on the isolation and identification of a cytotoxic compound from the sclerotia of *G. umbellata*.

For the isolation of the compound, a hexane soluble fraction of the sclerotia of *G. umbellata* was subjected to column chromatography on silica gel and/or Sephadex LH-20 column eluted with organic solvents. The structure of the isolated compound was elucidated using IR, MS, ¹H-, and ¹³C-NMR spectra, and the structure of the compound was determined as ergosta-4, 6, 8 (14), 22-tetraen-3-one (erogone).

Cytotoxic activities of erogone compared to human cancer cell lines, HT-29 (colon cancer), HeLa 229 (cervix cancer), Hep3B (liver cancer), and AGS (stomach cancer) were compared using the XTT assay kit. Erogone inhibited all cell lines as the dose was increased. In the case of Hep3B and HT-29 cell lines, maximal cytotoxic activities of erogone were achieved at the concentrations of 10 and 15 µ/mL, respectively. However, the cytotoxic activities of erogone compared to HeLa 229 and AGS were

much weaker than those of Hep3B and HT-29 cell lines. Values of 50% inhibitory concentrations (IC₅₀) of erogone against Hep3B, HT-29, HeLa 229, and AGS were 5, 7.2, 26.3, and 22 µ/mL, respectively.

Cytotoxic activities of erogone against various tumor cell lines were evaluated in this study for the first time. Therefore, other mushrooms were also examined for the presence of the compound. In the present study, we measured the content of erogone in eight mushrooms—*Grifola umbellata*, *Lentinus edodes* (Berk.) Singer, *Ganoderma applanatum* (Pers.: Wallr.) Pat., *Tricholoma matsutake* (S.Ito et S.Imai) Singer, *Sarcodon aspratus* (Berk.) S.Ito, *Ramaria botrytis* (Pers.) Ricken, *Pleurotus eryngii* (DC.:Fr.) Quél., and *Sparassis crispa* (Wulf.)Fr.—and four mycelia—*Grifola umbellata*, *Lentinus edodes*, *Ganoderma applanatum*, and *Tricholoma matsutake*—using HPLC. The contents of erogone in mushroom and mycelium were in the range of 4.8–29.0 µ/g and 15.5–38.0 µ/g, respectively. Among mushrooms and mycelia tested, the mycelia of *Grifola umbellata* and *Tricholoma matsutake* had the highest amounts of erogone (38.0 µ/g).