Cytotoxic activity of water extracts of two fungal species from nature and submerged cultivation

Kristina D. Atlagić [1], Miroslav Z. Živić [1], Jelena D. Marković Filipović [2], Jovana M. Lukičić [1], Maja A. Karaman [2]

[1] *Institute of Physiology and Biochemistry, Faculty of Biology, University of Belgrade, Belgrade, Serbia*

[2] *Department of Biology and Ecology, Faculty of Sciences, University of Novi Sad, Novi Sad, Serbia*

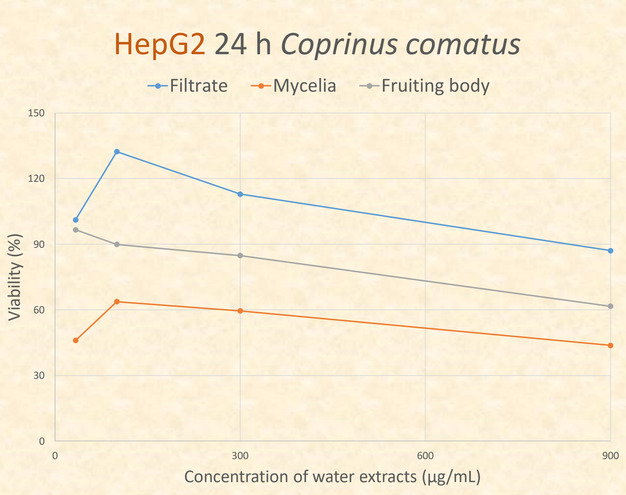
** Corresponding author: kristina.tesanovic@bio.bg.ac.rs*

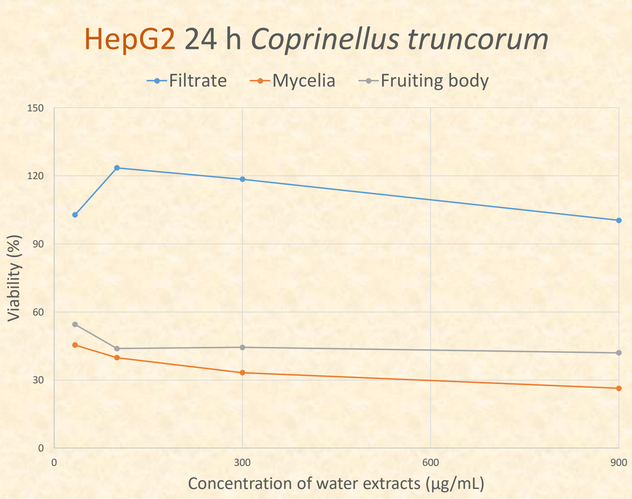
Introduction

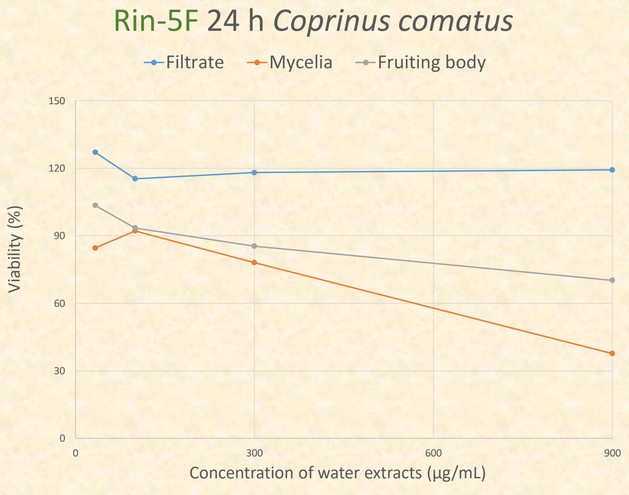
The therapeutic activities of fungi were first documented through traditional medicine practice in China. Fungal fruiting bodies were mainly used in preparation of soups, stew and tea, as hot water extract. Nowadays, numerous of studies are focused on research of medical activities of water fungal extracts – particularly anticancer activity. This study aimed to investigate cytotoxic potential of water extracts of two indigenous edible species *Coprinus comatus* and *Coprinellus truncorum*, towards human hepatocellular (**HepG2**) and rat pancreatic (**Rin-5F**) carcinoma cell lines.

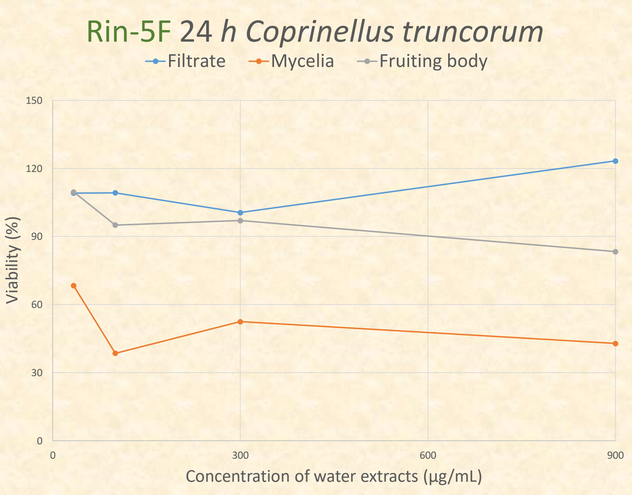
Material and methods

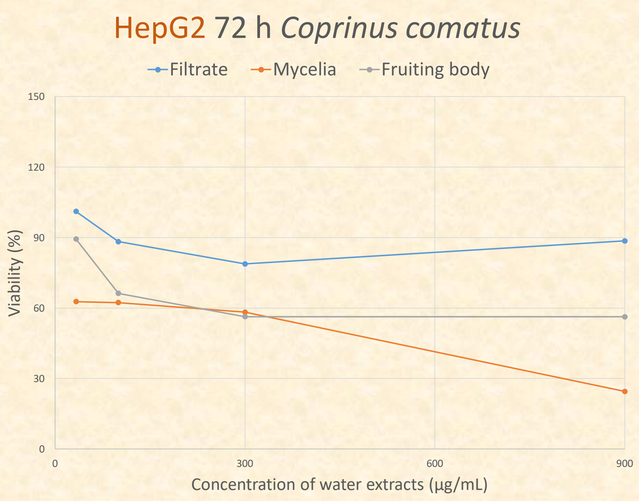
Cytotoxic activity of both species was estimated for fungal fruiting bodies (FB) from nature and submerged cultivated mycelia (M) and extracellular medium - filtrate (F). Mycelia of both fungi were cultivated for 14 days in a fermentation medium (120 rpm at 26°C). Cytotoxicity analysis was determined using a colorimetric MTT assay and fungal extracts were tested in concentration range from 33.33 to 900 µg/mL, for 24 and 72 hours. The cell viability was expressed in percentages (%) after comparison with control (untreated cells), which was 100% viable.

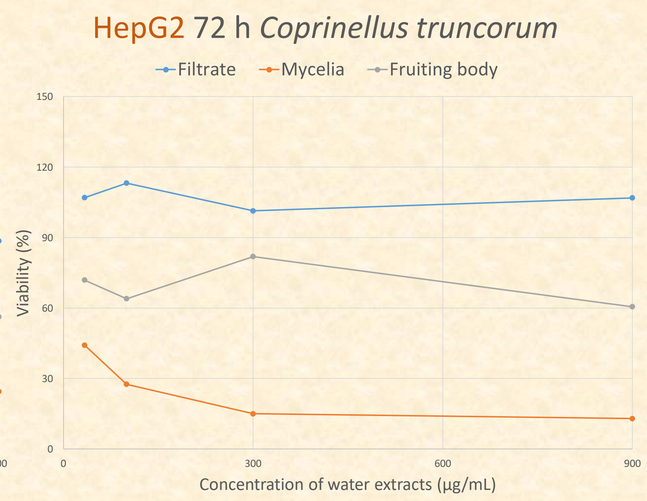


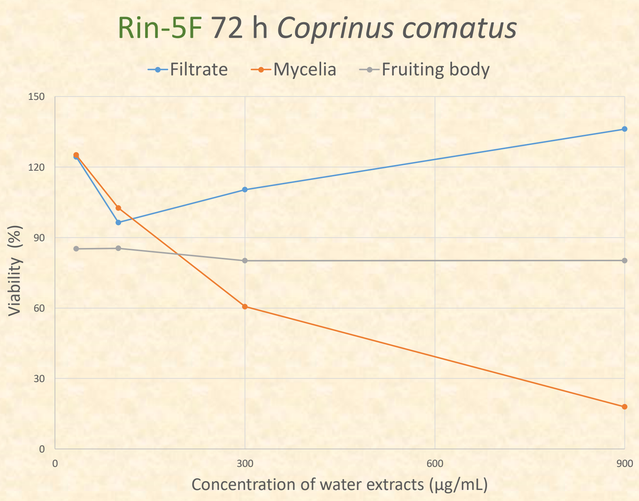


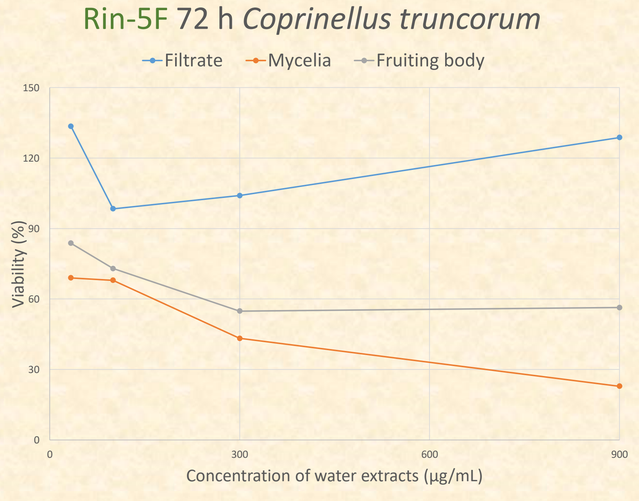












Results and discussion

The above shown diagrams display that the strongest effect on the viability decrease of tested cell lines was expressed by M extract of both species. After 72 hours of treatment, at 900 µg/mL M extracts of *C. comatus* (*C. truncorum*) reduced cell viability to 24% (13%) for HepG2 cells, and to 17% (22%) for Rin-5F cells, respectively. FB and F extracts of both species did not show substantial effect on reducing cell viability. The results indicated that both analyzed M extracts stood out as cytotoxic agents against HepG2 and Rin-5F cancer cell lines. Therefore, submerged cultivation of M represents a sustainable way for producing valuable fungal biomass with bioactive components and antiproliferative activity.

Acknowledgements: This work was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia