Studies on Antitumor Effect and Optimal Production of *Pleurotus ferulae* Fruiting Body

Wol Suk Cha

Dept. of Chemical Engineering, Chosun University, GwangJu 501-759, Korea

TEL:062-230-7218, E-mail:wscha@chosun.ac.kr

Introduction

In recent years, there has been a heightened antitumor material from natural products of the fast-growing field of biotechnology[1]. mushroom characteristically contains many different bioactive compounds with diverse biological activity. Some edible mushrooms have various degrees of immunomodulatory, antitumor and other beneficial or therapeutic health effects without any significant toxicity[2-7]. The cultivation of Pleurotus ferulae is an economically important food industry world wide which has expanded in the past few years. Nutritionally, it have unique flavor and aromatic properties, and they are considerd to be rich in protein, fiber, carbohydrate, vitamins and minerals[8]. So Pleurotus is promising as medicinal and edible mushrooms. In this study, we carried out screening the antitumor materials contained in pleurotus ferulae and artificial cultivation of Pleurotus ferulae fruitbody .

Materials and Methods

Materials-*Pleurotus ferulae*(fruitbody, mycelium)

Methods-Viability of cells<Human Lung Cancer (A549) and Cervical cancer (SiHa, HeLa)>→MTT assay

-Artificial cultivation→Growth Chamber(DS-52G3P)

Results and Discussion

The objective of this study was to screening the materials which have inhibitory effects on cancer cell proliferation contained in *Pleurotus ferulae*. Water and ethanol extracts of *Pleurotus ferulae* fruitbody(PF) and *Pleurotus ferulae* mycelium (PFM) were drying with freeze-dryer and used to water and ethanol extracts of PF and PFM.

As the result, PF ethano extract showed a strong cytotoxic activity against A549 cell lines(Fig. 2). These results suggested that PF ethanol extract contained active materials which have cell proliferation inhibitory effect against A549 cells. This study was carried out to investigate an artificial cultivation conditions of *Pleurotus ferulae*. The optimal concentration of additives for the production of fruting body were 76.4%(w/w) of cotton seed shell, 7%(w/w) of lime, 0.2%(w/w) of KH_2PO_4, 0.2%(w/w) of K_2HPO_4, 0.2%(w/w) of $CaHPO_4$, 4%(w/w) of Corn flour, 5%(w/w) of wheat flour and 7%(w/w) of garlic.

References

1. Cohen R., L. Persky and Y. Hadar (2002), Biotechnological applications and potential of wood-degrading mushrooms of the genus *Pleurotus, Appl. Microbiol. Biotechnol.* **58**, 582-94.
2. deVere White R. W., R. M. Hackman, S. E. Soares, L. A. Beckett and B. Sun (2002), Effects of a mushroom mycelium extract on the treatment of prostate cancer. *Urology* **60**, 640-4.
3. Filipic M., A. Umek and A. Mlinaric (2002), Screening of Basidiomycete mushroom extracts for antigenotoxic and bio-antimutagenic activity. *Pharmazie* **57,** 416-20.
4. Gruter A., U. Friederich and F. E. Wurgler (1990), Antimutagenic effects of mushrooms. *Mutat. Res.* **231,** 243-9.
5. Lakshmi B., T. A. Ajith, N. Sheena, N. Gunapalan and K. K. Janardhanan (2003), Antiperoxidative, anti-inflammatory, and antimutagenic activities of ethanol extract of the mycelium of *Ganoderma lucidum* occurring in South India. *Teratog Carcinog Mutagen* **23**, 85-97.
6. Nakajima A., T. Ishida, M. Koga, T. Takeuchi, O. Mazda and M. Takeuchi (2002), Effect of hot water extract from *Agaricus blazei* Murill on antibody-producing cells in mice. *Int. Immunopharmacol* **2,** 1205-11.
7. Mosmann T. (1983), Rapid colorimetric assay for cellular growth and survival: application to proliferation and cytotoxicity assays. *J. Immunol. Methods* **65**, 55-63.
8. Obodai M, J. Cleland-Okine and K. A. Vowotor (2003), Comparative study on the growth and yield of *Pleurotus ostreatus* mushroom on different lignocellulosic

by-products. *J. Ind. Microbiol. Biotechnol.* **30**, 146-9.

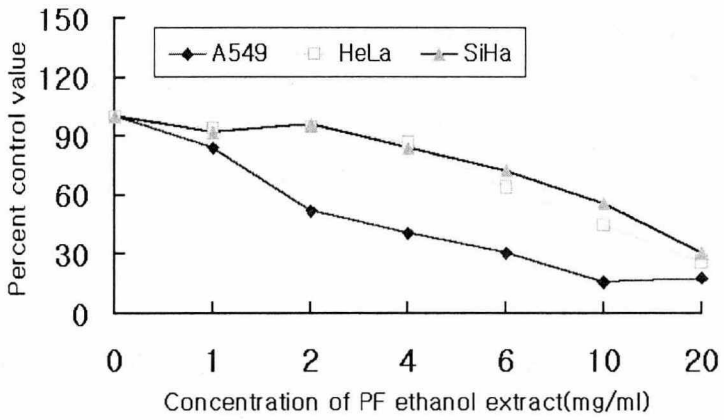

Fig. 1. Effects of ethanol extracts of *Pleurotus ferulae*(PF) on growth of human cancer cells. The cells were incubated with PF ethanol extracts for 2days in culture medium. The cell growth were measured by MTT test. The values represents the mean of triplicate samples.

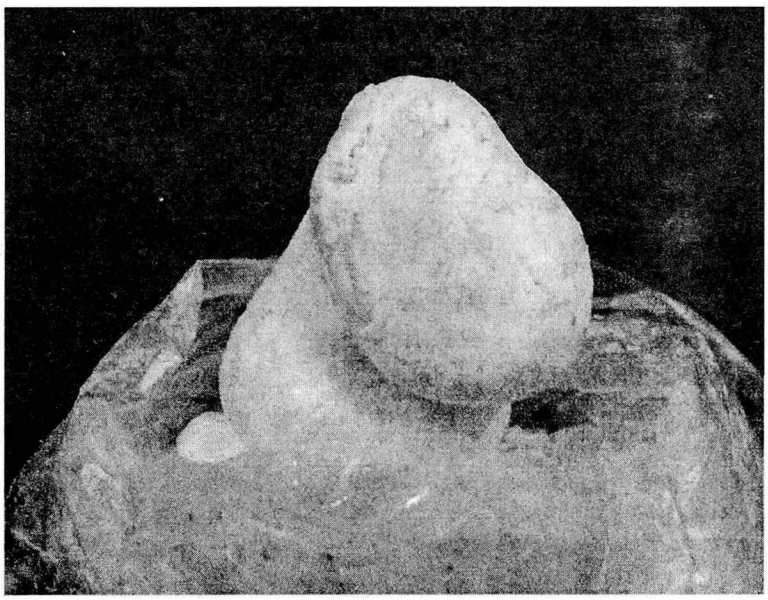

Fig. 2. *Pleurotus ferulae*(PF) fruitbody produced by optimal solid medium.