Extraction, Purification and evaluation of some antitumor compounds from *Pleurotus ostreatus*

By

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ABSTRACT

Student Name: **Lena Ahmed Saleh Al-Faqeeh**

Title of the thesis: **Extraction, Purification and evaluation of some antitumor compounds from *Pleurotus ostreatus***

Degree: **Master of Science (Microbiology)**

A factorial design L18 ($2^1 \times 1^1 \times 3^6$) was used to construct 18 media with different composition and condition, in addition to modified medium containing all the optimum factors for maximizing the proteoglycan production by the edible mushroom *Pleurotus ostreatus*. Media 16, 18 and modified were selected for mycelial proteoglycan study, whereas fruiting bodies grown on rice straw were chosen for fruiting bodies proteoglycan study. Complete purification scheme using ion exchange on DEAE- cellulose and gel filtration chromatography on sephadex G-100 revealed the presence of three peaks in fruiting bodies proteoglycan (FF1, FF2 and FF3) and one main fraction in mycelial proteoglycan (MF1). The FTIR revealed spectra of β-glucosidic bond, OH, C-O and C-O-C stretching bonds and spectra peaks of amide I, II and III. The HPLC analysis of the monosaccharides composition of *Pleurotus ostreatus* proteoglycan indicated the presence of arabinose, fructose, mannose, glucose and galactose in varing ratios among pure fractions. The amino acids analysis of proteoglycans showed the presence of 18 amino acids with leucin being of highest quantity. *In vitro* anticancer assay of the proteoglycans of *P.ostreatus* revealed its potent anticancer activity against cervical carcinoma (HELA), breast carcinoma (MCF7) and larynx carcinoma (HEP2) and to less extend on liver carcinoma (HEPG2) cell line while colon carcinoma (HCT116) was resistant. The crude extracts were more efficient than the pure fractions. *In vivo* assays using head and neck cancer bearing mice indicating that the pure fractions were more necrotic to cancer cells than the crude extracts. For rapid prediction of cancer advancement and healing in head and neck bearing mice, three biological markers were assayed which are plasma catalase, Red blood cells glutathione peroxidase, plasma lipid peroxidase and three

elements which are Zinc, Copper and Selenium. Measurments of these markers in head and neck bearing mice treated with *P.ostreatus* proteoglycans predicted a sign of cancer inhibition or healing.

Keywords: *Pleurotus ostreatus*, cancer disease, anticancer activity, proteoglycan compounds, cancer markers.

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APROVAL SHEET FOR SUMISSION

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Dedication

To the three pillars of my life: my parents, my brothers and sisters for their supporting, understanding and love.

List of Appreviation

EAT	:	Ehrlich ascites tumor
PBS	:	Phosphate buffer saline.
FF1	:	Fruiting bodies fraction 1.
FF2	:	Fruiting bodies fraction 2.
FF3	:	Fruiting bodies fraction 3.
MF1	:	Mycelial fraction 1.
HELA	:	Cervical carcinoma cell line.
MCF7	:	Breast carcinoma cell line.
HEP2	:	Larynx carcinoma cell line.
HCT116	:	Colon carcinoma cell line.
HEPG2	:	Liver carcinoma cell line.
PPI	:	Proteoglycan Production Index
C/P	:	Carbohydrate/Protein.
P/C	:	Protein/Carbohydrate.
H and E	:	Hematoxylin and Eosine stain

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