

Assessment the Cytotoxic Effect and Phytochemical Constituents of Ethyl Acetate Fraction of Iraqi *Cassia glauca* on Esophagus Cancer Cells

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ABSTRACT

Background: Cell lines obtained from cancer cells are usually used in experiments, such as use as a representative to cancer and to come up with a new treatment. The aim of the study: To explore the chemical constituents and assessment the anticancer activity against esophageal adenocarcinoma cell line of *Cassia glauca* (steams, leaves, flowers) parts where no phytochemical study had been done in Iraq on this plant.

Method: (Steams, leaves, flowers) parts of *C. glauca* defatted by maceration in n-hexane. The defatted plant parts were extracted by cold method, the aqueous ethanol 85% used as a solvent for extraction and the extract fractionated by chloroform, ethyl acetate and n-butanol. The ethyl acetate fraction then analyzed by High Performance Liquid Chromatography (HPLC) to investigate its constituents. The MTT assay used to evaluate the anticancer activity by employment 96 well plates, the cell lines implanted by (1×10^4) cells/well. And 24 h later different concentration had been used to treat the SK-GT₄ cell lines. By removing the medium after 72 h of treatment the cell viability was measured, 28 μ L of MTT solution of concentration (2 mg/mL) were added and then the cells were incubated for 1.5 h at 37°C. When the MTT solution where removed any crystals sticked on the walls by addition of 130 μ L of DMSO (Dimethyl Sulphoxide) were solubilized, then another incubation at 37°C with shaking for 15 min. On a micro plate reader at 492 nm (test wavelength) the absorbance where determined.

Conclusion: Plant extract from *C. glauca* ethyl acetate fraction showed very acceptable anticancer activity because it inhibits tumor progression particularly in human esophagus adenocarcinoma cell line. Our results encourage that this plant extract fraction is hopeful as anticancer reagent.

Key words: *Cassia glauca*, Anti-cancer activity, SK-GT-4, HPLC, Phytochemical

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INTRODUCTION

In 2018, the number of esophageal cancer worldwide estimated as 572000 new cases which include 85000 (15%) cases of Esophageal Adenocarcinoma (EAC) [1]. And the burden from EAC is going to increase specially in the high income countries, chiefly among men and by 2030, particularly in the United Kingdom and the Netherlands 1 in 100 are probable to have EAC during their lifespan [2]. And the esophageal cancer is known by its aggressiveness, due to the absence of serosa in the esophageal wall which is a serious factor in spreading of the cancer and makes it pervasive by many pathways including direct extension, hematogenous metastasis and lymphatic spread. Concerning the prognosis as no

anatomical barrier, the tumor diffuse readily into the vicinal organs of the thorax and neck which consist of the trachea, larynx, pericardium, thyroid gland, diaphragm and lung [3]. Thus, an important demand to evolve new, affordable and effective drugs [4]. An extracts from a number of herbal plants had been proved to have anticancer activities both *in vitro* and *in vivo* by several researches [5,6]. Due to enhancement the immune system as improved by many researches [7]. So the natural and herbal products have been rated as precious source for treatment of diseases and malignant and about 60% of drugs at present are used as a cancer medication it is source is the natural products [8,9].

The cassia is one of four large genus of the family leguminosaea (worldwide distribution family and had estimated to 16000 to 19000 species) and amongst the twenty five largest genera of dicotyledonous plants [10,11].

C. glauca is a tall tree, with glabrous branchlets. Leaves distinctly petioled, 1/2-3/4 ft; leaflets ovate, acute or sub-

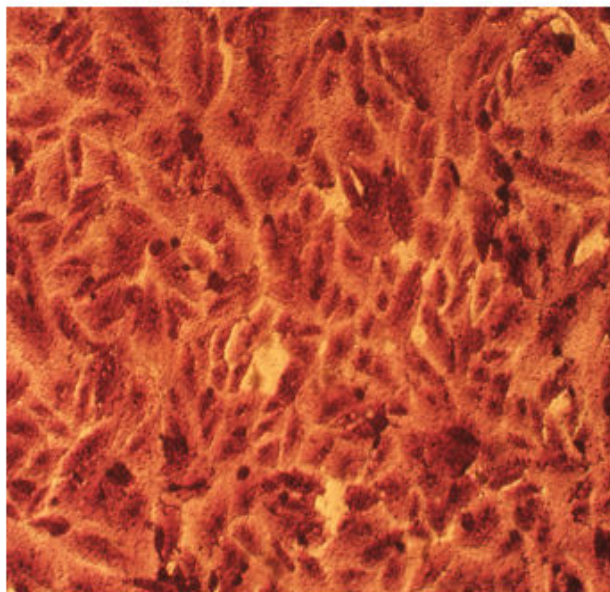


Figure 4: Control untreated SK-GT-4 cells.

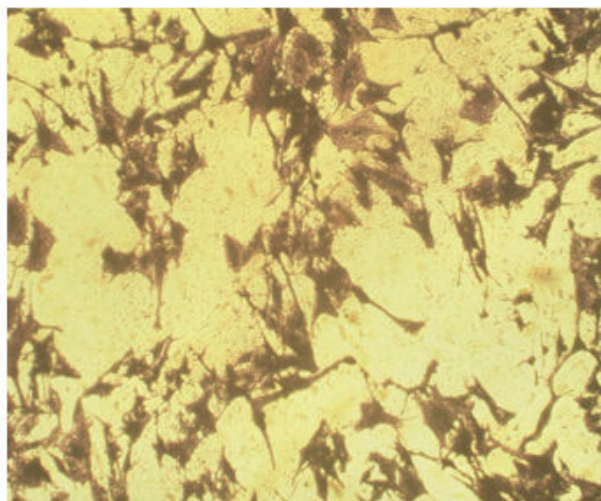


Figure 5: Morphological changes in SK-GT₄ cells after treated with *C. glauca* ethyl acetate fraction.

In spite of many compounds isolated from this plant are being precisely studied for their anticancer activity, it is becoming obvious that the benefit effects of whole plant parts use is because of the synergistic effect of the compounds which present rather than the use of single constituent alone [36,37].

CONCLUSIONS

C. glauca ethyl acetate fraction extract of (stems, leaves, flower) may have promising anticancer activity against EAC. The activity may be related to the flavonoids present in the fraction in addition to synergistic effect.

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