EFFECTS OF THE TOLUENE AND METHANOL EXTRACT OF SENNA (CASSIA ANGUSTIFOLIA VAHL) ON VIABILITY AND PROLIFERATION HELA CELLS

SUMMARY

Senna (Cassia angustifolia Vahl.) is used in food and pharmaceutical technologies as officinal drugs and natural laxative. The aim of the study was to investigate the effect of toluene and methanol Senna extracts on the viability and proliferation of HeLa cells. The senna leaves were extracted in Soxhlet’s extractor and obtained toluene and methanolic extracts were used for determination of effects on viability and proliferation. Cytotoxic effect of different concentrations (0.1%, 0.01%, 0.001% and 0.0001%) extracts was investigated in HeLa cells in vitro. MTT test showed significant cytotoxic activity for toluene extract, especially the concentration of 0.1%, while the tested concentrations methanolic extract did not show cytotoxic activity.

Key words: Cassia angustifolia, viability, proliferation, HeLa cell, MTT, cytotoxic activity.

INTRODUCTION

In recent years, interest in studying the different extracts of traditional medicinal plants as a source of potential cytotoxic activity has been increasing [1,2]. Cassia genus belongs to the family Fabaceae (also called Leguminosae), includes over 700 species which because of therapeutic efficacy are used in medicinal purposes [3,4,5]. Cassia L. and Senna Mill. are commonly used medicinal plants for a broad range of diseases and conditions including constipation, parasitic skin diseases, hypercholesterolemia, hypertension, inflammation, pain relief, and antiplatelet aggregating activity [4,5,6]. Cassia angustifolia is a plant widespread in tropical regions of East Africa and Asia, where it...
The aim of the study was to investigate the effect of toluene and methanol Senna extracts (Cassia angustifolia Vahl) on the viability and proliferation of HeLa cells.

### MATERIAL AND METHODS

Cells. The extracts were tested on the human cervical carcinoma cell line - HeLa. Cells were cultured in Dulbecco’s Modified Eagle’s Minimal Essential Medium (DMEM, PAA Laboratories GmbH) with supplements of 2 mM L-glutamine, 100 µg/ml streptomycin, 100 units/ml penicillin and 10% fetal bovine serum.

Extracts. Toluene and methanol (MeOH) extracts of Senna (Cassia angustifolia) were prepared by extracting finely milled plant leaves in a Soxhlet extractor for 3 hours. After that, the extract was evaporated under reduced pressure in a vacuum evaporator. The toluene and methanol Senna extracts (Cassia angustifolia and cell viability. HeLa cell viability at a concentration of 0.0001% of the extract is 70.70%, which suggested that there was a slight cytotoxic effect. Other concentrations of MeOH extract did not have cytotoxic effect on the cells during the incubation period of 24 hours. The cell viability with the saponin was 17.7%.

### RESULTS

Effects of the toluene and methanol extract of Senna after incubation for 24 hours. Figure 1 shows that cell viability ranges between 23.64% and 89.98%, after 24 hours of incubation with toluene extract of Senna. The 0.1% toluene extract of Senna shows the largest decrease in the viability of HeLa cells (23.64%), while the extract with a concentration of 0.01% shows the weakest effect on cell viability (89.98%). The viability of the cells with methanol extracts, after 24 hours of incubation is in the range of 70.7% to 101.94%. The lowest viability of HeLa cells was manifested MeOH extract concentrations of 0.0001%. The concentration of 0.001% and 0.01% were showed approximately the same effect on the viability of HeLa cells and which was around 100%. The viability of the HeLa cells at a concentration of 0.1% of MeOH extracts was 93.9%. The results do not indicate the existence of a dose relationship between the concentration of methanol extracts of Cassia angustifolia and cell viability. HeLa cell viability at a concentration of 0.0001% of the extract is 70.70%, which suggested that there was a slight cytotoxic effect. Other concentrations of MeOH extract did not have cytotoxic effect on the cells during the incubation period of 24 hours. The cell viability with the saponin was 17.7%.
Effects of the toluene and methanol extract of Senna after incubation for 72 hours. Figure 2 shows the viability of HeLa cells in the presence toluene extract of Senna after 72 hours of incubation. The viability of HeLa cells ranges between 71.10% and 101.51%. The highest reduction of cell proliferation (28.9%) occurs when the concentration of the toluene extract is 0.0001%. All other toluene extracts showed little effect on cell proliferation, while a 0.001% concentration showed an increase in the viability of HeLa cells by 1% in comparison to the negative control. The viability of the cells with methanol extracts, after 72 hours of incubation is in the range of 77.73% to 131.95%. MeOH extract with a concentration of 0.0001% displayed the greatest effect on the reduction of cell proliferation, while cell viability was 77.74%. Concentrations of 0.001% and 0.01% showed an increase in the viability of HeLa cells by about 130%, indicating that the given concentrations of Senna had a pronounced proliferative effect. When the concentration of the MeOH extract of Senna was 0.1%, cell viability amounted to 92.06%, displaying a slight suppression of cell proliferation in comparison to the control group.

After analyzing the impact of toluene and methanol extract of Cassia angustifolia on the viability of HeLa cells, we can conclude the following: Toluene extract with a concentration of 0.1% displayed a high cytotoxicity after 24 hours of incubation, while extracts with lower concentrations were slightly cytotoxic. After 72 hours of incubation, the tested toluene extracts did not inhibit the growth of cells. The tested methanol extracts displayed no cytotoxicity, except in the case of the lowest concentration, which exhibited low cytotoxicity and cytostaticity. Different (toluene and a methanol) extracts of the same plant species have different effects on the viability and proliferation of HeLa cells. The results could contribute to further research and finding new use of Senna, in order to extend the therapeutic indication and use of the chemotherapy but also the treatment of conditions which may find application.

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