

## Cytotoxic Activity of Some Medicinal Plants from Iran

Sahranavard Shamim<sup>1</sup>, Naghibi Farzaneh<sup>1</sup>, Mosaddegh Mahmoud<sup>1</sup>, Davari Elaheh<sup>1</sup>,  
Cheah Yew Hoong<sup>2</sup> and Noor Rain Abdullah<sup>2</sup>

1. *Traditional Medicine & Materia Medica Research Center, School of Pharmacy, Shaheed  
Beheshti University of Medical Science, Tehran, Iran and*

2. *Herbal Medicine Research Center, IMR, Jalan Pahang, 50588, Kuala Lumpur  
E-mail: shamisahranavard@yahoo.com*

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**ABSTRACT** Twenty crude methanolic extracts from medicinal plants used in the Iranian ethnomedicine by traditional healers to treat bacterial and fungal infections, wart and some other disease were screened invitro for cytotoxic activity on MCF7 (human breast epithelium) cell line . The effects of 72h incubation with different concentrations of the extracts on MCF7 cells were determined. Results from MTT assay demonstrated that two plants were cytotoxic.

### INTRODUCTION

Interest in ethnobotany has increased dramatically in recent years. Use of ethnobotanical information in medicinal plant research has gained considerable attention in segments of the scientific community (Ghorbani 2005). Natural crude drug extracts and biologically active compounds isolated from plant species used in traditional medicine can be prolific resources for new drugs (Saetung et al. 2005). Iran has a long medical tradition and traditional learning of plant remedies; on the other hand, cytotoxic screening models are the preliminary methods for selection of active plant extracts against cancer (Al-Fatimi et al. 2007). In the present study we evaluated some plant's cytotoxic activity in order to discover resources for new lead compound structures.

### MATERIAL AND METHOD

#### Plant Material

The selected plants were collected from different localities of Iran (Ghorbani 2005) and identified by qualified botanist (Table1).

#### Extraction

The plant material were dried and then ground and stored. The method for preparing extracts involved stirring the ground plant (10g

in methanol (50ml) over night. The extracts were then concentrated and stored in 4°C until use.

#### Cytotoxic Assay

**MCF7 Cell Culture:** Cells were grown in monolayer cultures in Dulbecco's Modified Eagle's Medium (DMEM) supplemented with 5% foetal bovine serum, 100U/ml penicillin, 10µg/ml streptomycin, and maintained at 37°C in a 5% CO<sub>2</sub> incubator. For testing, cells were washed by PBS (phosphate buffer saline) and harvested by trypsinization and plated (10<sup>4</sup> cell/well) in 96-well plates, and incubated for 24h at 37°C in the incubator. They were exposed to different concentrations of plant extracts and incubated for further 72h. At the end of this period MTT assay as described below was performed (Thabrew et al. 2005).

#### MTT Assay

This assay measures the metabolism of 3-(4,5-dimethylthiazol-2yl)-2,5-biphenyl tetrazolium bromide to form an insoluble formazan precipitated by mitochondrial dehydrogenases only present in viable cells. 50µl of MTT solution was added in each well of the 96-well plate, and plate incubated at 37°C for 4h then medium was removed by aspiration and 200µl DMSO was added per well. The plate was shaken for 30 sec and the absorbance at 570nm measured using ELISA microtiter plate reader. Viability was defined as

**Table 1: Plants used in Iranian ethnomedicine, their families and local name**

<i>Plant species</i>	<i>Family</i>	<i>Local name</i>
<i>Allium paradoxum</i>	Alliaceae	Tareh-sughan
<i>Allium rubellum</i>	Alliaceae	Ajuvah
<i>Chichorium intybus</i>	Astraceae	Sechertghi
<i>Ficus carica</i>	Moraceae	Anjir
<i>Foeniculum vulgare</i>	Apiaceae	Badian
<i>Glycyrrhiza glabra</i>	Fabaceae	Buyan
<i>Hymenocallis elegans</i>	Lamiaceae	Gole-serwaj
<i>Marrubium vulgare</i>	Lamiaceae	Gandna kouhi
<i>Nerium oleander</i>	Apocynaceae	Kar zahreh
<i>Origanum vulgare</i>	Lamiaceae	Kakellik-oti
<i>Ostegia michauxii</i>	Lamiaceae	Kaseh gole kazeruni
<i>Parrotia persica</i>	Hammamelidaceae	Enjili
<i>Proviskia abrotanoides</i>	Lamiaceae	Barazmbel
<i>Rubus sanctus schreb</i>	Rosaceae	Bewersen
<i>Rumex conglomeratus</i>	Polygonaceae	Ghowey-yarfagh
<i>Satureja mutica</i>	Lamiaceae	Kemer-oti
<i>Scutellaria multicaulis</i>	Lamiaceae	Boshghabi por sagheh
<i>Spinacia turkestanica</i>	Chenopodiaceae	Esmanagh
<i>Vitex pseudo-negundo</i>	Verbenaceae	Bangru
<i>Zygophyllum fabago</i>	Zygophyllaceae	Agh-uzarlek

the ratio (expressed as a percentage) of absorbance of treated cells to untreated cells that served as control (Thabrew et al. 2005).

## RESULTS AND DISCUSSION

Extracts of two plants used in traditional medicine in Iran inhibited mitochondrial respiration in MCF7 cells with IC50 less than 50µg/ml. These activity-monitored fractionation to identify active principles.

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