The Effect of Fig Tree Latex (*Ficus carica*) on Stomach Cancer Line

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**Abstract**

**Background:** The therapeutic effect of herbal materials in inhibition of cancer cell growth was shown. This study investigates the effect of fig tree latex (*Ficus carica*) on stomach cancer line.

**Methods:** The *in vitro* effect of different doses of fig tree latex on stomach cancer cell line and the peripheral blood mononuclear cells was evaluated after 72 hours.

**Results:** Fig tree latex could inhibit the proliferation of cancer cell line without any cytotoxic effect on human normal cells. Five mg/ml was the optimum concentration in inhibition of cell line growth.

**Conclusion:** Cancer cell line was more sensitive to *Ficus carica* latex than normal cells. This anticancer activity might be due to presence of its proteolytic enzymes.

**Keywords:** Fig; *Ficus carica*; Stomach cancer cell line; Latex

**Introduction**

Cancer originates from some mutations in transformed cells and other heritable variations in susceptible cells. So far, abnormalities in about 350 genes have been demonstrated in human cancers¹,² and epidemiologically, cancer is responsible for one in eight of worldwide deaths.³ Gastrointestinal tract cancers are considered as the most important causes of global deaths. In 2000, 2.3 million of cancer cases were in alimentary tract presenting in pharynx, oesophagus, stomach and colorectal region. In Fars Province, southern Iran, the annual crude incidence rate and ASR regarding cancer of stomach was reported 2.32 and 3.82 in males while these figures in females were 1.03 and 1.60.⁴ It was shown that neoplasias in digestive organ are mostly due to modification in dietary habits,⁵ and in this relation, plants and herbals as natural products were reported to have anti-cancer properties and even play an important role in the efficacy of chemotherapy.⁶⁻⁷ Different parts of *Ficus carica* (fig) and *Ficus sycomorus* were studied as herbal medicine. Latex is a substance originating from young leaves of fig tree when broken⁸ and has a cysteine proteinase enzyme that is active in a pH range of 6.5-8.5.⁹ Injection of *Ficus carica* latex was shown to change the growth rate of a benz-[a]-pyrene-induced sarcoma and could suppress small tumors in albino rats.¹⁰ Antioxidants and polyphenolic properties of fruits were demonstrated as an anti-inflammatory activity of fruits.¹¹⁻¹⁴ The reports show that polyphenolic component of fruits has an antioxidant, antiinflammatory, antiallergic, antimicrobial and anticancer effect.¹⁵,¹⁶ *Ficus carica* latex and its derivatives have been shown to suppress the growth of transplanted and spontaneous tumors in mice.¹⁷,¹⁸ Therefore in the present study, the therapeutic effect of fig tree latex on stomach cancer cell line and peripheral blood mononuclear cells were investigated in vitro.
Materials and Methods

We collected *Ficus carica* (fig) latex from fig tree in Sari (Iran) drop-by-drop through cutting young leaves of fig tree. Different concentrations of latex were provided including 0.125, 0.25, 0.5, 1, 2.5 and 5 mg/ml. The stomach cancer cell line was provided from National Cell Bank of Iran, NCBI=C-131. $3 \times 10^4$ cells were cultured in liquid medium (RMPI 1640) containing 10\% fetal calf serum, 100 U/L penicillin and streptomycin. The culture flask’s environment was kept at 37°C, with a saturated humidity and 5\% CO$_2$.

A peripheral heparinized blood sample was collected from 3 normal subjects and the mononuclear cells were isolated by centrifugation on a Ficoll histopaque (1.077, Sigma, USA). The cells from the interphase were washed three times with RPMI (1640 medium, Gibco) and counted and their viability was determined by trypan blue. All samples were run triplicates in 96-well plates. Cultures were incubated at 37°C in a humidified 5\% CO$_2$ atmosphere for 3 days and then pulsed with 200 µl 3-[4,5-dimethylthiazolyl]-2,5-diphenyl-tetrazolium bromide (MTT: Sigma) as a color indicator of metabolic activity. The supernatant was harvested for 4 hrs. Later, dimethylsulfoxide (DMSO) was added (200 µl) and the color change was read in an ELISA reader at 630 nm wave length.$^{19}$ Data are presented as mean±SD. For statistical analysis, paired t-test was used.

Results

After 72 h treatment of 1 mg/ml concentration of *Ficus carica* latex in culture media, the mean±SD was 0.23±0.033. In addition, for 2.5 mg/ml was 0.183±0.04 and in the concentration of 5 mg/ml, the mean±SD reached 0.17±0.014. The proliferation level of 1, 2.5 and 5 mg/ml concentrations of *Ficus carica* latex were significantly different from the control (Table1). After 72 h incubation, the effects of various concentrations of *Ficus carica* latex on cancer and normal cells were presented in Figures 1A, 2B and 3C.

![Fig. 1A: Growth of stomach cancer cell line without treatment of *Ficus carica* latex after 72 h.](image1)

![Fig. 1B: Growth inhibition of stomach cancer cell line treated with *Ficus carica* latex (5 mg/ml) after 72 h.](image2)

| Table 1: The effect of Fig tree latex on stomach cancer cell line proliferation in comparison with control in culture media, evaluated by MTT assay (optical density of 630 nm). |
|-----------------|------------------|----------------|
| **Fig concentration (mg/ml)** | **Mean±SD** | **P value** |
| 0.125           | 0.2687±0.06529   | 0.085        |
| 0.25l           | 0.2913±0.08109   | 0.40         |
| 0.5             | 0.3020±0.09627   | 0.463        |
| 1l              | 0.2323±0.03398   | 0.033        |
| 2.5l            | 0.1830±0.04051   | 0.025        |
| 5               | 0.1763±0.01498   | 0.008        |
| Control         | 0.3567±0.02743   |              |
References


13. Potter JD. Cancer prevention:


