Anticancer Effect of *Taraxacum officinale* Flower Extract on Cervical Cancer Cells

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***Abstract*—**These instructions give you guidelines for preparing papers for the Eminent Association of Pioneers (EAP). Use this document as a template if you are using Microsoft Word 6.0 or later. Otherwise, use this document as an instruction set. The electronic file of your paper will be formatted further at Journal of Advances in Computer Networks. Define all symbols used in the abstract. Do not cite references in the abstract. Do not delete the blank line immediately above the abstract; it sets the footnote at the bottom of this column.

***Index Terms*—**About four key words or phrases in alphabetical order, separated by commas.

I. Introduction

Cervical cancer is the fourth most frequent female malignancy worldwide, causing an approximate 266,000 deaths per year in global area. In the recent years, the incidence of cervical cancer is gradually increasing with the trend of patients being young. It is well known that human papillomavirus (HPV) infection is a prerequisite for cervical cancer. Moreover, some other HPV cofactors such as genetic susceptibility, premature sexuality, parity, and tobacco use may also contribute to cervical cancer pathogenesis. [1] Chemotherapy and radiation therapy are among common therapies for cervical cancer treatment. [2], [3] However, phototherapy also have been used for treatment of cancer including cervical cancer. [4]

Taraxacum officinale (Figure I) commonly known as dandelion belongs to family Asteraceae. The common name dandelion is derived from the French dent de leon, meaning "lion's tooth." The herb is similarly named in many Indo-European countries, and also being called "lion's tooth" in German (Löwenzahn) and Spanish (diente de leon). This is possible due to toothed margins of the leaves. Plant is native to Eurasia. Its distribution extends to Asia, Europe, North America to temperate zone of Northern Hemisphere. [5] *Taraxacum officinale* is a tropical Asian medicinal plant which contains taraxasterol and taraxerol in its roots, which are reported to be commercially important anticancer compounds. [6]

Taraxacum officinale is used for medicinal purposes because of its choleretic, diuretic, antioxidative, anti-inflammatory, and anti-carcinogenic properties. [7]

Fig. 1: *Taraxacum officinale* (Dandelion)

According to anticancer effects of Taraxacum officinale (Dandelion), the aim of this study was to investigate the anticancer effects of the plant flower extract on cervicak cancer cells proliferation in cell culture.

II. Material and Methods

Taraxacum officinale was collected from Guilan province, Iran. The flower parts were washed, dried and ground to get powder using a blender. Extractions were performed in a Soxhlet apparatus with ethanol. Hela cells (cervical cancer cell line) were purchased from National Cell Bank of Iran (Pasteur Institute, Tehran, Iran). Cells were grown and incubated in standard situation. Then, cells were sub-cultured into 75cm^2 flasks, 96-well plates or 6-well plates. Cytotoxicity of the extract was assayed using MTT method.

III. Results

Our results showed that exposure of cervical cancer (Hela) cells to 0.2 mg/ml of *Taraxacum officinale* flower hydroalcoholic extract led to significant decrease in cell viability indicating anticancer effects of the extract on cervical cancer cells in cell culture.

IV. Discussion

Our results showed that *Taraxacum officinale* flower hydroalcoholic extract has anticancer effects on cervical cancer

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cells in cell culture. In line with our findings previous studies have shown the anticancer effects of Taraxacum officinale. [6],[7] *Taraxacum officinale* is a wild plant that has been used for centuries as a traditional medicine in the relief and treatment of several diseases. This use is due to the presence of sesquiterpenes, saponins, phenolic compounds, flavonoids, and sugars, among others, found in the organs of the plant. [8]

Taraxacum officinale has also been well-known for its medicinal properties in different cultures. It has been described to treat illnesses such as anemia, cirrhosis of the liver, hepatitis, inflammation, and cancer. It is used in Jordan folk medicine for the treatment of male infertility. [9]

Recent studies show that dandelion-mediated nanoparticles synthesis can represent a novel approach to develop effective antimicrobial and anticancer drugs with a cheap and eco-friendly nature. [10]

Recent in-vitro studies also show the anti-cancer potential of an aqueous dandelion root extract in several cancer cell models, with no toxicity to non-cancer cells. It has also been shown that aqueous dandelion root extract has cancer cell-killing effect on colon cancer cell models.[11]

Studies show that *Taraxacum officinale* extract can induce apoptosis in human hepatocellular carcinoma cells in vitro.[12] It has also been demonstrated that *Taraxacum officinale* root extract has the potential to induce apoptosis and autophagy in human pancreatic cancer cells with no significant effect on noncancerous cells. [13]

The anticancer effects of *Taraxacum officinale* extract comes from the antioxidant and anticancer components found in the extract. *Taraxacum officinale* contains taraxasterol and taraxerol, sesquiterpenes, saponins, phenolic compounds and flavonoids which most of them are reported to have anticancer property. [6], [7], [14] Further research also are required to clarify that by which molecular mechanism/s *Taraxacum officinale* flower extract exerts its anticancer effects on cervical cancer cells in vitro.

V. Conclusion

Our results showed that *Taraxacum officinale* flower hydroalcoholic extract has anticancer effects on cervical cancer cells in cell culture.

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