

Assessment Of Cytotoxic Effect On Tulsi, Aloe Vera And Turmeric Aqueous Formulation

Research Article

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Abstract

Aim: The aim of the study is to assess cytotoxic effect on tulsi, turmeric and aloe vera aqueous extract.**Materials and Methods:** 2g of iodine free salt was weighed and dissolved in 200ml of distilled water. 6 well ELISA plates were taken and 10-12 ml of saline water was filled. To that 10 nauplii were slowly added to each well (20µL, 40 µL, 60 µL, 80 µL, 100 µL and Control). Then the aqueous extract of tulsi, turmeric and aloe vera were added according to the concentration level. The plates were incubated for 24 hours.**Results:** The results are calculated by day 1 and day 2. On day 1, at concentration of 5 µL, 10 µL, 20 µL, 40 µL, 80 µL and Control group the number of nauplii alive was 10. On day 2, at concentration of 5 µL, 10 nauplii alive, at 10 µL 9 nauplii was alive, 20 µL 8 nauplii alive, at 40 µL 8 nauplii alive. At 80 µL 7 nauplii alive and in control 10 nauplii alive.**Conclusion:** We conclude that aqueous extract of tulsi, turmeric and aloe vera proved to have a good cytotoxic effect. In future, this extract can be used as topical therapeutic herbal formulations in management of oral potentially malignant disorders.**Keywords:** Tulsi; Aloe Vera; Turmeric; Nauplii; Cytotoxic Effect.

Introduction

Plants have been the traditional source of raw materials for medicines. The plant species contain biologically active compounds that protect human health.[1, 2] Compounds from plants could act as protective agents with respect to human carcinogenesis, acting against initiation, promotion or progression stages, or destroying/blocking the DNA damaging mutagens, thus avoiding cell mutations.[3] The plant sources of India are likely to provide effective anti-cancer agents. These activities have been co-related to the presence of certain phytochemical substances.[4, 5] Herbs have a vital role in the prevention and treatment of cancer. Drug discovery from medicinal plants has played an important role in the treatment of cancer and indeed, over the last half century most of the plant secondary metabolites and their derivation have been used towards combating cancer.[6] Plants have been a major source of highly effective conventional drugs for the treatment of

many forms of cancer while the actual compounds isolated from the plant frequently may not serve as the drug, they provide leads for the development of potential novel agents. Plant derived natural products have received considerable attention in recent years, due to their diverse pharmacological properties including cytotoxic and cancer chemo preventive effects.[7, 8] The various bio polymers such as tulsi, aloe vera and turmeric are known for their anti-inflammatory and anti-cancerous properties. The plant *Ocimum sanctum*, better known as Tulsi or Holy Basil and belongs to the family Lamiaceae.[9] It can also dry tissue secretions and penetrates into deep tissues and has anthelmintic properties. There are also a number of medicinal properties of tulsi including anti-inflammatory, chemo preventive and carcinogenic, immunomodulatory have been studied and described in previous studies. [10, 11] In Aloe Vera the aloe term originated from the Arabian word "alloe" which means shiny and bitter, vera from the latin language which means true or genuine commonly known

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as a first aid plant because of its rejuvenating, healing or soothing properties.[12] Aloe Vera has vitamins, enzymes, minerals, amino acids, salicylic acids. Aloe vera which promotes wound healing, and also has anti-inflammatory, immune modulatory, and antioxidant properties.[13, 14] Turmeric also called curcumin is derived from the family of curcuma longa. Curcumin is considered to be safe, nontoxic and effective alternative drugs because of its effects on various systems and its therapeutic properties. The curcumin are curcuminoids, which have anti-inflammatory, antioxidant, anti-microbial, neuroprotective, cardio protective and antitumor actions.[15] The aim of the study is to assess cytotoxic effect on tulsii, turmeric and aloe vera aqueous extract.

Materials And Methods

The tulsii, aloe vera and turmeric aqueous extracts are subjected to cytotoxicity analysis using Brine shrimp lethality assay. 2g of iodine free salt was weighed and dissolved in 200ml of distilled water. 6 well ELISA plates were taken and 10-12 ml of saline water was filled. To those 10 nauplii were slowly added to each well (20µL, 40 µL, 60 µL, 80 µL, 100 µL and Control). Then the aqueous extract of tulsii, turmeric and aloe vera were added according to the concentration level. The plates were incubated for 24 hours. The number of live shrimps are counted, the outcome by which the toxicity (or the killing ability) of the compounds are determined. After 24 hours, the ELISA plates were observed and noted for number of live nauplii's present and calculated by using following formula,

$$\text{Number of dead nauplii} / \text{Number of dead nauplii} + \text{Number of live nauplii} \times 100$$

Results

The results are calculated by day 1 and day 2. On day 1, at concentration of 5 µL, 10 µL, 20 µL, 40µL, 80 µL and Control group the number of nauplii alive was 10. On day 2, at concentration of 5µL, 10 nauplii alive, at 10 µL 9 nauplii was alive, 20 µL 8 nauplii

alive, at 40 µL 8 nauplii alive. At 80 µL 7 nauplii alive and in control 10 nauplii alive. This ratio shows that aqueous extract of tulsii, turmeric and aloe vera shows good cytotoxic effect.

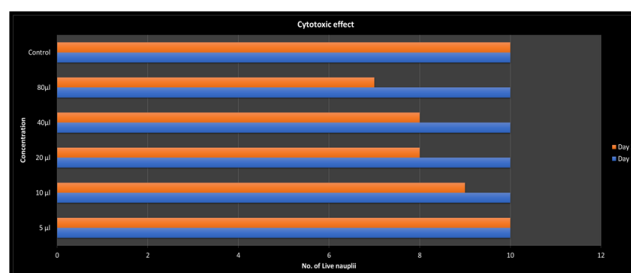
Discussion And Conclusion

In this study, assessing the lethality of the brine shrimp nauplii is one of the most commonplace approaches to determine cellular viability and cytotoxic effects.[16] Tulsii is rich in anti-inflammatory with several benefits such as relieves stress or adaptogen, bolsters immunity, enhances stamina, and promotes healthy metabolism and a natural immunomodulation. Some of the main chemical constituents of tulsii are: oleanolic acid, ursolic acid, rosmarinic acid, eugenol, carvacrol, linalool, β-caryophyllene (about 8%), β-elemene (c.11.0%) and germacrene D (about 2%).[17] Aloe vera is a mannoprotein containing many amino acids known as wound healing hormones. The polysaccharides contained in the gel of the leaves promote wound healing, and have anti-inflammatory, immunomodulatory, antioxidant properties and gastro protective properties. The sterols in the Aloe vera have a strong ability to inhibit inflammation similar to the action of cortisone without any side effects. Turmeric is known to be a strong anti-inflammatory and reduces inflammation. It increases blood circulation and is anti-mutagenic. Turmeric constituents include three curcuminoids such as Curcumin, demethoxy curcumin and bisdemethoxy curcumin. Turmeric, an anti-inflammatory used as a traditional medicine to suppress cellular transformation, proliferation, invasion, angiogenesis and metastasis.[18] The cytotoxic activity of the extracts of *Cocculus hirsutus* on MCF-7 cells from human breast cancer was investigated in vitro 3-(4) 5-Dimethylthiazol-Zyl) - 2,5 biphenyl tetrazolium bromide (MTT). The results showed decreased cell viability and cell growth inhibition in a dose dependent manner. The IC50 value of standard Tamoxifen, methanol extract were 9.3, 39.06 µg/ml respectively. Methanolic extract of *Centaurea aucheri*, *Centaurea pseudoscabiosa* subsp *pseudoscabiosa* and *Primula auriculata* was expected to show more cytotoxic activity against the tumor cells. [19, 20] In this study tulsii, turmeric and aloe vera possess good cytotoxic activity.

Figure 1: Elisa plate containing shrimps at 5µL,10µL,20µL,40 µL and 80 µL.



Figure 2: Cytotoxic effect on day 1 and 2 shows number of live nauplii in 5µL, 10 µL, 20 µL, 40 µL and 80 µL concentrations.



We conclude that aqueous extract of tulsi, turmeric and aloe vera proved to have a good cytotoxic effect. In future, this extract can be used as topical therapeutic herbal formulations in management of oral potentially malignant disorders and also other therapeutic oriented clinical trials due to its good cytotoxic effect. [21-27]

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