

Haloxylon F Salsoloidpae as an Alternative Nanoscience Medicine in Treatment of Cancer

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Abstract

Among screening of many traditional plants we found that some of these medicinal plant of a good efficient and significant value in treatment of cancer specially after extraction of active constituent from their leaves, fruits, stems and roots. Among these, Haloxylon, the activity of these natural materials when mixed with vincristine has shown tremendous result. This potentiation lead to decrease the dose and decrease the side effect of vincristine the structure and tunable surface functionality of these agents allows for the encapsulation of multiple entities may render them ideal drug deliver agents for various anticancer drugs which have ability to arrange excretion mode from body as a function of nanoscale diameter. From these result especially with Haloxylon active constituent may act as a new anticancer drug delivery or a new anticancer drug with high significant activity even with very low doses with low price and available resources from Iraqi desert, thus, this multifunctional unique small nanoparticulate has the potential to detect diseases, deliver medications which could change current scenario of cancer research and could be help in diagnosis at the same time. The extraction of active constituent materials includes alkaloid, flavonoids and terpenoid by using chromatography method (using a thimble of suxlet) with different organic solevents the alkaloid kills the cancer cells and flavonoids with terpenoids act as antioxidant which potentiat the anticancer activity of these natural agents. The significant effect of addition of Haloxylon active ingredient with vincristine in curing the sick cancer cell either potentiation or could act as ideal carrier agent of vincristine to the cancer infected cell so prevent the damage of normal un affecting cell.

Keywords: Cancer; Chemotherapeutic; Chromatography Haloxylon; Vincristine; Alkaloids; Flavonoids; Terpenoid

Introduction

Haloxylon f salsoloidpae medicinal plant is used in old traditional treatments and potentially lead to the development of therapeutics, the medicinal applications include wound healing, gastrointestinal, antiviral and anticancer therapy are to be reasonable. This plant mentioned by Ibn Sina, He described it in Cannon of Medicine [1].

However, these herbs and shrubs relatively cheap and available and their use depend on ancestral experience. These plants represent a great deal of a good reservoirs of drugs and structural diversity of their components make a valuable source of novel compounds. thus, there is a growing interest in the utilization of photochemical and natural product Scientists are intensifying efforts

toward evaluation of these valuable medicinal plant. One of these various families of herbs which deserve to study is Haloxylon an Iraqi deserty shrub and loranthus species etc.

Natural product will continue to be important in three areas of discovery

1. As target for production by biotechnology.
2. As source of new lead compounds of novel chemical structure.
3. As the active ingredients of useful treatments divided from traditional systems of medicines [2].

Figure 1 shows atypical picture of Haloxylon f salsoloidpae



Figure 1

Methods and Results A

Extraction of active ingredient of Haloxylon f salsoloidpae

Take 500 grams dried leaves and follow the following schematic diagram for preparation Halox. extract and fraction of its methanol in figure 2.

Then figure 3 shows a schematic diagram of classification of methods obtaining individual alkaloids.

In figure 4 shows the identification of active constituent.

In figure 5 shows the extraction of triterpen.

On the other hand, figure 6 shows separation of flavonoids.

In figure 7 shows separation of techniques for different categories of the plant constituent.



Figure 2

Table 1 shows the result of extraction, isolation and characterization and assays of active constituent and fractionation and identification of active ingredient of 500 g of dried leaves of Haloxylon f. salsoloidpae which used in the experiment in methods from (Figure 1-7).

Methods and Results B

The Carcinogenic agent used for the infection of rats is mixture of grease + benzene for both dermatologic and systemic infection in addition to aflatoxine from Mushroom and tomato.

Figure 2

Figure 3

Figure 4

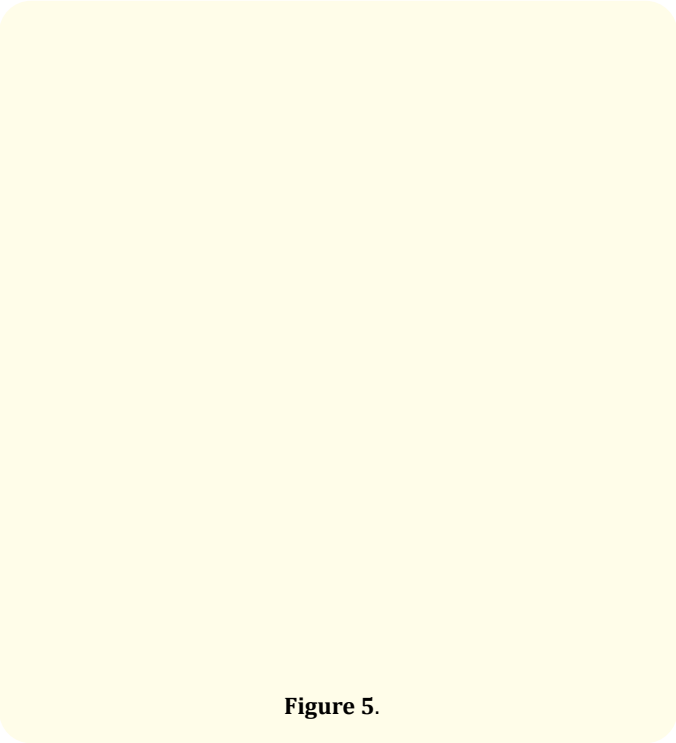


Figure 5.

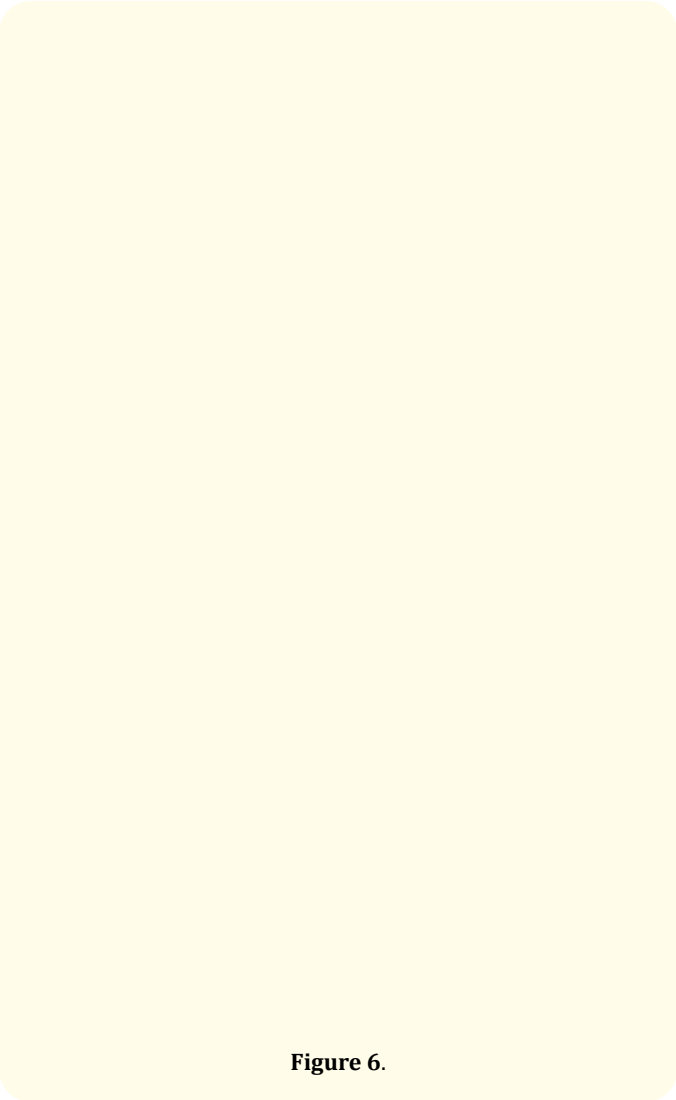


Figure 6.

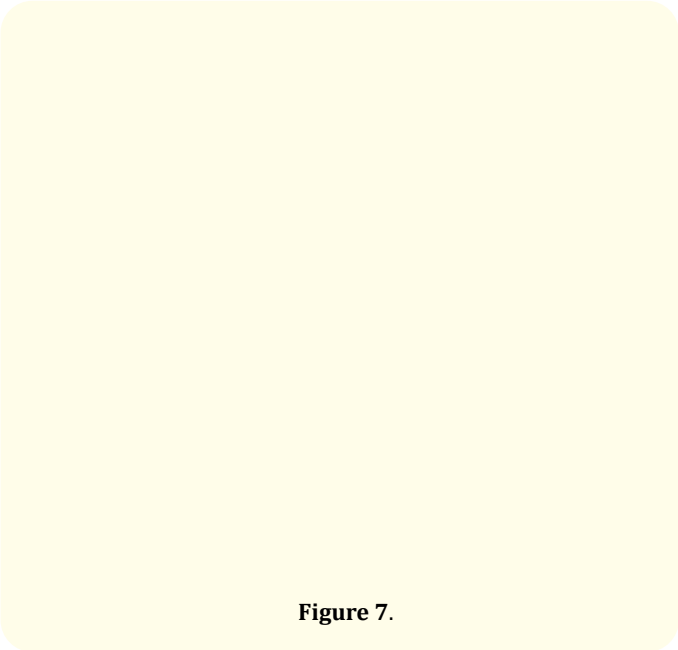


Figure 7.

Flavonoids % w/w	3.7 g
Terpenoids (quercetin and quercitrin) % w/w	1.2 g
Alkaloids % w/w M.Wt. 884.7	4 g

Table 1

60 adult male rats divided into 3 groups each group 20 rat's all groups infected by lymphoma cancer.

Group one given 0.1 mg/kg vincristine sulfate mixed with lactose q.s to make pellet 0.1g/kg the rat taken. All animals fed two pellets per a day for two days and left on normal food for two weeks then repeat the above schedule for three months. Group 2 received 0.1 mg/kg of haloxyalkaloid + flavonoids +terpenoid and mixed with lactose q.s make pellet of 0.1g/kg and tried as the first regimes in group one of treatment. Group 3 received 0.1mg of vincristine + Haloxylon mixture in group 2 and make pellet of 0.1g/kg and tried as in group one of treatment schedule. We got the following result.

Group one which took vincristine 10 cured 5 still sick and 5 died. Group 2 which received Haloxylon mixture 13 alive 3 did not show neurotoxicity 3 still sick and one dead. Group 3 which have taken vincristine and Haloxylon ingredient 16 cured 4 did not show any sign of neurotoxicity no death. In all experiment the animals checked before and after finishing the course of treatment. The checking include all pathological and hematological for lymphoma cancer. The active ingredient extracted from the Haloxylon used in this research in (Table 1).

Discussion

Cancer is one of the major causes of death. The treatment of cancers is unsatisfactory due to certain characteristic of the cancer cells like the capacity for uncontrolled proliferation, invasiveness and metastasis. More over the cancer cells act on cells unlike microbes which mean that the drug destroys both the affected cell and normal cell in addition the cancer cell cheating the drug by insensitivity and resting for a period then can start multiplying again. The main effect of vincristine block mitosis acting on tubulin molecules which fail to polymerize lead to dissolution of the mitotic spindle resulting to cell death which infected. The infected people in Iraq by cancer around 5 million since 2003, 1/3 of million in this year most of them have leukemia's Hodgkin's and lymphoma, wilms tumor and brain tumor. Vincristine used for treatment of lymphoma Hodgkin disease and wilms tumor etc.. it is of plant origin drug have less side effect than others anticancer agent.

In our study we found that Haloxylon medicinal plant contain alkaloid flavonoids and terpenoid in a good level compared with

other traditional anticancer medicinal plant. Haloxylon plant endogenous medicinal plant in Iraq and it does not need sophisticated instrument for extraction of active constituent [9]. In this research presence of flavonoid affecting the immunity they act as immunomodulators also does terpenoid both causes activation of unstimulated lymphocyte this stimulatory effect on lymphocyte proliferation [4].

The flavonoids act as anti-oxidant and neuroprotector [3]. The alkaloid of Haloxylon looks like vincristine blocks mitosis acting on tubulin which fails to polymerize it cause formation of adducts with DNA and result in affecting cell division so affecting the time of S and/or G2 phases resulting in killing the cancer cell [3]. The significant effect of addition of Haloxylon active ingredient with vincristine in curing the sick cancer cell either potentiation or could act as ideal carrier agent of vincristine to the cancer infected cell so prevent the damage of normal un affecting cell [5].

However, this possibility can be clear in figure 8.

Figure 8 show improving cancer treatment.

Figure 8.

This can explain the mechanism of action of Haloxylon active constituent on cancer cells. Still further work needs to be done to elucidate this phenomenon. Any how these results are promising in pharmaceutical and novel drug delivery system.

There is a need for PET-SCAN and nanosophiscated instrument to go further to apply this work on human being [6-8].

Conclusion

Natural products will continue to be important in three areas of drug discovery: a) as a targets for production by biotechnology. b) as a sources of new lead compounds of novel chemical structure. c) as the active ingredients of useful treatments derived from traditional systems of medicine. The extraction of active constituent materials from Haloxylon leaves includes alkaloid, flavonoids and terpenoid by using chromatography method (using a thimble of

suxlet) with different organic solvents the alkaloids kills the cancer cells without affecting the healthy cells and flavonoids with terpenoid act as antioxidant and immunomodulators and act as carrier for alkaloids which potentiate which of these natural agents. These results give us a promising new drug effective cheap, safe with less side effect, not toxic, extract from available desert shrub Haloxylon plant growing in Iraq. On the other hand, the potentiation effect of Haloxylon ingredient on the vincristine action may be resulted due to effect of these agents as ideal nano carrier to vincristine alkaloid these active carriers could be quercetin and quercitrin which found in flavonoids.

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