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Phytochemical screening of some herbal plants (*Menthe, Origanum and Salvia*) growing at al-gabal al-akhder region- Libya

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Abstract

Herbal plants have bioactive compounds which are used for curing of various human diseases and also play an important role in healing. The present study involves three different herbal plants (***menthe, origanum and salvia***). Which locally available at al-gabal al-akhder region of Libya . The leaves and steams of the selected herbal plants were washed, air dried and then powdered. The aqueous extract of leaf and steam samples were used for the phytochemical analysis to find out the constituents in the plants. The main objective of the research work was to check the presence or absence of the phytochemical constituents in all the selected herbal plants. The results of the phytochemical analysis of these herbal plants showed that the Tannins , saponins ,carbohydrate , glycosids were found in both of steams and leaves of the selected plants . On the side the (Sterols , Flvonides and coumarins) were recorded in some plants and absent in the other ones.

Key words: Phytochemical screening , Herbal plants , Libya.

Introduction

The medicinal plants are useful for healing as well as for curing of human diseases because the presence of phytochemical constituents [1]. Phytochemicals are naturally occurring in the medicinal plants, leaves, vegetables and roots that have defense mechanism and protect from various diseases. Phytochemicals are primary and secondary compounds. Chlorophyll, proteins and common sugars are classified as primary constituents and secondary compounds including terpenoid, alkaloids and phenolic compounds [2]. Terpenoids exhibit various important pharmacological activities i.e., anti-inflammatory, anticancer, anti-malarial, inhibition of cholesterol synthesis, anti-viral and anti-bacterial activities [3]. Terpenoids are very important in attracting useful mites and consume the herbivorous insects [4].

Alkaloids are used as anaesthetic agents and are found in medicinal plants [5]. More than thousand herbal products are used for treatment of diabetic patients and also helpful in lowering of glucose level in the blood [6].

The photochemical studies showed that the extracts of the herbal plants have different types of compounds . Many of those compounds were used as medicinal plants in African countries and most of them have shown strong anti-fungal activities [7]. Also they are still used as medicines for centuries [8]. The recent studies have investigated that pomegranates are used for the treatment of a number of diseases e.g., diabetes, dysentery, diarrhea, cough, asthma, bleeding disorders, bronchitis, fever, AIDS, inflammation, ulcers, malaria, prostate cancer, hypertension, atherosclerosis, hyper lipidemia, male infertility, infant brain ischemia and obesity.

Some studies used leaves and fruits in the phytochemical investigations [9]. The phytochemical analysis of the plants is very important commercially and has great interest in pharmaceutical companies for the production of the new drugs for curing of various diseases. It is expected that the important phytochemical properties recognized by our study in the indigenous herbal plants of al-gabal al-akhder (Libya) will be very useful in the curing of various diseases of this region.

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Material and Methods

Sampling :

Selection of medicinal plants for this study:

Three different plants samples were collected from Al-Gabel Al –Kadar Region during summer 2016 Season, The- Samples including: ***(Origanum*** , ***Mentha*** and ***Salvia***)

Samples preparation:

Leaves and steams of every type of Plant were separated and washed with distilled water several times, then dried in open air until dryness .

Phytochemical screening :

The phytochemical screening was carried out on the leaves and steams of the selected plants according to the following methods .

Test for sterols or terpenes : About one gram of dried plant powdered mixed with 10 ml petroleum ether, and then filtered, and the filtrate was evaporated to dryness. The residue was dissolved in 5 ml chloroform. To the filtrate , 0.3 ml acetic anhydride was added, followed by a few drops of concentrated sulphuric acid down the side of the tube, a reddish violet ring was formed at the interface indicating the presence of sterols or terpenes [10].

Test for carbohydrates or glycosides :

About one gram of dried plant powdered extracted with 10 ml ethanol (50%) and filtered. The ethanolic extract was mixed with 0.5 ml alpha naphthol reagent, and then , 1 ml sulphuric acid conc. was carefully poured on the wall of the test tube. A violet ring formed at the interface indicating the presence of carbohydrates or glycosides [11]

Test for tannins :

About one gram of dried plant powdered extracted with 10 ml ethanol (50%) and filtered. The addition of ferric chloride reagent to the filtrate gave a green color, then changed to bluish black color or precipitate, indicating the presence of tannins [11]

Test for flavonoids :

About one gram of dried plant powdered extracted with 10 ml ethanol (50%) and filtered. (a) Five ml from the extract was rendered alkaline with sodium hydroxide (10%). The appearance of a yellow color indicates the probable presence of flavonoids.

(b) Five ml of the extract was mixed with 1 ml conc. hydrochloric acid, and magnesium turning was then added. The presence of red color indicated the presence of flavonones or Flavonols [12]

Test for saponins :

(a) About 5 gram of dried plant powdered was macerated with 20 ml water and filtered. The filtrate was shaken vigorously. A persisting froth for about 30 min. was formed indicating the possible presence of Saponins .

(b) About one gram of the dried plant powdered was extracted with 10 ml ethanol (70%) then filtered. The ethanol extract was evaporated to dryness and the residue was dissolved in 10 ml of normal saline solution. To this solution, 2 ml defibrinated blood in normal saline was added and left for 24 hours. The occurrence of blood heamolysis indicated the presence of saponins [13].

Test for alkaloids :

The alcohol extract was dissolved in 20 ml dilute HCl (1%) and filtered. The filtrate was rendered alkaline with ammonium hydroxide, and then extracted with chloroform and the solvent was evaporated to dryness. The residue was dissolved in 2 ml dilute HCl (1%) and tested with Mayer reagent. The formation of a precipitate indicated the presence of alkaloids or nitrogenous bases [14].

Test for coumarins :

An amount of 5 gram of plant material was subjected to sublimation and filter paper moistened with sodium hydroxide solution and was exposed to the sublimate and examined for any fluorescence under UV light. The appearance of fluorescence indicated the presence of coumarins [12].

Results and Discussion

The results of the investigated compounds were illustrated in the Table (1) ,The results showed that the chemical qualitative tests for the presence of some compounds revealed that:

(a) The two plant species(L1, S1, L2 and S2) lack the presence of coumarins .

This might be explained by the fact that coumarins compounds and their closely related members occur mainly in the waxy coating of leaves, in fruits such as apples, in resins of barks of trees and in the latex of some plants[10] this does not apply to the case of the investigated plants.

(b)Tannins are present in the three plant in both the leaves and stems . (15) reported that typical tanning materials are obtained from oaks, certain willows, chestnuts, sumac leaves,oak galls canaiger root, birch,alder, hemlock berbeny leaves heather,blood root, alfalfa ,tea, sweet gals and certain fern's.

(c) Saponins are present in three studied plants in leaves and stems . However, saponins are widely distributed especially in desert plants [16].

(d) Flavonoid glycosides are present in three plant but absent in S1 and L2.

Some studies which carried out on different species of some plants had shown that members contain a number of flavonoids like four types of anthochlor

pigments, two luteolin glycosides, eight quercetin glycosides, one kaempferol glycoside, six patuletin glycosides and one patuletin bisulphate compound [17].

Table (1) : The phytochemical screening of the studied plants

Compounds	Tannins	Saponins	Carbohydrate	Sterol	Coumarins	Flavonids	Alkaloids
L1	+	+	+	+	-	+	+
S1	+	+	+	+	-	-	+
L2	+	+	+	+	-	-	+
S2	+	+	+	+	-	+	+
L3	+	+	+	-	+	+	+
S3	+	+	+	-	+	+	+

L1= Leave of *Origanum* , S1=steam of *Origanum*, L2=Leave of *Mentha*, S2=Steam of *Mentha*, L3=Leave of *Salvia* , S3=Steam of *Salvia*

It was also reported that, in general, each of the species is characterized by specific group of flavonoids [18] . (Wickramasinghe , 1974), the three of the sub species, used for flavonoid tests, to share a similar flavonoid chemistry; two of them have more in common with the third sub species. The evolutionary loss of flavonoids and other chemicals was reported of the different races of the same species.

Conclusion

The present manuscript recorded that the selected plants which mainlty caractiristing as medicinal plants at Al –Gabal Al –Akhder region Libya containing different constituents as (Tannins , saponins , carbohydrate / glycosids , sterols , coumarins , flvonoids and alkaloids) , the componatns were varied between the leaves and steams of the plants.

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