Journal of Materials and Environmental Sciences
ISSN : 2028-2508
CODEN : JMESCN

J. Mater. Environ. Sci., 2018, Volume 9, Issue 6, Page 1692-1699

https://doi.org/10.26872/jmes.2018.9.6.189

http://www.jmaerenvironsci.com

Monitoring and evaluation of some Egyptian wild plants grown in the Eastern Desert of Egypt

S. S. Ahmed[1], M. E. Ibrahim[1], S. A. El-Sawi[2], H. M. Motawe[2]

1. Medicinal and Aromatic Plants Research Dept., 2. Pharmacognosy Dept., National Research Centre, 12622-Dokki, Egypt

Received 13 Jun 2017,
Revised 22Jul 2017,
Accepted 29 Jul 2017

Keywords
- ✓ Wild plants;
- ✓ Egypt.;
- ✓ phytochemical screening;
- ✓ water extracts;
- ✓ alcoholic extracts;
- ✓ antimicrobial.

H. M. Motawe
hemaiamotawe@yahoo.com

Abstract

A part of our scientific research and exploration program is tantamount to discover new pharmaceutical raw materials from wild plants in the Egyptian desert plants. We are seeking to discover the areas where these plants grow. The wild plants were investigated in terms of the chemical content of the active chemical groups, as well as studying the effect of water and alcoholic extracts on microorganisms. This work focused on seven different plant families containing eleven plants that collected from the eastern Egyptian desert areas. These plants are *Rhus abyssinica*, *Rhus tripartite*, *Solenostemma arghel*, *Periploca aphylla*. *Heliotropium zeylanicum*, *Euphorbia cuneata*, *Euphorbia scordifolia*, *Ricinus commzrnis*. *Cullen plicata* (Delile), *Flueggea virosa* and finally *Ziziphus spina*. Plant extracts of the examined plants have both phytochemical and antimicrobial properties. They were tested against ten strains of microorganisms, including four gram positive and four gram negative bacteria, one yeast and one fungus. Phytochemical screening of the alcoholic extracts of the plants, in question showed different profiles of their contents. The antimicrobial activity has been corroborated by the selected plant species, and the results indicated that the plant extracts differed in their effectiveness against the antimicrobial activity. The present study indicates that the extracts of the Egyptian wild plants are a significant source of compounds such as tannins, flavonoids, steroids , phenols and coumarins with antimicrobial activities which could be developed to agents of great clinical significance and useful in treating many diseases

1. Introduction

In Egypt, wild medicinal plants are found in most desert lands. These herbs have the ability to synthesize a wide range of chemical compounds that are used to perform important biological functions. Many of these plants have long-term beneficial effects on health when consumed by humans and can be used to treat human diseases effectively. At least 12,000 chemical compounds have been isolated so far; less than 10% of the total is estimated [1,2]. These phytochemicals are categorized into:

(1) Primary metabolism likes sugars and fats, which are found in all medicinal herbs.

(2) Secondary metabolites - compounds found in a smaller group of plants, serve a more specific function [3]. Some secondary metabolites for example are toxins used for deter predation and other pheromones used to attract insects for pollination. These are secondary metabolites and pigments that can have therapeutic procedures in humans that can be refined to produce drugs [3]. Chemical constituents in plants mediate their effects on the human body through processes similar to those already well understood for chemical compounds in conventional medicines, thus herbal medicines do not differ significantly from conventional medicines in terms of how they work. This allows herbal medicines to be as effective as traditional medicines, but also gives them the same ability to produce harmful side effects [1,2]. At present, modern medicine tends to use the active ingredients of plants instead of whole plants. The phytochemicals may be manufactured, convert them to other pharmaceuticals. However, few traditional treatments have been translated into modern drugs, although there is ongoing research on the effectiveness and adaptation of traditional herbal remedies. In Egypt, the desert lands,

account for about 90% of Egypt's geographical area. Geological history in Egypt has produced five major physical areas, the Nile Valley, the Nile Delta, Western desert (Sahara -from the West Nile to the Libyan border) and Eastern Desert (extending from the Nile Valley along the route to the Red Sea coast). In addition to the Sinai peninsula between the Mediterranean Sea to the north and the Red Sea to the south, serves as a land bridge between Asia and Africa. It is the only part of Egyptian territory located in Asia.

Each geographical area has a variety of flora and fauna all adapted to its own habitat. In this work we decided to focus on the discovery of this area where a diversity of plants grow. So, this work includes seven different plant families containing eleven plants collected from the eastern Egyptian desert areas parallel to the Red Sea coast. These plants were *Rhus abyssinica* and *Rhus tripartite* belonging to the family Anacardiaceae. Also two plants belonging to the family Apocynaceae, were *Solenostemma arghel* and *Periploca aphylla*. *Heliotropium zeylanicum* (family Boraginaceae).Three plants belonging to the Euphorbiaceae family were *Euphorbia cuneata*, *Euphorbia scordifolia* and *Ricinus commzrnis*. *Cullen plicata* (Delile) (family Fabaceae), *Flueggea virosa* belonging to the Phyllanthaceae family and finally *Ziziphus spina*. (Rhamnaceae family). Many plants of the Apocynaceae family members have economic uses, as they represent several sources of important natural products and in some cases effective prescription drugs [4]. Medicinally, Plants of the *Boraginaceae* family are mainly astringent, internally good as tea or externally as poultices for pretty any wounds that need an astringent to tighten up the tissues. Little members of the family are also useful for their emollient properties. Some contain essential oils and may serve as an antidote for poisons by functioning as diaphoretics. Some members of this family have irritating hairs that can cause dermatitis on some individuals. Also, many plants contain minute amounts of venomous alkaloids, making them toxic to continued use [5, 6]

The Euphorbiaceae family includes about 7,500 species organized into 300 genera [7]. A number of plants of the Euphorbiaceae family are of great economic importance. In medicine, some Euphorbiaceae species proved effectiveness against genital herpes [8]

Fabaceae (Leguminosae) family is economically important because of its rich varieties and abundance, it represents a wide range of edible vegetables, and can be used in: horticulture and agriculture as food for its compounds containing medicinal uses and for oils and fats having a variety of uses. [9-12]

Phyllanthaceae family has a history of use in traditional medicine and is under study for its potential biological properties. The leaves, roots, bark and berries of these species contain many other phytochemicals [13-15]

Some species of the Rhamnaceae family are used medically as laxatives, their leaves as bandages wound and as a treatment for cholera. [16-17]. Extracts of wild plants have both phytochemical and antimicrobial properties and can have a great therapeutic value [9]. Therefore, the efficacy of plants to investigate their antimicrobial activity was investigated and tested [10].

Wild plants have been used for their antimicrobial properties, which are mainly due to the synthesis of secondary metabolites [5] and its impact inhibitory against the growth of human pathogens. With this in mind, efforts are being made to search for economic and safe phytochemicals for control of disease. Although the existence of effective antibiotics and anti-fungal and microbial strains resistant constantly appear, indicating the need for permanent research and development of new drugs.

In the present study, the wild plants collected from the Eastern Desert were evaluated and examined in terms of the chemical constituents of the active chemical groups, as well as study of the effect of water and alcoholic extracts on microorganisms.

2. **Materials and methods**

2.1. Plant materials

Plant material was collected from wild shrub populations of some plant species growing in sandy soils at Gebel Elba (GA) region approximately 1200 km south of Cairo. Identification of the species was achieved by specialists in the plant classification department at the National Research Centre in Cairo, Egypt, and compared with the Student Flora of Egypt [18]. Voucher numbers for the plants under investigation specimens are stored in the herbarium of NRC, Cairo, Egypt.

2.2. Preparation of crude extracts

2.2.1. Alcoholic extract

80% ethanolic extracts were prepared according to the process described elsewhere [19] as follows ; 100 g of the aerial parts of each plant were collected, dried in the oven at 40 °C and reduced to powder. They were separately macerated with the 80% ethanol and permitted to stand for 72 hrs and then filtered. The filtrates were then evaporated under reduced pressure and dried using a rotary evaporator at 50°C. Dried extracts were stored in labeled sterile screw capped bottles at 5°C in the refrigerator, until required for use.

2.2.2. Water extract

100 g of the dried powder of each plant were macerated in distilled water at room temperature for 24 hrs. The macerates were filtered and evaporated under vacuum till dryness. The residues were dissolved in ethanol and used for measuring the antimicrobial activity of the water extracts.

2. 3. Phytochemical screening

Plants under investigation were screened for carbohydrates and/ or glycosides; sterols and/ or triterpenes, flavonoids, tannins, saponins, coumarins and alkaloids, applying the standard procedures.

2.3.1. ***Flavonoids***

0.5g of the alcoholic extracts was defatted with petroleum ether. The defatted residue was dissolved in 20 ml of 80% ethanol and filtered. The filtrate was used for the following tests: 5 ml of dilute ammonia solution was added to the portion of the aqueous filtrate of each plant extract followed by the addition of concentrated H_2SO_4. The appearance of yellow coloration indicated the presence of flavonoids [20].

2.3.2. *Sterols, polyterpenes*

Using Liebermann reagent allows identifying these compounds, Blue-green ring between layers indicates the presence of steroids and pink- purple ring indicates the presence of terpenes [21].

2.3.3. ***Polyphenols***

To 1 ml of the alcoholic extract, 2 ml of distilled water followed by a few drops of 10% aqueous ferric chloride solution were added. Formation of blue or green color indicated the presence of phenols [20].

2.3.4. ***Tannins***

Using Stiasny reagent:- Five ml of alcoholic extract were evaporated to dryness. After adding 15 ml of Stiasny reagent to the residue, the mixture was kept in a water bath at 80°C for 30 min. The observation of a precipitate in large flakes characterized catechin tannins.

For gallic tannins, the previous solution was filtered. The filtrate was collected and saturated with sodium acetate. The addition of $FeCl_3$ drops causes the appearance of a blue-black coloration, indicating the presence of gallic tannins [22].

2.3.5. ***Alkaloids***

Alkaloids were characterized using Bouchardat reagent (iodo-iodized reagent) and Dragendorff' reagent (iodobismuthate of potassium reagent). 6ml of the alcoholic extract were evaporated to dryness. The residue is taken up in 6 ml alcohol at 60°C. The addition of 2 drops of Dragendorff reagent on the alcoholic solution caused a precipitate or orange color. Adding 2 drops of Bouchardat reagent on the alcoholic solution caused a reddish brown precipitate which indicated a positive reaction [24].

2.3.6. ***Saponosides***

10ml aqueous total extract in a test tube was shaken for 15 sec and allowed to stand for 15 min. A height of persistent foam greater than 1 cm indicated the presence of saponins [25].

2.3.7 ***Anthraquinones***

The plants were extracted with chloroform and dilute ammonia is added to it. The ammoniacal layer becomes pink to red due to the presence of anthraquinones derivative (Borntranger's test) [25].

2.4. Biological Activity

2.4.1 Extract preparation

The dry residue of the tested plants was dissolved in alcohol to give concentration of 100 µg/ml.

2.4.2. Microorganism strains

The alcoholic extracts antimicrobial activities were tested against four gram negative bacterial strains (*Escherichia coli, Proteus vulgaris, Pseudomonas fluroscens and Salmonella typhi*),four gram positive strains (*Bacillus subtilis* -NRRL–B543)*, Lactobacillus breveis, Staphilococcus aureus and chromobacter sp*), one fungal strain (*Aspergillus niger*) and one yeast strain (*Candida albicans*). Test organisms used were obtained from Faculty of Agriculture, Cairo University.

2.4.3 Agar diffusion method

Nutrient agar was used for the cultivation of bacteria and yeast, and Czapek-Dox's medium for cultivation of fungal species. In this method, pre-sterilized Whatman no.1 filter paper discs (5 mm in diameter) (Whatman International Ltd., Maidstone, England) were impregnated with 100 µl of the extract (100 µg/ml), allowed to dry (to get rid of the alcohol) and applied on the surface of agar plates freshly seeded with standard inocula of young cultures, 24-hrs-old bacteria and yeast, and 7-days-old fungi. The plates of test organisms were then incubated at 27° C for 24 hrs for bacteria and yeast and for 48 hrs for fungi. At the end of the incubation period, the inhibition zones were measured (the results are the average of triplicate measurements) [26].

3. Results and discussion

To identify and discover places where medicinal herbs grow in the Eastern Egyptian desert, which represents raw materials for pharmaceutical industries in Egypt, we focus on the detection areas where these plants grow. The period from October to May of each year is the most appropriate period for the exploration and collection of medicinal herbs from different regions of the eastern desert of Egypt, which starts with the rainy season beginning in October of each year. In all cases the most of wild medicinal plants were collected from different areas during the growing seasons 2015- 2016, according to the place and date listed in the Table . In all cases the wild plants were collected from wild shrub populations growing in sandy soils in the eastern Egyptian desert, approximately 1200 km south of Cairo. The genus of Rhus (Arabic name: Sumacs) is shrubs and small trees that can reach a height of 1–10 m (3.3–32.8 ft), some of its kinds contain volatile oil [30]. The plants were collected from Wadi Yahmib (GA) during Feb-2016. The plants have been used to treat various diseases in medicine. *Solenostemma argel* and *Periploca aphylla* (family Apocynaceae) were collected from Bear-El-Gahellia in December 2015. *Heliotropium zeylanicum (*Boraginaceae family), *Euphorbia cunenta Euphorbia scordijolia, Ricinus communis* (Family Euphorbiaceae), *Flueggea virosa* (family Phyllanthaceae) and *Ziziphus spina- christi* (family Rhamnaceae) were collected in December 2015 from Wadi Yahmib (GA) Finally *Cullen plicata* (Delile) (Fabaceae family) was collected from Wadi Idib (GA) on December2015.

The plants were investigated in terms of chemical content of the active chemical groups and tested against ten strains of microorganisms.

Table1. Families, locations and dates of collection of the investigated plants.

Family	Plant	Location	Collection Date
Anacardiaceae	*Rhus abyssinica*	Wadi Yahmib (GA)	Feb-2016
Anacardiaceae	*Rhus tripartite*	Wadi Yahmib (GA)	Feb-2016
Apocynaceae	*Solenostemma argel*	Bir El-Gahellia (GA)	Dec-2015
Apocynaceae	*Periploca aphylla*	Wadi Yahmib (GA)	Dec-2015
Boraginaceae	*Heliotropium zeylanicum*	Wadi Yahmib (GA)	May-2016
Euphorbiaceae	*Euphorbia cunenta*	Wadi Yahmib (GA)	Dec-2015
Euphorbiaceae	*Euphorbia scordijolia*	Coastal road 40 km north of Abu Ramad	Dec 2015
Euphorbiaceae	*Ricinus communis*	Wadi Yahmib (GA)	Dec-2015
Fabaceae	*Cullen plicata* (Delile)	Wadi Idib (GA)	Dec.- 2015
Phyllanthaceae	*Flueggea virosa*	Wadi Yahmib (GA)	Dec-2015
Rhamnaceae	Ziziphus spina- christi	Wadi Yahmib (GA)	Dec-2015

GA = Gebel Elba

3.2. Chemical constituents

Table 2 shows the phytochemical screening of 80 % alcoholic extract of the eleven plants which revealed the difference in their constituents.

Rhus abyssinica contains medium amounts of carbohydrates, sterols and/or terpenes, flavonoids and tannins, while alkaloids, saponins, coumarins and anthraquinones were absent. The same amounts of these compounds were found in *Rhus tripartite.* Concerning Apocynaceae family: *Solenostemma argel* contained high amounts of flavonoids, while, carbohydrates, sterols and/or terpenes and saponins were found in medium amount. Other chemical group in this respect was absent. At the same time sterols and/or terpenes was found in high amount in *Periploca aphylla* plant while, carbohydrates and alkaloids were found in moderate amount and the other chemical groups were absent. Regarding *Heliotropium zeylanicum* (Boraginaceae family) flavonoids and alkaloids groups were found in high amount, while carbohydrates and sterols and/or terpenes were found in moderate amounts. The other chemical groups were not detected

Euphorbiaceae family contains three plants were *Euphorbia cunenta, Euphorbia scordijolia* and *Ricinus communis*. Anthraquinones were absent in the three plants. Tannins were found in high amount in *Ricinus communis* plant . Also saponins were found only in moderates amount in Euphorbia cunenta plant and absent in the other two. Flavonoids group was found in high values in *Euphorbia cunenta* and *Euphorbia scordijolia,* while, it was in moderate amount in *Ricinus communis* plant. Carbohydrates, sterols and/or terpenes and flavonoids were found in high values in *Euphorbia scordijolia*

Cullen plicata (Delile) (Fabaceae family) contains high amount of carbohydrates and tannins, while, sterols and/or terpenes and alkaloids were found in moderates amounts. Other chemical groups were absent.

All chemical groups were found in moderates amounts in Flueggea virosa plant (Phyllanthaceae family) while, saponins and anthraquinones were not detected.

Ziziphus spina- Christi plant (Rhamnaceae family) was the richest plant in variety and amounts of chemical constituents except saponins and coumarins were absent

Table 2. Phytochemical screening of 80 % alcoholic extract of some plants growing wild in Egypt

Family Name	Plant Name	Carbohydrates and /or glycoside	Sterol and terpenes	Flavonoids	Tannins	Alkaloids	Saponins	Coumarins	Anthraquinones
Anacardiaceae	*Rhus abyssinica*	M	M	M	M	A	A	A	A
	Rhus ftexicaulis	M	M	M	M	M	A	A	A
	Rhus tripartite	M	M	M	M	A	A	A	A
Apocynaceae	*Solenostemma argel*	M	M	H	A	A	M	A	A
	Periploca aphylla	M	H	A	A	M	A	A	A
Boraginaceae	*Heliotropium zeylanicum*	M	M	H	A	H	A	A	A
Euphorbiaceae	*Euphorbia cunenta*	M	M	H	A	M	M	M	A
	Euphorbia scordijolia	H	H	H	A	A	A	M	A
	Ricinus communis	H	M	M	H	M	A	M	A
Fabaceae	*Cullen plicata (Delile)*	H	M	M	H	M	A	A	A
Phyllanthaceae	*Flueggea virosa*	M	M	M	M	A	M	M	A
Rhamnaceae	*Ziziphus spina- christi*	H	H	H	H	H	A	A	H

A= Absent M= Moderate H= High

3.2. Antimicrobial activity

3.2.1. Antimicrobial activities of 80% alcoholic extract

Data in Table 3 shows the antimicrobial activities of the 80% alcoholic extract of some plants growing wild in the eastern Egyptian desert. Four gram positive and four gram negative bacteria, one yeast and one fungus were tested for the activities against microorganisms. *R.abyssinica* and *H. zeylanicum* showed no antimicrobial activity against all tested strains

Concerning tested strains of Bacteria (G -ve). Data in Table 3 showed no activity against *E. coli*. With 80% alcoholic extract of *P. aphylla, H. zeylanicum* and *E. cunenta* respectively. While the other plants were active against the same tested strains of *E. coli*. which recorded inhibition zone=10, 9, 8, 9 and 8 mm in diameter for *R. tripartite, R. communis, Cullenplicata, F. virosa* and *Z. spina- Christi* plants, respectively. Also moderate activity was observed with 80% alcoholic extract of *E. scordijolia.* At the same time, the highest antimicrobial activity against tested strains of *P. vulgaris* and *S. typhi* were observed only with 80% alcoholic extract of *P. aphylla* and *F. virosa* plants. *P. aphylla* is active against two gram negative strains; *P. vulgaris* (inhibition zone= 12 mm in diameter), while 80% alcoholic extract of *F. virosa* was active against *S. typhi* (inhibition zone=7 mm in diameter

These results are compatible in agreement with Manash PS, *et al*. (2016) [27] stating that the medicinal plant extracts possess antimicrobial properties that can be used to control biological cultures and these biologically active compounds act as a source of antimicrobial agents against human pathogens.

Regarding tested strains of bacteria (G +ve , data in the same table showed that no antimicrobial activities were observed against gram positive strains; *B. subtilis* with 80% alcoholic extract of *S. argel, H. zeylanicum* and *P. aphylla* respectively while, positive effect was observed with other plants. They recorded inhibition zone=7, 20, 7, 7 and 8 mm in diameter for *R. tripartite E. cunenta, E. scordijolia, C. plicata* and *F. virosa* respectively. At the same time moderate effect on the same tested strain was observed with *R. communis and Z. spina- Christi plants* respectively.

Concerning gram positive strains of *C. sp* moderate effect was recorded with three plants only; *R. communis, C. plicata and F. virosa* plants. *E. cunenta and C. plicata* gave inhibition zone=15 and7 mm in diamete respectively against tested strains *L. Breveis,* while there was no effect detected against *S. Aureus* with 80% alcoholic extract of all plants.

Regarding tested strains of yeast, moderate effect was noticed with 80% alcoholic extract of *S. argel and C. plicata* plants, respectively , while 80% alcoholic extract of *R. communis and F. virosa* plants gave inhibition zone=7 and 8 mm in diameter, respectively

Moderate effect against tested strains of fungi was observed only with *E. scordijolia* and *F. virosa* while no active (or weakness) effect detected with other plants

Table 3. Antimicrobial activities of the 80 % alcoholic extract of some plants growing wild in the eastern Egyptian desert.

Test	Inhibition zone (mm in diameter) ± SE											
	Plant											
Bacteria (G - ve)	*R. byssinica*	*R. tripartita*	*S. argel*	*P. aphylla*	*H. zeylanicum*	*E. cunenta*	*E. scordijolia*	*R. communis*	*Cullen plicata*	F. virosa	*Z.spina- hristi*	Standard 100µg/
E. coli	NA	10	±	NA	NA	NA	±	9	8	9	8	16 ± 0.6
P. vulgaris	NA	W	W	12	NA	NA	NA	W	NA	±	NA	21± 0.90
P. Fluroscens	NA	NA	W	±	NA	W	NA	NA	W	W	NA	26± .39
S. typhi	NA	W	W	NA	NA	NA	NA	±	W	7	±	19± 0.83
Bacteria (G +ve)												
B. subtilis-NRRL–B543)	NA	7.00	NA	NA	NA	20	7	±	7	8	±	24± 0.51
C. sp	NA	NA	NA	W	NA	NA	NA	±	±	±	NA	N-T
L. Breveis	NA	NA	NA	NA	NA	15	NA	±	7	NA	±	N-T
S. Aureus	NA	NA	NA	W	NA	NA	NA	NA	NA	NA	NA	22± 0.80
Yeast												
C. albicans	NA	NA	±	NA	NA	NA	NA	7	±	8	±	12± 0.53
Fungi												
A. niger	NA	W	NA	NA	NA	NA	±	W	W	±	NA	9 ± 0.30

NA: not active, W= weakness ±= moderate activity,

3.2.1. Antimicrobial activities of water extract

Data in table 4 show the antimicrobial activities of the water extract of some plants growing wild in the eastern Egyptian desert.

Regarding tested strains of gram negative, the data showed that, the water extract of *R. abyssinica and R. tripartite* gave the beast results against the gram negative strains of *E. coli*, which recorded inhibition zone=12 and 14 mm in diameter for *R. abyssinica and R. tripartite,* respectively, while, this effect was moderate with the water extract of *S. argel and R. communis* plants and no activity with other plants.

Concerning gram negative strains of *P. vulgaris.* Four plants have moderate effect, these plants were, *R. abyssinica R. tripartite, S. argel* and *H. zeylanicum.* On the other hand, water extract of *P. aphylla* plant gave inhibition zone=12 mm in diameter and no antimicrobial activities were observed with other plants. Water extract of *R. tripartite* only gave inhibition zone=12 mm in diameter against gram negative strain of *S. typhi.*

Regarding tested strains of Bacteria (G +ve), data in Table 4 showed that the water extract of *R. abyssinica* and *R. tripartite* gave inhibition zone=12 and 13 mm in diameter, respectively against tested strains *B. subtilis.* The

moderate effect was observed with the water extract of *R. communis* plant against the same tested strain. No antimicrobial activities were observed against gram positive strains; *B. subtilis* with water extract of other plants.

R. tripartite extract recorded moderate effect against tested strain of *C. sp.,* while water extract *of E. cunenta* gave inhibition zone=15 mm in diameter against gram positive strain *L .Breveis.* Also *R. tripartite* extract gave inhibition zone=12 mm in diameter against gram positive strain *S. Aureus* and yeast *C. albicans*. On the other hand, no activity for water extract of all plants against fungi was detected.

Many researchers have studied the inventory and assessment of wild plants from a chemical point of view and their biological effects, among them Kubmarawa *et al*. [28], who studied the antimicrobial activity of the ethanol extracts of fifty plant species from Nigeria were studied for their antimicrobial activity against tested strains of *Bacillus subtilis, Escherichia coli, Staphylococcus aureus, Pseudomonas aeruginosa* and *Candida albicans.* They found that twenty eight extracts inhibited the growth of one or more test pathogens. Four plant extracts showed a wide spectrum of anti-microbial activity. Phytochemical study revealed the presence of essential oils, tannins, alkaloids, saponins, glycosides, and flavonoids. These results indicate that the selected plant extracts have antimicrobial properties and can be utilized to biological control of bacterial cultures. The results revealed that plant extracts differed in their effectiveness to block the growth of bacteria against pathogens tested.

Table 4. Antimicrobial activities of water extract of some plants growing wild in the eastern Egyptian desert

Test	Inhibition zone (mm in diameter) ± SE											
	Plant											
Bacteria (G -ve)	*R. abyssinica*	*R. tripartita*	*S. argel*	*P. aphylla*	*H. zeylanicum*	*E. cunenta*	*E. scordijolia*	*R. communis*	*Cullen plicata*	F. virosa	*Z.spina- christi*	Standard 100µg/
E. coli	12	14	±	NA	W	NA	W	±	NA	NA	NA	16 ± 0.6
P. vulgaris	±	±	±	12	±	NA	NA	NA	NA	NA	W	21 ± 0.90
P .Fluroscens	NA	NA	NA	±	W	W	W	W	W	NA	NA	26± 0.39
S. typhi	NA	12	NA	NA	W	NA	NA	±	NA	NA	NA	19 ± 0.83
Bacteria (G +ve)												
B. subtilis-NRRL–B543)	12	13	W	W	NA	W	NA	±	NA	NA	NA	24± 0.51
C. sp	NA	±	NA	W	NA	NA	W	NA	W	W	NA	N-T
L. Breveis	NA	NA	NA	NA	NA	15	NA	NA	W	NA	NA	N-T
S. Aureus	W	12	W	NA	W	NA	W	NA	NA	W	NA	22 ± 0.80
Yeast												
C. albicans	NA	12	NA	NA	NA	NA	NA	±	W	NA	NA	12 ± 0.53
Fungi												
A. niger	W	NA	W	NA	NA	W	NA	NA	NA	W	NA	9 ±0.30

NA= not active, W= weakness ±= moderate activity,

Conclusion

In the current study, phytochemical screening for Egyptian wild plants showed the presence of active components like saponins, tannins, flavonoids, terpenoids, glycosides and other active chemical groups. Secondary metabolites are compounds that are known to show therapeutic activity against several human diseases, and thus can explain the use of conventional medicinal plants to treat certain diseases

In conclusion, the study findings support the use of the selected plants in the treatment of infectious diseases caused by resistant microorganisms. These plants can also be used to discover biologically active natural products that may be leading to the development of new pharmaceuticals. It is confirmed antimicrobial activity by the wild plant species selected, and the results recorded that the plant extracts differed in their effectiveness against anti microbial activity

References

1. L.C. Tapsell, I. Hemphill, L. Cobiac, *Med. J. Aust.* 185 (2006)4.
2. *PK. Lai, J. Roy, " Med. Chem.* 11 (2004)1451
3. S. Meskin, Mark, *Phytochemicals in Nutrition and Health. CRC Press*. (2002) *123.*
4. S.H.J.V. Rapanarivo, A.J.M. Leeuwenberg, *Taxonomic revision of Pachypodium. Series of Revisions of Apocynaceae XLVIII. In: Rapanarivo, S.H.J.V., Ed., Pachypodium (Apocynaceae): Taxonomy, Habitats and Cultivation, Balkema*, (1999) 1.
5. L.Watson, M.J. Dallwitz, The families of flowering plants: descriptions, illustrations, identification and information retrieval. Version: 19 August 2013.
6. P. Joffe, *Creative gardening with indigenous plants: a South African guide. Briza Publications, Pretoria* (2001).
7. *"The Plant list: Euphorbiaceae". Royal Botanic Gardens Edinburgh and Missouri Botanic Gardens. Retrieved 31 March 2017.*
8. LA Betancur-Galvis; GE Morales; JE Forero & J Roldan. *Mem. Inst. Oswaldo Cruz*, 97(2002) 541.
9. O. N. Allen,E. K. Allen. *The Leguminosae, A Source Book of Characteristics, Uses, and Nodulation. The University of Wisconsin Press, Madison, USA*. 1981.
10. J. A.Duke, *Handbook of Legumes of Economic Importance. Plenum Press, New York, USA*. (1992)
11. P. H. Graham, C. P.Vance, *Plant Physiology. 131(2003) 872.*
12. M.F. Wojciechowski, *Agriculturally & Economically Important Legumes.* (2006)
13. V . Murugaiyah, KL. Chan *J Chromatogr A* 1154 (2007)198
14. V. Srivastava, M. Singh, R. Malasoni. *J Sep Sci* 31 (2008)47
15. G. Bagalkotkar, SR. Sagineedu, MS .Saad, J. Stanslas *J. Pharm. Pharmacol*.58 (2006) 1559
16. Shah, Tariq M, Al-Yahya MA. *Fitoterapia*. 61(1990)46
17. AH . Bachaya, Z. Iqbal, MN.Khan,Z. Sindhu, A. Jabbar, *J Ethnopharmacol*.123(2009)325
18. L. Boulos, *Flora of Egypt VII Al Hadara Publishing Cairo, Egypt* (2000).
19. E. M.Williamson, D.T. Okpako, , F.J Evans, *John Wiley & Sons, Chichester*, (1998) 15.
20. F. Ronchetti G.Russo, *Phytochem*. 10 (1971) 1385.
21. J. B. Harborne, *Methods of plant analysis. In: Phytochemical Methods* (Chapman and Hall, London) (1973).
22. R Hegnauer, *Chemotaxonomie der Pflanzen*, *Bikhäuser Verlag, Basel, Suttgart* 6 (1973) 761.
23. H.Wagner, *Drogenanalyse, Springer Verlag Berlin Heidelberg New York* (1983) 522.
24. Y. A.Békro, J. A. M. Békro, B. B.Boua, B. F. H. Tra, E. E.Ehilé, *Rev. Sci. Nat*.4 (2) (2007) 217.
25. J.W.Fairbrain, *J. Pharm. Pharmacol.* 1 (1949) 683.
26. C. T.Collins, P. M. Lyne, *Microbiological Methods (5th Edn),* Butterworth and Co Pub Ltd, London and Toronto (1985) 167.
27. B. Minakshi, D. Jharna, E. Chanbi Devi, T . ayan,PK. Partha, N. Kundal PS.Manash *J Pharm Res*, 1(2016): 104.
28. D. Kubmarawa, GA Ajoku, NM,Enwerem, DA, Okorie *Afr. J. Biotechnol.* 6(2007) 1696.

(2018) ; http://www.jmaterenvironsci.com