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Comparative phytochemical studies of plants from different habitat

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Abstract
The study of phytochemical analysis of species from land, saline and arid-saline plants. Plants selected for research work namely *Azadirachta indica, Moringa oleifera, Mimusops elengi, Salvadora persica* (costal), *Avicennia marina, Rhizophora mucronata*, and *Salvadora persica* (land). The qualitative analysis of phytochemical components parameters was carried out from leaves and stem samples collected during December 2024. Presence and absence of qualitative phytochemical compounds such as steroids, tannins, coumarins, phytosterols, flavonoids, proteins, saponins, terpenoids, carotenoids, carbohydrates, lipids and phenolic in leaf and stem extracts by using chloroform, methanol, water and acetone. These phytochemical components are considered to be natural bioactive compounds found in plants which act as a defence system against diseases. The aim of Phytochemical analysis is a scientific process that involves analysing, extracting, and identifying the chemical constituents of plants. It can help identify bioactive compounds that can be used to develop new drugs.

Keywords: Habitat, plant spices, phytochemicals and qualitative analysis

Introduction

An organism's habitat is the place on earth where it makes its home. Habitat provides all of the environmental requirements for an organism's survival. That includes everything an animal needs to locate and collect food, choose a partner and have a successful reproductive cycle. The ideal combination of light, air, water and soil must be present in a plant's habitat (Torrance, et. al., 2024) [18]. Gujarat's diverse geography, including coastal areas, forests, grasslands, and desert regions, supports a wide variety of plant species (Bajpai, et. al., 2024) [15].

Saline soil refers to soil with high concentrations of ions, such as sodium and chloride, which negatively affect natural and human values in the landscape by reducing plant growth and crop yield (Osman et. al., 2018) [17]. Saline soils have many physical changes compared to normal, healthy soils. These soils are known to be dead soils with limited biodiversity. The development of salt-tolerant plants has been shown to improve the physical characteristics of saline soils. It has been demonstrated that certain plant kinds increase the soil's bulk density, porosity, saturated hydraulic conductivity, structural stability, and water uptake. Porosity and the amount of organic matter in the soil are linked to increased water availability. It has been found that soil's hydraulic conductivity rises with its organic matter concentration, porosity, structural stability, and water retention (Corwin, et. al., 2003) [21]. Compared to salt-sensitive plants, salt-tolerant plants react differently to saline soils. Excess salts are simply not absorbed by certain salt-tolerant plants. Others absorb too much salt, which they subsequently expel through leaves. Others keep extra salts in vacuoles, which are cells (Paul, et. al., 2014) [22]. Many plants grow on saline land like *Avicennia marina*, *Avicennia officinalis* and *Rhizophora mucronata.*

The distinctive features of arid soils set them apart from soils found in more humid areas. Since biological activity is typically restricted in arid environments, low levels of organic carbon are constrained. The structure and functionality of arid soils are significantly influenced by this deficiency of organic carbon. Long-term water shortages also hinder the removal or leaching of soluble salts, which are then further accumulated as a result of high evaporation rates. Thus, silica, gypsum, or calcium carbonate tend to accumulate in arid soils. Despite having comparable soil origins, arid lands' diverse temperatures, geologies, and flora produce distinct soil properties, resulting in variations in soil morphology and properties. A soil's physical properties, such as its texture, structure, and depth, determine how much water it can hold (Steven, et. al., 2017) [23]. Arid plants are specialized vegetation that has evolved deep roots, smaller leaf surfaces, and effective water storage to thrive in arid, water-scarce environments, such as deserts (Trejo-Calzada, et. al., 2019) [24]. Many plants grow on arid region like *Mimosas elegy, Azadirachta indica, Moringa oleifera*, oak plants, cactus plants, *Withania somnifera* etc.

As a rule, arid areas receive less than 10 inches (25 cm) of precipitation annually. Rainfall in semi-arid areas ranges from 10 to 20 inches (25 to 50 cm) annually. Arid regions have a unique landscape even though the underlying tectonic characteristics and rocks may not be different from those in other locations. Erosion is the primary force that shapes the ground surface since there is minimal vegetation and a lot of loose surface material (Goudie, et. al., 2013) [25]. Generally speaking, soil salinity is categorized as "primary" if salt buildup results from natural processes and as "secondary" if it is a result of resource management. The formation of semi-arid and arid regions with naturally saline soils can result from prolonged exposure to climatic forces such as winds and precipitation (Gamalero, et. al., 2020) [14]. Many plants grow on semi-arid region like *Acacia jaquemontii, Ziziphus app., Capparis desidua, Salvadora persica Linn.*

Biologically active, naturally occurring chemical compounds called phytochemicals are present in plants and provide more advantages to humans than macronutrients and micronutrients. They enhance the color, flavor, and perfume of plants while shielding them from harm and disease. Generally speaking, phytochemicals are the plant compounds that protect plant cells from environmental hazards such as pollution, stress, drought, UV rays and pathogenic invasion (Velavan, S. 2015) [19]. Phytochemicals like steroids, tannin, coumarin, phytosterol, flavonoid, protein, saponin, terpenoid, carotenoid, carbohydrate, lipid, phenolic, etc.

It concludes that phytochemicals play a vital role in different physiological processes of plant growth. Phytochemicals in plants are affected by mineral elements, various biotic and abiotic stressors, and attacks by pathogens and microbes. Phytochemicals also regulate plant hormones and hence affect maturation and ripening. They provide plants with color and protect them from harmful substances like insects and microorganisms as well as harsh conditions like high temperatures (Thacker, et. al., 2020) [27]. Most phytochemicals, including alkaloids, fatty acids, and lipids; flavonoids; phenolics; quinines; tannins; terpenoids; steroids and saponins; and coumarins, are found in saline plants. The specific ecosystem in which the plant grows may have an impact on the secondary metabolites' composition. However, the most abundant substances include terpenoids, alkaloids, coumarins, saponins, flavonoids, and sterols.

This study relevant to that Bioactive organic substances such as alkaloids, steroids, tannins, cardiac glycosides, reducing sugars, phlobatanin, coumarin, terpenoids, and flavonoids are found in some semi-arid plants has very useful medical properties as well as these chemicals have specific physiological effects on human health.

Methodology

1. Plant collection

Select tree plants like *Azadirachta indica*, *Moringa oleifera*, *Mimusops elengi*, *Salvadora persica* (costal), *Avicennia marina*, *Rhizophora mucronate* and *Salvadora persica* (land), etc. Its leaves and stems are collected and carefully washed under running water to get rid of any dust or soil particles. Dry the leaf and stem carefully under sunlight in the shade to avoid. Plant material dries after 1 or 2 weeks. Then the leaf and stem were crushed into coarse powder form using a mechanical grinder (Fahal, Elzein M., et. al., 2018) [10].

2. Sample preparation

In solvents like water, acetone, methanol and chloroform were used. In 2.5 g of powdered plant material like stem and leaf was loaded and 50 ml of all solvents was also extracted independently. Then shake many times, and after 24 hours, filter for time. For extraction, use leaf powder, chloroform, acetone, water, measuring cylinder, beaker, cap line jar, etc. (Karangiya Ridhdhi K., et. al., 2019).

3. Phytochemical analysis

Steroids analysis:1 ml extract was dissolved in 10 ml of chloroform & equal volume of concentrated H_2SO_4 acid was added from the side of a test tube. The upper layer turned red and the H_2SO_4 layer showed yellow with green fluorescence. This indicates the presence is steroids (Ajayi, I. A., et. al., 2012) [9].

Tannin analysis: 2 ml leaf extract was added to 1% lead acetate a yellowish precipitate indicates the presence of tannins (Ujah, et. al., 2021) [1].

Coumarins analysis: 3mg of 10% NaOH was added to 2 ml of aqueous extract formation of yellow color indicates coumarins (Maharaj, et. al., 2022) [2].

Phytosterol (Salkowski's analysis): The extract was treated with chloroform and filtrate. The filtrate was treated with a few drops of concentrated H2SO4 and shakes, allowing standing, the appearance of golden red indicates the positive test (Vinoth, B., et. al., 2012) [20].

Phenolic compound (Phiobatannins analysis): Deposition of red ppt. when the aqueous of each plant sample was boiled with 1% Aqueous HCl was taken as evidence for the presence of phenolic compound (Shaikh, et. al., 2020) [3].

Flavonoids (Alkaline reagent test): The extract was treated with 10% NaOH solution; for estimation of an intense yellow color indicates the presence of Flavonoid test (Agidew, et. al., 2022) [4].

Protein (Xanthoprotein analysis): The extract was treated with a few drops of concentrated HNO3 formation of yellow indicates the presence of protein (Patel, Pinal, et. al., 2014) [13].

Saponins: To 2 ml of each extract, 6 ml of distilled water was added and shaken vigorously; the formation of bubbles or persistent foam indicates the presence of saponins (Kumar, Ashok, et. al., 2012) [12].

Terpenoids: Take 1 ml of each solvent and add 0.5 ml of chloroform followed by a few drops of concentrated sulphuric acid. The formation of a reddish-brown precipitate indicates the presence of terpenoids in the extract (Egbuna, et. al., 2018) [5].

Carotenoids: 1 g of each specimen sample was extracted with 10 ml of chloroform in a test tube with vigorous shaking. The resulting mixture was filtered and 85 % sulphuric acid was added. A blue color at the interface showed the presence of carotenoids (Hashmi, et. al., 2021) [6].

Carbohydrate (Molisch's test): Extract filtrates were treated with 2 drops of alcoholic α-naphthol solution in a test tube separately and 2 ml of concentrated sulphuric acid was added carefully along the sides of the test tubes. The formation of a violet ring at the junction may indicate the presence of carbohydrates (Balamurugan, et. al., 2019) [7].

Lipid: Mix the sample with equal parts ethanol and water, then shake. If lipids are present a cloudy white emulsion will form (Rajkumar, et. al., 2022) [8].

Resuit and Discussion

Table 1: Data showing qualitative phytochemical results of *Azadirachta indica*

Sr. No.	Qualitative Phytochemical *Azadirachta indica*	A. E		W. E		M. E		C. E	
		L	S	L	S	L	S	L	S
1	Steroids	+	+	+	+	-	+	-	+
2	Tannin	+	+	+	+	-	+	-	+
3	Coumarin	+	+	-	+	-	+	-	+
4	Phytosterol	+	+	+	+	+	+	+	+
5	Flavonoid	+	+	-	+	-	+	-	+
6	Protein	+	+	+	+	-	+	-	+
7	Saponin	+	+	+	+	+	-	-	+
8	Terpenoid	+	+	+	+	+	+	+	+
9	Carotenoid	+	+	+	-	-	+	-	-
10	Carbohydrate	+	+	+	+	-	-	-	-
11	Lipid	+	+	+	+	+	-	-	+
12	Phenolic	+	+	-	+	+	+	-	+

(A.E -Acetone Extract, W.E-Water Extract, M.E- Methanol Extract, C.E- Chloroform Extract, + sign Positive, - sign Negative, L-Leaf, S-Stem)

Phytochemicals such as steroids, tannins, coumarins, phytosterols, flavonoids, proteins, saponins, terpenoids, carotenoids, carbohydrates, lipids, and phenolics were mostly found in the acetone extract of *Azadirachta indica* stem and leaf. The aqueous extract of the leaf and stem contained important phytochemicals such as terpenoids, proteins, saponins, lipids, tannins, steroids, and carbohydrates. But the leaf extract included coumarin, flavonoids, and phenolics, but the stem extract did not. However, the stem extract only lacked carotenoids. Only the methanol extract of the stem contained major phytochemicals, such as steroids, tannins, coumarins, flavonoids, proteins, terpenoids, carotenoids, and phenolics, but the leaf did not. However, the leaf and stem methanol extract included phytosterols, terpenoids, and phenolics. But the only thing lacking from the stem extract was carotenoid. The stem lacks lipids and saponins. The stem and leaves are devoid of only carbohydrates. The chloroform extract of the stem included major phytochemicals such as steroids, tannins, coumarins, phytosterols, flavonoids, proteins, saponins, terpenoids, lipids, and phenolics, while the leaf did not. Whereas the stem and leaf lack carotenoids and carbohydrates, they do contain phytosterols and terpenoids.

Table 2: Data showing qualitative phytochemical results of *Moringa oleifera*

Sr. No.	Qualitative Phytochemical *Moringa oleifera*	A. E		W. E		M. E		C. E	
		L	S	L	S	L	S	L	S
1	Steroids	+	+	+	+	+	+	+	+
2	Tannin	-	+	-	-	+	+	-	+
3	Coumarin	+	+	+	-	+	-	+	+
4	Phytosterol	+	+	+	-	-	-	-	+
5	Flavonoid	+	+	+	-	+	-	+	+
6	Protein	+	+	+	+	+	+	-	+
7	Saponin	-	+	-	-	-	-	-	-
8	Terpenoid	+	+	+	-	-	-	-	+
9	Carotenoid	+	-	-	-	-	+	-	-
10	Carbohydrate	+	+	-	+	-	-	-	-
11	Lipid	+	+	+	+	+	+	-	+
12	Phenolic	+	+	-	+	+	+	+	+

(A.E -Acetone Extract, W.E-Water Extract, M.E- Methanol Extract, C.E- Chloroform Extract, + sign Positive, - sign Negative, L-Leaf, S-Stem)

The acetone extract included most of the phytochemicals found in *Moringa oleifera's* stem and leaf, including coumarins, phytosterols, flavonoids, terpenoids, carbohydrates, and phenols. However, only the leaf contains tannins and saponins, and only the stem has carotenoids. The aqueous extract of the leaf contained the majority of the phytochemicals, including proteins, terpenoids, flavonoids, lipids, coumarins, steroids, and phytosterols, but the stem did not contain any of these substances. Both the stem and the leaf lack carotenoids, tannins, and saponins. The stem and leaf included proteins, lipids, and steroids. The stem contains phenolics and carbohydrates, while the leaf does not. The methanol extract of the stem and leaf included the majority of the phytochemicals, including proteins, lipids, phenolics, steroids, and tannins. The leaf's methanol extract contains coumarins and flavonoids, whereas the stem does not. Both the stem and the leaf lack phytosterols, terpenoids, saponins, and carbohydrates. The chloroform extract of the stem included most of the phytochemicals, including proteins, terpenoids, lipids, tannins, and phytosterols, while the leaf did not. The leaf and stem chloroform extract contain phenolics, flavonoids, coumarins, and steroids. The leaf and stem lacked carbohydrates, carotenoids, and saponins

Table 3: Data showing qualitative phytochemical results of *Mimosas elegy*

Sr. No.	Qualitative Phytochemical *Mimosas elegy*	A. E		W. E		M. E		C. E	
		L	S	L	S	L	S	L	S
1	Steroids	-	-	+	-	+	+	+	+
2	Tannin	-	-	-	-	+	-	-	-
3	Coumarin	-	-	+	+	-	-	-	+
4	Phytosterol	+	-	+	-	+	+	-	+
5	Flavonoid	-	-	+	+	-	-	-	+
6	Protein	-	-	+	+	-	-	-	+
7	Saponin	+	-	+	-	-	-	-	-
8	Terpenoid	+	-	+	-	+	+	-	+
9	Carotenoid	-	-	+	+	+	+	-	+
10	Carbohydrate	+	+	-	-	-	-	-	+
11	Lipid	+	-	+	+	+	+	+	+
12	Phenolic	+	+	+	+	+	+	-	+

(A.E -Acetone Extract, W.E-Water Extract, M.E- Methanol Extract, C.E- Chloroform Extract, + sign Positive, - sign Negative, L-Leaf, S-Stem)

The acetone extract included most of the phytochemicals found in the stem and leaf of *Mimosas elegy*, including proteins, carotenoids, coumarins, tannins, steroids, and flavonoids. Lipids, phytosterols, terpenoids, and saponins are all found only in the leaf of the acetone extract. Both the stem and the leaf contained phenolics and carbohydrates. The leaf and stem water extract include coumarins, flavonoids, lipids, phenolics, carotenoids, and proteins. However, only the leaves were steroids, phytosterols, terpenoids, and saponins; the stem did not. Only the leaf lacks tannins and carbohydrates. The methanol extract of the leaf and stem contains lipids, phenolics, terpenoids, carotenoids, phytosterols, and steroids. But the leaf only contains tannins. The leaf and stem lack protein, coumarins, carbohydrates, flavonoids, and saponins. Major phytochemicals like coumarins, phytosterols, flavonoids, proteins, terpenoids, carotenoids, carbohydrates, and phenolics were present in the chloroform extract of the stem, but the leaf was absent. Tannins and saponins were absent in the stem and leaf. Steroids and lipids were present in the stem and leaf.

Table 4: Data showing qualitative phytochemical results of *Salvadora persica* (costal)

Sr. No.	Qualitative Phytochemical ***Salvadora persica*** **(costal)**	A. E		W. E		M. E		C. E	
		L	S	L	S	L	S	L	S
1	Steroids	+	+	-	+	+	-	-	-
2	Tannin	-	+	-	+	+	-	+	+
3	Coumarin	+	+	+	+	+	-	+	-
4	Phytosterol	+	-	-	-	-	+	+	-
5	Flavonoid	+	+	+	+	+	-	+	-
6	Protein	+	+	+	+	+	-	+	+
7	Saponin	-	+	-	+	-	-	-	-
8	Terpenoid	+	-	-	-	-	+	+	-
9	Carotenoid	+	+	-	+	+	+	+	-
10	Carbohydrate	+	+	-	+	+	-	-	-
11	Lipid	+	+	+	+	+	-	+	+
12	Phenolic	+	+	+	+	+	+	+	-

(A.E -Acetone Extract, W.E-Water Extract, M.E- Methanol Extract, C.E- Chloroform Extract, + sign Positive, - sign Negative, L-Leaf, S-Stem)

The majority of phytochemicals, including steroids, coumarins, flavonoids, proteins, carotenoids, carbohydrates, lipids, and phenolics, were found in the stem and leaf of both the land and coastal species of *Salvadora persica*. While the stem of land spices contains tannins and the leaf of coastal spices contains carbohydrates, the stem of coastal spices does not include either of these substances. The leaves of coastal spices contain phytosterols and terpenoids, but the leaves of land spices do not. While land spices lack saponins in both their leaves and stems, coastal spices only lack them in their leaves. The water extract contained most of the phytochemicals found in the stem and leaf of the land and coastal species of Salvadora persica, including coumarins, flavonoids, proteins, lipids, and phenolics. The stems of land spices contain steroids and tannins, but the leaves of coastal spices do not. Coastal spices lack both phytosterols and terpenoids in their leaves and stems, while land spices have both terpenoids and phytosterols in their leaves and stems, respectively. While coastal spices only lack saponins in the leaf, land spices lack them in both the leaf and the stem. Only the leaves of coastal plants lack carotenoids and carbohydrates, while the leaves and stems of land spices contain. Only phenolics are found in the methanol extract of the stem and leaf of the land and coastal species of Salvadora persica. The leaf and stem of land spices include steroid, coumarin, phytosterol, flavonoid, carbohydrate, lipid, protein, and terpenoid compounds, but only the leaf of coastal spices has their phytochemicals. Both the stem and the leaves of both spices lack saponins. Coastal spices lack terpenoids in their leaves and stems. Only the proteins of both spices are present in the leaf and stem in the chloroform extract.

Table 5: Data showing qualitative phytochemical results of *Salvadora persica* (land)

Sr. No.	Qualitative Phytochemical ***Avicennia marina***	A. E		W. E		M. E		C. E	
		L	S	L	S	L	S	L	S
1	Steroids	+	+	+	+	+	+	+	+
2	Tannin	+	-	+	-	+	+	+	-
3	Coumarin	-	+	+	+	+	+	+	+
4	Phytosterol	+	+	-	-	-	+	+	+
5	Flavonoid	-	+	+	+	+	+	+	+
6	Protein	-	+	+	+	+	+	+	+
7	Saponin	+	+	-	+	-	+	-	+
8	Terpenoid	+	+	-	-	-	+	+	+
9	Carotenoid	-	+	+	+	+	+	+	+
10	Carbohydrate	+	-	+	+	+	+	-	-
11	Lipid	+	+	+	+	+	+	-	+
12	Phenolic	+	+	-	+	+	+	-	+

(A.E -Acetone Extract, W.E-Water Extract, M.E- Methanol Extract, C.E- Chloroform Extract, + sign Positive, - sign Negative, L-Leaf, S-Stem)

Table 6: Data showing qualitative phytochemical results of *Avicennia marina*

Sr. No.	Qualitative Phytochemical ***Salvadora persica*** **(land)**	A. E		W. E		M. E		C. E	
		L	S	L	S	L	S	L	S
1	Steroids	+	+	+	-	+	+	+	+
2	Tannin	+	-	+	-	+	-	-	+
3	Coumarin	+	+	+	+	+	+	+	+
4	Phytosterol	-	+	-	+	+	+	+	+
5	Flavonoid	+	+	+	+	+	+	+	+
6	Protein	+	+	+	+	+	+	+	+
7	Saponin	-	-	-	-	-	-	-	-
8	Terpenoid	-	+	+	+	+	+	+	+
9	Carotenoid	+	+	+	-	-	-	+	+
10	Carbohydrate	-	+	+	+	+	+	-	-
11	Lipid	+	+	+	+	+	+	-	-
12	Phenolic	+	+	+	+	+	+	+	-

(A.E -Acetone Extract, W.E-Water Extract, M.E- Methanol Extract, C.E- Chloroform Extract, + sign Positive, - sign Negative, L-Leaf, S-Stem)

The acetone extract of *Avicennia marina* stem and leaf included the majority of the phytochemicals, such as tannins and carbohydrates. Stem and leaf components include lipids, phenolics, terpenoids, saponins, steroids, and phytosterols. Only the leaf contains carotenoids, proteins, flavonoids, and coumarins. The water extract contained the majority of phytochemicals, including proteins, saponins, carotenoids, lipids, coumarins, steroids, and flavonoids. The stem and leaf lack phytosterols, phenolics, and terpenoids. In leaves, only tannins are present. The methanol extract included most of the phytochemicals, including proteins, carotenoids, lipids, phenolics, tannins, coumarins, flavonoids, and steroids. The leaf contained phytosterols, saponins, and terpenoids, while the stem did not. The chloroform extract of the leaf and stem included the majority of phytochemicals, including terpenoids, proteins, flavonoids, coumarins, phytosterols, carotenoids, and steroids. In leaves, only tannins are found. The leaf lacked phenolics, lipids, carbohydrates, and saponins.

Table no: 7 Data showing qualitative phytochemical results of *Rhizophora mucronate*

Sr. No.	Qualitative Phytochemical ***Rhizophora mucronata***	A. E		W. E		M.E		C.E	
		L	S	L	S	L	S	L	S
1	Steroids	-	+	+	-	-	+	-	-
2	Tannin	-	-	+	-	+	+	-	+
3	Coumarin	-	+	-	-	+	-	+	-
4	Phytosterol	+	+	+	+	+	-	+	-
5	Flavonoid	-	-	-	-	+	-	+	-
6	Protein	-	-	-	-	-	+	+	+
7	Saponin	+	+	+	-	+	-	-	-
8	Terpenoid	+	+	+	+	+	-	+	-
9	Carotenoid	+	-	+	+	-	+	+	+
10	Carbohydrate	+	-	+	+	+	+	-	-
11	Lipid	+	+	+	+	+	-	+	+
12	Phenolic	+	+	+	+	+	-	-	-

(A.E -Acetone Extract, W.E-Water Extract, M.E- Methanol Extract, C.E- Chloroform Extract, + sign Positive, - sign Negative, L-Leaf, S-Stem)

The acetone extract of *Rhizophora mucronata's* stem and leaf contains the majority of the plant's phytochemicals, including phenolics, lipids, terpenoids, saponins, and phytosterols. The leaf and stem lacked proteins, flavonoids, and tannins. Carotenoids are carbohydrates that are found in leaves but not in stems. Only found in leaves are coumarins and steroids. The aqueous extract of the leaf and stem included most of the phytochemicals, including phytosterols, terpenoids, carotenoids, carbohydrates, lipids, and phenolics. Only the leaf contains saponins, tannins, and steroids. The stem and leaf lack proteins, flavonoids, and coumarins. The leaf's methanol extract included the majority of its phytochemicals, including coumarins, phytosterols, flavonoids, saponins, terpenoids, lipids, and phenolics, but the stem was absent. Only leaves contain proteins, carotenoids, and steroids. The stem and leaf contain carbohydrates and tannins. The chloroform extract of the stem and leaf included the majority of the phytochemicals, including coumarins, phytosterols, flavonoids, proteins, terpenoids, carotenoids, and lipids. The stem and leaf lacked steroids, tannins, saponins, carbohydrates, and phenolics.

Conclusion

The study of qualitative analysis of these plants concluded that the source of secondary metabolites like steroids, tannins, coumarins, phytosterols, flavonoids, proteins, saponins, terpenoids, carotenoids, carbohydrates, lipids and phenolic. Saponin mostly absent in stem of these land *Salvadora persica* plants. The aim of Phytochemical analysis is a scientific process that involves analysing, extracting, and identifying the chemical constituents of plants. It can help identify bioactive compounds that can be used to develop new drugs.

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