

PHYTOCHEMICAL ANALYSIS OF SELECTED MEDICINAL PLANTS USED FOR DERMATOLOGICAL INFECTIONS

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ABSTRACT: Skin diseases are most common disorders that occur in all ages. Different plant parts and extracts are used to treat the dermatological infections. The present study was investigated to explore the phytochemical test of selected plants which provide valuable bio-active constituents which are used in development of different dermatological drugs. Selected medicinal plants were collected from the different parts of Pakistan there plant parts were used for phytochemical analysis i.e steroids, phenolics, flavonoids etc, Maximum selected medicinal plant showed the positive test for saponins, phenolics, alkaloids, flavonoids, tannins, steroids, anthraquinones and essential oils. In quantitative analysis, Maximum and minimum flavonoid content was occurred in aerial part of *Ajuga bracteosa* and leaves of *Lantana camara* respectively. Highest and lowest amount of saponins was present in aerial part of *Trichodesma indicum* and leaves of *Dicliptera roxburghiana*. Leaves of *Lantana camara* and *Otostegia limbata* were showed the maximum and minimum quantity of alkaloids. Maximum flavonoid content is important to protect the skin from penetration of UVR and so used for sunscreen effect. These phytochemical studies will serve in separation of these novel compounds which may be used in further medicinal plant research.

Key words: dermatological disorders, phytochemical constituent, medicinal plants, research

INTRODUCTION

Human skin is the outer covering and largest part of the body. Skin disease are more frequent diseases to cause harmful effect in all ages. Bacterial, viral and fungal infection, acnes, pimple. rashes are common skin diseases [1]

Plant are important in modern system of medicine [2,3] because herbal medicine are used to treat many disease. Medicinal plant having these constituent are important source of medicinal drugs. Plants possess many phytochemical compounds like flavonoids, alkaloids, volatiles oils, saponins, tannins, phenol occur in different parts of plants i.e root, leaves, seeds, bark, fruit, flowers. Now-a-day natural herb are gaining popularity due to many effective product which are used for treatment of dermatological infections. Secondary metabolites produce beneficial medicines against various disorders [4] On the basis of function phytochemicals are classified into two form. Primary metabolites consist of amino acids, carbohydrates, protein and chlorophyll. Secondary metabolites comprises of flavonoids, saponins, alkaloids, tannin etc [5] Medicinal activity of plants depend upon phytochemical constituents [6] that are responsible for providing useful drugs which are used in prevention of various diseases... Many bio active compounds which are present in living organisms are used to convert free radical into stable form and important in defensive action. These secondary metabolites possess a wide spectrum of pharmacological activities against various diseases keeping in view other botanical and pharmacological importance of medicinal plants, present study was initiated for qualitative and quantitative phytochemical analysis of selected medicinal plants.

MATERIALS AND METHODS

Fresh plant materials were collected from different parts of Pakistan and identified by taxonomist Dr. Mustaq Ahmed. Aerial parts and leaves were washed with distilled water and dried Then plant part were ground into powder and used for phytochemical analysis.

Extraction

100 g of each plant was dissolved in methanol for 24 hours and each extract was filtered, This procedure was repeated and concentrated on rotary evaporator. The filtrate was used for qualitative and quantitative phytochemical analyses.

Preliminary bio-analysis

Phytochemical tests for identification of saponin, flavonoids and phenol were determined by using standard methods.

Detection of alkaloids

Dragendorff's reagent

2 ml of each plant extract was mixed with 1-2 drops of dragendorff reagent and orange brownish coloration exhibit occurrence of alkaloids [7].

Wagner's reagent

About 1-2 ml of each plant extract was mixed with few drops of wagner's reagent in test tube red brownish colour showed the presence of alkaloids [7].

Determination of saponins

Foam test

Plant extract was diluted with 10 ml of distilled water and then shake, Formation of foam indicate the presence of saponins [7].

Determination of flavonoids

Ferric chloride test

Extract was diluted with 10 ml of alcohol, few drops of Ferric chloride was mixed and development of dark reddish depicted the presence of flavonoids [8].

Lead acetate solution test

Lead acetate about 2-3 drops was mixed with extract of each plant and occurrence of yellowish colour indicates the flavonoids [8].

Pew's test

2 ml of each plant extract was mixed Conc. HCl and zinc powder and presence of purple, red and cherry colour the presence of flavonoids [8].

Alkaline reagent test

Sodium hydroxide was mixed with extract and then add 1-2 drops of dilute HCl and indication of colourless solution exhibit the flavonoids [9].

Shinoda test

1-2 ml of extract was mixed 1-2 pieces of Mg and then 1-2 drops of conc. HCl in it. Magenta colour indicates the presence of flavonoids [9].

Ammonium hydroxide test

10 % of ammonium hydroxide was mixed 3 ml of each plant extract and yellowish colour depicted the presence of flavonoids[9].

Determination of phenols**Ferric chloride test**

2 ml of extract was mixed with 1 ml of ferric chloride. Development of colour indicated the presence of phenol [7].

Ellagic acid test

Extract after dilution with alcohol mixed with 5% sodium nitrate and glacial acetic acid and presence of brown colour showed the presence of phenol [7].

Determination of tannins**Gelatin test**

Each plant extract was treated with gelation solution. Indication of whitish colour confirmed the occurrence of tannins [7].

Ferric chloride test

3-4 ml of ferric chloride was mixed each extract, green colour indicates the presence of tannins [7].

Lead acetate test

1 % lead acetate was mixed with each extract. Development of yellowish colour indicates positive test for tannins [7].

Detection of steroids**Liebermann Burchard test.**

Extract of each plant (1 ml) and 1-2 drops of acetic anhydride was mixed with it, after addition of conc. sulphuric acid green colour formed which exhibited positive test for steroids [9].

Detection of anthraquinones**Bornstager's test**

plant extract of 1-to 2 ml mixed with 1-2 ml of benzene, and filtered it by using filter paper, After addition of 4 ml of 10% ammonia solution, mixing it produce precipitation of red, violet and pink colour showed the presence of free anthraquinones [9]

Detection of essential oils

Each extract was kept on filter paper formation of stain showed presence of essential oils [7].

Quantative phytochemical analysis

Quantative flavonoids, saponins and alkaloids content was determined according to procedure of reference [10].

Determination of flavonoids

5g sample was kept in beaker and 100 mL of 80% aqueous methanol was added in it. It was heated over a water bath for 3-4h. Then filter it by using filter paper and filtrate was concentrated on water bath. It was allow to evaporate, samples were dried and % of flavonoid was calculated with difference in weights.

Determination of saponins

10g of each sample was put in flask and 100ml of 20% ethanol was added. The mixture was heated over water bath with continuous stirring at about 55C. The mixture was filtered by using filter paper no 42 and extraction was repeated by 200 ml of ethanol. The whole extract was concentrated over water bath to 40ml. 20 ml of diethyl ether was added and aqueous layer was recovered. 60 ml of butanol was added and combined extract were washed with twice with 10ml of aqueous 5% sodium chloride and remaining solution was heated on water bath. After evaporation samples was dried and % of saponin was calculated by difference in weights.

Determination of alkaloids

5g of plant powder was kept in beaker and mixed 100 ml of 20% acetic acid solution in ethanol, kept at room temperature for 4h. It was filter by using filter paper no 42 and concentrated on water bath. Concentrated ammonium hydroxide was added until precipitation was complete and mixture was allowed to settle and precipitate was collected and then washed, % of alkaloid was calculated by difference in weights.

RESULTS

Large no of selected medicinal plant parts exhibited the positive test for flavonoids, essential oils, alkaloids, saponins and tannins are shown in Table 1. Quantative phytochemical analysis of flavonoid, saponins and alkaloids was indicated in Table 2. Maximum and minimum flavonoid content was present in aerial part of *Ajuga bracteosa* and leaves of *Lantana camara* respectively. Highest and lowest saponins was found in aerial part of *Trichodesma indicum* and leaves of *Dicliptera roxburghiana*. Leaves of *Lantana camara* and *Otostegia limbata* were showed the maximum and minimum concentration of alkaloids. Figure 1 exhibit preliminary phytochemical test of plant parts. Quantative phytochemical analysis was represented in figure 2.

Table 01: Qualitative phytochemical analyses of selected medicinal plants

Name of species	Family	Plant part used	Al	Fl	Ph	Ta	St	Ant	Es oils	Sa
<i>Ajuga bracteosa</i> Wall. ex Benth.	Labiatae	Aerial part	+	+	+	+	+	+	+	+
<i>Mentha royleana</i> L.	Labiatae	Leaves	+	+	+	+	+	+	+	+
<i>Micromeria biflora</i> Buchi-	Labiatae	Whole plant	+	+	+	+	-	+	+	+

Ham.exD.DonBenth.										
<i>Stachy parviflora</i> Benth.	Labiatae	Aerial part	-	+	+	+	+	-	+	+
<i>Marrubium vulgare</i> L.	Labiatae	Whole plant	+	+	+	+	+	+	+	+
<i>Otostegia limbata</i> (Benth.) Boiss.	Labiatae	Leaves	+	+	+	+	+	-	+	+
<i>Dicliptera roxburghiana</i> Auct.	Acanthaceae	Leaves	-	+	+	+	+	-	+	+
<i>Trichodesma indicum</i> (L.) R. Br.	Boraginaceae	Aerial part	+	+	+	+	+	+	+	+
<i>Lantana camara</i> Linn	Verbenaceae	Leaves	-	+	+	+	+	+	-	+
<i>Hibicus rosa sinensis</i> L.	Malvaceae	Whole plant	-	-	-	+	-	+	+	-

Key words: Al, Alkaloids; Fl, Flavonoids; Ph, Phenolics; Ta, Tannin; St, Steroids; Ant, Anthraquinones; Es oils, Essential oils; Sa, Saponins; +, Positive; -, Negative

Table 02. Quantative phytochemical analysis of selected medicinal plants

Series No.	Name of Plants	Flavonoids (%)	Saponins (%)	Alkaloids (%)
1	<i>Ajuga bracteosa</i> Wall. ex Benth.	25.8	2.54	6.23
2	<i>Mentha royleana</i> L.	22.31	4.32	8.82
3	<i>Micromeria biflora</i> Buchi-Ham.exD.DonBenth.	20.42	3.20	8.90
4	<i>Stachy parviflora</i> Benth.	16.21	5.13	-
5	<i>Marrubium vulgare</i> L.	6.12	3.5	10.91
6	<i>Otostegia limbata</i> (Benth.) Boiss.	24.20	3.13	5.50
7	<i>Dicliptera roxburghiana</i> Auct.	6.2	2.27	-
8	<i>Trichodesma indicum</i> (L.) R. Br.	7.6	6.75	12
9	<i>Lantana camara</i> Linn	5	3.39	11.4
10	<i>Hibicus rosa sinensis</i> L.	-	-	10.1

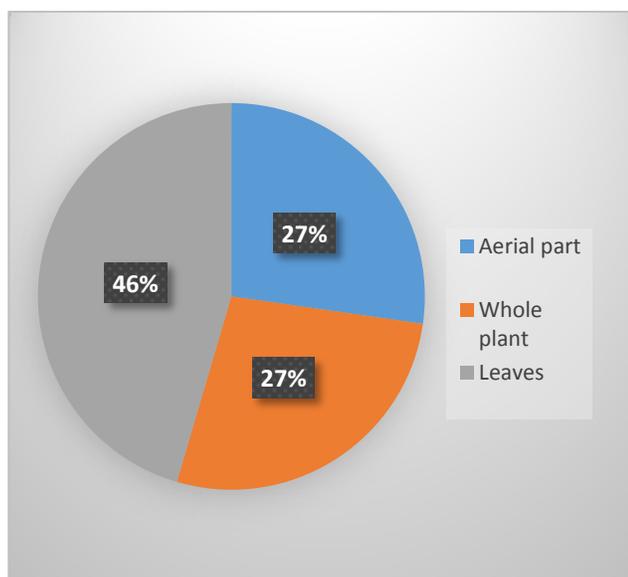


Fig. 1 % of Plant parts used for preliminary phytochemical tests

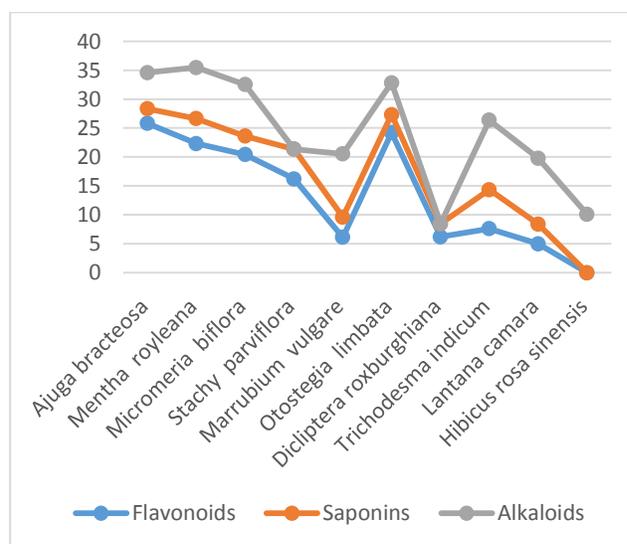


Fig.2. % of Quantative phytochemical analysis of medicinal plants

DISCUSSION

Awareness about medicinal plants has been increasing nowadays due to their importance as source of drugs [11] and value of medicinal plants lies in their phytochemical components which may prevent against various diseases [12]. Flavonoid, saponins, terpenoids etc are important phytochemical constituents that are used as antioxidant, antimicrobial and anti-inflammatory agents etc. These phytochemical constituents play important role in formation of crude drugs that contribute for development of several pharmaceutical industries [6]. The phytochemical components of these plants are used against various skin diseases. Extracts of these plant are used in different product of cosmetics. 46% Leaves parts of selected medicinal plant are used for preliminary phytochemical analysis followed by 27% of various plant portion i.e. whole, leaves and aerial plant parts are treated with different reagents for determination of bioactive constituents. In present research, 6 selected medicinal plant give positive test for alkaloids but *Lantana camara*, *Stachy parviflora*, *Dicliptera roxburghiana* and *Hibicus rosa sinensis* indicate the absence of alkaloids. Alkaloids basically affects the central nervous system, reduces appetite and behaves as diuretic [13]. The presence of flavonoids occurred in 9 selected medicinal plants but *Hibicus rosa sinensis* have contain no flavonoids. Flavonoid have strong anticancer activity and prevent oxidative cell stress [14,15]. 9 selected plants have contain phenolic compounds but leaves of *Hibicus rosa sinensis* have no phenol. Phenols are bioactive polyphenols because these may be helpful in prevention of oxidative stress diseases like cardiovascular disorder, cancer etc and also used as antioxidant, antimicrobial agent etc [16]. All the selected medicinal plants possess tannins which are known to increase wound healing and inflamed mucous. Steroids are present in 8 selected medicinal plant. *Micromeria biflora* and *Hibicus rosa sinensis* showed negative test for steroids. Steroids provide protection from stress and play important role in growth and development of individual. In present study Antraquinone is found in all selected medicinal plant except *Stachy parviflora* and *Otostegia limbata*.

Anthraquinones are used in treatment of many diseases. Essential oils occur in 9 medicinal plants. And *Lantana camara* showed negative test for essential oils. Essential oil are used in various industrial product like foods. Saponins was absent in *Hibicus rosa sinensis*. Saponins present in large quantities in plant part [17] and used commercially as nutraceuticals and dietary supplements cosmetics, pharmaceutical.

Quantative phytochemical analysis

Quantative phytochemical analysis like flavonoids, saponins and alkaloids was find out according to standard methods. Phytochemical compounds were present in different quantity. Medicinal plants of Lamiaceae showed the maximum flavonoid content as compared to other medicinal plants.

Among the quantative analysis of three phytochemical compounds highest flavonoid was found in all the medicinal plant extracts followed by alkaloid and saponins components. Flavonoid is important phytochemical compound used for skin diseases. Maximum flavonoid content in medicinal plants is associated to decrease the risk of skin damages by absorbing the UVR. Flavonoid act as sunscreen.

CONCLUSION

Maximum phytochemical components are present in different parts of medicinal plants. Flavonoid, saponins and alkaloids occur in different amount in tested medicinal plants. It is hoped that, this research will lead towards isolation of phytochemical compounds from these medicinal plants in future to be used in pharmacological and pharmaceutical research.

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