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Qualitative Examination of Phytochemicals from some Indiginous Medicinal Plants

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Abstract: The entire world is blessed with medicinal plants. The medicinal plants are strongly used as major bio- source of modern synthetic drugs, because these are beneficial for the society, indeed to mankind related medicinal field. Today health is considered as one of the major issue that is herbal drugs. In the present study four traditionally used medicinal plants, belonging to different families were carried out. The test were performed using four different solvent such as, Ethanol, methanol, chloroform and aqueous extract respectively. The test revealed that the presence phytochemicals such as Alkaloids, saponins, phenolic compounds, flavonoids, tannins, glycosides, carbohydrates, amino acids and proteins in the medicinal plants extract. Present study was designed to identify the sources and accurate information regarding the active components of medicinal plants and also to enhance awareness about these medicinal plants to public and private sector.

Keywords: Phytochemicals, Qualitative, Medicinal Plants, Organic Solvents

1. INTRODUCTION

Medicinal Plants have been used for treatment of various types of disease since ancient time by Unani , Ayurveda, folk, tribal, and native form. In the various ancient culture many herbal medicine from medicinal plants have been identified which have therapeutic properties (Girach *et al.,* 2003). Non-nutritive chemicals compounds are secondary metabolites that naturally occur in medicinal plants, having disease defensive properties which are obtained from the medicinal plants fruits and vegetables. Thousands of phytochemicals have been identified by researchers (Djeridane *et al.,* 2006). The root, stem, barks and fruit of medicinal plant perform the functions as treatment of diabetes, scabies, gastropathy, empyema, diarrhea, constipation, stomache, astringent, Antigalactic, expectorant, dysentery and it is also used for treatment of colic ulcer, ophthalmitis, hemorrhages, wounds and flatulence (Warrier and Nambiar, 1995). Traditional herbal medicines are also used for Skin diseases, diarrhea, and leprosy and piles (Uma *et al.,* 1999). And it is used for malaria, anemia, fever, intestinal parasites, scabies, toxic swelling external and internal trauma and rheumatism (Olagunju *et al.,* 2006; Jeyachandran., *et al.,* 2009; Jiangsu, 1979; Dai *et al.,* 2004). In the development countries there is a continuing awakening of awareness in the use of medicinal plants because plants medicines have capability no harmful side effect as compared to synthetic drugs in recent years. This research has proved that new drugs which are gained and formed from derived plants are better and cheaper than natural one. Some chemical compounds that can generate specific physiological actions on the human that has medicinal value is present in these plants which are also used as food for pregnant and nursing mothers for medicinal purposes in rare cases (Newman *et al.,* 2003).

2. MATERIALS AND METHODS

Collection, identifications and Sample preparation of plants:

All medicinal plants were collected from Hamal Lake and its adjoining areas of District Qamber/ Shahdadkot, sindh Pakistan. Plants were identified from the Institute of Plants Science, University of sindh Jamshoro. Fresh leaves and some whole plants were collected and the collected plant materials were deposited in Nutrition and Food Technology Research Laboratory in Institute of Biochemistry University of sindh Plants were washed with distilled water and dried under shade for about 15 days and made to a fine powder using a pestle and mortar and stored in an airtight plastic bag. These powdered materials were used for further phytochemical screening.

Preparation of extract:

10 g of each of the plant powdered samples were dissolved separately in 100 ml of ethanol, methanol, chloroform and aqueous in different conical flasks and kept on shaking bath at room temperature for 24 hours and then filtered through muslin cloth and centrifuged at 6000 rpm for 20 minutes. Supernatant was collected and kept in oven at 40 ^{O}C for four hours. The remaining solution was stored in refrigerator for further phytochemical screening (Malini *et al.,* 2013)

Screening of phytochemical from medicinal plants

Alkaloids: Extracts were treated with few drops diluted Hydrochloric acid and used for tests of alkaloids.

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❖ **Mayer's test:** 1 ml of extract treated with two of mayer's reagent. formation of white precipitate indicates existance of alkaloids (Evans, 1997).

❖ **Wagner's test:** 1 ml of extract and two drops of wagner's reagent was added. Formation of redish-brown precipitate indicates the existance of alkaloid. (Wagner, 1993).

❖ **Hager's test:** 1 ml of extract and 1 ml of Hager's reagent were added. Formation of of yellow precipitate indicates the existance of alkaloids (Wagner *et al.* 1996).

❖ **Dragendorff's test:** 1 ml extract and few drops of Dragendorff's reagent were added. Formation of yellow precipitate indicates the alkaloids present. (Waldi, 1965)

Phenolic compound and Tannins:

❖ **Ferric chloride test:** 1 ml of extract was treated with few drops of Ferric chloride. Appearance of dark green colour indicates the existance of phenolic compounds (Mace, 1963).

❖ **Lead acetate test:** 1 ml extract and 1 ml 10% acetate was added. Bulky white precipitate indicates the presence of tannins (Mace, 1963).

Flavonoids:

❖ **Sodium hydroxide test:** 1 ml extract and 1 ml NaOH were added. A dirty yellowish brown precipitate indicates the presence of flavonoids (Mace, 1963).

❖ **Shinda test:** Few ml of extracts and few fragments of magnesium turnings and then drops wise concentrated HCL was added. Pink colour was observed indicates the presence of flavonoids (Mace, 1963).

Saponins:

❖ **Foam Test:** 2 ml Extracts and 4 ml of distilled water was added. Vigorously shaken in a test tube for few minutes. Formation of foam indicates the of saponins (Kokate, 1999).

Protein and Amino acids:

❖ **Ninhydrin test:** 1 ml of extract was taken and ml of ninhydrin solution(5 mg of ninhydrin in 100 ml acetone) was added. and boiled in boiling water bath appearance of purple colour indicates the presence of amino acids (Yasuma and Ichikawa, 1953)

❖ **Biuret test:** 2 ml extracts and equal volume of NaOH was dissolved. Few drops of 2% Copper sulphate were added. Pink or purple color indicates the presence of amino acid and protein (Gupta, 2010)

❖ **Millon's test:** 2 ml of extract and few drops of Millon's reagent. appearance white color precipitate indicates the presence of protein (Rasch and Swift 1960):

Carbohydrates:

❖ **Molisch's test:** 2 ml of sample extracts and few drops of α-naphthol were added and shaken vigorously. 1 ml of $H2SO_4$ (concentrated) was added slowly along the side of test tube .allowed to stand, appearance of violet ring between two layers indicates the presence of carbohydrates.

❖ **Benedict's test:** 1 ml of extract and 4 ml of benedict's reagent were dissolved then heated on a boiling water bath for few minutes orange red colour precipitate indicates the presence of carbohydrates.

❖ **Fehling's test:** 2 ml of extract was taken. 1 ml of fehling's reagent A and 1 ml of fehling's reagent B Solution were added and kept in boiling water bath for few minutes yellow, and brick red precipitate indicates the presence of reducing sugar (Ramakrishanan *et al.,* 1994)

Glycosides:

❖ **Borntrager's test:** 2 ml of extract, 2 ml of chloroform were added, shaken vigorously chloroform layer separated equal volume of diluted ammonia was added. Pink colour indicates presence of glycosides (Evans, 1997).

❖ **Legal's Test:** 2 ml extract and 1 ml of pyridine and 1 ml of sodium nitroprusside and few ml of 10% NaOH were added. Apearance of pink to red colour indicates the presence of glycosides (Raman, 2006).

3. RESULTS AND DISCUSSION

The screening of phytochemical from the selected medicinal plants results showed the presence and absence of various types of phytochemicals such as phenolic compounds, flavonoids, tannins, alkaloids, saponins, glycosides, carbohydrates, proteins and amino acids) were prominently present and results are depicted in (**Table,1-4).** Test was performed by using of some organic solvent such as, Ethanol, methanol, chloroform and aqueous extract respectively. The various extracts of the plants *Solanum surattense and Rhazya stricta* were subjected to phytochemical screening which reveals the presence of various types of phytochemical components. Ethanol, methanol and Aqueous extract shows presence of phytochemicals such as phenolic compounds, flavonoids, tannins, alkaloids, saponins, glycosides, carbohydrates, proteins and amino acids. But absence of flavonoids in the Aqueous extract of *solanum surrattense* and methanol extract of *Rhazya stricta.* Chloroform extract above plants shows presence of carbohydrates, glycosides ,protein and saponin and absence of alkaloids ,phenolic compounds flavonoids and tannins. The results are shown in **Table: 1-2**. It was observed that phenolic compounds, flavonoids, tannins, saponins, glycosides, carbohydrates, proteins and amino acids are mostly present in the ethanol, methanol and aqueous extract of moringa olefera and *Cichorium intybus.* The results are shown in **Table 3,4**. It is noted that Absence of Alkaloids in the plant extracts of *moringa oleifera* and *Cichorium intybus* in this study *as a* compared to other authors mentioned that alkaloids is present in these plants. its presence in the other may be due to many biosynthetic and physiological reactions are occurring inside the plants, the environmental effect should not be neglected as always many things are

modified by the environment. Medicinal plants are one of the most important sources of traditional medicines all over the world. The major aim of this study was to enhance the trend of proper use of medicinal plants and try to identify the new indigenous sources of drugs (Parekh and Chanda, 2007). Extraction and screening of phytochemical from selected medicinal plants, as mentioned above, have been analyzed. The identified components which can play important role against various types of diseases such as antibacterial, antidiarrheal activity and help in electrolyte reabsorption prevent specific pathogen and dwell in intestinal motility (Ahmad *et al.,* 2006).

Table. 1. Screening of Phytochemical from *Solanum surattense*

Botanical Name of Plant		*Solanum surattense (Burm.f)*(Parts mixed) leaves , stem,roots, seed			
	Test	Extracts			
		Aqueous	Ethanol	Methanol	Chloroform
1.	Alkaloids.				
	Mayer's Test	+	+	+	-
	Wagner's Test	+	+	+	-
	Dragendorff's Test	+	+	+	-
	Hager's Test	+	+	+	-
2.	Phenolic compounds and Tannins				
	Ferric Chlorides Test	+	+	+	-
	Lead Acetate Test	+	+	+	-
3.	Flavonoids.				
	Alkaline Reagent Test	-	+	+	-
	Shinoda Test	-	+	+	-
4.	Saponins				
	Foam Test	+	+	+	+
5.	Protein And Amino Acids				
	Ninhydrin Test	+	+	-	-
	Biuret Test	+	+	+	+
	Millon's test	+	+	+	+
6.	Carbohydrates				
	Molisch's Test	+	+	+	+
	Benedict's Test	+	+	+	+
	Fehling Test	+	+	+	+
7.	Glycosides				
	Legal's Test	+	+	+	+
	Kellar Killani Test	+	+	+	+

Note. '+' = indicates presence and '-' = indicates absence

Table.2. Screening of Phytochemical from *Rhazya stricta*

Botanical Name of the Plant		***Rhazya stricta (decne)* (leaves)**			
No	**Test**	**Extracts**			
		Aqueous	Ethanol	Methanol	Chloroform
1.	**Alkaloids**				
	Mayer's test	+	+	+	-
	Wagner's test	+	+	+	-
	Dragendorff's test	+	+	+	-
	Hager's test	+	+	+	-
2.	**Phenolic compounds And Tannins**				
	Ferric chlorides test	+	+	+	-
	Lead acetate test	+	+	+	-
3.	**Flavonoids**				
	Alkaline reagent test	+	+	-	-
	Shinoda test	+	+	-	-
4.	**Saponins**				
	Foam test	+	+	+	+
5.	**Protein And Amino Acids**				
	Ninhydrin test	+	+	-	-
	Biuret test	+	+	+	+
	Millon's test	+	+	+	+
6.	**Carbohydrates**				
	Molisch's test	+	+	+	+
	Benedict's test	+	+	+	+
	Fehling test	+	+	+	+
7.	**Glycosides**				
	Legal's test	+	+	+	+
	Kellar killani test	+	+	+	+

Note. '+' = indicates presence and '-' = indicates absence

Table. 3 Screening of Phytochemical from of *Moringa oleifera*

Botanical Name of the Plant		***Moringa oleifera (lan)* (leaves)**			
No	**Test**	**Extracts**			
		Aqueous	Ethanol	Methanol	Chloroform
1.	**Alkaloids**				
	Mayer's Test	-	-	-	-
	Wagner's Test	-	-	-	-
	Dragendorff's Test	-	-	-	-
	Hager's Test	-	-	-	-
2.	**Phenolic compounds and tannins**				
	Ferric Chlorides Test	+	-	+	+
	Lead Acetate Test	+	-	+	+
3.	**Flavonoids**				
	Alkaline Reagent Test	-	-	+	-
	Shinoda Test	-	-	+	-
4.	**Saponins**				
	Foam Test	+	+	+	+
5.	**Protein and amino acids**				
	Ninhydrin Test	+	-	-	-
	Biuret Test	+	+	+	+
	Millon's test	+	+	+	+
6.	**Carbohydrates**				
	Molisch's Test	+	+	+	+
	Benedict's Test	+	+	+	+
	Fehling Test	+	+	+	+
7.	**Glycosides**				
	Legal's Test	+	+	+	+
	Kellar Killani Test	+	+	+	+

Note. '+' = indicates presence and '-' = indicates absence

Table 4. Screening of Phytochemical from of *Cichorium intybus*

Botanical Name of the Plant		*Cichorum intybus* (linn) (leaves)			
No	Test	Extracts			
		Aqueous	Ethanol	Methanol	Chloroform
1.	**Alkaloids**				
	Mayer's test	-	-	-	-
	Wagner's test	-	-	-	-
	Dragendorff's test	-	-	-	-
	Hager's test	-	-	-	-
2.	**Phenolic compounds and tannins**				
	Ferric chlorides test	+	+	+	+
	Lead acetate test	+	+	+	+
3.	**Flavonoids**				
	Alkaline reagent test	-	+	-	-
	Shinoda test	-	+	-	-
4.	**Saponins**				
	Foam test	+	+	+	+
5.	**Protein and amino acids**				
	Ninhydrin test	+	+	-	-
	Biuret test	+	+	+	+
	Millon's test	+	+	+	+
6.	**Carbohydrates**				
	Molisch's test	+	+	+	+
	Benedict's test	+	+	+	+
	Fehling test	+	+	+	+
7.	**Glycosides**				
	Legal's test	+	+	+	+
	Kellar killani test	+	+	+	+

Note. '+' = indicates presence and '-' = indicates absence

4. CONCLUSION

The present study screening of phytochemicals from some selected medicinal plants were carried out. Phytochemicals were extracted by organic solvents, including ethanol, methanol, chloroform, and aqueous extract. the result was showed that the presence of phytochemical constituents such as phenolic compounds, flavonoids, tannins, alkaloids, saponins, glycosides, carbohydrates, amino acids, proteins. Ethanol, methanol and Aqueous extracts shows the presence of majority of phytochemical constituents. Unlike chloroform extract shows absence majority of phytochemical constituents..The presence of above mentioned components in these plants clearly confirm that these plant species are rich indigenous sources for pharmaceutical industries. Rhazya stricta plant is showed better result than others plants.

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