PRELIMINARY PHYTOCHEMICAL SCREENING OF DIFFERENT SOLVENT. EXTRACTS OF SOME MEDICINAL PLANTS

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Abstract:
The present investigation aims to evaluate the phytochemical screening of different solvent extracts of some important medicinal plants. Thousands of species are acknowledged to have medicinal value to cure specific aliments has been in vogue since archaic periods. In the present study the phytochemical screening of medicinal plants were carried out for understanding their solvent solubility. Qualitative analysis of secondary metabolites was performed for the presence of Alkaloids, Tannins, Proteins, Flavonoids, Phenols, Steroids, Saponins, Quinines, Glycosides, Carbohydrates and Amino acid. The results revealed that in all studied species (viz.*Vitex negundo, memordica charantia* and *Ocimum sanctum*) shows either positive or negative response for steroids test indicates usefulness of these plants as food and fodder. It is evidence from result & literature available presence of phenol indicates their medicinal usefulness of these plants. The results also revealed that studied species have maximum phytochemicals which shows solublility in different solvent extracts.

Key words: Phytochemical screening, Medicinal plants, Solvent solubility.

I. INTRODUCTION:

Many plants are imperative to man for his life. World health organization (WHO) has also figured out that more than 80% of the world population relies on plants to fulfill their basic health care needs (Vines, 2004). Balakumar et al. (2011) has stated that medicinal plants with antibacterial action are local heritage with global importance. The medicinal plants extract have now emerged as a good alternative as they are rich in a wide variety of secondary metabolites such as tannins, phenolics, alkaloids and flavonoids etc which enhances growth, innate immune response and disease resistance against pathogenic bacteria in human as well as in different organisms (Edoga *et al*., 2005). Many health benefits and medicinal properties can be shown by Memordica charantia for example it reduces blood sugar, kills bacteria, balance hormones, reduce inflammation, kill viruses, fights free radicals and so forth (Kkorramabadi et al., 2017). Traditional folk treatment from wild plants has always guided researchers to search for novel medications to develop healthy life for humans and animals (Achterberg, 2013). India is represents as store house of genetic diversity of Medicinal Plant. Plants and plant derived agents have long history as supply of potential chemotherapeutical agents in Ayurvedic and Unani system of medication. The Vitex genus is members of Verbenaceae family ordinarily called Nirgundi, the Indic word nirgundi virtually means that protects our body from all diseases (kamlesh and vikrant 2010, silver, 1993). There are approximately 35,000 medicinal plants which are used for the therapeutic effect according to Ayurveda and siddha and unani and other traditional system. In which *ocimum sanctum* is one of the most important for medicinal purpose. It is employed in the treatment of various disease such as antimicrobial infection, antifungal, anticancer, arthritis, chronic fever, antifertility, eye disease, hepatoprotective, antispasmodic, and analgesic, antiemetic. Cardio protective (Rao et al., 2013). This medicinal herb have also been shown to reduce blood glucose levels, making it an effective treatment of diabetes (Lahon and Das 2011).

II. MATERIAL AND METHODS:

Phytochemical analysis of plant extracts:

A stock concentration of 1 % (W/V) was prepared using the respective solvent in each case. These extracts along with positive and negative controls were tested for the presence of active phytochemicals. Preliminary phytochemical screening was carried out to find the presence of the active chemical constituents in extracts such as alkaloids, flavonoids, tannins, carbohydrates, phenolic compounds, terpenoids, glycosides, steroids, fixed oils and fats. In general, tests for the presence of phytochemical compounds involved the addition of appropriate chemical reagent(s) to the extract in test tubes (Evans and Trease, 2008).

Test of Alkaloid

Mayer's test

Alkaloids are basic nitrogenous compounds with definite physiological and pharmacological activity. Alkaloid solution produces white yellowish precipitate when a few drops of Mayer's reagents are added most alkaloids are precipitated from neutral or slightly acidic solution by Mayer's reagent. The alcoholic extract was evaporated to dryness and the residue was heated on a boiling water bath with 2% hydrochloric acid. After cooling, the mixture was filtered and treated with few drops of Mayer's reagent. The samples were then observed for the presence of turbidity or yellow precipitation (Harborne, 1998).

Test of Flavonoids

Lead Acetate Test

Extracts were treated with few drops of 10% lead acetate solution. Formation of yellow colour precipitate indicates the presence of flavonoids.

Test of Glycosides

Aqueous Sodium hydroxide:

Extracts were treated with 1 ml water and 1 ml sodium hydroxide. Formation of yellow colour indicates the presence of glycosides.

Test of Steroids

Salkowski Test

Extracts were treated with few drops of chloroform and concentrated sulphuric acid. Formation of bluish red to cherry colour in chloroform layer green fluorescence acid layer indicates the presence of steroids.

Test of Terpenoids

5 ml of each extract was added to 2 ml of chloroform and 3 ml of concentrated sulphuric acid to form a monolayer of reddish brown coloration of the interface was showed to form positive result for the terpenoids.

Test of Tannins

To the extract 0.1% ferric chloride solution was added, formation of a dark blue or greenish blackcolor showed the presence of tannins.

Test of Phenols

Ferric Chloride Solution

Extracts were treated with 3-4 drops of 5 % ferric chloride solution. Formation of bluish black colour indicates the presence of phenols.

Test of carbohydrate

Extracts were dissolved individually in 5 ml distilled water and filtered. The filtrates were used to test for the presence of carbohydrates.

Benedict's test

Filtrates were treated with Benedict's reagent and heated gently in water bath 10 minutes. Brick red precipitate indicates the presence of reducing sugars.

Test of Proteins:

Xanthoproteic Test: Extract when added with sulphuric acid, white precipitate is formed. Which Shows the presence of proteins.

Test of Anthraquinones

Borntrager's Test:

Extract were added with Benzene and NH3(10%) were added into it. Pink, Violet or Red coloration in ammonical layer is formed. The absence of pink-red to blue-violet coloration indicated the absence of anthocyanins.

Test of Saponins:

Foam Test:

Persistent frothing on warming the extract indicated the presence of saponins in this plant only. The same extract with few drops of olive oil formed a soluble emulsion, confirming the presence of saponins.

III. Result :

The phytochemicals analysis in *Ocimum sanctum* (Tulsi) leave extracts in the two solvents and aqueous extracts were summarized in Table 1. Various bioactive molecules were found in Tulsi leaf extract from the phytochemical screening. The amount of extraction is more in case of organic solvent then that of water. From the quantitative analysis it was found that high amount of phenols are present in Tulsi leaf.

Phytochemical analysis of *Vitex negundo* was carried out by the following solvents Methanol, Ethanol,and Aqueous extracts .In Methanol extract of *Vitex negundo* contain all the components, carbohydrates, Alkaloids, flavonoids, tannin, terpenoids, glycosides, phenolic compounds and steroids are present (Table 2). Whereas the Ethanol extract of *Vitex negundo* contain all the constituents except carbohydrates. Alkaloids, flavonoids, tannin, terpenoids, glycosides, phenolic compounds and steroids are present.

Table 1: Qualitative Phytochemical Screening of various extracts of *Ocimum sanctum* Linn.

Phytochemicals	Aqueous Extract	Methanol Extract	Ethanol Extract
Protein	-	-	-
Carbohydrate	-	+	+
Phenol	+	+	-
Tannin	-	+	+
Flavonoid	+	+	+
Saponin	-	+	+
Glycosides	+	+	+
Steroid	-	-	-
Terpenoid	-	+	+
Alkaloid	+	+	+
Anthraquinone	-	-	-
Fixed oils and fatty acid	-	+	-

Table 2: Qualitative Phytochemical Screening of various extracts of *Vitex negundo*.

Phytochemicals	Aqueous Extract	Methanol Extract	Ethanol Extract
Protein	+	+	+
Carbohydrate	+	+	+
Phenol	-	+	+
Tannin	-	+	+
Flavonoid	+	+	+
Saponin	_	+	+
Glycosides	+	+	+
Steroid	-	+	+
Terpenoid	-	+	+
Alkaloid	-	+	+
Anthraquinone	+	-	-
Fixed oils and fatty acid	-	-	-

Table 3: Qualitative Phytochemical Screening of various extracts of *Memordica charantia.*

Phytochemicals	Aqueous Extract	Methanol Extract	Ethanol Extract
Protein	+	-	-
Carbohydrate	+	+	-
Phenol	-	-	-
Tannin	+	+	+
Flavonoid	-	+	-
Saponin	+	+	-
Glycosides	+	+	-
Steroid	+	+	
Terpenoid	+	+	+
Alkaloid	-	+	+
Anthraquinone	+	+	-
Fixed oils and fatty acid	+	+	-

The results of the phytochemical screening of the methanolic leaf extract of M. charantia presented in Table 3. This reveals the presence of alkaloids, tannins, steroids, flavonoids, saponins, phlobatinnins, cardiac glycosides and carbohydrates and absence of anthraquinones. Flavonoids are polyphenolic compounds present in plants as secondary metabolites and also have antioxidant activity. It provides many health benefits like protection against damage in blood vessels, thus decreasing the risk of cardiovascular diseases, prevent cancer and enhances immune system of body. Saponins inhibit Na+ efflux leading to higher Na+ concentrations in cells , there by activating a Na+ , Ca2+ antiport. This effect produces elevated cytosolic Ca2+ which strengthens the contraction of the heart muscles and thereby reducing congestive heart failure (Schneider and Wolfing, 2004).

IV. DISCUSSION:

The phytochemical constituents such as alkaloids, steroids, flavanoids, tannins, phenols and several other aromatic compounds of plants serve a defense mechanism against predation by many microorganisms, insects and other herbivore (Bonjar *et al.*, 2004) Glycosides can act as cardio stimulants in cases of cardiac failure (Sood et al., 2005). *Ocimum sanctum* has various properties such as antistress, antiseptic, analgesic, anti-inflammatory, antimicrobial, immunomodulatory, hypoglycemic, hypotensive, cardioprotective and antioxidant (Tanwar *et al*., 2015). In the present study, the phytochemical screening proved that the *M. charantia* leaves are pharmaceutically important due to presence of different medicinally important phytochemical compound and secondary plant metabolites. The plant extracts and juices have been found suitable for different diseases / problems (Nadakarni,1982). These secondary metabolites contribute significantly towards the biological activities of medicinal plants such as hypoglycemic, antidiabetic, antioxidant, antimicrobial, antiinflammatory, anticarcinogenic, antimalarial, anticholinergic, antileprosy activities etc. (Negi, 2011). Numerous studies have confirmed that saponins possess the unique property of precipitating and coagulating red blood cells (Okwu, 2004).

V. Conclusion:

The phytochemical constituents such as alkaloids, steroids, flavanoids, tannins, phenols and several other aromatic compounds of plants serve a defense mechanism against predation by many microorganisms, insects and other herbivore. Glycosides can act as cardio-stimulants in cases of cardiac failure. Tannins have anti-diarrheal and hemostasis properties. Flavonoids are responsible for antioxidant and immune-stimulatory properties. According to alkaloids, glycosides, flavonoids and saponins are antibiotic principles of plants and these antibiotic principles are actually the defensive mechanisms of the plants against pathogens.

VI. REFERENCE:

1. Achterberg J., 2013. Imagery *in Healing Shamanism and Modern Medicine*, Shambhala Publications, Boulder, Colo, USA.
2. Balakumar SSR, Thirunalalsundari T, Jeeva S. 2011. Antifungal activity of Aegle marmelos (L.) Correa (Rutaceae) leaf extract on dermatophytes. Asia Pacific Journal of Tropical biomedicine. 1(4): 309-312.
3. Bonjar, GHS., Nik, AK. and Aghighi, S., 2004, Journal of Biological Science, 4, 405-412.
4. Edoga, H.O., Okwu, D.E., Mbaebie, B.O. 2005, Phytochemicals constituents of some Nigerian medicinal plants. African Journal of Biotechnology, 4(7): 685-688.
5. Evans W.C. and Trease G.E. 2008. A text book of Pharmacognosy. Bailliare Tindall and Cassel. 14th ed.
6. Harborne JB., 1998. Phytochemical method, A Guide to Modern technique of Plant Analysis. 3rd Edition, Chapman and Hall. New York:-198.

7. Kamlesh KB, Vikrant singh MG., 2010. Natural products drug discovery research in India: Status and appraisal. Ind J of Exp Biol; 48:199-207.
8. Kkorramabadi RM, Ahmadvand H, Bagheri S., 2017. Momordica charantia and diabetes mellitus. Geriatrics Persia, Jul 2, 1(1).
9. Lahon K, Das S., 2011. Hepatoprotective activity of *ocimum sanctum* alcoholic leaf extract against paracetamol-induced liver damage in Albino rats. Pharmacognosy Res 3: 13-18.
10. Nadakarni, K. M.,1982. *Momordica charantia* L. Indian. Material. Medica. Vol. I, part II,; pp. 805-807.
11. Negi JS, Singh P, Rawat B., 2011.Chemical constituents and biological importance of *Swertia*: a review. Curr Res Chem. 3:1-15.
12. Okwu DE. Phytochemicals and vitamin content of indigenous spices of southeastern Nigeria. J Sustain Agric Environ 2004; 6:30-37.
13. Rao SA, Vijay Y, Deepthi T, Lakshmi CS, Rani V., 2013. Antidiabetic effect of ethanolic extract of leaves of *ocimum sanctum* in alloxan induced diabetes in rats. Int J Basic Clin Pharmacol 2: 613-616.
14. Schneider and Wolfing, J., 2004. Synthetic cardenoilds and related compounds. Current organic chemistry;8 No. 14.
15. Silver LL., 1993. Discovery and development of new antibioltics: the problem of antibiotic resistance. Antimicrob Agents Chemother. 37:377-383.
16. Sood, S., Narang, D., Dinda, A.k. and Maulik, S.K., 2005, Chronic oral administration of Ocimum sanctum linn augments endogenous antioxidants and prevents isoproternol- induced myocardial necrosis in rats, Journal of Pharmaco and Pharmacology, 57 (1): 127-133.
17. Tanwar, R., Pahare, A. and Naqvi, S. M. A., 2015, *Ocimum sanctum* (tulsi), excellent source of phytochemicals. Indo American Journal of Pharmaceutical Research, 12(5): 2231-6876.
18. Vines G., 2004. Herbal harvests with a future: towards sustainable sources for medicinal plants. Plant life International