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Screening of Phytochemicals Compounds in Medicinal Plants

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Abstract:
Some plants have good medicinal and therapeutic importance for healthy lifestyle.(8) One among them is Phyllanthus emblica (Linn) belongs to Euphorbeaceae family, commonly known as Amla which has superior value in traditional system of medicine. It has several pharmacological properties, mainly antioxidant activity and anti-inflammatory activity. (Jamwal. K. S. et. al.) The study is focused on phytochemical investigation. The extracts were used to detect the presence of alkaloids, phenols, flavonoids, terpenoids, steroids and other phytochemicals. Antioxidant assay was performed as DPPH radical scavenging activity (1,1-diphenyl-2-picrylhydrazyl). DPPH reacts with the free radicals and change its colour.

The basil leaf (occimum basilium van thyrsiflouruae): It contains various compounds such as flavinoids, alkaloid, phenol and essential oil. So, it needs to be fractionalised to find out the chemical substance but have a definite physiological action on the living system. The qualitative analysis is very essential to the phytochemical constituents present in medicinal plants.(Habib- ur Rehman. K.A.; et. al.) The basil leaves of phytochemical analysis revealed the presence of several bio active components such as flavinoids, phenols, alkaloids, tannins, steroids and saponin. (7)

21st March 1997 - It is native to asia (India, Pakistan, Thailand and other countries)

Phyllanthus niruri: We have selected Phyllanthus niruri commonly known as keezha nelli. It is an important ethno-botanical species of India and widely used in Ayurveda formulations. Plant derived immunostimulants are a promising alternative to chemotherapeutics and also perhaps vaccines.

Keywords: Phyllanthus emblica, Phyllanthus niruri, occimum basilium, phytochemical.

I. INTRODUCTION

Plants are composed entirely of chemicals of various kinds phytochemicals are chemicals produced by plants through primary or secondary metabolism they generally have biological activity in the plant host and play a role in plant growth or defense against competitors, pathogens, or predators.(7)

Phyllanthus emblica (Amla) is widely distributed in subtropical and tropical areas of India, China, Indonesia and Malaysia.[1] Amla as major constituent in several Ayurvedic treatment for health and longevity[2]. Amla is known for good source of polyphenols, flavonoids, tannins and other bioactive compounds.These substances being strong antioxidants might contribute to the health effects of Amla. Several active compounds like gallic acid, ellagic acid, 1-O-galloyl-D glucose, chebulininc acid,

quercetin, chebulagic acid, kaempferol, mucic acid 1,4-lactone 3-O-gallate, isocorilagin, chebulanin, mallotusinin and acylated apigenin glucoside compounds have been isolated from the aqueous extract of Amla[3]. These bioactive components have anticancer, hypolipidemic, expectorant, purgative, spasmolytic, antibacterial, hypoglycaemic [4,5] hepatoprotective, hypolipidemic activities and also can attenuate dyslipdaemia.[6] The World Health Organization have been estimated that 80% of the population believes in traditional medicine for their basic health care requirements[7].

Phyllanthus emblica (Linn). (Euphorbeaceae), commonly known as amla which has superior value in traditional system of medicine.The general techniques of extraction includes maceration, infusion, percolation, digestion,decoction, hot continuous extraction (soxhlet), Aqueous-alcoholic extraction by way of fermentation, counter modern extraction, microwave assisted Extraction, ultrasound extraction (sonication), Supercritical fluid extraction (SFE), phytonic extraction (with hydro-flouro-carbon solvents), and so forth. There are styles of hydrodistillation strategies (water distillation, steam Distillation, steam and water distillation), hydrolytic maceration accompanied by using distillation method,expression technique and enfleurage technique (cold Fat extraction) can be used.(11)

Pyllanthus niruri: Phytochemicals are recorded as research compounds rather than essential nutrients because of their possible health effects has not been established yet. Phytochemicals are grouped into carotenoids and polyphenols, which includes phenolic acids, flavonoids. (7,9)

The biologically active compounds present in plants are called Phytochemicals verboten G 2020. These Phytochemicals are used as sources of direct medicinal Agents. Phytochemicals play a vital role against number of diseases such as asthma, arthritis, cancer etc. unlike Pharmaceutical chemicals these phytochemicals do not have any side effects. Since the Phytochemicals cure diseases without causing any harm to human beings these can also be considered as “Man-Friendly Medicines”. (16) (18)

Basil Leaf (occimum basilium): It is one of the most common aromatic herbs, a rich source of bio active compounds and its used extensively to add aroma and flavor to the food. The leaves both in fresh and dried form are used as a ingredient in different culture. Basilium is also famous for its therapeutic potentials and preservation effects. The highest concentration of plant secondary metabolites including total phenolic acid, flavinoids and tannin extract was absorbed in ethanol extracts.

The aim of this study is conducted for the phytochemical analysis of amla, keezha nalli and basil leaf.

II. MATERIALS AND METHODS

The phytochemical extract has been taken from the three plants are

1. Pyllanthus niruri(Gale of wind)
2. Phyllanthus emblica(Indian goose berry)
3. Ocimum tennuiflorum(Holy Basil)

COLLECTION OF PLANT

Phyllanthus niruri, Phyllanthus emblica, Ocimum basilium are located from local market and are identified advantage of wild life plants is that they will not contain any pesticides.

CLEANING OF PLANTS

After plants collection they have to be cleaned properly. The cleaning process may involve the following steps. Cleaning, washing, peeling or stripping leaves from stems. Cleaning has to be done by hands in order to get better results.

DRYING

The main purpose of drying is to remove the water content from plants so that the plants can be stored. Plants have to be dried immediately as soon as the plants collection or this will lead to spoilage of plant materials.

EXTRACT PREPARATION

Natural process includes sun-drying. Sometimes plants are placed on drying frames or on stands, to be air-dried in barns or sheds. But this may take a few weeks for complete drying. The time depends on temperature and humidity. Dried plant parts were ground into fine powders and then the powered sample was soaked in 100 to 150 mL of water, shaken occasionally to mix, and macerated for 72 hours at room temperature. Maceration intends to soften and break the plants cell wall to release the soluble Phytoconstituents Analytical balance was used for weighing the powdered sample and chemicals in the experiments. Then the solution was percolated through cotton. Filtrate and macerated were obtained. The prepared extract of all the three plants was used to test various Phytoconstituents present in them. Different chemical reagents were prepared and specific tests for specific phytochemicals were done. These various tests were qualitative and hence termed phytochemical screening.

Phyllanthus niruri
Phyllanthus emblica
Ocimum tenuiflorum

PHYTOCHEMICAL ANALYSIS OF PLANT EXTRACTS

The presence of phytochemical substances are determined based on standard qualitative test procedures [12]. The aqueous, ethanol and methanol extracts of P.emblica, P.niruri, ocimum basilium was used for the following phytochemical assays.

1. Test for Alkaloids-Mayer's Test: To 2.0 ml extract, 2.0 ml concentrated hydrochloric acid followed by few drops Mayer's reagent were added and observed for the formation of green colour or white precipitate, which indicates the presence of alkaloids.
2. Test for Cardiac Glycosides-Ferric Chloride Test: To 0.5 ml extract, 2.0 ml glacial acetic acid and few drops 5% ferric chloride were added. This was under layered with 1.0 ml concentrated sodium hydroxide. Formation of the brown ring at the interface was observed, which indicates presence of cardiac glycosides.
3. Test for Flavonoids-Sulphuric Acid Test: 1.0 ml extract was treated with few drops of concentrated sulphuric acid and observed for the formation of orange colour.
4. Test for Glycosides-Sulphuric Acid Test: To 2.0 ml extract, 1.0 ml glacial acetic acid, 5% ferric chloride and few drops concentrated sulphuric acid were added and observed for the formation of greenish blue colour, which indicates the presence of glycosides.
5. Test for Phenols-Ferric Chloride Test: To 1.0 ml extract, 2.0 ml distilled water, followed by few drops of 10% ferric chloride were added. Formation of blue or green colour was observed, which indicates presence of phenols.

6. Test for Quinones-Sulphuric Acid Test: To 1.0 ml extract, 1.0 ml concentrated sodium hydroxide was added and observed for the formation of red colour, which indicates the presence of quinones.
7. Test for Saponins-Foam Test: To 1.0 ml extract, 5.0 ml distilled water was added and shaken well in a graduated cylinder for 15 min. lengthwise. Formation of 1.0 cm layer of foam was observed, which indicates the presence of saponins.
8. Test for Steroids-Salkowski Test: To 5.0 ml extract, 2.0 ml of chloroform and few drops concentrated sulphuric acid were added and observed for the formation of red colour, which indicates the presence of steroids.
9. Test for Tannins-Ferric Chloride Test: To 1.0 ml extract, 2.0 ml 5% ferric chloride was added and observed for the formation of dark blue or greenish black colour, which indicates the presence of tannins.
10. Test for Terpenoids-Sulphuric Acid Test: To 0.5 ml extract, 2.0 ml chloroform was added and to this, concentrated sodium hydroxide was added carefully. Formation of red brown colour at the interface was observed, which indicates presence of terpenoids.
11. Test for Renin: To the small amount of the extract was added with the 10 ml of petroleum ether are taken in the test tube and then same amount of copper acetate was added and the mixture was shaken vigorously, which indicates the presence of Renin.

III. RESULTS & DISCUSSION

TABLE: 1 – Qualitative phytochemical screening of Phyllanthus emblica, Phyllanthus niruri, ocimum basilium extracts.

S.No.	Test	Method	embilica	niruri	basilium
1.	Alkaloids	Mayer's Test	+	+	+
2.	Cardiac Glycosides	Ferric Chloride Test	+	+	+
3.	Flavonoids	Sulphuric Acid Test	+	+	-
4.	Glycosides	Sulphuric Acid Test	-	+	+
5.	Phenols	Ferric Chloride Test	+	+	-
6.	Quinones	Sulphuric Acid Test	+	+	-
7.	Saponins	Foam Test	+	+	-
8.	Steroids	Salkowski Test	+	+	-
9.	Tannins	Ferric Chloride Test	+	+	-
10.	Terpenoids	Sulphuric Acid Test	+	+	-
11.	Renin	-	-	+	

+Presence -Absence
Phyllanthus niruri
Phyllanthus emblica
Ocimum tenuiflorum

Qualitative analysis of phytochemical screening of the 3 one kinds of extracts of Phyllanthus niruri included the presence of various chemical substance gatherings. [Table 1]. The results of Phytochemical Screening of Phyllanthus niruri leaves extracts are presented in Table 1. Qualitative Phytochemical screening of aqueous, ethanolic & methanolic extracts showed the presence of, alkaloids, cardiae glycosides, flavonoids, glycosides, phenols, quinones, saponins, steroids, tannins, terpenoids and

Renin. Among the three extracts used ethanolic extract showed maximum number of Phytochemical compounds. From the results obtained if is confirmed that ethanol has the best efficacy to obtain maximum phytochemical compounds.

DISCUSSIONS

Phytochemical screening of plant extracts revealed the presence of alkaloids, steroids, terpenoids and cardiac glycosides. Phytochemical screening not only helps to reduce the constituents of the plant extract and the one that predominates over the others but also is helpful in searching of bioactive agents those can be used in the synthesis of useful drugs. Protect cells and DNA from damage that may lead to cancer. Reduce inflammation. Slow the growth rate of some cancer cells.(17)

Help regulate hormones. Phytochemicals under research can be classified into major categories, such as carotenoids and polyphenols, which include phenolic acids, flavonoids, stilbenes or lignans. The active phytochemicals, flavonoids, alkaloids, terpenoids, lignins, polyphenols, tannins, coumarins and saponins, have been identified from various parts of Phyllanthus niruri. All parts of the plant are used for medicinal purposes, especially the fruit, which has been used in Ayurveda as a potent rasayana and in traditional medicine for the treatment of diarrhea, jaundice and inflammation.

Phytochemical screening play an important play in identifying various phyto constituent present in plant extract phytochemicals in the aqueous extract slightly inhibits the growth. This study helped to know the cytotoxic effect of the phytoconstituents present in plant extracts on the living cells.(17)

IV. CONCLUSIONS

Phytochemical screening confirmed the presence of phyto-constituents like alkaloids, flavonoids, glycosides, phenols, lignins, saponins, sterols, tannins, anthraquinone and reducing sugar. Which are compounds capable of causing varied physiochemical and pharmacological Phyllanthus niruri, Phyllanthus emblica and ocimum tenuiflorum are the effective plants used as in the medicinal field. These phytochemicals render the medicinal values of the studied plants.

Phytochemical screening is a preliminary stage in a phytochemical study that aims to provide an overview of the class of compounds contained in plants that are being. In the qualitative analysis of phytochemical screening Phyllanthus niruri is more effective than the Phyllanthus emblica and ocimum tenuiflorum.

Phytochemicals or chemicals in plants play important roles in their growth and development. They protect plants from harmful agents such as insects and microbes as well as stressful events such as ultraviolet (UV) irradiation and extreme temperatures.

Phytochemical screening not only helps to reduce the constituents of the plant extract and the one that predominates over the others but also is helpful in searching of bioactive agents those can be used in the synthesis of useful drugs.(17)

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