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Preliminary Phytochemical Screening of Methanol Extract of Indigotera trita Linn

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Abstract

The aim of the study to phytochemical screening was carried out. The traditional medicine involves the use of different plant extracts or the bioactive constituents, qualitative phytochemical analysis of these plants confirm the presence of various phytochemicals like alkaloids, flavonoids, tannins, saponins, proteins, gums and mucilage, phytosterols. The result suggest that the phytochemical properties for curing various ailments and posses potential antioxidant and reads to the isolation of new and novel compounds.

Keywords: Secondary metabolites; Alkaloids; Flavonoids; Saponins; Phenolic compound

Introduction

Nearly 80% of the world's population relies on traditional medicines for primary health care, most of which involve the use of plant extracts [1]. In India almost 95% of the prescriptions were used in unani, Ayurveda, Homeopathy and siddha [2]. Phytochemicals are responsible for medicinal activity of plants [3] these are non-nutritive chemicals that have protected human from various diseases. The major constituents consists of Alkaloids, Flavonoids, Saponins, Phenolic Compounds, Phytosterols, Proteins and amino-acids, gums and mucilage and lignin [4] phytochemical constituents are the basic source for the establishment of several pharmaceutical industries the constituents are playing a significant role in the identification of crude drugs [5]. The medicinal value of these plants lies in some chemical substances that produces a definite physiological action on the human body [6]. The most important of these bio active constituents of plants to be more effective with little or no side effects when compared to the commonly used synthetic chemotherapeutic agents. The anti-inflammatory, antispasmodic, anti-analgesic and can be attributed to their high steroids, tanning, terpenoids and saponins [7].

Materials and Methods

Collection and identification

Indigotera trita was collected from Ammapettai in Thanjavur District. The plant was authenticated by Dr. Jayaraman Director plan was authenticated by Dr. Jayaraman Director plant anatomy and research centre W. Thambaram Chennai (Par/2015/3042). The specimen were stored in our lab.

Extraction

The entire plant were shade dried and pulverized. The coarse powder of 500 gm packed in a soxhlet apparatus to continuous hot percolation, from shours using 1.5 liters of methanol as a solvent. The extract was concentrated under vaccum and dried in a dessicator yield and 23.25 g (6.7% w/w).

Phytochemical screening

Chemical tests were carried out on the aqueous extract anel on the powdered specimens using standard procedures of identify the constituents as described by sofowara, Trease and Evans.

Test for alkaloids: About 2 g of powdered sample was stirred with a few drops of dilute hydrochloric acid and then filtered. The filtrate was used for following test with various alkaloid reagent such as Ref. [8].

S No	Alkaloid reagent	Observation
1.	Mayer's reagent	Cream Precipitate
2.	Dragondroff's reagent	Orange brown precipitate
3.	Hager's reagent	Yellow precipitate
4.	Wagner's reagent	Reddish brown precipitate

Table 1: Test with various alkaloid reagent.

Test for carbohydrates and glycosides: To 5 g of extracts were dissolved in 5 ml of distilled water and filtered. The filtrate was subjected to test for carbohydrates and glycosides [9].

Molisch's Test: The filtrate was treated with 2-3 drops of 1% alcoholic napthol and 2 ml of concentrated sulphuric acid was added along the sides of the test. Violet color was formed and indicate the presence of carbohydrates.

Fehling's Test: The filtrate was treated with 1 ml of Fehling's solution and heated in a boiling water bath. A reddish orange precipitate was obtained.

Test for glycosides: Two g of extract was hydrolyzed with hydrochloric acid for a few hours on a water bath and the hydrolysate was subjected to legal's, Borntrager's test to detect the presence of different glycosides [10].

Legal's Test: To the hydrolysate 1 ml of sodium nitroprusside solution was added and then it was made alkaline with sodium hydroxide solution. None of the extract produced pink to red color.

Borntrager's Test: Hydrolysate was treated with chloroform and the chloroform layer was separated. To this equal quantity of dilute ammonia solution was added. No color change in Ammonical layer was observed.

Test for Phytosterol: one gm of the extract was dissolved in few drops of dilute acetic acid, 3 ml of acetic anhydride was added followed by few drops of concentrated sulphuric-acid appearance of bluish green color shows the presence of phytosterol [11].

Test for fixed oils and fats: Small quantity of the extracts was separately pressed between two filter papers oil stain on the paper indicates the presence of fixed oil [12]. Few drops of 0.5N alcoholic potassium hydroxide were added to small quantity of various extracts along with a drop of phenolphthalein. The mixture was heated on water bath for 1.2 hours. Formation of soap or partial neutralization of alkali indicates the presence of fixed oil and Fats. The extract was diluted with 20 ml of distilled water and it was agitated on a graduated cylinder for 15 minutes. The presence of saponins was indicated by formation of 1 cm layer of foam [14].

Test for tannins: 2 ml of extract was added to few drops of 1% lead acetate. A yellowish precipitate indicated the presence of tannins [15]

To 2 ml of the extract was added 5% Dilute ferric chloride solution a violet color was formed indicate the presence of tannins.

Test for proteins and amino acids: Dissolve small quantities of various extract in a few ml of water and treated with [16] the following

Millon's reagent – Red Color

Ninhydrin reagent – Purple color

Biuret Test – Pink Color

Test for gums and mucilages: About 10 ml of the extracts was added to 25 ml of absolute alcohol with stirring and filtered. The precipitate was dried in air and examined for its swelling properties and for the presence of carbohydrates [17].

S No	Phytoconstituents	Indication
1.	Alkaloids	+
2.	Carbohydrates	+
3.	Glycosides	+
4.	Phytosterols	+
5.	Saporins	+
6.	Fixed oils and fats	-
7.	Tanning and Phenolic Compound	+
8.	Proteins and Free amino acids	+
9.	Gums and Mucilage	+
10.	Lignin	+
11.	Flavonoids	+
12.	Volatile oils	-

Table 2: Preliminary Phyto Chemical Screening of Methanol whole plant extract of Indigotera.

S No	Chemical test	Methanolic Extract	
		Daylight	UV light
1.	Sample as such	Greenish Brown	Light Green
2.	Extracs with aqueous NaoH	Yellow	Dark Green
3.	With alcoholic NaoH	Dark Yellow	Yellowish Green
4.	With HCL	Yellowish Brown	Light Green
5.	With 50% $HN0_3$	Brownish Yellow	Yellowish Green
6.	With 50% H_2SO_4	Brownish Yellow	Greenish Yellow
7.	With Methanol	Yellowish Green	Green
8.	With Ammonia	Light Yellow	Green
9.	With I_2 Solution	Dark Brown	Fluorescent green
10.	With $FeCl_3$	Yellowish Brown	Fluorescent Green

Table 3: Fluorescence Analysis.

Results and Discussion

The successive whole plant methanol extract of *Indigofera trita* Linn. have revealed the presence of alkaloids, flavonoids, Saponis, Carbohydrates, Phytosterols, Gums and mucilage, Lignin (Table 1). Thus, the preliminary screening tests may be useful in the detection of bioactive principle and may lead to the drug discovery and development. Fluorescence analysis of extract is tabulated in Table 3. Alkaloids have been well investigated for many pharmacological properties including antiprotozoal, cytotoxic, antidiabetic [18] and anti-inflammatory [19] properties. Plants with alkaloids in the present study are *Indigofeara trita* Linn is used to arthritis. Saponins are glycosides occurring widely in plants. They are abundant in many foods consumed by animals and man. Saponin is used as mild detergent and in intracellular histochemistry staining allow antibody access to intracellular proteins. In medicine, it is used in anti-oxidant, anti-cancer, anti-inflammatory central nervous system activities and weight loss etc. The plant having saponins are *Indigotera trita* Linn. Glycosides, Volatile oils and fats were absent in *Indigofera trita* Linn. Tannins were reported that certain tanning were reported that certain tannings were able to inhibit HIV replication selectively besides uses as diuretics and it is recognized for their pharmacological properties and are known to make trees and shrubs a different meal for caterpillars [20]. Apart from tannin and phenolic compound Alkaloids and flavonoids are potent water-soluble anti-oxidants and free radical scavengers, which prevent oxidative cell damage, have strong anticancer activity [21] and also anti-arthritic activity [22].

Conclusion

The plant extractive studied could be an answer to the people seeking for better therapeutic agents from natural sources which is

believed to be more efficient with little or no side effects when compared to the commonly used synthetic chemotherapeutic agent.

References

1. Sandhya B, Thomas S, Isabel W, Shenbag A (2006) Ethnomedicinal Plants Used By The Valaiyan Community of Piranmalai Hills (Reserved Forest), Tamil Nadu, India - A Pilot Study. Complementary and Alternative Medicines 3: 101-114.
2. Satyavati GV, Gupta AK, Tandon N (1987) Indigenous Plant Drugs For Diabetes Mellitus. Indian Council of Medicinal Research, New Delhi, India.
3. Kumar A, Ilavarasan R, Jayachandran T, Decaraman A, Aravindhan P, et al. (2009) Phytochemical investigation on a tropical plants. Pakistan Journal of Nutrition 8: 83-85.
4. Mallikaharajuna PB, Rajanna LN, Seetharam YN, Sharanabasappa GK (2007) Phytochemical studies of strychonas Potatorm L.F- A Medicinal Plant. E J Chem 4: 510-518.
5. Ajayi OB, Akomolafe SF, Adefioye A, Sofowara A (1993) Medicinal Plants and Traditional medicine in Africa. Spectrum Books Ltd., Ibadan, Nigeria, p: 289.
6. Trease GE, Evans WC (1989) Pharmacognsy. 11th edn. Brailliar Tirides can. Macmillian publishers.
7. Harbeorne JB (1973) Phytechemical Methods. London, Chapman and Hall, Ltd., pp: 49-188.
8. Khandelwal KR (2006) Practical Pharma Cognosy, Techniques and experiments. Nirali Prakashan, pp: 149-156.
9. Nandagopal S, Ranjitha Kumari BD (2007) Phytochemical and antibacterial studies of Chicory (Cichorium intybus L.) Multipurpose Medicinal Plant. Advan Biol Res 1: 17-21.
10. Cragg GM, David JN (2001) Natural Product drug discovery in the next millennium. J Pharm Biol 39: 8-17.
11. Gibbs RD (1974) Chemotaxonomy of flowering plants. Montreal and London, MC Gill Quuen's University Press, pp: 380-399.
12. Kokate CK, Purohit AP, Gokhale SB (2005) Pharmacognosy. 33rd edn. Nirali Prakashan, pp: 108-109.
13. Ayoola GA, Coker HAB, Adesegun SA, Adepoju AA, Beello K, et al. (2008) Phytochemical Screening and antioxidant activities of some seleced medicinal plants used for malaria theraphy in south western Nigeria. Trop J Pharm Res 7: 1019-1024.
14. Kumar A, Ilavarasan R, Jayachandran T, Decaraman M, Aravindhan P (2009) Phytochemical investigation on a tropical plant. Pak J Nutri 8: 83-85.
15. Trease GE, Evans WC (1985) Pharmascognesy. 17th edn. Bative Tinal, London, p: 149.
16. Pulok KM (2002) Quality Control of Herbal Drugs. 1st edn. New Delhi, Business Horizons, p: 284.
17. Evans WC (2005) Trease and Evans. Pharmacognosy. 15th edn. New Delhi, Elseiver, p: 193.
18. Cherian S, Augusti KT (1995) Insulin sparing action of leucopelargonidin derivative isolated from ficus benghalesis Linn. Indian Journal 33: 608-611.
19. Liu RH (2003) Health benefits of fruit and vegetables are from additive and synergistic combinations of phytochemicals. Americal Journal of Clinical Nutrition 78: 517-520.
20. Haslam E (1989) Plant polyphenol: Vegetable tannins. London, Cambridge University Press, p: 169.
21. Del-Rio A, Obduluio BG, Castillo J, Marin FG, Ortuno A (1997) Uses and Properties of citrus Flavonoids. J Agric Food Chem 45: 4505-4515.
22. Sindhu RK, Arora S (2013) Free radical Scavenging and antioxidant potential of ficus lacor Buch. Asia J Pharm Clin Res 6: 184-186.