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PRELIMINARY PHYTOCHEMICAL SCREENING OF *BUCHANANIA LANZAN* SPRENG. LEAVES

Atoofa Habib[*1], **Mukta Shrivastava**[2]
Department of Botany, Govt. M. L.B. Girls P.G. (Autonomous) College, Bhopal, M.P. 462002. India.

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ABSTRACT

Plants have bioactive compounds which are used for curing of various human diseases. Phytochemicals have two categories viz. primary constituents which include chlorophyll, Proteins, sugars, aminoacids and secondary constituents which include terpenoids and alkaloids. The primarily aim of the present study was to carry out a preliminary phytochemical screening of *Buchanania lanzan* leaves so as to evaluate the major class of compounds present in it. The leaf extracts of *B. lanzan* were prepared in different solvents like Petroleum ether, Dichloromethane, ethanol and water through soxhlation. The results of this study indicated the presence of alkaloids, tannins, saponins, flavonoids, phenols, glycosides, carbohydrates and triterpenes. Most of the phytochemicals were found in aqueous and ethanol extracts. The presence of these phytochemicals describes the importance of this plant as a good source of herbal medicine.

Corresponding author
Atoofa Habib
Department of Botany,
Govt. M. L.B. Girls P.G.(Autonomous) College,
Bhopal, M.P. 462002. India.
miratoofa7@gmail.com

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INTRODUCTION

Plants are important source of medicines. The medicinal plants are useful for healing as well as for curing of human disease because of the presence of pytochemical constituents. Phytochemicals are naturally occurring in the medicinal plants leaves, vegetables and roots that have defence mechanism and protect from various diseases. Phytochemicals are primary and secondary compounds. Chlorophyll, proteins and common sugars are included in primary constituents and secondary compounds have terpenoids ,alkaloids and phenolic compounds[1]..

In 1985 Farnce worth et al, identified 119 secondary plant metabolites which were used as drugs. Out of 255 drugs which are considered as basic and essential by the world health organisation (WHO), 11% are obtained from plants and a number of synthetic drugs are also obtained from natural precursors[2]. There are large number of medicinal plants whose scientific importance has not been explored. All over the world, plants have served as the richest source of raw materials for traditional as well as modern medicines, the study of medicinal importance of plants, scientifically and a confirmation of the use of these plants towards curing diseases is a possible solution to development of less costly and effective drug from our local raw materials[3].

Buchanania lanzan Spreng.(Chironji) is an important natural wild plant, of family Anacardiaceae. Chironji originated in the Indian subcontinent[4]. The tree is a medium evergreen deciduous tree, growing 50feet tall[5].The tree grows most commonly on yellow sandy-loam soil. The bark is rough and dark grey or black[6]. Flowering start from January to March and fruits ripen in the month of April-June[7].Flowers are small, greenish-white. Fruit is a yellowish-red drupe, one seeded ripens from April to May. It has tickly leathery leaves which are broadly oblong, with blunt tip and rounded base[8.] Leaves possess 10 – 20 pairs of straight parallel veins. *Buchanania lanzan* is a multipurpose medicinal species. All parts of the plant are used for the treatment of various disorders. The oil from the seeds is used to reduce granular swelling of the neck. The leaves of *Buchanania lanzan* are used for promoting wound healing[5].

Present investigation is carried out for phytochemical analysis of *B. lanzan*, so that various bioactive compounds will be evaluated. The leaf extracts of *B. lanzan* were prepared in different solvents like Petroleum ether, Dichloromethane ,ethanol and water through soxhlation. The results of this study indicated the presence of alkaloids, tannins, saponins, flavonoids, phenols, glycosides, carbohydrates and triterpenes.

MATERIALS AND METHODS

Plant material

Buchanania lanzan was selected as plant material to carry out the present study.

Sample collection:

Fresh leaves of *Buchanania lanzan* for the present investigation were obtained from the forests of Itarsi, district Hoshangabad, Madhya Pradesh, India. The plant was identified based on its floral description given in the literature.

Preparation of samples:

The plant leaves collected were washed thoroughly with tap water followed with distilled water to remove all surface impurities and then air dried under shade till constant weight was obtained. Fully dried leaves were then grinded using electric blender to obtain fine powder. The powder was transferred in an air tight container to prevent it from the effect of humidity.

Preparation of extracts:

Dried leaf powder materials were extracted using soxhlet extractor at different temperatures depending upon the boiling point of the solvents used. In the extraction methodology 40gm fine dried powder was filled in the thimble and the distillation flask was filled with petroleum ether solvent and the whole process was repeated for all other solvents used. The extracts obtained were concentrated using water bath evaporator and were weighed to determine the total yield and then stored and preserved at 4^0c in airtight containers till further use.

Chemicals :

All chemicals (solvents) used in this study were purchased from Merck chemicals, India , of analytical grade.

Preliminary phytochemical Analysis:

The extracts were analysed for the presence of alkaloids, tannins, saponins, flavonoids, phenols, glycosides, carbohydrates and triterpenes.

Test for Alkaloids:

0.2g of extracts were dissolved individually in dilute 1%Hydrochloric acid and shaken for three minutes and then filtered.

Dragendroff's Test:

Filtrates were treated with Dragendroff's reagent (solution of Potassium Bismuth Iodide). Formation of red precipitate indicated the presence of alkaloids.

Wagner's Test:

Filtrates were treated with Wagner's reagent (Iodine in Potassium Iodide). Formation of brown/reddish precipitate indicated the presence of alkaloids.

Mayer's Test:

Filtrates were treated with Mayer's reagent (Potassium Mercuric Iodide). Appearance of a yellow coloured precipitate indicated the presence of alkaloids

Hager's Test:

Filtrates were treated with Hager's reagent (saturated picric acid solution). Formation of yellow coloured precipitate indicated the presence of alkaloids.

Detection of carbohydrates:

0.2 g of Extract was dissolved individually in 5 ml distilled water and then filtered. The filtrate was then used to test for the presence of carbohydrates.

Benedict's Test:

Filtrates were treated with Benedict's reagent and heated gently for about two minutes. Appearance of Orange red precipitate confirmed the presence of reducing sugars.

Fehling's Test:

Filtrates were hydrolysed with dilute HCl, and then neutralized with alkali and heated with Fehling's A & B solutions respectively. Formation of red precipitate indicated the presence of reducing sugars.

Molisch's Test:

2 drops of alcoholic α-naphthol solution was added to the filtrates in a test tube. Formation of the violet ring at the junction indicated the presence of Carbohydrates.

Detection of glycosides:

Extracts were hydrolysed with dilute HCl solution, and then nutrilized with sodium hydroxide solution then subjected to test for glycosides.

Legal's Test:

About 3ml of Extract was treated with sodium nitropruside in pyridine and sodium hydroxide. Appearance of pink to blood red colour indicated the presence of cardiac glycosides

Modified Borntrager's Test:

3ml of Extract was treated with Ferric Chloride solution and then immersed in boiling water for about 5 minutes. The mixture was then cooled and extracted with equal volumes of benzene. The benzene layer was then separated and treated with ammonia solution. Formation of rose-pink colour in the ammonical layer indicated the presence of anthranol glycosides.

Detection of saponins

Foam Test:

0.2 gm of extracts were shaken with 2 ml of water. Formation of foam produced which persists for ten minutes signified the presence of saponins.

Froth Test:

0.2g of Extracts were diluted with distilled water to 20ml and then shaken in a graduated cylinder for 15 minutes. Formation of 1 cm layer of foam indicated the presence of saponins

Detection of triterpenes

0.2g of Extracts were treated with chloroform and then filtered.

Salkowski's Test:

The filtrates were treated with 2-3 drops of Conc. Sulphuric acid,and then shaken and allowed to stand. Appearance of golden yellow colour indicated the presence of triterpenes.

Detection of phenols

Ferric Chloride Test:

0.2g of extracts were treated with 3-4 drops of ferric chloride solution. Formation of bluish black colour indicated the presence of phenols.

Detection of tannins

Gelatin Test:

1% gelatin solution containing sodium chloride was added to 3ml of extracts. Formation of white precipitate indicated the presence of tannins.

Detection of flavonoids

Lead acetate Test:

3ml of extracts were treated with 2-3 drops of lead acetate solution. Formation of yellow colour precipitate indicated the presence of flavonoids.

Alkaline Reagent Test:

3ml of extracts were treated with few drops of sodium hydroxide solution. Appearance of intense yellow colour, which becomes colourless on addition of dilute acid, indicated the presence of flavonoids.

RESULTS AND DISCUSSION

The ethanol, petroleum ether , Dichloromethane and Aqeous extracts of *Buchanania lanzan* leaf having extractive yield as 5.90g, 9.02g , 10.05g , 4.23g respectively (Table1). On phytochemical screening the extracts showed the presence of alkaloids , phenols , saponins , tannins, carbohydrates, glycosides and flavonoids as chemical constituents. The results of these constituents are represented in Table 2.

Table1. Depicting Extractive yield of leaf extract of *Buchanania lanzan.*

S.no	Type of extract	Extractive yield(grams)
1	Aqueous	10.05
2	Pet ether	9.02
3	Ethanol	5.90
4	Dichloromethane	4.23

Table 2.Depicting phytochemical estimation results of *Buchanania lanzan* leaf extract.

S.no	Plant constituents	Aqueous	Pet ether	Ethanol	Dichloromethane
1	Test for alkaloids	+ve	+ve	_ve	_ve
2	Test for phenols	+ve	_ve	+ve	+ve
3	Test for saponins	+ve	_ve	+ve	_ve
4	Test for carbohydrates	+ve	_ve	+ve	_ve
5	Test for triterpenes	+ve	+ve	+ve	+ve
6	Test for glycosides	+ve	+ve	_ve	+ve
7	Test for tannins	+ve	_ve	+ve	_ve

+ve = positive; -ve= negative.

CONCLUSION

In conclusion it may be stated that *Buchanania lanzan* leaf extract possess a rich source of phytochemicals like phenols, glycosides, flavonoids, tannins, carbohydrates, saponins, triterpenes etc. Leaf extract in different solvent system confirms the presence of diverse group of phytochemicals. These extracts are used in various herbal formulations for the treatment of diseases. Further investigation is required in order to evaluate more and more bioactive compounds from this plant, so that they may be used in herbal medicine system.

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