



International Journal of Medicine and Pharmaceutical Research

Journal Home Page: www.pharmaresearchlibrary.com/ijmpr



Research Article

Open Access

Phytochemical screening of *Vernonia cinerea* leaf extracts

Varsha. V, Dr. S. N. Suresh*, Prejeena. V

PG and Research Department, Department of Biotechnology, Sree Narayana Guru College, K. G. Chavadi, Tamil Nadu, India-641105.

ABSTRACT

Plant materials are invaluable sources in treatment of various diseases and research on certain plants has opened the way to development of various therapeutic agents. Plant based natural compounds are increasingly used in agriculture, food industries and in production of certain organic compounds. The bioactive compounds in plants called as phytochemicals are synthesized as a result of plant metabolism. The beneficial effects of these constituents results from combination of secondary metabolites. The systemic screening of these phytochemicals helps in development of certain bioactive compounds. In the present study phytochemical screening of petroleum ether, ethanol and aqueous extracts of *Vernonia cinerea* was done to detect the constituents present in the plant. Leaves of *Vernonia cinerea* was shade dried and extracted with respective solvents. The findings shown evidence that extracts contain certain medically bioactive compounds.

Keywords: Phytochemicals, *Vernonia cinerea*, petroleum ether, ethanol, aqueous extracts.

ARTICLE INFO

CONTENTS

1. Introduction	1242
2. Materials and Methods	1243
3. Results and discussion	1244
4. Acknowledgements.	1244
5. References	1244

Article History: Received 18 October 2015, Accepted 21 November 2015, Available Online 10 December 2015

*Corresponding Author

S. N. Suresh
PG and Research Department,
Department of Biotechnology,
Sree Narayana Guru College,
Chavadi, Tamil Nadu- 641105, India.
Manuscript ID: IJMPR2817



PAPER-QR CODE

Citation: S. N. Suresh, et al. Phytochemical screening of *Vernonia cinerea* leaf extracts. *Int. J. Med. Pharm. Res.*, 2015, 3(6): 1242-1245.

Copyright© 2015 S. N. Suresh, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

1. Introduction

Medicinal plants possess wide range of chemical constituents which could serve as clue for drug designing and can perform definite physiological action on human

body. Plants have been known to relieve various diseases in Ayurveda and hence characterization and analysis of plant constituents are gaining interest among researchers [1].

Plants produce various organic chemical compounds to protect themselves. These compounds are synthesized by primary and secondary metabolism of plants. Secondary metabolites are valuable chemical constituents that are used in human therapy, veterinary, agriculture and scientific research. Large number of such compounds has shown therapeutic values and is used in drug development [2].

Vernonia cinerea, also known as little ironweed is a species of perennial plants belonging to the sunflower family. The species is native to tropical Africa and Asian countries. *Vernonia cinerea* is an annual herb with flat topped arrays of numerous flower heads, each with pinkish ray florets and grows up to 120cm height. The plant possesses great medicinal value in diverse traditional usage in different nations. The whole plant is used in decoction or infusion to treat fever and eye infections. It has been used as remedy for spasms of the urinary bladder and strangury, also often combined with quinine to treat malaria. Seeds are used as a source for alexipharmic and anthelmintic drugs [3]. Leaves of *Vernonia cinerea* have analgesic, antipyretic and anti-inflammatory effects. The whole plant is used for kidney disorders, stomach pain, diarrhoea, eczema, menstrual pains and decoction for diuretic. Juice of this plant is given to children to treat bed-wetting. Recently research is going on this plant as an aid to give up cigarette smoking. Natural products provide abundant opportunities for the formulation of novel drug. The compounds in plants are part of phytomedicines that can be derived from leaves, stem, bark, root, flowers and seeds. Analysis of these compounds provides insight into the biological activity of plants [4]. Preliminary phytochemical screening helps in the development of novel therapeutic agents. Thus the present study deals with the phytochemical screening of petroleum ether, ethanol and aqueous extracts of *Vernonia cinerea* for identifying their chemical constituents.

2. Materials and Methods

Collection of plant material

Fresh plants of *Vernonia cinerea* were collected from different areas of Kerala. It was authenticated from Botanical Survey of India, Tamil Nadu Agricultural University, Tamil Nadu.

Preparation of plant extract

Fresh leaves of *Vernonia cinerea* was washed thoroughly, shade dried and powdered. The plant powder was then kept in contact with petroleum ether, ethanol and distilled water separately in a stoppered container for a defined period with continuous agitation. The extract is then filtered, condensed and stored for further use of phytochemical studies.

Phytochemical Screening of *Vernonia cinerea* leaf extract

Test for Phlobtannins

To each plant extract 1% hydrochloric acid solution was added and boiled in a water bath. Formation of red colour precipitate indicates the presence of phlobtannins[4].

Test for alkaloids

Dragendroff's test

Each extract was treated with Dragendroff's reagent. Formation of red precipitate indicates positive result.

International Journal of Medicine and Pharmaceutical Research

Mayer's test

Each extract was treated with 2ml of Mayer's reagent. Formation of yellow coloured precipitate indicates the presence of alkaloids.

Test for proteins (ninhydrin test)

Each extract was treated with 2ml of 0.2% ninhydrin solution. Presence of violet colouration indicated amino acids and proteins.

Test for carbohydrates

Fehling's Test

Equal volume of Fehling A and Fehling B was mixed, 2ml of this solution was added to each extract and boiled. Formation of red brick precipitate at the bottom of the test tube indicated the presence of carbohydrates.

Benedict's Test

2ml of Benedicts solution was added to each extract and boiled. Formation of reddish brown precipitate indicated the presence of carbohydrates.

Iodine test

2ml of iodine solution was treated with each extract .Dark blue or purple coloration indicated the presence of carbohydrates.

Test for phenols

2ml of 2% ferric chloride solution was added to each extract. Blue green or purple coloration indicated the presence of phenols.

Test for flavonoids

Alkaline reagent test

Each extract was mixed with 2ml of 2% NaOH solution. Formation of intense yellow colouration turned colourless on addition of few drops on dilute acid indicating the presence of flavonoids.

Test for saponins

Foam test

Each extract was mixed with 5ml of distilled water and shaken vigorously. Formation of stable foam indicated the presence of saponins.

Froth test

Each extract was diluted with 20ml of distilled water and shaken for 15 minutes. Formation of 1cm layer of foam indicates the presence of saponins.

Test for glycosides

Liebermann's test

Each extract was mixed with 2ml of chloroform and 2ml of acetic acid. The mixture was cooled in ice. Concentrated sulphuric acid was carefully added. A colour change from violet to blue to green indicated the presence of glycosides.

Salkowski's test

2ml of chloroform was mixed with each extract. 2ml of concentrated sulphuric acid was added and shaken gently. Reddish brown colour indicated the presence of glycosides.

Test for steroids

Extracts was mixed with 2ml of chloroform and concentrated sulphuric acid. A red colour formed at the chloroform layer indicated the presence of steroids.

Test for terpenoids

2ml of chloroform was added to each extract and mixed well. 3 ml of concentrated sulphuric acid was added to each tube. Formation of reddish brown colour indicates the presence of terpenoids.

Test for tannins

Gelatin test

1% gelatine containing sodium chloride was treated with each extracts. Formation of white precipitate indicates the presence of tannins.

3. Results and Discussion

The phytochemical characteristics of petroleum ether, ethanol and aqueous extracts of *Vernonia cinerea* was screened and revealed the presence of certain phytochemicals which is summarized in table 1. The results revealed the presence of certain bioactive compounds in leaf extracts of *Vernonia cinerea*. Petroleum ether extract shown the presence of alkaloids, tannins, saponins and glycosides, other constituents like phenols, steroids flavonoids, carbohydrates, proteins, phlobtannins and terpenoids were found to be absent. Majority of the compounds like alkaloids, phenols, tannins, steroids, glycosides, flavonoids, carbohydrates and terpenoids were present in ethanolic extracts of *V. cinerea*. Alkaloids, phenols, saponins and phlobtannins are the compounds that were screened in aqueous leaf extracts.

4. Conclusion

Medicinal plants produce a wide range of metabolic compounds. Research on such constituents will provide light on their therapeutic properties revealing the activity of plants. Fresh leaves of *Vernonia cinerea* was taken and prepared the extracts with petroleum ether, ethanol and distilled water to analyze for their phytoconstituents. The screening of phytochemicals revealed the presence of medicinally active biocompounds like alkaloids, phenols, tannins, saponins, steroids, glycosides, flavonoids, carbohydrates, phlobtannins and terpenoids. More bioactive principles were found in the ethanolic extracts of *Vernonia cinerea*. Phytochemical analyses of medicinal plants have gained interest in research institutes and pharmaceutical industries for the development of new drug. Further studies should be done to check for its action in treatment of various ailments. Detailed research can be done on this plant to isolate, purify and characterize the compound responsible for the plant activity.

Table 1: Phytochemical Screening of *Vernonia cinerea*

	Petroleum Ether extract	Ethanol extract	Aqueous Extract
Alkaloids	+	+	+
Phenols	-	+	+
Tannins	+	+	-
Saponins	+	-	+
Steroids	-	+	-
Glycosides	+	+	-
Flavonoids	-	+	-
Carbohydrates	-	+	-
Proteins	-	-	-
Phlobtannins	-	-	+
Terpenoids	-	+	-

+ = presence of compound, - = absence of compound

5. References

- [1] RNS Yadav, Munin Agarwala. Phytochemical analysis of some medicinal plants. *Phytology.*, **2011**, 3(12):10-14.
- [2] Prashant Tiwari, Bimlesh Kumar, Mandeep Kaur, Gurpreet Kaur, Harleen Kaur. Phytochemical screening and extraction: A Review. *Internationale Pharmaceutica Scientia.*, **2011**, 1(1): 104-106.
- [3] Gunjan Guha, V Rajkumar, R Ashok Kumar, Lazar Mathew. Therapeutic potential of polar and non-polar extracts of *Cyanthellium cinereum* *Invitro. Evidence based complementary and Alternative medicine*, Hindawi Publishing Corporation., **2011**:1-10.
- [4] Abdul Wadood, Mehreen Ghufuran, Syed Babar Jamal, Muhammed Naeem, Ajmal Khan, Rukhsana Ghaffar, Asnad. Phytochemical analysis of medicinal plants occurring in local area of Mardan. *Biochem Anal Biochem.*, **2013**: 2-4.
- [5] Parekh J, Chanda S. Antibacterial and phytochemical studies on twelve species of Indian Medicinal Plants. *Afr. J. Biomed- Res.*, **2007**, 10: 175-181.
- [6] Parekh J, Chand S. Phytochemicals screening of some plants from western region of India. *Plant Arch.*, 2008, 8: 657-662.
- [7] Snehalata Pandey, Dr. Rajashree Pandey, Rita Singh. Phytochemical screening of selected medicinal plant *Cinnamon zeylanicum* bark extract, Area of research; Uttarakhand, India. *International Journal of Scientific and Research Publications.*, **2014**, 4(6): 1-5.
- [8] PA Batugal, J Kanniah, Lee SY, JT Oliver. Medicinal Plants Research in Asia, Volume 1, Future Harvest, Malaysia, **2004**, 3-4.
- [9] M P Ayyappa Das, R Dhanabalan, A Doss, M Palaniswamy. Phytochemical screening and antibacterial activity of aqueous and methanolic leaf extracts of two medicinal plants against Bovine Mastitis bacterial pathogens. *Ethnobotanica Leaflets.*, **2009**, 13: 131-139.
- [10] Manjulika Yadav, Sanjukta Chatterji, Sharad Kumar Gupta, Geeta Watal. Preliminary phytochemical screening of six medicinal plants used in traditional medicine. *Int. J Pharm Pharm Sci.*, **2015**, 6(5): 539-547.
- [11] Charu Arora Chugh, Sanjeev Mehta, Hena Dua. Phytochemical screening and evaluation of biological activities of some medicinal plants of Phadwara, Punjab. *Asian Journal of Chemistry*, **2012**, 24(12): 5903-5905.
- [12] Anjali Soni, Sheetal Sosa. Phytochemical analysis and free radical scavenging potential of herbal and medicinal plant extracts. *Journal of Pharmacognosy and Phytochemistry.*, 2013, 2(4): 22-29.
- [13] Sudipa Nag, Anirban Paul, Rituparna Dutta. Phytochemical analysis of methanolic extracts of leaves of some medicinal plants. *International*

Journal of Scientific and Research Publications.,
2013, 3(4): 1-5.

- [14] Venkata SSN Kantamreddi, Y Nagendra Lakshmi, VVV Satyanarayana Kasapu. Preliminary phytochemical analysis of some important plant species. *International Journal of Pharma and Biosciences.*, **2010**, 1(4): 351-358.