RESEARCH ARTICLE

Preliminary Phytochemical Analysis of *Euphorbia hirta Linn.* Leaves

Arsule CS* and Sable KV

New Arts, Commerce and Science College, Ahmednagar
*Corresponding author Email: - csarsule@gmail.com

Manuscript details:

Received: 12.10.2017
Accepted: 24.12.2017
Published : 31.12.2017

Cite this article as:
Arsule CS and Sable KV (2017) Preliminary Phytochemical Analysis of *Euphorbia hirta Linn.* Leaves; *International J. of Life Sciences*, 5 (4): 746-748.

ABSTRACT

Medicinal plants have biologically compounds which are used for treating various human diseases and also play an important role in curing. Phytochemicals have two categories i.e., primary and secondary constituents. Primary constituents involve chlorophyll, proteins sugar and amino acids whereas secondary constituents contain terpenoids and alkaloids. Due to the presence of these secondary constituent's medicinal plants show antifungal, antibacterial and anti-inflammation activities. The present study was designed to investigate the phytochemical screening and antimicrobial activities of *Euphorbia hirta* extracts. Phytochemical screening revealed the presence of alkaloid, flavonoid, saponin, terpenoid, tannin and phenol in the extracts of aerial part of *Euphorbia hirta*.

Key words: *Eubhorbia hirta* Linn. Phytochemicals, flavonoids, saponins, alkaloids.

INTRODUCTION

Phytochemistry or Plant chemistry (the Greek word "Phyto" meaning plant) is the branch of chemistry, deals with chemical nature of the plant or plant products (chemistry of natural products). Phytotherapy acts as a source of treating and improving certain diseases by using the beneficial effects of medicinal plants. Phytochemicals are the bioactive, natural chemical compounds, found in plants. The plant contains a wide variety of chemical compounds and they are broadly classified into two types, primary and secondary constituents. Primary constituents involve chlorophyll, proteins sugar and amino acids whereas secondary constituents contain terpenoids and alkaloids. Due to the presence of these secondary constituent's medicinal plants show antifungal, antibacterial and anti-inflammation activities. Different parts such as leaves, bark, seeds, roots, flowers and pods of plants also have different quality and quantity of active constituent.

Euphorbia hirta belong to genus Euphorbia and family Euphorbiaceae. It is a small annual herb and it is common to tropical countries. It can grow to a height of 40cm. *Euphorbia hirta* is a popular herb in practitioners of traditional herb medicine. *Euphorbia hirta* is also called asthma herb and pill bearing spurge. The stem of *Euphorbia hirta* is slender and other reddish in color and covered with yellowish bristly hair especially in young

part of *Euphorbia hirta*. The leaves of *Euphorbia hirta* are arranged oppositely and are usually reddish or greenish underneath measuring about 5cm long.

This economic important made scientists devote considerable attention for this crops in their research. Several species of *Euphorbia*, the largest genus in the family "Euphorbiaceae" have attracted; much attention for their antimicrobial, antiviral, antitumor, cytotoxic, pesticidal and phytotoxic activities.

MATERIAL AND METHODS

Collection of samples:
Fresh plant leaves of *Euphorbia hirta Linn.* were collected from Ahmednagar. The leaves are thoroughly washed through tap water and dried under shade for 3-5 days. The dried leaves are ground to fine powder and stored in polythene bags for further use.

Preparation of extracts:
2 grams of dried powder of *Euphorbia hirta Linn us* leaves was packed in five separate round bottom flask for sample extraction using five solvents namely aqueous, acetone, ethanol, methanol and Chloroform. The extraction was conducted with 20ml of each solvent for a period of 24 hours. At the end of the extraction the respective solvents were concentrated under reduced pressure and the crude extracts were stored in refrigerator.

Phytochemical analysis:
Various chemical tests are conducted to identify represented of different phytochemicals terpenes, alkaloids, flavonoids, glycosides, tannins and phenolic compound based on the protocols available in the literature.

Test of Alkaloids (Wagner's Test):
Take 1ml of plant extract and add 3-5 drops of Wagner's reagent and observe for the formation of reddish brown precipitate or colouration.

Test of carbohydrates (Molisch's test):
Take 1ml of plant extract and add 3-5 drops of Molisch's reagent, along with this add 1ml of conc. Sulphuric acid (H_2SO_4) down the side of the test tube. Then allow the mixture to stand for 2-3 min. Observe for the formation of red or dull violet colour at the interface of the two layers is positive result.

Test for Cardiac Glycosides (Keller Kelliani's Tets):
Take 1ml extract and treat it with 1ml of glacial acetic acid and 2-3drops of 5% ferric chloride solution. To this mixture add 0.5mlof conc.H_2SO_4. Observe for a brown ring at the interface shows the presence of deoxysugar characteristics of cardenolides. A violet ring may appear below the ring while in the acetic acid layer, a greenish ring may form.

Test for Flavonoids (Alkaline reagent Test):
Take 1ml of extract and treat it with 3-5 drops of 20% NaOH solution. Observe for the formation of intense yellow colour, which becomes colourless on addition of 0.5 ml dilute HCl indicates the presence of flavonoids.

Test for Phenols (Ferric Chloride Test):
Take 1ml of extract and add 5-6 drops of aqueous ferric chloride solution and observe for the formation of deep blue or black color.

Test for Amino acid and Proteins (1%Ninhydrin solution in Acetone):
Take 1ml of extract and add 2-5 drops of aqueous Ninhydrin solution and keep it in a boiling water bath for 1-2 min and observe for the formation of purple color.

Test for Saponins (Foam test):
Take 1ml of extract and add 5ml distilled water and shake vigorously. Observe for the formation of persistence foam for 10-15 min that confirms the presence of saponins.

Test for Tannins (Braymer's test):
Take 1ml of extract and treat it with 1ml of 10% alcoholic ferric chloride solution and observe for the formation of blue or greenish colour.

Test for Terpenoids (Salkowski Test):
Take 1ml of extract and treat it with 0.5ml of conc. HCl and observe for the formation of yellow precipitate or colouration.

Test for Quinones:
Take 1ml of extract and add 5ml distilled water and observe for the turbidity.

Test for Coumarins:
Take 1ml of extract and add 1.5ml of 10%NaOH then observe for the formation of yellow colour which indicates the presence of coumarins.

RESULTS AND DISCUSSION

Table 1. shows the preliminary phytochemical constituents of Aqueous, Acetone, Ethanol, Methanol and Chloroform of *Euphorbia hirta Linn* leaves. The phytochemical screening of the crude extract revealed the presence of Alkaloids, Carbohydrates, Cardiac glycosides and phenols in aqueous and methanol and acetone and ethanol and extract remaining are present whereas the Resins and Quanins were absent in all the extracts. Amino acids and proteins was present only in aqueous extract and remaining showed negative result. Saponins are present in `Aqueous, acetone, Methanol and Ethanol and absent in Chloroform. Tannins are present in aqueous, acetone, methanol and chloroform and remaining solvents showed negative result. Flavonoids are present in acetone and methanol and ethanol and chloroform extract and absent in Aqueous extract. Terpenoids are present in methanol, ethanol and chloroform extract and remaining solvent showed negative result. Coumarins are present in methanol and ethanol and absent in remaining solvent showed negative result.

Table 1: Preliminary phytochemical constituents of aqueous, acetone, ethanol, methanol and chloroform extracts of *Euphorbia hirta Linn.*

Sr. No.	Phyto Constituents	Aqueous extract	Acetone extract	Methanol extract	Ethanol extract	Chloroform extract
1	Alkaloids	+++	+++	+++	+++	+++
2	Carbohydrates	+++	+++	+++	+++	+++
3	Cardiac glycosides	+++	+++	+++	+++	+++
4	Flavonoids	---	+++	+++	+++	+++
5	Phenol	+++	+++	+++	+++	+++
6	Aminoacids / Proteins	+++	---	---	---	---
7	Saponins	+++	+++	+++	+++	---
8	Tannins	+++	+++	+++	---	+++
9	Terpenoids	---	---	+++	+++	+++
10	Quinones	---	---	---	---	---
11	Resins	---	---	---	---	---
12	Coumarins	---	---	+++	+++	---

Positive +++, Negative ---

Conflicts of interest: The authors stated that no conflicts of interest.

REFERENCES

Aska, AS, Kubmarawa D (2016) Preliminary Phytochemical Screening of Some Indigenous Medicinal Plants Used in the Treatment of Tuberculosis in Bauchi State, Nigeria. *IOSR Journal of Applied Chemistry (IOSR-JAC)* 9(4): 48-52.

Asha S, Thirunavukkarasu P, Mohamad Sadiq A (2015) Phytochemical screening of *Euphorbia hirta* linn leaf extracts. *World Journal of Pharmaceutical Sciences,*: 2321-3086.

Bhatia RK, Gill HS and Mehra SP (1982) Allelopathic potential of some weeds on wheat. *Ind J.Weed Sci*. 14(2):108-114.

Dharmaraj G, Chndra RB, Jaratnam NN and Subramaniam S (1988) Allelopathy of certain weed species. *Madras Agaric. J*. 75(3-4): 147-148.

Ghafoor A and Sadiq M (1991) Critical period of weed crop competition in winter wheat. *Pak. J. Agaric.Res*.12 (1):13-23.

Ghodake SD, Jagtap MD and Kanade MB (2012) Allelopathic effect of three *Euphorbia* species on seed germination and seedling growth of wheat. *Schol. Res.Lib. Ann.Biol. Res*. 3 (10):4801-4803.

Adjeroh LA, Ajuruchi VC, Nnokwe JC, Azuwike CO, Mgbemena IC (2015) Preliminary phytochemical screening and antimicrobial / antifungal activities of leaf extracts of *Euphorbia hirta. Journal of Natural Sciences Research*, 5(16) 2015.

Mahmoud MY, Madany Ahmed M. Salech , Department of Botany and microbiology, faculty of science, cairo university , Giza 12613, Egypt . Annual of agriculture science by Phyototoxicity of *Euphorbia hirta* L. on.*Triticum aestivum.*

Tanveer ARA and Ayub M (2001) Competition effect of *Euphorbia hirta* L. for potassium and grain yield in wheat (*Triticum aestivum L.) Sultan Qaboos Univ.J. Sc. Res. Agri. Sc*. 6:1-2, 11-14.

Waseem Ahmad, Shilpa Singh and Sanjay Kumar (2017), Phytochemical Screening and antimicrobial study of *Euphorbia hirta* extracts. *Journal of medicinal plants*; 5(2): 183-186.