



**ANALYSIS OF PRELIMINARY PHYTOCHEMICAL CONSTITUENTS OF WHOLE
PLANT EXTRACTS OF *CROTALARIA HEBECARPA* (DC.) RUDD.**

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ABSTRACT

Phytochemical analysis for whole plant extracts of *Crotalaria hebecarpa* is carried out in the present study. Whole plant extracts of *Crotalaria hebecarpa* were extracted separately with ethanol, methanol, Petroleum ether, acetone and water screened for phytochemical constituents. In the present analysis ethanol, methanol, Petroleum ether, acetone and water extracts of *Crotalaria hebecarpa* whole plant extracts were subjected for phytochemical studies. Different tests were conducted for phytochemical analysis. During this study we found that the presence of saponins, cardio glycosides, reducing sugars, alkaloids, flavonoids, phenols, monosaccharides, anthocyanins and tannins. Water extracts and petroleum ether extracts showed more phytochemicals than the acetone, Ethanol and methanol. Cardioglycosides, saponins, tannins, monosaccharides and Flavonoids are more in water and petroleum ether than the other solvents. Flavonoids are only observed in water not observed in extracts like ethanol, methanol, Petroleum ether and acetone. Whereas Phenols only observed in petroleum ether not in ethanol, methanol, acetone and water extract. Acetone Extracts showed low phytochemicals than methanol, ethanol, water and petroleum ether extracts.

KEYWORDS: phytochemicals, *Crotalaria hebecarpa*, Whole plant extracts.

INTRODUCTION

Crotalaria is a genus of herbaceous and woody plants of the Family Fabaceae commonly known as rattlepods. The *Crotalaria* genus includes about 500 species of herbs and shrubs. *Crotalaria* are mainly found in damp grassland, especially in floodplains, depressions and along edges of swamps and rivers, but also in deciduous bush land, roadsides and fields. Some species of *Crotalaria* are grown as ornamentals. *Crotalaria hebecarpa* is a fuzzy fruited prostrate annual herb commonly known as Fuzzy fruited Rattlepod in telugu Yerra palleru and Chera gaddemu (Rudd 1991 and Chopra *et al.*, 1956). Fuzzy fruited Rattlepod is irregularly found weed of open forests and cultivated fields. Flowering of this plant is occurring in between September-March. India harbours great number of plants in that mainly weeds as compared to any other adjacent country. This is because enormous arrangement of ecological habitats, climatic, edaphic and topographical factors. Singh (2010) Weeds are unnecessary plant growing in places where they are not required but majority of them are contains useful medicinal and economical properties. Many of them spread like

wildfire and grow in abundance and gregariously in the open spaces, roadsides and crop fields etc. and grow in all type of weather conditions but in winter and rainy seasons are most conducive for their growth. These weeds would be of greater sources for herbal medicines (Arjun Prasad Tiwari *et al.*, 2012). The World Health Organization 2002 estimated that 80% of the world's population mainly depends on traditional healing modalities and herbs. Most of the traditional medicinal herbs usually grow as weed. According to Bell (1905) weed is a plant of outside Places, many weeds are aggressive, troublesome and undesirable elements of the world's vegetation. Shaw (1956) stated that weed grow in places, where they are not desired. No plant is useless in nature. In fact, weeds are important from the standpoint of medicinal, allelopathic and food values (Oudhia and Tripathy, 1999). Singh *et al.*, (2007) and Prasant *et al.*, (2010) contributed to the knowledge of medicinal plants as well as medicinal value of weeds of Uttar Pradesh. Literature study showed that *Crotalaria* sps., possesses pharmacological properties and potential to develop natural compounds based pharmaceutical products. The in vitro propagated *C. retusa* has

significant pharmacological activities while the *Crotalaria prostrate* and *Crotalaria medicaginea* has low pharmacological activities (Devendra *et al.*, 2012). In the present study we made an attempt that the phytochemical analysis of whole plant extracts of weed *Crotalaria hebecarpa*.

MATERIAL AND METHODS

The healthy and disease free whole plant of *Crotalaria hebecarpa* plant material was collected from Karimnagar district, Telangana, India in the month of February, 2016. The collected plant material was washed thoroughly in tap water, shade dried in open air separately. Powder of the plant is obtained by grinding them mechanically. About 100 gm of each dried powder of the plant were soaked separately in 100 ml of different solvents like methanol, ethanol, acetone, pet ether and water in different conical flasks and then subjected to agitation on a rotary magnetic shaker for about 72 hours. After three days the plant extracts were subjected to filtration, filtered with No 42 whatman filter paper separately. Concentrated extracts was preserved in sterilized air tight labeled bottles and preserved in refrigerator at 4°C until required for further use. The extract was filtered under reduced pressure using rotary flash evaporator and subjected for further preliminary phytochemical tests. Different tests conducted for the identification of phytochemicals is adopted by using the methods described by Edeogal *et al.*, (2005) and Thamilmara selvi *et al.*, (2011).

Test for alkaloids

Alkaloids are confirmed by a cream colour precipitate was produced by adding to the 5ml of extract 5ml of 2N HCL is added and boiled then the mixture is filtered. To the filtrate a few drops of Mayer's reagent is added.

Test for saponins

Saponins are tested by boiling 5ml of extract in 10ml of distilled water in a test tube and are shaken vigorously for about 30 seconds. The test tube is allowed to settle for half an hour. Formation of froth indicates the presence of saponins.

Test for tannins

Tannins are tested by adding a few drops of 1% lead acetate to 5 ml of plant extract. Appearance of yellow precipitate indicates the presence of tannins.

Test for phenols

Phenols are tested by adding 2ml of ferric chloride solution to 2ml of plant extract. Appearance of bluish green colour solution indicates the presence of phenols.

Test for steroids

To test the presence of steroids 1ml extract was dissolved in 10ml of chloroform and equal volume of concentrated sulphuric acid was added from the walls of the test tube. Appearance of red colour in the upper layer and yellow with green fluorescence indicates the presence of steroids.

Test for cardioglycosides

To 1ml of extract glacial acetic acid, few drops of ferric chloride and then finally concentrated sulphuric acid were added from the walls of the test tube. Appearance of the reddish brown at the junction of two layers and the bluish green colour in the upper layer indicates the presence of cardiac glycosides.

Test for anthraquinones

5ml extract was boiled with 10ml of sulphuric acid and filtered while hot. The filtrate was shaken with 5ml of chloroform the chloroform layer was pipetted out into another test tube then 1ml of dilute ammonia is added. The resulting solution was observed for colour changes. The change in colour indicates the presence of anthraquinones.

Test for Flavonoids

To one ml of the extract, a few drops of dilute sodium hydroxide are added. An intense yellow colour was produced in the plant extract, which became colorless on addition of few drops of dilute acid. This indicates the presence of flavonoids.

Test for Terpenoids

1ml of the extract was dissolved in 1ml of chloroform; 1ml of acetic anhydride was added following the addition of 2ml of concentrated sulphuric acid. Formation of reddish colour indicates the presence of terpenoids.

Test for reducing sugars

1ml of extract was added 5 to 10 drops of Fehling's solution. Mixture was then subjected to boiling for 15 minutes. Appearance of brick red precipitate indicates the presence of reducing sugars.

Test for monosaccharides

To the 1ml of extract, 1ml of Barfoed's reagent was added and heated on water bath. Formation of brown precipitate indicates the presence of monosaccharides.

TABLE: Phytochemical screening test of whole plant extracts of *Crotalaria hebecarpa*

S.NO	phytochemicals	Methanol	Ethanol	Acetone	Petroleum ether	water
1	Tannins	-	+++	-	-	+++
2	Phenols	+++	+++	++	++	-
3	Saponins	++	++	-	-	+++
4	Alkaloids	++	+	-	-	++
5	Flavonoids	+++	++	+	+	+

6	Anthocyanins	–	–	+++	+	+
7	Reducing sugars	+++	+++	–	++	++
8	monosaccharides	++	++	++	+++	+++
9	Cardiac glycosides	+++	+++	+++	++	–

(+++)= strongly present, (+) = poorly present

(++)= moderately present (-) = absent

RESULTS

Table shows the phytochemicals that are present in the whole plant extracts of *Crotalaria hebecarpa* screened by different screening tests. The whole plant extracts of *Crotalaria hebecarpa* revealed the presence of saponins, cardio glycosides, reducing sugars, alkaloids, flavonoids, phenols, monosaccharides, anthocyanins and tannins. Water extracts and petroleum ether extracts showed more phytochemicals than the acetone, Ethanol and methanol. Cardiolglycosides, saponins, tannins, monosaccharides and flavonoids are more in water and petroleum ether than the other solvents. Flavonoids are only observed in water extracts not observed in extracts like ethanol, methanol, Petroleum ether and acetone. Phenols observed only in petroleum ether not in ethanol, methanol, acetone and water extract. Presence of phytochemicals more in water than petroleum ether, methanol, ethanol and acetone extracts.

DISCUSSION

The result shows that most of the phytochemicals which are present in the whole plant extracts of *Crotalaria hebecarpa* solubulised abundantly in water and polar solvents. Most of the extracts showed the similar properties to the screening tests. Arjun Prasad Tiwari *et al.*, (2012) reported that due to the presence of phytochemicals in the whole plant extracts of *Crotalaria hebecarpa* contains medicinal properties that acts against diarrhea, dysentery, fever, stomach disorders, piles, asthma, jaundice, skin disease, rheumatism, diabetes, liver disorders, etc. and also has antimicrobial, antifungal, antidiabetic and anticancer activities. Further phytochemicals found in whole plant extracts of *Crotalaria hebecarpa* will be tested for their antimicrobial activity.

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