



# Asian Journal of Research in Chemistry and Pharmaceutical Sciences

Journal home page: [www.ajrcps.com](http://www.ajrcps.com)



## PRELIMINARY PHYTOCHEMICAL ANALYSIS OF *CROTALARIA VERRUCOSA* LEAVES

J. Sirajudeen<sup>1\*</sup> and R. Elamparithi<sup>2</sup>

<sup>1\*</sup> & <sup>2</sup> PG & Research Department of Chemistry, Jamal Mohamed College, Tiruchirappalli, Tamil Nadu, India.

### ABSTRACT

Plants derived bioactive compounds have been focused on recent research due to their health promoting effects. Medicinal Plants serve as the main source of medicine to poor communities that do not have access to modern medical services. The present Investigation has been carried out to assess the phytochemicals of leaves from *crotalaria verrucosa* medicinal plant. The solvents like Acetone, Chloroform and Hydro alcohol were used for phytochemical screening of plant extract. The results revealed the presence of alkaloids, flavonoids, phenols, saponin, stereroids, tannin and carbohydrate.

### KEYWORDS

*Crotalaria verrucosa*, Acetone, Chloroform, Hydro alcohol extract and Phytochemical screening.

### Author for Correspondence:

Sirajudeen J,  
Department of Chemistry,  
Jamal Mohamed College,  
Tiruchirappalli, Tamil Nadu, India.

**Email:** sirajudeen2003@gmail.com

### INTRODUCTON

India is the herbal garden of the world and has been a source of medicinal plants with range of products, since antiquity man uses them in different way according to his needs, particularly as food and medicine. Among the entire flora 35,000 to 70,000 species have been used for medicinal purpose. The most important of these bioactive constituents of plants are alkaloids, tannin, flavonoid and phenolic compounds<sup>1</sup>. Through past experience, herbalists have used herbal preparations either from single plant or as combined proportions. Continuous usage of herbal medicine by a large proportion of the population in the developing countries is largely due to the fact that herbal medicines are more acceptable in these countries from their culture and

spiritual points of view and the high cost of western pharmaceuticals. According to the World Health Organization, 80 % of people in developing countries still depend on local medicinal plants to fulfill their primary health needs (WHO, 2002)<sup>2</sup>. Nature has provided many for humankind over the years, including the tools of the first attempts at therapeutic intervention. Ancient civilization depended on plant extracts for the treatment of various ailments.

Plant material remains an important source for combating illness, including infectious diseases and many of these plants have been investigated for novel drug or used as templates for the development of new therapeutic agents, food additives, agrochemicals and industrial chemicals<sup>3</sup>. Plant synthesizes a wide variety of chemical compounds which can be sorted by chemical class biosynthetic origin and functional groups into primary and secondary metabolites<sup>4</sup>. In 1985 Farnsworth *et al.*<sup>5</sup> identified 119 secondary plant metabolites which were used as drugs. Out of 225 drug which are considered as basic and essential by the World Health Organization (WHO), 11% are obtained from plants and a number of synthetic drug are also obtained from natural precursors<sup>6</sup>.

*Crotalaria verrucosa* L. Commonly known as blue rattle pod or blue rattle snake, is a species of flowering plant belonging to the legume family Fabaceae and subfamily is Faboideae. The leaves 5 -15cm long are ovate rhomboid and obtuse. The leaf extract is applied to soothe skin allergies<sup>7</sup>. Juice of leaves is used in scabies and impetigo both internally and externally, also considered efficacious in diminishing salivation. The leaf decoction is given orally to cure jaundice<sup>8</sup>.

## MATERIAL AND METHODS

### Collection plant material

The plant of *Crotalaria verrucosa* leaves were collected from Yercaud salem district, Tamil Nadu, India. The plant such as *Crotalaria verrucosa* was identified using floras and authenticated by Dr. S. John Britto the Director the Rapinat Herbarium and center for molecular systematic St. Joseph's college (campus) Tiruchirappalli, Tamil Nadu, India. Plant

materials were under running tap water, air dried and then homogenized to fine power and stored in airtight bottles in refrigerator.

### Preparation of Extracts

The plant extract was prepared by hot continuous percolation method in Soxhlet apparatus. About 50gm of powdered plant material was uniformly packed into a thimble and extracted with 250ml of chloroform, acetone and hydro alcohol solvents. The extraction cycle may be allowed to repeat many times, over hours or days. After that the extract was taken in a beaker and kept on hot plate and heated at 30 - 40° C till all the solvent got evaporated. The crude extract for future use in phytochemical analyses.

## QUALITATIVE ANALYSIS

## PHYTOCHEMICAL

Preliminary phytochemical analysis was carried out the extracts of *Crotalaria verrucosa* as per standard methods.

### Detection of alkaloids

2 ml extract was taken in test tube and then 0.2ml dilute HCL was included, followed by 1ml of Mayer's reagent. A yellow coloration indicates alkaloid's presence.

### Detection of flavonoids

3 drops of sodium hydroxide 10% were added to 1mL of diluted extract in isopropyl alcohol. Formation of yellow-red, coffee-orange, purple-red or blue coloration indicated the presence of xanthenes or flavones, flavonoids, chalcones and anthocyanins, respectively.

### Detection of phenols

To 1ml of extract was mixed with 5ml of 5% solution of FeCl<sub>3</sub>. A blue to black coloration indicated the presence of phenols.

### Detection of terpenoids

1ml of anhydrous acetic acid and 3 drops of concentrated sulfuric acid were added to 2 ml of the extract dissolved in isopropyl alcohol. After 5 min a blue - green color middle layer was indicative of sterols, but pink, red, magenta or violet color revealed the presence of terpenoids.

**Detection of saponin**

The crude extract stock solution was diluted with 20 ml of distilled water and it was agitated in a graduated cylinder for 15 min. The formation of 1 cm foam layer showed the presence of saponins.

**Detection of steroids**

1 ml of the crude plant extracts was dissolved in 10 ml of chloroform and to it was added an equal volume of concentrated sulfuric acid from sides of the test tube. The upper layer turns into red and sulfuric acid layer showed yellow with green fluorescence. This indicated the presence of steroids.

**Detection of tannin**

10 mg of each extract were dissolved in 1mL of ethanol, then 2mL of distilled water was added followed by 4 drops of ferric chloride aqueous solution. Formation of a blue or green color indicated the presence of tannin.

**Detection of carbohydrate**

0.2gm filtrate is boiled on water bath with 0.2ml each of Fehling solution A and B. a red precipitate indicates the presence of sugar.

**Detection of Oils and resins**

1ml of extract was diluted with water. Formation of bulk black precipitate indicates the presences of resins.

**RESULTS AND DISCUSSION**

The percentage yield obtained with different solvents are shown in the Table No.1. The hydro alcohol to be the better solvent for extraction when compared to acetone and chloroform extract.

Phytochemical analysis conducted on the plant extract revealed the presence of constituents which are known to exhibit medicinal as well as physiological activities<sup>9</sup>. The analytical results of the phytochemical analysis is listed in Table No.2. Alkaloids, flavonoids, phenols, steroids and carbohydrate are present in the acetone extract whereas chloroform extract showed the presence of alkaloids, flavonoids steroids and carbohydrate. The hydro alcoholic showed the presence of alkaloids, flavonoids, phenols, saponins, steroids tannin and carbohydrate.

**Table No.1: Yield obtained from various solvents**

S.No	Solvent	Yield obtained (g)	Percentage yield (w/w)
1	Acetone	5.2	10.4
2	Chloroform	6.1	12.2
3	Hydro alcohol	15.6	31.2

**Table No.2: Phytochemical analysis of *crotalaria verrucosa* present in different solvent extracts**

S.No	Test	Acetone Extract	Chloroform Extract	Hydro alcohol Extract
1	Alkaloids	Present	Present	Present
2	Flavonoids	Present	Present	Present
3	Phenols	Present	Absent	Present
4	Terpenoids	Absent	Absent	Absent
5	Saponins	Absent	Absent	Present
6	Steroids	Present	Present	Present
7	Tannin	Absent	Absent	Present
8	Carbohydrate	Present	Present	Present
9	Oils and Resins	Absent	Absent	Absent

## CONCLUSION

The results revealed the presence of medicinally active constituents in the *crotalaria verrucosa*. The phytochemicals identified in this study have earlier been proved to be bioactive. The present study leads to the further research in the way of isolation and identification of the bioactive compounds from the *crotalaria verrucosa* plant using chromatographic and spectroscopic techniques.

## ACKNOWLEDGMENT

The authors are thankful to the management of Jamal Mohamed College (Autonomous), Tiruchirappalli - 20 for providing them necessary facilities and support to carry out this work.

## CONFLICT OF INTEREST

We declare that we have no conflict of interest.

## BIBLIOGRAPHY

1. Mohamed sham shihabudeen H, Hansi Priscilla D, Kavitha Thirumurugan. Antimicrobial activity and phytochemical analysis of selected Indian folk medicinal plants, *International journal of pharma sciences and research*, 1(10), 2010, 430-434.
2. Tsobou Roger, Mapongmetsem pierre-Marie, Voukeng Kenfack Igor, Van Damme Patrick. Phytochemical screening and antibacterial activity of medicinal plants used to treat typhoid fever in Bamboutous division, west cameroon, *Journal of applied pharmaceutical science*, 5(06), 2015, 034-049.
3. Kumbhar R R, Godghate A G. Physicochemical and quantitative phytochemical analysis of some medicinal plants in and around gadhinglaj, *International journal of science Environment and Technology*, 4(1), 2015, 172-177.
4. Ahirrao R A, Patel M R, *et al.* Phytochemical Screening of leaves of *Jatropha curcas* plant, *International journal of research in ayurveda and Pharmacy*, 2(4), 2011, 1324-1327.
5. Norman Farnsworth R, Olayiwola Akerele, Audrey S. Bingel, Djaja Soejarto D and Zhengang Guo. Medicinal plants in therapy, *Bull World Health Organ*, 63(6), 1985, 965-981.
6. Joseph B S, *et al.* Preliminary phytochemical screening of selected Medicinal plants, *International research journal of science and Engineering*, 1(2), 2013, 55-62.
7. Okonwu K and Eboh I G. Effect of seed treatment on the germination of *Crotalaria verrucosa* L, *Journal of applied life sciences international*, 10(2), 2017, 1-8.
8. Prabhakar G, Kamalakar P, Ashok T, Vardhan and Shailaja K. *In - Vitro* screening of antibacterial activity of seeds of *crotalaria verrucosa* L. and *Duranta erecta* L, *Eropean journal of pharmaceutical and medical research*, 2(4), 2015, 411-419.
9. Azra Kamal and Md.Matloob Raza Khan. Phytochemical evaluation of some medicinal plants, *Indian journal of plant sciences*, 3(4), 2014, 5-8.

**Please cite this article in press as:** Sirajudeen J and Elamparithi R. Preliminary phytochemical analysis of *crotalaria verrucosa* leaves, *Asian Journal of Research in Chemistry and Pharmaceutical Sciences*, 7(1), 2019, 278-281.