Medicinal potential of *Cascabela thevetia* flowers extract

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DOI 10.51129/ujpah-2024-37-2(12)

Received – November 18, 2024
Revised – November 21, 2024
Accepted – November 25, 2024
Published – December 07, 2024

Abstract-The present study highlights the medicinal potential of *Cascabela thevetia* flowers extracts (aqueous, acetone, ethanol). Cardiac glycosides, tannin, phlobatannin, phenolic compound, alkaloids, phytosterols, terpenoids, flavonoids, anthocyanin and quinones were the phytoconstituents present in significant amount in plant. Phytochemicals are highly active in the presence of ethanol extract. Cardiac glycosides, phlobatannin, tannin also showed significant reaction in acetone extract of flower. This phytochemical screening is more prominent in ethanol and acetone extract as compared to aqueous extract

Key Words: *Cascabela thevetia*, flower extract, medicinal potential, phtochemicals.

Introduction

Natural products played an essential role as a complementary cytotoxic agent avoiding complications of therapies. Herbal drugs of have attracted more attention for more bioavailability and less active dose. Phytoconstituents individually or in the combination, determine the therapeutic value of a medicinal plant. (Surana and Wagh, 2015). Alkaloids, flavonoids, phenolics, tannins, saponins, steroids, glycosides, terpenes etc. are some of the important phytochemicals with diverse biological activities.

Cascabela thevetia is a very common plant on the premises of temples in India, A highly toxic plant, used medicinally, and also as a hedging plant. Generally found in

Himalayas region in India, Sri Lanka, Bangladesh, China (including Taiwan), West Africa, its flowers are used for worship and other rituals. The plant parts of this species are also used to cure many health problems. The qualitative phytochemical analysis of flowers using three extracts (aqueous, acetone and ethanol).

Material and Methods

Collection of plant material

The flowers of *C. thevetia* were collected from the Botanical Garden, Department of Botany, D.A.V (PG) College, Muzaffar-nagar, UP, India.

Preparation of plant extracts

Preparation of sample and extraction were carried out as described by Saha *et al (2004)* with slight modifications. The fresh flower samples were washed with distilled water and cut in to small pieces, shade- dried under for 1 week and followed by complete drying at 50 °C in oven. Then grinded to from powder. 15g of these dried sample from each variety was extracted separately with 150 mL of three different solvents: aqueous, ethanol and acetone for 24 h in a shaker at 100 rpm at room temperature. The extracts were filtered using Whatman filter paper and filtrates were used as an extract. Extracts were kept at 4 °C for the further analyses. Detection of different phytochemicals was carried out using standard methods (Hebbar *et al.*, 2024; Mahendru *et al,* 2024; Mety *et al,* 2024).

Test of Alkaloids

(Wagner's test)A few drops of Wagner's reagent were added to 1 mL of extract. The formation of a creamy brown/ reddish precipitate was considered positive for the alkaloid.

Test of Cardiac – Glycosides

(Keller- Killani Test): 1 mL of acetic acid and 2 - 3 drops of ferric chloride were added to 1 mL of extract, then 2 mL of concentrated sulfuric acid was added in this solution, the colour change was observed. Blue colour solution was observed in the acetic acid layer.

Test of Tannin

(Braymer's Test): 3 mL of 10% of ferric chloride solution were added in I mL of extract. The blue green colour formation confirmed the presence of tannin.

Test of Flavonoids (Alkaline reagent Test)

1 ml of extract was taken and added 2 ml of 2 % NaOH solution followed by few drops of HCl into it. The colour initially turned to an intense yellow colour with the addition of NaOH solution and later become colourless with addition of dilute acid. This change in colour confirmed the presence of flavonoids.

Test of Terpenoids

About 2 ml of the filtrate of fruit extract was added with 6 drops of chloroform and place it in the water bath for few minutes. Then 6 drops of concentrated H_2SO_4 were added. The appearance of reddish-brown interface confirmed the presence of terpenoids.

Test of Phenolic Compounds

(Ferric chloride test) 1 ml of extract was taken and few drops of 5% Ferric chloride solution were added into the extract. The appearance of bluish black colour provides the positive result of the phenolic compounds.

Test of Phlobatannins

(Foam Test) When an aqueous extract was boiled with 1%aqueous HCl, red precipitate was deposited which was taken as evidence for the presence of phlobatannins.

Test of Phytosterols

(Salkowski Test) 5 mL of extract mixed with 2 ml of chloroform then 2 mL of concentrated H_2SO_4 were added into it. Red colour was observed in lower layer of chloroform indicates the presence of phytosterols.

Test of Quinones

2ml of extract were mixed with 3ml of concentrated HCl to form green colour indicates the presence of quinones.

Test of Anthocyanins

2ml of aqueous extract is added to 2ml of 2NHCl and ammonia. The appearance of pink-red turns blue violet indicates the presence of anthocyanins.

Results and discussion

Phytochemical screening was carried out and it was found that phytochemicals including tannin, saponin, flavonoids, terpenoids, phenolic compound, alkaloids, cardiac glycosides, phlobatannin, phytosterols and quinones are present in all the extract. (Table) In ethanol extract, above phytochemicals are abundantly present. Cardiac glycosides, phlobatannin, tannin showed significant amount in acetone extract. This phytochemical screening is more prominent in ethanol and acetone extract as compared to aqueous extract as phytochemicals are organic in nature and soluble in organic solvent. The detected compound might be responsible for the toxicity, antimicrobial, anti-inflammatory and antioxidant properties in plant. Presence of tannin in all extracts of flower might be responsible to treat fungal infections. It is also used in the treatment of external wounds, infected area, ring worms and tumours in traditional system of medicine (Bisso BN *et al*, 2022). The presence of classes of phytochemicals as such; flavonoid, alkaloid, tannin showed cytotoxic effect (Chowdhury *et al.* 2017).

Table- Medicinal potential of *C. thevetia* flowers extract in different solvent

S. No.	Phytochemical	Test Name	Aqueous	Acetone	Ethanol
1	Alkaloids	Wagner's test	++	+	+++
2	Cardiac Glycosides	Killer- Killani test	+	+++	+++
		Baljet Test	+	+++	+++
3	Flavonoids	Alkaline reagent Test	++	++	++
4	Phenolic compound	Ferric chloride test	+++	+++	+++
5	Tannin	Braymer's Test	++	+++	+++
6	phlobatannin	Foam Test	+++	+++	++
7	terpenoids		++	++	+++
8	phytosterols	Salkowski Test	+++	+	++
9	quinones	Con HCl test	+	++	++
10	Anthocyanin	HCl test	++	++	+++

Conclusion

Plants are a great source of phytochemicals that could be utilized in curing various types of diseases. The study was only based on qualitative analysis. Cardiac glycosides, tannin, phlobatannin, phenolic compound, alkaloids, phytosterols, terpenoids, flavonoids, anthocyanin and quinones were the phytoconstituents present in significant amount in plant. The majority of the biologically active phytochemicals were found present in ethanol, acetone as compared to aqueous extracts of flowers of *C. thevetia*. The study provided an important basis for further investigation into the isolation and quantitative determination of phytoconstituents from the selected plants for the development of drugs.

Disclaimer Statement

Authors declare that no competing interest exists. The products used for this research are commonly used products in research. There is no conflict of interest between authors and producers of the product.

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