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Research Article

**QUALITATIVE PHYTOCHEMICAL ANALYSIS OF
METHANOLIC AND AQUEOUS EXTRACTS OF *BARLERIA
CRISTATA*****B. Sumaya sulthana¹, E. Honey², B. Anasuya³, H. Gangarayudu⁴, M. Jyothi reddy⁵, C. Girish***^{1,2,3,*} S.V.U.College of Pharmaceutical Sciences, Sri Venkateshwara University, Tirupati - 517502.
A.P, India.^{4,5} Sri Lakshmi venkateswara Institute of Pharmaceutical Sciences, Proddutur, Kadapa dt, A.P, India.**Abstract:**

Barleria cristata has been used for several diseases. *Barleria cristata* belongs to family Acanthaceae. The present study comprises phytochemical evaluation of different extracts (methanolic and aqueous extracts) of *Barleria cristata* by using different standard methods. The investigation of phytochemical analysis was carried out to estimate the presence of carbohydrates, glycosides, flavonoids, tannins, phytosterols and phenolic compounds in different extracts of *Barleria cristata*. Results revealed the presence of carbohydrates, alkaloids, saponons, phytosterols, flavonoids, fats and oils. The present investigation will helpful in Assessing the quality and purity of a crude drug and laying down pharmacopoieal standards for *Barleria cristata*

Key words: *Barleria cristata*, phytochemical evaluation, alkaloids and flavonoids.**Corresponding Author:****Dr. C.Girish,****M.Pharm, PhD, FICCP, MIFS.**

Assistant Professor,

S.V.U. College of Pharmaceutical Sciences,

Sri Venkateshwara University,

Tirupati, Andhra Pradesh - 517502. India.

Mobile: +91 - 9290534422

E-mail: cgirish.svu@gmail.com

QR code



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INTRODUCTION:

Barleria cristata Linn grows as a shrub. It belongs to family Acanthaceae which is a dicotylectonous flowering plant. It contains about 250 genera and 2500 species. In India 508 species are present. Southern China, India and Myanmar are the native places where wide ranges of these species are found. These are cultivated as ornamental plants and also grown as ruderal species along road sides. Leaves are elliptical to ovate in shape which is dark green on upper side and pale green on lower side. Funnel shaped flowers in violet, pink and white colour. Fruits are ellipsoid capsules which become glossy and smooth at the stage of maturity. Seeds are attached to hooked stalk that ejects them from the capsule [1]. The calyx has four lobes and corolla with five lobes. Stamens are arranged in pairs on corolla.

Different parts of this plant are used as traditional herbal medicine to treat many diseases like asthma, bronchitis and skin diseases. *Barleria cristata* act as diuretic and blood purifier. It consists of various phytochemical constituents like phenolic compounds, flavanoids, phenylehanoid glycoside [2], Iridoidal glycosides. These chemical constituents of this plant exhibit several biological activities such as anti-inflammatory, antioxidant [3], antimicrobial, antiarthritic, cytotoxic, thrombolytic, antidiabetic and membrane stabilising activities. It is used as antidote, treatment of cough and it reduces swelling. The present objective of the study is investigation of phytochemical parameters of aqueous and methanolic extracts of *Barleria cristata* leaves.



Fig : 1 Leaves and flowers of *Barleria cristata*

MATERIALS AND METHODS:**Collection of leaves and authentication:**

The fresh leaves of *Barleria cristata* leaves were collected from village chennuru, Kadapa district, Andhra Pradesh, India, In the month of January 2017. The plant was authenticated by K.ARUNA KUMARI, lecturer in botany, Govt. Arts college, proddatur, kadapa (district), AndhraPradesh, India. The leaves were shade dried at room temperature

and the dried leaves of *Barleria cristata* were powdered to 40 mesh size.

Extraction of leaves of *Barleria cristata*:

The powdered material of plant was passed through 40 mesh size. The dried powder (50g) was extracted with methanol and distilled water using soxhlet apparatus for about 72 hrs. After extraction with solvent, the marc was dried in hot air oven below 40⁰c and was concentrated by distilling off the solvent and evaporating to dryness. The dried extract was subjected to preliminary phytochemical screening for detection of various phytoconstituents.

Phytochemical Screening:**Qualitative phytochemical studies:**

The methanolic extract and its fractionated extracts were subjected to qualitative chemical screening to detect the presence of various plant constituents [4].

1. Test for alkaloids [5]:

To the extracts dilute hydrochloric acid was added and filtered. The filtrate was treated with various alkaloid reagents.

A. Dragendroff's test (solution of potassium bismuth iodide):

The filtrate was treated with dragendroffs reagent. The formation of orange brown precipitate indicates the presence of alkaloids.

B. Wagner's test (solution of iodine in potassium iodide):

The filtrate was treated with wagner's reagent. The formation of orange reddish brown precipitate indicates the presence of alkaloids.

2. Test for carbohydrates and reducing sugars [6]:

Small quantities of the extracts were dissolved in 4ml of distilled water and filtered.

The filtrate was subjected to following tests.

A. Fehling's test (solution of copper sulphate ,sodium tartarate and sodium hydroxide):

The extracts were treated with fehling solution A&B. The appearance of reddish brown colour precipitate indicated the presence of reducing sugars.

B. Molisch's test (alpha naphthol solution in alcohol):

To the extract (2-3ml) few drops of molish's reagent was added. The test tube was shaken well and conc. sulphuric acid was added along the sides of the test tube. Formation of violet ring at the junction of two liquids indicates the presence of carbohydrates.

3. Test for steroids [7]:**A. Libermann Buchards test:**

To the extracts few drops of acetic anhydride was added, boil and cool. Then add conc. sulphuric acid from sides of test tube appearance of brown ring indicates the presence of steroids.

B. Salkowski test:

To the extracts add few drops of conc .sulphuric acid appearance of red colour at lower layer indicates the presence of steroids.

4. Test for tannins [8]:**A. Ferric chloride test:**

To the extract add ferric chloride solution appearance of blue colour indicates the presence of tannins.

B. Phenazone test:

To the extract add about 0.5g of sodium acid phosphate, warm it and filtered. To the filtrate add 2% of phenazone solution formation of bulky precipitate indicates the presence of tannins.

5. Test for amino acid:**A. Millons test:**

To the extracts add about 2 ml of millons reagent formation of white precipitate indicates the presence of amino acids.

B. Ninhydrin test :

To the extract add ninhydrin solution and boil, appearance of violet colour indicates the presence of amino acids.

6. Test for flavonoids [9]:**A. Shinoda test:**

To the extracts add few magnesium turnings and conc.hydrochloride solution drop wise appearance of pink scarlet colour indicates the presence of flavonoids.

B. Alkaline reagent test:

To the extracts add few drops of sodium hydroxide solution formation of intense yellow colour and turned into colourless on addition of dilute acid indicates the presence of flavonoids.

7. Test for glycosides:**A. Borntrager's test:**

Boil the test material with 1ml of sulphuric acid in a test tube for 5 minutes. Filter while hot, cool the filtrate and shake with equal volumes of methanol. Separate the lower methanol layer and shake it well with half of its volume of dilute ammonia formation of rose pink to red colour in ammonical layer indicates the presence of glycosides.

B. Baljet's test:

To the test solution add picric acid or sodium picrate, appearance of orange colour indicates presence of glycosides.

8. Test for proteins [10]:**A. Warming test:**

Heat the test solution in boiling water coagulation of proteins occurs indicates the presence of proteins.

B. Xanthoproteic test :

To the test solution (5ml), add 1ml of conc. nitric acid and boil, yellow precipitate is formed. After cooling it, add 40% sodium hydroxide solution, formation orange colour indicates the presence of proteins.

RESULTS:

Methanolic and aqueous extract of *Barleria cristata* leaves were subjected to phytochemical screening. Methanolic extract of the plant contains carbohydrates, proteins and aminoacids, alkaloids, sterols, flavonoids, glycosides, and tannins where as aqueous extract of the plant contains carbohydrates, alkaloids, flavonoids, glycosides, and tannins (Table 1).

Table 1: The chemical constituents those are present in plant *Barleria cristata*

S/No	Test	Methanolic extract	Aqueous extract
1	Test for Flavanoids	+	+
2	Test for Glycosides	+	+
3	Test for Tannis	+	+
4	Test for Carbohydrates	+	+
5	Test for Steroids	+	-
6	Test for Proteins and Amino Acids	+	-
7	Test for Alkaloids	+	+

DISCUSSION AND CONCLUSION:

The methanolic and aqueous extracts of *Barleria cristata* tested for phytochemical constituents like flavanoids, glycosides, carbohydrates, steroids, proteins and amino acids. The knowledge of chemical constituents of plants helps to screen for biological activities. Phytochemistry of the extracts of *Barleria cristata* leaves reveals that they contain flavanoid, phenol and tannins as secondary metabolites which confirm that the extracts of *Barleria cristata* leaves has wide range of biological activities like anti-inflammatory, antioxidant, antiarthritic, antidiabetic and membrane stabilising activities.

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