

# Qualitative Analysis of Ethanolic Extract of Cayratia Trifolia (Medicinal Climber) For Primary Metabolites

## Abstract

*Cayratia trifolia* is perennial medicinal climber plant belonging to family Vitaceae. Qualitative analysis of primary metabolites from the ethanolic extract of different parts of this plant has been done in this work. The study revealed that they contain sufficient amount of Carbohydrates, Proteins and Lipids.

**Keywords:** Metabolites, Alkaloid, Phenol, Glycoside, Turpenes.

## Introduction

Metabolic substances are an important part of plant life, without which biological processes cannot be imagined. In plant cells, biochemical processes occur in the coordinated and balanced form. The bio molecules produced by these pathways are termed metabolites. The metabolites can be mainly divided into two types such as primary metabolites and secondary metabolites. The primary metabolites are essential for the survival of the plants life. There products is result of the primary metabolic pathways, which include sugars, proteins, amino acids, fatty acids, fats, pyrimidines and purines. These cells are produced in large amounts. Secondary metabolites are non-essential for basic biochemical and survival of plants process. Secondary metabolic products, such as alkaloid, phenol, glycoside, turpenes, and gums antibiotics and so on are produced as a result of the secondary metabolic pathway. They work in plants only for safety, accumulation of food, energy, and resistance against various pathogens. They do not make special contributions to the life processes of plants but make any plant species special. Some of the products derived from that plant are very useful economically in therapeutic practices for human and animals. Plants products are most wonderful gift from nature has been used as drugs. Some plant species which are across different ethnic groups various types of drugs are obtained from are known as medicinal plants (Yadav *et al*, 2010).

*Cayratia trifolia* (Family Vitaceae) is climbing or prostrate, much branched, perennial herb commonly known as fox grape in English and Amalbel in Hindi. It also possess medicinal properties. *Cayratia trifolia* is a weak herbaceous climber contains trifoliated leaves with (2-3 cm), long petioles and ovate to oblong-ovate leaflets. Flowers are tiny greenish white brown in colour. It is distributed in both wild and cultivated states on the plains of India. The present research paper deals and qualitative test of the ethanolic extracts of climber *Cayratia trifolia* for primary metabolites.

## Aim of the study

1. To prepare extract of different parts (leaves, stem, fruit) of *Cayratia trifolia* on organic solvent ethanol.
2. Identification of primary metabolite in the extract to facilitate further study for human welfare.

## Material and Methods

### Plant Collection

*Cayratia trifolia* was collected from in and around catchment area of Mej River. The identity of the plant species was established by Herbarium chamber Government College, Bundi by author department of botany.

### Preparation of Plant Extract

Fresh leaves stem and fruit of *Cayratia trifolia* were washed thoroughly tap water and were dried in hot air oven at 40-50° c for a week. 60gm of dried powder was extracted for 24 hours in 300 ml solvent (ethanol 99%). Repeated extraction was done with the some solvent till colourless solvent was obtained. The condensed extract was used for



**Rajendra Prasad**

Assistant Professor,  
Deptt. of Botany,  
Government College,  
Bundi, Rajasthan, India



**O.P.Sharma**

Associate Professor  
Deptt. of Botany,  
Government College,  
Bundi, Rajasthan, India

screening of primary metabolites. Soxhlet equipment was used in this study. Powdered plant material (60 g) was extracted with organic solvents (300 ml) such as n-hexane, ethyl acetate methanol and ethanol in Soxhlet apparatus (Raaman, 2006)

#### Primary Metabolites analysis

##### Test for carbohydrates

###### Molisch test

The test was carried out by following the method Ramakrishnan *et al.* 1994. 2 ml of aliquot of the extract was treated with 2 drops of Molisch reagent. After shaking and holding test tube in slanting position 2 ml concentrate Sulphuric acid along the side of the test tube. The reddish violet ring at the junction of two solutions indicates presence of Carbohydrates.

###### Benedict's test:-

1 ml of aliquot of the extract was treated with 3 ml of Benedict's reagent in a test tube and boiled for 10 minutes. Bluish or yellowish orange precipitate indicates the presence of reducing sugar.

##### Test for Proteins

###### Millon's test

The test was carried out by following the method Fisher, 1968; Ruthmann, 1970. 2 ml of aliquot of the extract was treated with 2 drops of Millon's reagent in a test tube. The test tube a white creamy precipitate appeared which changed to brick red on heating. It indicates the presence of Proteins.

###### Biuret test

The test was carried out by following the method Gahan, 1984. An aliquot of 2 ml of filtrate is treated with few drops of copper sulphate solution. To this, 1 ml of ethanol (95%) is added, followed by excess of potassium hydroxide pellets. Pink colour in the ethanolic layer indicates the presence of Proteins.

##### Test for Fats and Fixed Oils

###### Saponification Test

The test was carried out by following the method Kokate, (1999). A few drops of 0.5 N alcoholic potassium hydroxide solutions are added to a small quantity of extract along with a drop of phenolphthalein. The mixture is heated on water bath for 2 hours. Formation of Soap or partial neutralization of alkali indicates the presence of fixed oils and fats.

##### Result and Discussion

Table displays result of qualitative analysis of ethanolic extract of different part of *Cayratia trifolia*

which reveal that all the extracted plant material (Leaves, Stem, Fruit) of *Cayratia trifolia* possess carbohydrates. The presence of carbohydrates was ascertained by Molisch test. The result reveals that fruits and leaves extract has more quantity of carbohydrates as it exhibited higher degree of precipitation (+++). However the stem extracts showed lesser degree (+) of precipitation.

The presence of reducing sugars was ascertained by Benedict test. Fruit extract exhibited presence of reducing sugars with higher degree of red precipitation (+++). However leaf extract showed presence of reducing sugars with moderate degree of precipitation (++) and stem extract showed lesser degree of precipitation (+).

The presence of protein in the extract was ascertained by Millon test and Biuret test. Fruits and Leaves extract exhibited presence of protein with higher degree of precipitation (+++) in both Millon and Biuret test. However stem extract showed presence of protein with higher degree of precipitation (+++) in Millon test and stem extract showed moderate degree of precipitation (++) in Biuret test.

Saponification test indicates the presence of Fats and fixed oils with high degree of precipitation (+++) in fruit extract whereas the same test resulted in lesser degree of precipitation (+) for the leaves and stem extract.

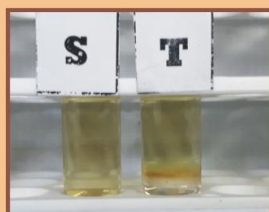
Present findings are supported by work of a number of researchers who also carried out phytochemical analysis studies of *Cayratia trifolia*. Sowmya *et al.* (2015) were investigated the presence of phytoconstituents in the different parts stem, leaf and fruit of *Cayratia trifolia*. Singh *et al.* (2012) was carried out to establish the pharmacognostical studies, physico-chemical parameters along with preliminary phytochemical screening of petroleum ether, chloroform, methanolic and aqueous extracts of *Cayratia trifolia* (Linn.) Kumar *et al.* (2012) were presented a detailed pharmacognostic study of the leaf of *Cayratia trifolia*. Present finding are supported similar research worked by Prasad & Sharma (2018), Bhaduria *et al.*, (2012), Rahman *et al.*, (2015) and Deokate & Khadabadi, (2012). They evaluated different climber species which also support present research work.

Table -1

S.No.	Phytochemical	Name of test	Plant part	Observation
1	Carbohydrates	Molisch test	Leaves	+++
			Stem	+
			Fruit	+++
		Benedict's test	Leaves	++
			Stem	+
			Fruit	+++
2	Proteins	Millon test	Leaves	+++
			Stem	+++
			Fruit	+++
		Biuret test	Leaves	+++
			Stem	++
			Fruit	+++
3	Fats and fixed oils	Saponification test	Fruit	+++
			Leaves	+
			Stem	+

### Primary Metabolites test for *Cayratia trifolia*

#### Detection of Carbohydrates



Molisch Test C T - Leaf



Molisch Test C T - Stem



Molisch Test C T - Stem

#### Detection of Reducing Sugars



Benedict Test C T - Leaf



Benedict Test C T - Stem



Benedict Test C T - Fruit

#### Detection of Proteins



Million Test C T - Leaf



Million Test C T - Stem



Million Test C T - Fruit



Biuret Test C T - Leaf



Biuret Test C T - Stem



Biuret Test C T - Fruit

#### Detection of Fats



Saponification Test CT-Leaf



Saponification Test CT-Stem



Saponification Test CT-Fruit

**Conclusion**

Present research highlights the presence of primary metabolite like carbohydrates, protein and lipid in *Cayratia trifolia*. Beneficial properties could be done in further study by qualitative assessment of this climber.

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