



## **Qualitative test on ethanolic extract of *Coccinia indica* for profiling Secondary metabolites**

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### **Abstract**

*Coccinia indica* is climber, perennial medicinal plant belonging to family Cucurbitaceae. A qualitative assessment of ethanolic extract of different parts of the plant species revealed that they contain protein, carbohydrates, and lipids, Alkaloids, Phenols, Flavonoids, Saponin, Terpenoids and Glycosides.

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

### **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 the 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 [1].

*Coccinia indica* (synonym *Coccinia grandis*) Wight and Arn (Family Cucurbitaceae) which is a climbing or prostrate, much branched, perennial herb commonly known as *kundri* is also a medicinal plant. It is distributed in both wild and cultivated states on the plains of India. The present research paper deals with and qualitative test of the ethanolic extract of climber *Coccinia indica* for Secondary metabolites.

### **Aim of the study**

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

### **Material and Methods:-**



### **Plant collection**

*Coccinia indica* 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 (see plate no-1).

### **Preparation of plant extract:-**

Fresh leaves stem and fruit of *Coccinia indica* were washed thoroughly tap water and were dried in hot air oven at 40-50 °C for a week. 30gm of dried powder was extracted for 24 hours in 300 ml solvent (ethanol 99%). Repeated extraction was done with the same solvent till colourless solvent was obtained. The condensed extract was used for screening of primary and secondary metabolites.

### **Secondary Metabolites analysis:-**

Extracts were tested for the presence of active principles. Following standard procedures were used [2, 3].

#### **Test of Alkaloids**

Mayer's test:-

4 ml of aliquot of the extract was treated with 1 ml of Mayer's reagent (Potassium mercuric iodide).

White or Creamy Precipitate in the ethanolic layer indicates the presence of Alkaloids.

Wagner's test:-

4 ml of aliquot of the extract was treated with 1 ml of Wagner's reagent (iodine in Potassium iodide). A reddish brown precipitate confirms the test as positive.

Hager's test:-

4 ml of aliquot of the extract was treated with 1 or 2 ml of Hager's reagent (saturated aqueous of picric acid). Prominent yellow precipitate in the ethanolic layer indicates the presence of Alkaloids.

#### **Test for Phenols**

Ferric chloride test:

The test was carried out by following the method Mace, 1963. An aliquot of 3 ml of filtrate is treated with 1ml of 5% Ferric chloride solution in a test tube. The Black-Blue colour in the ethanolic layer indicates the presence of Tannins and Phenols.

Lead acetate test:

An aliquot of 3 ml of filtrate is treated with 1 ml of 10% Lead acetate solution. A bulky white precipitate indicates the presence of phenolic compound.

#### **Test of Flavonoids**

Alkaline reagent test

An aliquot of 3 ml of filtrate is treated with few drops of 10% Sodium hydroxide solution. Formations of intense yellow colour, which colour become colourless on further addition of dilute acid, indicate the



presence of Flavonoids or an aliquot of 3 ml of filtrate is treated with few drops of 10% Ammonium hydroxide solution. Yellow fluorescence indicates the presence of Flavonoids.

### **Test of Saponins**

Forth test

Take 1ml ethanolic aliquot and mix 50 mg sodium carbonate with 1.5 ml distilled water. It mixtures, shaken vigorously up to 5 minutes and formation of honey comb like froth was formed which showed the presence of Saponins. Which is stable for 15 minutes for a positive result.

### **Test of Terpenoids**

Horizon test:-

To 1 ml of ethanolic extract, 2 ml of trichloroacetic acid was added. The formation of yellow to red precipitate shows the presence of Terpenoids.

### **Test of Glycosides**

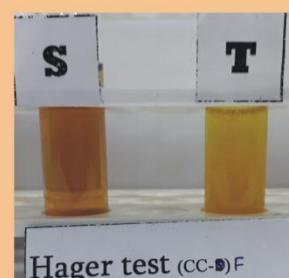
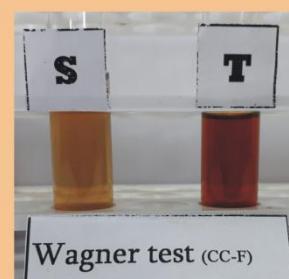
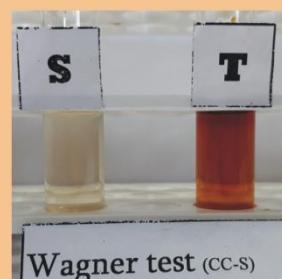
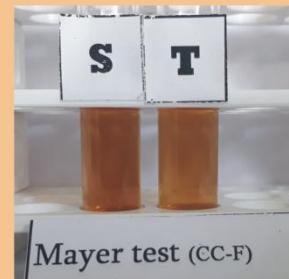
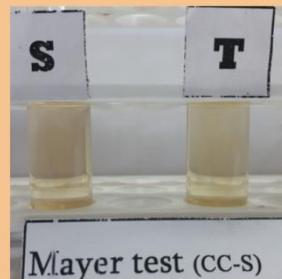
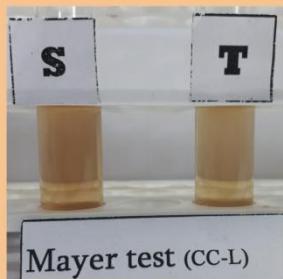
Legal test:-

To 2ml of extract, 1 ml of Peridine and 1 ml of Sodium nitroprusside were added. The change in colour pink or red indicates the presence of glycosides.

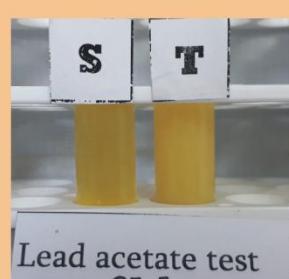
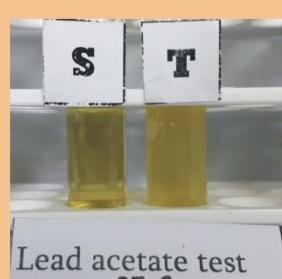
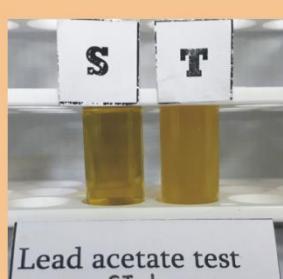


**PLATE:- 01**  
**Secondary Metabolites test for *Coccinia indica***

**Test for Alkaloids**



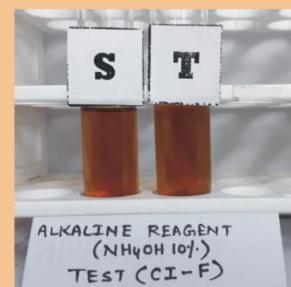
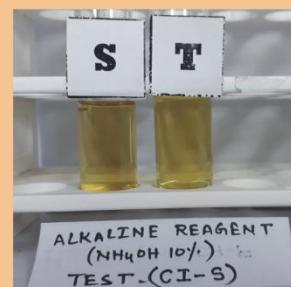
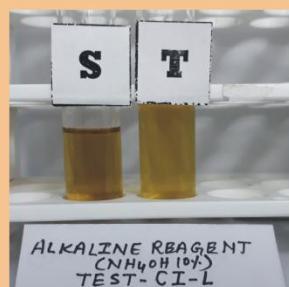
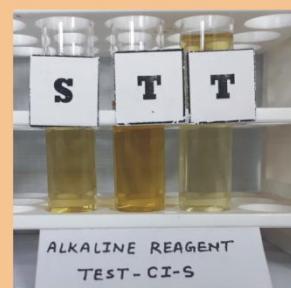
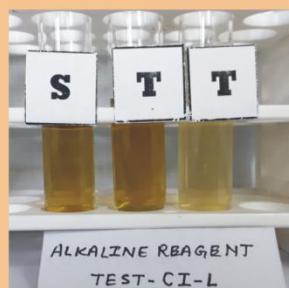
**Test for Phenols**



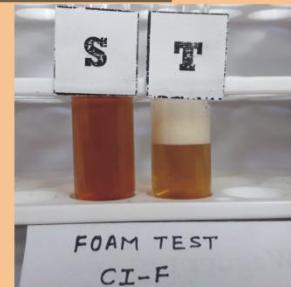
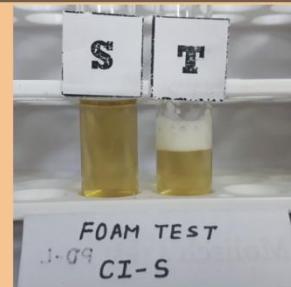


**PLATE:-02**  
**Secondary Metabolites test for *Coccinia indica***

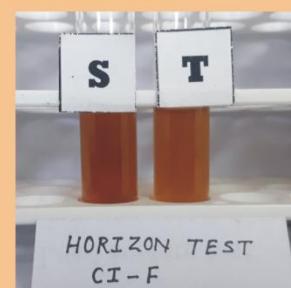
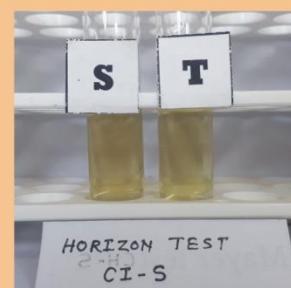
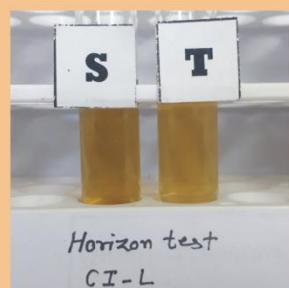
**Test for Flavonoids**



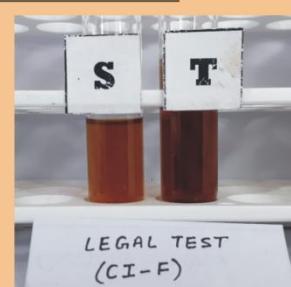
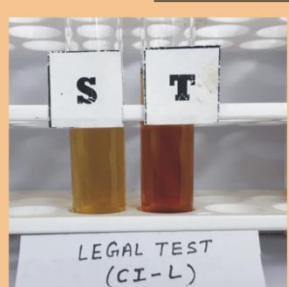
**Test for Saponins**



**Test for Terpenoids**



**Test for Glycosides**





### **Result and discussion:-**

Table 1 and figures 1, 2 displays results of qualitative analysis of ethanolic extract of different part of *Coccinia indica* which reveal that all the extracted plant material (Leaves, Stem, Fruit) of *Coccinia indica* possess various secondary metabolites. The presence of alkaloids was ascertained by three tests namely, Mayer test, Hager test and Wagner test. The results reveal that stem and fruit extracts have more quantity of alkaloids as they exhibited higher degree of precipitation (+++) for Hager test, however, for the same test extract of leaves showed lesser degree (+) of precipitation. For all three extracts Mayer and Wagner's test resulted in lesser degree (+) of precipitation.

Ferric Chloride test and Lead Acetate test for testing presence of phenol compounds and tannins resulted in higher degree (++) of precipitation for all three extracts. Sodium Hydroxide test and alkaline reagent test conducted for ascertaining presence of flavonoids showed presence of the same by varying degree of colouration.

Foam test for ascertaining presence of saponin resulted in formation of foam which shows presence of saponin in all three extracts. Fruit extract showed higher degree (++) of yellow to red precipitate in Horizon test however stem and leaf extract showed lesser degree (+) of the precipitation. Legal test for presence of glycosides showed increasing intensity of colour for stem, leaves and fruit extract, respectively.

Present finding are supported by studies of Khatun et al. (2012) [4]. who found *Coccinia indica* contain bioactive constituents such as Tannins, Saponins, Phenols, Flavonoides and terpenoides. Yadav et al., (2010)[2] , Shalini et al.,(2014)[5], Bhaduria et al.,(2012)[6], Rahman et al., (2015)[7], Deokate & Khadabadi,(2012)[8], Sakharkar & Chauhan, (2017)[9] also evaluated different species of Coccinia which also support present research work.

**Table -1**

S.No.	Phytochemical	Name of test	Plant part	Observation
1	Alkaloids	Mayer's test	Leaves	+
			Stem	+
			Fruit	+
	Wanger's test	Leaves	+	
			Stem	+
			Fruit	+
	Hager's test	Leaves	+	
			Stem	+++
			Fruit	+++
2	Phenolics &Tennins	Ferric Chloride test	Leaves	+++
			Stem	+++
			Fruit	+++
	Lead Acetate Test	Leaves	+++	
			Stem	+++
			Fruit	+++



3	Flavonoids	Sodium Hydroxide Test	Leaves	+
			Stem	+
			Fruit	+++
4	Saponins	Alkaline reagent test	Leaves	+
			Stem	+
			Fruit	+
5	Terpenoids	Horizon Test	Leaves	+++
			Stem	+++
			Fruit	+++
6.	Glycosides	Legal Test	Leaves	++
			Stem	+
			Fruit	+++

## Conclusion

Present research highlights the presence of primary metabolite like carbohydrates, protein and lipid. *Coccinia indica* a medicinal plant species and further study may prove beneficial for human welfare.

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