

## Qualitative study of phytoconstituents present in *Curcuma aromatica* and *Curcuma caesia roxb*

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### Abstract

Plants are being widely used either as single drug or in combination in health care. The Indian herbs are broadly utilized as source of drugs mentioned in the traditional systems of medicine. *Curcuma aromatic* and *curcuma caesia* are the one of the well-known herbal plant. It is commonly known as haldi and kali haldi. These are erect perennial herb, grow all over in India mainly Bengal Southern India. The objective of the present study is to evaluate scientific data for presence of various phytochemicals in the different extract of 70% methanol, ethyl acetate and petroleum ether. The three different extracts of rhizomes found to contain alkaloids, triterpenoids, flavonoids, phenolic, tannins & carbohydrate. Presence of such secondary metabolites makes this plant useful for mankind. In future we can prepare herbal drug from the rhizomes of this plant.

**Keywords:** Phytochemicals; Secondary metabolites; Rhizomes; Flavonoids

### 1 Introduction

Plant plays a vital role in the life of human being. India has long history of using plants for medicinal purpose as mention in Ayurveda. The significance of medicinal plants for prevention, mitigation and cure of diseases are always recognized. History revealed that plants have been a valuable source of natural products for maintaining human health at all the times.



**Figure 1** *Curcuma caesia* and *Curcuma aromatica* rhizomes

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*Curcuma aromatica* is a well-known herb from family Zingiberacea. It has numerous medicinal property, it is very useful for delaying ageing process, protecting liver diseases, sprains and enhancing complexion (Dosoky and Setzer 2018). Its leaves are useful to healing wounds and fracture bones. Similarly *Curcuma caesia* is also from the same family commonly known as kali haldi traditionally rhizome and leaves of this plant used in different part of the world as a tonic for brain and the heart, dried rhizome used to cure piles, leprosy, asthma, tooth ache etc (Ravindran *et al.*, 2007). *C.caesia* rhizome essential oil useful for heal asthma, tuberculosis bronchitis (Sahu *et al* 2016; Donipati & Sreeramulu, 2015) since both these plants have high potency towards curing many diseases so here we are analyzing qualitative phytochemicals present in the rhizomes of both plants.

## 2 Materials and methods

### 2.1 Collection of Plant Material & authentication

Rhizomes of plant collected from the Sanjivani Bhopal. Dr. Zia Ul Hasan Professor, Department of Botany, Safia College of Art & Science, Bhopal, identified and authenticated this part of the plant.

### 2.2 Preparation of test extracts

The rhizomes of were collected and air dried at room temperature. Crushed powders of species were successively soxhlet extracted. Later, each of the homogenates was filtered and the residue was re-extracted twice for complete exhaustion, the extracts were cooled individually. Each filtrate was concentrated to dryness in vitro and re dissolved in respective solvents, were stored at 4°C in a refrigerator, until screened for phytochemical activity.

### 2.3 Phytochemical analysis of different Crude extracts

#### 2.3.1 Qualitative analysis

Extracts were tested to identify presence or absence of phytochemicals such as Triterpenoids, Steroids, Saponins, Alkaloids, Flavonoids, Tannins, Proteins, glycosides and Carbohydrates by using the standard procedures [Kokate C.K. *et al.*, 2006].

## 3 Results

The present study was carried out on the *Curcuma aromatica* and *Curcuma caesia Roxb* revealed the presence of active phytochemical constituents. The bioactive components of *Curcuma aromatic* and *Curcuma caesia Roxb* were qualitative analyzed from different extracts of rhizomes and the results are mentioned in Table 1.

**Table 1** Different extracts of rhizome

| S.No. | Experiments             | <i>Curcuma aromatica</i> |               |          | <i>Curcuma caesia Roxb.</i> |               |          |
|-------|-------------------------|--------------------------|---------------|----------|-----------------------------|---------------|----------|
|       |                         | Pet ether                | Ethyl acetate | methanol | Pet ether                   | Ethyl acetate | methanol |
| 1     | Test for alkaloids      |                          |               |          |                             |               |          |
| i     | Mayer's test            | +ve                      | +ve           | +ve      | -ve                         | +ve           | -ve      |
| ii    | Wagner's test           | +ve                      | +ve           | +ve      | -ve                         | +ve           | -ve      |
| iii   | Hager's test            | +ve                      | +ve           | +ve      | -ve                         | +ve           | -ve      |
| 2     | Test for carbohydrates  |                          |               |          |                             |               |          |
|       | Molish's test           | -ve                      | +ve           | +ve      | -ve                         | +ve           | -ve      |
|       | Barfoed test            | -ve                      | +ve           | +ve      | -ve                         | +ve           | -ve      |
| 3     | Test for reducing sugar |                          |               |          |                             |               |          |
|       | Fehling's test          | -ve                      | -ve           | -ve      | -ve                         | +ve           | -ve      |
|       | Benedict's test         | -ve                      | -ve           | -ve      | -ve                         | +ve           | -ve      |

|   |                                       |     |     |     |     |     |     |
|---|---------------------------------------|-----|-----|-----|-----|-----|-----|
| 4 | Test for flavonoids                   |     |     |     |     |     |     |
|   | Alkaline reagent test                 | -ve | +ve | +ve | -ve | +ve | +ve |
|   | Shinoda test                          | -ve | +ve | -ve | -ve | +ve | +ve |
|   | Lead acetate test                     | -ve | +ve | -ve | -ve | +ve | +ve |
| 5 | Test for glycoside                    |     |     |     |     |     |     |
|   | Borntrager test                       | -ve | -ve | +ve | -ve | +ve | -ve |
|   | Legal test                            | -ve | -ve | +ve | -ve | +ve | -ve |
|   | Killer-killiani test                  | -ve | -ve | +ve | -ve | +ve | -ve |
| 6 | Test for Tannin and phenolic compound |     |     |     |     |     |     |
|   | Ferric chloride test                  | -ve | +ve | +ve | -ve | +ve | +ve |
|   | Lead acetate test                     | -ve | +ve | +ve | -ve | +ve | +ve |
|   | Dilute iodine solution test           | -ve | +ve | +ve | -ve | +ve | +ve |
| 7 | Test for saponin                      |     |     |     |     |     |     |
|   | Foam test                             | -ve | -ve | -ve | -ve | -ve | -ve |
| 8 | Test for protein & amino acids        |     |     |     |     |     |     |
|   | Ninhydrin test                        | -ve | -ve | -ve | -ve | +ve | +ve |
| 9 | Test for terpenoids and steroids      |     |     |     |     |     |     |
|   | Salwonski test                        | -ve | +ve | +ve | -ve | -ve | +ve |
|   | Libberman and Burchard test           | -ve | +ve | +ve | -ve | -ve | +ve |

#### 4 Discussion

In this study we checked presence of various qualitative phytochemical constituents. In the above study it is clear that pet ether extract of *Curcuma aromatica* contains only alkaloids *Curcuma aromatica* shows presence of carbohydrates in its all extracts while *Curcuma caesia* robx. Shows presence of carbohydrates only in ethyl acetate extract, *curcuma aromatica* don't have reducing sugar in all its extract while *C. caesia* shows reducing sugar in its ethyl acetate extract, both shows presence of flavonoids in its ethyl acetate and 70% methanol extract. *C. aromatica* shows presence of glycosides in its 70% methanol extract while *C. caesia* shows in ethyl acetate extract, plant rhizomes of both plants are rich in tannin and phenolic compound while saponin is not at all present in both plants, and protein is present only in *Curcuma caesia* robx. In ethyl acetate and 70% methanol extract but not in *C. aromatica*, terpenoids and steroids present in *C. aromatica* in ethyl acetate and 70% methanol extract while in *C. caesia* it is present only in 70% methanolic extract this shows that both plant is rich in phytoconstituents according to this study. Since protein is presence of in *C. caesia* robx. makes its rhizome more dominance than *C. aromatica*.

#### 5 Conclusion

The presences of phytoconstituents makes the plant useful for treating different malady and have a potential of providing useful drugs of human use. In the present study, we have found that 70% methanol and ethyl acetate extracts of rhizomes of *C. aromatica* and *C. caesia* shows presence of flavonoid, phenolic tannins, steroids and terpenoids. These phytoconstituents can act as a source of useful drugs and also to improve the health status of the consumers as a result of the presence of various compounds that plays vital role for good health.

#### Compliance with ethical standards

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