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# PHYTOCHEMICAL STUDIES ON *ACORUSCALAMUS* L.

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**ABSTRACT**
*Acorus calamus* Linn. (Araceae), is a well known medicinal plant since the time of Charaka. In the present investigation, a few of secondary metabolites like phenols, flavonols and tannins were estimated and found to be 3.46 mg/100 gm, 5.41 mg/100 g and 31.7 mg/100 gm respectively. Phenols and flavonols were separated on Thin layer chromatography (TLC) and the $R_f$ values were recorded.

**KEYWORDS:** *Acorus calamus*, Secondary metabolites, TLC.

## INTRODUCTION

*Acorus calamus* L. has been employed since the time of charaka as one of the ingredient of medicines like Pippaladya Ghrita, Gandhahasti, Mathagandhahasti, Citrakadya leha[1] etc. Till to date, it is well known for its antiinflammatory, and antibacterial properties and also used in perfumery and alcoholic beverages.[2] The powdered rhizomes said to act as diphoretic, expectorant and can cure tuberculosis, lung cancer and heart cancer.[3]

In the present investigation, the secondary metabolites which are indirectly responsible forthe curative properties mentioned above were estimated. The phenols and flavonols were separated on TLC and Rf values were recorded.

## MATERIALS AND METHODS

**Source of explant**: The rhizome of *Acorus calamus* was collected from the botanical garden Gulbarga University, Gulbarga and was authenticated using the "Flora of Presidency of Madras" by Gamble[4] and Flora of Gulbarga District" by Seetharam[5], where a voucher specimen was deposited, (HGUG 352). Preliminary phytochemical tests[6] were conducted using fresh rhizome for phenolics, flavonoids and tannins.

The shade dried and powdered rhizome was used for quantitative estimations. Estimation of phenols was done by folin-ciocalteau method[7], estimation of flavonols was done by Swain-Hill method[8] and estimation of tannins was done by Folin-Denis method[9] and the chromatographic plates were prepared as reported by Stahl".

### Separation of phenols and flavonols

***Phenols:** Plant material was extracted with ethanol and condensed the volume to 1/4$^{th}$ at room temperature, solvents used for the separation as a mobile phase were benzene; acetone (9:1). The phenolic compounds were detected and compared with by spraying Folin-ciocalteau reagent and water (1:1) and compared with the standard phenolics.

**Flavonols:** The plant material was defatted by using petroleum ether and the supernatant was evaporated to dryness at room temperature. Methylene chloride was added to the residue and left for evaporation at room temperature. The residue was redissolved in chloroform and used for the chromatogrphic studies. The solvents used for the separations as a mobile phase were butanol, acetic acid and water (4:1:5). The $R_f$ values were recorded in both visible and UV light.

## OBSERVATION

The plant material showed positive results to the preliminary phytochemical tests. The presence of phenols was confirmed by observing a brown ring at the junction of the dipped and undipped portion of the rhizome and also when treated with ferric chloride, an intense white coloured precipitate was formed. The presence of flavonols was confirmed after the formation of magenta colour when treated with concentrated sulphuric acid and magnesium turnings.

A white precipitate was obtained when the ethanolic extract was treated with 1% (w/v) solution of gelatin containing 10% (w/v) sodium chloride solution confirming the presence of tannins (Table-1).

The amount of phenols, flavonols and tannins found in the plant material were 5.41 mg/100 g, 3.46 mg/100 g and 31.7 mg/100 g respectively (Table-2).

**Phenolic separation**: A spectrum of two bands of different Rf value was seen. The Rf. Values andcolour of the bands under visible light was recorded.

**Flavonol separation:** Under visible light the chromatogram showed two spots whereas under UVlight it showed two spots with different Rf. values.

**Table 1: Showing the occurrence of phenols, flavonoids and Tannins.**

| Sl. No. | Test | Observation | Inference |
|---|---|---|---|
| 1. | Test for phenols<br>a) Phenol test<br>b) Ellagic acid test | <br>White precipitate<br>Muddy brown precipitate | <br>Present<br>Present |
| 2. | Test for flavonoids<br>a) Flavonoid test<br>b) Shinoda test | <br>Magenta colour<br>Yellowish brown | <br>Present<br>Present |
| 3. | Test for tannins<br>a) Gelatin test | <br>White precipitate | <br>Present |

**Table 2: Showing quantity of phenols, flavonols and tannins present in *Acorus calamus* L.**

| Sl. No. | Parameter | Quantity (mg/100 gm) |
|---|---|---|
| 1. | Phenols | 5.41 |
| 2. | Flavonols | 3.46 |
| 3. | Tannins | 31.7 |

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