

## Pharmacognostic aspect of *Scoparia dulcis* L.

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### ABSTRACT

A study was carried out at Avinashilingam Institute for Home Science and Higher education for Women Coimbatore to evaluate the Pharmacognostic, phytochemical and biochemical aspect of *Scoparia dulcis* (L.).The Pharmacognostic studies involved organoleptic study, fluorescence analysis, preliminary photochemical studies and biochemical analysis. Observations revealed the presence of biologically active compounds. The results of root and shoot analysis gave a contribution to the world of traditional medicines. Both the sample showed pleasant odour and bitter taste. The fluorescence analysis of root and shoot powder under UV light and ordinary light showed a little difference only. Biochemical studies on the two samples showed the presence of protein and carbohydrates. Shoot extract showed more content of both protein and carbohydrates.

**Key words:** Medicinal plants, *Scoparia dulcis* L., Pharmacognostic studies, Photochemical and biochemical aspect, Organoleptic study, Fluorescence analysis.

### INTRODUCTION

Since the dawn of civilization, man utilized plants for their medicinal and edible value. By trial and error, man distinguished between the beneficial and poisonous plants. Today, this method is used by scientists to isolate active compounds from medicinal plants. Majority of rural dwellers in developing countries still depend on medicinal plants to prevent or eliminate diseases. The biochemistry of herbs and Pharmacognostic aspects initiates many herbalists to do researches. An investigation has been carried out to evaluate the Pharmacognostic, phytochemical and biochemical aspect of *Scoparia dulcis* L.

### MATERIALS AND METHODS

To assess the activity of *Scoparia dulcis* (L.) Pharmacognostic studies like organoleptic studies, fluorescence analysis, preliminary phytochemical studies and biochemical analysis were carried out. Organoleptic studies were carried

out on the basis of Jackson and Showdown Method (1968) and fluorescence analysis following Kokoshi *et al.*, (1958) and Chare and Pratt(1949).The biochemical parameters like protein (Lowry *et al.*, 1951) and carbohydrates (Hedge and Hofreiter, 1962) were also analyzed .

### RESULTS AND DISCUSSION

#### Pharmacognostic study

The Pharmacognostic characters of the root and shoot of *Scoparia dulcis* L. are indicated through the following parameters.

#### Organoleptic Study

The organoleptic study indicates the external characters like colour, odour and taste. The results of the present study are indicated in Table 1.

There was a slight colour variation in the two samples. But in both the samples, the odour was pleasant and the taste was bitter. Pandey *et al.* (1984) and Gupta (1986) tested the plant powders

and observed their behaviors. In the present research similar Pharmacognostic study has been done. Organoleptically, *Abrus precatorius* seeds yield coarse powder and colour of red seeds were yellowish brown with red and black spots and colour of white seeds were white in colour (Prathyusha *et al.*, 2010).

### Fluorescence Analysis

The powdered samples of each part extracted in water, 10% NaOH, 50% H<sub>2</sub>SO<sub>4</sub> and 1N HCl. The fluorescence of these extracts were observed under ordinary visible light and also under UV light (254 nm) and recorded in Table 2.

Prathyusha *et al.* (2010) conducted the fluorescence analysis of seed extracts of red and white forms of *Abrus precatorius* in day light and at 254 nm UV light and recorded the colour changes of the powder. The fluorescence colour is specific for each compound. A non-fluorescent compound may fluoresce if mixed with reagents (Kala *et al.*, 2011).

### Preliminary phytochemical screening

Phytochemical analysis intends to serve as a major resource for information on analytical and instrumental methodology in plant science as was reported in "phytochemical analysis"

**Table 1: Organoleptic study of the sample of root and shoot**

S.No.	Sample	Colour	Odour	Taste
1.	Root	Yellowish green	Pleasant	Bitter
2.	Shoot	Light green	Pleasant	Bitter

**Table 2: Fluorescence analysis of the samples of root and shoot**

Samples	Treatment with chemical reagents	Under ordinary light	Under UV light (254 nm)
1. Root	Powder with water	Dull white	White
Shoot		Light green	Light green
2. Root	Powder with 1 N NaOH	Light brown	Dark brown
Shoot		Light brown	Yellowish brown
3. Root	Powder with 50% H <sub>2</sub> SO <sub>4</sub>	Light green	Green
Shoot		Dark green	Green
4. Root	Powder with 1 N HCl	Light yellow	Yellow
Shoot		Light green	Pale green

**Table 3: Preliminary phytochemical analysis of *Scoparia dulcis* L. root and shoot**

S. No	Sample	Extract used	Alkal-oids	Flavon-oids	Tannin	Phenol	Ster-oids	Terpen-oids	Quin one	Starch	Cellu-lose	Fixed Oil
1.	Root	Petroleum ether	-	+	-	-	-	+	-	+	+	-
		Chloroform	-	+	-	+	-	-	+	+	+	-
		Methanol	+	+	+	-	-	-	-	+	+	-
		Water	+	+	+	+	+	-	-	-	+	-
2.	Shoot	Petroleum ether	-	+	-	+	-	-	-	+	+	-
		Chloroform	-	+	-	-	-	-	+	+	+	-
		Methanol	+	+	-	-	-	-	+	+	+	+
		Water	+	+	+	+	-	-	+	+	-	-

**Table 4: Estimation of protein and carbohydrates content of root and shoot extracts of *Scoparia dulcis* L.**

S. No.	Samples	Protein (mg / 100 g)	Carbohydrates (mg / 100 g)
1.	Root	9.37	25.19
2.	Shoot	9.57	33.95

(Houghton *et al.*, 2004). In the present study, a phytochemical screening was carried out to detect the active constituents such as cellulose, starch, fixed oil, alkaloids, flavonoids, tannins, phenols, steroids, terpenoids and quinine (Table 3).

Among the two samples, performance of the root extracts showed maximum result. Of the different extracts water extract showed more positive results. Phytochemical analysis of shoot extracts in comparison with root showed minimum result. In this also water extract showed maximum result compared to other three extracts.

The preliminary phytochemical investigation of selected ethnomedicinal plants of Dindigul district showed the presence of phenolics, flavonoids, terpenoids and alkaloids respectively in 60, 58, 50 and 37 plant species (Karuppusamy and Karmegam, 2005). Qualitative phytochemical analysis of different extract of *Abrus precatorius* showed the presence of alkaloids, saponins, carbohydrates, gums, steroids, fixed oils and triterpenoids (Prathyusha *et al.*, 2010).

#### Biochemical analysis

Protein content of both the samples were on par with each other. That is shoot sample showed 9.57 mg / 100 g and root sample showed 9.37 mg / 100 g (Table 4) and .Carbohydrate contents of shoot samples was more when compared to that of root sample (33.95 mg / 100 g and 25.19 mg / 100 g respectively).

Udayakumar *et al.* (2003) screened the protein content of the plant *Solanum xanthocarpum* through Million's reagents and estimated the protein content. Phytochemical screening of *Bauhinia variegata* showed the presence of alkaloids in the

methanolic and water extract, but was found absent in petroleum ether. Carbohydrates and phenolic compounds were found to be present in all the extracts (Sawhney *et al.*, 2012). Naseerbanu *et al.* (2003) estimated carbohydrates content in *Amaranthus viridis* and *Spinacea oleracea* in which *A. viridis* showed higher carbohydrates content (35.62 mg / 100 g) than *Spinacea oleracea*. Amount of carbohydrates in poly herbal powder and various extracts was found to be less when compared with *A. viridis*.

#### CONCLUSION

The results of root and shoot analysis gave a contribution to the world of traditional medicines. The root sample showed yellowish green colour, while shoot showed light green colour. Both the sample showed pleasant odour and bitter taste.

The fluorescence analysis of root showed a little colour variation under UV light. It showed white and yellowish brown colour variation with different chemicals. Shoot samples showed colour variation from light green to pale green. Root powder showed dull white, light green, light brown and light yellow colour under ordinary light. But the shoot showed light green and light brown colour under ordinary light.

The presence of alkaloids, phenols, steroids, terpenoids, flavonoids, tannins, quinone and starch were confirmed in both root and shoot powders. Fixed oils showed negative result Biochemical studies on the two samples showed the presence of protein and carbohydrates. Shoot extract showed more content of both protein and carbohydrates

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