



ALLELOPATHIC EFFECTS OF LEAVES AND STEMS EXTRACT OF HOLMSKIOLDIA SANGUINEA RETZ

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Article Received on 20/09/2018

Article Revised on 10/10/2018

Article Accepted on 01/11/2018

ABSTRACT

Holmskioldia sanguinea Retz. belongs to Verbenaceae family which is commonly known as Kapni or Rithoul in Hindi. It is distributed in Punjab eastward in hills ascending upto 1500 m, and subtropical and Himalayan regions from Kumaon to Bhutan. It is shrub, 10-30 feet in height. Its flowers are borne on axillary cymes. It is reportedly used in traditional medicine. Its crushed fresh leaves and shoots are applied in rheumatism and rheumatoid arthritis. Its extracts of leaves and stem bark are used in the treatment of dysentery. In the present paper we report allelopathic effect of aqueous extract of leaves and stem parts of plant on seed germination, shoot of seeds of *Cicer arietinum* L. which have shown good results.

KEYWORDS: *Holmskioldia Sanguinea*, Verbenaceae, Allelopathic, *Cicer Arietinum* L., Seeds.

INTRODUCTION

Holmskioldia sanguinea Retz. belongs to Verbenaceae family which is commonly known as Kapni or Rithoul in Hindi. It is distributed in Punjab eastward in hills ascending upto 1500 m, and subtropical and Himalayan regions from Kumaon to Bhutan. It is shrub, 10-30 feet in height.^[1-2] Its flowers are borne on axillary cymes. It is reportedly used in traditional medicine. Its crushed fresh leaves and shoots are applied in rheumatism and rheumatoid arthritis. Its extracts of leaves and stem bark are used in the treatment of dysentery. Various pharmacological activities like analgesic, anticancer, diuretic, anti-inflammatory, CNS depressive and antimicrobial activities have been reported from aerial parts of plant.^[3-8] A large number of compounds isolated from plant have been reported by earlier workers, like diterpenoids, andrographolides, neoandrographolides, some lipids, wogonin, friedelin, friedelinol, β -sitosterol, glucose β -amyryn, 27-methylnonaicosanol iridoid and phenolic glycosides.^[9-11]

Experimental

Plant Material

Holmskioldia sanguinea Retz. belongs to Verbenaceae family which is commonly known as Kapni or Rithoul in Hindi. The stems and leaves of this plant were collected from sagar region and were taxonomically authenticated by the Department of Botany, Dr. H. S. Gour University Sagar. The voucher specimens have been deposited in the Natural Products Laboratory, Department of Chemistry, Dr. H. S. Gour University Sagar (M.P.), India.

Extraction

The shade dried and powdered stems and leaves part (4 Kg of each) of the plant were extracted with water in Soxhlet apparatus for seven days. The water soluble fractions of these parts of the plant were concentrated under reduced pressure to yield light brown viscous mass, which were subjected for allelopathic activity.

Allelopathic Activity

Pot study: Seven pots were taken for allelopathic activity^[12-18] of leaves and stems extract of plant. Then added soil from agriculture land in all the pots and put eight seeds of *Cicer arietinum* L. (Fabaceae) in each pot. Tap water was added in pot no. 1 and used as a control. Solution of three different concentrations (50, 75, 100 %) of leaves and stems extracts were prepared separately. Stems and leaves extract of the plant were added in pot no. 2 to 4 and pot no. 5 to 7 respectively and after 20 days observed the germination and seedling growth of seeds of the plant at room temperature. Shoot lengths was measured in cm unit.

Percentage of germination and seedling vigor index was determined from following equation.

$$\text{Germination \%} = \frac{\text{Germinated seeds}}{\text{Total number of seeds}} \times 100$$

$$\text{Seedling Vigor Index} = \frac{\text{Seedling length} \times \text{Germination percentage}}{100}$$

Results obtained from experimental findings have been reported in Table (1&2).

RESULT AND DISCUSSION

From above results it was observed that, when concentration of aqueous extract of leaves and stems of

the plant are increasing, shoot length of *Cicer arietinum* L. are also increasing in both extracts. Therefore extracts obtained from the both parts of plant may be used as a natural fertilizers for the sustainable agriculture.

Table. 1: Allelopathic activity of aqueous extract of leaves of the plant against germination and seedling growth of *Cicer arietinum* L.

Tested species	Extracts	Pot No.	Extract Solution (%)	Germination %	Shoot length (cm)	Seedling Vigor Index
<i>Cicer arietinum</i> L.	Aqueous extract (Leaves)	1	Control Water	90.47	10.25	9.27
		2	50	90.67	10.80	9.79
		3	75	92.41	14.30	13.21
		4	100	95..53	18.50	17.67

Table. 2: Allelopathic activity of aqueous extract of stems of the plant against germination and seedling growth of *Cicer arietinum* L.

Tested species	Extracts	Pot No.	Extract Solution (%)	Germination %	Shoot length (cm)	Seedling Vigor Index
<i>Cicer arietinum</i> L.	Aqueous extract (Stems)	1	Control Water	90.47	10.25	9.27
		5	50	90.71	14.50	13.15
		6	75	93.47	20.50	19.16
		7	100	95.23	33.10	31.52

ACKNOWLEDGEMENT

I am thankful to Head Department of Chemistry, Dr. H. S. Gour Vishwavidyalaya for providing laboratory facilities, Dr. Pradeep Tiwari, Department of Botany of this university for identification of plant. One of the author (Ms. J. Raghuvansi) is grateful to UGC for financial assistance.

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