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PHARMACOGNOSTICAL STUDIES ON LEAF OF *Coldenia procumbens* Linn

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***ABSTRACT**: The **plant Coldenia procumbens Linn**. is used commonly in Indian system of medicine for various ailments. The present paper deals with detailed pharmacognosy of the leaf of coldenia procumbens Linn. and includes its Macro/Micro morphological (vein islet, vein termination numbers and stomatal index) anatomical characters, Physico chemical standards such as ash values, extractive values, crude fibre content and fluorescence characters of various extracts and leaf powder after treatment with different chemical reagents under UV light. Prelimanary phytochemical tests on various extracts of the leaf have also been carried out.*

INTRODUCTION

Coldenia procumbens 1-6 Linn. (Family-Boraginaceae) is abundantly available in most parts of India and has been used by locals for number of medicinal purposes. In villages, the fresh leaves are ground and applied to rheumatic swelling. The whole plant used in external application of causing suppuration of boils. The leaves are also used to cure fever, piles and scorpion sting. But it has still not been explored properly and remains as a silent drug in herbal medicine. Considering various uses of the leaf, the present investigation was undertaken to being out the detailed pharmacognostical characteristics of the leaves as whole an fits powdered form .

MATERIALS AND METHODS

Plant Materials

The plant material were collected from Tirunelveli in the month of May 1997 and authenticated by Dr. V. Nandhagopalan, Department of Botany, National College, Tiruchirapalli. A Herbarium specimen of the plant is preserved in the Department of Pharmacognosy of our Institute for future reference. The collected leaves were shade dried, Pulverized to get a coarse powder and used for the present study.

Reagents

All the reagents used were of analytical grade obtained from S.d. Fine chemicals Ltd., Mumbai, Qualigens Fine Chemicals, Mumbai.

Methods

The morphological characters of the plant *Coldenia procumbens* Linn. were observed. Free hand sections of leaf were taken, fixed in 70% ethanol, stained with safranin and fast green and mounted following the usual plant micro technoque7 (Johansen, 1940). The histo chemical colour reactions of the leaf were done according to the methods described by Trease and Evans8, (1972) and K.V. Krishnamoorthy9 (1988) and the microscopic photographs were taken by

fitting Minolta X-300s Camera (Belgium) in Topic T-Trinocular Research Microscope. The quantitative microscopical analysis such as vein islet, vein termination numbers and stomatal index. 10 of the leaves were studied.

The ash values, ethanol soluble and water soluble extractive values of leaves were determined as per the Indian Pharmacopoeial methods11 and the crude fibre content was done by Dutch process 12. other extractive values were determined successively starting from pet. Ether (60-80c), benzene, chloroform, acetone, alcohol by using soxhlet extraction apparatus. The dried extractive were obtained after evaporation of solvent under reduced pressure. The fluorescence characters of the various extracts and powdered leaf with different chemical reagents were observed under ultra violet at 254nm 13. preliminary phyto chemical tests of different extracts were performed by specific reagents.14,15.

RESULTS:
MORPHOLGY 16
Habit and Habitat

It is a prostrate herb usually lying quite flat on the ground, stems reaching 45cm long , shaggy with whit hairs, branches often numerous, young plants silky with white hairs. It is distributed in tropical and subtropical zones.

LEAVES

Crisped, 1.3-3.8 by 0.6-2cm, obovate to oblong, rounded at the apex, coarsely serrate, very hairy on both sides, base tapering, petioles 3-10 mm long, shaggy.

FLOWERS

Pale yellow, solitary, axillary, nearly sessile; calyx-divided to the base or nearly, so, very hairy. Segments 4, ovate, acute, 2-5mm long, ciliate; corolla-2.5 mm long, lobes 4, oblong, rounded at the apex; Androceium—long stamens 4, scarcely higher than the corolla-tube; Gynoceium-ovoid, slightly 4 lobed, sub 4 celled with one ovule in each cell. Style 2, distinct from the base or cohering to the middle, but easily separable, terminal stigmas capitate.

FRUIT:

A dry 4 lobed pyramid about 3mm high and 4 mm across at the widest part, grooved on two and ribbed on the other two sides, with a sharp central double beak, hairy, muriculate, ultimately separating into 1 celled, beaked pyrenes; Seeds-albuminous.

HISTOLOGICAL STUDIES (Fig-1)

Anatomy of *Coldenia procumbens* Linn. leaf, The transverse section of leaf through midrib shows. The cells in both the epidermises are one layered in thickness, some of the epidermal cells re modified into hairs, which are unicellular, thick walled in nature. The palisade layer are well distinguished, they are double layered compact cells and radially arranged but the spongy mesophyll cells are much more differentiated, spongy parenchyma are loosely arranged, intercellular spaces are found. The midrib portion of the leaf contains 3 to 4 layers of collenchymatous cells on lower epidermis. The vascular bundles located at the centre of midrib portion, the large bundle was typically centre in position and small bundle was observed just above to the central bundle. The vascular bundle is surrounded by parenchymatous cells, having radiated xylem and phloem. Paracytic stomata are

seen in the lower epidermis and upper epidermis.

POWDER CHARACTERISTICS (Fig.2)

The leaf powder is pale greenish grey in colour, having characteristic odour and slightly bitter in taste. It shows following powder characteristics.

1. Thick walled unicellular trichomes
2. Paracytic stomata,
3. Palisade cells,
4. Loosely arranged spongy parenchyma

The histo chemical colour reactions of the leaf of *Coldenia procumbens* Linn. and quantitative microscopical analysis such as vein-islet, vein-termination numbers and stomatal index are reported in Table No. 1&2. Physico chemical standards such as ash values, extractive values, loss on drying, crude fibre content are shown in table No 3&4. The results of preliminary phyto chemical tests show the presence of phyto constituents of different extracts of reported in table No.5. The Fluorescence characteristics of various extracts of leaf powder with different chemical reagent under UV light are tabulated in Table No. 6&7.

DISCUSSION

The histological studies and powder microscopy showed characteristic diagnostic features such as unicellular trichomes and paracytic stomata. Quantitative microscopical studies also give valuable informations regarding specific leaf constants such as vein-islet, vein termination numbers and stomatal index. These microscopical characters along with other physicochemical standards such as ash values, extractive values, crude fibre content and fluorescence analysis will be useful to identify the authenticity of the drug even from the crushed or powdered plant materials.

The alcohol (90%) soluble extractive is high as compared with water soluble extractive, The cholorform extract shows minimum extractive value where as alcoholic extract shows maximum extractive value. The preliminary phytochemical studies showed the presence of glycosides, phytosterols, proteins, amino acids, fixed oils flavonoids, gums and mucilage. Thus the present study well be more useful for the pharmacognostical identity of the leaf of *Coldenia procumbens* Linn. and also helps in the detection of adulteration.

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TABLE NO 1
HISTOCHEMCIAL COLOUR REACTIONS OF THE LEAVES OF *Coldenia procumaens* LINN

S. NO	REAGENTS	TEST FOR	NATURE OF CHANGE	HISTOLOGICAL ZONE	DEGREE OF CHANGE
1.	Toludine Blue O	Carboxylated Poly Saccharides	Pink to reddish Purple	Epidermis and Palisade layer	+++
2.	Fast Green FCF	Basic Protein	Bright Green	Palisade layer and mesophyll cells	+++
3.	Coomassie Brilliant Blue R(CBB)	Total protein	Reddish Pink	Trichomes. Palisade layer and mesophyll cells	+++
4.	Nile-Blue A	Steriods	Blue	Trichomes and upper epidermis	+++

TABLE NO 2
QUANTITATIVE MICROSCOPICAL ANALYSIS OF LEAVES OF *Coldenia procumbens* Linn

SL. NO	VEIN ISLET NUMBER	VEIN TERMINATION NUMBER	STOMATAL INDEX	
			UPPER SURFACE	LOWER SURFACE
Minimum	9	12	8.6	9.5
Average	11	15	9.8	10.8
Maximum	14	19	11.1	12.0

TABLE NO 3
EXTRACTIVE VALUES OF THE LEAVES OF *Coldenia procumbens* Linn

PLANT NAME	PART USED	METHOD OF EXTRACTION	YIELD IN PERCENTAGE				
			PET. ETHER	BENZENE	CHOLORO FORM	ACETONE	ALCOHOL
Coldenia procumbens Linn	Leaves	Continuous Hot Percolation using Soxhlet apparatus	2.72	1.80	0.63	0.75	2.75

TABLE NO 4
PHYSICO CHEMICAL STANDARD VALUES OF THE LEAVES OF *Coldenia procumbens* Linn

SL.NO.	TOTAL ASH %	WAHER SOLUBLE ASH %	ACID INSOLUBLE ASH %	SULPHATED ASH %	LOSS ON DRYING %	WATER SOLUBLE EXTRACTIVE %	ALCOHOL SOLUBLE EXTRACTIVE %	CRUDE FIBRE CONTENT %
1.	22.50	9.00	6.00	20.00	2.50	5.00	16.70	50.00
2.	22.15	8.70	5.600	20.40	2.40	4.70	16.20	49.70
3.	21.94	9.20	6.10	20.10	2.50	4.90	16.50	48.50
4.	21.98	9.40	5.40	19.70	2.40	5.10	17.10	49.20
5.	22.2	8.80	6.40	19.90	2.50	5.20	16.60	48.70
Minimum	22.15	8.70	5.40	19.70	2.44	4.78	16.24	48.54
Average	22.11	8.96	5.90	20.02	2.49	5.02	16.64	49.27
Maximum	22.5	9.20	6.40	20.40	2.52	5.24	16.72	50.00

TABLE NO .5
PRELIMINARY PHYTOCHEMICAL SCREENING OF THE LEAF POWDER AND VARIOUS EXTRACTS OF *Coldenia procumbens* Linn

CONSTITUENTS	PET. ETHER	BENZENE	CHLOROFORM	ACETONE	ALCOHOL	AQUEOUS	LEAF POWDER
Alkaloids	-	-	-	-	-	-	-
Carbohydrates& Glycosides	-	-	-	+	+	+	+
Phytosterol	+	+	+	-	-	-	+
Phenolic compounds & Tannins	-	-	-	-	-	-	-
Proteins & Amino Acids	-	-	-	+	+	+	+
Saponins	-	-	-	-	-	-	-
Gums & Mucilages	-	-	-	-	+	+	+
Fixed Oils & Fats	+	+	-	-	-	-	-
Flavonoids	-	-	-	+	+	+	+
Lignins	-	-	-	-	-	-	+

TABLE NO .6
FLUORESCENCE ANALYSIS OF LEAF EXTRACTS

EXTRACTS	DAY LIGHT	UV LIGHT
Petroleum ether	Yellowish brown	Yellowish brown
Benzene	Dark green	Dark green
Cholorform	Pale green	Dark green
Acetone	Yellow	Yellowish green
Alcohol	Yellowish brown	Yellowish green
Aqueous	Reddish brown	Brown

TABLE NO .7
FLUORESCENCE ANALYSIS OF LEAF POWDER

CONTENT	DAY LIGHT	UV LIGHT
Leaf powder as such	Pale green	Green
Leaf Powder + 1 N NaoH (aq)	Brown	Greenish brown
Leaf Powder + 1 N NaoH (al)	Green	Green
Leaf Powder + 1N Hcl	Pale grey	Dark green
Leaf Powder + 50% H2So4	Grey	Grey
Leaf Powder + 50% HNo3	Pale Yellow	Pale green
Leaf Powder + Methanol	Green	Dark green