HISTO – PHARMACOGNOSTIC EVALUATION AND CULTIVATION OF *CINERARIA MARITIMA* LINN. - A VERY GOOD REMEDY FOR CATARACT

RAJAT RASHMI, KAVITA TYAGI* AND SANDHYA SHARMA*

Homoeopathic Pharmacopoeia Laboratory, Department of AYUSH, Ministry of Health and Family Welfare, Govt. of India, Kamla Nehru Nagar, Ghaziabad. (U.P.) India E-mail : rajatrashmi@sify.com

**Department of Botany, M.M.H. (P.G. & Research Studies) College, Ghaziabad. (U.P.)*

Cineraria maritima Linn. (Dusty miller) is an important medicinal plant in homoeopathy, used in incipient corneal opacity and cataract. It is a perennial plant, found in Mediterranean region & contains many alkaloids of pyrolegidiene group. Pharmacognostic studies revealed presence of alkaloids, lignin, carbohydrate but flavons, turpine, tannin, resin, saponin, steroids were absent. TLC & Spectroscopy was also done. The species could be successfully propagated by stem cutting.

Key words : *Cineraria maritima,* cataract, Histo-pharmacognosy.

Cineraria maritima Linn. (Syn. Senecio cineraria D.C.), commonly known as dusty miller (Asteraceae) is an important medicinal plant in Homeopathy. The species native of Mediterranean region but also being cultivated in India. It is an old fashioned garden plant in Europe and at the present time it is much used in American gardens for ribbon beds and margins (fig-I). The sterilized juice of fresh whole plant excluding roots collected just before opening of flower buds, is used for treatment of capsular and lenticular cataract of eye and is recomended before resorting to operation. (Uphof, 1968; Grieve, 1971). It has reputation to cure cataract and corneal opacity caused by metabolic disorder like diabetes, gouty conditions and old age, used externally by putting in to the eye one drop 4-5 times a day, which could be continued for several months. (Boerick, 1927; Blackwood, 1959). The present work has been undertaken to study the pharmacognostic characters of this important plant and possibility of its mass multiplication.

MATERIAL AND METHOD

The material was procured from medicinal plant survey and collection unit C.C.R.H., Ootacamund and from "Herb garden", Homeopathic pharmacopoeia lab, Ghaziabad, studied morphologically & fixed in FAA for microscopical studies. After conventional methods of dehydration, the material was embedded in paraffin wax (Johansen, 1940), serial microtome sections were cut at 10-12 m thickness and Safranine & Aniline blue combination was used in making DPX mounts. Anatomical studies were conducted following Metecalfe (1947),and Jackson & Snowdon (1968) was followed for powder studies. For chemical analysis Johensen (1940), Youngken (1951), Cromwell (1955) and Trease & Evans (1972) were followed.

OBSERVATIONS

1. Macromorphological A perennial rhizomatous bushy suffruticose herb with weak untidy ramifications, up to 75 cm high and branching from the base white throughout. Leaves alternate, white, woolly, pinnatifid, with oblong and obtuse unequal segments. Capitulum yellow, daisy like radiate 0.6 to 1.25 cm high disposed in small compact cymes. Each capitulum has 9 –12 ray florets at the periphery and the disc florets in the centre with stigma. Fruit a glabrous achene with 5-6 longitudinal walls.

2. Microscopial

(a) Leaf:- Transection shows single layered epidermis covered with thick cuticle and unicellular trichomes, having 1-2 celled uniseriate pedestal and long whip like terminal cell forming web like covering on the epidermis; stomata anomocytic, only

on lower surface. Mesophyll differentiated into 3 layers of palisade and 3-5 layers of chlorenchymatous spongy parenchyma; midrib more protuberated; lower epidermis followed by 2-3 layer of chlorenchymatous cells; vascular bundle conjoint, collateral, encapped by sclerenchymatous sheath, xylem towards adaxial side & phloem towards abaxial side; ground tissue compact parenchymatous; secretory canal present on abaxial side of the bundle. (fig.3)

(b) Petiole:-shows three ridges with two leaf like projections on adaxial side. Epidermis single layer of radially elongated cells having thick cuticle & unicellular trichomes of same type as described in leaf; epidermis followed by 2-4 layers of chlorenchyma at furrows & leafy projections and 5-6 layered collenchyma at ridges; vascular bundle found arranged in arc in parenchymatous ground tissue, xylem towards adaxial side & phloem towards abaxial side; secretory duct present on abaxial side of each vascular bundle. Ground tissue parenchymatous containing stone cells (fig.4)

3. Preliminary colour Reaction test:- The colour reaction suggested presence of alkaloids, carbohydrates, lignin, suberin, and absence of flavones, steroids, saponine, glycosides steroids, oil etc. (Table-1)

Table1:- Preliminary colour Reaction test:-

S. No.	Reagent	Test Performed	Result
1.	Dragendorff's reagent	Alkaloids	+ve
2.	Phloroglucinol + Hcl	Lignin	+ve
3.	$Fecl_3$	Tannin	-ve
4.	Molish test	Carbohydrates	+ve
5.	Heating with strong KOH+H_2So_4	Suberin	+ve
6.	Molisch test after hydrolysis	Glycosides	-ve
7.	Alc ext.+ Acetic anhydride +H_2So_4	Saponin	-ve
8.	Mg powder +Conc. HCl	Flavones	-ve
9.	Libermann+Conc. Hcl	Steroids	-ve
10.	Sudan IV	Oils	-ve

4. TLC:- Spots of chloroform extract were allowed to run in chloroform: methanol (92:8) for a suitable distance & on air drying were sprayed with Dragendorff's reagent. The four spots with the Rf values are shown in Table-2

Table 2

	Colour of spots	Rf values
1.	Orange	0.98
2.	Orange	0.55
3.	Orange	0.19
4.	Orange	0.10

Spots of chloroform extract was spotted on another plate and allowed to run for suitable distance into the system methanol : ammonia (100:1.5) and on air drying were sprayed with Draggendorff's reagent the following two spots were visible (Table-3)

Table 3

	Colour of spots	Rf values
1.	Orange	0.98
2.	Orange	0.93

5. U.V. Spectroscopy:- The diluted (1:99 menstrum) *Cineraria maritima* Linn. were run for a study at 360-200 nm. The graph showed one peak at 262 nm.

(a) Physical Evaluation:- Various flourescence behaviour are depected in Table-4.

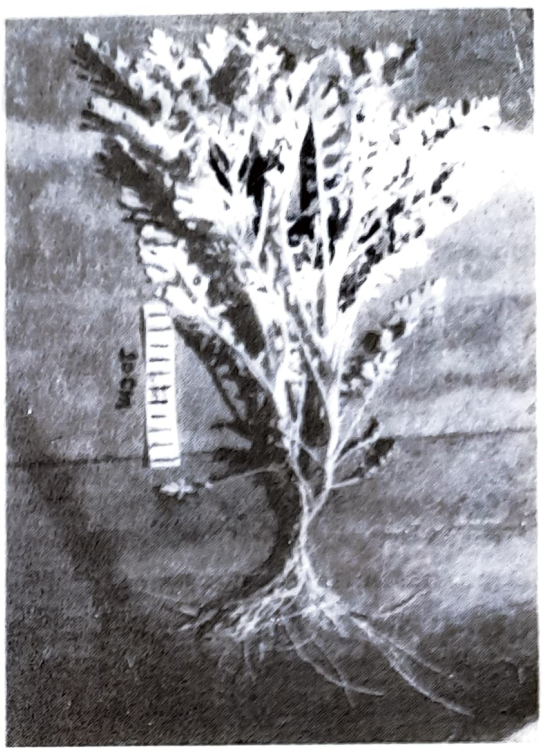
Table-4

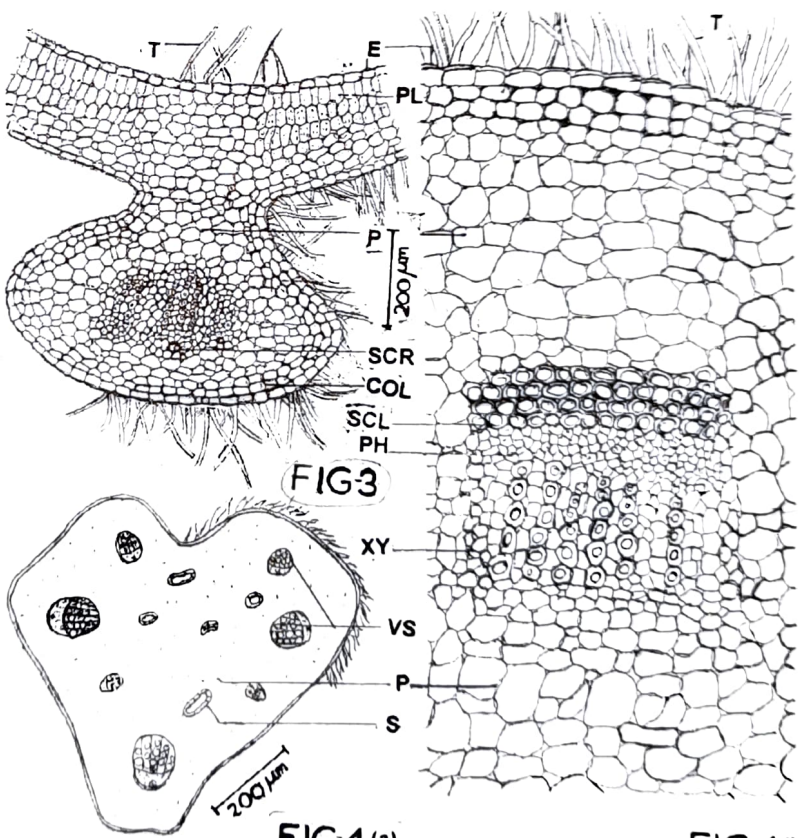
S. No.	Material taken	Colour in day light	Colour in fluorescence light
1.	Powder as such	light green	bluish green
2.	Powder rubbed in filter paper	leaf geen	dark green
3.	Aqueous extract of powder	pale green	sea green
4.	Alcoholic extract of powder	yellowish green	golden green

(b) Total solids – 0.2010 –0.2080%
(c) specific gravity – 0.9982 – 0.9985
(d) pH (at 25^0C) – 5.6 to 5.8

CULTIVATION

Cineraria maritima L. grows on weed free





Explanation of Figs. 1-4

Fig. 1 *Cineraria maritima* Linn
Fig. 2 Plant grown by the stem cutting
Fig. 3 T.S. of Leaf through midrib
Fig. 4 (a) T.S. of Petiole (Diagrammatic)
Fig. 4 (b) T.S. of Petiole (Cellular)

Abbreviation:-

COL-Collenchyma, E-Epidermis, PL-Palisade layer, P-Parenchyma, PH-Phloem, SCL – Sclerenchyma, SCR– Secretory canal S-Stone cell, T – Trichomes , VS – Vascular bundle, XY- Xylem.

nutritious soil by seeds & stem cuttings. Owing to the small seeds, it requires very careful soil preparation and deep ploughing. Seeds should be sown in the second and third week of November. The seedlings are first raised in nursery and then planted in the fields. The percentage of germination is very low, its varying from 10% to 40%.

The experiment was conducted at experimental herb garden, HPL Ghaziabad. Stem cutting of 10-30 cm. specially the apical portion of the primary & secondary branches of mature plant were taken and planted in good garden soil, having well decomposed farm yard manure in late November and early December. Chemical treatment was not given to stem cuttings, hence fertilizers and pesticides were also avoid. The establishment percentage of successful cuttings is 86. Rooting responses were recorded after 20-30 days. The cutting established successfully in garden soil, need the temperature range of 12^0C-25^0C or lower. No difference was observed in the total length, internodal length and branches of the cutting after the period of growth. The number of branches or vegetative shoots per cutting varies between 8-13, length of internodal region is 1.4 to 2.0 cm, number of nodes also varies from 23-32. However the length of apical shoot and length of leaf are almost equal in size in every case; 30-38 roots came out from under ground nodal region and cut end, and maximum length varied between 19 to 26 cm. Chemical or enzymatic treatment was not given for initiation of root & shoot. Without any fertilizer & pesticides, plant established successfully in garden soil (fig.2). Our observation clearly emphasizes that this species can be easily multiplied by stem cutting during winter season in plains.

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