

Preliminary pharmacognostic evaluations and phytochemical studies on root of *Vernonia cinerea* Less.

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ABSTRACT

Vernonia cinerea Less. belongs to family Asteraceae and is widely distributed in India. It grows up to 12-75cms in height with cylindrical stem, bears pinkish violet colored flowers. The plant consists of tap root which is used as a folklore medicine in many countries as Antimicrobial, Antidiarrhoeal and Antileprotic. Even though the root of plant has gained scientific importance recently, there is a need for Pharmacognostic standardization. Hence, the present work the root part of the plant was subjected to microscopical and physical evaluation. In the microscopical studies, the different cell structures and powder characters were studied. In the Physical evaluation the Ash value, Extractive value, Loss on drying and reaction of powder with chemical reagents were studied. The various Pharmacognostical constants obtained could help in the development of a suitable monograph for the plant.

Key words: *Vernonia cinerea* Less, pharmacognostic, phytochemical, powder analysis.

INTRODUCTION

Vernonia cinerea Less. known as purple fleabane in English, Sahadevi in Sanskrit, Garita kammi in Telugu and Sahadevi or Sadodi in local language. The plant is distributed throughout India as a weed on road sides and open places. The plant is branched herb, erect or decumbent growing up to 12-75 cms height, with cylindrical, glabrous, slightly branched stem of 10-17 cms long, 1-8 mm thick. The leaves are simple, alternate, lanceolate, 2.5 cms long and 1.8-3.6 cms broad. The flowers are pinkish violet, in small heads. Fruits are oblong achenes slightly narrowed at the base, clothed with appressed white hairs. Roots are 5-12 cms long, 1-7mm thick, oblique and gradually tapering, bearing few root lets, external surface dirty brown, fracture short. The roots are useful in Diarrhoea, Abdominal pain, Cough, Renal and Vesical calculi. Roots are said to be beneficial in vitiated conditions of Vata, Leucoderma, Inflammation and Intermittent fever.

Literature survey on *Vernonia cinerea* Less. suggest various therapeutic use of plant reported such as anti-inflammatory (E.O.Iwalwa *et.al.*, 2003), anti-pyretic (Malaya Gupta *et.al.*, 2003), Hypoglycemic activity (G.Y.Sy *et.al.*, 2005), fungistatic activity (G.N. Krishna *et. al.*, 2003) and Antidiuretic activity (J.O. Adeboye *et. al.*, 1997)

MATERIAL AND METHODS

The roots of *Vernonia cinerea* Less. collected in the month of November from agricultural land in Chillargi, Bidar, Karnataka, India. The plant was authenticated by Prof. B.S.Sajjan, Head, Dept of Botany B.V.B.College, Bidar, Karnataka. A T S of boiled root in Chloral Hydrate was prepared and mounted on glass slide for identification of cellular structures. Powder of dried root was used for the observation of the powder microscopic characters, Ash value, Extractive values, Phytochemical constituents.

RESULTS AND DISCUSSION

Transverse section of root (Fig. 1)

Mature root shows 4-5 layered cork, consisting of tabular, tangentially elongated, thick walled cells filled with reddish brown contents; secondary cortex consists of white zone of thin walled parenchymatous cells having a few resin ducts, secondary phloem, a narrow zone composed of sieve elements and phloem parenchyma, transversed by phloem rays, xylem well developed, composed of vessels, tracheids, fibers and xylem parenchyma, transverse by 1-5 seriate xylem rays.

Powder microscopy of root: (Fig. 2)

1. 4-5 layers of cork cells seen in surface view
2. Xylem vessels are solitary or 2-4 in groups with reticulate thickening
3. Fibers are aseptate and pointed
4. Wood elements are well developed wide vessels with reticulate thickenings

Behavior of powder with reagents

Behavior of root powder with different reagents was studied to detect the presence of phyto constituents with colour changes under day light by reported method (Mukharjee, 2002). The results are shown in Table 1.

Table 1: Behavior of root powder of *V. cinerea* with reagents

S.No.	Reagents	Colour/ Precipitate	Constituents
1	Powder+ Picric acid	No precipitation	Alkaloid absent
2	Powder+ Conc H ₂ SO ₄	No Change	Steroids absent
3	Powder+ Aq.FeCl ₃	Yellowish green	Tannins present
4	Powder + Iodine sol	No colour change	Starch absent
5	Powder + aq. NaOH	Yellow	Flavonoides present
6	Powder+ Mg-Hcl	Magneta	Flavonoides present
7	Powder + Aq KoH	No Change	Anthraquinone glycosides absent
8	Powder + Dil NH ₃	No Change	Anthraquinone glycosides absent
9	Powder + Picric acid	No colour change	Cardiac glycoside absent
10	Powder + Conc HNO ₃	No yellow Ppt	Protein absent
11	Powder + Trichlor acetic acid	No ppt	Protein absent
12	Powder + Molisch reagent+ H ₂ SO ₄	No Change	Carbohydrate absent
13	Powder + Aq.Lead acetate	White ppt	Tannins Present
14	Powder + NaHCO ₃	No effervescence	Acidic compound

Table 2: Physico-chemical constants of *V. cinerea* root

S.No	Parameters	Value(% w/w)
1	Loss on drying	03.83
2	Total ash	04.66
3	Acid insoluble ash	00.66
4	Water soluble ash	02.50
5	Water soluble extractive	06.33
6	Alcohol soluble extractive	03.00

Physico-chemical parameters

The various physico-chemical parameters like Total ash, Acid insoluble ash, Watersoluble ash, Extractive values and loss on drying values of the root powder were done as per IP 2007 and results are tabulated in Table 2.

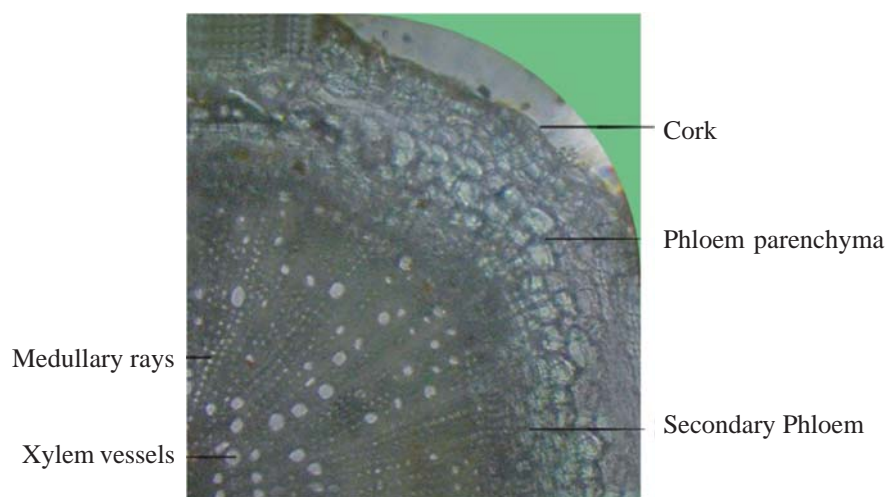
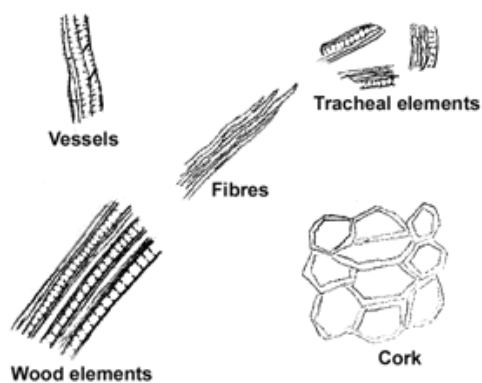
Preliminary Phytochemical screening

Preliminary Phytochemical screening was carried out by using standard procedure described by Kokate(1986) and Harborne (1998) and results are given in Table 3.

Table 3: Preliminary phytochemical screening of *V. cinerea* root.

S. No	Phytochemical Constituents	Petroleum Ether Extract	Chloroform Extract	Absolute Ethanolic Extract	70% Ethanolic Extract	Aqueous Extract
1	Alkaloids	-	-	-	-	-
2	Carbohydrates	-	-	-	-	-
3	Glycosides	-	-	-	-	-
4	Steroids	+	-	-	-	-
5	Saponins	-	-	-	-	-
6	Flavonoides	-	-	+	+	+
7	Tannins	-	-	-	+	+
8	Triterpenoids	-	-	-	-	-
9	Protein & Amino Acids	-	-	-	-	-
10	Fixed oil & Fats	-	-	-	-	-
11	Mucilage	-	-	-	-	-

+ = Present, - = Absent

**Fig. 1: T. S. of root of *Vernonia cinerea* Less.****Fig. 2: Powder characters of *V. cinerea* root**

CONCLUSION

As there is no pharmacognostical work on record of this traditionally much valued drug, the present work was taken up with a view to lay down standard, which could be useful to detect the authenticity of this medicinally used plant. Macro and microscopical and proximate analysis standards discussed here can be considered as identifying parameters to authenticate the drug.

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