



Primary studies on Morphology, anatomy and phytochemistry of “*Blepharis repens* (Vahl) Roth”

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Abstract: *B.repens*(Vahl)Roth belongs to family *Acanthaceae* commonly called as Hadsan in Marathwada region. The whole plant is used against persistent fever, wounds, nasal haemorrhage, aphrodisiac, expectorant and in joining broken bones by local peoples from Parbhani district.

The current paper deals with morphological, anatomical and phytochemical studies of *B.repens*(Vahl)Roth, which may help in correct identification of this plant.

Key words: *B.repens*(Vahl)Roth, Morphology, anatomy, phytochemistry.

I. INTRODUCTION

B.repens(Vahl)Roth is a traditional medicinal herb of *Acanthaceae* is popularly known as hadsan in Marathi. It is commonly used in treatment of bone fractures, fevers, aphrodisiac and expectorant (Naik.V.N.1998) in traditional medicine system. The plant found on open grasslands and rocky soil collected from different regions of Parbhani district and brought to laboratory for correct identification with different floras (Cook T 1958, V.N .Naik 1998) and the fresh plant material is made in to herbarium and deposited as voucher specimen in department of Botany Shri Shivaji College Parbhani for ready reference.

Some of the fresh material is used for anatomical studies, vessel analysis of root and stem (Table-1) and phytochemical analysis includes histochemical tests (Table-2) and estimation of carbohydrates, lipids and amino acids determination (Table-3). Shade dried plant material of root, stem and leaves are used for ash analysis (Table-4) and determination of extractive percentages (Table-5).

Morphological investigations shows that it is a prostrate herb with wirey stem. Leaves in whorls of four, fleshy, obovate, oblong with size 7-20mm, 3x6mm, the leaflet is narrow at base, entire, hispid. The flowers are blue, bracteolate, sessile, solitary-axillary, fruit-capsule.

Chemical composition:- *B.repens* (Vahl)Roth contains olenaic acid, Beta sitosterol, lupeol, quercetin, acanthifolin, saponins from roots and leaves (Rastogi and Mehrotra 1994).

Medicinal uses:- The entire plant is dried and powdered, taken during winter for joint pain. The fresh leaves are given in chronic fever, expectorant, nasal haemorrhage, liver and spleen disorders (Naik.V.N.1998)

II. MATERIAL AND METHODS:-

For Macroscopic and Microscopic studies fresh as well as dried powdered material is used for phytochemical analysis.

Microscopic (anatomical) study is carried out by taking free hand sections of fresh root, stem and leaf by double staining method.

Fresh leaves were used to study type of Stomata and Stomatal index.

For vessel analysis of root and stem, maceration technique is used and vessels were classified according to Radford et al classification (1974) into class A, B and C (Table 1)

Histochemical and phytochemical studies were carried out as per methods suggested by Jayaraman (1981) and Krishnamoorthy et al (1989) (Table 2&3)

The ash analysis was carried out by taking 10gm dried plant parts powder in a crucible over burner and then the charred material was heated in muffle furnace for 6hrs at 600°C and total ash value, acid soluble, water soluble ash value was found out with reference to dried plant powder and results were tabulated (Table-4).

The extractive percentage of water soluble, alcohol soluble and ether soluble extractive is determined and the results were tabulated (Table-5).

III. RESULTS AND DISCUSSION :-

Macroscopic studies reveals that it is a prostrate herb with wirey, sub-quadrangular stem and tap root. The leaves are fleshy, subsessile, in whorls of four, hispid. Flowers are blue, sessile, bracteate. Seeds sessile, hygroscopic, hairy (fig1).

For microscopic study transverse sections of root, stem and leaves were studied.

Anatomy of Root -T.S. of Root is circular in outline. Epidermis is single layered covered with cuticle, followed by 5-6 layers of cork cells followed by outer collenchyma and inner parenchymatous layer. Stele consists of Secondary xylem and phloem. Secondary xylem is traversed by 1-3 celled rays. Parenchymatous pith is present in centre (fig 2).

Anatomy of Stem -T.S of Stem is slightly quadrangular in outline .single layered epidermis with papillated cells, externally covered by uniseriate multicellular ,nonglandular trichomes. Outer cortex is collechymatous with isolated patches of fibrous cells, inner cortex is parenchymatous.The secondary tissue is found as a continous ring of phloem and xylem (fig. 3).

Anatomy of Leaf – The leaf is isobilateral. T.S.of leaf shows preseence of single layered epidermis on both sides of leaves, externally covered by thick cuticle and uniseriate multicellular hairs. Mesophyll consists of single layered palisade on both surfaces, followed by spongy parenchyma. Arc shaped, close, collateral vascular bundles are present in centre, bounded by parenchymatous bundle sheath (fig.4) . **Stomatas and Trichomes** – The leaf is amphistomic with diacytic stomatas. The stomatal index is 32 (fig 5). Trichomes are multicellular uniserriate with average length 80mm.(fig 6). (Sayed et al 2010)

Measurement of macerated Root and Stem tissues shows presence of fibers, trachieds and vessels (fig.7 & 8) of different classes as follows-

Table -1- Macerated Vessel elements in Root and Stem-

Root vessels	Class A-27%- Extermly short Avg. length 150-175 µm	Class B-36% - Very short Avg.length 187.5-250 µm	Class C-37%-Mod. short Avg.length 262.5-350 µm
Stem vessels	Class A-33.33% Extermly short Avg.length 87.5-175 µm	Class B-33.33% Very short Avg.length 187.5-250 µm	Class C-33.34% Mod.short Avg.length 262.5-350 µm

Histochemistry- Histochemical tests were carried out for starch, tannins, saponins, fats, proteins glucosides, saponins and alkaloids as per Johansen(1940) results were tabulated as follows-

Table 2- Histochemical tests-

Sr.no.	Test	Root	Stem	Leaf
1	Starch	+ve	+ve	+ve
2	Proteins	+ve	+ve	+ve
3	Tannins	-ve	+ve	+ve
4	Fats	+ve	+ve	+ve
5	Glucosides	-ve	-ve	-ve
6	Saponins	+ve	+ve	+ve
7	Alkaloids	+ve	+ve	+ve

From table 2 it is conclude that except glucosides all the above sec. metabolities are present in root ,stem and leaf, tannins are absent in root.

Phytochemistry- Phytochemical tests were carried out for carbohydrates,lipids and aminoacids . Results are tabulated follows-

Table 3- Phytochemical test

Sr.no.	Test	Root	Stem	Leaf
1	Carbohydrate	1.7%	2.4%	1.3%
2	Lipids	1.6%	1.3%	1.7%
3	Aminoacids	0.06%	0.04%	0.02%

Phytochemical analysis shown that percentage of carbohydrates is higher in stem than root and leaf, lipids were higher in leaf than root and stem, aminoacids were higher in root than stem and leaf.

Table 4- Determiration of ash values (mg/gm of dry weight)

Sr no.	% of	Root	Stem	Leaf
1	Total ash	10.14	10.40	11.60
2	Water soluble	3.5	3.9	5.88
3	Acid insoluble(HCl)	2.0	4.38	5.23

The percentage of total ash, water soluble ash and acid insoluble ash content is higher in leaves as compare to stem and root.

Table 5-Determination of Extractive percentage (Solvent mg/gm dry weight)

Plant part	Water soluble extractives %	Alcohol soluble extractives %	Ether soluble extractives %
Root	50.42	27.00	19.88
Stem	66.00	32.00	24.89
Leaf	68.75	42.00	24.00

From table 5 the water soluble and alcohol soluble extractive percentage is higher in leaves than stem and root, the ether soluble extractives is higher in stem than leaves and root.

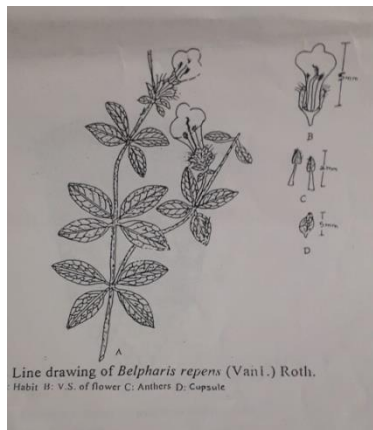


Fig. 1

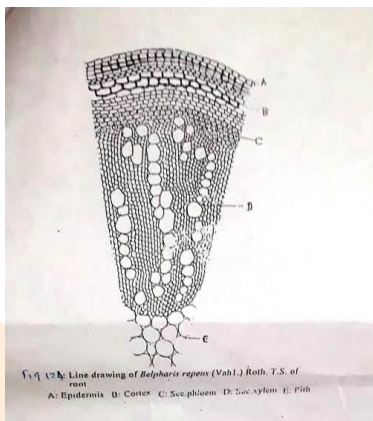


Fig. 2

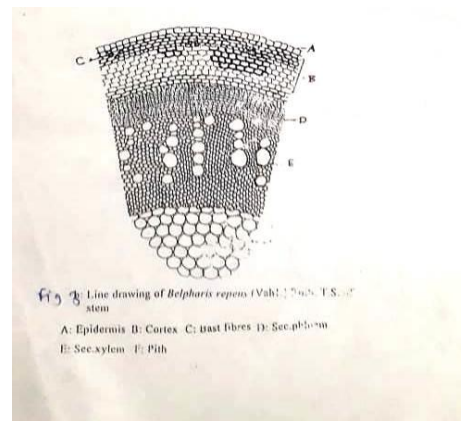


Fig. 3

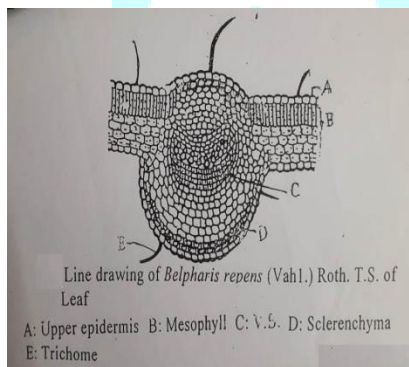


Fig. 4

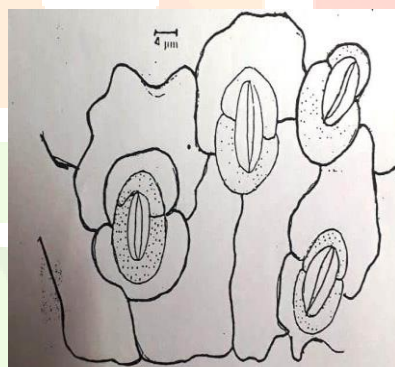


Fig. 5

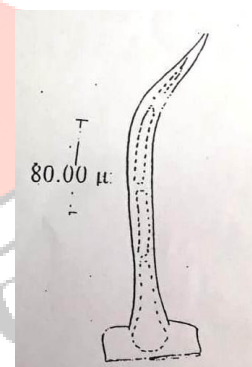


Fig. 6

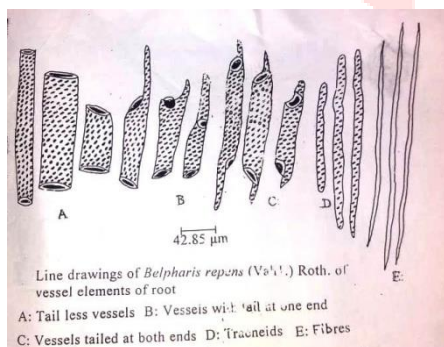


Fig. 7

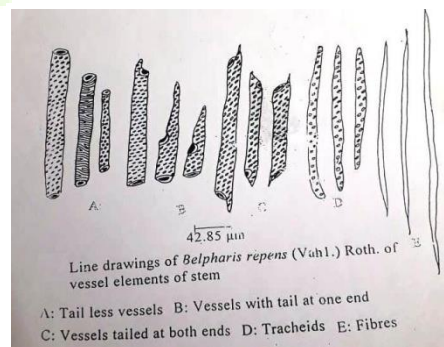


Fig. 8

I. REFERENCES-

- 1- Cook T (1958)-Flora of Presidency of Bombay Vol.I-III BSI Culcutta(Reprint Ed).
- 2- Jayraman J (1981)-Laboratory Manual in Biochemistry.Wiley Eastern ltd.NewDelhi.
- 3- Johansen D.A (1949) -Plant Microtechnique Tata McGraw Hill New York .
- 4- Naik V.N.(1998)- Flora of Marathwada Vol.II. Amrut Prakashan Aurangabad
- 5- Naik. V.N.(1998)- Marathwadyatil samanya vanaushadhi , Amrut Prakashan Aurangabad.
- 6- Radford E A,CW William,R Massey,J Bell and C Ritcha,1974. Vascular Plant Systema cs. Harper and Raw Publisher New York.
- 7- Rastogi and Mehrotra Vol.IV(1994)-Compendium of Indian Medicinal Plants,Central Drug Research Lukhnow and publication and information Directorate,NewDelhi.
- 8- S.V.Sayed and B.R. Zate- 2010 “Pharmacognosic study of *Blepharis repens (Valh) Roth*” Proceedings of 33rd Conference of I.B.S. and International Symposium on The NewHorizons of Botany. 2010; Nov 10th -12th page no. 137

