
MORPHOLOGICAL ANATOMICAL AND PHYTOCHEMICAL STUDY OF SANSEVIERIA ROXBURGHIANA L.

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ABSTRACT

It is wild as well as cultivated species occurring in Maharashtra region. This plant has been used in the indigenous system of medicine for a long time. Root is used as an electuary in consumptive complaints and chronic cough of long standing. Juices of tender shoots are given to children to clear viscid phlegm in throat (Maheshwary, 2000). Rhizome is used in purgative, febrile, gonorrhoea, heart-disease, itch, leprosy, fever, cough, piles, asthma, tuberculosis and dysuria (Saraswathy, 2007). Juice of tender shoots given to children for cleaning the phlegm from the throat (Ambasta *et. Al.* 1986).

In Maharashtra region of India *Sansevieria roxburghiana* L. belonging to the family Agavaceae are locally known as 'Ghannasaphan, Nagphan, Mundari, Morwa, Murgali. These local names derived from some local importance. The description of plant species is short imperfect or unscientifically documented. Present study reveals for morphology, anatomy and phytochemical study of the plants for the correct identification, authenticity and genuineness of drugs. The details are present in paper.

Sansevieria roxburghiana L. Family - Agavaceae

Schult. and Schult. F. in R. and S. Syst. Veg. 7: 357, F. 12, D-E. 1829; Laxshmi, in Sharma *et. al.* Fl. Maharashtra st. Monocot 142. 1996. *S. zeylanica* Roxb. Pl. corom. T. 184. 1804, non willd. 1799; Hook. F. op cit. 270; Cooke, Fl. Pres. Bombay, 3: 252. 1958, (Repr.)

Vernacular names: - **Sanskrit:** *Marura, Maruva, Sinhalese, Niyanda.* **Tamil:** *Marul,* **Telugu:** *Chaga, Chamacada, Saga.* **Bengal:** *Gorachakra, Murba, Murga, Murgabi* **English:** *Bowstring Hemp,* **Hindi:** *Marul, Murva,* **Marathi:** *Ghannasaphan, Nagphan, Mundari, Morwa, Murgali..*

Description: Scapigerous, perennial herbs, Leaves linear-oblong, 30 - 45 × 3 - 4 cm, erect, slightly narrowed at base, entire, acute, convex on lower (outer) surface, shallowly channeled on the inner surface, green with irregularly wavy, grayish cross bars, with yellow margins; tip ending in a solid, 2 cm long cusp. Flowers dull brownish white, 2 - 3 cm long, clustered along the stout scapes perianth segments linear-oblong, united for 1/3 at their base. Ovary oblong 2 mm long, fruits not seen.

Flowers: - May to September. **Distribution:** - Native probably of S. Africa, grown in gardens. **Locality:** - Jalna, Aurangabad, Parbhani, Beed.

Medicinal Properties:

Fibers development from leaf (Arthur *et. al.*, 1947). *Sansevieria* uses bowstring hemp obtained from leaf (Albert, 1951). The leaf fibers used cordage, bowstring hemp, (Katherine Esau, 1959). In *sansevieria*, *Agave* and *Musa* the average length of the extraxylary fibers

depend on the length of the part of the leaf from which fibers are obtained (Meeuse, 1938) (Katherine Esau, 1965). Stem of *Sansevieria*, Secondary growth from a restricted meristem occur in herbaceous and woody Liliiflorae (*Alove*, *Sansevieria*, *Yucca*, *Agave*, *Dracaena*) and other group of monocotyledons (Cheadle, 1937- Katherine Esau, 1965)

Sansevieria uses as bowstring hemp (Elizabeth Cutter, 1970). Used as cordage, bowstring hemp (Katherine Esau, 1974). Yield of fiber used for bowstrings cordage, matting, and fine cloth Rhizomes mucilaginous used in the form of an electuary for cough, Juice of tender shoots given to children for cleaning the phlegm from the throat (Ambasta *et. al.*, 1986). On experiment, these plants produced most beautiful fibers, as soft and as fine human hairs, but possessing, not withstanding, extraordinary strength and tenacity. He derived great quality of flax from this plant. Root is used as an electuary in consumptive complaints and chronic cough of long standing. Juices of tender shoots are given to children to clear viscid phlegum in throat (Maheshwary, 2000). Brushes and ropes from sisal (*Agave sisalana*), *sansevieria* and sun hemp some vegetable fibers are obtained from the mesophyll of some leaves, for example *sansevieria*, *Sisal*, *furcraea*, (Maiti and Singh, 2006).

Leaf sheath contain (Meeusic acid, alpha- pinene, gamma terpinene, alphaterpene, terpinolene, p - cymene, linalool, alpha - terpenol and cissabinene hydrate), (Maiti *et. al.*, 2006). The plants of general *sansevieria* produced fiber for the utilization of cordage growing principally in the tropical and sub - tropical countries of Africa and Asia, finding more than 50 species. Leaves produced fibers being white, strong and elastic using for the fabrication of carpets, cordage, (Maiti and Singh, 2006). Fleshy creeping root is in a slight degree, warm to the taste, and of not unpleasant odour. It is prescribed in the form of an electuary, in consumptive complaints and coughs of long standing to a quantity of small tea spoonful twice daily. Rhizome is used in purgative, febrige, gonorrhoea, heart-disease, itch, leprosy, fever, cough, piles, asthma, tuberculosis and dysuria (Saraswathy, 2007).

Anatomy:

Transverse section of *S. roxburghiana* root reveals the epiblema is outermost layer which is composed of single layer of hexagonal compactly arranged cells. Cortex composed of 12 - 14 layers, cells of which are circular, oval and single walled, it measured 20 - 40 μ . Endodermis is single layered and composed by radially elongated parenchymatous cells which measures 20 -30 x 30 - 35 μ . Pericycle is single layered and shows continuous prominent ring. Cells measures 10 - 15 x 20 - 25 μ . Phloem composed of 3 - 5 layers having rectangular cells. It measured 10 - 15 x 20 - 25 μ . Phloem is followed by large circular strands of xylem; vessels are circular, oval in outline, single or in groups of two, it measures from 35 - 50 μ . Ray parenchyma is uniseriate, cells are radially elongate, ovate, rectangular, fibers places and axil parenchyma occupies the rest of the space. It resembles small pith (Plate -6.10).

Transverse section of *S. roxburghiana* leaf shows the epidermis of both surfaces is single layered and covered by cuticle. The upper epidermis is composed by squarish to rectangular cells which measures 5 - 7 x 10 - 15 μ and lower epidermis also composed by squarish to rectangular cells which measures 5 - 10 x 10 - 15 μ . Trichomes are absent on both surfaces. The stomata are tetracytic, amphistomatic with stoma measure 51.15 X 18.15 μ of adaxial surface and 49.50 X 19.80 μ of abaxial surface.

The mesophyll tissue is not differentiated into palisade and spongy tissue. Only spongy tissue is present and whole lamina formed of thin walled regularly arranged parenchymatous cells. Vascular strands are scattered at certain distances in the center of

lamina which are covered by single layered bundle sheath. The vascular bundles are conjoint and collateral (Plate – 6.19).

Phytochemical study:**I) Physical parameter:**

- 1) Colour: *Sansevieria roxburghiana* root colour is brown, leaf color is yellowish green.
- 2) Odour: *S. roxburghiana* root odourless, leaf – pungent. Taste: Root- intensely bitter

II) Chemical Parameter:

- 1) Dry matter: Dry matter value for root is 51.93 % and leaf is 42.60%.
- 2) Bulk density: Bulk density of root is 0.377% and leaf is 0.344%
- 3) Total ash: Total ash of *S. roxburghiana* root is 05.80 % and leaf is 07.045%
- 4) Acid insoluble ash in root is 0.15% and leaf is 1.25%.
- 5) Acid soluble ash in root is 0.15%, and in leaf 06.20%.
- 6) Water soluble ash in root is 1.0% such as in leaf is 5.5%.
- 7) Water insoluble ash in root is 04.80 % and in leaf is 01.95%.
- 8) Nitrogen: 1.98% of nitrogen is in root and leaf is 2.54%.
- 9) Water soluble nitrogen present in root is 1.235% and in leaf is 2.750%.
- 10) Crude proteins in root is 14.06% and in leaf is 14.56 %
- 11) Reducing sugar present in root is 2.351% and in leaf is 3.323%
- 12) Total sugar present in root is 1.642% and in leaf is 2.367%
- 13) Non reducing sugar present in root is 0.792% and in leaf is 0.956%
- 14) Crude fat is in root is 06.76% and in leaf is 08.00%
- 15) Crude fiber is in 24.65% and in leaf is 27.55%.
- 16) Cellulose present in root is 13.20% and in leaf is 23.63%
- 17) Gross energy is in 3.52% and in leaf is 4.08%
- 18) Calcium present in root is 1.658% and in leaf is 1.563%
- 19) Phosphorus present in root is 0.24% and in leaf is 0.29%

Extractive values:

- I) Extractive value in water in root is 12.2% and in leaf is 14.5%
- II) Extractive value in Acetone in root is 2.0% and in leaf is 2.8%
- III) Extractive value in Butanol in root is 5.2% and in leaf is 5.2%
- IV) Extractive value in chloroform in root is 3.0% and in leaf is 4.0%
- V) Extractive value in Diethyl ether in root is 6.2% and in leaf is 1.2%
- VI) Extractive value in ethyl alcohol in root is 6.2% and in leaf is 8.5%
- VII) Extractive value in methanol in root is 11.1% and in leaf is 11.1%
- VIII) Extractive value in petroleum ether in root is 1.0 % and in leaf is 1.4%
- IX) Extractive value in root is 3.2% and in leaf is 3.4%

Table No. 1 Chemical parameter

Sr.No.	Chemical parameter	Root	Leaf
1	Dry matter	51.93 %	42.60%.
2	Bulk density	0.377%	0.344%

3	Total ash	05.80 %	07.045%
4	Acid insoluble ash	0.15%	1.25%.
5	Acid soluble ash	0.15%,	06.20%.
6	Water soluble ash	1.0%	5.5%.
7	Water insoluble ash	04.80 %	01.95%.
8	Nitrogen	1.98%	2.54%.
9	Water soluble nitrogen	1.235%	2.750%.
10	Crude proteins	14.06%	14.56 %
11	Reducing sugar	2.351%	3.323%
12	Total sugar	1.642%	2.367%
13	Non reducing sugar	0.792%	0.956%
14	Crude fat	06.76%	08.00%
15	Crude fiber	24.65%	27.55%.
16	Cellulose	13.20%	23.63%
17	Gross energy	3.52%	4.08%
18	Calcium	1.658%	1.563%
19	Phosphorus	0.24%	0.29%

Table No. 2 Extractive values:

Sr. No.	Extractive value	Root	Leaf
1	Extractive value in water	12.2%	14.5%
2	Extractive value in Acetone	2.0%	2.8%
3	Extractive value in Butanol	5.2%	5.2%
4	Extractive value in chloroform	3.0%	4.0%
5	Extractive value in Diethyl ether	6.2%	1.2%
6	Extractive value in ethyl alcohol	6.2%	8.5%
7	Extractive value in methanol	11.1%	11.1%
8	Extractive value in petroleum ether	1.0 %	1.4%
9	Extractive value in propanol ether	3.2%	3.4%

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