Rauvolfia serpentina (L.) Benth. ex Kurz

Synonyms: *Ophioxylon serpentium* L.
Ophioxylon album Gaertn.
Rauvolfia trifoliata (Gaertn.) Baill.

Family: Apocyanceae

Various names

Common/Trade names: Sarpagandha, Indian Snakeroot

Sanskrit names: Sarpasugandha, Sugandha, Vasupushpa, Vishamardani

Hindi names: Nakulikanda, Sarap-gandha, Candrabhaga

Popular names in the southern region

- *Andaman & Nicobar Islands*: Not recorded
- *Andhra Pradesh*: Dumparasna, Sarpagandhi
- *Karnataka:* Haavukannina gida, Shivanabhi, Sarpagandhi
- *Kerala*: Amalpori, Sarpagandhi
- *Lakshadweep*: Amalpori, Sarpagandhi
- *Puducherry*: Aarpagaanthi
- *Tamil Nadu*: Chivan melpodi, Sarpaganthi
- *Telangana*: Dumparasna, Sarpagandhi

Distribution

Rauvolfia serpentina is distributed in south and south east-asia. In India, it is distributed in the sub-Himalayan tracts from Himachal Pradesh to Arunachal Pradesh and in the hills of Western and Eastern Ghats as well as Eastern and Central India.

Description

Perennial shrubs with thick root stock. Stem reaches a height up to 40 cm. Leaves simple, 3-4 at each node, 7-10 × 3-4 cm, oblanceolate. Flowers white, 1.5 long, arranged in axillary and terminal, densely flowered cymes. Fruit is fleshy, often in pairs, 0.5 cm, ovoid, obtuse, black, fruiting calyx red, seed one, 2-3 mm in size.

Uses

Preparations made out of the plant are used as a sedative, and also for treating high blood pressure. The alkaloids stimulate the central nervous system. Root is also used as antihelminthic and an antidote to snake venom. A decoction made of the plant is given during labor pains to increase uterine contraction. Leaf juice is used for the cure of corneal opacity of eyes.

Agro-ecological requirements

It grows well in frost-free tropical to sub-tropical sites under irrigation. Clay-loam to silt-loam soils, rich in organic content are suitable for its commercial cultivation. Its common habitats receive an annual rain fall of 1500-3500 mm and the annual mean temperature is 10-38^{0}C.

Cultivation

Planting-stock production: The crop can be propagated by seed, stem cutting, and root cuttings. Seed propagation is the best method for raising commercial plantation.

Root cutting: Nearly 5 cm long root cutting is planted closely during spring season in nursery beds containing well-matured farm yard manure, sand, and saw-dust.

Stem cutting: Hardwood stem cuttings measuring 15 to 22 cm are closely planted during June in the nursery beds where continuous moisture is maintained.

Root stumps: About 5 cm of roots, intact with a portion of stem above the collar, are directly transplanted to the field under irrigation.

Seed: Seed germination in Rauvolfia is highly variable. It is reported to vary from 5 to 30%. Light and heavy seeds can easily be separated by simple water flotation. Light seeds are to be discarded. Germination of heavy seeds during May-June after soaking them in water for 24 hours was 20-40%. Freshly collected seeds reported germination up to 62.77 %. In all, 6 kg of seeds is required to raise one-hectare plantation.

The seeds are sown, 2-3 cm apart in rows in shallow furrows of nursery beds. The furrows are then covered with a fine mixture of soil and farm yard manure. Keep the beds just moist by light watering. Germination starts after 15-20 days and continues up to 30 to 40 days which were ready for transplantation.

Improved varieties: RS-1 (Jawaharlal Nehru Krishi Vishwa Vidyalaya, Indore); CIM Sheel (CIMAP, Lucknow); RI-1 (College of Agriculture, Indore).

Field planting: The seedlings are transplanted at 30 cm distance within the rows spaced at 45 cm. If rains are not received during or immediately after transplantation, irrigation is necessary for a better stand. *Rauvolfia* is a long duration (18 months) and slow growing crop.

Manuring/Fertilizer: Organic manures like farm yard manure, vermicompost, green manure etc. may be used to increase growth and yield of roots.

Irrigation: The plant, when grown in areas with a rainfall of 1500 mm or above well distributed

throughout the growing season such as in Assam and Kerala, can be raised as a rainfedcrop under subtropical conditions. It needs regular irrigation in areas with high temperature and low rainfall during the rainy season. It is suggested to give 15 to 16 irrigations, at 20 days interval in summer and at 30 days interval in winter.

Pests and Diseases: The species is susceptible to diseases such as leaf spot, mosaic, leaf blotch, leaf blight and bud rot. A very few pests have been recorded. The pyralid caterpillar causes appreciable damage to the leaves. To prevent diseases, bio-pesticides could be prepared (either single or a mixture) from Neem (kernel, seeds & leaves), Chitrakmool, Datura, Cow's urine etc.

Harvesting & Post-harvest processing

The crop produce maximum yield 18 months after planting. The harvesting period coincides with the shedding of leaves during the early autumn season next year. At this stage, the roots contain maximum concentration of total alkaloids. At harvest, the root may be found to go up to 40 cm deep in the soil. Harvesting is done by digging up the roots; thin roots are also collected. The roots are cleaned, washed and cut into 12 to 15 cm long pieces for convenience in drying and storage. The dry roots retain 8-10 per cent of moisture. The dried roots are stored in polythene lined gunny bags in cool dry place to protect it from the mould.

Yield

On an average, root yield around 500 kg per hectare of dry weight and 7.5 kg of seeds per hectare..

Economics of cultivation

Cost of cultivation: ₹ 75,000 per hectare

Market price: *Roots*- ₹ 875/kg (as on June 2019)

Quantitative qualitative standards (acceptable limits) (w/v)

- *Foreign matter*: Not more than 2.0 %
- *Ash*: Not more than 9.0 %
- *Acid-soluble ash*: Not more than 3.0 %
- *Ethanol-soluble extractive*: Not less than 4.5 %
- *Water-soluble extractive*: Not less than 9.0 %

Note: The farmers are advised to adopt suitable practices so as to meet the quality parameters and standards of the buyers.