



Aloe vera – the Miracle Plant

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Aloe vera has been widely used externally to treat various skin conditions such as cuts, burns and eczema. It has antiseptic and anti biotic properties which make it highly valuable in treating cuts and abrasions. About 23 polypeptides are present in aloe juice which are anti tumour agents and also helpful in controlling of immune system diseases and disorders. The plant produces about 6 antiseptic agents such as lipoic acid, salicylic acid, urea nitrogen, cinnamonic acid, phenols, and sulphur. These are considered antiseptic because they are used as pain killer to control mold, bacteria, fungus, viruses, etc.

Introduction

Aloe vera is an important and traditional medicinal plant belonging to the family liliaceae. It is indigenous to Africa and Mediterranean countries. It is a hardy perennial tropical plant that can be cultivated in draught prone areas. *Aloe vera* has been widely used externally to treat various skin conditions such as cuts, burns and eczema. It has antiseptic and anti biotic properties which make it highly valuable in treating cuts and abrasions. Aloe has been marketed as a remedy for coughs, wounds, ulcers, gastric, diabetes, cancer, headaches, arthritis, immune system deficiencies.

Medicinal Properties

The plant produces about 6 antiseptic agents such as lipoic acid, salicylic acid, urea nitrogen, cinnamonic acid, phenols and sulphur. These are considered antiseptic because they are used pain killer to control mold, bacteria, fungus, viruses, etc. Lipoic acid and salicylic acid present in the juice are two very effective pain killers. About 23 polypeptides are present in aloe juice which are anti tumour agents and also helpful in controlling of immune system diseases and disorders. It contain anti inflammatory fatty acids, cholesterol, campesterol, and β -sitosterol which are highly effective in treatment of burns, cuts, scrapes, abrasions, allergic reactions, rheumatoid arthritis, rheumatic fever, acid indigestion, ulcers and many inflammatory conditions of the digestive system and other internal organs, including the stomach and small intestine and colon liver, kidney and pancreas.

Cultivation Practices

1. Soil: It is grown successfully in marginal to submarginal soils having low fertility. The plants have tendency to tolerate high pH with high Na and K salts. It is observed that its growth was faster under medium fertile heavier soils such as black soil. But well drained

loam to coarse sandy loam soils with moderate fertility and pH up to 8.5 are preferred for its commercial cultivation.

2. Varieties: Several species of the genus are used under common name of Aloe, viz. *Aloe vera* Linn *A. barbadensis*, Miller, *A. Ferox*, Miller. *A chinensis* Baker, *A. indica* Royale, *Aloe perryi* Baker belong to the family liliaceae.
3. Land preparation: Aloe does not penetrate below 20 - 30 cm depending upon soil type and agro climatic conditions. In general, 1-2 ploughing is done followed by levelling. The field may be divided into plots (10-15 m x 3 m) considering the source of irrigation and slope.
4. Propagation: Propagation is by rootsuckers or rhizome cuttings. Root suckers can be planted without damaging the parent plant at the base and directly planted in the field.
5. Planting time: Suckers should be planted in July - August during monsoon season to get better field survival, average about 25000 suckers are required for 1 ha field. However, under irrigated condition, planting can be done around the year expect in rainy and winter months.
6. Manuring: During first year of plantation, FYM @ 20t/ha is applied at the time of land preparation and same is continued in the subsequent years. Besides, vermicompost @ 25t/ha can also be applied.
7. Spacing and planting: Suckers are planted 15 cm deep pits with 60 x 60 cm apart. Soil around root zone must be pressed firmly to avoid water stagnation.
8. Plant protection: Mealy bugs and anthracnose and leaf spots have been reported in some parts of the country. Sometimes termite problems have also been observed which can be easily managed by light irrigation.
9. Harvesting and yield: Leaving the fresh and young leaves from the top, the outer leaves are generally harvested. The plant can be removed manually. Crop is ready to harvest after 18 months of sowing. Economic yield are obtained up to 5 years, after that it needs replanting. In India, the average yield for organically grown aloe is about 12 tonnes/ha.

Post Harvest Management and Processing

Aloe should be processed within the couple of hours of harvest so as to prevent oxidation. The aloe leaf consists of 3 layers a) outer thick rind b) viscous jelly like mucilage layer into vascular bundles attached to inner surface of the rind. c) The fillets consist of hexagonal structures containing fillet fluid. The pericyclic cells located at the top of vascular bundles containing the yellow sap or 'latex'. Aloe leaves are processed by hand filleting methods or by whole leaf method. The traditional hand filleting method of processing of aloe leaves was developed to avoid possible contamination of fillets with the yellow sap. In this method, the lower one inch of the leaf base, the tapering point (2-4") of the leaf top, and the spines located along the leaf margins are removed into the mucilage layer below the green rind avoiding the vascular bundles and top rind is removed, and the rind apart to which possible a significant amount of mucilage remains attached are discarded. Another portion of mucilage layer is accumulated at the top of filleting table is of concern because of the highest concentration of potentially beneficial aloe constituents in this layer. The hand filleting method is very labour intensive and the machines have been designed to employ which attempt to stimulate the hand filleting technique. In the whole leaf method, the base and the tip are removed as previously delineated and then the leaf is cut into sections and ground into

particulate slurry. The material is then treated with the chemical which breaks down the hexagonal structure of the fillet releasing the constituents. The constituents are filtered by the means of series of coarse and screening filters or passed through various filtering columns which remove the undesirable laxative agents. The process performed properly, can produce Performed properly, can produce a constituent rich juice, virtually free of the laxative anthraquinines.

Indoor Cultivation

Aloe grows openly in the field but can also be grown indoors in pots kept in sunny southern and eastern window. Containers have to quarter full with drainage material and compost consisting of two parts loam and one part coarse sand, crushed lime stone with a bit of bone meal added. Plant should be spotted in the spring and watered carefully until established. During the summer, water can be given as soon as the soil is dry, but from September to March very little water is needed just enough to prevent the leaves from shrivelling. The plants take 4 years to reach the maturity. The leaves are harvested after 4 years when it reaches maturity. The plants can be harvested every 6-8 weeks by removing 3-4 leaves per plant.

Health Benefits

1. Help digestion: Drinking *aloe vera* juice naturally allows the body to cleanse the digestive system.
2. Builds immunity: It is especially helpful for those who have chronic immune disorder like fibromyalgia since the polysaccharides in *aloe vera* juice stimulate macrophages, the white blood cells that fight viruses.
3. Detoxifies: Drinking *aloe vera* juice provides a fantastically rich cocktails of vitamins, minerals, and trace elements to help our bodies, deals with these stresses and strains every day.

Side Effects

1. Pregnancy and breast feeding: Oral aloe is not recommended during pregnancy due to theoretical stimulation of uterine contractions, and in breastfeeding mothers it causes gastrointestinal distress in the nursing infant.
2. Oral: Abdominal cramps, diarrhoea, red urine, worsening of constipation, etc.

Conclusion

Aloe vera is a medicinal plant and due to its extensive medicinal, nutraceutical and other uses, it enjoys a great demand in the market across the globe. The major markets for *Aloe vera* and its extracts are Australia, US and the entire Europe. Given the exponentially growing demand for it in the international market, *Aloe vera* presents the finest commercial opportunity among the various medicinal plants. India is among the few countries gifted with the unique geographical features essential for cultivation of *Aloe vera* and other high potential medicinal plants.