**Asparagus racemosus (Shatavari): An Overview**

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**ABSTRACT**

*Asparagus racemosus* is an indigenous medicinal plant of the family Liliaceae 1956; is important for its sapogenin content the precursor of many pharmacologically active steroids. It has antioxidant activity, anti-abortifacient activity (Shatvarin 1), Antioxytoxic (shatavarin4), spasmodic to uterus, hypoglycemic, hypertensive activity, anticoagulant activity, antiviral activity, anticaner. Antidsenteric activity. This species occurs widely throughout the tropical and subtropical regions. The racemosides saponin content of *Asparagus racemosus* roots revised the structures of the two major saponins of this plant. Shatavarins I, 10 and 1V, 7 further confirmation was provided by the isolation of a new minar steroidal saponin from the *Asparagus racemosus* roots *shatavarin* V, 6 and the demonstration that this saponin in fact possessed the structure previously incorrectly assigned to shatavarin 1V isolation and structure elucidation of the steroidal saponins isolated from the root of this plant.

**Keywords:** *Asparagus racemosus*, Liliaceae, Antioxytoxic activity.

**INTRODUCTION**

*Asparagus racemosus* is an indigenous medicinal plant of the family Liliaceae (Chopra et al., 1956; Anonymous, 1976) is important for its sapogenin content (Rao, 1952; Subramanian and Nair, 1968), the precursor of many pharmacologically active steroids. This species occurs widely throughout the tropical and subtropical regions. Several authors (Trease and Evans, 1978; Jha and Sen, 1983) have shown that the species from different localities often differ in their chemical constituents and contents. In *Asparagus racemosus* during summer, rhizomes and tuberous roots are inconspicuous and aerial portion dies which is the dormant phase. The present investigation was thus under taken to assess the sapogenin content of the plant from different areas as well as at different growth phases vis-à-vis different seasons.

**VERNACULAR NAME** (Anonymous, 2003).

<table>
<thead>
<tr>
<th>Language</th>
<th>Vernacular Name</th>
</tr>
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<tbody>
<tr>
<td>English</td>
<td>Wild asparagus</td>
</tr>
<tr>
<td>Hindi</td>
<td>Satavar</td>
</tr>
<tr>
<td>Bengali</td>
<td>Shatamuli</td>
</tr>
<tr>
<td>Gujarati</td>
<td>Ekalkanto, Satavari,</td>
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<td>Kannad</td>
<td>Callagadda</td>
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<td>Tamil</td>
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<td>M.P.</td>
<td>Narbodh, Sattmooli</td>
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<td>Satawar</td>
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<td>Oriya</td>
<td>Chhotaru, Mohajolo</td>
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<td>Telugu</td>
<td>Satavari, Callagad</td>
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**SCIENTIFIC CLASSIFICATION**

<table>
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<tr>
<th>Kingdom</th>
<th>Plantae</th>
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<tbody>
<tr>
<td>Division</td>
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<tr>
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<tr>
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<tr>
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<tr>
<td>Species</td>
<td><em>Asparagus racemosus</em></td>
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</tbody>
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**SYNONYMS**

- *Asparagus rigidulus* Nakai
- *Protasparagus racemosus* (wild)
PLANT PART USED
Tuberous Roots, Leaves, flowers and fruits

HABITAT
This climber growing in low jungles is found all over India; especially in Northern India. (Nadkarni, 1954). The plant is a climber growing to 1-2m in length found all over India (Jarald & Jarald, 2007).

DESCRIPTION
Asparagus racemosus is plant with a woody stem that sends runners out, has needle like leaves with small white flowers, (Aviva Romm, 2010), Scandant, much branched spinous under shrub with tuberous, short root, stock bearing numerous fusiform tuberous roots 30-100cm thick leaves reduced to minute chaffy scales & spines. Cladodes acicular 2-6 hate, falcate finely acuminate flower white, berries 7mm in diameter, globose, 1-seeded, red (Sharma et al., 2000).

DISTRIBUTION
Throughout India, Tropical and subtropical parts including Andamans and ascending in the Himalayas up to an altitude of 1500m (Sharma et al., 2000).

PROPAGATION AND CULTIVATION
The plants can be successfully grown in Varity of soil, but it prefers sandy well drained soil. They can be propagated by seeds and divisions of rhizomatous disc. Seedling should be planted preferably on ridges, 60 in to 60 cm apart. Application of 12 tons per hectare increases the yield of roots considerably. Harvesting is recommended 40 months after plantation. Shatavari can also be propagated by shoot tip culture on MS medium supplemented with BAP (0.5mg/l). Shoot tip proliferates into a number of offshoots supplemented with NAA (1.0 mg/l)+ kn (0.5 mg/l) (Sharma et al., 2000).

MORPHOLOGY
Mcroscopy
The air dried roots are brown in color, tuberous, elongated, and tapering at both the ends, up to 30-100 cm long. The fresh roots are fleshy and white in color; while on drying it become shrunked, longitudinal ridges appeared and the color turned light brown. Outer surface of the fresh root is soft and contains epidermal hairs. Taste is mucilaginous, fracture brittle. The powder drug swells on moistening with water. Roots are cylindrical, fleshy tuberous straight or slightly curved, tapering towards the base & swollen in the middle; white buff colour, 5-15cm in length 1-2 cm diameter (Jarald & Jarald, 2007).

Microscopy
Transverse section of the root is circular or elliptical, periderm is composed of 5-6 layers of compact cells, tangentially elongated thin walled phellem. About 2-3 peripheral layers of cork cells followed by a single layer of phelloderm. The phelloderm is followed by 6-7 layers of cortical cells. Vascular bundles are arranged in the center forming a circular ring. Protoxylems are arranged toward the center; while the metaxylem toward the outer side. There is a wide zone of secondary phloem composed
of sieve tubes, companion cells and phloem parenchyma. A wide zone of secondary xylem, which is composed of vessels, tracheids and xylem parenchyma, follows secondary phloem. The epidermal layers contain numerous epidermal hairs (Anonymous, 2003).

**Reported Phytoconstituents**

Recently, the racemosides (Mandal *et al*., 2006) the saponin content of *Asparagus racemosus* roots revised the structures of the two major saponins of this plant. Shatavarins I,10 and 1V,7(Hayes *et al*., 2006a). further confirmation was provided by the isolation of a new minor steroidal saponin from the *Asparagus racemosus* roots (Hayes *et al*., 2006b) shatavarin V, 6 and the demonstration that this saponin in fact possessed the structure previously incorrectly assigned to shatavarin 1V (Jadhav and Bhutani, 2006; Ravikumar *et al*.,1987) isolation and structure elucidation of the steroidal saponins isolated from the root of this plant. A limited number of steroidal saponins have been reported previously from the roots of this plant, with the major one being shatavarins 1 and 4 (Ravikumar *et al*., 1987; Joshi and Sukh, 1988; Jadhav and bhutani, 2006) shatavarin V (Hayes *et al*., 2006b) and Immunoside (Handa *et al*., 2003). From the herbs of *Asparagus racemosus* (roots) sarsapogenin, saponins A4-A7, Glycosides of quercetin, rutin, hyperoside and diosgenin, quercetin 3-glucuronide, sitosterol and stigmasterol alongwith their glucosides, two spirostanolic and furostanolic saponins and sapogenin, 4 saponins, viz., shatavarin 1 to 4, polycyclic alkaloid, asparagamine A and disaccharide in roots are reported (Lopez *et al*., 1996).
SUBSTITUTES AND ADULTERANTS
It is reported that in Indian markets apart from Asparagus racemosus, the roots of Asparagus sarmentosus Linn., Asparagus curillus Ham., Asparagus filicinus Ham. And Asparagus sprengeri Regal are also being probably sold in the name of Shatavari (Sharma et al., 2000).

PHARMACOLOGICAL ACTIVITIES
Anticancer activity, antidysenteric activity, antifungal activity, antibacterial activity, anti-inflammatory activities, antulcer activity, antioxidant activity, anti-abortifacient activity (Shatvarin 1), Antioxytoxic (shatavarin4), spasmodic to uterus Hypoglycemic, hypertensive activity, anticoagulant activity (Sharma et al., 2000).

FORMULATIONS AND PREPARATIONS
Shatavari kalpa, Eranda paka, Puga khanda, Bhriratchaladaya ghrita, Phalaghrita, Narayana taila, Shatavaryadi ghrita, Garbhachintamani rasa, Vishnu taila Shatavari modaka, Shatamoolyadi lauha, Shatavari panaka, Bhrirashwagandha ghrita (Sharma et al., 2000).

MEDICINAL USES
Plants for a future can not take any responsibility for any adverse effects from the use of plants. Always seek advice from a professional before using a plant medicinally. Alterative; Antispasmodic; Aphrodisiac; Demulcent; Digestive; Diuretic; Galactogogue; Infertility; Women’s complaints. Root is employed in Diarrhea as well as in cases of chronic colic and dysentery. “Root boiled with some bland oil, is used in various skin diseases ‘root is boiled in milk and the milk is administered to Shatavari (this is an Indian world meaning a woman who has a hundred husbands) is the most important herb in ayurvedic medicine for dealing with problems connected women’s fertility. It is taken internally in the treatment of infertility, loss of libido, threatened miscarriage, menopausal problems, hyperacidity, stomach ulcer and bronchial infection. Externally it is used to treat stiffness in the joints (Bown, 1995). The root is used fresh in the treatment of dysentery. It is harvested in the autumn and dried for use in treating other complaints. The whole plant is used in the treatment of diarrhea, rheumatism, diabetes and brain complaints. It is also Used in Management of behavioral disorder and minimal brain dysfunction (Sheth et al., 1991). The rhizome is a soothing tonic that acts mainly on the circulatory, digestive, respiratory and female reproductive organs. The root is alterative, antispasmodic, aphrodisiac, demulcent, diuretic, galactogogue and refrigerants (Chopra et al., 1986).

REFERENCES
1. Anonymous. The wealth of India, Raw materials (CSIR), New Delhi, 1985,1; A (Rev.), 470.
2. Anonymous. Quality standards of Indian Medicinal plants, Indian
council of medical Research, New Delhi, 2003a.1, 27.