Review on medicinal plant: *Asparagus adscendens* Roxb.

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**ABSTRACT**

The use of medicinal plants is as old as human civilization. About 1,100 plants species are frequently used in Indian system of healthcare and medicines for preparation of ayurvedic, unani and homeopathic drugs. One of those plants is *Asparagus adscendens* Roxb, this herb is usually found in Himalayan mountain ranges. Naturally occurs in forests of western Himalya, Gujarat, Madhya Pradesh and Maharashtra states that are listed in the endangered species of India. Roots of this plant are used for the preparation of nutritive tonics. This plant is a source of a nutritious starch and low in calories and is very low in sodium and good source of vitamins also. Active compounds present in asparagus are well known for their multiple health benefits because of presence of ingredients like proteins, alkaloids, saponins and tannins. This in turn helps in improving fertility and vitality in women and men. Active composition enriched in asparagus calms down nerve cells and prevents the risk of nervous disorders like depression, anxiety and stress. These days, there is a very vast demand from all over the world. However, because of indiscriminate use of these natural resources overtime and fragmentation of habitats, many of these species are increasingly threatened and face the risk of becoming genetically impoverished. Any further ecological change and disturbance can cause their extinction. So it is a matter of urgency, considering the medicinal importance of this species to protect it in its natural population.

**Key words:** *Asparagus adscendens* Roxb, medicinal plant, phytochemicals, Genetic variability.

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INTRODUCTION

Plants have been the basis for life saving drugs for medical treatment in human history and medicinal plants are the most exclusive source for the majority of the world’s population and the use of plants as a medicine is as old as human civilization. In the world population man has traditionally needed these plants to cure diseases and knowledge of the medicinal plants and practiced for regular uses, extends to several parts of the world. Thus mixture of magic, necessity, error and culture has created knowledge of medicinal plants; which has formed the base of modern medicine and preserved from a long time all over the world. These are not only used for primary health care not just in rural areas in developing countries, but also in developed countries as well where modern medicines are predominantly used. The herbal drugs are prepared from medicinal plants only; while the traditional medicines are derived from medicinal plants, minerals, and organic matter. India is the traditional most medico-culturally diverse country in the world where the uses of medicinal plants is part of a time-honored tradition that is in regular uses and respected even today by various indigenous healthcare systems of medicine include ayurveda, unani and siddha [1]. According to the World Health Organization (WHO), approximately 25% of modern drugs used in the United States have been derived from medicinal plants in practice today. At least 7,000 medical compounds used in drug industry in the modern pharmacopoeia are derived from plants and widely used in modern medicine today, 80% show a positive correlation between their modern therapeutic use and the traditional use of the plants from which they are derived [2].

The connection between man and his search for plant derived drugs from nature continue to the far past, of which clearly evidenced from various sources: preserved monuments, written documents, and even original plant medicines practiced now a day’s also. The knowledge of the development of ideas and evolution of awareness related to the usage of medicinal plants in traditional healthcare systems is a result of the many years of struggles against diseases due to which man learned to use plant mediated drugs from roots, leaves, barks, seeds, fruit bodies, and other parts of the plants. It increased the ability of pharmacists and medical industry to respond to the challenges comes with the spreading of professional services in facilitation of society [3].

India has been identified as one of the top twelve mega diversity centers in the world having 45,000 species of floral diversity and 6,500 species of faunal diversity; out of these approximately 70% of India’s medicinal plants have been found to be in tropical regions, where as less than 30% in temperate and alpine areas.
their occurrence, but they include species of high medicinal value in drug industry [4]. Recently ministry of environment through a co-ordination research project on ethno botany has succeeded in getting the local uses of about 7,500 species documented. About 1,100 plants species are frequently used in Indian medicinal system and out of these, 500 plants are commonly used in preparation of different drugs [5]. Himachal Pradesh is sighted between 30°22’40” to 33°12’40” North latitude and 75°47’55” to 79°4’20” East longitude responsible for its unique climatic conditions and geographical positions. The plats used for various therapies are variably available and easy to use also having long shelf life also having minimal side effect ad low cost as compare to homeopathic drugs [6].

However, because of regular and indiscriminate use of these plant resources over time and fragmentation of habitats, many of these species become endangered and threatened and some of them face the risk of becoming genetically impoverished from their natural habitat. About 12.5% of the 422000 plant species documented worldwide are reported to have medicinal values; but only a few hundred are known to be in cultivation. With dwindling supplies from natural sources and increasing global demand, the medicinal and aromatic plants will need to be cultivated to ensure their regular supply as well as conservation [7].

It is imperative to give emphasis on viable strategies to conserve and save the surviving population of genetically impoverished plants and their genetic resources in natural form are formulated. The initial step towards this approach is to identify the habitat sites with the viable populations followed by studying their genetic diversity as plants grow in population in different situations along temperature gradients, geographical variation in longitudinal, latitudinal sites and therefore variation within and between populations. The problems of variations along populations are further compounded in medicinal plants which also synthesize and accumulate a diversity of plant specific compounds called metabolites (primary and secondary metabolites). Currently, most of these secondary metabolites are isolated from wild or cultivated plants because their chemical synthesis is either extremely difficult or economically infeasible [8].

Asparagus plants native to the western coasts of Europe (from northern Spain north to Ireland, Great Britain, and northwest Germany) and is native to most of Europe, northern Africa and western Asia, and is widely cultivated as a vegetable crop. About 300 species of asparagus
are known to occur in the world. Some of the European species to be mentioned are *Asparagus officinalis*, *Asparagus sprengeri* and *Asparagus acutifolius*. *Asparagus officinalis* is reported to be a popular vegetable consumed in many parts of the world [9]. Out of several species of 'Asparagus' grown in India, *Asparagus racemosus*, *Asparagus gonaclades* and *Asparagus adsendens* are most commonly used in indigenous medicine [10]. Already about 20,000 years ago, *Asparagus officinalis* was eaten near Aswan in Egypt and it has been used as a vegetable and medicinal plant, due to its flavor, diuretic properties, and more. It is pictured as an offering on an Egyptian frieze dating to 3000 BC; Still in ancient times, it was known in Syria and in Spain [11]. *Asparagus racemosus* became available to the New World around 1850, in the United States and has been used for centuries for the preparation of unani, siddha and ayurvedic medicines.

![Figure 1: Image of Asparagus adscendens roots](image1)

![Figure 2: Image of Asparagus adscendens leaves](image2)

*Asparagus adscendens* is a flowering perennial, spring plant species in the genus *Asparagus* [11]; Which is a large genus of herbs and under shrubs with stout, tuberous roots and erect or climbing stems. It was once classified in the *lily* family, like its *Allium* cousins, onions and garlic, but the *Liliaceae* has been split and the onion-like plants are now in the family *Amaryllidaceae* and asparagus in the *Asparagaceae* family [9].
grows one to two metres tall and prefers to take root in gravelly, rocky soils high up in piedmont plains, at 1,300 - 1,500 metres elevation and it was botanically described in 1799.

**Scientific classification**

Kingdom: Plantae  
Clade: Angiosperms  
Clade: Monocots  
Order: Asparagales  
Family: Asparagaceae  
Subfamily: Asparagoideae  
Genus: *Asparagus*  
Species: *A. adscendens*

*Asparagus adscendens* Roxb. is known by various common names i.e. Shatawari, Safed musli, Shatavar, Shatamuli, Sahasrapal, Sainsarbuti. It was initially grown in thick forest in natural form, and is a customary medicinal plant; is an herb with sub-erect lanceolate leaves and tuberous root system. The plant form of *Asparagus adscendens* is a shrub of struggling nature much branched, spines with woody stem, It can grow up to an utmost height of 1.5 feet. Cladodes are 0.6-1.2 cm long linear in shape but stout, straight, bear spines (Figure 1). Flowers are small, white, 3-4 cm across, solitary or fascicled with copious racemes. Fruits are 0.8 cm in diameter, globes, 3 lobed berries with only one seed [12]. Tubers can grow up to a depth of 10 inch (Figure 2). *Asparagus* is a sub-erect prickly shrub with white tuberous root that grows well in tropical and sub-tropical climates with heights up to 1,500 meters. *Asparagus adscendens* is usually found throughout India and Himalayan Mountain ranges. Naturally occurs in forests of western Himalaya, Gujarat, Madhya Pradesh and Maharashtra States that are listed in the endangered species of India. In Himachal Pradesh it is found growing sporadically in districts of Una, Chamba, Bilaspur, Hamirpur, Kangra, Mandi, Solan [12]. It was initially grown in thick forest in natural form, and is a customary medicinal plant.

The plant is a source of a nutritious starch that can be used. Asparagus is low in calories and is very low in sodium. It is a good source of vitamin. The shoots are prepared and served in a number of ways around the world, typically as an appetizer. The part of the plant that is used is not specified but is mostly to be the root. Steroidal glycosides are identified in tuberous roots. Active compounds present in asparagus are well known for their multiple health benefits. The powdered dried root exhibits galactogogic properties. It is reported to be useful against diarrhoea, dysentery and in general debility.
The uses of the medicinal plants are found in Rig Veda, perhaps the oldest repository of human knowledge. Charka Samhita (1000 B.C.) records the use of over 340 drugs of plant origin. There are two basic uses of medicinal plants: direct use as dietary supplement or as chemical factories for the production of plants derived drugs. Growing genetically defined plant material improves biomass quality and helps to protect the world germplasm from extinction as there are few breeding programs for medicinal plants [13]. Therefore, it is prudent to study Asparagus adscendens at genetic and molecular levels for efficient conservation and management of its genetic diversity.

**Review of Literature**

Asparagus adscendens is initially grown in thick forest in natural form, and is a customary medicinal plant. Mostly its tuberous roots are used in Ayurvedic medicines. To make salep, the root is dried and ground into a powder and the powdered dried root exhibits galactogogic properties; used for the preparation of nutritive tonic used in general sexual weakness. These roots hold spermatogenetic, spermatorrhoea and chronic leucorrhoea due to some chemical content. This plant is a source of a nutritious starch and low in calories and is very low in sodium. It is a good source of vitamin also. Steroidal glycosides are identified in tuberous roots. Active compounds present in asparagus are well known for their multiple health benefits. It is reported to be useful against diarrhea, dysentery and in general debility. Sarsasapogenin, diosgenin and sitosterol have been isolated earlier from the fruits. Whereas some steroidal saponins were reported from roots and leaves and several lipid constituents has identified from the roots. The presence of key ingredients in asparagus like proteins, alkaloids, saponins and tannins enhance the production of estrogen. This in turn helps in improving fertility and vitality in women and men. Active composition enriched in asparagus calms down nerve cells and prevents the risk of nervous disorders like depression, anxiety and stress. These days, there is a very vast demand from all over the world (Especially gulf countries and cold countries) and due to its vast demand it is extremely costly (Figure 3).
Among the estimated 250,000-500,000 plant species, only a small percentage has been investigated phytochemically and the fraction submitted to biological or pharmacological screening is even smaller. Thus, any phytochemical investigation of a given plant will reveal only a very narrow spectrum of its constituents. Historically pharmacological screening of compounds of natural or synthetic origin has been the source of innumerable therapeutic agents.

The hemi-celluloses of the tubers of *Asparagus adscendens* Roxb have been isolated and chemically examined. They are composed of two fractions, $A_2$ and $B_2$ of Norris and Preece designation. Both the fractions are constituted from the same sugars and uronic acid, viz., xylose, glucose and glucuronic acid but in different proportions. In hemicellulos $A_2$ the ratio of these components is 2:1:1, while in $B_2$ it is 1:1:2 [14]. The *Asparagus adscendens* plant stem is used as an aphrodisiac and root bark as a tonic for promotion of strength and longevity in Kumaon region of Uttar Pradesh. Stem is eaten as a vegetable also in traditional dishes [15].

The methanolic extract of the defatted roots of *Asparagus adscendens* Roxb. yielded beta-sitosterol beta-D-glucoside, two new spirostanol glycosides (asparanin C and asparanin D)
and two new furostanol glycosides (asparoside C and asparoside D) [16]. The leaves of musli are used for the treatment of dysentery in Punjab, Haryana, Rajasthan and Gujarat. The roots are used for preparing veterinary medicines in Morni and Kalesar district of Haryana [17]. Two new oligofurostanosides Adscendosides A (3) and B (4) and two spirostanosides Adscendins A (1) and B (2) are reported from the methanol extract of the leaves of Asparagus adscendens [18]. The protein content is significantly high in the roots and steroidal glycosides are identified in tuberous roots. Several compounds like 3-heptadecanon, 8-hexadecenoic acid, methyl pentacosanoate, palmitic acid, stearic acid are identified. The saponin mixture from the dried roots yield glycosides, O-([β-D-2 tetracosylxylopyranosyl]-stigmasterol, and 3-β-O-[β-D-glycopyranosyl (12) –α-L-arabinopyranosyl] stigmasterol [19].

Three medicinal plants namely Asparagus adscendens, Chlorophytum arundinaceum (both known by common name safed musli) and Curculigo orchioides (kali musli) were analyzed for pharmacognosy, chemistry and pharmacological properties. Different phytochemicals like steroids, triterpenoids, glycosides, saponins, phenolic compounds, aliphatic compounds and nitrogenous constituents reported in these plants [20]. Effect of aqueous and alcoholic extracts of the roots of Asparagus adscendens was studied on the spontaneous movements of whole worm and nerve muscle preparation of Setaria cervi and on the survival of microfilariae in vitro. Aqueous as well alcoholic extracts caused inhibition of Setaria cervi characterized by initial, short lasting small increase in amplitude and tone of contractions followed by paralysis [21].

The traditional uses of plants for food, shelter, fodder, health care and other cultural purposes were documented, based on interviews with some 100 informants. The need for such documentation, useful findings concerning medicinal plants, pressure on fuelwood species, use of fodder species, and beekeeping as a useful incentive for protecting the local flora. Asparagus adscendens, Berberis lycium and Viola canescens were identified as being vulnerable to over harvesting. Acacia modesta, A. nilotica, Buxus papillosa and Dodonaea viscosa are under pressure due to collection as fuelwood. Grewia optiva (used as fodder and for rope making) was the most sustainable species as it grows quickly and regenerates within a year [22].

In 1996-99 a field experiment was conducted on the root yield of Asparagus racemosus and Asparagus adscendens to determine the effect of plant density in Uttar Pradesh, India (1.11,
0.5, 0.28 and 0.12× 10³ plant/ha). The results shows that *Asparagus racemosus* produced about 1.6 fold higher yields than *Asparagus adscendens* and the highest root yield was obtained with a plant density of 1.11× 10³ plant/ha [23]. The physicochemical characteristics of powdered tubers of *Asparagus adscendens* collected from Meerut, Uttar Pradesh, India, were studied. The extractive values were 12.52, 12.97, 10.42, 39.98 and 59.20% (w/v) using petroleum ether, ethyl acetate, chloroform; water-soluble ash and sulfated ash were 5, 2.3 and 5.0% respectively found [24]. A very high rate of multiple shoots was obtained from nodal explants of *Asparagus adscendens* Roxb. on Murashige and Skoog medium supplemented with α-napthaleneacetic acid, Kn and agar. Good rooting response was observed when individual regenerated shoots were inoculated on to Murashige and Skoog medium with indole-3-butyric acid (IBA), ancymidol and sucrose. Such plantlets were successfully transferred to soil after hardening with a high rate of survival [25].

Spirostanol glycosides (asparanin A and asparanin B) and two furostanol glycosides (asparoside A and asparoside B) have been isolated from the methanol extract of the roots of *Asparagus adscendens* [26]. *Asparagus adscendens* shown a significant non-toxic increase in glucose-dependent isuliotropic action in the clonal pancreatic β cell line, and it revealed the presence of insulinotropics, insulin-enhancing activity and inhibitory effects on starch digestion [27]. A protocol for isolating genomic DNA from fresh and dry roots of medicinal plants was developed. It involves a modified cetyl trimethylammonium bromide (CTAB) procedure and extraction was carried out at 70°C. A slight increase in the concentrations of the chemical components helped in the removal of secondary metabolites from the DNA preparation. The quantity and purity of isolated DNA was higher when compared with DNA extracted by other methods. The DNA yield ranged from 33 to 68 μg per g of root samples and it was 1.47 times greater in dried than fresh samples. The DNA samples were found suitable for analysis with restriction enzyme digestion and random amplification of polymorphic DNA (RAPD). The total duration for DNA extraction from roots of medicinal plants using this protocol was 135 min as compared to 225 min with existing protocols [28].

Essential and non-essential heavy metals like Mn, Zn, Fe, Ni, Cu, Cr, Pb and Cd were quantified in selected medicinal plants including Artemisia vulgaris L., *Asparagus adscendens* Roxb, *Cyamopsis tetragonoloba* L., *Galium aparine* L., *Mucuna pruriens* L., *Stevia rebaudiana* and *Withania somnifera* L., by using atomic absorption spectrometry. The main purpose of this
study was to document evidence of essential and non-essential heavy metals in these herbs, which are extensively used in the preparation of herbal products and standardized extracts. High iron contents were observed in *W. somnifera* 206.69 ppm, *S. rebaudiana* 201.38 ppm, *G. aparina* 180.91 ppm, *C. tetragonaloba* 87.14 ppm, *A. adscendens* 85.27 ppm, *A. vulgaris* 81.39 ppm and *M. pruriens* 33.21 ppm. The concentration of other heavy metals particularly manganese and zinc was also found on the higher side in the selected herbs [29].

The effects of the methanol and aqueous extracts of the tuberous roots of these plants were examined in an experimental mouse model of stress, induced by swimming. The extracts were shown to exert an inhibitory effect on pro-inflammatory cytokines, namely interleukin 1β and tumour necrosis factor α, and on the production of nitric oxide in mouse macrophage cells stimulated by lipopolysaccharide in vitro. Similar inhibition was also observed in the production of interleukin 2 in lymphoma cells stimulated by concanavalin [30].

*Asparagus adscendens* studied for its phytochemical compounds and reported the presence of insulinotropic, insulin-enhancing activity and inhibitory effects on starch digestion. Conypododiol exhibited significant inhibition of both acetylcholinesterase and butryrylcholinesterase, having the IC(50) values 2.17 ± 0.1 μM and 11.21 ± 0.1 μM, respectively, Conypododiol was found safe against monkey kidney epithelial cells and mice hepatocytes [31]. The cancer chemopreventive efficacy of the roots of *Asparagus adscendens*, evaluating using different doses in a test diet examined on 7,12-dimethylbenz(a)anthracene induced skin and benzo(a)pyrene-induced for stomach papillomagenesis in mice. The result exhibited a significant reduction in the skin and the fore stomach tumor incidence with respect to all the three (2, 4 and 6%, w/w) doses as compared with control. Further, the roots of *Asparagus adscendens* inhibited phase I, and activated phase II system and antioxidant enzymes in the liver especially with 4% of test diet. Together, these results suggest the cancer chemopreventive potential of *Asparagus adscendens* which could be mediated through drug-metabolizing phase I and phase II enzymes as well as free radical scavenging antioxidant enzymes [32].

Analysis of saponins by thin layer chromatography (TLC) is reported. The solvent system was *n*-butanol:water:acetic acid (84:14:7). Detection of saponins on the TLC plates after development and air-drying was done by immersion in a suspension of sheep erythrocytes, followed by washing off the excess blood on the plate surface. Saponins appeared as white spots against a pink background. The protocol provided specific detection of saponins in the saponins

The traditional Indian system of medicine can be classified into the forms of folk medicine which are village based, region-specific, indigenous herb based, local resources based and in many cases, community-specific. Musli (*Asparagus adscendens*) is useful as aphrodisiac and nervine tonic. It is a sub erect prickly shrub, with white tuberous roots. It is distributed in West Himalayas and Punjab to Kumaon [34]. The species of Asparagus are traditionally used in medicines, vegetables and as ornamental plants. Here RAPD markers are used to evaluate the genetic diversity among 9 species of *Asparagus* and 6 cultivars of *Asparagus officinalis* L. using 7 random primers yielded total amplification of 245 bands, among 220 were polymorphic bands with an average of 31.4 bands per primers [35].

*Asparagus adscendens* root extract (200 and 300 mg/kg doses) caused a significant increase in body (*p* < 0.02 and *p* < 0.001) and testes (*p* < 0.01 and *p* < 0.001, control versus treated) weights. Reproductive activity showed significant a increase in testicular tubular diameter (*p* < 0.005–0.001), the number of round/elongated spermatids (*p* < 0.02–0.001), DSP, and ESC (*p* < 0.05–0.001). The sexual behavioral parameters including mounting/intromission frequency (13.0 ± 0.32/11.8 ± 0.37 and 18.2 ± 2.12/14.8 ± 1.15 versus 11.2 ± 0.66/8.2 ± 1.16), ejaculation latency (187.4 ± 1.91 and 191.4 ± 1.72 versus 180.0 ± 3.47), and penile erections (13.5 ± 0.3 and 14.5 ± 0.5 versus 8.5 ± 0.2) showed a significant increase at 200 and 300 mg/kg doses (ED50 300 mg/kg), but less than a standard control. There was increased anabolic, reproductive, and sexual activities by *Asparagus adscendens* root extract treatment [36] (Table I).

Table 1: Represented *Asparagus adscendens* reported work

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Plant</th>
<th>Fraction used</th>
<th>Work done</th>
<th>References</th>
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<th>parts</th>
<th>Tuber parts</th>
<th>Chemical Constituents</th>
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<tr>
<td>1 Tubers</td>
<td>Tuber hemicellulos</td>
<td>Hemicelluloses $A_2$, hemicelluloses $B_2$</td>
<td>Rao and Gakhar 1952</td>
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<tr>
<td>2 Whole plant</td>
<td>-</td>
<td>Herbal folk medicines in Northern India</td>
<td>Shah and Joshi, 1971</td>
</tr>
<tr>
<td>3 Roots</td>
<td>Methanol extract</td>
<td>Spirostanol glycosides and furostanol glycosides</td>
<td>Sharma et al. 1982</td>
</tr>
<tr>
<td>4 Leaves, root</td>
<td>-</td>
<td>Medicinal uses</td>
<td>Jain, S.P. 1984</td>
</tr>
<tr>
<td>5 Leaves</td>
<td>Methanol extract</td>
<td>Oligofurostanosides Adscendosides and spirostanosides Adscendins</td>
<td>Sharma and Sharma 1984</td>
</tr>
<tr>
<td>6 Roots</td>
<td>Methanol extract</td>
<td>Glycosides, O-stigmasterol, and 3-β-O-stigmasterol</td>
<td>Tandon, Shukla et al. 1990</td>
</tr>
<tr>
<td>7 Roots, leaves</td>
<td>Aqueous and Alcoholic extracts</td>
<td>Medicinal and aromatic plants</td>
<td>Tandon and Shukla. 1995</td>
</tr>
<tr>
<td>8 Roots</td>
<td>Aqueous and Alcoholic extracts</td>
<td>Inhibition of S. cervi</td>
<td>Singh et al. 1997</td>
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<tr>
<td>9 Whole plant</td>
<td>-</td>
<td>Medicinal uses</td>
<td>Shinwari et al. 1999</td>
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<tr>
<td>10 Whole plant</td>
<td>-</td>
<td>Effect of plant density on the root yield</td>
<td>Singh, Kumar et al. 2001</td>
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<tr>
<td>11 Tuberous roots</td>
<td>Aqueous and Alcoholic extracts</td>
<td>Physicochemical characteristics</td>
<td>Zafar, G. S. et al. 2005</td>
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<tr>
<td>12 Nodal explants</td>
<td>Methanol extract</td>
<td>Direct in vitro propagation and HPLC</td>
<td>Mehta and Subramanian 2005</td>
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<tr>
<td>13 Roots</td>
<td>Methanol extract</td>
<td>Spirostanol glycosides and two furostanol glycosides</td>
<td>Jadhav and Bhutani 2006</td>
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<td>14 Roots</td>
<td>Aqueous extract</td>
<td>Stimulates insulin secretion, insulin action and inhibits starch digestion</td>
<td>Mathews, Flatt et al. 2006</td>
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<td>15 Root</td>
<td>Isolated DNA extract</td>
<td>RAPD and Restriction digestion</td>
<td>Khan et al. 2007</td>
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<td>16 Leaves</td>
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<td>Profile of heavy metals</td>
<td>Khan et al. 2008</td>
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<td>Effects of Chlorophytum arundinaceum</td>
<td>Kanwar and Bhutani 2010</td>
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<td>18 Roots</td>
<td>Chloroform fraction of Methanolic extract</td>
<td>Conypododiol as a dual cholinesterase inhibitor</td>
<td>Khan, Nisar et al. 2010</td>
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<td>19 Roots</td>
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<td>Chemomodulatory potential</td>
<td>Singh, R. K. et al.</td>
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<td>Thin layer chromatographic analysis</td>
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<td>Herbal medicinal plants</td>
<td>Sharma and Kumar 2012</td>
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<td>22</td>
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<td>Genetic diversity among <em>Asparagus</em> species</td>
<td>Irshad et al. 2014</td>
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<td>23</td>
<td>Roots extract</td>
<td>Anabolic, reproductive, and sexual behavioral activity</td>
<td>Bansode et al. 2014</td>
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</table>

**CONCLUSION**

As of today, genetic conservation in medicinal and aromatic plants has become of paramount importance because of ruthless extraction by upcoming biotechnology and pharmaceutical industry. For efficient conservation and management of medicinal plant diversity, the genetic composition of species collected from different phyto-geographical regions has to be assessed well in time. This review summarizes researches conducted on *Asparagus adscendens* specifically in medicinal field. Numerous studies have been conducted on different parts of *Asparagus adscendens*, this plant has developed as a drug by pharmaceutical industries. However, because of indiscriminate use of these resources overtime and fragmentation of habitats, many of these species are increasingly threatened and face the risk of becoming genetically impoverished. It is imperative that viable strategies should be adopted to conserve the surviving population and their genetic resources. This species has very small population and specific habitat and due to deforestation, forest fires, habitat fragmentation and human interference the population of this rare, endangered plant is on the decline. Any further ecological change and disturbance can cause their extinction. A detailed and systematic study is required for identification, cataloguing and documentation of plants, which may provide a meaningful way for promoting traditional knowledge of the medicinal herbal plant. So it is a matter of urgency, considering the medicinal importance of this species to protect it in its natural population and this review is a good source of literature survey for researchers who intended to do studies in this particular field.

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