

Sustainable Harvesting, Conservation and Analysis of Genetic Diversity in *Polygonatum Verticillatum* Linn.

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Abstract : Indian Himalayas with their diverse climatic conditions are home to many rare and endangered medicinal flora. One such species is *Polygonatum verticillatum* Linn., popularly known as King Solomon's Seal or Solomon's Seal. Its mention as an incredible medicinal herb comes from 5000 years ago in Indian Materia Medica as a component of Ashtavarga, a poly-herbal formulation comprising of eight herbs illustrated as world's first ever revitalizing and rejuvenating nutraceutical food, which is now commercialised in the name 'Chaywanprash'. It is an erect tall (60 to 120 cm) perennial herb with sessile, linear leaves and white pendulous flowers. The species grows well in an altitude range of 1600 to 3600 m amsl, and propagates mostly through rhizomes. The rhizomes are potential source for significant phytochemicals like flavonoids, phenolics, lectins, terpenoids, allantoin, diosgenin, β -Sitosterol and quinine. The presence of such phytochemicals makes the species an asset for antioxidant, cardiogenic, demulcent, diuretic, energizer, emollient, aphrodisiac, appetizer, glactagogue, etc. properties. Having profound concentrations of macro and micronutrients, species has fine prospects of being used as a diet supplement. However, due to unscientific and gregarious uprooting, it has been assigned a status of 'vulnerable' and 'endangered' in the Conservation Assessment and Management Plan (CAMP) process conducted by Foundation for Revitalisation of Local Health Traditions (FRLHT) during 2010, according to IUCN Red-List Criteria. Further, destructive harvesting, land use disturbances, heavy livestock grazing, climatic changes and habitat fragmentation have substantially contributed towards anomaly of the species. It, therefore, became imperative to conserve the diversity of the species and make judicious use in future research and commercial programme and schemes. A Gene Bank was therefore established at High Altitude Herbal Garden of the Forest Research Institute, Dehradun, India situated at Chakarata (30042'52.99"N, 77051'36.77"E, 2205 m amsl) consisting 149 accessions collected from thirty-one geographical locations spread over three Himalayan States of Jammu and Kashmir, Himachal Pradesh, and Uttarakhand. The present investigations purport towards sampling and collection of divergent germplasm followed by planting and cultivation techniques. The ultimate aim is thereby focussed on analysing genetic diversity of the species and capturing promising genotypes for carrying out further genetic improvement programme so to contribute towards sustainable development and healthcare.

Keywords : *Polygonatum verticillatum* Linn., phytochemicals, genetic diversity, conservation, gene bank

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