A VERSATILE MEDICINAL PLANT SPECIES *PARIS POLYPHYLLA*- AT LACHUNG FOREST, SIKKIM-CONSERVATION INITIATIVES

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INTRODUCTION

Medicinal plants play a significant role in all around the world. Himalayas has diverse medicinal plant available and has been recorded in ancient Indian scripts 1000 BC. Indian Himalayan Region (IHR) there are over 1748 plant species, (1685-angiosperms, 12-gymnosperms and 51 pteriophytes, including 1020 herbs, 335 shrubs and 330 trees of medicinal value (Samant *et al.*, 1998). Medicinal plants mostly found in herbs category which are being used for the treatment of various diseases/ailments of both human being and animal too. The herbal medicines have global market value of about US$ 43 billion a year (Christie, 2001).

Sikkim Himalayan region is home to several versatile medicinal plant species such as *Podophyllum hexandrum*, *Aconitum ferox*, *Aconitum heterophyllum*, *Angelica glauca*, *Hedychium spicatum*, *Gloriosa superba*, *Paris polyphylla*, *Nardostachys jatamansi*, *Rheum australe*, *Rhododendron anthopogon*, *Picrorhiza kuriooa*, *Saussurea costus*, *Swertia chirayita*, *Taxus baccata* etc., Among them *Paris polyphylla* Sm. which have versatile medicinal properties and have been listed under vulnerable category (V) by IUCN.

The present articles revealed the *Paris polyphylla* plant species was discovered, abundantly distributed in partial shade, humus rich soil and moisture places under the canopy of *Tsuga dumosa*, *Picea smithiana* with *Rhododendron arboreum* and under most common shrub *viz.*, *Viburnum erubescens*, *Piptanthus nepalensis*, *Ribes* sp. and small tree *Rhododendron niveum* and herb which was inventorised *viz.*, *Arisaema griffithii*, *Euphorbia sikkimensis*, *Polygonatum* sp. *Persicaria* sp. including many ferns species at Lachung temperate coniferous forest near Yakchey (North Sikkim) at elevation between 2900 - 3000 m asl. But scarcely distributed in FambongLho Wildlife Sanctuary (East Sikkim) at elevation 2500 m asl and Maenam Wildlife Sanctuary (South Sikkim) at 2500 m asl of Oak broadleaved forest mixed with *Schima wallichii* plant species during Rapid Biodiversity Survey undertaken under the JICA funded Sikkim Biodiversity Conservation and Forest Management Project.

The species in recent time, has been heavily exploited unscientific harvesting leading to rapid decline in its population and illegal export to neighbouring country. The seed germination is found to be very low in the wild. The young shoots and fruits are eaten by foraging livestock. Once grazed it takes considerable time to regenerate. *Paris polyphylla* has anti-tumor active constituents from the rhizome parts of *Paris polyphylla* var. yunanensis in China by Zhongguo. 2007. Yan et al. (2009) mentioned that *Paris polyphylla* is used to treat anticancer activity of steroid saponins isolated from the rhizomatic parts of the plant.

**STUDY AREA**

The present study area between 2800-3200 m asl, 88°44′57.3N Longitude and 27°42′45.0E Latitude lies within Lachung Forest of North Sikkim, covering approx. 7 km². The slope angle of the sampled sites range between mild up to 40 degree and facing E, N and NE aspect. The area is prone to natural calamities, e.g., avalanche and landslides.

*Photo 1: A Part of Lachung Forest, North Sikkim*

**MATERIAL& METHODS**

For data collection, field survey was carried out during rapid biodiversity survey in May 2014. A technique of random systematic design was applied. The random sampling sites were selected and each quadrat site of 1m² were laid down under 27 plots for herbs. In each small quadrat total number of herbs including *Paris polyphylla* and its percent coverage were
inventorised. Additionally, GPS were calibrated in study area recording altitude, latitude and longitude.

MORPHOLOGY

*Paris polyphylla* Sm. (*Paris* = equal and *polyphylla* = many-leaved. The plant is grows about 10-100 cm tall. It is a perennial herbaceous plant which is much sought after for its beautiful spidery flowers. Leaves 4-9 numbers arise from whorl. The flower has a ring of 4-6 green leaf-like perianth segments, which are 5-10 cm long and occurs single at the end of the branches. There is an inner ring of long-purple or yellow perianth segment which look like spider legs. Ten short stamens are arranged again in a ring. Flowers turn into globular fruit with scarlet seeds. Flowering occurs from April to May and fruiting occurs between September to October.

ECOLOGY

*Paris polyphylla* in natural habitat it blooms well at places which are moist with humus rich soil and high nutrient content under partial shade. It is grows in forest, bamboo forests, thickets, grassy or rocky slopes and bank of streams. This plant species is propagated through seed and underground rhizomes. The aerial part of the plant dries out but the underground rhizomes remain dormant during the winter. At the onset of spring the rhizome gives a new plant.

MEDICINAL VALUES

The rhizome part is used for various medicinal purposes viz., for treatment of anti – tumor, cancer, liver, stomach, nose, lung, throat and breast cancer in traditional Chinese medicine. Paste is applied as an antidote to snake bites and poisonous insects bite. A piece of underground parts is chewed to treat internal wounds. The rhizome part is in high demand in international markets and fetches Rs. 40,000 - 50,000 per kilo/gram leading unscrupulous harvesting and illicit trading. In Nepal, the plants are harvested on Tuesday of mid April (i.e., last Tuesday of Chaitra month) when it is believed to be more effective as medicine than those harvested at any other season (Madhu *et al.*, 2010).
Results & Discussion

Total 27 plots, the maximum plant species were recorded from herb category (Subba et al. 2015) including the Paris polyphylla high medicinal plant species. 7 plots were found P. polyphylla out of 27 plots and maximum number of population was recorded at 2900 - 3000 m asl. Between these altitudes it is most suitable for the growth in Sikkim Himalayan Region. The maximum herbs percent cover was recorded viz., in association with Arisaema griffithii and Fragaria nubicola. It is also good indicator the growth of P. polyphylla with Arisaema species. Madhu et al. (2010) have mentioned that the Paris polyphylla found growing with shrub associated species Vibrunum erubescens and Arisaema sp and fern. A similar case was recorded in this study. This species is found growing in natural habitat.
most in temperate coniferous forest, ecological conditions and physiological factors are most suitable for the growth of the plant.

CONSERVATION INITIATIVES

The conservation initiatives have to be started for the preservation of wild natural forest by encouraging local people and the dissemination of biodiversity information for promoting public awareness on the value of medicinal plants. Medicinal plant as natural resources has tremendous scope and also generates revenue in the state. Medicinal plants are one of the major wild biological natural resource that offer entrepreneurial opportunities to young people in the Sikkim Himalayan Region by promoting herbal medicinal nursery garden though in-situ and ex-situ conservation. Sikkim Biodiversity Conservation and Forest management Project aims to enhance the socio-economic value of biodiversity, which can be achieved through establishment of nursery and maintenance of biodiversity in the State.

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