

Ecology and Conservation of *Paris polyphylla*

A Threatened Medicinal Plant from the Western Himalayas

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FOR millennia, medicinal plants have safeguarded humanity, with their traditional uses dating back to the earliest civilisations. In recent decades, however, a surge in global commercial demand for medicinal plants has led to over-exploitation, illegal trade, unsustainable habitat, and fragmentation, threatening these invaluable biological resources at serious risk. Therefore, the conservation of medicinal plants can be viewed as a microcosm of broader plant conservation and ecosystem protection efforts. The Himalaya is a storehouse of biodiversity, providing habitats

for various rare, endemic, threatened, and medicinal plant species. The Indian Himalayan Region (IHR), which spans 13 Himalayan states in the country, contains 1748 species of medicinal use. Of these, 1127 species belonging to 153 families have been recorded from the Uttarakhand state.

The genus *Paris* (family: Melanthiaceae) includes 27 species distributed across Asia, Europe, the Indian Sub-Continent, and Indo-China. Of which only three species, *P. polyphylla*, *P. thibetica*, and *P. marmorata*, are reported in India, along with six intraspecific taxa. *P. polyphylla* is the sole species found in the western Himalayas. *Paris polyphylla* (Smith), commonly known as *Satuwa*, is a highly valued medicinal plant known for its immense ecological, medicinal, and economic importance. This perennial herb is widely distributed across the Indochina region, China, and the Indian sub-continent. The name “Paris” is derived from Latin, meaning “consistency,” referring to its uniform floral and foliar structures, while “Polyphylla” comes from Greek, “Poly” meaning “many” and “Phylla” meaning “leaves”. It generally occurs over a narrow geographical range due to its rigid ecological requirements, typically found at an altitudinal range covering 1500 to 3500 m asl.

As per the available herbarium records housed in Botanical Survey of India (BSI), Forest Research Institute (FRI), Wildlife Institute of India (WII) (Dehradun), and the Regional Ayurveda Research Institute (RARI), Ranikhet, *P. polyphylla* has been reported in the seven districts of Uttarakhand state, including Pithoragarh, Bageshwar, Nainital, Chamoli, Rudraprayag, Tehri Garhwal, and Pauri Garhwal.

It grows up to a height of 10-100 cm, with a symmetrical arrangement of leaves and flowers, typically bearing 5-12 leaves (1.5-4 cm wide). Inner tepals are narrow (1-2 mm wide) and slightly longer than the outer ones. Seeds are encased in a red, succulent aril that helps in dispersal. A thick rhizome (1-2.5 cm in diameter) aids anchorage and regeneration. This species thrives in dense forests with minimal human interference and prefers shaded environments amidst — *Schima wallichii*, *Alnus nepalensis*, *Bauhinia purpurea*, *Pinus roxburghii*, *Rhododendron arboreum*, *Quercus spp.*, *Taxus baccata*, and Bamboo. This scieophytic herb thrives well in moist, well-drained soil and sloping terrain. The flowering starts from late April to June, with seed formation initiating in September and maturing by October.

Traditional healers recognise the rhizome of *P. polyphylla* as the most medicinally valued part; it is rich in bioactive compounds, particularly steroidal saponins (more than 80%). Indigenous Himalayan communities have long used it to treat a