Cultivation: A promising method for conserving *Picrorhiza kurrooa*

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**Abstract:** Himalayas are one of the greatest reservoirs of medicinal and aromatic plants, which has made people to use them for various health related problems. Due to their high medicinal potential, they are under high demand in national and international market. The ruthless extraction from the wild and illegal trade has contributed to endangerment of the plant. *Picrorhiza kurrooa* Royle ex Benth, a valuable herb of Himalayan region is in great demand due to its high medicinal potential, which has caused severe exploitation of the species from the nature. As a result the plant has come under endangered category. Since the species is threatened, the cultivation of species within the distribution range will be the ideal approach to conserve it and it could be a good income generating source to the local farmers.

**Keywords:** Medicinal plants, *Picrorhiza kurrooa*, Exploitation, Cultivation.

India is gifted with a rich wealth of medicinal plants. The Himalayan region is one of the well defined and better known phyto-geographical regions of the Indian subcontinent. It is extremely rich in plant life and abounds in genetic diversity of MAP (Rao 1994), with large number of peculiar medicinal plants in different habitats such as alpine meadows, rocks, moraine, rivulets, ponds, lake etc.

Medicinal plants are essential natural resource which constitutes one of the potential sources of new products and bioactive compounds for drug development (Gangwar et al. 2010). It is estimated that 60% of the world population and 80% of the population of developing countries rely on traditional medicine, mostly plant drugs, for their primary health care needs (Shrestha and Dhillion 2003). Traditional medicinal uses contribute significantly to such drug development. Himalaya has been a potent source of important medicinal herbs. The medicinal values of some of these plants are mentioned in the oldest Hindu scriptures viz. Rigveda, which is said to be source of Ayurvedic medicine system. Today majority of world’s population is running behind the herbal medicinal system because of their efficacy, safety and lesser side effects. Due to increasing national and international demand, the medicinal plants are facing continuous exploitation from their natural pockets. This initially uncontrolled exploitation along with several other factors like destruction of habitat, overgrazing and tourism development etc. is fast leading to deterioration of important plant habitats and selective eradication of commercially more valuable plants (Badoni and Badoni 2001). India is one of the world’s major exporters of raw herbal drugs and the Himalaya is renowned for the vast storehouse of medicinal plants. One of such important medicinal plants of Himalayan region is *Picrorhiza kurrooa* commonly known as Kutki or Kadwi (Figure 1).

*Picrorhiza kurrooa* Royle ex Benth belongs to the family Scrophulariaceae and is found in the Himalayas from Kashmir to Sikkim at an elevation of 2700-4500m (Figures 2 and 3). It is a perennial herb with elongated stout, creeping stolon. Leaves almost radical, spathulate, sharply serrate; flowers white or pale blue to purple, in a dense terminal spicate raceme; fruit ovoid capsule.

Kutkin is the active principle of *P. kurrooa* and is comprised of Kutkoside and the iridoid glycoside picrosides I, II and III. Other identified active constituents are apocynin, drosin and, nine cucurbitacin glycosides (Weinges et al. 1972; Stuppner and Wagner 1989). It is considered to be a valuable bitter tonic, antiperiodic, chalagouge, stomachic, laxative in small doses and cathartic in large doses, and useful in drop-
P. kurrooa has been used to cure cardiac ailments (Kumar et al. 2001). In traditional medicine, it has also been used to cure hepatitis, abdominal pain, stomach disorder, anemia, jaundice and for promoting bile secretion (Anandan et al. 2000). Picroside I, Picroside II and Kutkoside are the naturally occurring free radical scavenging principles present in the root and rhizome of P. kurrooa (Rastogi et al. 2001; Russo et al. 2001). The antifungal potential of alcoholic extract of P. kurrooa was tested against the fungi, Candida albicans. The extract of kutki and its major constituent exhibited significant activity against the fungi (Mandloi et al. 2010).

High market demand of P. kurrooa has caused ruthless extraction from the wild and illegal trade contributing to endangerment of the species. The species is collected by the low income groups and traders in an unscientific manner, which adversely affects the availability of plant. The increasing domestic and international trade of herb, coupled with concern about its fast shrinking population, prompted the inclusion of P. kurrooa in CITES Appendix II. In a

Figure 1. Natural habitat of Picrorhiza kurrooa.

Figure 2. Picrorhiza kurrooa.

Figure 3. Picrorhiza kurrooa in nature.
Conservation Assessment and Management Prioritization workshop for medicinal plants of Northwest Himalayan states of Jammu & Kashmir, Himachal Pradesh and Uttarakhand, held at Shimla in 2003. *P. kurrooa* was assigned endangered status in J&K and H.P. while its status in Uttarakhand was declared as Critically Endangered (Ved et al. 2003). Indiscriminate collection of medicinal plants from wild has caused ayurvedic and pharmaceutical industries to face problems due to insufficiency of the plant material. Taking into account the above crisis, cultivation of medicinal plants will be the ideal system. This will ultimately reduce the pressure on wild sources.

In order to save this herb in its natural habitat, the cultivation in the high altitude region is the most effective way to sustain conservation. Through proper extension and training program local farmers can be provoked to promote the cultivation practice of threatened medicinal plants. By developing agro techniques large scale cultivation will not only meet the growing demand but also reduce the pressure on natural stands of these medicinal plants. Further proper trading facilities should be provided to the farmers, so that the cultivated material could directly reach to the industry through a proper channel. Majority of the business organizations, the mass-market, over-the-counter pharmaceutical companies as well as the larger herb companies, prefer cultivated material, particularly since cultivated material can be certified biodynamic or organic (Laird and Pierce 2002). For cultivation of *P. kurrooa*, an altitude of 2200 m asl was regarded as best for higher production and cost benefit analysis after third year of cultivation indicated benefits of Rs 87,600/ha based on maximum production (Nautiyal et al. 2001). Through this local people could get source of income and self employment. Extensive field survey made by the authors revealed that different natural pockets of the species indicate remarkable variations in morphological features of the plant. Such variation could be indicative of differences in the active content of the plants. Garhwal Himalayas have large number of natural pockets of Kutki, and the superior population could be identified by chemical characterization. Further, mass multiplication of the promising population for commercial cultivation is required, so as to ensure high quality and better profits to the farming communities as well as better raw material to industry. Therefore considering the high medicinal potential and global trade of *P. kurrooa* conservation through cultivation could definitely save the natural pockets of this valuable herb which is under tremendous pressure.

References


