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Cordyceps sinensis: fungus inhabiting the Himalayas and a source of income

Cordyceps sinensis is a parasitic fungus which infects the lepidopteran larva. The infected larva is commonly known as fungus caterpillar and is valued for its medicinal properties. In Uttarakhand it is locally known as 'keera jari' and is usually found in the meadows at a height of 3,500–5,000 m asl. The larva is infected by the fungus at the end of autumn; it slowly infects the whole body of the larva resulting in its death. During winter the larva remains buried in the soil. However, once the snow starts melting the fungus-infected larva sporulates giving rise to a shoot-like structure (Figure 1). Due to its potential medicinal value, *C. sinensis* has a huge market and is highly priced. Its collection therefore has become a good source of income for the locals. However, over-exploitation is alarming.

In Uttarakhand, *C. sinensis* is primarily found in Chiplakot, Ultapara, Brahmkot, Najari and Nangnidhura–Munshyari region of Pithoragarh district and Ghat, Dewal, Niti and Mana valleys of Chamoli

district. However, as the resource and collection of *Cordyceps* is rare and difficult, the supply often falls short of demand. In Central Himalaya, the harvesting season begins in April and continues up to May. The local collectors camp together with friends and family for collection, and then sell it to the authorized agencies such as the Forest Department Corporation. The non-residents (outsiders who migrate to the collection areas) are predominantly male, while local collectors display a more even male–female ratio. The collection method varies – some use a knife or dig a small hole to carefully pull out keera jari from the ground. The caterpillar fungus is more valuable before it sporulates or early during sporulation. In the final stages of sporulation the host larva becomes soft and undesirable and the upper part of the mushroom sometimes splits.

Well known for its medicinal value, keera jari contains chemically active compounds cordycepin (deoxyadenosin) and cordycepic acid^{1,2}, which are known to increase the cellular ATP. Many complex polysaccharides, proteins, sterols, vitamins, nucleosides^{3,4} and different types of sugars – mono, di and oligosaccharides are also found. It is often used by athletes to boost their stamina. Several studies have also indicated the use of *C. sinensis* in the Chinese and Tibetan systems of medicine against various diseases.

Due to its potential medicinal value, keera jari is highly priced. Depending on the quality and size of the larval host, the cost varies. A kilogram of the harvest is priced INR 4–5 lakhs in the Indian mar-

ket or INR 200–500 per piece. However, the international market offers US\$ 25,000/kg. This has enthused local collectors to collect keera jari on a large scale. The State Government, through Van Panchayats and the Forest Development Corporation, is also engaged in the collection and marketing of this important species. The Government offers INR 50,000/kg. Hence, the economic condition of this region has seen significant improvement. However, variation in the price offered by the Government and the market allows illegal collection. This calls for conservation and demands regulation to control over-exploitation. We suggest that the collection of keera jari should be done in alternate years. The Government of Uttarakhand should take stringent steps to curb illegal collection and supply.

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Figure 1. Fruiting body of *Cordyceps sinensis* with host larvae.