

## Project Update: November 2017

The alpine meadows in the Himalaya lying between the tree and snow lines function as sponges by absorbing melting snow and acting as natural water towers. They typically have high herbaceous species richness and with plants that are adapted to harsh climate. The plants in these high altitudes (3,000 to 5,000 m) have only a short growing season. Moreover, most of the high alpine habitats of the Indian Himalayan alpine region are actually stony deserts with perpetual snow and harsh environment (Fig. 1 and 2) therefore, only few vascular plant species can survive there. They have to be acclimatised for freezing temperatures, high winds and for a short growing season. The pristine alpine meadows of the Himalaya support many species that provide the leaves, tubers and rhizomes for traditional medicines. Caterpillar fungus flourishes in subalpine and alpine grasslands of gentle mountain slope of the Tibetan Plateau and Himalaya. The species is comprises of a completely mummified larva, filled and coated with mycelia, with a slender, brown, club-shaped fruiting body that usually emerges from the ground just above the eyes of the larva. This fruiting body is often about twice the length of the caterpillar body and protrudes from the ground.



**Figure: 1.** Caterpillar fungus' habitat (alpine pasture) covered with snow in the winter season

The project team has visited in alpine meadows of the Askot landscape to investigate habitat of caterpillar fungus and its associated vegetation composition as well as ecological threats. During the field visit, maximum parts of the alpine pasture were covered with snow (Fig. 1). However, proposed project activities for the estimation of associated vegetation composition by seasonal (winter) quadrat

sampling in the caterpillar fungus' habitat have been conducted (Fig. 4). Each sampling plot has been marked and precise GPS location has been recorded. To cover more area in each study site, the team has maintained a gap of at least 100 m in among the plots. The team has also conducted experiments to measure environmental abiotic factors (slope, temperature, alleviation aspects etc.) and collected soil samples for analysis of edaphic parameters (pH, moisture, water holding capacity, organic matter, nitrogen, phosphorus, potassium etc.) in the laboratory.



**Figure: 2.** A typical habitat of caterpillar fungus without any human presence (anthropogenic pressure) in off harvesting season

In the alpine meadows of the Indian Himalayan region, people depend on ecosystem services for their livelihood and sustenance. Since the lower altitude grazing lands are limited in the Askot landscape, the practice of summer migration to the higher altitude alpine meadows are necessary to sustain the number of livestock. The duration of their stay in the meadows depends on availability of fodder and local weather like snowfall and precipitation. During the field visit, shepherds were coming back with livestock to their respective villages to spend the winter (Fig. 3). The team has also visited them in villages to document traditional grazing system and their ecological knowledge of the alpine ecosystems. Each pasture has grazing rights, usually belonging to particular village. There is view that the pasture and their management are as old as the settlements there, pasture allocations having been made by the villages elders without any interference from the rulers. The information related to pasture ownership is also available in old documents. Most decisions and disagreements on pasture use are resolved by the traditional administration body like *Van Panchayat* (forest council). Nowadays, each village has also a *Panchayat* (village council), which is elected democratically, and can also be approached resolved the issues related local issues.



**Figure: 3.** Shepherds returning from alpine meadows with herd of goats and sheep



**Figure: 4.** Project team during quadrat sampling in the alpine meadow (caterpillar fungus' habitat)

The degradation of alpine meadows is a major conservation concern because they support numbers of threatened, endangered and endemic flora and fauna. They also provide ecosystem services to rural dwellers of the Himalaya. There are various

ecological issues linked with caterpillar fungus' harvesting, grazing and firewood collection from the pastures. During this field visit, project team has completed planned assignment successfully and made many field observations. For instance, livestock grazing and extraction of medicinal plants including caterpillar fungus by the pastoral communities go together. Consumption of firewood is very high around tree line and sub-alpine zones of the landscape. There are also indicators of grass land degradation and natural tree line in many parts of the landscape has lowered considerably that may be a result of increased anthropogenic activities associated with caterpillar fungus harvesting, pastoralism and chopping of woody vegetation from more than a decade.



**Figure: 5.** Goriganga valley of Askot landscap enveloping the pristine habitats for caterpillar fungus