GOLD NUGGET

Soil Biodiversity And Ecoregions – Montane Grassland And Shrubland

Montane grasslands and shrublands located above the tree line are commonly known as alpine tundra, and occur in mountainous regions around the world. This major habitat type includes the Puna and Páramo in South America, subalpine heath in New Guinea and East Africa, and the steppes of the Tibetan Plateau. Montane grasslands and shrublands, particularly in subtropical and tropical regions, often evolved as virtual islands, separated from other montane regions by warmer, lower elevation regions, and are frequently home to many distinctive and endemic plants which evolved in response to the cool, wet climate and abundant tropical sunlight.

The páramos of the northern Andes are the most extensive examples of this habitat type. The heathlands and moorlands of East Africa, Mount Kinabalu of Borneo and the Central Range of New Guinea are all limited in extent, extremely isolated, and support highly endemic biodiversity. Drier, yet distinctive, subtropical montane grasslands are found in the Ethiopian Highlands, Zambia and southeastern Africa. A unique feature of many alpine grasslands is the presence of distinctive plant species. Montane grasslands form where sediments from the weathering of rocks have produced soils that are sufficiently well-developed to support grasses and sedges. Because of the elevation, in some areas, such as the highest zones of the Tibetan Plateau, plants are not able to grow and the soil is covered by a biological soil crust which influences soil-living organisms.

Montane grasslands are fragile habitats, exposed to several pressures due to their challenging climatic and soil conditions. Excessive ploughing, overgrazing, burning and growing populations are especially evident. Of these overgrazing has the greatest negative impact on montane habitats. This leads to modifications of the vegetation structure and alteration of soil biodiversity associated with those plant species. In extreme cases, very heavy grazing and trampling can lead to exposure of bare soil and erosion, with a possible further reduction of soil life. Because of their distribution and relatively limited accessibility, soil biodiversity in alpine grasslands has not been extensively investigated.

Soil biodiversity

Most studies on soil biodiversity in montane grasslands have been conducted in the Tibetan Plateau. For instance, about 30 arbuscular mycorrhizal fungal species were isolated in two different analyses. Soil biocrust from the Tibetan Plateau was also analysed, and an increase of the cyanobacterial biomass was observed with increasing elevation. The soil microfauna of Tibetan grasslands was also studied. A study of nematode communities along a grazing gradient, from low to high intensity, retrieved a total of 37 genera with, interestingly, the highest richness in the areas subjected to high levels of disturbance. In particular, nematodes feeding on plants and bacteria were the most well adapted to those conditions. A good example of an endemic species is the Ethiopian African mole-rat that lives exclusively in the high plateau of Ethiopia, from 3 000 to 4 150 m. It is a solitary, aggressive animal living underground in a system of foraging burrows, where it creates a deep nest with a toilet area. The species density is typically 36 individuals per hectare, but reaches 90 individuals/ha when conditions are favourable. It prefers soil depths below 50 cm, and its burrowing activity aids in the aeration and mixing of soil and enhances infiltration of water, thus curtailing erosion. There are also other burrowing rodents endemic of alpine grasslands requiring further evaluation.

Soil Lovers say: ***Plant And Animal Species Still Cycle In Extreme Environments***

Ref: **A Global Atlas of Soil Biodiversity p84**