



Soil Biodiversity And Ecoregions – Tropical And Subtropical Forest

Tropical forests can be found in Asia, Australia, Africa, South America, Central America, Mexico and on many of the Pacific, Caribbean and Indian Ocean Islands and can be characterised in two words: hot and wet. Year round mean monthly temperatures exceed 18°C during all months and average annual rainfall is not less than 250 mm and can exceed 1 000 mm.

Between 40 % and 75 % of all biotic species are indigenous to rainforests. Rainforests are home to half of all animal and plant species on the Earth. Two-thirds of all flowering plants can be found in rainforests. A single hectare of rainforest may contain 42 000 different species of insects and up to 1 500 species of higher plants. Rainforests are divided into different layers, with vegetation organised in a vertical pattern from the top of the soil to the canopy. Each layer has a unique biotic community containing animals adapted for life in that particular layer. Four layers are distinguishable:

1. the forest floor, the bottom-most layer, receives only 2 % of sunlight
2. the understory layer lies between the canopy and the forest floor
3. the canopy layer is the primary layer of the forest forming a roof over the two remaining layers
4. the emergent layer is unique to tropical rainforests, while the others are also found in temperate forests. It contains a small number of very large trees, called emergents, which grow above the general canopy, reaching heights of 45 - 55 m; occasionally, a few to a height of 70 - 80 m

Soil biodiversity occupies the litter layer of the forest floor. The numbers of organisms found in tropical soils are huge and may host the main part of soil invertebrate biodiversity.

In addition, tropical forests host a wide diversity of invertebrates that are rare or absent from any other biome but that may have found an ultimate refuge in this kind of environment. The occurrence of giant earthworms is another characteristic of tropical soils along with small earthworm species. Earthworms are more abundant in humid areas and are also sensitive to the nutrient status and organic contents of soils. Communities dominated by litter-feeders are associated with poor soils from South America and Africa, whereas earth-eating organisms are characteristic of the rich, neutral soils of Mexico.

Social insects are the most abundant and diverse components of soil invertebrate communities in tropical forests. Tropical forests of Amazonia, for example, may host more than a hundred species at a single location. Whilst fungi-growing species are only found in Africa and some parts of Asia, fungus-growing termites and ants can build impressive and long-term nests containing millions of workers, and the agricultural symbiosis with fungi has allowed them to occupy previously inaccessible niches that have abundant resources.

The surface of tropical soils are characterised by large amounts of decaying material that support great numbers of fungal diversity. About 1 700 different species were identified across three major tropical forests in the western Amazon Basin. Distribution of fungi varies not only at spatial but also at temporal scales because of the disturbances caused by seasonal changes in rainfall. It has been shown that pathogenic fungi may have a positive effect on plant biodiversity in tropical forests, by acting as a sort of diversity police. Indeed, these fungi spread quickly between closely packed plants of the same species, preventing them from dominating and enabling a wider range of species to flourish.

Farming Secrets says: Our World Depends On Maintaining And Supporting Tropical Forests

Ref: A Global Atlas of Soil Biodiversity p78