ENVIRONMENT

The other Tropical Ecosystems

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RAIN-FORESTS have existed for millennia and are home to over half of the biodiversity found in the world. But there are other tropical ecosystems present in the world besides rainforests, namely tropical savannas and deserts. Let's take some time to learn about the other tropical ecosystems found in the neotropics, which we call home.

There are two types of tropical savannas, those that arrive from a variety of climatic or edaphic factors. The savannas that arise from the former set of conditions are termed seasonal savannas and the latter is a non-seasonal savanna.

When most people think of savannas they think of large expanses of land covered in grass, and this has some truth to it. The vegetation found in these savannas is generally low and herbaceous and is dominated by grasses and sedges. However, there is a canopy layer present, which is usually restricted to the ground and in some places, an irregular tree layer.

This low canopy layer and vegetation is due to the low primary productivity or periodic removal of biomass in this ecosystem and this is the case in non-seasonal savannas where fire acts to periodically remove the biomass which is the energy source for this ecosystem from it; so that it is hampered from succeeding to become a dry forest. The biomass can also be removed by grazing, for example in Africa where large herds of herbivores like antelope and gazelles have kept the ecosystems in their current state. However, this is not the case in all non-seasonal savannas where the limiting factors can by the soil present in the area.

Some of the adaptations that the vegetation found in tropical savannas, have developed to deal with the environment include thick leathery leaves and the presence of sub-surface perenniating organs as well as an annual regeneration life strategy. Another survival strategy includes resistance or avoidance of fire, for example, Coratella Americana, which can resist fires due it thick, bark. The plants found here can also tolerate these conditions by either reducing photosynthesis or send down roots.

One of the conditions found in seasonal savannas is that the soil gets waterlogged. Hence the vegetation found in here are adapted to such conditions, for example by having root aeration structures as well as water dispersal of reproductive structures.

Trinidad is home to both types of tropical savannas; with seasonal savannas found in the southwest of the island in Erin Savannas and non-seasonal savannas found in the Aripo Scientific Reserve in the northwestern part of the island. The biomass of the first is limited by fires while that of the latter is restricted by poor soil conditions.

Tropical deserts are the second type of tropical ecosystems we will deal with and are found at latitudes of 30o North and South of the Equator but are centered around 23 1/3o. Unlike non-seasonal savannas tropical deserts do not usually have fires, as there is not enough primary productivity (vegetation) to support them.

The vegetation in these ecosystems is usually restricted to widely spaced low growing clumps of grass and shrubs. They are widely spaced to avoid competing with each other. Also these clumps are quite small as there is not enough biomass present in each for them to expand. However, the canopy can become more dense and higher in more favourable microclimates, for example, in a basin or ridge where rainfall is higher.

Some of the adaptations by tropical desert plants include leathery leaves or photosythtic stems, as well as the reduction of the leaf area in some cases to zero. The latter is the case in the Prickly Pear cactus (Opuntia sp.) where the needles of the cactus are actually reduced leaves.

As to be expected, primary productivity in these ecosystems is very low and occurs in short sections whenever rainfall occurs, while at other times it can be essentially zero.

Some plants survive arid conditions by sending out large taproots to ground water sources so they can photosynthesise and stay green throughout the year, for example, Date palms. Other plant species may close to stay in stasis for most of the year and when water is available the stomata will open and photosynthesis will occur like mad. Nutrients are also released when water is available so nutrients are released after rainfall. While other plant species avoid dry conditions completely and shed their leaves and retreat to seeds. When they sense water they will germinate to take in water and nutrients and grow and shed more seeds. These plants cannot really be termed annuals since rainfall events are not annual and the seeds can survive between three to five years between rainfall events.

They may not be as diverse in species diversity as tropical rainforest but they do contribute to the diversity of the worldwide flora and fauna. So next time you hear the words "biodiversity" and "tropics" in the same sentence, give some thought to the other tropical ecosystems.