CHEMICAL DIVERSITY

Searching for Biocides in the Tropical Forests in El Edén Ecological Reserve, Quintana Roo, Mexico.

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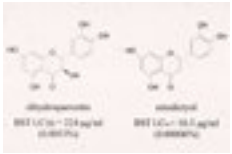
An innovative chemical diversity project is being conducted at El Eden in parallel with the biodiversity assessment project. The objective of this project is to understand the distribution of secondary compounds in the different ecosystems through a **chemical screening** of the most important species found in the permanent plots. Biological interaction studies will complement the information of the selected species for chemical screening. Extracts will be done in the field for chemical analysis and different **bioassays** will be conducted for biological activity. The results of this research will contribute to a more complete understanding of the relationships between plant chemistry and animal diversity.



The potential utilization of some plant metabolites is important due to the urgent need to search for new biocides of natural origin. Advantages of these natural biocides lie in their quick and easy degradation, therefore their impact on the environment is minimal.

One of the major reasons to conserve nature is the existence of potential new chemicals that can be used in agriculture and medicine. Most of the organisms on earth is yet to be discovered as well as the bio-active compounds that they produce. So, chemical exploration can be a great contributor to biodiversity conservation.

In this project we test a methodology and research protocols that could be applied to other tropical areas. We make bioassays with seeds, fungi, nematodes, mycorrhizae, and insects to detect the potential bioactivity of metabolites produced by different organisms, particularlyplants. In

this way, we are preparing a long term project on the search of new natural products from the Yucatan Peninsula.

Periphyton of the El Edén Ecological Reserve, Quintana Roo, Mexico: A Potential Biofertilizer for Agricultural Purposes

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The periphyton is recognized as the floating biomass of the continental water bodies, permanent or temporal, of the Savanna at the El Eden Ecological Reserve. The biological composition of the periphyton is very complex. However, its main component is the algae that constitute the substrate for the bacterial community and an ecological niche for protozoa and microcrustaceous, among other organisms.

The periphyton originated in temporal lagoons, located in flooding areas of the El Eden Savanna, turns into a very evident crust that cover the soil.

Once this crust of periphyton is ground and homogenized, it shows particular physical and chemical proper ties. Among these the most relevant are:

a) a very high contents of organic matter, nitrogen and phosphorus (32, 3 and 0.8 %, respectively);

b) a high cation exchange capacity (100 meq/100 g), and

c) a high content of exchangeable K, Ca and Mg (25, 110 and 15 meq/100 g, respectively).

The richness in nutrients of the periphyton leads to consider the probable role that it had as a biofertilizer, used by the Maya people settled in that region.

Based on this hypothesis, an experimental design, entirely at random, was established, allowing a relative readily way to evaluate the effect of periphyton on the growth of some cultivated plants (lettuce, corn and tomato) as well as on the establishment of arbuscular mycorrhiza in these three species. The experiment was established under greenhous

e conditions, using plastic seedling-nursery trays. Calcimagnesic soil, poor in nitrogen and phosphorus was used. This soil had shown a good mycorrhizal potential (80 propagules/g of dry soil).

To determine the role played by the microorganisms from the periphyton as well as from the soil, the experiment was carried out on both soils, sterile and none sterile.

Results of foliage dry weight on none sterile soil indicate a positive effect from the periphyton on the growth of the three plants. On tomato plants, a similar effect as that obtained with ammonium sulfate was observed. On sterile soil, the periphyton effect on the three test plants was more notable than that with ammonium sulfate. Finally, the mycorrhizal colonization percentages indicate a positive effect with periphyton on mycorrhizal establishment, markedly greater on lettuce and maize, compared with that obtained with ammonium sulfate.