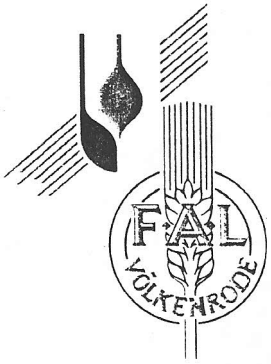

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Microorganisms in the rhizosphere of useful tropical plants

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The amazon region maintains the largest intact tropical rain forest, but after opening the forest by slash and burn it cannot provide a permanent agriculture. The main reason is that soils of the central and eastern Amazon Basin are old, highly leached, and low in available nutrients (Stark 1971, 1977). The mechanism which allows the primary rain forest to produce high biomass under these conditions lies in effective root systems for the retention, absorption and recycling of nutrients. On Oxisols, the roots are near the surface, and in some places form a top on the mineral soil. Some authors discussed that mycorrhiza, bacteria and non-mycorrhiza forming fungi within the root mat could contribute to the nutrient conserving mechanisms. In case this hypothesis is right the destruction of the root mat and the associated microorganisms (during clearing and burning for agriculture) will take away the nutrient conserving mechanisms and nutrient loss from the ecosystem soon follows.
There has been little attention on the role of microorganisms other than mycorrhizal fungi and their role in nutrient cycling at the rhizosphere interface in tropical plants.
In 1994 we started a collection of bacteria and fungi from *Theobroma grandiflorum* (Willd. ex Spreng.) Schum. and *Bactris gasipaës* H.B.K. in order to analyse species composition and the ability of selected isolates to solubilize phosphate from $AlPO_4$. Estimation of MPN (most probable number) was done, too.
Both species reveal high numbers of fungi and bacteria at the inner rhizosphere (2-10 mm) and a lower amount at the outer rhizosphere (10-20 mm). The number of bacteria and fungi differed between the plant species. In root systems of *Theobroma grandiflorum* up to 10^2 more bacteria and 10^2 more fungi were formed at the inner rhizosphere as in root systems of *Bactris gasipaës*. Thus the two species obviously have considerable influence on the composition (quantitative and qualitative) of microorganisms, presumable caused by root exudates. Therefore further investigation on root exudates composition is necessary.
Furthermore, the root system of these plants has to be analysed in detail. *Bactris gasipaës* reveals a gross root system while *Theobroma grandiflorum* had a very extensive system of fine roots.
Findings on P-solubilizing *Sphingomonas* strains will be presented.