

Mycorrhizal situation of native trees in the Brazilian tropical ecosystems Varzea, Igapo, Terra firme and Cerrados

Falko Feldmann*, Jeanne Miranda+, Aparecida d. G. C. Souza#

* Angewandte Botanik, Marseiller Str. 7, 20355 Hamburg, FRG

+ CPAC/EMBRAPA, Planaltina, DF, Brasil

CPAA/ENBRAPA, Km 28, Am 010.C.P.319, Manaus, AM, Brasil

A lot of tropical trees became useful plants of a great economic potential. Autecological studies on useful plants are one of the most important steps on the way to a plant production system which respects the plants' natural demands. One of the most important biological ecofactors are mycorrhizal fungi. Some of the useful plants are already known to be mycorrhizal, but it is seldom known to which extent the plants depend on the mycorrhizal symbionts. Field studies on the occurrence of the symbiosis under different environmental conditions give a first information about the importance of the symbiosis for the plant at its natural stands.

In this contribution results from a survey on the occurrence of mycorrhizal spores and the root colonization of trees in different tropical ecosystems are demonstrated. The ecosystems Cerrados, Terra firme, Igapo and Varzea mainly differ in the water regime and in the availability of nutrients in the soils. The selected trees were *Hevea* spp. (*H. brasiliensis*, *H. benthamiana*, *H. spruceana*) and *Theobroma* spp. (*T. cacao*, *T. grandiflorum*). It was observed that *Hevea* spp. never occurred without root symbionts, while *Theobroma* spp. sometimes did not form the symbiosis.

In Cerrado soils, introduced *Hevea* spp., cultivated in very acid soil conditions (pH 4.0), have been observed to be associated with different species of endomycorrhizal fungi, like *Acaulospora rehmi*, *Acaulospora scrobiculata*, *Scutellospora reticulata*, *Glomus manihotis* and *Glomus occultum*. Though, root colonization by this native mycorrhizal population was very low.

The most intensive root colonization of the rubber tree was observed at water influenced stands (Varzea, Igapo). *Theobroma*, a genus which occurs mainly on terra firme, showed a lower or no root colonization by mycorrhizal fungi at stands with the best nutritive conditions.

The spore number at every *Hevea* or *Theobroma* stand was very heterogeneous, probably due to the sporulation behaviour of different fungal species than to differences in the environmental conditions.

To test the dependency of the trees they were inoculated with a selected isolate of *Glomus etunicatum* under favourable growing condition for the plants in a greenhouse experiment. *Hevea* was colonized intensively and the growth was stimulated by the symbiosis.

Theobroma was only slightly colonized and the growth was not significantly stimulated. The conclusion was drawn that both plant genera are mycotroph, but *Hevea* probably will be recognized in further investigations as obligately mycotroph, while *Theobroma* seems to be only facultatively mycotroph.