



## Research project of counterparts funded at IPB

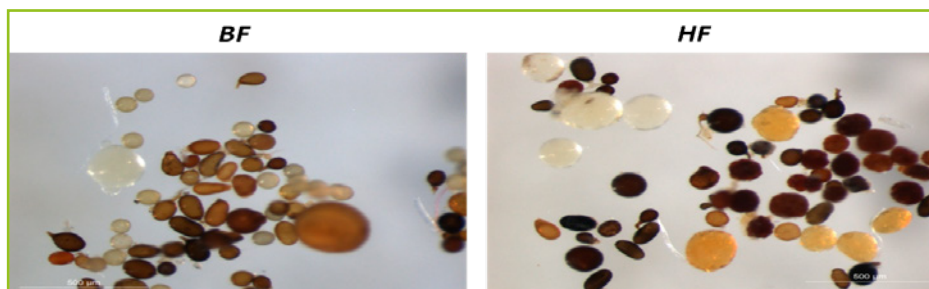
Name	Counterpart	Title
Sri Wilarso Budi	B07	Diversity of arbuscular mycorrhizal fungi in Bukit Duabelas and Harapan Forest, Jambi Province

### Background and methods

Mycorrhizal fungi play important roles in fostering plant nutrition and growth. The presence and functionality of mycorrhizal symbiosis in agrosystems can be affected by several factors such as vegetation removal, agricultural practices, soil properties and application of fertilizers. The objective of the present study was to determine the diversity of arbuscular mycorrhizal fungi (AMF) in lowland rain forests located in Bukit Duabelas National Park and Harapan Forest Jambi Province in comparison with rubber and oil palm plantations and agro-forest systems (see photo).

### Results

The number of AMF spores per soil mass was lowest in the lowland rain forests in both areas, Bukit Duabelas and Harapan. The abundance of AMF spores was negatively related to the availability of phosphorous (P) in the soil as well as to soil organic matter. The disturbance of the ecosystems by intense management seemingly influenced spore abundances. In contrast, the diversity of spores, based on their morphology, was higher in the soil of lowland rain forests than in the other land use systems. Further research on AMF diversity in soil is currently being conducted. It is also necessary to investigate whether increases in spore abundance indicate loss in soil fertility in rubber or oil palm plantations or loss of host species.



**Figure 1.** Examples for spores extracted from soil of Harapan and Bukit rain forests (HF and BF). Please note that the size, color and shape of the spores differ because they represent different arbuscular mycorrhizal fungal species.

The objective of the present study is to determine the diversity of arbuscular mycorrhizal fungi (AMF) in lowland rain forest located in Bukit Duabelas National Park and Harapan Rainforest in Jambi Province. Analysis of the number of AMF spores showed that there was variation in four types of ecosystems, both in Bukit Duabelas and Harapan Rainforest. The number of spores in the forest ecosystem was lower than in rubber plantations, oil palm plantations and jungle rubber, both in Bukit Duabelas and in Harapan Rainforest. The disturbance of ecosystems seems to influence the abundance and distribution of AMF spores. On the contrary, based on the morphology of the spores, the number of different spore types found in the forest ecosystem was higher than in the other ecosystems, both in Bukit Duabelas and in Harapan Rainforest. This means that the transformation of land may decrease the diversity of AMF species, but increase the number of spores. Further research is needed to know whether the transformation of ecosystems to rubber or oil palm plantations decreases soil fertility.