

Year of CfP: 2009

Project No 0901-001

Project title: Has <i>Ceratonia siliqua</i> set up a joint venture with mycorrhizal and nitrogen fixing symbioses? Potential for early tree growth and orchards implantations
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Unit managing the project: LSTM (Laboratory of Tropical and Mediterranean Symbioses) [CIRAD, INRA, IRD, Montpellier SupAgro, UMII]

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Countries involved in the project: Morocco

Sub-thematic axes: IPB-1 (Integrative Plant Biology 1: *Genetics and genomics, plant breeding, ecophysiology*), STDI-1 (Socio-Technical Dynamics of Innovation 1: *Agri-environmental innovations, agri-ecosystems, resources management*)

Objectives:

According to the Moroccan forest ministry, 12.5% of the territory is occupied by forest stands, whereas 56% of the territory remains available to forest or agroforest implantation. Among native tree species carob tree (*Ceratonia siliqua*) is an emblematic species in Morocco particularly due to its multipurpose uses for farmers (human and forage uses, mixed agroforestry systems, ornamental ...) and at industrial levels (carob flour, gelification, cosmetics, pharmaceuticals, and food additive). *Ceratonia siliqua* thus constitutes one of the major cards in the diversification of productions and cash incomes for small farmers.

Ceratonia siliqua is non nodulated but depends on arbuscular mycorrhizal (AM) symbioses for its development. Some results suggest that in ancestral legumes nodulation would not occur, but a primitive form of nitrogen fixing association would result from AM infection as a "vector" of bacteria to the intercellular compartment. Additionally a number of studies have reported the natural occurrence within AM fungi of nitrogen fixing bacterial strains.

The overall objective of the project is to depict how these arbuscular mycorrhizal symbioses could be the hidden and obligatory vector of an un-described nitrogen fixing association, both associated partners optimizing the survival of young plants in orchards.

Total Agropolis Fondation funding: €30,000 (running costs, travel expenses)

Funding category(ies): Agropolis Fondation small grants (support for small exploratory, risky and innovative projects, « proof of concept », new frontier research..., and support to pre-doctoral students)

Project duration: 24 months

Keywords: mycorrhiza – fungi - nitrogen – symbioses – growth – tree – orchard – *Ceratonia siliqua*