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ABSTRACTS BOOK

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In the intimacy of an old Mediterranean affair between a fruit tree and a microbiota: perspectives in conservation and agroecology

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The carob tree, *Ceratonia siliqua L.* (Leguminosae), is an important component of Mediterranean thermophilous woodlands and traditional rural landscapes. It is currently used for industrial, agricultural and soil restoration purposes. Its exploitation have known an important decline in favour of other fruit sectors despite its high production yields even in marginal soils under semi-arid climate. Recently, the carob is making a dynamic come-back to human nutrition as functional food and its tolerance to water and nutrient deficiency make it a key model for sustainable agriculture and food production. Since its domestication in the Middle East around 6,000-4,000 years BP, the carob tree, has probably experienced extensive genetic and physiological modifications conducing to potential changes of a major compartment of its functioning: the plant microbiota. Indeed, the carob tree is highly dependent of arbuscular mycorrhizal symbiosis, and some evidences tends to demonstrate the role of other microbial compartments in its functioning. In the framework of the international projects DYNAMIC and BARACA, a holistic ecological approach and experimental implementations were applied to estimate several proxies of the carob tree-microbiota interactions. First, soil carob-based agroecosystems and carob genetic structure were characterized at the Mediterranean scale, and compared to carob microbiota. Second, the efficiency of different types of carob-microbiota associations regarding carob growth and water deficiency tolerance was evaluated in controlled conditions. The results provide new insights into the carob evolutionary history, rejecting previous hypotheses, and demonstrate the domestication (cultivated vs wild) and genetic (evolutionary significant unit) legacy on the carob microbiota structure. Experimental carob-microbiota associations strengthened the importance of mycorrhizal symbiosis as well as certain members of rhizosphere microbiota in improving carob growth and physiology. Perspectives for the development of more efficient strategies in conservation and agroecology based on tree-microbiota management, and the need to associate wild biodiversity in cultivated areas are discussed.

Keywords: carob, symbiosis, microbiota, agroecology, domestication.