ABSTRACT BOOK

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Black pepper (Piper nigrum) – Arachis pintoi intercropping system in the Central Highlands in Vietnam: Impact on the soil fertility and the diversity of native rhizobia

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Abstract

Vietnam is leading the growth of black pepper worldwide, accounting for more than one-third of the global production. However, this is achieved by the intensive use of chemical fertilizers and pesticides, causing pollution to the environment and reduction of soil health. Overall, it favors the development of soil-borne pathogens, such as *Fusarium*, *Phytophthora*, and *Pythium*/*Phytopythium*. *Arachis pintoi* is a legume that can contribute to biological nitrogen fixation (BNF), due to its symbiosis with rhizobia. It is widely planted as a cover crop to reduce soil erosion, suppress weeds, control several pests and soil-borne diseases. For instance, in Vietnam, *A. pintoi* has been intercropped with black pepper to enhance soil health and sustain the yield. However, its impacts on reducing weeds, pests and soil-borne pathogens remain largely unknown. Meanwhile, limited information is available about the rhizobia nodulating *A. pintoi* in Vietnam.

In this study, we investigated the impact of *A. pintoi* intercropped in black pepper plantations in Gia Lai and Dak Lak provinces in the Central Highlands in Vietnam. Soil samples were analyzed, and the results showed that plantations intercropped with *A. pintoi* significantly improved the total nitrogen. Besides, nodules of *A. pintoi* from these provinces were collected and screened for their rhizobial strains. The intergenic spacer (IGS 16-23S) region of the rhizobial DNA was amplified by PCR, and restriction was digested with two enzymes (MspI and HaeIII) to group rhizobia based on their restriction profiles. During the initial phase of our project, 38 strains have been isolated from 108 nodules and grouped into 13 different groups. The objective is to identify elite strains associated with *A. pintoi* and to formulate effective rhizobial inoculants to allow effective BNF by this legume, hence, reducing the need for fertilizer inputs, and assisting in soil health restoration of black pepper plantations.

Keywords : Arachis pintoi; Black pepper; Rhizobia; Soil health; Vietnam