

RESUMEN DEL SEGUNDO SEMINARIO INTERNACIONAL DE SANIDAD AGROPECUARIA (SISA)

Potencial of *Bacillus pumilus* (CCIBP-C5) against *Mycosphaerella fijiensis*

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**Mileidy Cruz-Martín^{I*}, Eilyn Mena^I, Mayra Acosta-Suárez^I, Miguel Tzec Simá^{II}, Berkis Roque^I,
Michel Leiva-Mora^I, Tatiana Pichardo^I, Blondy Canto Canche^{II}, Yelenys Alvarado-Capó^I**

^IInstituto de Biotecnología de las Plantas (IBP). Universidad Central Marta Abreu de Las Villas. Carretera a Camajuaní
km 5.5. Santa Clara. Villa Clara. Cuba. CP 54 830. *E-mail: mileidy@ibp.co.cu.

^{II}Centro de Investigación Científica de Yucatán (CICY), Mérida Yucatán, México.

Black sigatoka, caused by the fungus *Mycosphaerella fijiensis*, is the most important disease of banana and plantain crops worldwide. This fungus dramatically reduces plant photosynthetic area and causes premature ripening of fruits. Associated microorganism of crops either in the phyllophere or rhizosphere have been used for the control of different pathogens. Induced systemic defense response in plants have been reported as one of the mechanisms by which these microorganism reduce the disease in plants in conjugation with other mechanisms including direct antagonism and antibiosis. Bacteria isolated CCIBP-C5 from the surface of banana leaves was selected for *in vitro* antagonism against *Mycosphaerella fijiensis* and was identified by molecular and biochemical techniques. The effect of cell free culture (CF) of bacterial strains against *M. fijiensis* was evaluated *in vitro* and in *Musa* plant inoculated in greenhouse. The bacterial strain and their diffused and volatile metabolites produced inhibition on *M. fijiensis* mycelial growth. CCIBP-C5 strain was identified as *Bacillus pumilus* and their CF significantly affected fungal growth and induced damage and oxidative stress on mycelia. In the artificial plant inoculation study, it was found reduction of *M. fijiensis* biomass by real time PCR technique. In the leaves callose deposition was observed, this results suggested that CF was able to induce defense response in *Musa* plants. This study demonstrates that the *B. pumilus* strains CCIBP-C5 merit further investigation for possible use as biocontrol agents of *M. fijiensis*.