

6<sup>th</sup> Annual Conference on

## MICROBIOLOGY

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Annual Conference on

## MICROBES AND BENEFICIAL MICROBES

October 16-17, 2017 Baltimore, USA

**Influence of diazotrophic bacteria on growth and biomass production of sugarcane *in vitro*****A R M Solaiman<sup>1</sup>, G M A Hossain<sup>2</sup>, A J M S Karim<sup>3</sup>, G K M M Rahman<sup>3</sup> and M A Baset<sup>4</sup>**  
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An *in vitro* experiment was carried out to determine the effect of diazotrophic bacteria inoculation on growth and biomass production of sugarcane. The experiment was conducted for eight weeks starting from 05 November 2011 to 05 January 2012. Two diazotrophic bacterial strain isolated from sugarcane rhizosphere i.e. *Bacillus cereus* (BUSo 13) and *Acinetobacter calcoaceticus* (BUSo 9) and one reference strain, *Azospirillum barsilense* (SP 7) were used to conduct the experiment. Seedlings from sugarcane bud chips were used in this experiment. Hoagland solution was used to grow sugarcane seedling in test tube. Three levels of nitrogen viz., no nitrogen, 50% nitrogen and 100% nitrogen were provided for the crop. The experiment was laid out in a Completely Randomized Design (CRD) with three replications having 11 treatment combinations viz., T<sub>1</sub>: Control (no nitrogen), T<sub>2</sub>: 50% N, T<sub>3</sub>: 100% N, T<sub>4</sub>: 50% N + *Acinetobacter calcoaceticus* (BUSo 9), T<sub>5</sub>: 50% N + *Azospirillum barsilense* (SP 7), T<sub>6</sub>: 50% N + *Bacillus cereus* (BUSo 13), T<sub>7</sub>: 100% N + *Acinetobacter calcoaceticus* (BUSo 9), T<sub>8</sub>: 100% N + *Azospirillum barsilense* (SP 7), T<sub>9</sub>: 100% N + *Bacillus cereus* (BUSo 13), T<sub>10</sub>: 50% N + mixed inoculums, T<sub>11</sub>: 100% N + mixed inoculums. The results of the experiment revealed that diazotrophic bacterial inoculation in sugarcane increased growth parameters and biomass yield significantly. The highest leaf greenness (38.67), number of leaf per plant (9.67), plant height (76.00 cm), root length (31.67 cm), dry matter yield (3.17 g), N content in plant (1.52%) and N-uptake (48.12 mg g<sup>-1</sup>) were obtained in treatment T<sub>6</sub> receiving 50% N along with *Bacillus cereus* (BUSo 13) inoculation.

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