J Biotechnol Biomater 2017, 7:4 (Suppl)
DOI: 10.4172/2155-952X-C1-080

18th Biotechnology Congress

October 19-20, 2017 | New York, USA

Effects of 1-MCP on plant growth characteristics and spikelets development under salt stress in rice

Qianyu Jin, Junhua Zhang, Jie Huang, Sajid Hussain and **Zhigang Bai**
China National Rice Research Institute, China

Statement of the Problem: Rice growth and development was badly affected by its salt sensitivity. It faces osmotic, ionic as well as hormonal (ethylene) stress due to salt stress. High ethylene production effects inferior and superior spikelets development in rice cultivars under salt stress. 1-Methylecyclopropne (1-MCP) is an excellent ethylene inhibitor in plants, which has been recently explored as an important ethylene inhibitor in rice. However, effects of 1-MCP in rice growth and development under salt stress is a novel study.

Methodology & Theoretical Orientation: Two rice cultivars, Liangyoupiejiu (LYP9, Indica) and Nipponbare (NPBA, Japonica, sensitive to salt stress) were grown in green house with three salt stress levels: 0 (Control, CK), 1.5 g NaCl/kg dry soil (Low Salt Stress, LS), and 4.5g NaCl/kg dry soil (Heavy Salt Stress, HS).

Findings: The results showed that 1-MCP significantly improved photosynthesis rate (Pn), transpiration rate (Tr), stomatal conductance (Gs), and SPAD values of flag leaf in both cultivars than no 1-MCP. It was higher effective in increasing grain weight and grain filling rate of LYP9 than NPBA under all salt levels. 1-MCP significantly inhibits ethylene production in inferior spikelets in LYP9 and NPBA than superior spikelets. Application of 1-MCP positively improved rice plant dry matter and improved grain yield and yield components for LYP9 and NPBA, especially for LYP9.

Conclusion & Significance: 1-MCP favorably improved plant growth characteristics and development of superior and inferior spikelets in rice under slat stress, LYP9 showed better performance than NPBA after application of 1-MCP under salt stress

jinqianyu@caas.cn