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Survival of rhizobacteria (RMT2NF4) with cyantraniliprole on agar medium

NICHAKARN POTA¹, TAWANCHAI KHUENDEE¹, NARIN IAMTHONGIN¹, JEERANAN KHOMAMPAI¹,
NUTTAPON KHONGDEE², YUPA CHROMKAEW¹

¹*Chiang Mai University, Dept. of Plant and Soil Science, Thailand*

²*Chiang Mai University, Dept. of Highland Agric. and Natural Resources, Thailand*

Abstract

In Thailand, sweet corn is a significant crop for the economy. It is grown over much of Thailand, particularly in the north. However, both quality and quantity are needed to produce sweet corn. Large amounts of chemical pesticides and fertilisers are therefore required. The fall armyworm damages sweet corn during early cultivation, which lowers yields. Therefore, it is imperative to use insecticides belonging to the cyantraniliprole group—a class of substances that the Department of Agriculture recommends. This study evaluated the survival of rhizobacteria (RMT2NF4) in the presence of the insecticide cyantraniliprole on nutrient agar and nutrient broth media. The research was conducted at the Soil Microbiology Laboratory, Faculty of Agriculture, Chiang Mai University, from June 2023 to March 2024. The objective was to assess the survival rate of RMT2NF4 rhizobacteria when exposed to varying concentrations of cyantraniliprole across seven levels in nutrient agar and broth cultures. The results demonstrated that RMT2NF4 rhizobacteria could grow on all media treatments containing cyantraniliprole. On nutrient agar, the highest microbial population of 3.4×10^7 cfu ml⁻¹ was observed at a cyantraniliprole concentration of 3 ml l⁻¹. Notably, in nutrient broth, the peak microbial population of 8.6×10^6 cfu ml⁻¹ was attained with a higher cyantraniliprole concentration of 25 ml l⁻¹. Overall, the survival rate of RMT2NF4 rhizobacteria ranged from 10^6 to 10^7 cfu ml⁻¹ across the tested cyantraniliprole concentrations in both media types. These findings indicate that RMT2NF4 rhizobacteria can coexist with cyantraniliprole, suggesting compatibility between this bacterial strain and the insecticide. Based on their demonstrated survival, further investigations can be pursued to evaluate the potential of RMT2NF4 rhizobacteria in promoting plant growth when applied alongside cyantraniliprole in subsequent laboratory experiments.

Keywords: Insecticide, PGPR, sweet corn