

Selective Influence of Cyflumetofen in Degradation and Ecological Risk Assessment

Linlin Shi¹, Ping Zhang², Qi Chen², Cancan Yang², Daqi Zhang², Jun Xu¹, and Lin He²

¹CAAS

²Southwest University

June 19, 2021

Abstract

Pesticide pollution has gradually caused land degradation. In order to avoid this problem, it is recommended to use enantiomeric pesticides that have less impact on the soil. The degradation of CYF enantiomers and the effect on soil functions are closely related to microorganisms. (+)-CYF enantiomer is degradable preferred and further discovered that related microorganism that degrades enantiomers. CYF enantiomers alter the bacteria structure and decreased the bacteria abundance. The combination of high-throughput and quantitative PCR results showed that the diversity of the (+)-CYF treatment was significantly lower than that of the (-)-CYF (-30.41 to 44.60) treatment and the (+)-CYF treatment (-27.80 to 56.70%) was more capable of causing the decrease in the number of soil microorganisms. In addition, (+)-CYF severely interferes with nitrogen cycling-related functions. Furthermore, the soil microbial structure was changed to its original level by enantiomers posed. In the study of nitrogen cycle function, we found that both enantiomers can restrain the abundance of nitrogen cycle-related genes, especially the (+)-CYF treatment decreased more. CCA showed that g-Massilia and g-Arthrobacter are closely related to nitrogen fixation genes and nitrification genes and degradation of the two enantiomers of CYF by g-Arthrobacter is closely related. The biological effects of cyflumetofen enantiomers remain unclear. Bioassay results show that enantiomers have similar virulence to *Tetranychus cinnabarinus*. Therefore, while achieving the prevention and control effect, the use of a single isomer (+)-CYF has a higher potential risk to the soil ecosystem.

Hosted file

MS.doc available at <https://authorea.com/users/420592/articles/526914-selective-influence-of-cyflumetofen-in-degradation-and-ecological-risk-assessment>

Hosted file

Table.docx available at <https://authorea.com/users/420592/articles/526914-selective-influence-of-cyflumetofen-in-degradation-and-ecological-risk-assessment>









