

## ABSTRACT

In this study, tea extracts were intercalated in chitosan gel to enhance the inhibitory effect of the complex on bacterial wilt in tomato. The disease caused by *Ralstonia solanacearum* can result in 100% crop loss under severe infection. Chitin was ground into powder of 0.1 mm size, deacetylated using concentrated NaOH solution and tea extracts from green, purple and black tea adsorbed through rotary evaporation. Confirmatory tests on effective adsorption were done using FTIR and XRD, while bioassay experiments were performed to determine efficacy of the chitosan intercalated with crude tea extracts (CICTE) on the pathogen and tomato growth. *In vitro* and *In situ* tests were carried out in growth chambers and greenhouse respectively. The greenhouse trials were conducted for a period of 2 years in three sites i.e. Gatundu, JKUAT and Makuyu. The bioassays demonstrated significant ( $p < 0.05$ ) reduction of *R. solanacearum* turbidity marked by change of optical densities (OD) from 3.55 to 1.04. In addition, there was significant ( $p < 0.05$ ) inhibition of the cultured *R. solanacearum* and reduced wilt incidence in tomato plants treated with CICTE and later inoculated with the pathogen. Tomato plants treated with CICTE also recorded a significantly ( $p < 0.05$ ) higher yield compared to the control. The study therefore recommends utilization of CICTE as an effective and environmentally safe biopesticide for the devastating bacterial wilt pathogen.