Nursery evaluation of potential endophytic Trichoderma spp. from North Sumatra, Indonesia as a biocontrol agent against ganoderma boninense

ABSTRACT

Basal stem rot (BSR) caused by the fungus Ganoderma boninense is regarded as the most destructive disease of oil palm (Elaeis guineensis Jaqc.) causes significant economic losses in the oil palm industry. An early study on the endophytic Trichoderma spp. showed they were promising potential in suppessing and preventing BSR. However, investigation on the effectiveness of endophytic Trichoderma from North Sumatra, Indonesia in preventing BSR disease in oil palms still scarce. The aim of this study was to evaluate the effectiveness of endophytic Trichoderma from North Sumatra, Indonesia in preventing BSR disease in the nursery. The active Trichoderma mixture (ATM) was prepared by first grown in PDA for six days before mixed and homogenized in 3 ml of sterile water. The mixture was later inoculated with a ratio of 1 ml to 150 g of mixture of cooked and sterilized broken corn and rice (3:4) medium. ATM was further dried and mixed homogeneously with zeolite (1:10) for application in the nursery. The potential endophytic Trichoderma spp. in suppressing BSR was monitored in the nursery for ten months. The external and internal symptoms of disease development were observed and disease incidence (DI) was also recorded. Total phenolic content (TPC) was analyzed using Folin-Ciocalteu method to determine the effect of endophytic Trichoderma in inducing oil palm seedling resistance to BSR disease. The result showed that application of endophytic Trichoderma spp. was found to be effective in suppressing G. boninense infection, where endophytic T. reesei ET501 to be the most effective in preventing disease incidence (DI) with only 13.4 % infection after ten months of observation followed by endophytic T. asperellum ET537 (48.4 %) and T. asperellum ET523 (71.8 %), respectively. Application of endophytic Trichoderma spp. in the nursery also exhibited the potential in inducing TPC amount and it helps in developing resistance in oil palm seedlings, thus protecting the seedlings from G. boninense infection.