Effect of kaempferol on the establishment of arbuscular mycorrhizal fungi on oil palm seedlings roots

ABSTRACT

Arbuscular mycorrhizal fungi (AMF) could associate beneficially with more than 80% of terrestrial plants roots including oil palm roots and as an alternative to reduce chemical fertilizer applications. Oil palm root exudate such as flavonoid is important in the interaction between the crop and AMF. Flavonoids exhibit a strong stimulatory effect on AMF hyphal growth, hyphal differentiation and root colonization, plus improving plant-microbe interactions. The present studies were conducted with the following objective to determine the flavonoid efficiency on AMF establishment in oil palm roots. Exogenous kaempferol as one of the flavonoid types was applied at four concentrations (0, 2.5, 5.0 and 10.0 ppm) with three AMF sources (Glomus mosseae, mixed AMF and non-inoculated) with complete fertilizer. Each pot contained sand mixture with one-month-old oil palm seedling. The planting time is twelve weeks in the net shelter house. The oil palm growth and root development significantly affected by the treatment (G. mosseae*10 ppm kaempferol) since plant height, root length and phosphorus uptake showed significant interactions between the treatments with 20.91%, 27.24%, and 102.33% difference, compared to non-inoculated plant at the same concentration, respectively. The results for shoot biomass, root biomass, root volume, root diameter, phosphorus in soil and root infection showed the highest value compared to AM mixed species and non-inoculated plants.

Keyword: Flavonoid; Kaempferol; Mycorrhiza; Oil palm; Root exudates