Control of Fusarium Disease in Onion with Plant Growth Promoting Rhizobacteria and Mycorrhizae and Its Effect on Growth and Yield of Onion

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Abstract

Onion is a vegetable crop with high economic value, but its productivity in Indonesia is still relatively low. One of the causes is fusarium wilt disease caused by *Fusarium oxysporum* f.sp *cepae*. Biological controls can be applied using PGPR and Mycorrhizae. The research was conducted from January to August 2015, with the purpose of understanding the interaction between PGPR and Mycorrhizal fungi inoculation against fusarium wilt intensity as well as the growth and yield of onions. It consisted of *in-vitro* and *in-vivo* researchs. In *in-vitro* research, the experiement started with the isolation of *F. oxysporum* f.sp *cepae* and PGPR, followed by the tests of PGPR inhibition ability, phosphate solvent and HCN compound productivity. The method used in the field was a completely randomized design (CRD) with two factors: PGPR (3 isolates) and two species of Mycorrhizae. The results showed that (1) the application of the combined treatment of PGPR and Mycorrhizae had no significant effect on the intensity of Fusarium wilt disease, incubation period of the pathogen, diameter of bulb, dry weight of plant and number of leaves in the observation at week 1, 2, 3, 5, 6 and 7; (2) there was interaction between the third isolate of PGPR and Mycorrhizal fungus *Gigaspora* towards the number of leaves in the observation week 4 and wet weight of bulbs per hill, and it had a very significant effect on the number of bulbs; 3) the application of PGPR as the single factor had a significant effect on the inhibition ability of PGPR, number of leaves in the observation at week 4, 5, 6 and 7, number of bulbs, dry weight of plant and intensity of the disease; 4) the application of mycorrhizae as the single factor had a very significant effect on the number of bulbs.

Keywords: *Gigaspora*, *Glomus*, mycorrhizae, onion, PGPR