Biological Control of *Lycoriella mali* (Diptera: Sciaridae), a Pest of Oyster Mushroom, *Pleurotus ostreatus* Using Entomopathogenic Nematodes

Ho Yul Choo, Hyeong Hwan Kim, Heung Su Lee[1], Seung Wook Lee, Sun Ho Park[2], Byung Rae Jin[3] and Young Moo Choo[3]

Department of Agricultural Biology, College of Agriculture, Gyeongsang National University, Chinju, Gyeongnam, Republic of Korea, [1]Division of Plant Environmental, Gyeongnam Agricultural Research & Extension Service, Chinju, Gyeongnam, Republic of Korea, [2]School of Chemical Engineering and Materials Engineering, Keimyung University, Taegu, 704-701, Republic of Korea, [3]Department of Applied Biological Science, College of Natural Resources & Science, Dong-a University, Pusan, Republic of Korea

The potential of two entomopathogenic nematodes, *Steinernema carpocapsae* Pocheon strain and *Heterorhabditis bacteriophora* Hamyang strain was evaluated as biological control agents against mushroom fly, *Lycoriella mali* in laboratory and field. Mortality of *L. mali* was significantly different according to nematode species, concentration, temperature, and developmental stage of fly. *S. carpocapsae* Pocheon strain was more effective than *H. bacteriophora* Hamyang strain. Mortality of *L. mali* by nematodes was higher at 25℃ than 20℃. In addition, the 3rd instar and the 4th instar of *L. mali* were more susceptible than the 2nd instar. The lowest LC_{50} value was represented by *S. carpocapsae* Pocheon strain, 20.0 infective juveniles(Ijs) in the 3rd instar and 27.5 Ijs in the 4th instar at 25℃. *S. carpocapsae* Pocheon strain infected all the developmental stages of *L. mali* except egg stage and the 1st instar. The highest mortality was shown in an adult female representing 74.0% at 20℃ and 80.0% at 25℃. Adult female of *L. mali* was influenced by *S. carpocapsae* Pocheon strain in oviposition. The number of eggs of *L. mali* females infected by nematodes was much lower than uninfected females. *S. carpocapsae* Pocheon strain was dispersed by infected *L. mali* adults. The higher numbers of nematodes were dispersed by females than males. When the *S. carpocapsae* Pocheon strain was applied at the rate of 2.25×10^5 and 4.5×10^5 Ijs/1.5㎡ in the mushroom house, mortalities were 42.2% and 81.6%, respectively. The infective juveniles of nematodes survived for 14 days in the mushroom medium. However, entomopathogenic nematodes did not affect mushroom growth negatively.