

Effect of chitosan and chitosan nanoparticles on fungal growth and chilli seed quality

N. Chookhongkha, T. Sopondilok, S. Photchanachai

Acta Horticulturae 973: 231-237: 2013

Abstract

Chitosan is an antimicrobial substance used to protect against a wide range of target organisms. At present, chitosan nanoparticles are being applied for many uses but there are very few reports of their antifungal activity in seeds. This research aimed to study the effect of chitosan polymer (M.W. 200 kDa) and chitosan nanoparticles on mycelial growth of four fungal species and on chilli seed quality. Potato dextrose agar (PDA) incorporating chitosan polymer and chitosan nanoparticles at a concentration of 0.6% w/v significantly delayed mycelial growth of *Rhizopus* sp., *Colletotrichum capsici*, *C. gloeosporioides*, and *Aspergillus niger* when compared with 0.15% w/v captan, 0.2% w/v chitosan nanoparticles, and the control (PDA). Chitosan polymer solution dissolved with 0.5% v/v acetic acid was applied as a coating substance on chilli seeds. The coating procedure was done by spraying chitosan at 20 and 100 ppm on chilli seeds using top-spray fluidized bed coating equipment. Another two samples were sprayed with distilled water and 0.5% v/v acetic acid. The treated samples were then monitored for infection and compared with the non-treated control samples. Coating the seeds with chitosan at 20 and 100 ppm by this technique resulted in lower seed infection compared with the other treatments. Seed coating with chitosan at 20 and 100 ppm, however, did not significantly affect moisture content, germination, germination after accelerated ageing, germination index, and mean germination time when compared with the control samples. Therefore, chitosan appears to preserve seed quality, and further investigations into longer periods of storage are being carried out.