

## Abstract

The interactions between two antagonistic yeasts (*Pichia membranefaciens* and *Cryptococcus albidus*) and three fungal pathogens (*Monilinia fructicola*, *Penicillium expansum* and *Rhizopus stolonifer*) were examined both on apple juice agar plates and in apple wounds. Light microscopy and scanning electron microscopy (SEM) observations indicated that *P. membranefaciens* had a stronger capability of attaching to the fungal hyphae than *C. albidus* did. The attachment was blocked thoroughly by SDS and  $\beta$ -mercaptoethanol. Addition of nutrients had no visible effect on the interaction between yeasts and pathogens. Culture extract of *P. membranefaciens* had higher  $\beta$ -1,3-glucanase and exo-chitinase but less endo-chitinase activity than that of *C. albidus* in Lilly–Barnett medium supplied with cell wall preparation (CWP) of pathogens as the sole carbon source. This indicated that tenacious attachment, along with the secretion of extracellular lytic enzymes, may play a role in the biocontrol activity of yeast antagonists, and the interaction between yeasts and pathogens was hampered by a protein denaturant at low concentrations.