

Abstract

The yeast *Candida oleophila*, the base of the commercial product Aspire, is recommended for the control of postharvest decay in citrus and pome fruit. Its modes of action include nutrient competition, site exclusion, and direct mycoparasitism. In the present study, we showed that application of *Candida oleophila* to surface wounds or to intact 'Marsh Seedless' grapefruit elicited systemic resistance against *Penicillium digitatum*, the main postharvest pathogen of citrus fruit. The induction of pathogen resistance in fruit was already pronounced 24 h after elicitation; it was distance, concentration, and time dependent and restricted to the peel tissue closely surrounding the yeast application site. The induction of pathogen resistance required viable yeast cells at concentrations of 10^8 to 10^9 cells ml⁻¹. Nonviable autoclaved or boiled yeast cells or lower yeast concentrations were ineffective in enhancing fruit disease resistance. Application of *Candida oleophila* cell suspensions to grapefruit peel tissue increased ethylene biosynthesis, phenylalanine ammonia lyase activity, and phytoalexin accumulation, and increased chitinase and beta-1,3-endoglucanase protein levels, indicated by western immunoblotting analysis. Scanning electron microscope observations revealed that spore germination and germ tube growth of *Penicillium digitatum* were markedly inhibited in wounds made near the yeast-treated sites. Overall, this study provides evidence that induced resistance against postharvest decay of citrus fruit should be considered an important component of the multiple modes of action of the yeast *Candida oleophila*.