

Title Nutritional enhancement of biocontrol activity of *Candida sake* (CPA-1) against *penicillium expansum* on apples and pears

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Abstract

Pome fruits are poor in nitrogenous compounds and the addition of nitrogen can improve colonisation of the fruits by antagonists. Twenty-two nitrogenous compounds were evaluated for their effect on *Candida sake* (CPA-1) growth *in vitro*. Ten compounds that induced greater growth were applied with the antagonist to wounded fruits to evaluate their effect on enhancing control of *Penicillium expansum*. Calcium chloride and 2-deoxy-D-glucose were also tested. L-serine and L-aspartic acid enhanced biocontrol by *C. sake* against *P. expansum* on apples. On apples and pears, ammonium molybdate, calcium chloride and 2-deoxy-D-glucose improved the capacity of the antagonist to control *P. expansum*. The addition of ammonium molybdate at 1 mM allowed *C. sake* to be used on apples and pears at a lower concentration without diminishing control. Similar results were observed with the addition of calcium chloride to the antagonist. 2-deoxy-D-glucose at 6 and 18 mM enhanced biocontrol on pears by over 81%, but on apples the improvement of biocontrol was observed only at 6 mM. In cold storage, the combination of ammonium molybdate and *C. sake* completely eliminated the incidence of blue mould on pears, and reduced its severity and incidence by more than 80% on apples.