Title Improvement of biocontrol activity of *Pantoea agglomerans* CPA-2 to control postharvest diseases in citrus by preharvest applications

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Abstract

Postharvest pathogens such as *Penicillium digitatum* often occur in the field prior to harvest. It would be better to apply biocontrol agents before harvest, to reduce initial infection and then maintain active control of pathogens in storage and/or commercial conditions, but biological control in the field is usually limited by fluctuating environment and by the narrow range of environmental conditions. The main goal of this research was to determine the influence of different formulation strategies on the survival and efficacy of*Pantoea agglomerans* cells under field conditions, including lyophilised cells, osmotic adaptation of *P. agglomerans* by NaCl treatments, and additives. Different additives, such as summer oils, alginate, glycerol and food additives were tested mixed with *P. agglomerans* in laboratory studies. The additive providing the highest bacterial viability on oranges was the food film Fungicover (FC) at 50 g/l. In general, osmotically adapted and lyophilised *P. agglomerans* cells survived better than non-adapted or fresh cells when sprayed in field conditions. However, this superiority was only found when Fungicover was also added to the suspensions. These results show that it is possible to improve environmental stress tolerance and ecological competence of *P. agglomerans* cells using certain formulation strategies.