

# The influence of N-acetylglucosamine: Inducing *Rhodosporidium paludigenum* to enhance the inhibition of *Penicillium expansum* on pears

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Postharvest Biology and Technology, Volume 176, June 2021, 111486

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## Abstract

On the way to impel *Rhodosporidium paludigenum* to behave like a serviceable and beneficial biocontrol antagonist, it was found that adding different concentrations of N-acetylglucosamine (GlcNAc) during the culture can reduce the incidence of pears caused by *Penicillium expansum*. 0.1 % GlcNAc is an optimal concentration in the range of 0.001 %–2 %. *R. paludigenum*, cultivated and gathered from the medium with a final concentration of 0.1 % GlcNAc, declared the best impact on restraint on *P. expansum* on pears. This inhibitory effect is analogous to the consequence of spore germination experiments *in vitro*. The *R. paludigenum* gathered after GlcNAc induction, at the same time, displayed exceptional viability and vigour under different stress conditions, including sodium chloride (NaCl), calcofluor white (CFW), Congo red (CR) and sodium dodecyl sulfate (SDS). The enzyme activity and the relative gene expression levels of some antioxidant-related enzymes in *R. paludigenum*, including peroxisomal catalase (CAT), thioredoxin reductase (TrxR), glutathione peroxidase (GSH-PX), glutathione reductase (GR) and superoxide dismutase (SOD), were detected to be up-regulated in further testing. At the same time, the reactive oxygen species (ROS) remained at a low status.