

Exploiting yeast isolates from pear cv. Abbé Fétel carposphere as biocontrol candidates against *Stemphylium vesicarium*, the causal agent of the brown spot disease

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Introduction

Microbial biodiversity is essential for ecosystem balance and plant health. In line with the EU Farm to Fork Strategy indication to reduce pesticide use in agriculture, this study explored the potential of yeasts inhabiting pear cv. Abbé Fétel carposphere as candidate microbial biocontrol agents (mBCA) against *Stemphylium vesicarium*, causal agent of brown spot of pear (BSP).

Materials and methods

In 2024, pear fruits were collected from thirteen orchards located in Emilia-Romagna region and conducted with organic (BIO) and integrated (IPM) pest management, respectively. Yeasts were isolated on YPDA medium, morphologically characterized and screened for their antimicrobial activity *in vitro* against *S. vesicarium* strains. Then, a selection of 25 yeast isolates was molecularly identified at species level by sequencing the rDNA ITS region.

Results

A biobank of 260 yeast isolates was established, displaying a mycelia growth inhibition of *S. vesicarium* ranking from -15.71% to 42.48%. The strains were attributed to the species *Aureobasidium pullulans*, *Metschnikowia* spp., *Rhodotorula babjevae*, *Pichia kluyveri*, and *Hanseniaspora uvarum*. One isolate was identified as *Papiliotrema horticola*, an endophytic yeast previously associated with apple fruits. Sequencing of the ITS PCR amplicons failed for all *Metschnikowia* spp. isolates, in agreement with previous studies reporting rDNA heterogeneity within this clade. When the selection of yeast BCA candidates was further tested against different *S. vesicarium* strains, their antagonistic activity performances were slightly variable, depending on the *S. vesicarium* strain used.

Discussion

The presence of diverse yeast species with antagonistic activity against *S. vesicarium* highlights the pear carposphere as a reservoir of potential novel mBCAs for effective and sustainable pathogen management. Future *in planta* experiments are ongoing to investigate their ecological role and potential in controlling BSP.

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