



***Stemphylium vesicarium* affecting pear: exploiting bacterial isolates from carposphere as potential microbial biocontrol agents**

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The Farm to Fork Strategy, part of the European Union Green Deal (1), foster the importance for innovative and sustainable solutions for pathogen management by limiting the use of synthetic pesticides in agriculture. This study explored the potential of bacteria inhabiting the carposphere of pear cv. Abbé Fétel as candidate microbial biocontrol agents (*mBCAs*) against *Stemphylium vesicarium*, the causal agent of brown spot of pear (BSP). In 2023 and 2024, pear fruits were collected from orchards located in Regione Emilia Romagna conducted with organic (BIO) and integrated pest management (IPM), respectively. Bacteria were isolated, morphologically characterized and screened *in vitro* by means of dual assays to check their antagonistic potential against a set of *S. vesicarium* strains. A total of 639 bacterial isolates were collected, displaying an *in vitro* mycelial growth inhibition up to 87.44%. The most prospective isolates were molecularly identified at genus level by sequencing the 16S rRNA region and were further tested for their ability to inhibit six additional *S. vesicarium* strains *in vitro*, and *in vivo* on detached fruit (2). The selected strains were assigned to the genus *Bacillus*, *Pseudomonas*, *Erwinia*, *Pantoea*, *Micrococcus*, *Frigobacterium* and *Variovorax*. The *in vitro* antagonistic performance of the selected isolates was slightly variable, depending on the *S. vesicarium* strain tested. Concerning the biocontrol potential on detached fruits, *Bacillus* (DLS321 and DLS323), *Pantoea* (DLS311) and *Pseudomonas* (DLS329) resulted the most effective, with BSP severity reduction up to 80%. Intriguingly, the *in vitro* and pear fruit bioassay results were not always correlated. Therefore, further studies are needed to investigate the mechanisms by which these *mBCAs* might exert their protective effects against *S. vesicarium* (3). Here, high-throughput genomic approaches may shed light on those specific secondary metabolites and their biosynthetic gene clusters (BGCs) for the development of efficient and sustainable *mBCAs* for engineering pear microbial communities and controlling BSP disease.

References

1. European Commission. Farm to fork strategy; for a fair, healthy and environmentally-friendly food system; 23 Pages; European Commission: Brussels, Belgium, (2020). Available online: https://food.ec.europa.eu/system/files/2020-05/f2f_actionplan_2020_strategy-info_en.pdf. Accessed 22 March 2025