THE DIVERSITY AND PATHOGENICITY OF RAHNELLA SPECIES ISOLATED FROM DISEASED ONION BULBS IN THE UNITED STATES AND SOUTH AFRICA

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Text

The genus Rahnella contains widely distributed, facultative, Gram negative, anaerobic bacteria in the Yersiniaceae. Rahnella species have been isolated from water, human wounds, oak trees, beetle guts and, recently, symptomatic onion bulbs and foliage. There can be significant losses in onion crops from pre- and/or post-harvest diseases caused by bacterial pathogens. To develop management strategies, it is important to understand the diversity and pathogenicity of Rahnella species on onions. In 2020-2021, Rahnella was isolated from diseased onion bulbs in the USA and South Africa. The 60 isolates formed cream, round, convex colonies on nutrient agar, and were identified as Rahnella based on 16S rRNA sequences. A multilocus sequence analysis (MLSA) with atpD, gyrB, infB, and rpoB was used to define Rahnella strains to species. Pathogenicity trials were completed with onion bulb, foliage, and a red scale necrosis (RSN) assays. A concatenated maximum likelihood phylogenetic tree of the four genes revealed multiple Rahnella species, with large clusters of R. perminowiae, R. aceris, and R. aquatilis. Other species from the USA included R. varrigena and R. victoriana. Among South African isolates, R. perminowiae, R. aceris, and R. aquatilis were dominant. Mild to moderate internal bulb decay was observed with all the species but no isolates were pathogenic with the RSN and foliar assays. The mechanisms by which Rahnella species cause onion bulb rot should be investigated.

P4.2-070

DIAPASON : DIAGNOSTIC OF GRAY LEAF SPOT BY DIGITAL PCR

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Text

Fungal pathogens are a major threat to plants, whether they are cultivated for food or for recreational areas. Pyricularia oryzae is a fungal pathogen infecting more than 50 grasses and is particularly known on major food species such as rice and wheat. This fungus is also known on turf grass as the causal agent of gray leaf spot. As of 2016, in France, the disease is present on the lawns of professional Football stadiums. Gray leaf spot is a cyclic disease, difficult to eradicate once establish on the field. Indeed, phytosanitary treatments are often

ineffective if the application is too late. To manage efficiently the gray leaf spot disease on their sport fields, turf managers require an early and quick diagnostic during the first cycle of the disease. The objective of the Diapason project (partnership UMR PHIM / IAGE company) is thus to develop an early diagnostic method based on digital PCR. The diagnostic was first validated in vitro on pure strains of fungal pathogens and in vivo on samples produced under controlled conditions by artificial inoculations. The application of the diagnostic on sport fields was then done on grass clippings, sampled on a Football stadium presenting symptoms of the disease. An improvement of the diagnostic is under progress (i) to discriminate the P. oryzae lineage affecting turfgrass, rice and wheat and (ii) to extend the diagnostic to other turfgrass diseases identified in stadium, golf courses, and race courses.

P4.2-071

FROM ORCHARD TO STORAGE: DIAGNOSE YOUR APPLES.

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Text

Apple diseases can cause heavy losses, difficult to control for the farmers. Many of them develop during storage. Currently, phytosanitary products are used on the harvested apples to control these diseases. To limit such treatments and to assist farmers in reducing their economic losses, four main diseases must be considered: the emerging ramularia disease (caused by Ramularia mali/eucalypti), the already established and problematic Bitter Rot (caused by different species of Colletotrichum), or gleosporium rot (caused by the plant pathogen Neofabrae vagabunda), as well as the mildew (caused by phytophthora syringae/cactorum), a disease transmissible from apple to apple once harvested. Sampling is a key step to ensure a reliable diagnosis of the whole orchad because each one occurs at a different time. However, they are all detectable on apples a few days before harvesting the fruits.

IAGE guides the farmers on apples' sampling in the orchard and then uses an innovative diagnosis based on digital PCR to simultaneously target the pathogens causing the four diseases of interest. Then, IAGE's expertise allows advice to be given to the farmers about the apple's storage. The bottom line of this diagnosis is to help reducing the use of phytosanitary products from the orchard to the storage.

P4.2-072

PRESENCE OF CURTOBACTERIUM FLACCUMFACIENS IN BELGIAN AND DUTCH GREENHOUSE POINSETTIA PRODUCTION – RUINING THE CHRISTMAS SPIRIT?

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