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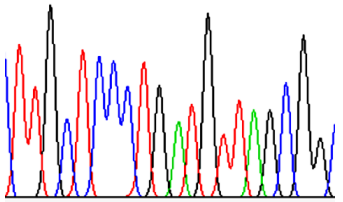
Shoot rot of *Zizania latifolia* and first record of its pathogen *Pantoea ananatis* in China

Key words: ***Zizania latifolia,*** **Phylogeny,** ***Pantoea ananatis,*** **Multilocus analysis, Scanning electron microscopy, Species-specific primers**

Research Summary

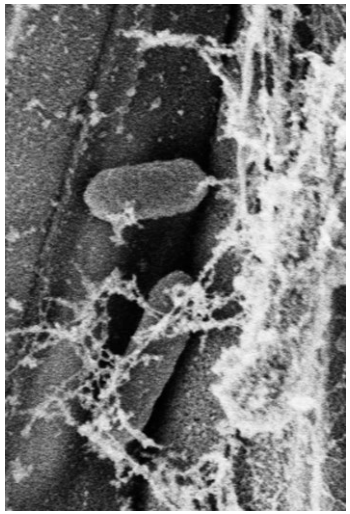
This study mainly focused on identification of pathogen causing shoot rot of *Zizania latifolia,* a new disease, designation of species-specific primers, and the key contents included in the following aspects:

- **Symptom observation of new disease.**



- **Phylogenetic analysis of pathogen.**

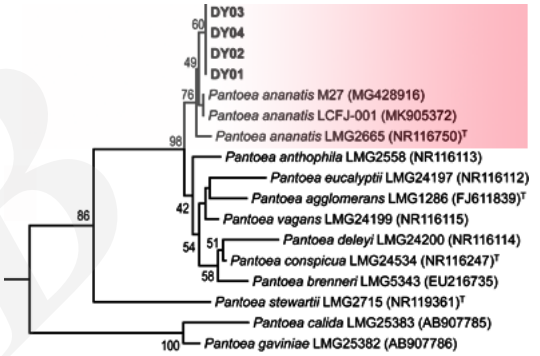
- **Ultrastructural observations**



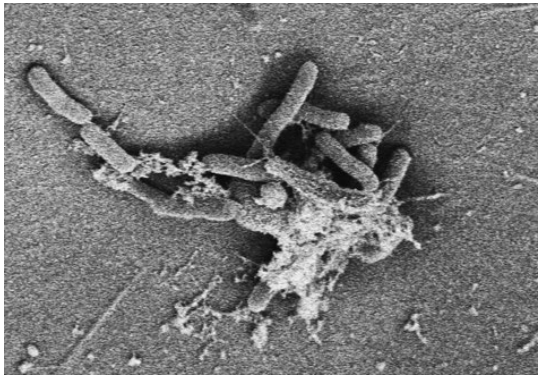
- **Designation of species-specific primers.**

Innovation points

- **Pathogen causing sheath rot disease of *Zizania latifolia* was identified as *Pantoea ananatis*.**



- **Biofilm formation and extension between vessel elements via the perforated plates during interaction of *P. ananatis* and host was revealed.**



- **Species-specific primers were designed and validated for detecting the pathogen in the diseased tissues.**

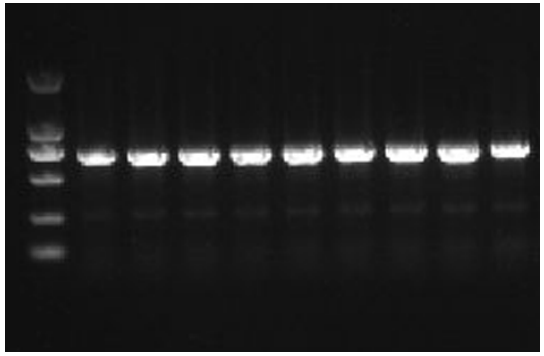


Figure 4

Innovation points

A series figures were generated to summarize the disease symptoms, identification of pathogen, pathogen-host interaction, and rapid detection of pathogen.

Figure 1 | Symptoms of shoot rot of *Zizania latifolia* in fields.

Figure 2 | Symptom variability on the leaf sheaths of *Zizania latifolia* after inoculation.

Figure 3 | Phylogenetic tree generated by the neighbor-joining method from16S gene sequences of 19 taxa *of Pantoea*.

Figure 4 | Maximum-likelihood tree based on concatenated housekeeping gene (atpD + Gryb + infB+ rpoB) sequences showing the relationships among members of strains of *Pantoea* spp.

Figure 5 | Scanning electron micrographs of *Pantoea ananatis* DY03 colonizing a vessel of *Zizania latifolia*.

Figure 6 | Position of designed forward and reverse primers in the gryB gene in the genus *Pantoea* and their base differences among different species.

Figure 7 | Analysis of specificity and reliability of PCR amplification using the primerpairs pagyrB-F/R.

Figure 8 | Vessels with perforation plates in a leaf sheath of *Zizania latifolia*.