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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

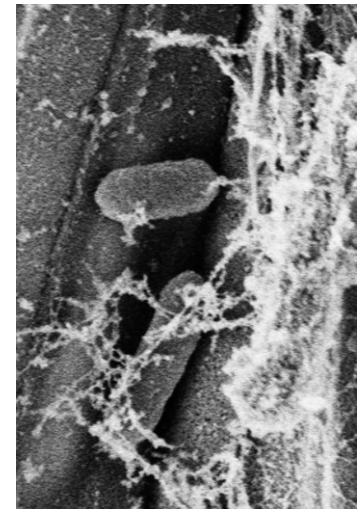
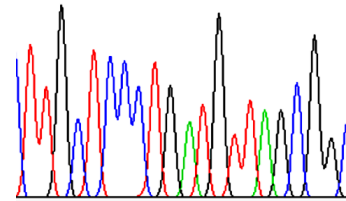
Research Summary

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:



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actggcggtgacgggtgagaccgacattacc
g.....a.....a.....
g.....a.c.....c.....tt.a.....
g.....c.t.....t.....c.....
g.....t.....c.c.....tt.g.....
gt.....t.....c.....tt.g.....
g.c.a.c.....c.c.....tt.a.....
gt.....ct.c.....agcc.....
g.t.....at.c.....agcc.....
q.....a.cg.c.....t.....t.a.....
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- 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.**

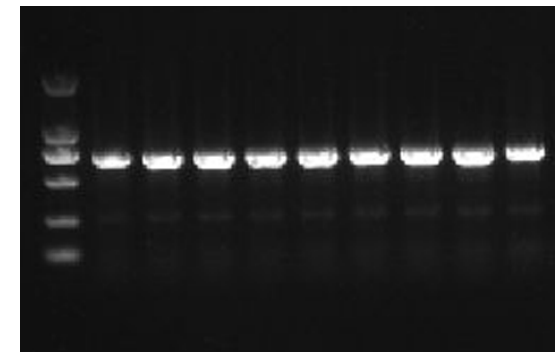
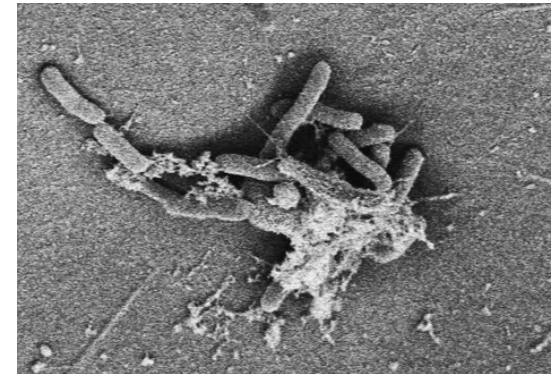
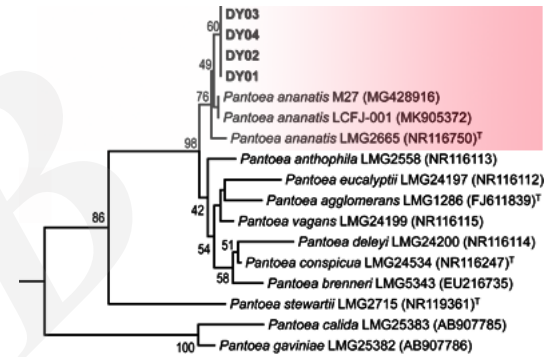


Figure 4

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 from 16S 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*.