

Can bacterial plant pathogens be written off from grain discolourations observed on rice in northern Queensland?

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Introduction

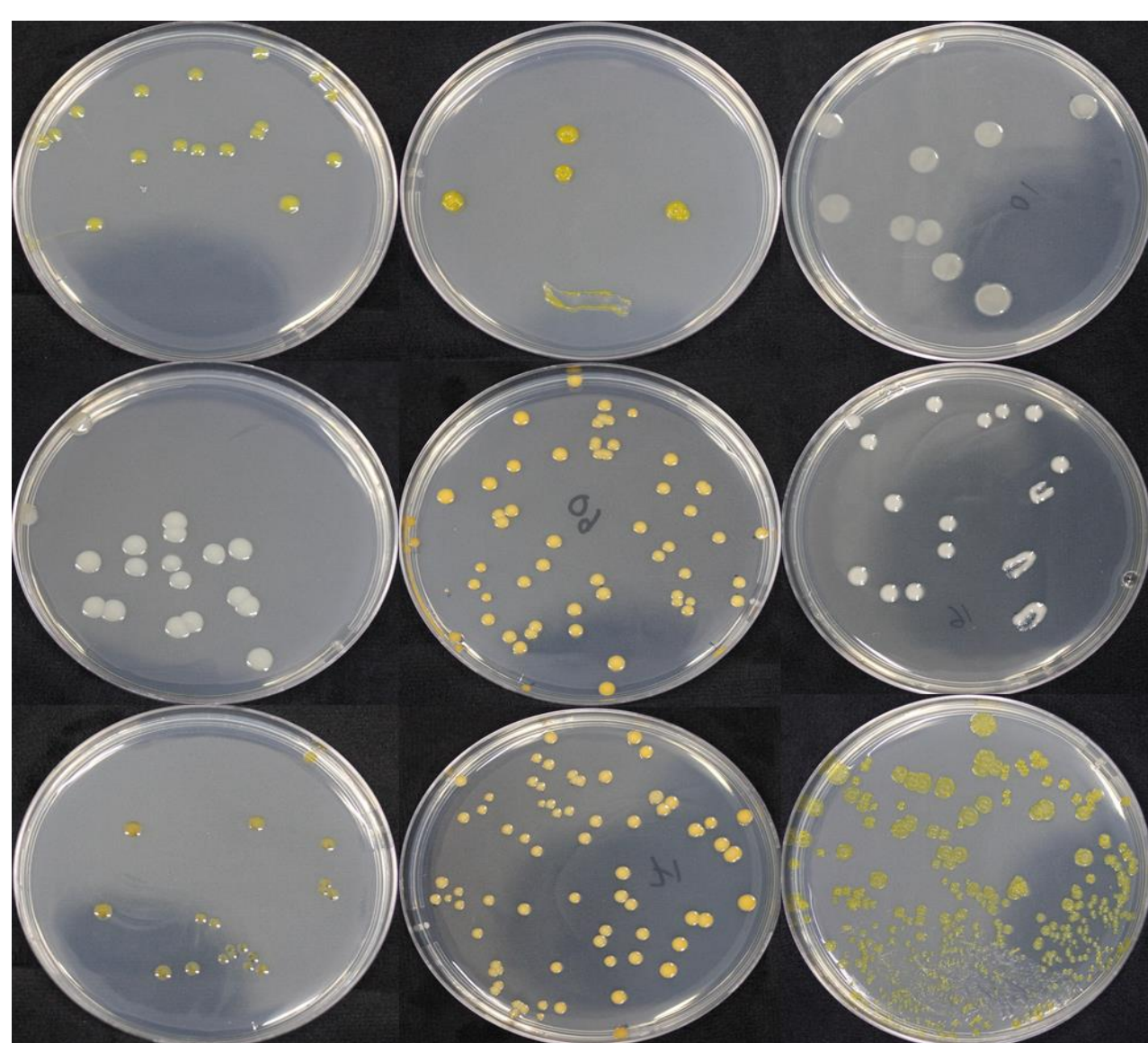
Grain discolouration can be attributed to both fungi and bacteria, where previous studies have largely ignored the involvement of bacterial pathogens in grain discolouration in northern Queensland (QLD). However, a few reports shown the involving bacteria in grain discolouration in southern New South Wales.

The purpose of this study was to investigate the involvement of bacteria in rice grain discolouration in northern QLD.

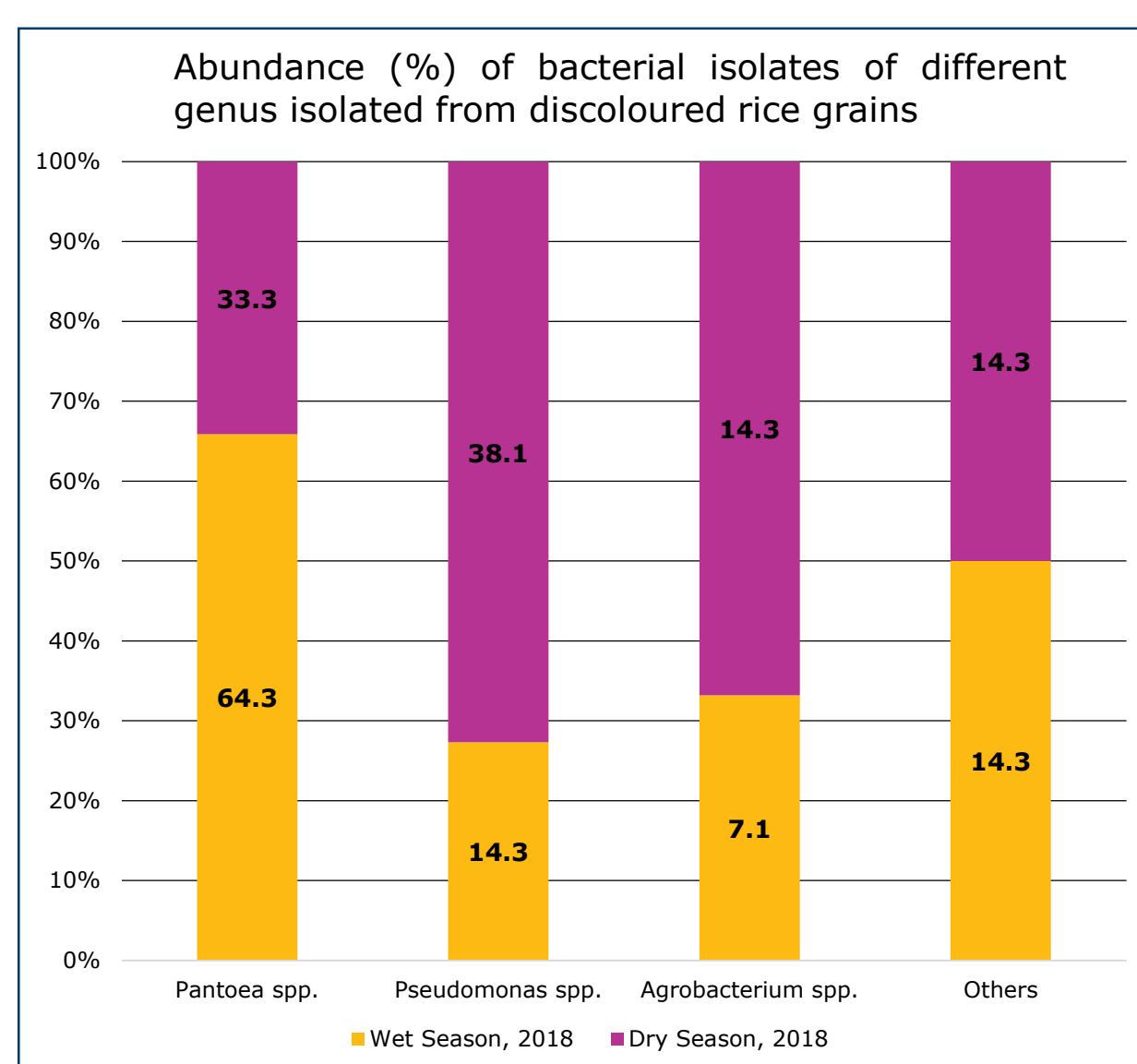
More than 40 bacterial isolates were obtained from discoloured grains collected from northern QLD during the wet and dry seasons in 2018 and the wet season in 2019. Identification based on 16S rRNA gene sequencing was performed for all the isolates, followed by a pathogenicity test on a single rice cultivar, Opus.

Results

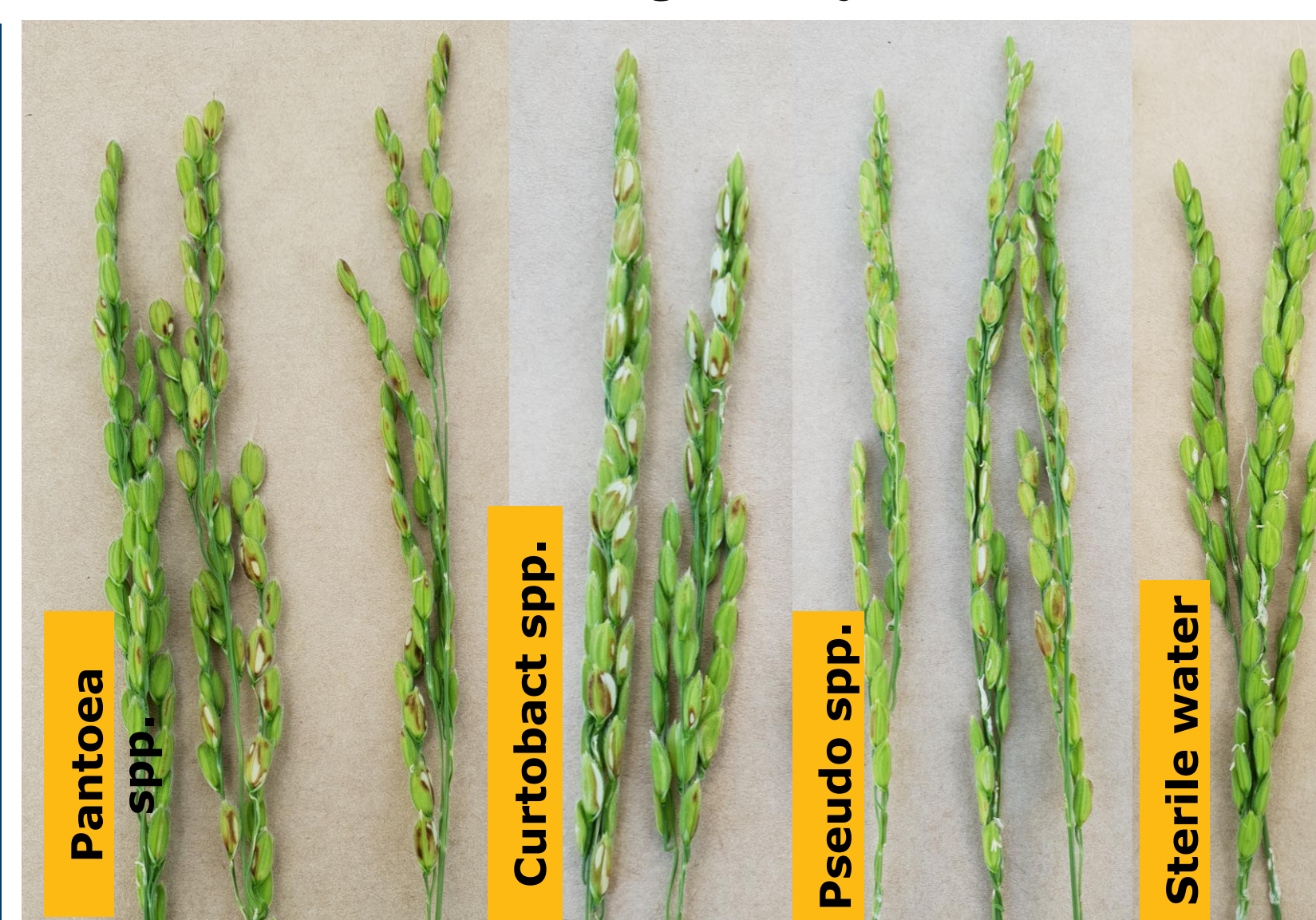
1. Isolates from discoloured grains



3. Seasonal abundance

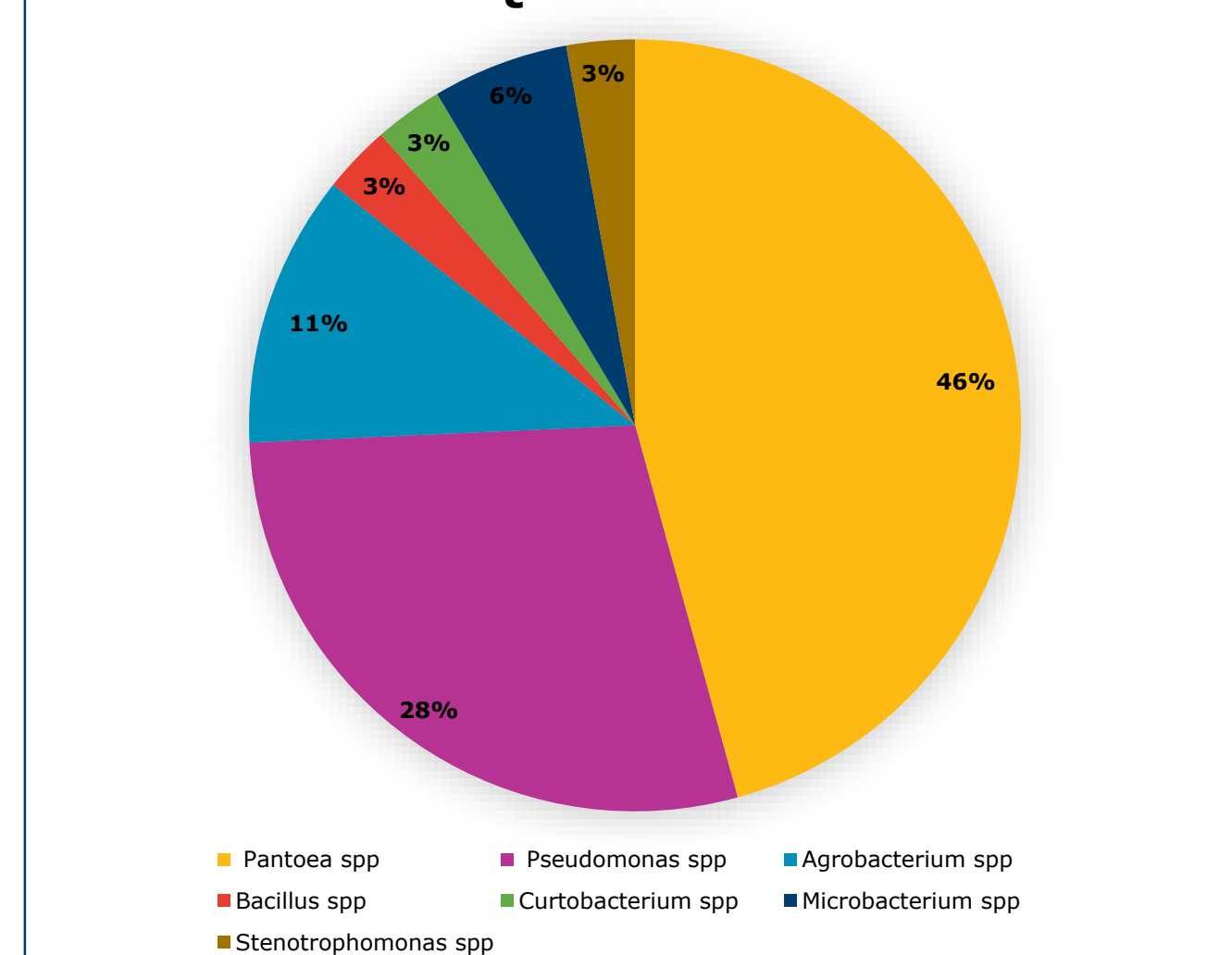


5. Pathogenicity test



2. 16S rDNA Identification

Different bacterial genus isolated from cultivated rice in northern Queensland



4. Hypersensitivity test



6. Discolouration severity



Conclusion

These results indicate that bacterial pathogens could be responsible for rice grain discolouration observed in northern QLD. Whilst bacterial diseases are not considered a significant threat to the temperate rice in Australia, our results suggest that bacterial pathogens could pose a threat to the emerging tropical rice industry in northern QLD.