Predominant but previously-unseen prokaryotic drivers of reductive nitrogen transformation in paddy soils, unveiled by metatranscriptomics.

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Waterlogged paddy soils possess anoxic zones in which microbes actively induce reductive nitrogen transformation (RNT). In the present study, a shotgun RNA sequencing analysis (metatranscriptomics) of paddy soil samples revealed that most RNT gene transcripts in paddy soils were derived from *Deltaproteobacteria*; in particular, the genera *Geobacter* and *Anaeromyxobacter*. Despite the frequent detection of their rRNA in paddy soils, their RNT-associated genes have been rarely detected by previous PCR-based studies. Therefore, the present metatranscriptomics has provided novel insights into the diversity of RNT microbes present in paddy soils as well as the ecological function of *Deltaproteobacteria* predominating in such soils.

Keywords: Reductive nitrogen transformation, Deltaproteobacteria, Metatranscriptome, Soil ecosystem, iron-reducing bacteria

