

Determination of fungal indicator taxa of the tidal flats in South Korea by metagenomic analysis

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Purpose: Tidal flats were widely distributed in South Korea, but greatly reduced due to the reclamation and the construction of salt ponds. Recently, the government has tried to restore it, as the ecological importance of the tidal flats were reevaluated. However, there was no reliable indicator for assessing the recovery, and it was necessary to find the indicator taxa that exist specifically in the tidal flats that are not interfered by human.

Methods: Environmental DNA was extracted from the sediments of the tidal flats and closed salt ponds in the west coast of South Korea. The internal transcribed spacer region sequences were amplified and sequenced using an Illumina MiSeq platform. Four kinds of statistical analyses were conducted using the fungal operational taxonomic units and their abundance data.

Results and conclusions: The indicator taxa selected for each analytical method were different from each other. Among them, *Glomeromyces* and *Umbelopsidomyces* were commonly selected from three different analyzes, and determined to be the indicator taxa of the tidal flats in the west coast of South Korea. Since *Glomeromyces* are mycorrhizal fungi, it was suggested that they are strongly related to the indigenous halophytes like *Phragmites australis*. We demonstrate that these two indicator taxa can be used as reliable indicators for tidal flat restoration assessment.