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Relations between multifractal soil pore characteristics and soil properties. A case study in coastal saline soils.

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Soil salinization is one of the significant constraints to food security. Anthropogenic activities such as improper agricultural practices and poor drainage systems can accelerate salinization. The reclamation of these saline areas, such as the coastal areas in Jiangsu province (China), is vital to produce sufficient food, fodder, and fibre sustainably.

Soil washing was applied at Rudong location (Jiangsu) in 2007 as a method of soil reclamation. The monitoring of coastal saline soil improvement at three different depths (0-20, 20-40, 40-60 cm) has been followed through physical, chemical, and biological measures.

At the same time, soil samples collected by plastic rings were scanned, obtaining a central region of interest (ROI) of 512×512×512 voxels. These grey images, and their binary images, were analyzed in 2D and 3D using multiscaling techniques extracting standard multifractal parameters.

The results found different relationships between laboratory measures and image analysis parameters in which soil depth influences. Grey images parameters showed a stronger relation compared to binary images.

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