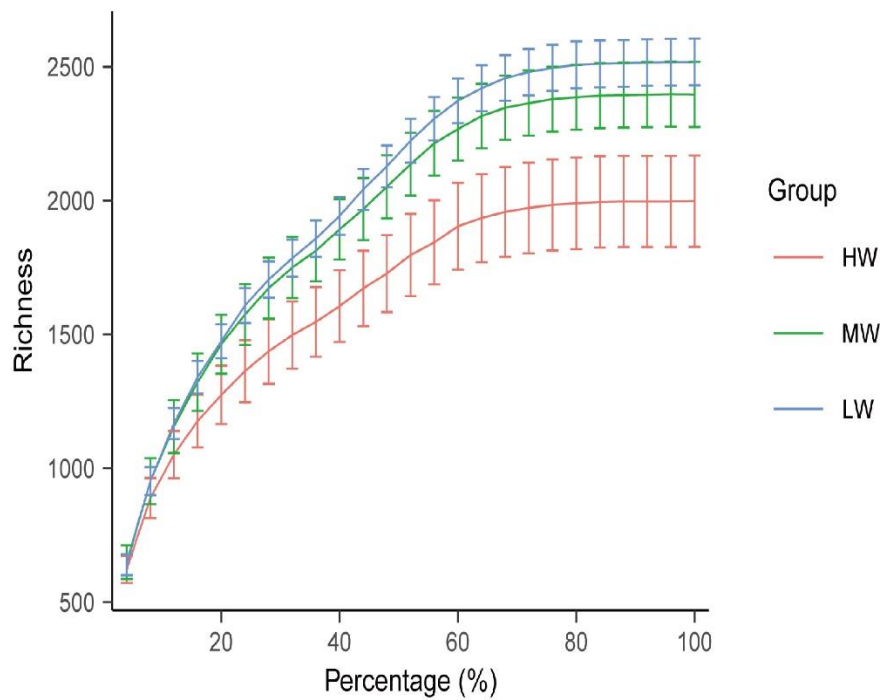
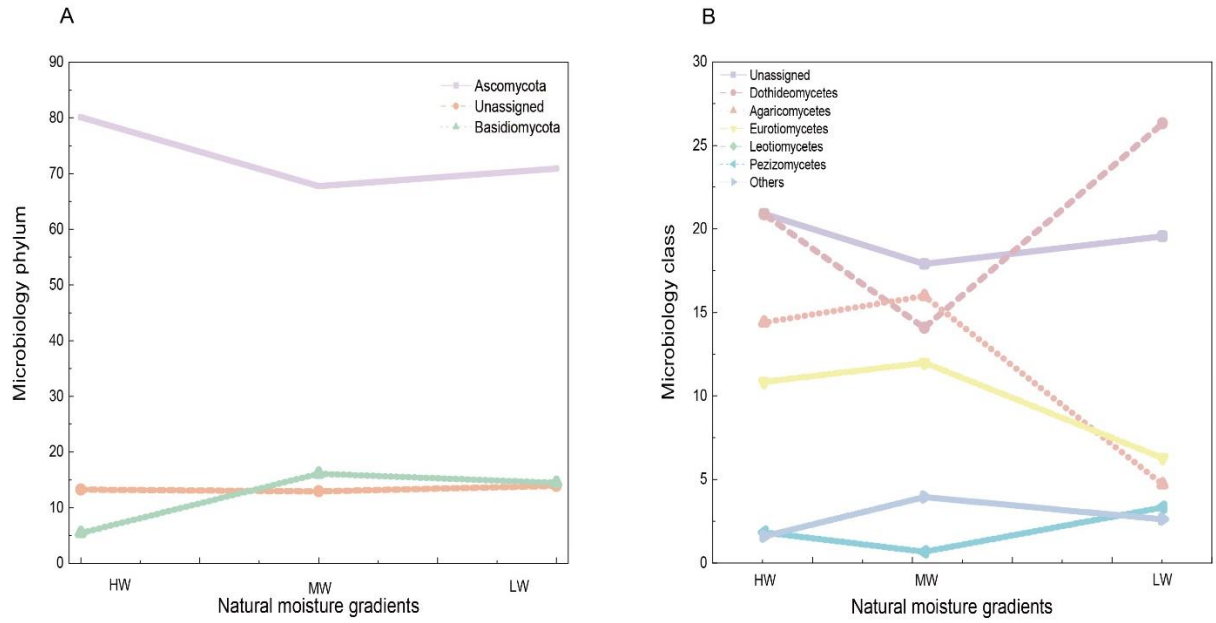


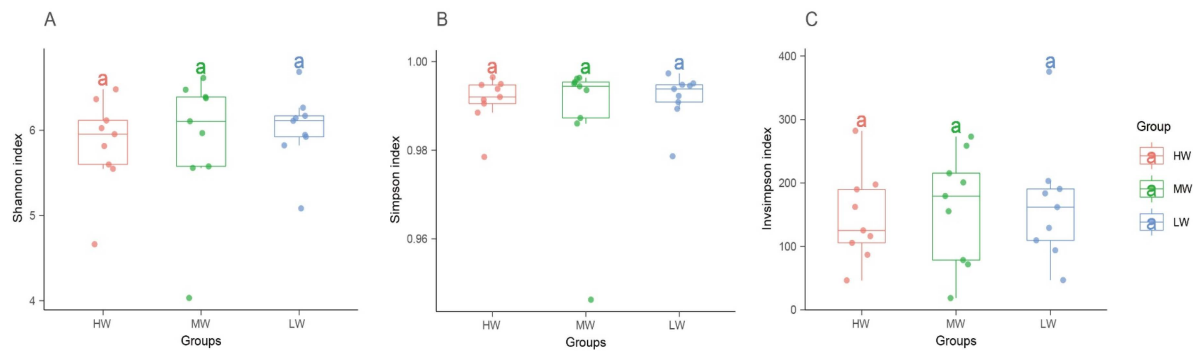
**Figure S1.** Sample site clustering analysis-complete connection.



**Figure S2.** The fungal rarefaction curves curve under a natural moisture gradient. HW: high water content; MW: medium water content; LW: low water content.



**Figure S3.** The relative abundance of fungal phylum (A) and class (B) under soil moisture gradient on the south shore grassland ecosystem of Hulun Lake. HW: high water content; MW: medium water content; LW: low water content. Different color lines represent different species.



**Figure S4.** Diversity of Shannon (A), Simpson (B) and Invsimpson's index (C) of soil fungal communities under soil moisture gradient on the south shore grassland ecosystem of Hulun Lake. HW: high water content; MW: medium water content; LW: low water content. Boxplots with different letters above the box indicate significantly different means ( $P < 0.05$ ).