Study reveals allocation patterns of foliar-P fractions of Alhagi sparsifolia in different P availability soils
4 November 2021, by Li Yuan

Researchers from the Xinjiang Institute of Ecology and Geography (XIEG) of the Chinese Academy of Sciences found that foliar-phosphorus (P) fractions of Alhagi sparsifolia changed with different P availability soils. The findings were published in Geoderma on Oct. 27.

Allocation of foliar-P fractions is considered to be an efficient P-use strategy for plants to accommodate harsh P nutritional status.

Legume Alhagi sparsifolia (A. sparsifolia) is a widely distributed natural vegetation in the juncture of the Qira oasis and the Taklamakan Desert. It acquires N from groundwater or soil via the root system, but it can also obtain N through biological N₂ fixation.

Therefore, A. sparsifolia needs to obtain more P to maintain elemental homeostasis. However, its allocation pattern of foliar-P fractions in different P availability soils are still unclear.

In this study, the researchers investigated A. sparsifolia growing in four different soil sites with differing availability of P in this area to explore the allocation pattern of foliar-P fractions of A. sparsifolia and its relationship with soil-P fractions and soil properties.

They found that A. sparsifolia growth was highly likely to be limited by soil-P in this area, and the concentrations of foliar total-P and young leaf metabolic-P increased with increasing soil-P availability, while foliar-N was relatively constant.

As soil-P availability decreased, A. sparsifolia allocated a higher proportion of foliar-P to nucleic acid-P and a lower proportion to structural-P. Furthermore, foliar metabolic-P, nucleic acid-P, and structural-P had the strongest positive response to soil labile-P in topsoil. Soil electrical conductivity, labile-P, and moderately labile-P influenced foliar-P fractions.


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