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Soil moisture for vegetation growth is very important in Loess Plateau. Soil water migration is essential to describe the movement of salt, carbon, nitrogen and other nutrient. Although there are many studies on the soil moisture, there are less works on the mechanism of soil water migration in the unsaturated zone in Loess Plateau of arid region in China based on successive observations and isotopes. The scientific issue of this paper is sure, research idea is clear, research method is correct, and research results are reliable. From my point of view, the work is well-done and provides reliable results to soil water migration in arid region of China.

1. Adding relevant detailed introduction about soil and hydrology in the research area.

Response: Done. We have revised it. The same as above.

The watershed area is 8.91km^2, which belongs to the hilly and gully region of Loess Plateau. Gully density is 3.14km/km^2, and the ditch depth ranges from 30 to 50m. Soil type is yellow loessal soil and saline soil, and the average thickness ranges from 40 to 60m. The soil density of soil layer ranges from 1.1 to 1.4 g/cm^3, average soil porosity is 55%. Soil structure has a vertical joint, and the nature of soil is loose and its wet collapsibility is serious. The grassland and shrubland ecosystems are the most extensively dominant ecosystems in the Anjiugou river basin. As it is a representative area of Loess Plateau area, the Anjiagou River basin is a suitable area for soil water study in semi-arid region.

The study area has broken terrain and serious soil erosion, with the terrain being loess long beam and terraces, and gully valley landscape. Geological structure is the uplift zone between the eastern part of Qilian fold system and the west Qinling fold system, at an altitude of 1700 m ~ 2580 m, with the gully density being 3 ~ 5 km/km^2, ditch slope being 5 ~ 10%, and the mountain slope being generally 20 to 50. The sunny slope is steep, while the shade slope is relatively flat.

The soil parent material is quaternary eolian loess, and the zonal soil mainly is yellow spongy soils, sierozem, which belongs to the typical semiarid loess hilly-gully region. It has soft soil, homogeneous structure, thicker soil layer, good water performance, and the widest distribution. The average thickness is 40 ~ 60 m. Clay soil is between 33.12% ~ 42.17%, organic matter content is between 0.37% ~ 1.34%, soil bulk density is 1.17 g/cm^3, wilting moisture content is 7.3%, and the saturated moisture content is 21.9% at the 0 ~ 20 cm. The soil bulk density is 1.09~1.36g cm^{-3}, and the porosity is 50% ~ 55% at the 2 m soil layer. The soil has vertical joint and strong collapsibility, so the

soil erosion is easily happened, and the soil erosion modulus is 5000 $t/km^2 \cdot a$.

2. As mentioned in the paper, "Soil moisture content was determined by oven drying method simultaneously" How much about the depth of soil sample? Does every depth be concluded respectively? Does the measured depth be in accordance with that of time domain reflectometry ?

Response: Done.

Soil samples in the unsaturated zone were collected at 10 cm intervals from 100 to 130 cm. Maximum depths of sampling ranged up to 130 cm, with every depth at 0-10, 10-20, 20-30, 30-40, 40-60, 60-80, 80-100and 100-130 cm being determined by oven drying method. The measured depth were accordance with that of time domain reflectometry (TDR).

3. Please explain the reason for choosing caraganakorshinshiikom as the object of study, and illustrate its characteristics in the part of research area summary.

Response: Done. We have revised it.

The grassland and shrubland ecosystems were the most extensive dominant ecosystems in Loess Plateau. The area accounts for about 50% of the total area, and it is the main part of loess plateau surface cover. Caraganakorshinshiikom is the dominant species in the study area. It is most widely distributed. Therefore, we choose caraganakorshinshiikom as the object of the study.

4. There are many mentioned in the paper, such as "Plant Xylem" "The isotopic composition of soil layer is similar to the xylem water is confirmed by comparing _D and _18O of xylem water and soil water, which reflect the signatures of soil at the depth of soil water uptake by plants." "soil water from the surface horizons (20-40cm) contributed to 8%-21% of plant xylem water," plant roots. Is it the xylogen and root system of a certain kind of plant? Caraganakorshinshiikom?

In general, this is a well-written paper containing reliable results which merits publication.

Response: Done. The xylogen and root system is Caraganakorshinshiikom，