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The Influence of topography on formation characteristics of hygroscopic and condensate water in Shapotou

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The formation characteristics of hygroscopic and condensate water for different topographic positions were observed using the PVC pipes manual weighing and CPM method in the typical mobile dunes fixed by straw checkerboard barriers in Shapotou. The results indicated that the formation amounts and duration of hygroscopic and condensate water show moderate spatial heterogeneity at the influence of topography. The formation amounts of hygroscopic and condensate water at different aspects conform to the classical convection model, in which the hygroscopic and condensate water amounts are highest at hollow, and windward aspect gets more water than leeward aspect, the hygroscopic and condensate water amounts at different aspects are expressed as: hollow>Western-faced aspect>Northern-faced aspect>hilltop>Southern-faced aspect>Eastern-faced aspect. The hygroscopic and condensate water amounts at different slope positions for every aspect are as follows: the foot of slope>middle slope>hilltop. A negatively linear correlation is got between slope angles and hygroscopic and condensate water amounts, hygroscopic and condensate water amounts decrease gradually along with the increase of slope angles, the amounts of hygroscopic and condensate water at the vertical aspect are only half of horizontal aspect, which indicated topography were important influence factors for the formation of the hygroscopic and condensate water in arid area.