



## **Evidence for direct water absorption by shallow-rooted desert plants in desert-oasis ecotone, Northwest China**

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Besides the absorption by roots from the soil substrate, it has long been known that plants exhibit alternative water-absorption strategies, particularly in drought-prone environments. For many tropical epiphytic orchids, air moisture can be absorbed directly by aerial roots. Some conifers are also found to utilize air moisture by foliar absorption during the summer fog season. However, few studies have been carried out on the atmospheric water vapor absorption by shallow-rooted desert plants. We conducted experiments in desert-oasis ecotone and investigated the effects of dew absorbed by three kinds of shallow-rooted seedlings on net photosynthesis rate, as well as on other water relations variables. Three kinds of typical shallow-rooted desert species (*Bassia dasyphylla*, *Salsola collina* and *Corispermum declinatum*) have been chosen and potted. Each species were subjected to contrasting watering regimes (normal and deficient) and different air moisture conditions (having dew and having no dew) for 10 weeks. Net photosynthesis rate was measured on six occasions during the study. Other water relations variables (midday shoot water potential, relative water content, stomatal conductance) were also measured. Under the dew conditions, average net photosynthesis rate, shoot water potential, leaf relative water content and stomatal conductance increased, with greater responses observed for plants subjected to a deficient watering regime than for well-watered plants. These results indicated dew occurred in arid region could be utilized through foliar absorption by some shallow-rooted plants, and for the shallow-rooted plants, the presence of dew could significantly relieve the deficit of water in water-stressed regime.