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Regional Water Use of Natural Plants in the Draa Valley — Southern Morocco

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Abstract

Compared to the basic information of the water use of oases in arid regions, just a few is known about the areal water use of the natural plants, even if they form the vegetation cover of major parts of the region. In addition, there is also just as little information about the biomass distribution of natural plants. Investigations of ecophysiology and spatial distribution of different natural plants were carried out in the Draa valley, southern Morocco, in the years 2001–2003, in order to achieve an estimate of the plant influence on the hydrological circle of this water catchment.

Ecophysiological measurements were placed in two characteristic rangeland areas of the Draa valley, the southern site at El Miyit (792 m a.s.l.), located within a large basin at the foot of the Jebel Bani and characterised by large areas and small Wadis were most of the vegetation concentrates. The dominant plant species are *Acacia raddiana*, *Retama reatam*, *Withania adpressa* and *Ziziphus lotus*. The northern site, Taoujgalt (1,900 m a.s.l.), is located at the southern slope of the high Atlas mountains with a homogeneous plant cover. The dominant perennial species are *Artemisia herba-alba* and *Teucrium mideltense*.

The results show that in both areas the annual water use of the natural plants is less than the annual precipitation, but the primary processing time of water use of the north area is the second half of the year. This is different from the southern area, where main water use occurred in spring. The reason for this is found to be the biomass constitution. The dominant species *Artemisia herba-alba* representing two third of total biomass at Taoujgalt, with a maximum in autumn both for biomass as for leaf area based transpiration rates. Contrary to El Miyit were the plant transpiration is strongly depended on the local rainfall, areal transpiration rates of the northern area are less closely linked to local precipitation, and may even exceed precipitation in some months. This indicates the influence of local water storage in the soil, and/or the influence of groundwater fluxes within this mountainous region.

Keywords: Biomass, desert, hydrological circle, precipitation, South Morocco, transpiration rates, water use