



Efficient fog harvesting by *Stipagrostis sabulicola* (Namib dune bushman grass)

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Stipagrostis sabulicola is an endemic species of the central Namib Desert which settles on extremely arid dune fields. Due to its ability to persistence even during exceptionally dry years it is generally assumed that water supply of this species is substantially based on fog water. In this contribution, the results of a study investigating the capability of *S. sabulicola* for fog harvesting are presented. For this purpose, stem flow rates of *S. sabulicola* during fog events, spatial gradient of soil water content (SWC) close to mounds of *S. sabulicola* and its leaf water potential (LWP) before and after fog events were monitored together with climate parameters.

According to the data obtained during this study, *S. sabulicola* is able to harvest substantial amounts of water by fog catchment from nocturnal fog events. Since culms of *S. sabulicola* are often stiff with an upright habitus, fog harvesting occurs via stemflow that conducts water directly towards the root zone of a plant. According to this mechanism, the stem runoff is concentrated within the area of the mound. A medium-sized mound of *S. sabulicola* is able to collect an amount of about 4 l per fog night. This fog harvesting leads to a considerable spatial gradient of soil water content with values decreasing with increasing distance from the mound. As a result of the water input by fog drip, SWC within the mound increases significantly, particularly close to the culm bases where SWC values increased to 2.2 % after a fog event.

Due to the uneven distribution of water by stemflow, SWC within a mound shows high spatial heterogeneity which is also illustrated by the numerous outliers and extreme values of SWC within the mound region. This heterogeneity is also due to the fact that several sagging leaves are always present causing fog drip which more or less irregularly scatters moisture. For bare soil outside of a mound, the water content is not substantially increased, amounting to 0.78 % on average during dry days and 0.89 % after fog events. Fog harvesting affects also leaf water potential: whereas leaf water potential declines during dry days, it remains more or less constant on days following fog events. Since mounds of *S. sabulicola* provide shelter and food for various other organisms such as ants and lizards, their ability for nocturnal fog catchment is of high significance for the ecosystem of the Namib dunes.