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Salt creep and wicking counteract hydrophobic organic structures

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The hydrophobic nature of many biological and edaphic surfaces prevents wetting and water movement. Already small amounts of salts and other hygroscopic material (e.g. by aerosol deposition to leaf surfaces) may change this situation. Salts attract minute amounts of liquid water to the surface and may dynamically expand on the original surface by creeping (evaporation-driven extension of crystals). Creeping is governed by fluctuations of relative humidity and increases with time. Under high, almost saturated concentrations of the salt solutions, ions from the chaotropic side of the Hofmeister series creep most efficiently. Once established, continuous salt connections may act to channel small water flows along the surface. They may act as wicks if water is removed from one side by evaporation. Stomata may in this way become ‘leaky’ by the leaf surface accumulation of hygroscopic aerosols.