

Abstract:

Hydraulic redistribution is a widespread process of passive water transport through the plant root system along the gradient of water potential. This process significantly affects other plant belowground and aboveground processes. Water can be transported in several directions by hydraulic redistribution.

The aim of the first part of this thesis is to summarize the knowledge about the operation of hydraulic redistribution. It describes the causes and consequences of the hydraulic redistribution as well as its main types. Subsequently, mainly vertical hydraulic redistribution is observed, the main components of which are the hydraulic lift and the hydraulic descent. The second part focuses on how vertical hydraulic redistribution can influence the interactions among plants and the functioning of the whole ecosystem. The answer to this question is sought in the savanna plant life, which is composed of scattered trees and their grassy understory. Savanna plants are exposed to dry and wet seasons, which creates a changing soil gradient of water potential throughout the year, which is of great interest for hydraulic redistribution research. This thesis shows that woody species have a competitive advantage over the grassy understory due to the presence of a hydraulic descent. Competition between trees and grasses is limited to precipitation periods. The last part of the thesis provides two different views on the question, whether the grassy understory during the dry season is able to profit from water redistributed by trees.

The thesis deals mainly with savanna plants, but hydraulic redistribution is undoubtedly also present in plants of other biomes of the world. In the future, climate change may lead to the increase of the importance of the research regarding hydraulic redistribution also in temperate latitudes.

Keywords:

Hydraulic redistribution, hydraulic lift, hydraulic descent, savanna, savanna trees, grassy understory, interspecific interactions, competition