

**Abstract:**

Woody plants must cope with drought as it is one of the main factors of the ongoing climate change. The ability of woody plants to adapt to this stressor determines whether they will survive in constantly changing environmental conditions. The deciduous trees of European temperate forests are not as adapted to drought as Mediterranean trees and shrubs, and therefore the lack of water is a major stress for them. Leaf turned out to be the most flexible plant organ in its response to drought.

The aim of this work is to summarize the knowledge about the effect of water deficit on the anatomical structure of leaf and its selected physiological parameters. The first part of this thesis is focused on the drought affecting European tree species and their various defensive strategies against this factor. It mainly describes the modification of leaf's anatomy structure as their defensive reactions observed in dermal, ground and vascular tissue. The second part of this thesis is devoted to the influence of water deficit on the selected leaf's physiological processes, especially on transpiration and photosynthesis, and the key role of stomata closure on both of these physiological processes.

Drought causes changes in leaf anatomical structure and its physiological functions. The leaf's developmental stage at which it is exposed to the water deficit is crucial for the leaf's ability to adapt to drought. When developing under water stress the plant alternate the anatomical structure of leaves as a defensive mechanism (e.g., changing stomata density, thickening the cuticular layer, compacting mesophyll structure), while fully differentiated leaves tend to adapt by changing the physiological processes (e.g., declining transpiration). Anatomical and physiological adaptations frequently occur at the same time and complement and influence each other.

**Keywords:**

epidermis, deciduous trees, drought, leaf, leaf anatomy, mesophyll, photosynthesis, stomata, transpiration