

SENSITIVITY OF NATIVE (*QUERCUS ROBUR*) AND EXOTIC (*QUERCUS RUBRA*) OAK TREES TO PERIODIC DROUGHT EVENTS IN A WARMING CITY OF SOUTHWEST GERMANY

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Extreme drought events in urban areas can predispose single-standing city trees to drought-induced mortality and early senescence. We compared trees' radial growth, tolerance to periodic drought, and internal trunk damage of native and exotic oak species growing in contrasting habitats of parks and streets. We randomly selected 40 *Quercus robur* trees and 40 *Q. rubra* trees from across the city, evenly distributed between parks and streets. We measured the internal trunk damage by impulse tomography using an ARBOTOM® (Rinntech-Metriwerk GmbH & Co. KG of Heidelberg, Germany) and performed a tree health and dendrometric survey. The radial growth was higher in park trees than in street trees in both species. The correlations between stem growth and drought were more substantial in *Q. robur* than in *Q. rubra*, and *Q. robur* was more sensitive to winter and spring drought than *Q. rubra*. The resilience, recovery, and resistance often showed alternating trends between species and years of drought. The recovery time after the drought has almost doubled since 2003 compared to droughts between 1959 and 1991 in both species. *Quercus rubra* needed more time to recover than *Q. robur*. The impulse tomography result showed that trees with higher drought-induced growth decline also had more significant internal damage. *Quercus robur* had more wood damage inside the trunk than *Q. rubra*. We can conclude that with increased drought intensity and frequency in cities, both *Q. rubra* and *Q. robur* trees take more time to recover from droughts, which leads to internal damage to the trunk due to secondary pathogen infections that warrant further investigations.

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