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The epiphyte habitat – a tree biology perspective

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Among the fascinating relationships of orchids with other organisms, i.e. pollinators, symbiotic fungi, and phorophytes, the latter is currently receiving the least attention. Studies show that there is hardly ever a monospecific relation between an epiphytic orchid species and a tree species, but preferences towards and avoidance of certain tree species are well documented, allowing a diversification of niches for epiphytic orchids. Often, the range of phorophytes for a particular orchid seems narrow, and could be a conservation concern in case of tree species composition change. Furthermore, epiphytic orchid species diversify in habitat within the crown of trees, some species being confined to twigs, other to larger branches or to main stems. In this review we look into the mechanisms that could prevent or confine establishment to certain trees and certain parts of the crown, discussing specific differences in bark quality as well as dynamic changes in crown position, branch size, and bark quality over the typical life span of the epiphytic orchid. The successful epiphyte needs to adjust to the continuous development of the phorophyte, being able to germinate on bark that is considerably younger than the bark supporting the flowering plants a decade or so later. The challenge and the outcome also depend on the success and growth rate of the phorophyte in question. We do have tools to approach these questions experimentally, but currently most data and inferences about the epiphytic habitat are based on correlative studies.