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The plant cuticle as an interface between leaves and air-borne pollutants

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Abstract

Material deposited on leaf surfaces may be taken up into the interior either by the stomatal or the cuticular pathway. The uptake of non-volatile substances is restricted to the penetration of the cuticle. The objective of the collaborative work reported here was to characterise important aspects of the interactions between air-borne pollutants and the cuticle of trees. The amounts and composition of the cuticular waxes of the needles of *Picea abies* and the leaves of *Fagus sylvatica* were investigated with special attention to the effects of age and environmental factors. The transport properties of plant cuticles were studied using a variety of techniques covering uptake into intact needles, permeability of isolated cuticular membranes and the mobility of permeants in reconstituted cuticular waxes. Effects of polluted sea-spray on the needle surfaces of conifers growing close to the Mediterranean Sea were also investigated.

Keywords: air pollution, *Citrus aurantium*, cuticle, cuticular waxes, *Fagus sylvatica*, *Hordeum vulgare*, permeability, *Picea abies*, *Pinus halepensis*, sea spray, surfactants