

Publication

Isotopic evidence in adult oak trees of a mixotrophic lifestyle during spring reactivation

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In deciduous oaks, spring reactivation modifies the capability of ectomycorrhizal fungi (EMf) to mobilise carbon from soil organic matter. Plant carbon budget is also unbalanced during spring reactivation: carbon demand is high to build new tissues and carbon may be provided by reserves only as new photoassimilates are not yet available. Using a stable isotope approach with C-13-labelled litter, we have estimated that after a six months experiment, less than 1% of carbon is derived from litter during spring reactivation and is channelled from the soil to the thick roots of *Quercus petraea* via ectomycorrhiza, even when leaves are photosynthetically active. Our results are promising for future detailed quantification of different carbon sources (i.e. reserves, photosynthesis and litter derived) in EMf oak trees. They also support the hypothesis that oak trees of *Q. petraea* in north-eastern France are partially mixotrophic plants. (C) 2012 Elsevier Ltd. All rights reserved.

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