

Publication

Low secondary leaf wax n-alkane synthesis on fully mature leaves of C3 grasses grown at controlled environmental conditions and variable humidity

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Leaf wax n-alkanes are long-chained aliphatic compounds that are present in the cuticle of terrestrial plant leaves. Their $\delta(2)$ H values are used for the reconstruction of past environments and for plant ecological investigations. The timing of n-alkane synthesis during leaf development and the rate of synthesis of secondary n-alkanes in fully matured leaves are still a matter of debate.; Using a (2) H-labeling approach we estimated secondary leaf wax n-alkane synthesis rates in mature leaf blades of six C3 grass species grown in climate chambers under controlled environmental conditions.; We found that mature grass leaves continue the synthesis of leaf wax n-alkanes after leaf maturation. The rate of secondary n-alkanes synthesis was, however, relatively low and varied in response to atmospheric humidity and among species from 0.09 to 1.09% per day.; Our investigation provides new evidence on the timing of cuticular wax synthesis in grass leaves and indicates that the majority of n-alkanes are synthesized during the initial development of the leaf. Our study will improve the interpretation of leaf wax n-alkane $\delta(2)$ H values in environmental and geological studies as it suggests that secondary synthesis of leaf wax n-alkanes in grass leaves contributes only slightly to the geological record. Copyright © 2016 John Wiley & Sons, Ltd.

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