

# **Influence of Wind on Carbon-Isotope Composition of Plants**

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Carbon isotope composition of organic substances of a plant and its derivatives has been widely used to gain insights into many natural processes. The applications are, of course, based on the knowledge of the relationship between the composition and the parameters of interest to us. We have been investigating the effect of wind on the isotopic composition of plants to better our understanding of the relationship. This is a report of our preliminary findings.

Our preliminary results indicate that the effect of wind on carbon isotopic composition can be large (i.e., at least about ten times greater than analytical precision).  $\delta^{13}\text{C}_{\text{PDB}}$  values of leaf samples taken from windward and leeward side of the *Scaevola serica* bushes of Sandy beach, Ohau, Hawaii, are consistently different by about 1‰ ( $\delta^{13}\text{C}_{\text{PDB}}^{\text{W}} < \delta^{13}\text{C}_{\text{PDB}}^{\text{L}}$ ). Similar but slightly greater differences are also found in leaf samples of *Glycine max*(L.) *Mevrilx* ( $\text{C}_3$ ) and *Zea mays* ( $\text{C}_4$ ) grown under and without influence of wind. The wind speeds prevailed during the experiments range from 0.3 to 4.7 meter/second and with the average around 2 m/s.

The obvious conclusions from our preliminary results are that wind does exert important influence on the carbon isotope composition of plants and that the effect of wind is to make the  $\delta^{13}\text{C}_{\text{PDB}}$  values toward more negative. This may be a consequence of either more efficient in supply of  $\text{CO}_2$  to the leaves for fixation or lowering the efficiency of  $\text{CO}_2$  fixation in the plant; or a combination of the above.