



## **Dissolved organic carbon flows from ombrotrophic peat profiles to porewaters.**

**C. Zaccone, C. Cocozza and T.M. Miano**

Dipartimento di Biologia e Chimica Agro-forestale ed Ambientale, Università degli Studi di Bari, Italy, (zaccone@agr.uniba.it / Phone: +39 080 5442857)

An important part of the peat bog carbon budget is the occurrence and transport of the dissolved organic carbon (DOC) fraction.

A peat core (2T, 15 x 15 x 105 cm) was removed in 2005 from a Swiss ombrotrophic bog and divided in several ( $n = 91$ ) slices of  $1 \pm 0.15$  cm of thickness. Porewaters were extracted and DOC was determined on  $0.45 \mu\text{m}$  filtered porewater samples.

In the upper-oxic zone (first 18 cm), DOC decreases with depth and ranges between  $2201.0 \pm 0.1$  and  $225.1 \pm 0.6 \text{ mg l}^{-1}$ . These high values are probably due to low molecular weight organic compounds resulting from the physiological activity of plants and microorganisms and/or affected by the period of sampling (end of June). In fact, several Authors (e.g., Scott et al., 1998) found a considerable seasonal variation of DOC concentration in peatlands, with a minimum concentration in winter time and a peak concentration reached in late summer, often in connection with an increase in water flow after a dry summer period. Consequently, the DOC variation could be not just a phenomena of dilution but reflect the seasonal variation of microbial activity.

In the lower suboxic-anoxic layers, instead, DOC ranges between  $48.2 \pm 0.4$  and  $115.3 \pm 0.2 \text{ mg l}^{-1}$ . Even if DOC is defined like the most mobile fraction of the organic matter, a direct correlation ( $R^2 = 0.88$ ) was found with the dried peat density. Thus, in this zone data seem to suggest horizontal instead of vertical flows along the bog profile due to a stronger sorption of the hydrophobic fraction onto the peat.