



## **Potential of a multi-isotopic and dendroecological approach to study the impact of a traffic road on *Quercus robur* individuals in a natural reserve in Northern Italy.**

Simona Altieri (1), Manuela Capano (1), Carmina Sirignano (1), Fabio Marzaioli (1), Carmine Lubritto (1), Giovanna Battipaglia (2), and Antonio D'Onofrio (1)

(1) Department of Environmental Sciences, Second University of Naples, Caserta, Italy (simona.altieri@unina2.it /fax: (0039) 0823 274605/ tel: (0039)0823 274651/274814), (2) ENEA-Italian National Agency for New Technologies, Energy and Sustainable Economic Development, Roma, Italy

Tree rings represent an important tool to monitor, over time, environmental information and anthropogenic emission related to the region where trees grow. Isotopic and dendroecological analyses on wood can detect the physiological responses of trees to environmental changes and are a powerful resource for the quantitative assessment of pollution trends. In the natural reserve of "Bosco Fontana" (Mantova, North Italy), eight specimens of *Quercus robur* were sampled at increasing distance from the heavily trafficked street SS236. Dendroecological and carbon ( $^{13}\text{C}$  and  $^{14}\text{C}$ ), nitrogen ( $^{15}\text{N}$ ) and oxygen ( $^{18}\text{O}$ ) isotopic analyses were performed to understand the spatial and temporal effect of the vehicle exhaust on tree growth. Cellulose was extracted from wood for C and O measurements; instead, movable nitrogen was removed to select only structural nitrogen, avoiding interferences in N analyses. A specific protocol of measurement of  $\delta^{15}\text{N}$  with IRMS in low nitrogen concentration wood (<1%) was here defined for *Quercus robur* species. Preliminary results of  $\delta^{13}\text{C}$  and  $\Delta^{14}\text{C}$  suggested the presence of different pollution sources affecting tree growth. The isotopic measurements will be completed and they will help to better decipher such complex effects, underlining the usefulness of a multi-analytic approach.