Environmental pollution is recorded in trees: dendrochemistry in urban forestry

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Monitoring of environmental pollution in urban areas is essential to inspect environmental health and to address safety action.

The first stations measuring air pollutants were installed during the 1980s.

“the removal of atmospheric pollutants by vegetation is one of the most commonly cited ecosystem services, yet it is one of the least supported empirically”

Pataki et al. (2011)
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Dendrochemistry allows to reconstruct past pollution episodes and to acquire spatial distribution of pollutants. Trees can accumulate pollutants in very low concentration in the environment.

The availability of trees in the environment allows to sample and analyse them.

The use of dendrochemistry for the biomonitoring of pollutants requires further and continuously updated investigations.
Pinus sylvestris

Steel factory
Quercus pubescens
Quercus pubescens

**Cr**

Index


Tree-Ring Year

**Ni**

Index


Tree-Ring Year

**Pb**

Index


Tree-Ring Year

**Co**

Index


Tree-Ring Year
Tree-rings represent a widely available source of long-term data.

Availability of historical pollutant loading
(not available from monitoring station data)!

The data proved to be useful in determining the policies needed to control airborne pollution as input information for future air quality modelling.

High value of trees outside forest and greenspaces in urban contest to provide several ecosystem services!
... must be taken into account

the accumulation of heavy metal depends by trees (which species?) and pollutant (chemical specificity?)

accumulation processes are described by plant-pollutant relationship (e.g., radial translocation, root, leaf or bark absorption)

appropriate sampling are necessary to improve the definition of spatial and temporal pollutant trends

environmental pollution thresholds can be linked to tree-ring signal through the use of bioindicators (e.g., lichens)
Il valore nascosto degli alberi in città

Dall’anidride carbonica assorbita all’ombra offerta: ecco gli algoritmi che danno un prezzo e calcolano i benefici economici che ogni pianta garantisce ai singoli edifici

di Leonard Berberi - lberberi@corriere.it

Grazie per l’attenzione
Claudia Cocozza