

European Network on New Sensing Technologies for Air Pollution Control and Environmental Sustainability - *EuNetAir*

COST Action TD1105

WGs and MC Meeting at LINKOPING, 3 - 5 June 2015

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USING LICHENS AS MULTI-POLLUTANT BIOINDICATORS IN AIR QUALITY MONITORING



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 **cost**
EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY





....Biomonitoring

- Information on the effect on the biological component (bioaccumulation, cumulative effect, chemosensitization,...)
- Cumulative information in longer time period
- Respons proportional to biological available amount of pollutants

- Not enough information on the exact pollutant

Lichens As Multi-pollutant Bioindicators In Air Quality Monitoring



Lichens take all necessities for life from THE AIR

FIGURE 1. *Xanthoria parietina*



FIGURE 2. Lichen growth forms (from left to right: crustose, foliose, fruticose)

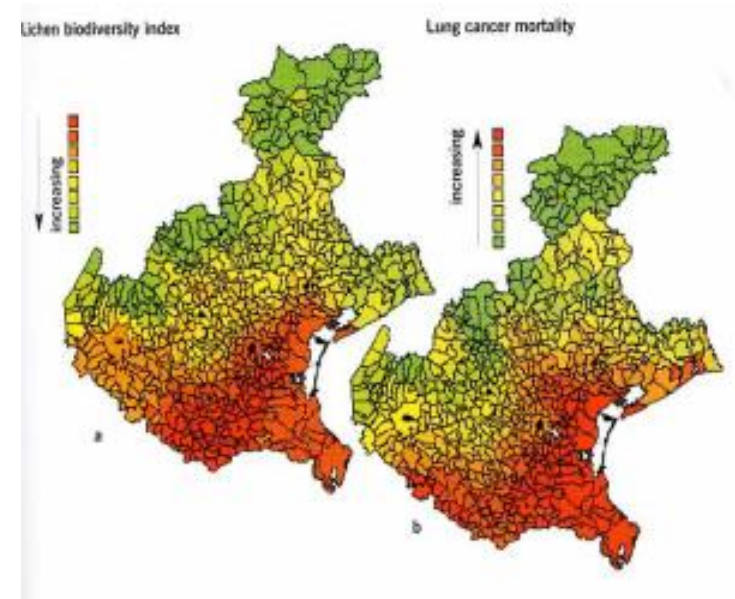
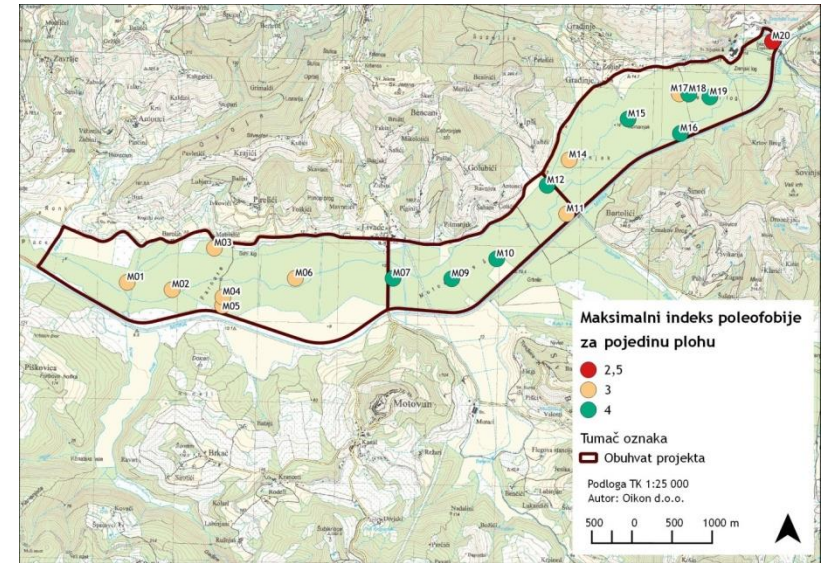


FIGURE 3. Lichen biodiversity indeks with respect to lung cancer mortality

Projects

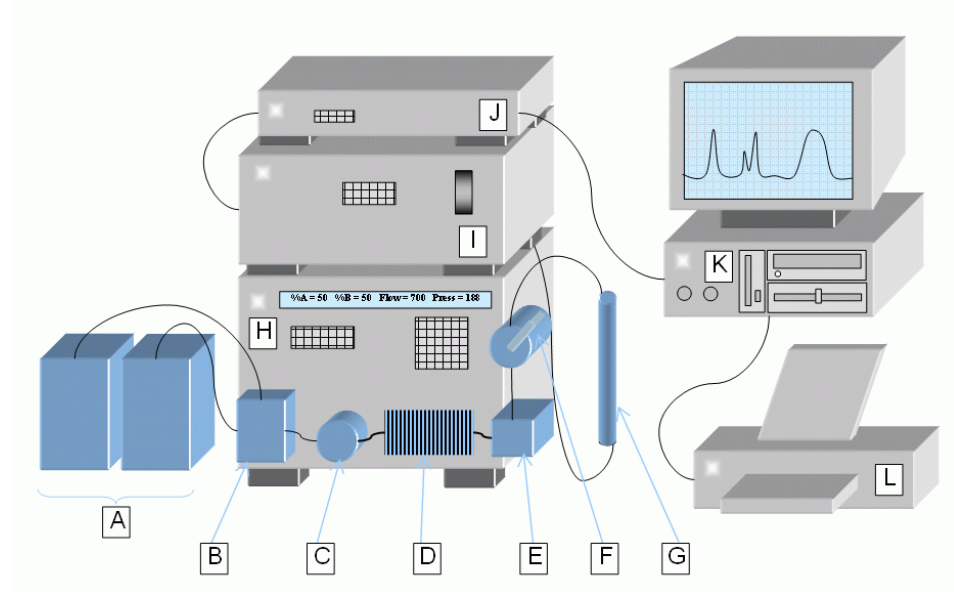
- Mirna river restoration – old forest habitat
- PhD project – comprehensive view on lichen physiology - indicators of pollution (even earlier signs of pollution) + numerical modeling (GEKOM)
- EIA



Workshops - highschool



Research Facilities



University of
Zagreb

+ GIS



Suggested **R&I Needs** for future research

Lichen bioindication

Cheaper

Higher spatial resolution

Lower time resolution

Cumulative effect

Biotransformation

Pollutant bioavailability and extractability



Suggested **R&I Needs** for future research

- Interdisciplinary approach – using bioindicators and biomarkers together with physicochemical methods → **modeling long-term multi-pollutant effects**