Palynology as a tool for the knowledge on the millennial human impact and land management in the central Mediterranean

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- Palynology and Cultural Landscape
- Long-Term Environmental Change (LoTEC)
- The LoTEC becomes Cultural Landscape
- Influence or Impact?
  - 1. Multifunctional land-use in Mediterranean prehistory
  - 2. Landscape and human activity at Stromboli, Sicily
  - 3. Pastures and crops of Greek colonies in southern Italy
  - 4. Agriculture and local economies of Roman central Italy
- Conclusions
Human impact and land management can be studied by palynology
The millennial scale of these phenomena as Long-Term Environmental Change (LoTEC)

The LoTEC studies successions from undisturbed to anthropogenically influenced environment (Faegri et al 1989)

Interdisciplinary a-b-g applications

Palaeoecology / Ecology

Conservation biology

Landscape reconstructions

Land-use management

The understanding of LoTEC implies

knowledge and description of environments at subsequent steps of human impact

knowledge on the scale and duration of human presence in a territory
The LoTEC becomes Cultural Landscape

The 3-concept definition of Cultural Landscape

by Mulk and Bayliss-Smith (1998)

In: Ucko PJ, Layton R (eds)
The Archaeology and Anthropology of Landscape.
Routledge, London, pp 358-96

- **Ecological**
  - landscape produced by cumulative effects of human activities:
    - dynamic ecosystems

- **Formal**
  - landscape produced by a particular culture:
    - biostratigraphic deposits

- **Cognitive**
  - intangible links between humans and their territories:
    - symbols and traditions

Concepts

marine / continental cores
archaeological sites

Mercuri 2014 - Landscape Ecol 29: 1799-1810
✓ human ecosystems replace natural ecosystems
✓ cultural landscapes are the lands transformed by human impact

- Palaeobotanical record
- Spatial scale
- Human group
- Cultural Landscape concept

- Off-site
- On-site
- Ethno / Archaeo

- supra-regional
- regional
- local
- large
- small

- Ecological
- Formal
- Cognitive
Influence or impact?

**On-site** palynology to recognise the **first influence** of humans

**Near/Off-site** sequences to recognise the **area of site influence**

Comparison of regional (natural?) and local (disturbed) pollen diagrams
1. From influence to impact (8.0-2.8 ka BP)

Palynology of prehistoric Mediterranean archaeological sites shows a **multifunctional land use** (Mercuri et al 2019)

**Neolithic/Bronze**: an increasing importance to **wood exploitation** seems to have occurred over time, that was probably the main cultural change at the passage from the Neolithic land-use (*influence*) to the Bronze age land exploitation (*impact*).
Similar general patterns:
(1) declines of trees at the onset of settlement (especially oaks)
(2) alternative cycles of retreat and recovery of woodland
(3) trends of decrease of woodland cover just before the abandonment

All the sites were settled near wet environments, surrounded by grasslands and mixed oakwoods, with many synanthropic taxa
- Sylvo-pastoral and crop farming mixed systems
- Neolithic and Bronze different focuses on land uses and cultural skills
- Increasing importance given to wood exploitation over time

Principal Component Analysis of selected pollen taxa and sums from the 6 archaeological sites

Axis 1: from forested towards more open environments, and from tree crops to herb crops and grassland

Axis 2: from more forested to tree crops against open and wetland environments
Early evidence of agrarian practices, including cereal cultivation, dates back to the Bronze Age while the current vegetation seems to have originated during the Medieval period.
3. Pastures and crops of Greek colonies in southern Italy (Chora of Metaponto, 6th-1st BC)

Reconstruction of the agrarian landscape on which was based the economy of the Greek colonial system at Metaponto (Florenzano & Mercuri 2012, 2018)

Economy was prevalently based on crop (cereals) and tree (olives) cultivation and pastoralism or animal breeding; agriculture was performed just close to the settlements.

Florenzano A & Mercuri AM 2012 - Rendiconti Online SGI 21: 750-752
Roman sites were built in patches of **fields and pastures** simultaneously present in the territory intensively exploited and managed by farmers and peasant people.

Information on the land-use, agrarian landscape and site function to illuminate the complexity of Roman peasant life-ways (Bowes et al 2020)

**Case Nuove** processing site

7 archaeological sites (rural settlements and temporary use structures) in the Ombrone river valley.
87 pollen samples and 84 macroremain samples taken from different contexts

- Pastures (c.38%)
- Legumes (4.5%)
- Cereals (4.4%)

Bowes K et al 2020 – University Pennsylvania Museum Press
Conclusions

Human impact and land management are studied by palynology as LoTEC and researches on the transition from influence to impact.

- Central Mediterranean
  - Multiple land use activities (multifunctional landscapes) since the Neolithic

- Stromboli island
  - Environmental reconstruction pointing to the availability of resources in a limited space; current Mediterranean landscape since the Middle Ages

- Greek colonies in S Italy
  - Complex agro-pastoral system instead of monoculture cropping in the chora-countryside

- Roman central Italy
  - Signals of great human control over productive landscapes; seasonality of agrarian activities and dynamic production system
Quoted references

Bowes et al. (2020) University Pennsylvania Museum Press


