

## POLLEN EVIDENCE OF VEGETATION CHANGES AND LAND USE ON THE TROPEA PROMONTORY (CALABRIA, ITALY) DURING PREHISTORY

Halinka Di Lorenzo, Elda Russo Ermolli

Dipartimento di Scienze della Terra, dell'Ambiente e delle Risorse, Università di Napoli Federico II, Napoli, Italy  
Corresponding author: H. Di Lorenzo <[halinka.dilorenzo@unina.it](mailto:halinka.dilorenzo@unina.it)>

**ABSTRACT:** Pollen analysis was undertaken on a sediment core drilled at the top of the Tropea Promontory (Calabria), an area rich in archaeological evidence from the Eneolithic up to the Iron Age. Human impact is clearly detected in the basal portion of the core through deforestation, fires, crops and pasturage activities. The anthropic pressure seems to generally reduce around the core site in the second half of the core, when a significant forest recover is recorded. These local vegetation changes and land use could be ascribed to both a gradual closure of the marsh and a possible abandonment of this area for pastoral and agricultural practices.

**KEYWORDS:** Palynology, microcharcoals, deforestation, human impact, late Holocene

### 1. INTRODUCTION

Archeological surveys of the last years have witnessed a diffuse human presence in the Tropea Promontory during prehistoric times (Pacciarelli, 2004, 2011; Lo Torto, et al., 2011; Jung, et al., 2015). In order to better define the impact that humans exerted on this territory during Prehistory, palynological investigations were realized with the main aim of distinguishing the natural and anthropogenic forcing in the evolution of the past landscapes. The results here presented increase the knowledge, already acquired in this area (Russo Ermolli et al., 2018), on the complex human - environment interactions in a key region for the Italian Prehistory.

### 2. MATERIAL AND METHODS

A sediment core was drilled at 555 m a.s.l. on top of the Tropea Promontory, a site rich in archeological evidence dated from the Eneolithic up to the Iron Age. The site was selected on the basis of a previous study (Lo Torto et al., 2011) highlighting the occurrence of buried layers with Eneolithic pottery in the Passo Murato locality. The coring, realized in 2015 with a small piston corer, intercepted a peat deposit (from 1.10 to 2.40 m depth), covering the pre-Quaternary substratum, whose base likely corresponds to the levels analyzed by Lo Torto et al. (2011).

Pollen analysis was undertaken on 21 peat samples collected from the core each 5 cm, from 110 to 235 m depth. Chemical (HCl 20%, HF 40%, hot HCl 10%, acetolysis) and physical (10  $\mu\text{m}$   $\leq$  sieving  $\leq$  200  $\mu\text{m}$ , ZnCl<sub>2</sub> floating) treatments were used to concentrate pollen grains in the residue. Slides were mounted in glycerin to permit pollen motion and facilitate taxonomical determination. Determinations and counts were carried out under a light microscope at 500x and 1000x

magnification, with the support of pollen atlases (Reille, 1992-1995; Beug, 2015) and reference pollen material.

### 3. RESULTS

Almost all analyzed samples resulted rich in well preserved pollen grains and only 4 samples resulted poor; 74 taxa were recognized. A synthetic diagram was realized (Fig. 1) by selecting taxa, or groups of taxa, among the most representative of man impact.

From the left-hand side of the diagram, some selected trees are shown: *Quercus ilex* (Mediterranean forest), *Quercus* (deciduous forest) and *Alnus* (floodplain forest), followed by microcharcoals. The Arboreal Pollen (AP) curve indicates the rate of the forest cover. It is assumed that AP percentages over 70% are indicative of a forested landscape while percentages below 40% indicate open environments (Favre, et al., 2008). Intermediate percentages (from 40 to 70%) indicate a patchy landscape with open spaces and scattered forested areas. The herbaceous taxa are dominated by the Poaceae family. The main anthropogenic indicators are displayed with different percentage scales, depending on their amounts. Cyperaceae (marsh plants) are listed at the extreme right of the diagram.

### 4. DISCUSSION AND CONCLUSION

In the basal part of the diagram, high amounts of microcharcoals, recorded in concomitance with the lowering of arboreal pollen percentages, attest to the use of anthropogenic fires to open the landscape for agricultural practices (cereals) and animal husbandry, which is well testified by the high amounts of fungal spores, indicative of pasturage (Cugny et al., 2010; Ejarque et al., 2011).

Starting from 165 cm depth, a decrease in the fire practice is coupled with the recovery of the forest cover and an increase in the marsh plants. These vegetation

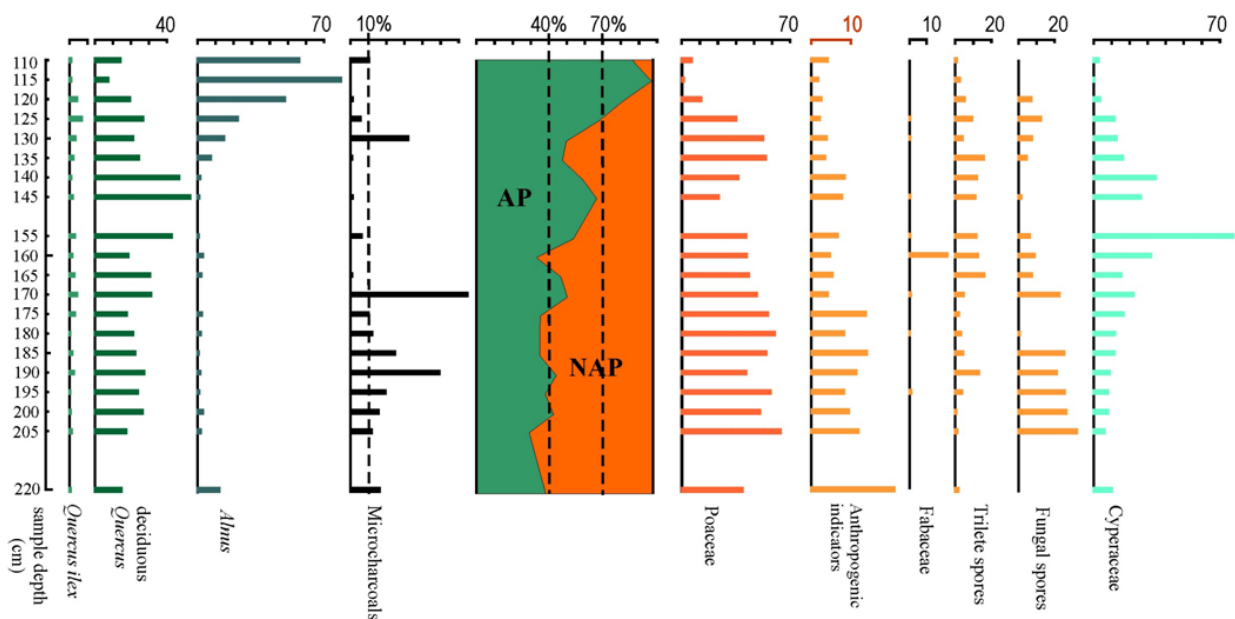


Fig. 1- Synthetic pollen diagram of Passo Murato core

changes could indicate both a contraction of the marsh and a partial abandonment of the area. Some cereal crops were still present and a peak of *Trifolium* opens up interesting hypothesis on the occurrence of forage crops (Miras et al., 2018).

Another important change is recorded from 130 cm depth, when *Alnus* markedly increases in concurrence with the decrease in *Cyperaceae*. These results could indicate a further contraction and final closure of the marsh, which led to the rapid development of an alder forest on the wet soils. Evidence of abandonment is clearly recorded in the last levels even if the topmost sample seems to suggest a possible recolonization, with a slight forest decline and cereal increase.

The reconstructed history of vegetation and land use changes on the Tropea Promontory certainly needs further investigation especially concerning their connection to the presence of prehistoric communities. The detailed dating of the core, which is in progress, will allow such connections to be established. With this perspective, the Passo Murato core represents an important sedimentary archive that enriches the knowledge of an important territory widely exploited by prehistoric human communities.

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