



Conservation of the Macedonian oak (*Quercus trojana*) at its westernmost boundaries

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Abstract: The Murgia Materana regional park is located in the Basilicata region, Italy, extending on a surface of 8000 ha circa. In addition to habitats such as Mediterranean pseudo-steppe and Mediterranean bush, it presents relatively large clusters of the Macedonian oak (*Quercus trojana*). The park is thought to constitute the westernmost point of the distribution of the Macedonian oak. In the past years, we conducted a census of the Macedonian oak trees present in the area, with an evaluation of plant health. The majority of the trees are located on the higher altitude zones of the park. We detected that large veteran trees (DBH > 200 cm) are predominantly found in the vicinities of ancient large farms ("masserie"). We established wildfires to be the principal threat to the survival of this species in the area. In order to reintroduce individuals in fire-damaged zones, we collected and planted acorns from a selection of individuals. At the present time, we are about to transfer the samplings in the wild.

Key words: South Italy, oak distribution, Natural park, biodiversity

Introduction

The largest forest present in the Murgia Materana Regional Park are known as "Bosco del Comune" and "Bosco di Lucignano" and are located in the southern sector of the park. They constitute the testimony of the existence of much larger formations, that covered vast areas of the Matera and Puglia Murgia plateau in the past.

The "Bosco del Comune" is a complex forest of great historical and cultural value, attestation of ancient civic uses of the wood, dating back to the Middle Ages. This forest was managed for centuries by the Municipality of Matera, with environmental sustainability criteria. Today it is a mixed forest of evergreen and deciduous trees: together with the evergreen holm oak (*Quercus ilex* L.), the deciduous Virgilian oak (*Quercus virgiliana* Ten.) and Dalechamp oak (*Quercus dalechampii* Ten.) are present.

"Bosco di Lucignano" is detached from the "Bosco del Comune" by the canyon named "Vallone della Femmina". It stands almost on the border with the territory of Ginosola (in the Province of Taranto, Apulia) and represents a precious and rare example of the forest vegetation that covered the easternmost part of the Murgia Materana. It is a forest dominated by the Macedonian oak (*Quercus trojana* Webb) and contains the westernmost clusters of living specimens of this species.

The woodland formations present inside the boundaries of the “Murgia Materana Regional Park” are habitats listed in the Annex I of the Habitat Directive 43/92/EEC, respectively

- Habitat 9250 “*Quercus trojana* woods”
- Habitat 9340 “*Quercus ilex* and “*Quercus rotundifolia* Lam. forests”

The Macedonian oak is found prevalently in South-Eastern Europe, reaching the Mediterranean shores of Turkey, in the region surrounding the ancient city of Troy, to which owes its scientific name. It is most abundant in the Balkan Peninsula, where it spans from Croatia towards Montenegro, Albania and Greece. In Italy, it is found in the regions of Puglia and Basilicata where it occupies a territory that coincides with the one of the Murgia. These are the westernmost woodlands of this species and consist of few isolated clusters of trees, most of which lie within the boundaries of the Murgia Materana Regional park. Its presence has a considerable relevance in terms of the phytogeography of the Italian peninsula, demonstrating the presence of a land bridge between Balkan region and Southern Italy.

Macedonian oak forests (*Euphorbio apii – Quercetum trojanae*) have been object of a recent phytosociological classification and are characterised, in the Murgia Materana Regional Park, by a thermophilic association with evergreen forests of holm oaks *Fraxino orni – Quercion ilicis*.

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Material and methods

Acorn collection

The following associations have been involved in the collection of Macedonian oak acorns across the park territory: *Falco naumanni* trekking association, WWF and Legambiente (Matera branches). More than 5000 acorns have been collected in the Murgia Materana Regional Park. Acorn collection followed a simple protocol to select which acorns to gather. It aimed at maximizing the quality of the collected seeds and at ensuring the highest germination percentages. Here the key steps of the operative protocol for acorn collection:

- 1) collect exclusively Macedonian oak acorns (Figure 1);
- 2) store and transport the collected acorns in recipients made of breathable materials (cotton, canvas, paper), avoiding plastic bags;
- 3) collect acorns either from the tree (by selecting the ripest ones) or picked up from the ground (prioritizing freshly fallen ones);
- 4) when collecting acorns, it is important to verify whether the seed has been infected by parasites: this is usually indicated by the presence of holes, cuts, and sawdust. Even a small black dot on the surface of the seed might be an indication of a parasitic infection, hence the general recommendation was to only collect healthy acorns.



Figure 1. Acorns (left) and greenhouse seedlings of the Macedonian oak (right).

Seedling cultivation

The project culminated with the emergence of about 5000 seedlings, cultivated in the greenhouse “Masseria Radogna”, realised and maintained with funding provided by the LIFE ARUPA project. The young trees will be employed in reforestation activities of *Q. trojana* woodlands, particularly in areas that have been severely damaged by fires.

Surveying and compiling a catalogue of Macedonian oak trees

The largest trees of Macedonian oak present in the Murgia Materana Regional Park have been surveyed in order to realise a specimen catalogue. All trees with a diameter at breast height (DBH) greater than 75 cm have been georeferenced. The template of the field data sheet is illustrated in the Figures 2 and 3 below.

The protocol for tree specimen survey is the following:

- 1) data were collected in the field and recorded on the data sheet;
- 2) every individual with a DBH > 75 cm was censused;
- 3) the DBH was measured at a height of 130 cm from the ground. For polycormic trees (with multiple trunks branching at a height < 130 cm), the largest trunk was chosen for measurements;
- 4) the GPS coordinates of every tree were recorded and stored in a uniquely named .gpx file.

A total of 108 specimens of Macedonian oak were sampled during the project. Forty-eight of these had a circumference > 1 m. The distribution of the censused trees provided an understanding of the area covered by woodlands of Macedonian oaks in the ancient Basilicata. The largest specimen censused had a trunk circumference of 217 cm and was located near Masseria Malvezzi.

Environmental education

Local schools have been involved in activities like planting and organising the collected acorns.

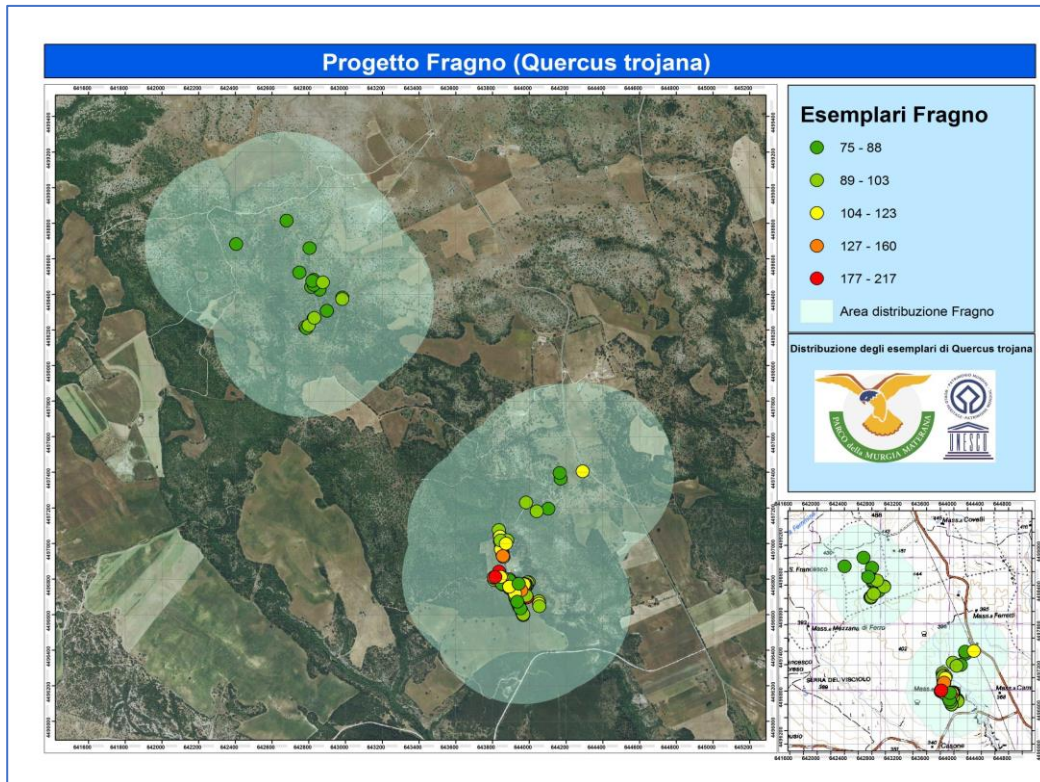


Figure 2. Clusters of Macedonian oaks in the park.

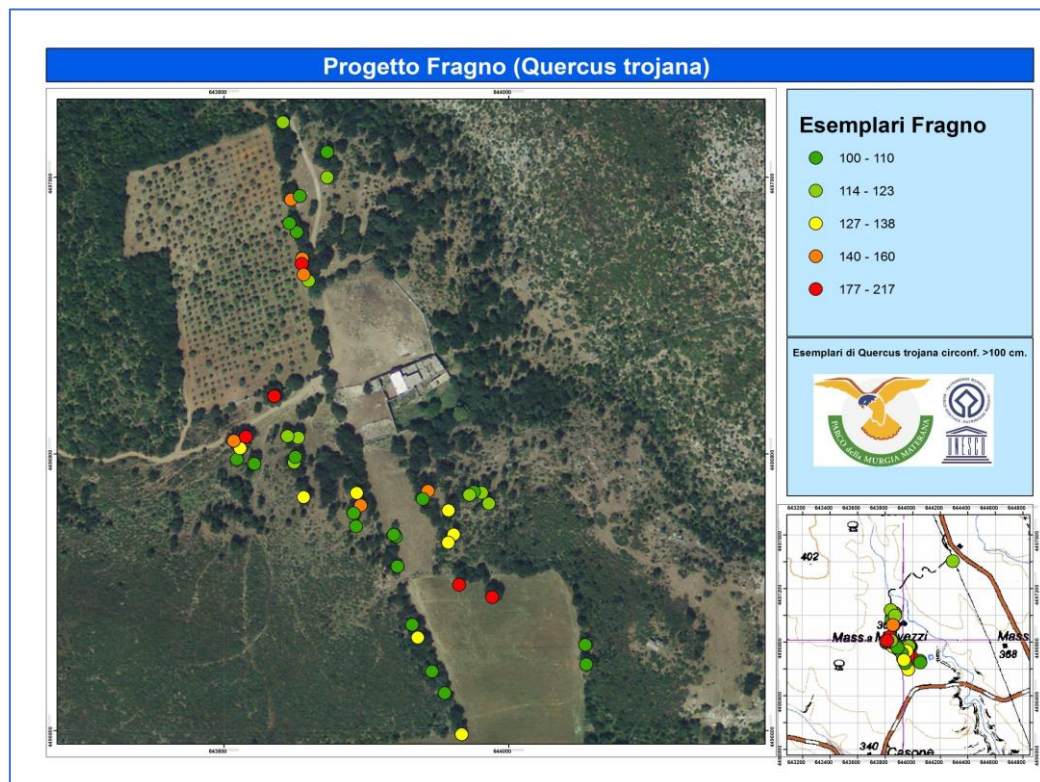


Figure 3. Mapping specimens.