

THE “MUSHROOM GARDEN” AT THE AGADAKI ESTATE (KAIRIOS LIBRARY)

Elias Polemis and Georgios I. Zervakis
Agricultural University of Athens
Laboratory of General and Agricultural Microbiology



The traditional oil-mill with ... its Clathrus!

The residents ...



Since the beginning of the restoration works at the Estate, the first “mushroom resident” was a familiar sight, i.e., a polypore (a bracket fungus commonly known as “esca”) which was found growing on the trunk of an almond tree at the SW part of the Tower. *Phellinus pomaceus* is a wood-rotting (saproxylic) fungus often observed on the trunk and branches of old almond-, cherry-, sour cherry- and other stone-fruit trees (i.e., species of the genus *Prunus*).

In November 2020, while approaching the old olive-mill, we were greeted by a strong fetid odor. There are some mushrooms that you first smell and then see! Indeed, a *Clathrus ruber* mushroom dominated in all its stinking grandeur this particular place attracting clouds of flies. As repulsive as its smell might be, it has impressive looks! It does not resemble a mushroom at all, while its presence in the Estate is a sign of a rich and vibrant ecosystem. The particular species is often found in Andros both by the streams near plane trees and alders, as well as in gardens, like the one found at the Agadaki Estate.





The “jack-o'-lantern mushroom” (*Omphalotus olearius*) could be often observed in olive groves during autumn and early winter; it is considered as a weak pathogen of aged olive trees. Therefore, the occurrence of this fungus at the Agadaki Estate was not a surprise... It was detected in more than one sites, near the trunks of olive-trees always associated with the roots. It is a particularly impressive mushroom with vivid colors, also famous for its bioluminescence (i.e., production and emission of light by a living organism). However, this mushroom is highly toxic and causes severe gastrointestinal poisoning in humans; therefore, it should not be consumed!



C *ryptomarasmius corbariensis* is another strictly Mediterranean species that grows exclusively on fallen olive leaves. The mushrooms are tiny and their caps (pilei) measure only a few millimeters in diameter. Consequently, it easily goes unnoticed and is rarely recorded. Its first record in Greece was from Andros more than 15 years ago, but since then it was also reported from other regions of the country as well.



A recently-cut mulberry tree was found to host a very familiar fungus on its cut trunk. After close inspection, it became evident that it was a large, albeit overripe, *Pleurotus ostreatus* mushroom. This common edible and widely cultivated species (known as ‘oyster mushroom’) is relatively rare in Andros. We also recorded it on alders within the priority habitat at Vori. Initially, it was planned to be transferred to the Garden as an exhibit, but as it turned out it was already there!

Some of the most popular edible mushrooms in Greece, known as “Kokkinomanites” in Andros, comprise species of the genus *Agaricus*. The common cultivated “button” and “portobello” mushrooms belong to this genus. Since no tillage or other soil processing has been performed at the Agadaki Estate, we were bound to meet a rather ordinary representative of the genus whose habitats are the uncultivated fields and pastures, i.e., the “meadow mushroom” (*Agaricus campestris*).



In several parts of the Estate, pruning residues have been deposited for years, and they have already reached an advanced stage of decay. It is very often in orchards, where cut and rotten branches are present, to detect small groups of delicate, fragile and relatively ephemeral mushrooms of *Psathyrella conopilea*. Its name refers to the shape of the mushrooms with a special feature, which is the “conical cap”.



A pile of cut logs and thick branches of walnut and fig trees, wood that could be used at the fireplace, has been literally “consumed” by both wood-boring insects and various wood-rotting fungi. Among others, we found on such plant residues, the “black-wood ear mushroom” (*Auricularia auricula-judae*), a very common species in Greece (and in Andros), which forms dark grey to black gelatinous caps of little gastronomic value. Similar species are cultivated and highly valued in the East Asia.

On such substrates, i.e., wood in advanced rot, another mushroom species is also found, namely *Coprinellus domesticus*. The rotten branches at the Agadaki Estate produced an abundance of these small and extremely ephemeral mushrooms, which in less than 24 hours grow and then self-dissolve as their cap melts, a process – also observed in other mushrooms – that is called “autolysis”.





In addition to the aforementioned mushroom species, other rarer or less known species grew on the pruning residues at the Estate. A typical example is *Hohenbuehelia atrocaerulea* found on walnut branches recorded for the second time in Andros and for just the third time in Greece. It produces minute mushrooms that can be identified to species only after microscopic examination.



Another interesting wood-rotting mushroom is *Psathyrella melanthina*; it is a species that prefers warm climates, hence it is more common in the Mediterranean region. It is noteworthy that it was recorded for the first time in Greece at the priority habitat at Vori and Lefka on alder wood. Except of Andros, unpublished reports about its existence in Greece originate thus far only from Crete.

And the guests!

In the framework of the LIFE Andros Park project activities, a permanent installation with mushroom exhibits was designed and implemented by the mycological team of the Agricultural University of Athens along with the creation of the Botanic Garden. For this purpose, samples of living mushrooms found on logs and wood, predominantly alder but also other tree species, were collected from various areas of Andros, such as Vori, Arni, Apoikia and Katakalaioi, and were transferred to the Agadaki Estate. Apart from the authors of the present report, fellow mycologists Vassilios Daskalopoulos and Georgios Koutrotsios contributed significantly to this project, while the participation of Panagiotis Loukadis (gardener at the Agadaki Estate) was also decisive. In addition, the contribution and continuous support of Mrs. Irini Dampasi (Director of the Kaireios Library) is more than valuable.



Transport of alder logs with living mushrooms from the Vori

A particular site at the lower terraces of the Agadaki Estate was chosen as the permanent exhibition space of these specimens. It is situated close to the river and is naturally kept moist since the water from one of the springs of the Estate ends up there, while it is also shaded by olive and plane trees. Therefore, this an ideal place for hosting mushrooms! The species selected to be transported were mainly perennial polypores whose mushrooms are relatively large and remain alive, and therefore visible, all-year-round for many years to come. Apart from these, other wood-rotting species, less impressive and with a shorter lifespan, but indicative of the large variety of saprotrophic fungi of Andros were also transferred to the Estate.



Installation of trunks bearing mushrooms in the Botanic Garden of the Agadaki Estate

In addition to the mushrooms appearing on tree trunks, an original experiment of outdoor cultivation involving two edible mushrooms is performed in soil-beds covered with woody particles obtained by milling the pruning residues from the Estate’s orchard. The well-known and popular edible species “Parasol mushroom” (*Macrolepiota procera*) and a morel (*Morchella* sp.) were “sown” in these beds. We hope to see them produce mushrooms in the next 1-2 years if the conditions are favorable!



Mushroom “sowing” at the soil-beds of the ‘Mushroom Garden’ performed by V. Daskalopoulos and G. Koutrotsios