
Democritus University of Thrace,
Department of Forestry and Management
Environment and Natural Resources

Forest Soil Laboratory.

Soil Science Laboratory

The Laboratory work covers the scientific field of the relationships between parent rock material, soil and forest, biology of forest soil, humus and forest soils, evolution of forest soils, physicochemical properties of forest soils, relations between forest land and forest vegetation, soil and forest nurseries, relations between soil and artificially established clusters, methods of improving non-productive forest soils, soil and methods of harvesting and classifying forest soils.



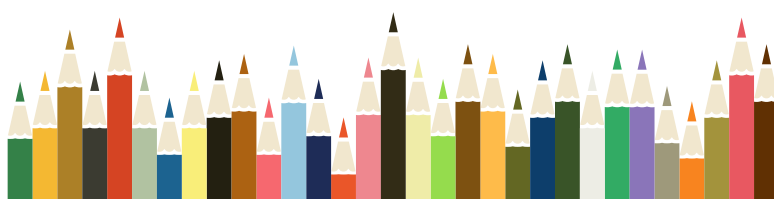
Associate Professor

Orfanoudakis Michail

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Teaching Courses:

**Soil Science,
Forest Soils,
Forest soils fertility,
Soil Microbiology**





Research tools.

- Cultivation and processing of fungi forming Arbuscular mycorrhiza (AMF).
- Analysis, treatment of fungi forming ericoid mycorrhiza.
- Cultivation and processing of fungi forming ectomycorrhizas.
- Cultivation and treatment of Frankia radiomyces.
- Plant development plant management and analysis of data from them.
- Root system analysis (Root growth, root hair).
- Knowledge of Rizotron
Chemical analysis of soils,
Analysis of soil natural properties.
- Soil profile analysis.
- Use of image processing systems (Measuring surfaces, length, etc.).
- Knowledge of molecular techniques.

Short Curriculum vitae

Research interest

The effect of mycorrhizal symbiosis on soil properties, as well as on the carbon cycle.

Isolation, recognition and development in cultivation with a host plant of native species of fungi that form sacrificial mycorrhizas (AMF).

The study and role of mycorrhizas in plant development under stress conditions.

The study and isolation of native Frankia actinomycetes.

Development and growth of the root system of plants under various soil conditions..

Root architecture in symbiosis with, AMF and Frankia,

Physical and Chemical soil properties.

Soil Restoration.

Soil nutrient flow at the natural ecosystems

The role of soil in controlling greenhouse gas emissions.



Research projects participation.

A. Research projects ended

2017- 2020 Life LIFE IP4 NATURA Programme - Integrated actions for the conservation and management of **NATURA 2000 areas**, habitat species and ecosystems in **Greece**.. In this research project I participate in a project on the recording of soil conditions – Biological soil synthetics.

2015- 2018 Life FoResMit Program - "Recovery of degraded coniferous Forests for environmental sustainability Restoration and climate change **Mitigation** "In this research program I participate in the analysis of territorial properties.

5/2011-2016 Exploitation of the by-products of the electrolytic treatment of **MnO₂** . The research project is carried out by the Forest Soil Laboratory of A.. P. I. i. Within the framework of the program, mycorrhizal symbiosis was studied.

5/2011-7/2012 Restoration of disturbed soils from the mining activity of soils in the wider area of the **Kassandra Mines of Halkidiki**.. The research project is carried out by the Forest Soil Laboratory of A.. P. I. i. Within the framework of the program, mycorrhizal symbiosis was studied..

1/2005-8/2005 IIKY: Postdoctoral fellowship from the State Scholarship Foundation to the postgraduate fellowship from the State Scholarship Foundation, in the research project "The role of mycorrhiza implants resistance in degraded soils: The role of mycorrhizal fungi on drought stress".

2005-2008 Pythagoras II: Participation in the research team as a post-doctor of the research project: "Role of AMF mycorrhizas in the physical structure of natural herbaceous plant communities" (Project: 80880).

05/2005-9/2005 Archimedes: Participation in the project entitled "Climate-»environmental



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changes and sensitivity of the annual rings of Aleppo pine in the basin of **Attica**". I carried out soil, needle and wood analyses".

1/2004- 2007 Pythagoras I **Πυθαγόρας Ι**: Active participation in the research team of the research project : "Role of mycorrhizas in natural and agricultural ecosystems". (Project Code:21890).

B. research programs in progress.

7/2018 Innovative research programme: MYCCORN 'The ability of corn genotypes to exploit the available inputs at the individual level and the search for appropriate mycorrhizal vaccines to improve **production**.

Participation in 5 work packages, for the purpose of classification, and evaluation of indigenous Glomeromycota, Fungi. Production of specialized inoculum

1/2019 Research project innovation : CONFORMIT "**Contribution** of plantations at the Lignite Centre of Western Macedonia to the protection of the environment and the mitigation of climate change".'. Participation in the analysis of the properties of the substrate and calculation of underground biomass.

List of selected publications

1. **Orfanoudakis M. Z.**, Hooker J. E and Wheeler C. T (2004): " Early interactions between Arbuscular mycorrhizal fungi and Frankia during colonisation and root nodulation of *Alnus glutinosa*". *Symbiosis*, 36p 69-82 (2004).
2. **Αλιφραγκής Δ**, Παπαϊωάννου Α., **Ορφανουδάκης Μ.**, Αλιφραγκή Μ., Βερεσόγλου Σ. και Γούλας Κ. (2004). "Εδαφος και δασοπονικό είδος: Μεταβολές στις χημικές ιδιότητες του εδάφους μετά την εισαγωγή κωνοφόρων σε οικοσύστημα πλατυφύλλων." *Επιστημονική Επετηρίδα Τμήματος*

Δασολογίας και Φυσικού Περιβάλλοντος. Τιμητική έκδοση για τον Ομότιμο Καθηγητή κ. Δ. Μουλαλή.

3. **Orfanoudakis M., Mamolos A. P., Karanika F and Veresoglou D. S (2005).** “Benomyl effects on plant productivity through arbuscular mycorrhizas restriction in a Greek upland grassland”. *Optimisation of Nutrient Cycling and Soil Quality for Sustainable Grasslands: Proceedings of a satellite workshop of the XXth International Grassland Congress, July 2005, Oxford, England 2005*, Pages 1-116.
3. **Anastasia Pantera, Andreas M. Papadopoulos, and Michail Orfanoudakis (2007)** “ Trace Element Accumulation in tree rings of pinus halepensis during the last 140 years”. [Global NEST Journal 9 \(3\)](#) : 286-292 (Nov 2007).
4. **Orfanoudakis M, Wheeler CT, Hooker JE (2010)** Both the arbuscular mycorrhizal fungus *Gigaspora rosea* and *Frankia* increase root system branching and reduce root hair frequency in *Alnus glutinosa*. *Mycorrhiza* 20: 117-126.
5. **Theocharis Chatzistathis,; Michail Orfanoudakis; Dimitrios Alifragis; Ioannis Theriosl (2013).** “ Colonization of Greek olive cultivars' root system by arbuscular mycorrhiza fungus: root morphology, growth, and mineral nutrition of olive plants” *Scientia Agricola* 70 (3) , pp. 185-194.
6. **Aimilia Lempesi, Apostolos P. Kyriazopoulos , Michail Oorfanoudakis, Giorgos Korakis. (2013).** “ Soil properties and plant community changes along a goat grazing intensity gradient in an open canopy oak forest” *Notulae Botanicae Horti Agrobotanici Cluj-Napoca* 2013; 41(2):567-575., I.
7. **Janusz Błaszowski, Przemysław Ryszka , Michail Orfanoudakis (2014)** *Septoglomus jasnowskiae* and *Septoglomus turnaumi*, two new species of arbuscular mycorrhizal fungi (Glomeromycota). *Mycol Progress* (2014) 13: 985.
8. **Gakis S, Orfanoudakis M, Papaioannou A, Mantzanas K, Papanastasis V, Seilopoulos D, Kostakis S (2014).** Long term evolution of tree growth, understorey vegetation and soil properties in a silvopastoral system of northern Greece. *Ann. For. Res.* 57(2): 247-265, 2014.
9. **Apostolos P. Kyriazopoulos, Michail Orfanoudakis, Eleni M. Abraham², Zoi M. Parissi², Nikoleta Serafidou (2014)**“ Effects of arbuscular mycorrhiza fungi on growth characteristics of *Dactylis glomerata* L. under drought stress conditions” *Not Bot Horti Agrobo*, 2014, 42(1):132-137 .
10. **George P Stamou, Sotiris Konstadinou, Nikolaos Monokrousos, Anna Mastrogianni, Michalis Orfanoudakis, Christos Hassiotis, Urania Menkissoglou-Spiroudi, Despoina Vokou, Efimia M Papatheodorou (2017):**“ The effects of arbuscular mycorrhizal fungi and essential oil on soil microbial community and N-related enzymes during the fungal early colonization phase”; *AIMS Microbiology*, 3(4): 938-959., DOI:10.3934/microbiol.2017.4.938
11. **Christos N. Hassiotis, Michail Orfanoudakis (2018):** *The impact of Lavandula stoechas L. degradation on arbuscular mycorrhizal fungi, in a Mediterranean ecosystem.* *Applied Soil Ecology* 2018; 126., DOI:10.1016/j.apsoil.2018.02.025
12. **Maria G. Alifragki, Athina K. Pavlatou-Ve, Michail Z. Orfanoudakis (2018):** Phytoremediation affects microbial development on a limestone quarry. *International Journal of Phytoremediation* 2018;20(9). DOI:10.1080/15226514.2018.1452183
13. **Gianluigi Mazza, Alessandro E. Agnelli, Paolo Cantiani, Ugo Chiavetta, Foteini Doukalianou, Kyriaki Kitikidou, Elias Milios, Michail Orfanoudakis, Kalliopi Radoglou, Alessandra Lagomarsino: (2018)** *Short-term effects of thinning on*

- soil CO₂, N₂O and CH₄ fluxes in Mediterranean forest ecosystems*. *Science of The Total Environment* 09/2018; 651(Pt 1), DOI:10.1016/j.scitotenv.2018.09.241
14. F Doukalianou, K Radoglou, A E Agnelli, K Kitikidou, E Milios, **M Orfanoudakis**, A Lagomarsino (2019): Annual Greenhouse-Gas Emissions from Forest Soil of a Peri-Urban Conifer Forest in Greece under Different Thinning Intensities and Their Climate-Change Mitigation Potential. *Forest Science* 2019; DOI:10.1093/forsci/fxy069.
 15. BŁASZKOWSKI, J., NIEZGODA, P., DE PAIVA, J.N., DA SILVA, K.J.G., THEODORO, R.C., JOBIM, K., **ORFANOUDAKIS, M.** and GOTO, B.T., 2019. *Sieverdingia* gen. nov., *S. tortuosa* comb. nov., and *Diversispora peloponnesiaca* sp. nov. in the Diversisporaceae (Glomeromycota). *Mycological Progress*, 18(11), pp. 1363-1382.
 16. Monokrousos, N., Papatheodorou, E. M., **Orfanoudakis, M.**, Jones, D. -., Scullion, J., & Stamou, G. P. (2020). The effects of plant type, AMF inoculation and water regime on rhizosphere microbial communities. *European Journal of Soil Science*, 71(2), 265-278. doi:10.1111/ejss.12882.

