UNIVERSITATEA DIN ORADEA
Facultatea de Protecția Mediului

Nr. înreg. …… /……

Topics and References for the position No. 4 Professor from Staff Establishment of the Department of Environmental Engineering for the year 2024 – 2025

Disciplines: Environmental microbiology I-II

ENVIRONMENTAL MICROBIOLOGY I – course

1. Indoor microaeroflora, its influence on human health and aspects of microclimate conditions and biodeterioration process.
2. The influence of some abiotic stress factors on soil microbiological activity.
3. Soil microbiology. Soil microbial profile.
4. Interactions between soil microorganisms and higher plants.
5. Microbial bioproducts.

References:

1. Barton Larry, Northup Diana, 2010, Microbial Ecology. Wiley-Blackwell. Oxford: John Wiley & Sons. p. 22.
2. Bitton Gabriel, 2002, Encyclopedia of Environmental Microbiology. New York: Wiley Publishing House.
3. Bornehag C. G., Blomquist G., Gyntelberg F., Järvholm B., Malmberg P., Nordvall L., Nielsen A., Pershagen G., Sundell J., 2001, Dampness in buildings and health. Nordic interdisciplinary review of the scientific evidence on associations between exposure to "dampness" in buildings and health effects, Indoor Air, 11, 72-86.
4. Dincă L, Spârchez G, Dincă M., 2014, Romanian's forest soil GIS map and database and their ecological implications. Carpathian J Earth Environ Sci 92:133-142.
5. Gömöryová E, Střelcová K, Fleischer P, Gömöry D., 2011, Microbial characteristics at the monitoring plots on windthrow areas of the Tatra National Park Slovakia.: their assessment as environmental indicators. Environ Monit Assess 174:31-45.
6. Maillard, F., Leduc, V., Bach, C., Reichard, A., Fauchery, L., Saint-André, L., Zeller, B. and Buée, M., Soil microbial functions are affected by organic matter removal in temperate deciduous forest. Soil Biology and Biochemistry, 2019, 133, pp.28-36.
7. Nabti E, Jha B, Hartmann A., 2017, Impact of seaweeds on agricultural crop production as biofertilizer. Int J Environ Sci Technol 14:1119–1134.
8. Nabti E, Jha B, Hartmann A., 2017, Impact of seaweeds on agricultural crop production as biofertilizer. Int J Environ Sci Technol 14:1119–1134.
9. Ortiz R., Párraga M., Navarrete J., Carrasco I., De La Vega E., Ortiz M., Herrera P., Jurgens J. A., Held B. W., Blanchette R. A., 2014, Investigations of Biodeterioration by Fungi in Historic Wooden Churches of Chiloé, Chile, Fungal Microbiology, 67, 568-575.
10. Pascual J.A., Garcia C., Hernandez T., Moreno J.L., Ros M., 2000, Soil microbial activity as a biomarker of degradation and remediation processes, Soil Biology and Biochemistry, 32, 1877-1883.
11. Schloter M, Nannipieri P, Sorensen SJ, Dirk Van Elsas J., 2018, Microbial indicators for soil quality. Biol Fertil Soils 54:1-10.
12. Schloter M, Nannipieri P, Sorensen SJ, Dirk Van Elsas J., 2018, Microbial indicators for soil quality. Biol Fertil Soils 54:1-10.

13. Soan BD., 2017, The role of organic matter in soil compactibility: A review of some practical aspects. Soil Till Res 16:179–201.
14. Xiao, W., Fei, F., Diao, J., Chen, B.J. and Guan, Q., Thinning intensity affects microbial functional diversity and enzymatic activities associated with litter decomposition in a Chinese fir plantation. Journal of Forestry Research, 2018, 29(5), pp.1337-1350.
15. Yassin M. F., Almouqatea S., 2010, Assessment of airborne bacteria and fungi in an indoor and outdoor environment, International Journal of Environmental Science& Technology, 7, 535-544.
16. Yergeau E, Bell TH, Champagne J, Maynard C, Tardif S, Tremblay J, Greer CW., 2015, Transplanting soil microbiomes leads to lasting effects on willow growth, but not on the rhizosphere microbiome. Front Microbiol6:1436.

ENVIRONMENTAL MICROBIOLOGY II – course

1. Bioremediation and wastewater microbiology.
2. The study of mycorrhizae and the potential to form arbuscular mycorrhizae.
3. Soil biostimulation processes used to reduce pollutants and to improve the properties of degraded soils.
4. Microorganisms involved in obtaining biogas and factors influencing methanogenesis.
5. Microbial biodegradation in nature.

References:

1. Corcoz, L.; Păcurar, F.; Vaida, I.; Pleșa, A.; Moldovan, C.; Stoian, V.; Vidican, R. Deciphering the colonization strategies in roots of long-term fertilized festuca rubra. Agronomy, 2022, 12(3), p.650.
2. Deshannavar U. B., R. K Basavaraj., M.N. Naik, 2012, High Rate Digestion Of Dairy Industry Effluent By Upflow Anaerobic Fixed-Bed Reactor. Journal of Chemical and Pharmaceutical Research, 4(6):2895-2899.
3. Eilers KG, Lauber CL, Knight R, Fierer N., 2010, Shifts in bacterial community structure associated with inputs of low molecular weight carbon compounds to soil. Soil Biology & Biochemistry 42: 896–903.
4. Javed I.Q., N. Muhammad, S.B. Shagufta, B. Shahjahan,S. Quratulain, 2011, Anaerobic Fixed Film Biotreatment of Dairy Wastewater Middle-East Journal of Scientific Research 8 (3): 590-593, ISSN 1990-9233,© IDOSI Publications.
5. Jurkšienė, G.; Janušauskaitė, D.; Baliuckas, V. Microbial Community Analysis of Native Pinus Sylvestris L. and Alien Pinus Mugo L. on Dune Sands as Determined by Ecoplates, Forests, 2020, 11, 1202, doi:10.3390/f11111202.
6. Glymph, Toni, 2005, Wastewater Microbiology: A Handbook for Operators.
7. Keffala Christina, Zouhir Fouad, Ben Hadj Abdallah, Kammoun Siwar, 2017, Use Of Bacteria And Yeast Strains For Dairy Wastewater Treatment. International Journal of Research in Engineering and Technology, vol. 6, Issue 04.
8. Konopka, Allan, 2009, Encyclopedia of Microbiology. pp. 91–106.
9. Kučera, A., Holík, L., Rosíková, J., Volařík, D., Kneifl, M., Vichta, T., Knott, R., Friedl, M., Uherková, B. and Kadavý, J. Soil Microbial Functional Diversity under the Single-Season Influence of Traditional Forest Management in a Sessile Oak Forest of Central Europe. Forests, 2021, 12(9), p.1187.
10. Marshall, Kevin, 2013, Advances in Microbial Ecology. ISBN 978-1-4684-7609-5

11. Narany T.S., Ramly F.M., Aris A., Sulaiman W., Fakharian K., 2014, Spatial Assessment of Groundwater Quality Monitoring Wells Using Indicator Kriging and Risk Mapping, Amol-Babol Plain, Iran, Water, 6, 68-85.
12. Pająk, M., Błońska, E., Frąc, M. and Oszust, K.,Functional diversity and microbial activity of forest soils that are heavily contaminated by lead and zinc. Water, Air, & Soil Pollution, 2016, 227, pp.1-14.
13. Pop-Moldovan, V.; Corcoz, L.; Stoian, V.; Moldovan, C.; Pleșa, A.;Vâtcă, S.; Vidican, R. Models of mycorrhizal colonization patterns and strategies induced by biostimulator treatments in Zea mays roots. Frontiers in Plant Science, 2022, Vol. 13, https://doi.org/10.3389/fpls.2022.1052066.
14. Popa Lucian, Herlea Vlad, Bulai Doina, 2002, Microbiologie industrială. Editura Universității: București.
15. Stoian, V.; Vidican, R.; Corcoz, L.; Pop-Moldovan, V. Mycorrhizal maps as a tool to explore colonization patterns and fungal strategies in the roots of festuca rubra and zea mays. JoVE (Journal of Visualized Experiments), 2022,(186), p.e63599.
16. Stoian, V.; Vidican, R.; Crişan, I.; Puia, C.; Şandor, M.; Stoian, V.A.;Păcurar, F.; Vaida, I. Sensitive approach and future perspectives in microscopic patterns of mycorrhizal roots. Scientific Reports, 2019, 9(1), p.10233.
17. Tawfika A., M. Sobheyb, M. Badawya, 2008, Treatment Of A Combined Dairy And Domestic Wastewater In An Up-Flow Anaerobic Sludge Blanket (UASB) Reactor followed By Activated Sludge (AS system) Desalination 227 167– 177.
18. Zhang X., Qian H., Chen J., Qiao L., 2014, Assessment of Groundwater Chemistry and Status in a Heavily Used Semi-Arid Region with Multivariate Statistical Analysis, Water, 6, 2212-2232.

ENVIRONMENTAL MICROBIOLOGY II – practical works

1. Evaluation of the total number of microorganisms using the Koch method (*Plate Count Agar*).
2. Determination of the total number of microorganisms from water. Membrane filters method.
3. Determination of the total number of aerobic bacteria, yeasts and molds from soil.
4. Study of the cellulosic bacteria and *Actinomycetes* in the soil.
5. Study of the symbiotic nitrogen fixation bacteria from the genus *Rhizobium*.

References:

1. Botnaru Oleg, Grati Vasile, Cozari Tudor, Cotruță Maria, 2014, Modern systematics in the study of biology. Environment Journal.
2. Jităreanu Gerard, Ailincăi Costică, Bucur Daniel, 2006, Influence of tillage system on soil physical and chemical characteristics and yield in soybean and maize grown in the Moldovian Plain (North-Eastern Romania). Soil management sustainability – A cooperating series of the I.U.S.S.
3. Konopka, Allan, 2009, Encyclopedia of Microbiology. pp. 91–106;
4. Marshall, Kevin, 2013, Advances in Microbial Ecology. ISBN 978-1-4684-7609-5
5. Moldovan Ramona, Licker Monica et all., 2002, Practical works guide. Lito UMFT Publishing House: Cluj-Napoca.
6. Narmadha D. and Mary Selvam Kavitha, 2012, Treatment of domestic wastewater using natural flocculants. Int. J. LifeSc. Bt & Pharm. Res. Vol. 1, No. 3, pp. 206-213.
7. Sylvia David, Führmann Jeffry, Hartel Peter, Zuberer David, 1999, Principles and applications of soil microbiology. Prentice Hall Inc, Upper Saddle River, NJ.
8.Verstraete Willy, 2007, Microbial ecology and environmental biotechnology.The ISME Journal 1.

9. Whitman Wiliam, 2015, Taxonomic Outline of Bacteria and Archaea. Bergey's manual of systematics of Archaea and bacteria. ISBN 9781118960608.
10. Zara Margareta, 2006, General microbiology, EuroPlus Publishing House.
11.Zarnea Gheorghe, Popescu Octavian, 2011, General microbiology and molecular biology dictionary. Romanian Academy Publishing House: Bucharest.

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