

Course: Soil Biology

Identification

Code: SOL 846

Credits: 5 (2 hours theory - 3 hours practice)

Level: Master and Doctorate

Professors: Zaida Inês Antonioli and Rodrigo Josemar Seminoti Jacques

System: Annual (I semester)

Discipline objectives

To provide students with the knowledge of the main groups of organisms of the soil fauna; recognize the ecological factors that determine the occurrence and distribution of organisms in edaphic ecosystems; know soil management practices that enhance soil biological activities for agroecosystem maintenance and production.

Syllabus

Ecosystem and soil organisms. Biotic groups of soil fauna. Methods of collecting soil fauna. Soil biodiversity. Soil fauna in biodynamic soil processes.

Methodology and/or teaching instruments

Lectures, seminars, discussion of scientific articles, and practical classes.

Forms of evaluation

Written tests, seminars, class participation, and reports from practical classes.

Program: Title and Breakdown of Units

Unit 1

Ecosystems and soil biota

- 1.1 - Ecosystems
- 1.2 - Classification, location, and feeding regimes of macrofauna, mesofauna, and microfauna
- 1.3 - Density, distribution, biomass, activity, and indicator species of soil animals
- 1.4 - Factors that control the structure of soil fauna communities

Unit 2

Biotic groups of the soil fauna

- 2.1 - Phylum Arthropoda (Collembola, Isoptera, Hymenoptera, Coleoptera, Arachnida, Chilopoda, and Diplopoda).
- 2.2 - Phylum Mollusca
- 2.3 - Phylum Annelida
- 2.4 - Phylum Nematoda

Unit 3

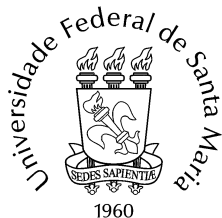
Methods of collecting soil fauna

- 3.1 - Destructive methods
- 3.2 - Non-destructive methods
- 3.3 - Arthropod extraction methods
- 3.4 - Storage of soil fauna organisms
- 3.5 - Identification keys of edaphic fauna

Unit 4

Edaphic biodiversity

- 4.1 - Soil biodiversity
- 4.2 - Faunistic and biodiversity indexes



Ministry of Education
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Unit 5

Edaphic fauna in biodynamic soil processes

- 5.1 - Pedobiological activities
- 5.2 - Relation with abiotic and biotic factors of the environment
- 5.3 - Edaphic fauna as an agent and reflection of land use and management

Recommended literature

- BROWN, G.G; FRAGOSO, C. *Minhocas na América Latina: Biodiversidade e Ecologia*. Londrina: Embrapa, 2007, 545p.
- COLEMAN, D. C.; CALLAHAM JR, M. A.; CROSSLEY Jr D.A. **Fundamentals of soil ecology**. 3 ed. Academic Press, 2017, 369 p. <https://doi.org/10.1016/C2015-0-04083-7>
- ECKHARDT, D. P.; ANTONIOLLI, Z. I.; SCHIEDECK, G.; SANTANA, N. A.; REDIN, M.; DOMINGUEZ, J.; JACQUES, R. J. S. Vermicompostagem como alternativa para o tratamento de resíduos nas propriedades rurais do sul do Brasil. In: TIECHER, T. (Org.). *Manejo e conservação do solo e da água em pequenas propriedades rurais no sul do Brasil: práticas alternativas de manejo visando a conservação do solo e da água*. UFRGS, Porto Alegre, 2016. 186p. Cap. 8, p. 100-117, 2016.
- JACQUES R. J. S.; ANTONIOLLI, Z.; SOBUCKI, L. **Biologia do solos: aulas práticas**. Santa Maria: UFSM/CCR/DS, 2019, 158p (Coleção Ciências Rurais).
- MOREIRA, F. M. S.; CARES, J. E.; ZANETTI, R.; STÜRMER, S. L. **O ecossistema solo: componentes, relações ecológicas e efeitos na produção vegetal**, Lavras: UFLA, 2013. 352 p.
- MOREIRA, F. M. S.; SIQUEIRA, J. O.; BRUSSAARD, L. **Biodiversidade do solo em ecossistemas brasileiros**. Lavras: UFLA, 2008, 768p.
- MOREIRA, F.M.S.; HUISING, J.; BIGNELL, D.E. **Manual de Biologia dos Solos Tropicais. Amostragem e Caracterização da Biodiversidade**. Lavras: UFLA, 2010. v.1, 368p.
- ORGIAZZI, A.; BARDGETT R. D.; BARRIOS E. (Eds). **Global soil biodiversity atlas**. Supporting the EU Biodiversity Strategy and the Global Soil Biodiversity Initiative: preserving soil organism through sustainable land management practices and environmental policies for the protection and enhancement of ecosystem services. Global soil biodiversity initiative. 2016. 11176 pp.
- SANTANA, N. A.; ROVEDDER, A. P.; ANTONIOLLI, Z. I.; ALMEIDA, H. Z.; JACQUES, R. J. S. Diversidade biológica e qualidade dos solos do bioma Pampa. In: PEDRON, F.A.; DALMOLIN, R.S.D. (Org.). **Solos arenosos do bioma Pampa**. Santa Maria: Editora UFSM, 2019, 218 p.