

Programa Analítico de Disciplina

ENT 774 - Interações Inseto-Microrganismo

Departamento de Entomologia - Centro de Ciências Biológicas e da Saúde

Catálogo: 2025

Número de créditos: 4

Carga horária semestral: 60h

Carga horária semanal teórica: 4h

Carga horária semanal prática: 0h

Semestres: I

Ementa

Introdução
Interações Inseto-Vírus
Interações Inseto-Procaríota
Interações Inseto-Protista
Interações Inseto-Fungo
Interações Inseto-Nematóide
Extensões

Conteúdo

Unidade	T	P	To
1. Introdução 1. O que é a Simbiose? Parasitismo e Mutualismo como um Contínuo 2. Meios de Transmissão dos Simbiontes 3. Teoria da Evolução de Virulência 4. Tipos de Parasitismo: Castração, Gigantismo etc, Manipulação do Hospedeiro 5. Defesa Imune 6. Insetos como Vetores: Plantas versus Animais e Vetores como Hospedeiros 7. Tipos de Mutualismo 8. Uma Visão de Aplicações (Controle Microbiano e Biotecnologia)	16h	0h	16h
2. Interações Inseto-Vírus 1. Baculovírus e Outros Vírus Oclusos 2. Artrópodes Vetores de Vírus de Plantas 3. Artrópodes Vetores de Vírus de Animais 4. Vírus Mutualistas ou Não-Patogênicos (ou seus restos)	8h	0h	8h
3. Interações Inseto-Procaríota 1. Bacillus thuringiensis 2. Outros Bacillus e outros Patógenos Bacterianos 3. Wolbachia e outros Distúrbios de Razão Sexual 4. Bactéria como Mutualistas Defensivas e Tróficas 5. Insetos como Vetores de Procaríotas	10h	0h	10h
4. Interações Inseto-Protista	2h	0h	2h

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1. Protista como Patógenos e Mutualistas Tróficas			
5. Interações Inseto-Fungo 1. Entomophthoraceae - Obrigadas a matar 2. Patógenos Hipocrealeanos 3. Mutualismos Tróficos e Fungicultura 4. Insetos, Endófitos e Fungos Fitopatogênicos 5. Microsporídia	10h	0h	10h
6. Interações Inseto-Nematóide 1. Nematoides Parasitas de Insetos 2. Nematoides Patogênicos com Mutualistas Bacterianas	4h	0h	4h
7. Extensões 1. O Microbioma Entomológico e Teias Alimentares 2. A Produção de Entomopatôgenos 3. Aplicações Biotecnológicas 4. O Manejo de Doenças Vetoriais 5. Doenças de Insetos Benéficos	10h	0h	10h
Total	60h	0h	60h

Teórica (T); Prática (P); Total (To);

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Bibliografias básicas

Descrição	Exemplares
Douglas, A.E. (2010). The Symbiotic Habit. Princeton University Press, Princeton, NJ, USA. ISBN 978-0-691-11341-8	0
Hajek, A.E., Shapiro-Ilan, D.I. (Eds). (2018). Ecology of Invertebrate Diseases. Wiley, Oxford, UK. ISBN 9781119256076	0
Lacey, L.A. (Ed.) (1997). Manual of Techniques in Insect Pathology. Academic Press, San Diego. ISBN 0-12-432555-6	0
Lacey, L.A. & Kaya, H.K. (Eds) (2007). Field Manual of Techniques in Invertebrate Pathology. Springer, Dordrecht, The Netherlands. ISBN 978-1-4020-5932-2	0
O'Neill, S.L., Hoffmann, A.A. & Werren, J.H. (Eds.) (1997). Influential Passengers. Inherited Microorganisms and Arthropod Reproduction. Oxford University Press, Oxford, UK. ISBN 0-19-850173-0	0
Van Driesche, R., Hoddle, M. & Center, T. (2008) Control of Pests and Weeds by Natural Enemies. An introduction to biological control. Blackwell, Oxford, UK. ISBN 978-1-4051-4571-8	0
Vega, F.E. & Blackwell, M. (Eds.) (2005). Insect-Fungal Associations. Ecology and Evolution. Oxford University Press, Oxford. ISBN 0-19516652-3	0
Vega, F.E. & Kaya, H.K. (Eds.) (2012). Insect Pathology (2nd Ed.) Academic Press, London. ISBN 978-0-12-384984-7	0

Bibliografias complementares

Descrição	Exemplares
Butt, T.M, Jackson, C.W. & Magan, N. (Eds.) (2001). Fungi as Biocontrol Agents. Progress, Problems and Potential. CABI Publishing, Wallingford, Oxon, UK. ISBN 0-85199-356-7	0
Davies, N.B., Krebs, J.R. & West, S.A. (2012). An Introduction to Behavioural Ecology (4th Edn). Wiley-Blackwell, Oxford, UK. ISBN 978-1-4051-1461-5	0
Douglas, A.E. (2022). Insects and Their Beneficial Microbes. Princeton University Press, Princeton, NJ. ISBN 9780691192406	0
Ewald, P.W. (1994) Evolution of Infectious Disease. Oxford University Press, Oxford, UK. ISBN 0-19-511139-7	0
Goater, T.M. Goater, C.P. & Esch, G.W. (Autor) (2013). Parasitism: The Diversity and Ecology of Animal Parasites. Cambridge University Press, Cambridge. ISBN 0521190282	0
Khan, M.A. & Ahmad, W. (Eds.) (2019). Microbes for Sustainable Insect Pest Management. An Eco-friendly Approach - Volume 1. Springer, ISBN: 978-3-030-23047-0	0
Lacey, L.A. (Ed.) (2016). Microbial Control of Insect and Mite Pests: From Theory to Practice. 1st Ed. Elsevier, Amsterdam. ISBN: 9780128035276	0
Margulis, L. (1998) The Symbiotic Planet. A new look at evolution. Weidenfeld & Nicolson,	0

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London. ISBN 0-297-81740-X	
Schmid-Hempel, P. (1998). Parasites in Social Insects. Princeton University Press, Princeton, NJ, USA. ISBN 0-691-05924-1	0
Thomas, F., Ranaud, F. & Guégan, J.-F. (Eds.) (2005) Parasitism & Ecosystems. Oxford University Press, Oxford UK. ISBN 0-19-852987-2	0

Syllabus

ENT 774 - Insect-Microbe Interactions

Departamento de Entomologia - Centro de Ciências Biológicas e da Saúde

Catalog: 2025

Number of credits: 4
Total hours: 60h
Weekly workload - Theoretical: 4h
Weekly workload - Practical: 0h

Period: I

Content

Introduction
Insect-Virus Interactions
Insect-Prokaryote Interactions
Insect-Protist Interactions
Insect-Fungus Interactions
Insect-Nematode Interactions
Extensions

Course program

Unit	T	P	To
1. Introduction 1. What is Symbiosis? Parasitism and Mutualism as a Continuum 2. Modes of Transmission of Symbionts 3. Theory on Evolution of Virulence 4. Types of Parasitism: Castration, Gigantism etc, Host Manipulation 5. Immune Defence 6. Insects as Vectors: Plants versus Animals and Vectors as Hosts 7. Types of Mutualism 8. An Overview of Applications (Microbial Control and Biotechnology)	16h	0h	16h
2. Insect-Virus Interactions 1. Baculoviruses and other Occluded Viruses 2. Arthropod Vectors of Plant Viruses 3. Arthropod Vectors of Animal Viruses 4. Mutualistic or Nonpathogenic Viruses (or their remnants)	8h	0h	8h
3. Insect-Prokaryote Interactions 1. Bacillus thuringiensis 2. Other Bacilli and other Bacterial Pathogens 3. Wolbachia and other Sex Ratio Distorters 4. Bacteria as Defensive and Trophic Mutualists 5. Insects as Vectors of Prokaryotes	10h	0h	10h
4. Insect-Protist Interactions 1. Protists as Pathogens and Trophic Mutualists	2h	0h	2h

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5. Insect-Fungus Interactions 1. Entomophthoraceae - Obligated to Kill 2. Hypocrealean Pathogens 3. Trophic Mutualisms and Fungiculture 4. Insects, Endophytes and Phytopathogenic Fungi 5. Microsporidia	10h	0h	10h
6. Insect-Nematode Interactions 1. Nematode Parasites of Insects 2. Nematode Pathogens with Bacterial Mutualisms	4h	0h	4h
7. Extensions 1. The Insect Microbiome and Food Webs 2. Production of Entomopathogens 3. Biotechnological Applications 4. Management of Vectorborne Diseases 5. Diseases of Beneficial Insects	10h	0h	10h
Total	60h	0h	60h

Theoretical (T); Practical (P); Total (To);

ENT 774 - Insect-Microbe Interactions

Fundamental references

Description	Copies
Douglas, A.E. (2010). The Symbiotic Habit. Princeton University Press, Princeton, NJ, USA. ISBN 978-0-691-11341-8	0
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