Programa Analítico de Disciplina

FIP 701 - Interação Patógeno-Hospedeiro

Departamento de Fitopatologia - Centro de Ciências Agrárias	
Catálogo: 2024	
Número de créditos: 4 Carga horária semestral: 60h Carga horária semanal teórica: 4h Carga horária semanal prática: 0h	Semestres: I

Ementa

Histórico e Conceito da interação Patógeno-Hospedeiro.
Eventos da Patogênese.
Alterações Fisiológicas da Planta durante a Patogênese.
Dinâmica da Resistência de Plantas à Patógenos.
Modelos de patossistemas usados para estudar interações patógeno-hospedeiro.
Técnicas histoquímicas, de microscopia e moleculares usadas para o estudo da interação patógeno-hospedeiro.

Conteúdo

Unidade	T	P	To
1. **Histórico e Conceito da interação Patógeno-Hospedeiro.**	1h	0h	1h
2. **Eventos da Patogênese.** 1. Processo de infecção: adesão, germinação, pré-penetração e penetração. 2. Eventos moleculares durante o período de reconhecimento do patógeno pelo hospedeiro e do hospedeiro pelo patógeno. 3. Cascata de sinais durante a interação patógeno-hospedeiro. 4. Colonização do hospedeiro e transferência de nutrientes. 5. Enzimas e toxinas relacionadas com a patogênese.	15h	0h	15h
3. **Alterações Fisiológicas da Planta durante a Patogênese.** 1. Transpiração e respiração. 2. Fotossíntese. 3. Translocação, permeabilidade e metabolismo de carbohidratos e nutrientes. 4. Atividades enzimática e participação de proteínas, ácidos nucléicos e hormônios.	12h	0h	12h
4. **Dinâmica da Resistência de Plantas à Patógenos.** 1. Mecanismos de resistência estrutural e bioquímico pré e/ou pós-formados. 2. Co-evolução e especificidade nas interações patógeno hospedeiro. 3. Resistência sistêmica adquirida ('SAR') e resistência induzida por fatores bióticos e abióticos.	22h	0h	22h
5. **Modelos de patossistemas usados para estudar interações patógeno-hospedeiro.**	4h	0h	4h
6. **Técnicas histoquímicas, de microscopia e moleculares usadas para o estudo**	6h	0h	6h

da interação patógeno-hospedeiro.			
Total	**60h**	**0h**	**60h**

Teórica (T); Prática (P); Total (To);

FIP 701 - Interação Patógeno-Hospedeiro

Bibliografias básicas	
Descrição	**Exemplares**
Glazebrook, J., Rogers, E. E., and Ausubel, F. M. Use of Arabidopsis for genetic dissection of plant defense responses. Annual Review of Genetics. 31:547-569, 1997.	0
Goodman, R.N.; Kiraly, Z.; Wood, K.R., (eds.). The Biochemistry and Physiology of Plant Disease. University of Missouri Press, Columbia, 433 p. 1986.	0
Grayer, R. J., Kokuhun, T. Plant-fungal interactions: the search for phytoalexins and other antifungal compounds from higher plants. Phytochemistry 56:253-263, 2001.	0
Howard, R. J. Cytology of fungal pathogens and plant-host interactions. Current Opinion in Plant Biology 4:365-373, 2001.	0
Huang, J.-S. Plant Pathogenesis and Resistance. Biochemistry and Physiology of Plant-Microbe Interactions. Kluwer Academic Publishers, Norwell, Madison, 691 p. 2001.	0
Joosten, M. H. A. J., Wit, P. J. G. M. The tomato-Cladosporium fulvum interaction: A versatile experimental system to study plant-pathogen Interactions. Annual Review of Phytopathology 37:335-367, 1999.	0
Keen, N. T. A century of Plant Pathology: A retrospective view on understanding host-parasite interactions. Annual Review of Phytopathology 38:31-48, 2000.	0
Kosack, K. H., Jones, J. D. G. Responses to Plant Pathogens. In: Buchananm B. B., Gruissem, W., and Jones, R. L. (eds.). Biochemistry & Molecular Biology of Plants. American Society of Plant Physiologists, Rockville, Maryland, p. 1102-1318, 2001.	0
Maleck, K., Dietrich, R. A. Defense on multiple fronts: how do plants cope with diverse enemies? Trens in Plant Science 4:215-219, 1999.	0
Misaghi, I. J. Physiology and Biochemistry of Plant-Pathogen Interactions. Plenum Press, New York, 287 p. 1982.	0
Stahl, E. A., Bishop, J. G. Plant-pathogen arms races at the molecular level. Current Opinion in Plant Biology 3:299-304, 2000.	0
Van Loon, L. C. Induced resistance in plants and the role of pathogenesis-related proteins. European Journal of Plant Pathology 103:753-765, 1997.	0
Vidhyasekaran, P. Fungal Pathogenesis in plants and Crops-Molecular Biology and Host Defense Mechanisms. Marcel Dekker, Inc. New York, 553 p. 1997.	0
Kaur, S., Samota, M. H., Choudhary, M., Choudhary, M., Pandey, A. K., Sharma, A., Thakur, J. (2022) How do plants defend themselves against pathogens - Biochemical mechanisms and genetic interventions. Physiology and Molecular Biology of Plants, 28, 485-504.	0
Kesel, J., Conrath, U., Flors, V., Luna, E., Mageroy, M.H., Mauch-Mani, B., Pastor, V., Pozo, M. J., Pieterse, C. M. J., Ton, J., Kyndt, T. (2021) The induced resistance lexicon: do's and don'ts. Trends in Plant Science, 26, 685-691.	0
Zeier, J. (2021) Metabolic regulation of systemic acquired resistance. Current Opinion in Plant Biology, 62, 102050.	0

Bibliografias complementares
Não definidas

Syllabus

FIP 701 - Host-Parasite Interaction

Departamento de Fitopatologia - Centro de Ciências Agrárias	
Catalog: 2024	
Number of credits: 4 Total hours: 60h Weekly workload - Theoretical: 4h Weekly workload - Practical: 0h	Period: I

Content

History and Concept of Host-Pathogen Interaction.
Pathogenesis Events.
Physiological Changes on Plants during Pathogenesis.
Dynamics of Plant Resistance to Pathogens.
Pathosystem models used to study host-pathogen interactions.
Histochemical, microscopical, and molecular techniques used to study host-pathogen interaction.

Course program

Unit	T	P	To
1. **History and Concept of Host-Pathogen Interaction.**	1h	0h	1h
2. **Pathogenesis Events.** 1.1. Infection process: adhesion, germination, pre-penetration and penetration. 2. Molecular events during the period of recognition of the pathogen by the host and the host by the pathogen. 3. Signal cascade during host-pathogen interaction. 4. Host colonization and nutrient transfer. 5. Enzymes and toxins related to pathogenesis.	15h	0h	15h
3. **Physiological Changes on Plants during Pathogenesis.** 1.1. Transpiration and respiration. 2. Photosynthesis. 3. Translocation, permeability and metabolism of carbohydrates and nutrients. 4. Enzymatic activity and participation of protein, nucleic acid and hormone.	12h	0h	12h

4. **Dynamics of Plant Resistance to Pathogens.** 1.1. Pre- and/or post-formed structural and biochemical resistance mechanisms. 2. Co-evolution and specificity in host-pathogen interactions. 3. Acquired systemic resistance (SAR) and resistance induced by biotic and abiotic factors.	22h	0h	22h
5. **Pathosystem models used to study host-pathogen interactions.**	4h	0h	4h
6. **Histochemical, microscopical, and molecular techniques used to study host-pathogen interaction.**	6h	0h	6h
Total	**60h**	**0h**	**60h**

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

FIP 701 - Host-Parasite Interaction

Fundamental references	
Description	**Copies**
Glazebrook, J., Rogers, E. E., and Ausubel, F. M. Use of Arabidopsis for genetic dissection of plant defense responses. Annual Review of Genetics. 31:547-569, 1997.	0
Goodman, R.N.; Kiraly, Z.; Wood, K.R., (eds.). The Biochemistry and Physiology of Plant Disease. University of Missouri Press, Columbia, 433 p. 1986.	0
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Keen, N. T. A century of Plant Pathology: A retrospective view on understanding host-parasite interactions. Annual Review of Phytopathology 38:31-48, 2000.	0
Kosack, K. H., Jones, J. D. G. Responses to Plant Pathogens. In: Buchananm B. B., Gruissem, W., and Jones, R. L. (eds.). Biochemistry & Molecular Biology of Plants. American Society of Plant Physiologists, Rockville, Maryland, p. 1102-1318, 2001.	0
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Zeier, J. (2021) Metabolic regulation of systemic acquired resistance. Current Opinion in Plant Biology, 62, 102050.	0

Complementary references
Not defined