

國立中興大學教學大綱

課程名稱 (course name)	(中) 植物-病毒-媒介昆蟲之交互關係(7131)				
	(Eng.) Plant-Virus-Vector Interactions				
開課單位 (offering dept.)	植病系				
課程類別 (course type)	選修	學分 (credits)	2	授課教師 (teacher)	葉錫東
選課單位 (department)	植病系碩士班	授課語言 (language)	英文	開課學期 (semester)	1041
課程簡述 (course description)	<p>To induce a disease, a plant virus has to spread through, and replicate, in most part of the infected plant. How the virus move from the site of initial infection to give a systemic infection, and the effects of this on the induction of dysfunction of plant physiology to induce disease are important subjects for plant pathology. Thus, the movement of a virus from cell-to-cell and then final translocation to systemic distribution are the major themes of this course. Along with these processes, the host factors involved in viral translation, replication, cell to cell movement, systemic translocation and host defense reactions will be discussed. Mover, host reactions such as innate R genes, cellular gene silencing, hypersensitive reaction at tissue level and limitation in vascular tissue, in regard to disease induction will be emphasized. After successful infection in individual plants, the virus usually depends for survival on being able to spread from one susceptible host to another in nature. Knowledge of the ways in which viruses are transmitted from plant to plant by various vectors is important for two reasons. First, these vectors play a major role in disseminating virus diseases of economic importance in all countries. Second, virus-vector relationships are of considerable biological interest, especially those where the virus replicates in the animal vector as well as in its plant host. This part of major topics will focus on transmission by invertebrates, with special emphases on relationships between plant viruses and their vectors, such as aphids, leafhoppers and plant hoppers, whiteflies, thrips, mealybugs, beetles and mites. In this course, Chair Professor Shyi-Dong Yeh will give a series of top lectures on how plant viruses spread in their hosts and how plant biological vectors transmit plant viruses.</p>				
先修課程名稱 (prerequisites)					
課程與核心能力關聯配比(%) (relevance of course objectives and core learning outcomes)			課程目標之教學方法與評量方法 (teaching and assessment methods for course objectives)		
課程目標	核心能力	配 比(%)	教學方法	評量方法	
探討植物、病毒、媒介昆蟲之交互關係	1.植物病理學與防檢疫相關知識及技術 2.植物病原微生物學相關知識 3.農業生物技術應用相關能力 4.植物醫學實務相關技術	25 25 25 25	討論 講授 專題探討/製作	書面報告 出席狀況 口頭報告 作業	
授課內容(單元名稱與內容、習作/每週授課、考試進度-共18週) (course content and homework/tests schedule)					
<p>In this course, Chair Professor Shyi-Dong Yeh will discuss on how plant viruses spread in their hosts and how plant biological vectors transmit plant viruses.</p> <p>The major topics are:</p>					

I.Virus movement through the plant and effects on plant metabolism

- A.Routes by which viruses move through plants
- B.Transport across nuclear membrane
- C.Cell-to-cell movement
- D.Long distance movement.
- E.Processes involved in symptom induction

II.Steps in Induction of disease

- A.Host response to inoculation-R genes
- B.Hypersensitive local response
- C.Systemic necrosis
- D.Program cell death and plant viruses
- E.Local and systemic acquired resistance
- F.Ability of virus to spread through various barriers
- G.Systemic host response

III.Inherent host response

- A.Transcriptional and post-transcriptional gene silencing
- B.Genes involved in post-transcriptional gene silencing
- C.Mechanism of post-transcriptional gene silencing
- D.Suppression of gene silencing
- E.Mechanism of cross protection

IV.Relationships between plant viruses and invertebrates

- A.Aphids: life cycle and feeding habits; aphid transmission by cell injury; type of aphid-virus relationship; non-persistent transmission; semi-persistent transmission; bi-modal transmission; and persistent transmission
- B.Leafhoppers and Plant hoppers:
Structure and life cycle; kinds of virus-vector relationship; semi-persistent transmission and persistent transmission
- C.Whiteflies:
Life cycle and feeding habits; ipomoviruses; begomoviruses; closteroviruses and criniviruses; virus-vector relationship
- D.Thrips:
Thrip anatomy; tospovirus transmission; virus-vector relationship; route through the thrips
- E.Other sucking and piercing vector groups:
Mealybugs; bugs
- F.Vectors with biting mouthparts:
Vector groups and feeding habits; viruses transmitted by beetles; beetle-virus relationship
- G.Mites, pollinating insects; nematodes, and fungi

學習評量方式
(evaluation)

書面報告
出席狀況
口頭報告/課堂討論發表
作業

教科書&參考書目(書名、作者、書局、代理商、說明)
(textbook & other references)

- 1.Plant Virology, 4th edition, Roger Hull, 2002, Academic Press, San Diego, CA.
- 2.Principles of Plant Virology, S. Astier, J. Albouy, Y. Maury, C. Roboglia and H. Lecog, 2007, Science Pub Inc.
- 3.Recent Advances in Plant Virology, 2011, C Caranta, MA Aranda, M. Tepfer, and JJ Lopez-Moya, Aaister Academic Press, Norfolk, UK.
- 4.Relevant publications in current journals.

課程教材（教師個人網址請列在本校內之網址）
(teaching aids & teacher's website)

課程輔導時間
(office hours)

請尊重智慧財產權，不得非法影印他人著作。

列印日期：2016年2月19日