



Department of Plant protection

College of Agricultural Engineering Sciences

Salahaddin University

Subject: Phytobacteriology

Course Book – (Year 4)

Lecturer's name: Tavga Sulaiman Rashid, PhD

Academic Year: 2023/2024

Course Book

1. Course name	Phytobacteriology
2. Lecturer in charge	Assist Prof. Dr. Tavga Sulaiman Rashid
3. Department/ College	Plant protection department/ Agricultural Engineering Sciences
4. Contact	e-mail: tavga.rashid@su.edu.krd, tavga2020@yahoo.com Tel: 009647504524781
5. Time (in hours) per week	Theory: 2 Practical: 3
6. Office hours	Availability of the lecturer to the student during the week
7. Course code	
8. Teacher's academic profile	BCs (Bachelor of Science) from Faculty of Agriculture, plant protection department, at Salahaddin University, Erbil, Iraq in July 2004. After obtaining MSc (Master of Science) at the same college in January 2008 in Plant Pathology, cooperated as a lecture in Agriculture college, Salahaddin University for a period of 4 years. Received PhD from Faculty of Agriculture, plant protection department in University Putra Malaysia (UPM) May 2016. Published 24 journal articles, 2 patent, 2 gold medals, 1 silver medal, research projects, seminar proceeding and workshops.
9. Keywords	Phytobacteria, diagnoses of bacteria, management
10. Course overview:	Students will learn about molecular mechanisms required for bacterial symbiosis with plants, including pathogenic and mutualistic symbiosis mechanisms. This course builds upon basic concepts learned in an introductory plant pathology and microbiology courses. Students must have a basic understanding of bacterial and bacterial genetics.
11. Course objective:	<ol style="list-style-type: none"> 1. To become familiar with current taxonomy of plant pathogenic prokaryotes and important bacterial diseases. 2. To become familiar with techniques for manipulating bacteria such as isolation, identification and inoculation of pathogens. 3. To gain the knowledge of different pathogenic mechanisms used by different groups of major bacterial pathogens. 4. To understand the ecology of various plant pathogenic bacteria and current disease management strategies for bacterial diseases.
12. Student's obligation	Students must complete Learning assessments based on lecture material and supplementary lecture-related material. Research and reading is required to complete these. There is a voluntary competition where students must write about bacteria that cause diseases on plant.
13. Forms of teaching	The lecturer will use data show by preparing PowerPoint presentations in which outlines of each lecture will be shown however the details of the lecture will be narrated by the lecturer herself. In some cases, samples will be shown to students to have a close and real idea on the subject.

<p>14. Assessment scheme Students are evaluated during the semester for the theory part by daily short quizzes which giving 3 marks out of 15. Two term exams 12 mark each out of 15. The practical part is given 35 marks in total.</p>	
<p>15. Student learning outcome: Breadth and Depth of Knowledge in Phytobacteriology Explain the functions of molecular and cellular factors that affect bacterial symbiosis with plants and with the insect vectors of bacterial pathogens. Describe the evolutionary importance of genetic variation in bacterial symbiosis with plants. Evaluate experimental designs and methodologies in peer-reviewed scientific publications that report new findings in phytobacteriology. Agricultural Literacy Demonstrate an understanding of the social, economic, biological, and physical aspects of the management of bacterial pathogens in managed ecosystems. Explain how research in phytobacteriology has impacted agriculture and other scientific fields.</p>	
<p>16. Course Reading List and References:</p> <ul style="list-style-type: none"> ▪ Key references: <ul style="list-style-type: none"> • Janse, J. D. (2005). <i>Phytobacteriology: principles and practice</i>. Cabi. • Shoda, M. (2000). Bacterial control of plant diseases. <i>Journal of bioscience and bioengineering</i>, 89(6), 515-521. • Buttmer, C., McAuliffe, O., Ross, R. P., Hill, C., O'Mahony, J., & Coffey, A. (2017). Bacteriophages and bacterial plant diseases. <i>Frontiers in microbiology</i>, 8, 34. • Borkar, S. G., & Yumlembam, R. A. (2016). <i>Bacterial diseases of crop plants</i>. CRC Press. • Lelliott, R. A., & Stead, D. E. (1987). <i>Methods for the diagnosis of bacterial diseases of plants</i>. Blackwell Scientific Publications. 	
17. The Topics:	Lecturer's name
1. Introduction History and Economic importance of phytobacteriology	(2 hrs)
2. Bacterial and plant structures Taxonomy Terminology Life cycles and disease triangle	(2 hrs)
3. Presumptive diagnosis (symptoms, sample collection and handling), Isolation, cultural characteristics	(2 hrs)
4. Gram staining, physiological and biochemical tests Serology, nucleic acid analysis, fatty acid analysis, pathogenicity tests Bacterial growth, measurement of growth in bacteria,	(2 hrs)
5. Necrotrophic bacterial pathogens Dickeya and Pectobacterium	(2 hrs)
6. 1 st Exam	
7. Hemi-biotrophic bacterial pathogens Pseudomonas and Xanthomonas	(2 hrs)

8. Gall-forming plant pathogens Agrobacterium	(2 hrs)
9. Biotrophic bacterial pathogens / Insect transmission Xylella	(2 hrs)
10. Human pathogens on plants Salmonella and Escherichia coli adherence to plants, interactions with plant pathogens, survival in soil and water Are these bacteria plant pathogens?	(2 hrs)
11. 2 nd Exam	
12. Small molecules Streptomyces – toxins Rhizobium – nod factors	(2 hrs)
13. Diagnostics and detection Biochemical phenotypes Molecular detection methods - PCR, ELISA, RPA, LAMP In- field DNA sequencing	(2 hrs)
14. Epidemiology AND Management of bacterial plant pathogens	(2 hrs)
Review	(2 hrs)
18. Practical Topics (If there is any)	
1. Introductory + Background of phytobacteriology	Mrs. Nask
2. Dickeya and Pectobacterium	
3. Pseudomonas	
4. Xanthomonas	
5. Ralstonia	
1st Exam	
6. Agrobacterium	
7. Xylella	
8. Streptomyces	
9. Other genus of plant bacteria	
10. Confirmation of bacterial pathogens in plant samples	
11. Isolation of bacteria from plant samples	
12. Medium for isolation of plant pathogenic bacteria	
2nd Exam	
19. Examinations:	
1. Definitions	
2. What are the management strategies of plant bacterial diseases?	
3. What are the differences between:	
20. Extra notes:	
Here the lecturer shall write any note or comment that is not covered in this template and he/she wishes to enrich the course book with his/her valuable remarks.	

21. Peer review

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I approve that the course is comprehensive and cover all the aspects of the course.

Name:

Degree:

Specialty:

Sign:

Date: