



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Izbrana poglavja iz rastlinskih tkivnih kultur
Course title:	Selected topics in Plant Tissue Cultures

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Doktorski študij Ekološke znanosti, 3. stopnja		1. ali 2.; 1st or 2nd	1. 2. ali 3. ; 1st, 2nd or 3rd
Doctoral Study Ecological Sciences, 3rd degree			

Vrsta predmeta / Course type

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Lab. vaje Laboratory work	Terenske vaje Field work	Samost. delo Individ. work	ECTS
5	5				140	5

Nosilec predmeta / Lecturer:

Jeziki /	Predavanja / Lectures:	slovenski / slovene
Languages:	Vaje / Tutorial:	slovenski / slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Poznavanje botanike in fiziologije rastlin na ravni dodiplomskega programa prve stopnje ter ekofiziologije na ravni magistrskega programa druge stopnje.

Prerequisites:

Knowledge of botany and plant physiology at graduate level and plant ecophysiology at master level.

Vsebina:

Obravnavana so izbrana poglavja iz naslednjih sklopov:
Načini in uporaba rastlinskih tkivnih kultur v znanosti in v tržne namene ter biologija gojenja rastlinskih celic.
Predmet v prvem delu obravnava tehnične pogoje za vzgojo rastlinskih tkivnih kultur. V drugem delu obravnava postopke

Content (Syllabus outline):

Selected topics in the following chapters are discussed:
Principles and application of plant tissue culture in research and in commercial production and the biology of cultured plant cells.
The course in the first part introduces technical requirements for plant tissue cultures. In the second part present different techniques as

mikropropagacije, somatske embriogeneze, vzgojo brezvirusnih rastlin, krioprezervacijo ter pridobivanje sekundarnih metabolitov.

micropropagation, somatic embryogenesis, virus free plant breeding, criopreservation, and acquisition of secondary metabolites.

Temeljni literatura in viri / Readings:

Bohanec B. 1992. Tehnike rastlinskih tkivnih kultur. Biotehniška fakulteta, Ljubljana.
Pierik R.L.M. 1997. In vitro culture of higher plants. Kluwer Academic Publishers. Dordrecht.
Raspor, P. (ur.). 1996. Biotehnologija, Osnovna znanja. BIA, Ljubljana
Thomas B. (ur.). 2003. Encyclopedias of applied plant sciences. Elsevier, Academic press, Amsterdam.
Chawla H.S. 2009. Introduction To Plant Biotechnology. Oxford & IBH Publishing Company Pvt. Limited
Chawla H.S. 2003. Plant biotechnology: practical approach. Science Publishers, Enfield.
George E.F. 1993. Plant propagation by tissue culture: Part 1: The technology, Part 2: In practice. Exegenetics Limited, Edington.
George E. F., Hall M. A. in De Klerk, G.J. (Eds.) 2008. Plant Propagation by Tissue Culture. Vol 1 and Vol 2. Exegetics, Basingstoke, UK
Trigiano R.N. in Gray D.J. 2011. Plant tissue culture concepts and laboratory. CRC Press, Boca Raton.
Kleyn J., Scoggins H. in Bridgen M. 2013. Plants from Test Tubes: An Introduction to Micropropagation. Timber Press
Izbrani članki iz znanstvenih revij.

Cilji in kompetence:

- Razumeti tehnične zahteve vzgoje rastlin v tkivni kulturi.
- Razumeti lastnosti aseptičnega dela.
- Pregled različnih načinov uporabe rastlinskih tkivnih kultur v znanosti in v komercialne namene.

Objectives and competences:

- Understand the technical requirements of tissue culture cultivation.
- Understand the nature of aseptic work
- To give an overview through the different ways of using plant tissue culture in research and commercial production.

Predvideni študijski rezultati:

Znanje in razumevanje:

Tehnične zahteve vzgoje rastlin v tkivni kulturi.
Priprava vcepkov in gojišč.
Rastlinski hormoni.
Organogeneza, embriogeneza.
Značilnosti gojenja rastlin v tkivni kulturi.
Različni tipi tkivnih kultur.
Pridobivanje sekundarnih metabolitov.
Krioprezervacija.

Prenesljive/ključne spretnosti in drugi atributi:

- Izbrati ustrezno gojišče, metodo mikropropagacije in ex situ strategijo varstva za določen vcepek in rastlinsko vrsto.
- Seznanjanje z izbranimi laboratorijskimi

Intended learning outcomes:

Knowledge and understanding:

Technical requirements of tissue culture cultivation.
Tissue and media preparation.
Plant hormones.
Organogenesis, embryogenesis.
Tissue culture cultivation features.
Different tissue culture types.
Secondary metabolites production.
Cryopresevation.

Transferable/Key Skills and other attributes:

- Determine appropriate growth medium, micropropagation procedure and strategy for ex situ conservation for particular explant and plant species.
- Qualification for work with selected

metodami dela.

laboratory methods.

Metode poučevanja in učenja:

Predavanja s študijami primerov
Seminar

Learning and teaching methods:

Lectures with case studies
Seminar

Načini ocenjevanja:

Pisni izpit in seminarska naloga s
predstavitvijo in zagovorom.

Delež (v %) /

Weight (in %)

50/50

Assessment:

Written exam and Seminar work with
presentation and defence.

Reference nosilca / Lecturer's references:

AMBROŽIČ-DOLINŠEK, Jana, RAVNIKAR, Maja, ŽEL, Jana, DEMŠAR, Tina, CAMLOH, Marjana, CANKAR, Katarina, DREO, Tanja. Tissue culture of Pyrethrum (*Tanacetum cinerariifolium*) and associated microbial contamination = Tkivna kultura bolhača (*Tanacetum cinerariifolium*) in z njo povezana okužba z mikroorganizmi. *Acta biologica slovenica*, ISSN 1408-3671. [Tiskana izd.], 2010, vol. 53, št. 1, str. 63-68. [COBISS.SI-ID 17957896]

AMBROŽIČ-DOLINŠEK, Jana, CAMLOH, Marjana, ŽEL, Jana, KOVAČ, Maja, RAVNIKAR, Maja, CARRARO, Luigi, PETROVIČ, Nataša. Phytoplasma infection may affect morphology, regeneration and pyrethrin content in pyrethrum shoot culture. *Scientia horticulturae*, ISSN 0304-4238. [Print ed.], 2008, vol. 116, no. 2, str. 213-218. <http://dx.doi.org/10.1016/j.scienta.2007.11.013>. [COBISS.SI-ID 1842511]

CAMLOH, Marjana, AMBROŽIČ-DOLINŠEK, Jana. In vitro regeneration systems of *Platyserium*. V: FERNÁNDEZ, Helena (ur.), KUMAR, Ashwani (ur.), REVILLA, Maria Ángeles (ur.). *Working with ferns : issues and applications*. New York [etc.]: Springer, cop. 2011, str. 111-125, ilustr., doi: [10.1007/798-1-4419-7162-3_8](https://doi.org/10.1007/798-1-4419-7162-3_8). [COBISS.SI-ID 18091272]

AMBROŽIČ-DOLINŠEK, Jana, KOVAČ, Maja, ŽEL, Jana, CAMLOH, Marjana. Pyrethrum (*Tanacetum cinerariifolium*) from the northern Adriatic as a potential source of natural insecticide. *Annales, Series historia naturalis*, ISSN 1408-533X, 2007, letn. 17, št. 1, str. 39-46. [COBISS.SI-ID 1352147]