Manoharbhai Shikshan Prasarak Mandal, Armori

RASHTRAPITA MAHATMA GANDHI

ARTS AND SCIENCE COLLEGE NAGBHID DIST - CHANDRAPUR

NAAC Reaccredited 'B+' Grade

In Collabration With

The National Acadamy Of Science [NASI], India, Nagpur Chapter

Certificate

This is to certify that, Mr./Mrs. Priyanshu A. Yermalwar

of Government Science College, Gadchiroli has participated in

STATE LEVEL STUDENT SEMINAR COMPETITION

On 26th February 2024, in Subject: **Zoology/ Botany/ Chemistry/ Physics**

And Secured ~~First/Second/Third/ Consolation Prize~~/Paticipated in event.

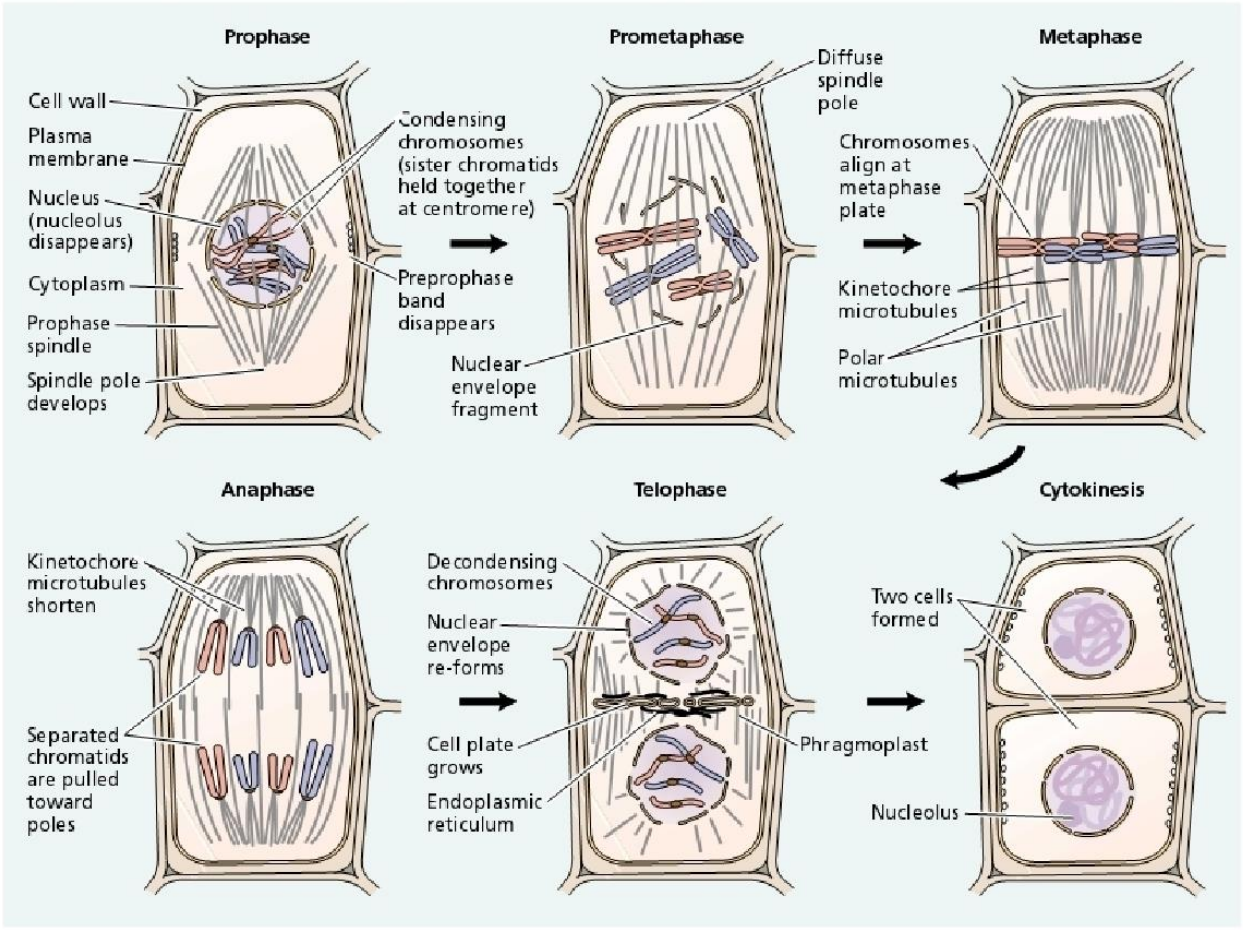
His/Her Valuable Participation in the Competition hereby Acknowledged.

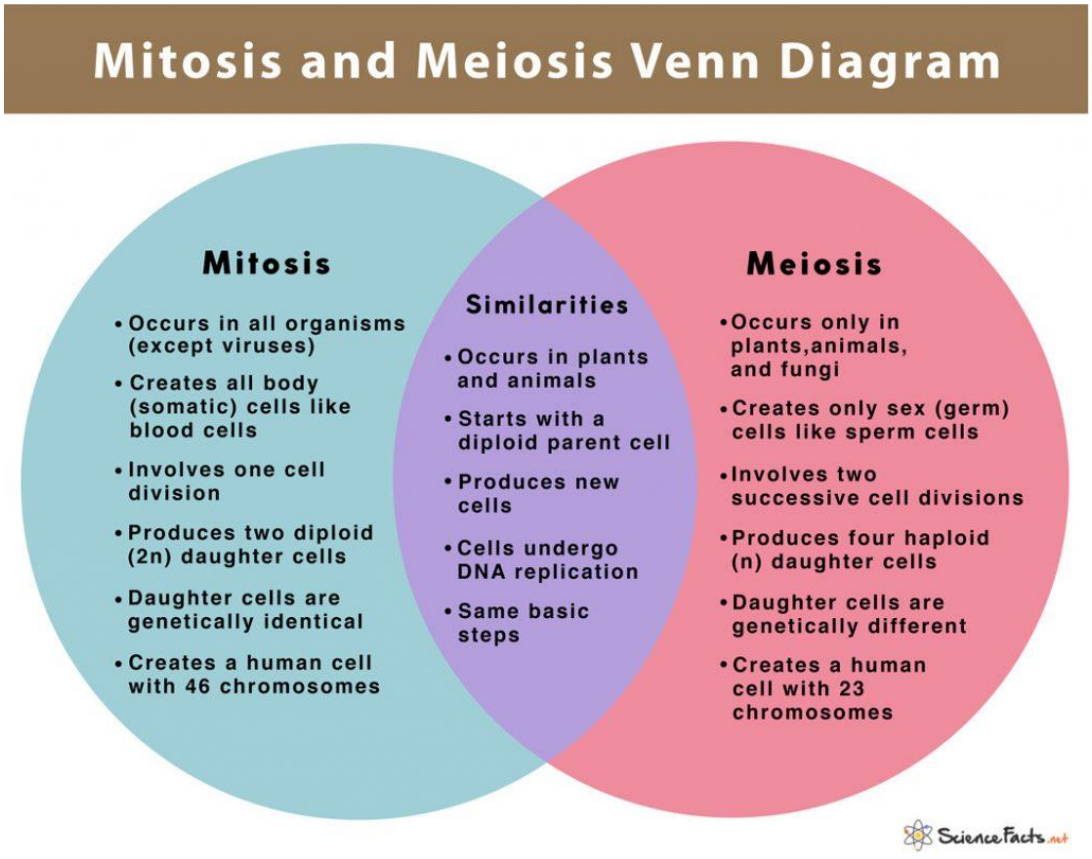
CONGRATULATIONS

Prof. N.S. Gajbhiye
Chairman
NASI, Nagpur Chapter

Dr. G. D. Deshmukh
Principal
R.M.G. College, Nagbhid

Government Science College,Gadchiroli
Department of Botany





Submitted by - Miss. Sanjana V. Kawale, Miss. Varsha M. Bure, Miss. Manisha S. Sontakke
B.Sc II (CBZ), Sem IV (Summer-2024)

GOVT. SCIENCE COLLEGE GADCHIROLI
PG DEPARTMENT OF BOTANY
LIST OF PROJECTS CARRIED OUT BY STUDENTS
M.Sc II (Botany) (CBCS), Sem IV
Session : 2023-24

Sr. No	Name of Student	Title of Project	Type Lab Work /Field Work, Survey/ Other	Name of Supervisor
1.	Miss. Rabina Samar Mandal	"Wild edible vegetables in chamorshi"	Field Work, Survey	Dr. P. S. Jakhi
2.	Miss. Anjali Nandkishor Sonkusare	"Effects Of Organic Manures On Seed Germination in Some Vegetable Crops"	Lab Work	Dr. Shagufta. A. Sheikh
3.	Miss. Punam Anandrao Nagpurkar	"Influence of organic manure on seed germination in some vegetable crops"	Lab Work	Dr. Shagufta A. Sheikh
4.	Miss. Maheshwari Vikas Nandeshwar	"Study on Ethnobotanical Survey of Kurkheda tahshil"	Field Work, Survey	Mr. Amar S. Kuril
5.	Miss. Sapana Dubraj Meshram	"Seed Germination of Pulses"	Lab Work	Miss. Priyanka M. Sahare
6.	Miss. Ankisha Fakira Chaudhari	"Studies on plants used for purpose of fencing and agricultural implements by the local people of Gadchiroli tahshi."	Field Work, Survey	Dr. P.S.Jakhi
7.	Miss. Mayuri waman Borkar	"Study of fruit marketing from Gadchiroli"	Field Work, Survey	Dr. Prashant S. Jakhi
8.	Miss. Raksha Satywan Raut	"Agricultural seeds , Pesticides & Fertilizer available in kurkheda tehsil."	Field Work, Survey	Dr. P. S. Jakhi
9.	Miss. Ragini Machhindranath Lakade	"studies on Dye yielding plants from gadchiroli district of Maharashtra."	Field Work, Survey	Mr. Amar S. Kuril
10	Miss. Sejal Vinod Sakhare Supervisor Name -	"Documentation of wild and cultivated vegetables in Gadchiroli tehsil"	Field Work, Survey	Miss. Kalyani G. Khobragade
11	Miss. Pallavi Shamrao Kadyami	"Aquatic plants diversity of Gadchiroli Tehsil"	Field Work, Survey	Mr. Amar S. Kuril
12	Miss. Achal Homraj	"Documentation on thorny,	Field Work,	

	Chahande	spiny and prickles plants of Gadchiroli Tahsil."	Survey	Miss. Kalyani G. Khobragade
13	Miss. Urvashi Gowardhan Uikey	"Biodiversity assessment of aquatic plants from few selected sites in Kurkheda tehsil, District Gadchiroli"	Field Work, Survey	Mr. Amar S. Kuril
14	Miss. Revata Sitaram Sondarkar Supervisor Name: Priyanka M. Sahare	"Leaf epidermal studies of some species of Apocynaceae and Asteraceae"	Lab Work	Miss. Priyanka M. Sahare
15	Miss. Mayuri kalidas Gurnule	"Checklist of plants available in premises of Government Science College, Gadchiroli."	Field Work, Survey	Dr. P. S. Jakhi
16	Miss. Babita Ramesh Buddhe.	"Qualitative studies on Agricultural diversity and their soil testing of few selected sites from Desaiganj tahsil dist.Gadchiroli"	Lab Work	Mr. Amar S. Kuril

Date:- 28/04/2024

Principal
Govt. Science College
Gadchiroli

Department of Botany

Unit Test Bsc.(Botany) Sem-I (Paper-II) Plant Diversity II (Bryophytese,Pteridophytes, Gymnosperm and Paleobotany)

Session:2023-24(Winter-2023)

Name of Teacher: Dr. Shagufta Amir Sheikh

Month: september

Full Name	Group	Unit Test I (on Unit I), 09/09/2023 @11:15 AM, Max. Marks 20	Paper I. 04/09/23
ADURWAR RIYA PURUSHOTTAM	CBZ	9	10
ARJUNKAR RHUTUJA PRAKASH	CBZ	AB	AB
ATRAM YUVRAJ KAILASH	CBZ	AB	AB
BARBATKAR VAISHNAVI MANOJ	CBZ	12	14
BARSAGADE ASHWINI SHARAD	CBZ	AB	AB
BARSAGADE PRATIKSHA BANDU	CBZ	AB	AB
BHANARKAR HARSHAL CHANDRAHAS	CBZ	14	18
BHURSE SAMIKSHA RAMESH	CBZ	4	6
BHURSE ZALKESHWARI BHARAT	CBZ	10	8
BODALKAR SHUBHANGI RAVINDRA	CBZ	9	7
BODALKAR SNEHA GHANSHAM	CBZ	AB	AB
BODALKAR TANVI DHANWAN	CBZ	8	9
BORKUTE MAYURI NETAJI	CBZ	2	4
CHALAKH DHANSHRI DEVENDRA	CBZ	AB	AB
CHANDANKHEDE VAISHNAVI KALIDAS	CBZ	7	9
CHANNEWAR ABHISHEK RAVINDRA	CBZ	3	6
CHUNARKAR SNEHAL PRABHAKAR	CBZ	4	6
DHODARE SANJANA DEVNATH	CBZ	9	12
DHURVE HEENA GANESH	CBZ	3	5
DUDHABAWARE KAJAL RUSHIDEO	CBZ	4	5
DUGGA SHUBHAM SUKLAL	CBZ	AB	AB
GAWADE KUNAL DOMRAJ	CBZ	AB	AB
GAWHARE ANSHUL SOMESHWAR	CBZ	AB	AB
GEDAM SAMIR NARENDRA	CBZ	5	6
GHONGADE DAMINI DEVIDAS	CBZ	AB	AB
GORLAWAR SANKET RAMESH	CBZ	6	7
JADI RATAN SWAMI	CBZ	AB	AB
KALSAR SUJATA LALAJI	CBZ	4	6
KOSARE ADITYA RAVINDRA	CBZ	3	6
KOTHARE DEVYANI RAKESH	CBZ	AB	AB
KOTHWAR TEJASWI MAHESH	CBZ	4	6
KUDKALWAR VANSHITA PRASHANT	CBZ	11	13
KUMRI NIRJA SADANAND	CBZ	13	12
LONBALE RUCHI MADHAV	CBZ	AB	AB
MADAVI AKSHAY PRAKASH	CBZ	AB	AB
MADAVI KAPIL SUDHAKAR	CBZ	AB	AB
MALODE LINAY DADAJI	CBZ	4	6

Sheikh 27/09/2023

(Dr. S. A. Sheikh)

IRAM PRATIKSHA ASHOK	CBZ	11	16
JDE PIYUSH CHANDRAKANT	CBZ	15	18
NAIK PINTESH BANDU	CBZ	12	
NAITAM HARISH RAMSING	CBZ	AB	AB
NAITAM TARA SANTOSH	CBZ	3	4
NAROTE ANKITA SURESH	CBZ	3	6
NAROTE PRANAY LALU	CBZ	2	3
NAROTE VAISHNAVI NAMDEO	CBZ	9	12
NIMBORKAR RAJSHRI RAVINDRA	CBZ	4	5
PADA SAHIL ASHOK	CBZ	4	6
PADA SUSHMITA VITHOBA	CBZ	7	9
PARCHAKE VIKRANT EKNATH	CBZ	7	10
PATHAN SANIYASADAF JAMAL AHEMAD	CBZ	AB	AB
RAUT KHEMLAL MANSING	CBZ	5	5
RAUT SANJEEVANI SUDHAKAR	CBZ	3	4
RAUT VAISHNAVI KISHOR	CBZ	AB	~~AB~~
SAKHARE PRUTHVI KALIDAS	CBZ	AB	~~AB~~
SANDE MOHAN MANOHAR	CBZ	5	6
SARKAR ASHIT ASHIM	CBZ	AB	~~AB~~
SARKAR RAKHI RADHAKRUSHNA	CBZ	AB	~~AB~~
SHETTIWAR PREETI VILAS	CBZ	AB	~~AB~~
SONULE PRATIKSHA YASHWANT	CBZ	5	6
SORTE DEEPALI DILIP	CBZ	18	18
SURYAWANSHI PRATIKSHA REVNATH	CBZ	5	6
TOPPO RAJESH PANJABRAO	CBZ	5	7
USENDI PRATHAMESH CHAITU	CBZ	3	5
USENDI RAGINI SUDHAKAR	CBZ	3	5
WADDE VIKASH GANDO	CBZ	AB	~~AB~~
YELEKAR TINU BHASKAR	CBZ	AB	~~AB~~
YENDALWAR SAKSHI VASANT	CBZ	12	14
TOFA MAYURI LALA	CBZ	11	14
RAUT JAGRUTI JANKIRAM	CBZ	10	12
YENGANTIWAR SHRAWANI S	CBZ	AB	~~AB~~
JANBANDHU PRAJWAL PARSHURAM	CBZ	5	6
ATRAM LOKESH K	CBZ	AB	~~AB~~
YESANSURE MOHINI RAJESH	CBZ	AB	~~AB~~
DONADKAR VEDANTI DEVANAND	CBZ	AB	~~AB~~
SATPUTE DIVYANI UMAKANT	CBZ	3	6
SHETTIWAR RADHA MADHUKAR	CBZ	3	4
NAROTE ACHAL BABURAO	CBZ	5	6
MADAVI NILAM DEVRAO	CBZ	0	2
GURNULE SAKSHI SUNIL	CBZ	AB	~~AB~~
KUMRE NIJAMSAY DEVSING	CBZ	AB	~~AB~~
SARKAR RESHMA NIRABINDU	CBZ	2	4
NAITAM VAIBHAV DEWAJI	CBZ	AB	~~AB~~
KOWASE ASHWINKUMAR KISHOR	CBZ	AB	~~AB~~
MANDAL SHUBHAM SHANKAR	CBZ	7	6

KN SHITAL CHARANDAS	CBZ	AB	AB
OTA ASHWARYA BACHCHAN	CBZ	AB	AB
MADAVI RAJESHWARI VASUDEV	CBZ	4	6
TALANDE SONALI PANDURANG	CBZ	AB	AB
GUDADHE MAYURI MANOHAR	CBZ	AB	AB
BOGA KARTIK VILAS	CBZ	7	8
NAROTE SHIVANI DEVRAO	CBZ	AB	AB
HICHAMI SANIYA MANOHAR	CBZ	AB	AB
LEKAMI SANIYA LAXAM	CBZ	3	4
KANNAKE BHAGYASHRI DEVAJI	CBZ	12	12
TIMMA MOHINI DAULAT	CBZ	11	12
MESHRAM SAHIL DEVAJI	CBZ	5	6
TUMRETI AMAN SURESH	CBZ	4	8
GEDAM SHREYA DEEGAMBER	CBZ	3	6
MADAVI VAISHNAVI RAGHUNATH	CBZ	AB	AB
ATRAM KUMKUM MAHADEV	CBZ	AB	AB
PENDAM PURSHOTAM PRANAY	CBZ	0	2
GOTA ASHWARYA BACHCHAN	CBZ	0	2
DUGGA SHUBHAM SUKLAL	CBZ	4	6
ATRAM KUMKUM MAHADEV	CBZ	2	4
KUMARE SEJAL KHUSHAL	CBZ	4	3
HALAMI PUNAM KARANGSHAHA	CBZ	5	6
WADDE VIKASH GANDO	CBZ	6	8
MADAVI KAPIL SUDHAKAR	CBZ	AB	AB

Class: BSc. Semester-1
time: 1hr.
Paper 2 Plant Diversity-11
Test Topic : Unit 1 (Maximum Mar5ks 20)
Date: 9/9/2023

27/10/2023

Dr. Shagufta A. Sheikh

Government Science College,Gadchiroli
PG DEPARTMENT OF BOTANY
"NOTICE : Assignment Topics"

Class:- M. Sc II, Sem-IV (CBCS) **Session:- Summer 2024**

All the students **M. Sc II, Sem- IV** are hereby inform that, you have to submit the Assignment which is the part of Internal Assessment. The following topics are mentioned according to M.Sc (Botany) (CBCS) syllabus and you have to submit it as Assignment of all four papers in Single Register (50/100 pages) having full information like Name of College, Name of Department, Name of Student,Class, Semester, Session, Name of topics & with duly Signed by Subject Paper Teacher Incharge and HOD.

Write ALL the topics and Draw diagrams where ever necessary.

Submit the signed checked assignment to HOD Botany up to 10 February 2024.

Groups	Assignment Topics as per syllabus paper wise
Group No. 1 (Roll No. 01 to 04)	Que 1 construction of DNA libraries; screening of DNA libraries and introduction of the recombinant DNA into the host cells.
	Que 2 General account, distinguished characters, floral variation and evolution. affinities of :- Magnolidae, Hamamelidae, Dilleniidae
	Que 3 Double fertilization, triple fussion and unusual features, placental pollination, Gynogenesis,Endosperm mutant.
	Que 4 Conservation of genetic diversity, species diversity and ecosystem diversity.
Group No. 2 (Roll No.05 to 08)	Que 1 Molecular markers for introgression of useful traits; high throughput sequencing; functional genomics; Protein profiling and its significance.
	Que 2 Interesting features and systematic position of Cucurbitaceae, Cactaceae, Asteraceae, Amentiferae.
	Que 3 Suspensor-Ultra structure of suspensor cells, cytology of suspensor cell, physiology and biochemistry of suspensor Polyembryony.
	Que 4 Social approaches to conservation, Biodiversity awareness programmes, Sustainable development
Group No. 3 (Roll No.09 to 12)	Que 1 Tissue culture media; callus induction and cell suspension; aspects of morphogenesis; haploid and triploid production
	Que 2 speciation and extinction, IUCN categories of threat, distribution and global pattern of biodiversity.
	Que 3 Apomixes - causes & significance, cellular totipotency, Androgenesis,pollen analysis of honey.
	Que 4 Role of plants in relation to Human Welfare, Avenue trees.
Group No. 4 (Roll No.13 to onwards)	Que 1 Literature database (PubMed, OMIM), Information Retrieval system (Entrez). Other databases: GeneBank, KEGG, Taxonomy databases,Sequin & SWISS prot.
	Que 2 Role of biodiversity in ecosystem functions and stability, Endemism, hotspots and hottest hotspots, invasions and introductions
	Que 3 Biotransformation and production of useful compounds through cell culture, factor affecting yield, biotransformation, bioreactors
	Que 4 Alcoholic beverages through ages, Fruits and nuts, Wood and its uses.

Date:- 06/01/2024

Mr. Amar S. Kuril
Teacher Incharge

Dr. P. S. Jakhi
HOD Botany

Government Science College,Gadchiroli
PG DEPARTMENT OF BOTANY
"NOTICE : Assignment Topics"

Class:- M.Sc I (BOTANY), Sem-II (As per NEP 2020) **Session:- Summer 2024**

All the students **M.Sc I, Sem-II** are hereby inform that, you have to submit the Assignment which is the part of Internal Assessment. The following topics are mentioned according to M.Sc Sem II (Botany) (As per NEP 2020) syllabus and you have to submit it as Assignment of all four papers in Single Register (50/100 pages) having full information like Name of College, Name of Department, Name of Student,Class, Semester, Session, Name of topics & with duly Signed by Subject Paper Teacher Incharge and HOD.

Write ALL the topics and Draw diagrams where ever necessary.

Submit the signed checked assignment to HOD Botany up to 10 February 2024.

Groups	Assignment Topics as per syllabus paper wise
Group No. 1 (Roll No. 01)	Que 1 Mechanism of electron transport, Photo protective mechanism,C3 &C4 pahway.
	Que 2 Organization of shoot apical meristem (SAM); cytological and molecular analysis of SAM; control of cell division and cell communication
	Que 3 Structure, diversity origin and evolution of stamen & carpels, Placentation types & Evolution.
	Que 4 Developmental and functional aspects of male sterility environmental factors, role of mitochondrial genome in male sterility, gametocides.
Group No. 2 (Roll No. 02)	Que 1 Mechanism of respiration ,Glycolysis,Citric acid cycle, oxidative pentose phosphate pathway.
	Que 2 Flower Development – Physiology of flowering, florigen concept and photoperiodism, Genetics of floral organ differentiation; Root Microbes interaction.
	Que 3 relative merits and demerits of major systems of classifications, Heterobathmy, Analytic Vs. Synthetic Character (Arificial, Natural and Phylogenetic systems)
	Que 4 Microgametogenesis and Male gametophyte development: Development of the male gametophyte,Floral attractants & Rewards.
Group No. 3 (Roll No. 03)	Que 1 Phloem loading: from chloroplast to sieve elements, Phloem Unloading: sink-to-source Transition, mechanism of translocation in the phloem.
	Que 2 microsporogenesis, tapetum; pollen development and gene expression; male sterility; sperm dimorphism; pollen germination
	Que 3 Taxonomic evidence: Morphology, anatomy, embryology, palynology, cytology, phytochemistry, genome analysis, Computer & GIS.
	Que 4 Megasporogenesis and megagametogenesis : Meiosis, functional megaspores, organization of female gametophyte, structure & types of the embryo sac.
Group No. 4 (Roll No. 04)	Que 1 Structure, function and mechanisms of action of phytochromes, cryptochromes, Biosynthesis of alkaloids, terpenes, phenols.
	Que 2 Biochemistry of pollen germination; RNA and protein metabolism during pollen tube, Pollination mechanism-biotic and abiotic pollination, floral attractions and rewards.
	Que 3 Biosystematic categories, methods of biosystematics studies.homoplasy, monophyly, polyphily, Salient features of ICBN.
	Que 4 Self incompatibility - Basic concepts, mechanism of self-compatibility (interspecific, intraspecific, homomorphic, heteromorphic.GSI,SSI, CSI and LSI.)

Date:- 06/01/2024

Mr. Amar S. Kuril
Teacher Incharge

Dr. P. S. Jakhi
HOD Botany

Government Science College,Gadchiroli
PG DEPARTMENT OF BOTANY
"NOTICE"

SEMINAR

Session : Summer - 2024

All the students of M.Sc (Botany)(CBCS) Sem- IV and II are hereby informed that your **'SEMINAR'** is going to held from **11 January 2024, as per time table scheduled,** so you all should remain present & all well prepared for the same. The seminar will be **consisting** of **four students** (as per the list given below).

The seminar will be held **in Department of Botany M.Sc Part II Lab** and you have to **submit your seminar Hardcopy** with certificate having handout of PPT along with **soft copy at the time of seminar**.

Note : The seminar should be as per M. Sc Sem - IV (CBCS)/Sem II (NEP 2020) syllabus and must be in detail, use reference Books/Research papers/Journals. You can show some videos related to your topics.

Seminar is MANDATORY If you remain ABSENT/Didn't deliver seminar then you will be FAIL in University examination.

Date: 30/12/2023

Mr. Amar S. Kuril
Seminar Incharge

Dr. P. S. Jakhi
HOD Botany

Government Science College,Gadchiroli
PG DEPARTMENT OF BOTANY
(SEMINAR DETAILS, SUMMER-2024)
Class: M.Sc (Botany) II, Sem-IV

Sr. No.	Name of Student M.Sc (Botany) II	Name of Seminar Topic	Sign & Date
1	RAGINI M. LAKADE	Vector, and Types and their properties	R.Lakade.
2	Sapana Dubraj Meshram	Conservation of Biodiversity	07/02/24 Meshram
3	Maheshwari Vikas Nandeshwar	Forest Utilization and its comercial aspects.	8/02/24
4	Sejal Vinod Sakhare	Melittopalynology	08/02/24
5	Punam Anandrao Nagpurkar	Role of biodiversity in ecosystem	Punam
6	Rabina Samar Mandal	Polyembryony	08-02-24
7	Mayuri Kalidas Gurnule	Def^n & classification of apomixis & type of apomixis	Gurnule
8	Babita Ramesh Buddhe	Role of plants in relation to Human welfare.	Buddhe
9	Pallavi Shamrao Kadyami	Global putterns of biodivessity	Bkadyami 08/02/24
10	Raksha Satywan Raut	plant tissue culture	Raut
11	ANJALI N. SONKUSARE	Social approaches to conservation	Anjali 08/02/24
12	REVATA S. SONDARKAR	Endosperm Development of Endosperm, Type of Endosperm	Revata
13	Urvashi gowardhan Uikey	Paethenocarpy its Types.	Uikey
14	Ankisha Fakira Chaudhari	Transgenic plants	A.C.
15	Achal Homraj Chahande	Recombinant DNA Technology	Achande.
16	Mayuri waman Borkar	Endospeterm	8/2/24

Date: 30/12/2023

8/2/2024
Mr. Amar S. Kuril
Seminar Incharge

Dr. P. S. Jakhi
HOD Botany

Unit Test

Subs Botony II (Unit II)

21/2/202

7½ = 08/15

Name: Sakshi R. Kokode

Class: B.sc. (3rd year - (B2)

Q.3 Write 2-3 lines only

a) Ri plasmid.

→ Ri plasmid is root-inducing plasmid which is present in Agrobacterium rhizogene They induce hairy root disease in dicots.

b) T-DNA

→ T-DNA is transfer DNA which induce tumour in plant (host). It is the transferred DNA of Ti-plasmid of some species of bacteria such as A. tumifaciens A. Rhizogene.

d) Gall

→ Gall is the type of disease which is known as crown-Gall disease. It causes due to Agrobacterium tumifacien bacteria. It is gram negative bacteria Gall means tumour like structure. or balb like structure is formed.

f) Octopine

→ Octopine is the gene which is present on Ti plasmid within specific region.

Q.1 Write on any one.

A) Agrobacterium mediated gene transfer.

→ The Agrobacterium mediated gene transfer is the indirect method of gene transfer. This method is very important in yeild improvement or crop improvement. This method is useful in economic conditions. Also useful in evaluting different species.

In Agrobacterium mediated gene transfer, Agrobacterium tumifaciens plays important role. It is a gram negative, Rod shaped bacteria which causes tumour or gall or crown in plant. This disease is known as 'Crown Gall disease'

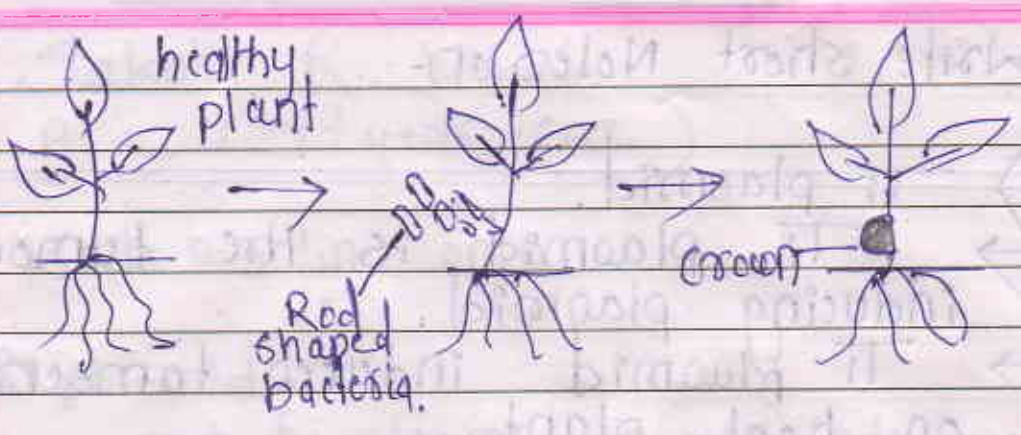


Fig. A. tumifaciens causing crown gall disease.

In Crown-Gall disease, bulb like structure is formed. The number of cell formed in specific region of host plant.

Agrobacterium tumifaciens transfer its gene through or with the help of Ti-plasmid. Ti is Tumour inducing plasmid. It is a vector which transfer genetic material of A. tumifaciens bacteria into host plant. There are specific regions present on Ti plasmid which helps them to transfer DNA of bacteria.

When bacteria affects the plant, there is formation of tumour i.e. bulb like structure in which number of cells increased at one place.

03

Q.2 Write short Notes on-

a) Ti plasmid.

Ans: → Ti plasmid is the tumour inducing plasmid.

→ Ti plasmid induced tumour on host plant

→ Ti plasmid contain Auxin, cytokinin & opine region.

→ It plays role of vector.

→ The well-known bacteria. i.e. Agrobacterium tumifaciens caused Crown Gall disease in plants with the help of Ti plasmid.

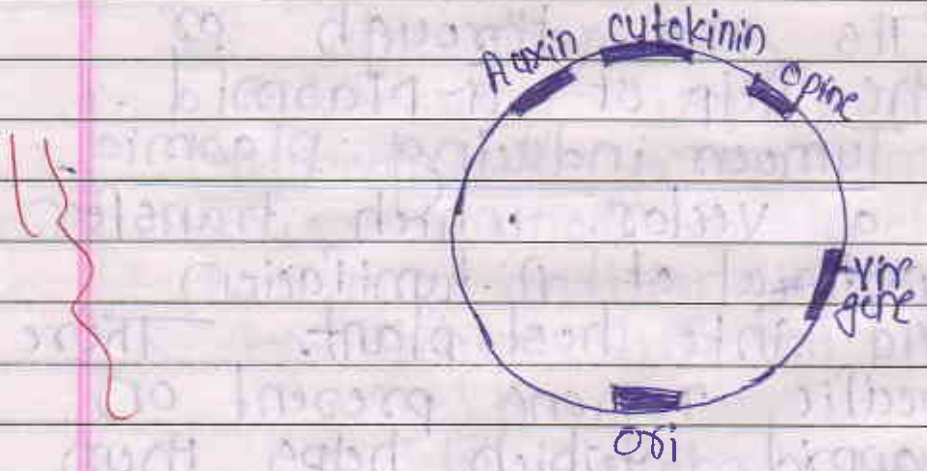


Fig. Ti plasmid

PAPER II - PLANT BIOTECHNOLOGY

UNIT TEST (Unit II) 10/15 28/12/24

Name:- Anjali Diwakar Chilbule

Q-3- B] T- DNA

⇒ It is a transfer DNA and small fragment of Ti Plasmid (Tumour inducing plasmid) which consist gene transfer into the host natures Plant DNA genome.

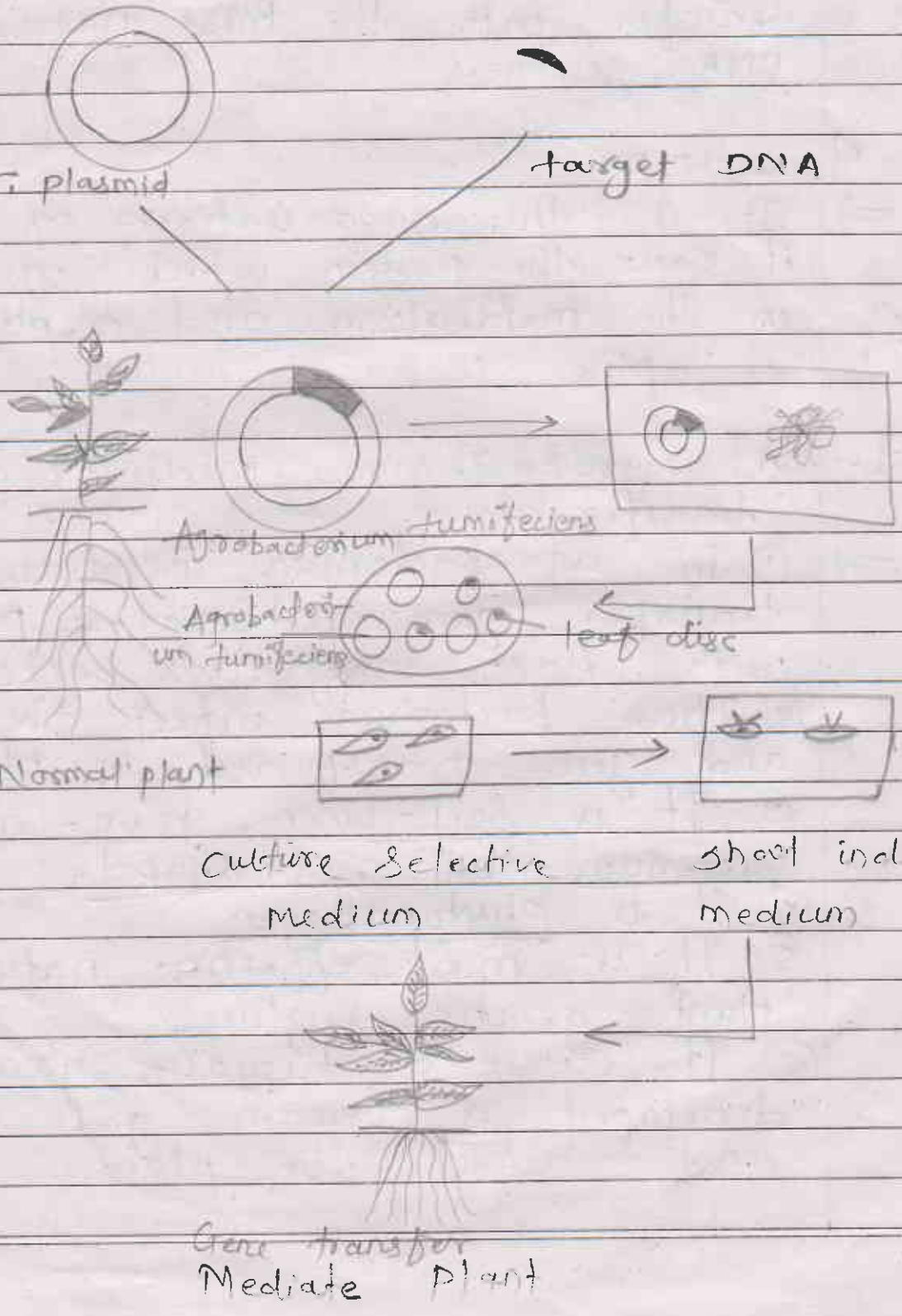
F] octopine.

⇒ It is the organisation of Ti plasmid it code the protein which involved in the metabolism and replication of opine.

Q-1. A] Agrobacterium mediated gene transfer.

⇒ ① In agrabacterium mediated gene transfer, gene integrated plant with first integrated bacterium.
② Those bacterium infect the plant and gene transformed in plant.
③ It is soil-born, gram-negative bacterium and rod-shaped.
④ It is phytopathogen
⑤ It is most effective natures in plant genetic engineer.
⑥ It cause a tumour growth & developed a Crown gall disease and infect the plant.

(7) Here, two enzymes involved, i.e. restriction enzyme and ligase



⑧ It is the indirect method of gene transfer in plant. through bacterium.

03

Q-2

A] Ti plasmid

⇒ ① It is known as Tumour-inducing plasmid.
② It is ~~used~~ to help to gene transfer in plant.
③ It involved in transformation Process.
④ And it codes the proteins which involved in transformation process

Organisation of Ti plasmid

① ~~Gene~~ origin of replication.
② Selectable marker is present.
③ Virulence region is present.
④ T- DNA is present.

① T- DNA region -

- T- DNA is a transfer DNA which Contain a gene for transfer in host ~~gene~~ gene DNA genome.
- It is the small fragment of Ti plasmid

② Virulence region.

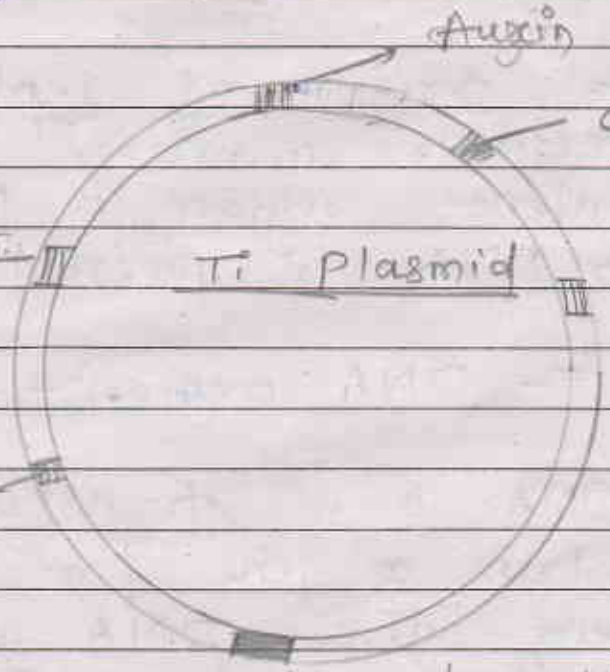
- It is known as Vir - region.
- It is present in outside of T-DNA.
- It is the small fragment of Ti-Plasmid which is present in outside of T-DNA (Transfer DNA)

③ Selectable markers

- Selectable marker is present in Ti - Plasmid to detect the amount of number of gene.

④ Origin of replication.

- It code the protein which involve in transformation process. and mechanism of gene



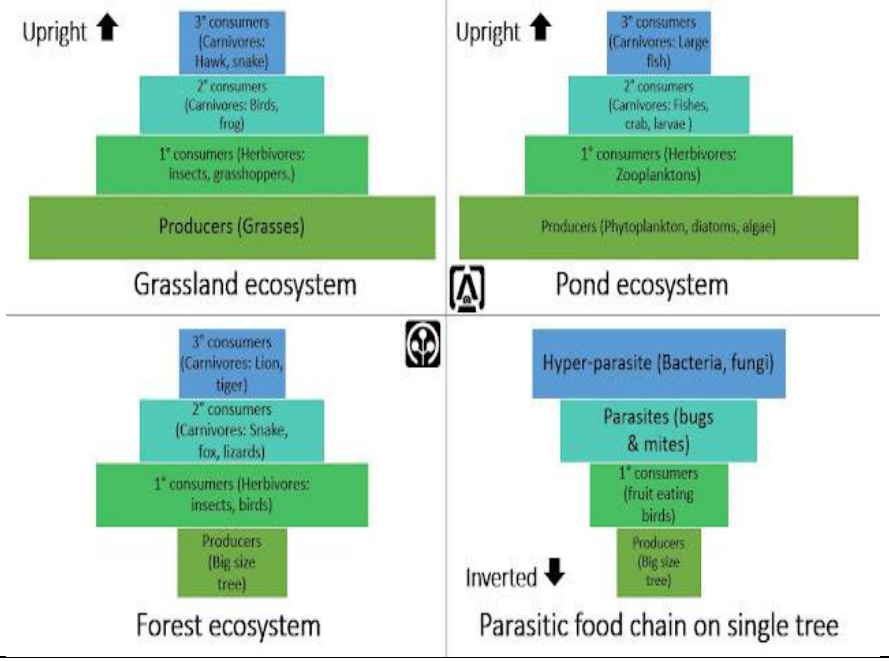
(5) T- DNA is biosynthesized the growth hormone i.e. Auxin and cytokinin.

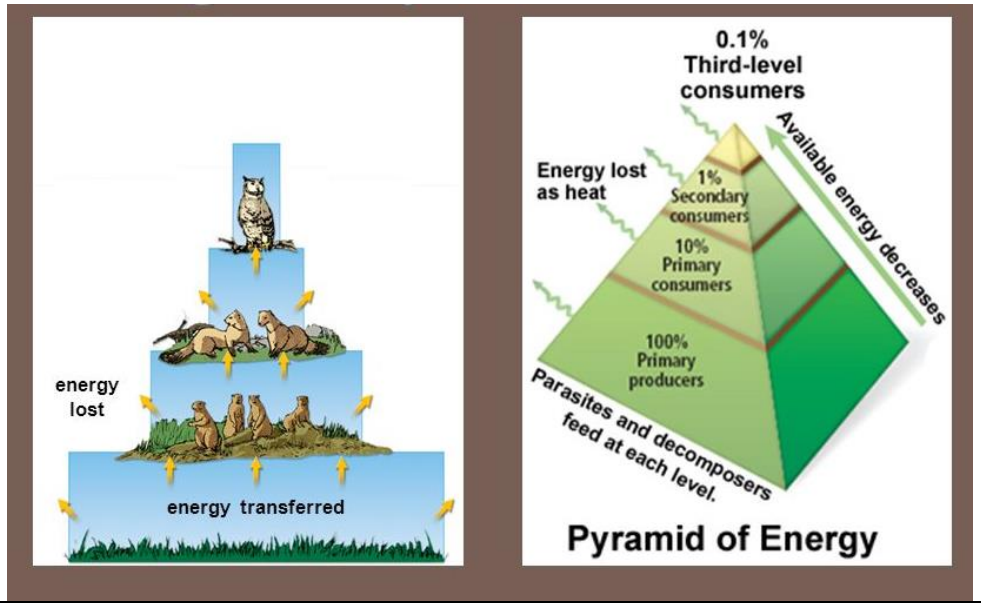
(6) ~~It code the expressed to bio~~

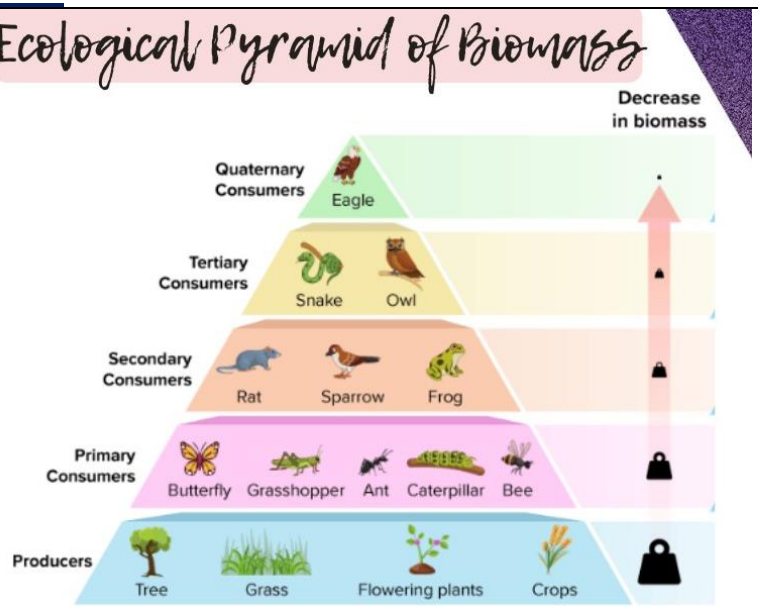
(6) ~~Antiotics~~ It code hpt, npt II, gox and expressed to antibiotics of A streptomycin, glycophosphate.

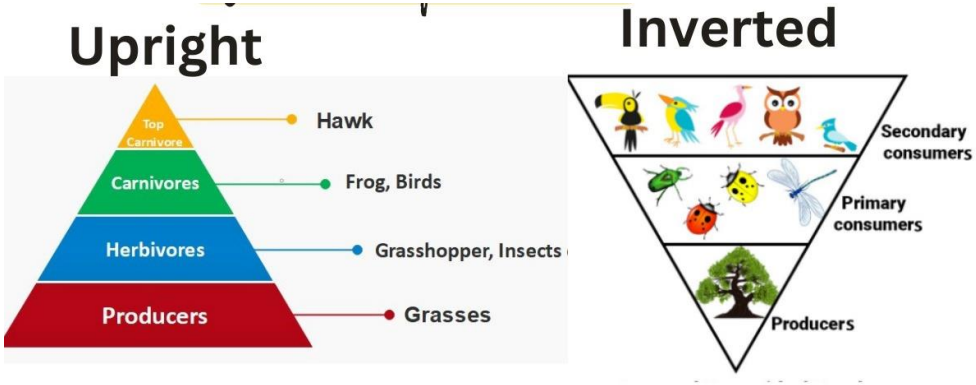
Government Science College,Gadchiroli
DEPARTMENT OF BOTANY

ECOLOGICAL PYRAMIDS







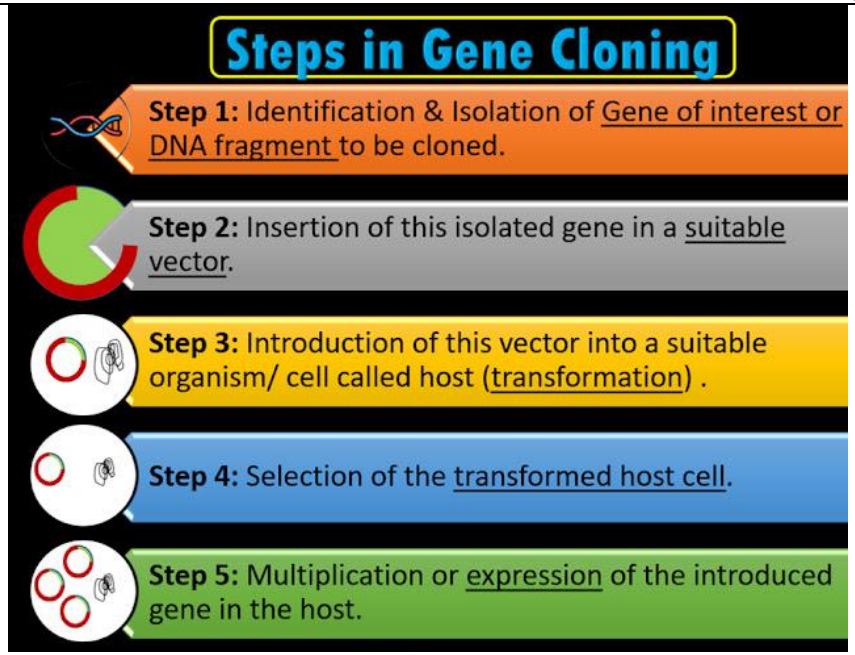


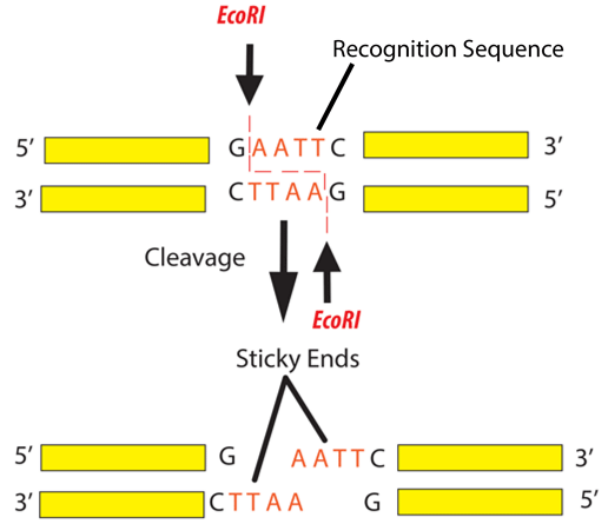
Pyramid of Number

Submitted by - Miss. Sapana P. meshram, Miss. Kishori M. Mussadiwar, Miss. Babita Naitam
B.Sc II (CBZ), Sem IV (Summer-2024)

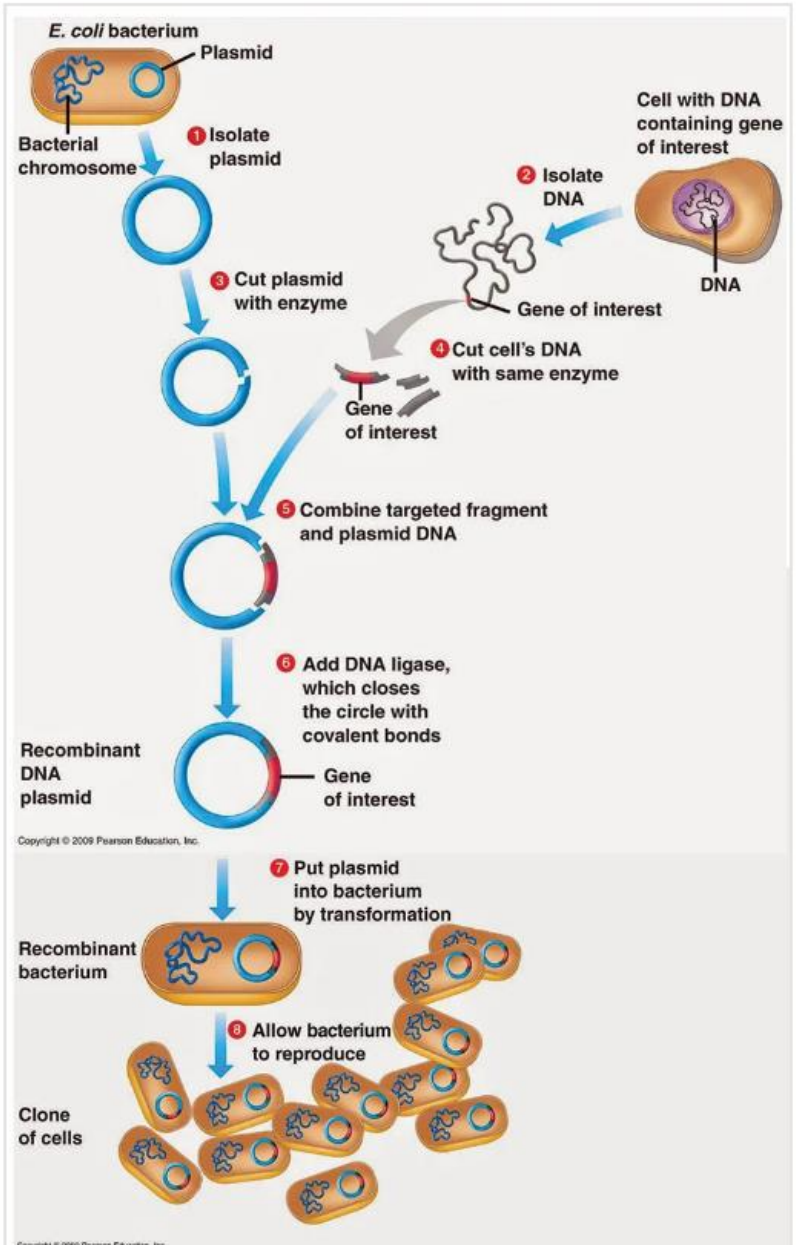
Government Science College,Gadchiroli
DEPARTMENT OF BOTANY

TECHNIQUES OF GENE CLONING





ACTION OF Type II RESTRICTION ENZYME eg. EcoRI



Submitted by - Miss. Vaishnavi V. Seelam, Miss. Isha R. Bhandekar, Miss. Vaishnavi R. Kanthilwar
B.Sc II (CBZ), Sem IV (Summer-2024)

Government Science College, Gadchiroli.

Department of Botany.

Internal Assignment Submission and

Seminar : Plant Hormones and their Functions.

submitted by -

Name : Akanksha Jitendra Patle.

Class : Bsc III year (CBZ)

Sem : VI

Session : Summer 2023-2024.

Teacher Incharge :

1. 22/02/2024

2. 26/2/24

Dr. P.S. Takhi sir.
Head of Botany
Department.

Paper - I

DOMS | Page No.
Date / /

Que.1 Secondary metabolite production, organogenesis.

Secondary Metabolites : Secondary metabolites are generally defined as small organic molecules produced by an organism that are not essential for their growth, development and reproduction.

- They may include pharmaceuticals, fragrance, food additives, feedstock, etc.

- Plant hormones, which are secondary metabolites, are often used to regulate the metabolic activity within cells and oversee the overall development of the plant.
- It protect plant against herbivores and microbial pathogens.
- It serves as attachments for pollination and seed dispering animals.

- Plants are valuable sources of secondary metabolites that can be used as pharmaceuticals, agrochemicals, flavors, fragrances, colours, biopesticides and food additives.
- They are not involved in primary cell events essential for survival, but are the means by which plant cells adapt to their ~~surviv~~ environment.
- Plants responds to the attack of pathogens, wounds, insects and herbivores or to other biotic stresses such as malnutrition and abiotic stresses such as low temperature, by activating an array of defense mechanisms including induction of biosynthesis of secondary metabolites.

- It is very difficult to obtain a uniform distribution of secondary metabolites in vivo by classical agriculture.
- In vitro cultivation of plant cells in a bioreactor which offers a controlled supply of secondary metabolites with consistent quality and yield independent of the external factors is an industeral alternative.

types of secondary metabolites :

- Plant metabolites can be antibiotic, antifungal and antiviral agents that protect the plants from pathogens, and are called phytoalexins.

- Alleopaths are anti-germinative or toxic for other plants.
- Secondary metabolites are classified according to their biosynthetic pathways and can be studied under five major groups as : polyketides, isoprenoids, alkaloids, phenylpropanoids and flavonoids.

- Secondary metabolite biosynthesis in plant cells under stress can be induced by elicitors or precursors and/or by application of both.
- Precursors are chemical stress factors that are key substrates, intermediate products or enzymes of secondary metabolite biosynthesis pathways. However, they can have toxic or inhibitory effects on the plant cells if not used at the right stage and/or concentration.

Government Science College, Gadchiroli.

Department of Botany.

Internal Assignment Submission and

Seminar : Plant Hormones and their Functions.

submitted by -

Name : Akanksha Jitendra Patle.

Class : Bsc III year (CBZ)

Sem : VI

Session : Summer 2023-2024.

Teacher Incharge :

1. 22/02/2024

2. 26/2/24

Dr. P.S. Takhi sir.
Head of Botany
Department.

Paper - I

DOMS | Page No.
Date / /

Que.1 Secondary metabolite production, organogenesis.

Secondary Metabolites : Secondary metabolites are generally defined as small organic molecules produced by an organism that are not essential for their growth, development and reproduction.

- They may include pharmaceuticals, fragrance, food additives, feedstock, etc.

- Plant hormones, which are secondary metabolites, are often used to regulate the metabolic activity within cells and oversee the overall development of the plant.
- It protect plant against herbivores and microbial pathogens.
- It serves as attachments for pollination and seed dispering animals.

- Plants are valuable sources of secondary metabolites that can be used as pharmaceuticals, agrochemicals, flavors, fragrances, colours, biopesticides and food additives.
- They are not involved in primary cell events essential for survival, but are the means by which plant cells adapt to their ~~surviv~~ environment.
- Plants responds to the attack of pathogens, wounds, insects and herbivores or to other biotic stresses such as malnutrition and abiotic stresses such as low temperature, by activating an array of defense mechanisms including induction of biosynthesis of secondary metabolites.

- It is very difficult to obtain a uniform distribution of secondary metabolites in vivo by classical agriculture.
- In vitro cultivation of plant cells in a bioreactor which offers a controlled supply of secondary metabolites with consistent quality and yield independent of the external factors is an industeral alternative.

types of secondary metabolites :

- Plant metabolites can be antibiotic, antifungal and antiviral agents that protect the plants from pathogens, and are called phytoalexins.

- Alleopaths are anti-germinative or toxic for other plants.
- Secondary metabolites are classified according to their biosynthetic pathways and can be studied under five major groups as : polyketides, isoprenoids, alkaloids, phenylpropanoids and flavonoids.

- Secondary metabolite biosynthesis in plant cells under stress can be induced by elicitors or precursors and/or by application of both.
- Precursors are chemical stress factors that are key substrates, intermediate products or enzymes of secondary metabolite biosynthesis pathways. However, they can have toxic or inhibitory effects on the plant cells if not used at the right stage and/or concentration.

Government Science College, Gadchiroli.

Department of Botany.

Internal Assignment Submission and

Seminar : Plant Hormones and their Functions.

submitted by -

Name : Akanksha Jitendra Patle.

Class : Bsc III year (CBZ)

Sem : VI

Session : Summer 2023-2024.

Teacher Incharge :

1. 22/02/2024

2. 26/2/24

Dr. P.S. Takhi sir.
Head of Botany
Department.

Paper - I

DOMS | Page No.
Date / /

Que.1 Secondary metabolite production, organogenesis.

Secondary Metabolites : Secondary metabolites are generally defined as small organic molecules produced by an organism that are not essential for their growth, development and reproduction.

- They may include pharmaceuticals, fragrance, food additives, feedstock, etc.

- Plant hormones, which are secondary metabolites, are often used to regulate the metabolic activity within cells and oversee the overall development of the plant.
- It protect plant against herbivores and microbial pathogens.
- It serves as attachments for pollination and seed dispering animals.

- Plants are valuable sources of secondary metabolites that can be used as pharmaceuticals, agrochemicals, flavors, fragrances, colours, biopesticides and food additives.
- They are not involved in primary cell events essential for survival, but are the means by which plant cells adapt to their ~~surviv~~ environment.
- Plants responds to the attack of pathogens, wounds, insects and herbivores or to other biotic stresses such as malnutrition and abiotic stresses such as low temperature, by activating an array of defense mechanisms including induction of biosynthesis of secondary metabolites.

- It is very difficult to obtain a uniform distribution of secondary metabolites in vivo by classical agriculture.
- In vitro cultivation of plant cells in a bioreactor which offers a controlled supply of secondary metabolites with consistent quality and yield independent of the external factors is an industeral alternative.

types of secondary metabolites :

- Plant metabolites can be antibiotic, antifungal and antiviral agents that protect the plants from pathogens, and are called phytoalexins.

- Alleopaths are anti-germinative or toxic for other plants.
- Secondary metabolites are classified according to their biosynthetic pathways and can be studied under five major groups as : polyketides, isoprenoids, alkaloids, phenylpropanoids and flavonoids.

- Secondary metabolite biosynthesis in plant cells under stress can be induced by elicitors or precursors and/or by application of both.
- Precursors are chemical stress factors that are key substrates, intermediate products or enzymes of secondary metabolite biosynthesis pathways. However, they can have toxic or inhibitory effects on the plant cells if not used at the right stage and/or concentration.

Page No.

Date / /

Government Science college Gadchiroli

DEPARTMENT OF BOTANY

"Internal assignment submission and seminars" "Anther culture"

submitted by,

Name : Tabish M. Pathan

Class : Bsc III yrs, sem - VI

session : winters / summers - 2024 - ~~2025~~

submitted to,

Teachers incharge

1. Plant Biotech - I ~~Signature~~ 06/02/2025

2. Plant Biotech - II 20/2/24

Seminars - Anthers culture

20/2/24

Dr. P.S. Jakhi
Head Department
of Botany

Shrikrupa

Page No.
Date / /

Paper-I

Page No.

Plant Biotechnology-I

Date / /

Q.1 Embryogenesis (somatic and zygotic)

An embryo is defined as a plant in its initial stage of development. Each embryo posseses two distinct poles, one to form root and the other shoot, and is the product of fusion of gametes. In some plant species, embryo are produced without the fusion of gametes and termed as asexual embryogenesis or adventitious embryoony.

In an intact plants this type of embryogenesis may occur in sporophytic tissues like integuments nucellar tissues or from unfertilized gametic cells. Apart from the normal cases of embryo formations such as: zygotic embryogenesis and adventitious embryony, instances of embryo formations from the tissues culture in vitro were reported. This phenomenon termed as somatic embryogenesis was first observed by Steward and his co-workers (1958) in suspension cultures of carrot followed by Reinert (1959). since then a number of reports of embryo formation have been published.

Shrikrupa

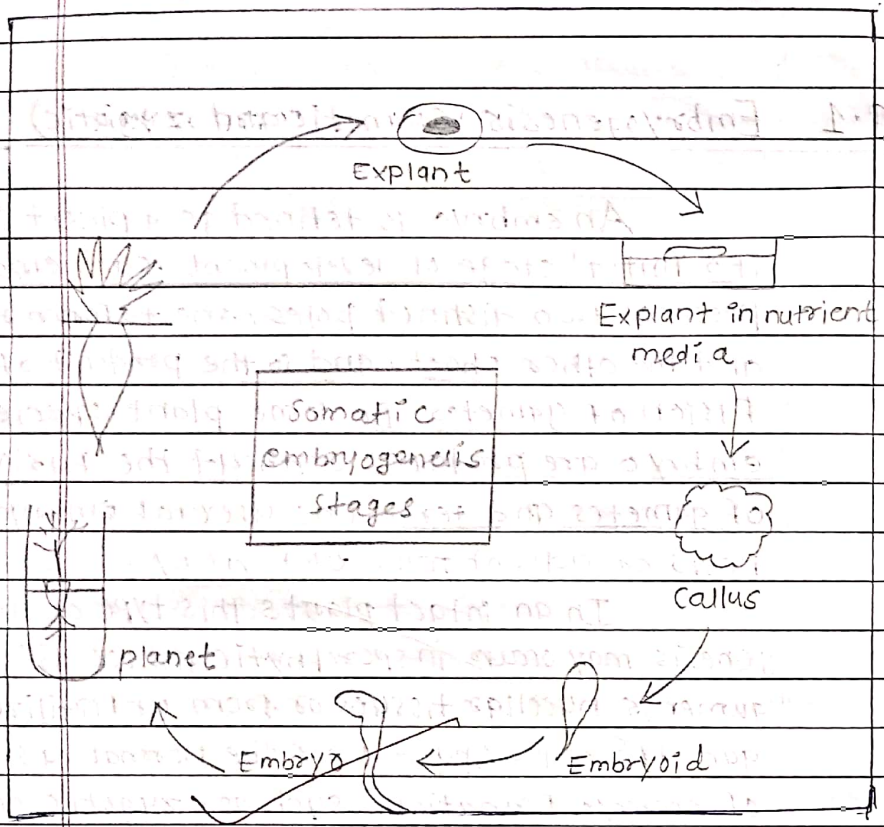


Fig. Somatic embryogenesis stages

Somatic embryogenesis in vitro produces embryo like structures resembling the zygotic embryos in structure and morphogenetic potential. Despite this resemblance, the origination and development of an embryo like struc from somatic cell differs from that of zygotic embryo, where the origin is from a single cell

Embryoid is generally used to denote the embryo like structures from cultured tissues.

Q.2 Major types of tissue culture media (MS, B5, N6)

1. Murashige and skoog medium (MS)

Murashige and skoog (MS) originally formulated a medium in 1962, to induce organogenesis, and systems. Murashige & skoog medium (MS) is used for micropropagation organ culture, callus culture and cell suspension culture. Murashige and skoog medium (MS) is established by Murashige and skoog (1962) for in vitro callus culture and Nicotiana tobacum (family – solanaceae). Murashige and skoog Medium (MS) provides all essential Macroelements and vitamins for the growth of plant cell, tissue and organ culture in vitro. Medium with high concentration of salts is used for cultivating plant cell, tissue and organ culture.

2. B5 medium

The B5 medium Developed by O.L Gamborg in 1968, was originally designed for cell suspension and callus cultures of Glycine-max. At present with certain modifications

Page No.
Date / /

Despite being the first to develope golden rice in century, in 2017 a group of indian researchers reported that genes needed to produce Golden Rice have uninucleated effects when they inserted the engineered DNA in the high yelding and agronomically superior Indian rice variety Soarma, it became pale and stunted the yeilds were so reduced that it was unsuitable for cultivation. There hasnot been much progress since for duelopment of golden rice in india.

Shrikrupa

Page No.
Date / /

Seminar

* **Anther culture**

Anther culture means plant regeneration from the haploid microspore cells with the aim of haploid and dippid plant.

Anther culture was first reported in the 1970s through in methods by guha and maheshwaraj. from the plant datura.

Anther culture is a technique by which the technique delveloping anthers at a precise and critical stage are excised aseptically from unopened flowers bud and are cultured in a nutrient medium where the microspores with cultured anthers develop into callus tissue or embryoids that give rise to haploid plantlets either through organogenesis or embryogenesis.

• **pollen culture**

pollen or microspore culture is an in vitro techniques by which the pollen grains prefably at the uninucleated stage, are squeezed out aseptically from the intact anthers and then cultured on nutrient medium the microspores develop into embryoids or callus tissue that gives to rise plantlets by embryogenesis or organogenesis.

Shrikrupa

Page No.
Date / /

- **Anthers culture**

The selected flowers buds of young plants are surface sterilized and anthers removed along with their filaments. The anthers are excised under aseptic conditions are crushed in 1% aceto carmine to test the stage of pollen development.

If they are at the correct stage, each anthers is gently seperated (from the filament) and the intact anthers are inoculated on a nutrient medium. Injured anthers should not be used in cultures as they results in callusing of anther wall tissue.

The anthers cultures are maintained in alternating period of light (12-18) and darkness (6-12 hrs.) at 28 °C. As the anthers proliferate, they produce calli which later forms an embryo and then a haploid plant.

* **Androgenesis :**

Anther/pollen culture is referred androgenesis (the male gametophyte microspore or immature pollen produces haploid plant. The cultured microspores mainly follow four distinct pathways during initial stages of in vitro androgenesis.

Page No.
Date / /

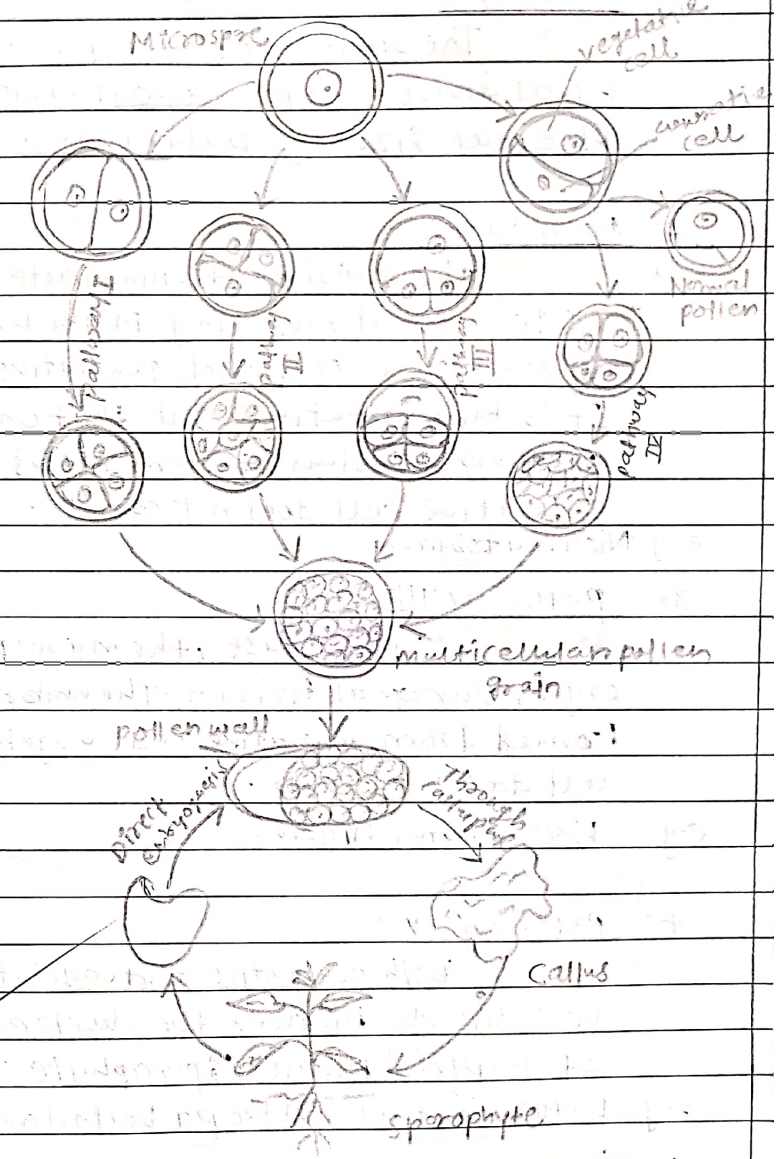


Fig. Diagram showing the origin of sporophytes from pollen grains in anther culture.

Page No.
Date / /

1. Pathway I:
The uninucleate microspore undergoes equal division to form two daughters cells of equal size e.g. Daturainoxia.

2. Pathway II:
The division of uninucleate microspores is unusual, resulting in the formation of vegetative cell and generative cell. It is the vegetative cell that undergoes further divisions to form callus or embyo generative cell does not divide.
e.g. Nicotina tobaccum

3. Pathway III:
In this case, the microspore undergoes unequal division. the embryos are formed from generative cell. vegetative cell does not divide.
e.g. Hyoscyamus nigero.

4. Pathway IV:
Both generative and vegetative cell divide further the development of haploid plant / sporophyte.
e.g. Datura metal, Atropa belladona.

At the initial stages, the microspore may follow any one of the fours pathways described above. As the cell divide the pollen grain becomes multicellular and burst open. this multicellular mass may form a callus which later differentiates into a plant (through callus phase). Alternately the multicellular mass may produce the plant through direct embryogenesis.

* Advantages of Anthers culture

- simple technique
- Less time consuming
- A high frequency of haploid plants, which is easily identified by their smaller sterile flowers.
- Easy to induce cell division in most species.
- No requirement for very high level of expertise.

20/11/19