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.

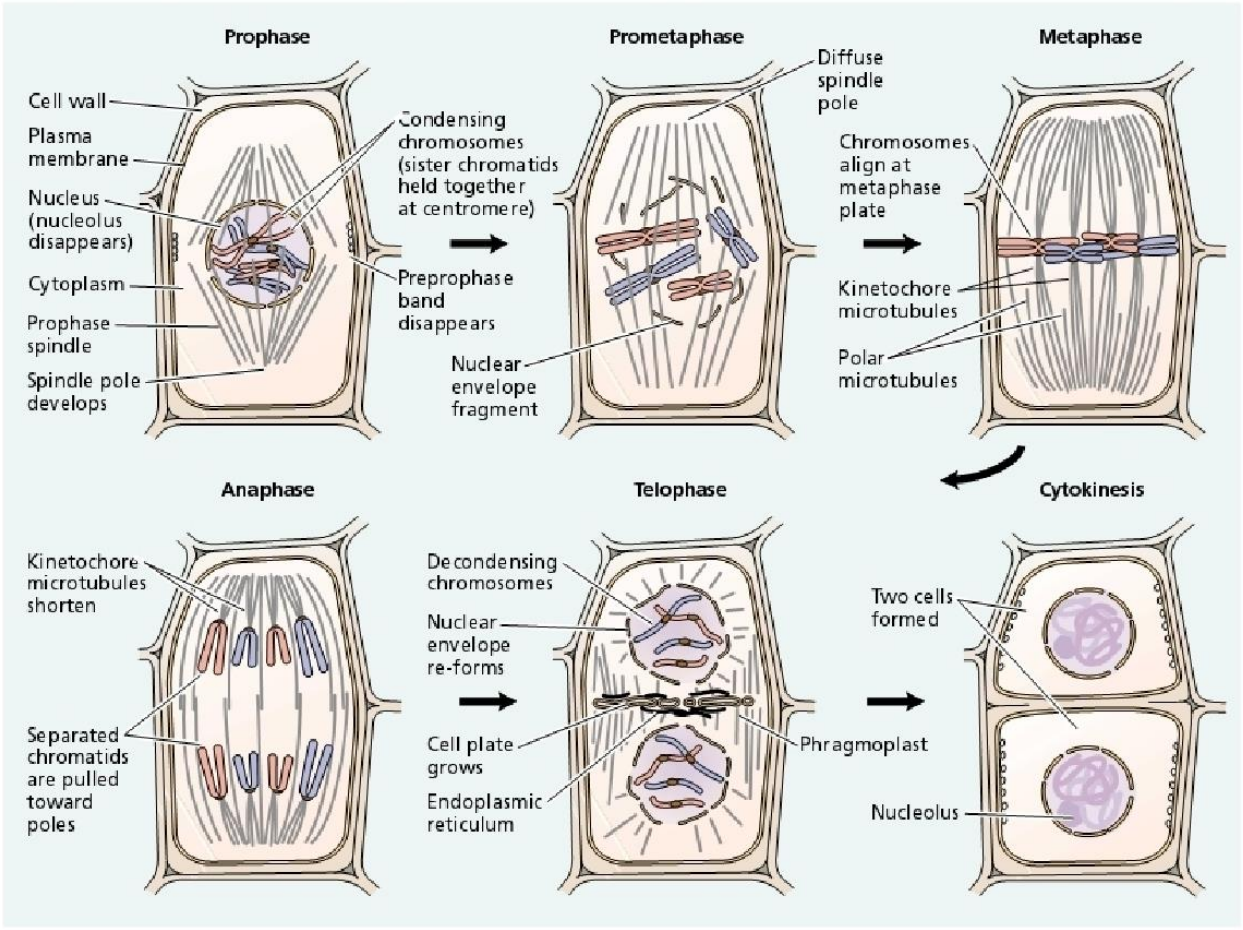
His/Her Valuable Participation in the Competition hereby Acknowledged.

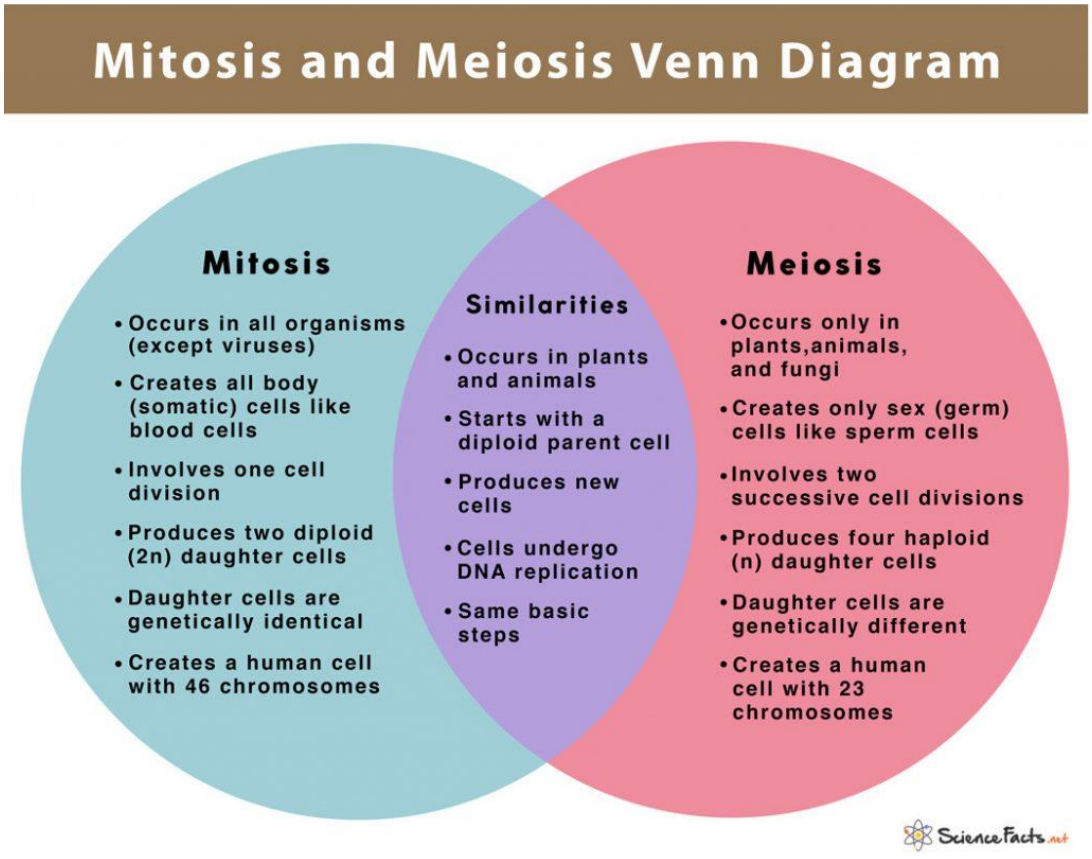
**CONGRATULATIONS**

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

## OEE Result for Academic Year 2024-2025

**This is not the Merit List; it is only the result of the OEE 2024.**

*** Serach Options:**

| Program Name Wise | User Name Wise | Application ID Wise |
|---|---|---|
| ○ | ◉ | ○ |

*** Enter User Name / Email ID:**

AKANKSHAPATLE74@GMAIL.COM

## Result

| egory | Domicile | University | Divyanag | Total Marks |
|---|---|---|---|---|
| C | Maharashtra | Other University | No | 19.25 |

For Technical queries mail us from your registered e-Mail address at - **CSPSupport@pun.unipune.ac.in** OR call us at **020-71533899**

| | |
|---|---|
| Applicant Name | Akanksha Jitendra Patle |
| Status | You have not submitted a valid Category Certificate. Until you upload a valid Category Certificate, you will be considered under GENERAL Category. The last date for submission of the Category Certificate is 31st March 2024. |

| Test Paper(s) | Marks Scored out of 100 |
|---|---|
| Biotechnology (BT) | **28.33** |

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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

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Paper-I

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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

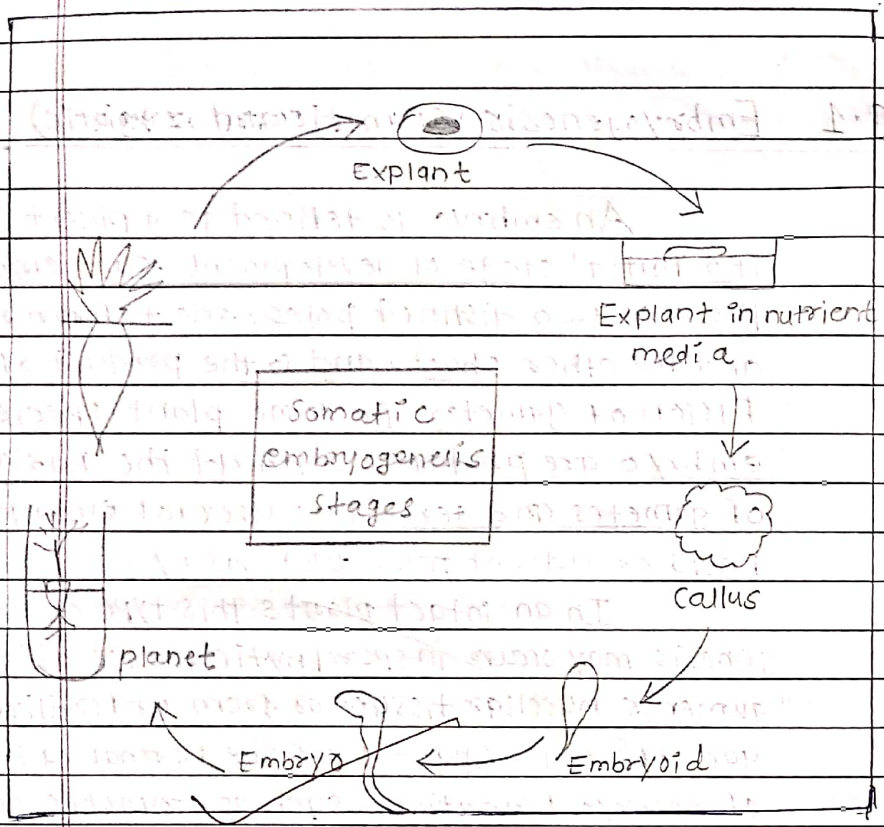


Fig. Somatic embryogenesis stages

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

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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.

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# 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.

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- **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.



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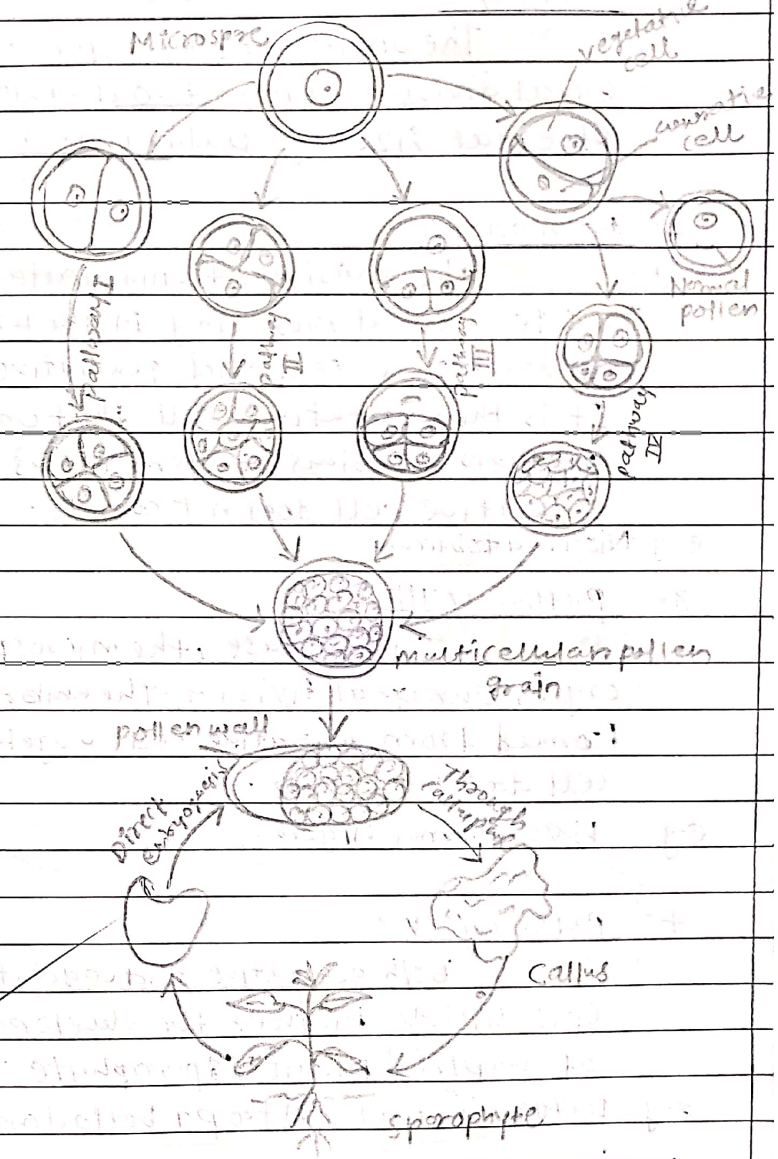


Fig. Diagram showing the origin of sporophytes from pollen grains in anther culture.

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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