

**Proceedings of the Commissioner of Collegiate Education::AP:Mangalagiri**  
**Present: Dr. Pola Bhaskar IAS**

**Rc.No:1/Single Major/TOT/CCE/OSD-1/AC-04/2024**

**Date:28.02.2024**

**Sub:** Collegiate Education- Single Major Subject UG Pattern - Botany & Microbiology Subjects - Training of Trainers (TOT) 05 days Non-residential Training Programme at Nodal Resource Centers(NRCs) across the state - Scheduled from 29.02.2024 to 05.03.2024 - Communication of List of Participants and Instructions - Reg..

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According to the National Educational Policy - 2020; Single Major Subject Pattern is introduced in all the Under Graduate Colleges of the Andhra Pradesh for Holistic and Multi-disciplinary learning in the Higher Education. For empowering the faculty, the UGC has launched Madan Mohan Malaviya Mission Teacher Training Programmes with an aim of improving the quality of education at all levels by infusing quality and excellence in the teachers and their teaching. In this connection the Commissionerate of Collegiate Education (CCE) has approached the HRDC/MMTC, University of Hyderabad(UOH), Hyderabad for this training and identified 20 Faculty of Botany & 11 Faculty of Microbiology across the state have been trained as Key Resource Persons from 19.01.2024 to 31.01.2024.

In continuation to this Five Day Non-residential Training of Trainers (TOT) Programme was initiated at NRCs to all the Regular, Contract and Guest Botany & Microbiology Faculty working in the GDCs on the curriculum of Single Major Subject - Botany & Microbiology streams. This training programme was scheduled from 29.02.2024 to 05.03.2024.

In view of the above the Principals of the respective Government Degree Colleges are requested to relieve the concerned lecturers as per the Annexures (I & II) to enable him/her to attend the TOT programme with an instruction to report at the venue by 09.00 AM on 29.02.2024. As the training programme is mandatory , no exemptions will be entertained. If any Botany or Microbiology faculty ( Regular / Contract / PTL/ Guest ) name is missed in the list, the Principals concerned has to relieve such candidate, with an instruction to attend programme, with prior intimation to the respective NRC Principal. Principals of all GDCs are requested to ensure that all the Botany & Microbiology faculty( Regular, Contract, PTL & Guest ) should complete the training on Single Major Subject - Botany &

Microbiology Streams and if any faculty missed out the TOT it will be viewed seriously. It is further informed to contribute Rs.1000/- per participant, which can be met from the internal funds of the respective college, to the respective NRC for food and other training arrangements. Master Trainers are permitted to claim TA from the internal resources of their respective colleges subject to the availability of funds.

**Sd/- Dr. Pola Bhaskar I.A.S**

**Commissioner of Collegiate Education**

**To**

The Principals of All GDCs

Copy to RJDCEs of Zone - I, II, III & IV

**Enclosures :**

Annexure I : List of TOT Venues NRC wise

Annexure II : List of Botany Key Resource Persons mapped to NRC wise

Annexure III : List of college wise Botany Faculty( Regular, Contract & Guest)  
attending the TOT

Annexure IV : Instructions to the Faculty attending the TOT

Annexure V :Time Table of the Five Day TOT of Botany Faculty

**// ATTESTED //**



**Officer on Special Duty**

**O/o Commissioner of Collegiate Education**

**Annexure - I**  
**Commissionerate of Collegiate Education::AP:Mangalagiri**  
**Five Days Training of Trainers(TOT) Single Major Subject UG Pattern - Botany &**  
**Microbiology Subjects from 29.02.2024 to 05.03.2024**  
**List of TOT Venues NRC Wise**

| S. No. | Name of the Venue              | Name of the NRC mapped         | Number of Botany & Microbiology Faculty | NRC Wise Total |
|--------|--------------------------------|--------------------------------|-----------------------------------------|----------------|
| 1      | GDC (M), Srikakulam            | GDC (M), Srikakulam            | 10                                      | 18             |
|        |                                | GDC(W) Srikakulam              | 8                                       |                |
| 2      | GDC (Dr.VSK)(A), Visakhapatnam | GDC, Cheepurupalli             | 8                                       | 28             |
|        |                                | GDC (Dr.VSK)(A), Visakhapatnam | 11                                      |                |
|        |                                | GDC (W) Visakhapatnam          | 9                                       |                |
| 3      | GDC (PR)(A), Kakinada          | GDC (PR)(A), Kakinada          | 18                                      | 41             |
|        |                                | GDC (A), Rajamahendravaram     | 23                                      |                |
| 4      | GDC, Tanuku                    | GDC, Tanuku                    | 13                                      | 18             |
|        |                                | GDC, Tadepalligudem            | 5                                       |                |
| 5      | GDC (SRR&CVR)(A), Vijayawada   | GDC (SRR&CVR)(A), Vijayawada   | 10                                      | 22             |
|        |                                | GDC (W)(A), Guntur             | 12                                      |                |
| 6      | GDC (DK)(W)(A), Nellore        | GDC(W), Ongole                 | 6                                       | 18             |
|        |                                | GDC (DK)(W)(A), Nellore        | 12                                      |                |
| 7      | GDC (PVKN)(A), Chittoor        | GDC, Nagari                    | 8                                       | 26             |
|        |                                | GDC (PVKN)(A), Chittoor        | 13                                      |                |
|        |                                | GDC, Pileru                    | 5                                       |                |
| 8      | GDC (M)(A), Kadapa             | GDC (M)(A), Kadapa             | 13                                      | 29             |
|        |                                | GDC(W) (A), Kadapa             | 7                                       |                |
|        |                                | GDC, Nandyal                   | 9                                       |                |
| 9      | GDC (M)(A), Ananthapuramu      | GDC, Guntakal                  | 11                                      | 30             |
|        |                                | GDC (M)(A), Ananthapuramu      | 19                                      |                |

**Sd/- Dr. Pola Bhaskar I.A.S**

**Commissioner of Collegiate Education**

// ATTESTED //



**Officer on Special Duty**

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**Annexure -II**

**Commissionerate of Collegiate Education::AP:Mangalagiri**  
**Five Days Training of Trainers(TOT) Single Major Subject UG Pattern - Botany &**  
**Microbiology Subjects from 29.02.2024 to 05.03.2024**  
**List of Key Resource Persons(KRPs)**

| S.No                    | TOT Venue                                                                                                 | College Name of the KRP      | Name of the KRP           | Mobile Number of the KRP | Email ID of the KRP        |
|-------------------------|-----------------------------------------------------------------------------------------------------------|------------------------------|---------------------------|--------------------------|----------------------------|
| <b>Botany KRPs List</b> |                                                                                                           |                              |                           |                          |                            |
| 1                       | GDC (M), Srikakulam                                                                                       | GDC W (A) Srikakulam         | Rudrama Ranisadu          | 9492764034               | srrani800@gmail.com        |
| 2                       | GDC (M), Srikakulam                                                                                       | GDC Seethampeta              | Dr.U.Phani Kumari         | 9912064437               | phaninammi@gmail.com       |
| 3                       | GDC (Dr.VSK)(A), Visakhapatnam                                                                            | GDC Vizianagaram             | DR.D.Appa Rao             | 9440447676               | apparaodanga@gmail.com     |
| 4                       | GDC (Dr.VSK)(A), Visakhapatnam                                                                            | Dr. VSKGDC(A), Visakhapatnam | Smt.G.R.N.S.Sujatha       | 8897047672               | sujathagaganam@gmail.com   |
| 5                       | GDC (Dr.VSK)(A), Visakhapatnam                                                                            | GDC Paderu                   | Dr.S.Chandra Kala         | 8341252126               | kalapaderu@gmail.com       |
| 6                       | GDC (PR)(A), Kakinada                                                                                     | GDC(W)(A),Kakinada           | Sulakshana Maddala        | 7997633870               | sulakshanabotany@gmail.com |
| 7                       | GDC (PR)(A), Kakinada                                                                                     | GDC(A), Rajamahendravaram    | Dr A Srinivasa Rao        | 9985076306               | drasrbotany@gcrjy.ac.in    |
| 8                       | GDC (PR)(A), Kakinada ( 29.02.2024 to 02.03.2024) & SRR & CVR GDC, Vijayawada (04.03.2024 to 05.03.2024 ) | GDC(A), Rajamahendravaram    | Sri K.Gani Raju           |                          | ganirajukota83@gcrjy.ac.in |
| 9                       | GDC, Tanuku                                                                                               | SCIM GDC, Tanuku             | Chamundeswari Devi Palaka | 9391627315               | chamudevi120@gmail.com     |
| 10                      | GDC, Tanuku                                                                                               | GDC Ganapavaram              | Dr Ch Chaitanya           | 9573602152               | chaitanya06hcu@gmail.com   |
| 11                      | SRR & CVR GDC, Vijayawada                                                                                 | GDC Darsi                    | Dr.N.V.Ramana             | 7382244344               | nvrbotany@gmail.com        |
| 12                      | GDC (DK)(W)(A), Nellore                                                                                   | GDC,Addanki                  | Sri D.Rajasekhar          | 9704261926               | dega.rajasekhar@gmail.com  |
| 13                      | GDC (DK)(W)(A), Nellore                                                                                   | GDC Venkatagiri              | Y.Manjunatha Reddy        | 7780351012               | yarramreddy88@gmail.com    |
| 14                      | PVKN GDC, Chittoor                                                                                        | GDC , Puttur                 | Dr.P.Sujana               | 8333824096               | sujanapapani@gmail.com     |
| 15                      | PVKN GDC, Chittoor                                                                                        | GDC,Nagari                   | Dr.A.Indira Priyadarsini  | 9949027095               | darshinibharath@gmail.com  |

|    |                             |                           |                               |                |                              |
|----|-----------------------------|---------------------------|-------------------------------|----------------|------------------------------|
| 16 | PVKN GDC, Chittoor          | BT GDC,<br>Madanapalle    | Dr. C. S. Sailaja             | 9676269<br>010 | sailajarajaram2009@gmail.com |
| 17 | GDC (M)(A), Kadapa          | GDC, Mydukur              | Dr P Venkata<br>Krishna Reddy | 9493369<br>454 | pattikrishnareddy@gmail.com  |
| 18 | GDC (M)(A),<br>Anantapuramu | GDC<br>Uravakonda         | K Y Narayana                  | 9885053<br>326 | narayanaspeaking@gmail.com   |
| 19 | GDC (M)(A),<br>Anantapuramu | GDC (A),<br>Ananthapuramu | Dr. E. Sreedevi               | 9441165<br>268 | bot.sreedevi@gmail.com       |

**Microbiology KRPs List**

|    |                                   |                                      |                                  |                |                             |
|----|-----------------------------------|--------------------------------------|----------------------------------|----------------|-----------------------------|
| 1  | GDC (Dr.VSK)(A),<br>Visakhapatnam | GDC<br>(Dr.VSK)(A),<br>Visakhapatnam | Dr. K. Prakash<br>Narayana Reddy | 948235<br>7349 | prakashreddy.369@gmail.com  |
| 2  | GDC (Dr.VSK)(A),<br>Visakhapatnam | GDC W<br>Visakhapatnam               | Smt A. Jyothi                    | 817939<br>3442 | jyothi87.ou@gmail.com       |
| 3  | GDC (PR)(A),<br>Kakinada          | GDC(A),<br>Rajahmundry               | Dr.T.Sujatha                     | 944039<br>2455 | sujatha.taidala@gmail       |
| 4  | SRR & CVR GDC,<br>Vijayawada      | GDC W Guntur                         | P.Aruna                          | 929855<br>8440 | patchalaaruna@gmail.com     |
| 5  | GDC DKW Nellore                   | GDC DKW<br>Nellore                   | Smt. E. Kanya<br>Kumari          | 970469<br>1625 | kumarietta35@gmail.com      |
| 6  | GDC DKW Nellore                   | GDC, Naidupet                        | Dr. Md.<br>Maqsood Ahmed         | 984953<br>0338 | mdmaqsood.micro@gmail.com   |
| 7  | GDC PVKN<br>Chittoor              | GDC(W),Chittoor                      | Dr.K.Ushasri                     | 852090<br>6318 | uva1368@gmail.com           |
| 8  | PVKN. GC(A),<br>Chittoor          | PVKN. GC(A),<br>Chittoor             | Sri G. Prasad                    | 944164<br>3317 | geddam_prasad1@yahoo.com    |
| 9  | GDC M Kadapa                      | GDC W Kadapa                         | Dr.B.Priya<br>Darsini            | 984977<br>4906 | priyadarshinibada@gmail.com |
| 10 | GDC (A),<br>Anantapuramu          | GDC (A),<br>Anantapuramu             | Dr. H.Pallavi                    | 949123<br>3355 | pallavi.pavan2003@gmail.com |

**Sd/- Dr. Pola Bhaskar I.A.S**

**Commissioner of Collegiate Education**

**// ATTESTED //**



**Officer on Special Duty**

**O/o Commissioner of Collegiate Education**

**Annexure - III**  
**Commissionerate of Collegiate Education::AP:Mangalagiri**  
**Five Days Training of Trainers(TOT) Single Major Subject UG Pattern -**  
**Botany & Microbiology Subjects from 29.02.2024 to 05.03.2024**  
**List of Participants**

| S.No               | Name of the College | Name of the Faculty       | Type of Faculty | Mobile No. | Email ID                             |
|--------------------|---------------------|---------------------------|-----------------|------------|--------------------------------------|
| <b>Botany List</b> |                     |                           |                 |            |                                      |
| 1                  | GDCW(A)SRIKA KULAM  | CH SUNEETHA               | Contract        |            | sunitachapa@gmail.com                |
| 2                  | GDCW(A)SRIKA KULAM  | A VYSHNAVI                | Guest           |            | anyapuvyshnavi@gmail.com             |
| 3                  | GDC, Ponduru        | M SRILATHA                | GUEST           |            | modalavalasasrilatha2@gmail.com      |
| 4                  | GDC, Thogaram       | Dr. P. RAMARAO            | REGULAR         |            | paidiramaraao27@gmail.com            |
| 5                  | GDC Rajam           | Dr.S.Radha                | Regular         |            | drsrbotanymrc                        |
| 6                  | GDC Palakonda       | Sri. V. Janardhana rao    | Contract        |            | janardhanavrao@gmail.com             |
| 7                  | GDC Palakonda       | Sri, P. Upendra Rao       | GUEST           |            | saiupendra7@gmail.com                |
| 8                  | GDC,TEKKALI         | D.Vasu Babu               | Regular         |            | vasubabu148@gmail.com                |
| 9                  | GDC,TEKKALI         | L.Dilleswararao           | Guest           | 7075407732 | dilleswararao252@gmail.com           |
| 10                 | GDC BARUVA          | P.Snehalatha              | Contract        | 7093313310 |                                      |
| 11                 | GDC (M), Srikakulam | Sri.D.Ravindra            | Regular         | 9949000000 | dasariraveendra123@gmail.com         |
| 12                 | GDC (M), Srikakulam | Dr.R.Prameela             | Regular         |            | prameelachris@yahoo.com              |
| 13                 | GDC (M), Srikakulam | Sri G Rama Krishna        | Contract        |            | ramakrishnarao.gunapu@gmail.com      |
| 14                 | GDC Ichapuram       | T.Brundavanam             | Guest           |            | brundavan333@gmail.com               |
| 15                 | GDC Narasannapeta   | Sri.S.Parameswara Rao     | Contract        |            | sahukaru.p.yashhanth@gmail.com       |
| 16                 | GDC, Pathapatnam    | G.Venkata Rao             | Contract        |            | gavaravenkatarao@gmail.com           |
| 17                 | GDC Veeraghattam    | SRI A HANUMAN PRASADA RAO | Regular         |            | prasad.hdp123@gmail.com              |
| 18                 | GDC Parvathipuram   | Sri B. Malleswararao      | PTL             | 9966757914 | balagamalleswararao@gmail.com        |
| 19                 | GDC Salur           | Sri.N. Umamaheshwarrao    |                 | 9491571370 | nemalipuri.umamaheshwarrao@gmail.com |
| 20                 | GDC Salur           | M.Yasodha                 | Guest           | 9515895138 | yasodhamentada@gmail.com             |

|    |                               |                          |                  |            |                                    |
|----|-------------------------------|--------------------------|------------------|------------|------------------------------------|
| 21 | GDC,<br>Gummalakshmipur<br>am | Sri.T.Satya Rao          | Guest            | 9494205213 | satyarao.toyaka@gmail.com          |
| 22 | GDC<br>Cheepurupalli          | Dr.Y. Vijaya Bharathi    | Regular          |            | bharathi@gmail.com                 |
| 23 | GDC<br>Vizianagaram           | DR.P.SREEVANI            | REGUL<br>AR      |            | sravani6@gmail.com                 |
| 24 | GDC,<br>Gajapathinagaram      | Dr. D. S. Madhavarao     | REGUL<br>AR      |            | dsmadhavarao456@gmail.c<br>om      |
| 25 | Dr.VSKGDC(A),<br>VSP          | Dr.B.Chandra Mouli       | Regular          | 9491931211 | drbcm1975@gmail.com                |
| 26 | Dr.VSKGDC(A),<br>VSP          | Dr.A.H.D.Pushpalatha     | Regular          | 9494781393 | lathahani2004@gmail.com            |
| 27 | Dr.VSKGDC(A),<br>VSP          | Sri.P.Swamynaidu         | Regular          | 8332980221 | swamynaidup@gmail.com              |
| 28 | Dr.VSKGDC(A),<br>VSP          | Dr.V.Padmaja             | Regular          | 8374373879 | vayapadmajaphd@gmail.co<br>m       |
| 29 | Dr.VSKGDC(A),<br>VSP          | Dr. S.Padmavathi         | Regular          | 8106543229 | apb1904@gmail.com                  |
| 30 | GDC<br>Bheemunipatnam         | Sri.S.Srinu              | Contract         | 8074716897 | suragalisrinu@gmail.com            |
| 31 | GDC, Araku<br>Valley          | Sri B. Latchanna         | Guest            | 9491626648 | boyilatchanna055@gmail.c<br>om     |
| 32 | GDC Chodavaram                | G.Narayanamurthy         | Regular          | 8247470250 | murthy4532@gmail.com               |
| 33 | GDC Chodavaram                | U.Thata Rao              | Guest            | 7569317250 | undathatarao@gmail.com             |
| 34 | GDC,Sabbavaram                | Dr.T.M.A.NIVEDITH<br>A   | Regular          | 7893486868 | nivedithachiru@gmail.com           |
| 35 | GDC W<br>Visakhapatnam        | Dr J Lavanya             | Regular          | 9381887362 | jakkapulavanya1983@gmail<br>.com   |
| 36 | GDC V.Madugula                | Smt,G.Jaya Lakshmi       | Regular          | 9951676581 | gompajayalakshmi1969@g<br>mail.com |
| 37 | GDC<br>Yellamanchili          | Kum.V.Tejaswini          | Guest<br>Faculty | 6281398572 | tejaswinivasadi123@gmail.<br>com   |
| 38 | GDC<br>Yellamanchili          | Dr.K. V.Lakshmi          | Regular          | 9491979436 | vijayakidambi14@gmail.co<br>m      |
| 39 | GDC<br>NAKKAPALLI             | B.Suribabu               | Contract         |            |                                    |
| 40 | GDC Narsipatnam               | Sri Ch. Akhilraja        | Guest            | 9391674704 | chakhilraja1234@gmail.co<br>m      |
| 41 | GDC,Chintapalli               | K.Purna rao              | Guest            | 9490818622 | puri2454@gmail.com                 |
| 42 | GDC Marripalem                | Smt.B.Kumari             | Regular          | 9441841122 | bojjakumari0099@gmail.co<br>m      |
| 43 | GDC PR Kakinada               | Dr.John Samuel           | Regular          | 7382525604 | drjohnsamuel@yahoo.com             |
| 44 | GDC PR Kakinada               | Capt.Dr.M.Krishna<br>Rao | Regular          | 9440134559 | mortha9@gmail.com                  |

|    |                      |                          |          |            |                                   |
|----|----------------------|--------------------------|----------|------------|-----------------------------------|
| 45 | GDC PR Kakinada      | BANDE ASHOK<br>RAMA RAJU | Guest    | 7093492122 | ashok@prgc.edu.in                 |
| 46 | GDC PR Kakinada      | N Deepika                | Guest    | 9885963744 | deepikaneela999@gmail.com         |
| 47 | GDC PR Kakinada      | B.Bhanu Teja             | Guest    | 8978756718 | bhanutejaborapureddi@gmail.com    |
| 48 | GDC PR Kakinada      | PENDURTHI<br>RAJESH      | Geust    | 9550808269 | rajesush235@gmail.com             |
| 49 | GDC PR Kakinada      | M.V.V.S.GANGA<br>BHAVANI | Guest    | 9000655127 | mvvsghbhavani@prgc.edu.in         |
| 50 | GDC PR Kakinada      | M.sesha siva parvathi    | Guest    | 9550570600 | mancheelaparu31@gmail.com         |
| 51 | GDC(W)(A),Kakinada   | KOTIPAMU<br>NVSNESWARI   | Regular  | 9948899093 | knvsneswari.3@gmail.com           |
| 52 | GDC Tuni             | KVGK.Varaprasad          | Regular  | 9908876727 | jkcrjyec.tuni@gmail.com           |
| 53 | GDC Yeleswaram       | Dr.D.Prayaga Murty       | Regular  | 9885852068 | pragada007@gmail.com              |
| 54 | GDC Pithapuram       | K. Usha Sri              | Regular  | 9441158594 | myduushasri@gmail.com             |
| 55 | GDC Perumallapuram   | Sri.P.Janaki Rao         | Regular  | 9490649732 | janakiraopujari57@gmail.com       |
| 56 | GDC Ramachandrapuram | PALAPARTHYSARA           | Regular  | 7386379223 | sharagiridhar@gmail.com           |
| 57 | GDC Ramachandrapuram | V.MEENAKUMARI            | Guest    | 7382454131 | meenakumarvarasala27576@gmail.com |
| 58 | GDC Mummidivaram     | Smt. P.Durga Devi        | Guest    | 9000057618 | srisiva57618@gmail.com            |
| 59 | GDC Jaggampeta       | Y.Naveena                | GUEST    | 9493748588 | pentakotanaveena23@gmail.com      |
| 60 | GDC Chinturu         | Dr.Y Padma               | Regular  | 8074891814 | paddubot09@gmail.com              |
| 61 | GDC Chinturu         | P Alivelu                | Guest    | 9676084977 | perumallapalli1990@gmail.com      |
| 62 | GDC Rampachodavaram  | G.sravani                | Guest    | 7893146301 | gollasravani6301@gmail.com        |
| 63 | GDC Mandapeta        | Sri Ch. Abinay           | Guest    | 9908606240 | Chabhi456@gmail.com               |
| 64 | GDC(A), Rajahmundry  | Dr. K.Nagaendra Prasad   | Regular  | 8143288215 | nagandrabotany@gmail.com          |
| 65 | GDC(A), Rajahmundry  | Smt.M.V.V.Satyaveni      | Regular  | 9493990914 | satyavenisk@gmail.com             |
| 66 | GDC(A), Rajahmundry  | Sri.N.Nageswara Rao      | Regular  | 6305268681 | nnrbotany1971@gcrjy.ac.in         |
| 67 | GDC(A), Rajahmundry  | B.Bujji Babu             | Contract | 9948807896 | bujjibabu@gcrjy.ac.in             |
| 68 | GDC(A), Rajahmundry  | Dr.R.Venkatesh           | Contract | 8309690036 | venkateshrampilla70@gmail.com     |



|    |                                |                        |              |                               |                                |
|----|--------------------------------|------------------------|--------------|-------------------------------|--------------------------------|
| 69 | GDC(A),<br>Rajahmundry         | Yedida Baby            | Guest        | 9154009896                    | babyyedida@gcrjy.ac.in         |
| 70 | GDC(A),<br>Rajahmundry         | P. Satish Babu         | Guest        | 9912929349                    | satishbabu@gcrjy.ac.in         |
| 71 | GDC(A),<br>Rajahmundry         | G N V SWARUPA<br>RANI  | Guest        | 9441880399                    | swaruparani@gcrjy.ac.in        |
| 72 | GDC(A),<br>Rajahmundry         | B VIJAY KUMAR          | Guest        | 9291491851                    | vijaykumarb@gcrjy.ac.in        |
| 73 | GDC(A),<br>Rajahmundry         | G Vivekananda<br>swamy | Guest        | 9347626668                    | gandham.vivekbab@gcry.ac.in    |
| 74 | GDC(A),<br>Rajahmundry         | K.SAIRAM               | Guest        | 6302586694                    | sairam@gcrjy.ac.in             |
| 75 | SKVT GDC,<br>Rajamahendravaram | Kum M.Sabitha          | Part Time    | 9701422675                    | Msabitha1982@gmail.com         |
| 76 | SKR GDC (W),<br>Rajahmundry    | Smt.M.Sree Devi        | PART<br>TIME | 9640021718                    | msdbotany@gmail.com            |
| 77 | SKR GDC (W),<br>Rajahmundry    | Kum.P.Sri Devi         | PART<br>TIME | 9949200533                    | psridevijuly3@gmail.com        |
| 78 | SKR GDC (W),<br>Rajahmundry    | Kum.T.Naga Muni        | PART<br>TIME | 9346507004                    | tnagamuni.2014@gmail.com       |
| 79 | GDC Kovvur                     | Dr.M.Bhupathi Rayulu   | Regular      | 9491792080<br>-<br>9705377344 | bhupathirayulu@gmail.com       |
| 80 | GDC Kovvur                     | Kum S.kavya            | Guest        | 7989201001                    | savanakavya@gmail.com          |
| 81 | GDC Ravulapalem                | Smt.M.Hemalatha        | Contract     | 7997873131                    | krishna77reddy@gmail.com       |
| 82 | GDC, Razole                    | P Sunitha              | Contract     | 9493174355                    | sunithasirish@gmail.com        |
| 83 | GDC, Razole                    | U Sujatha              | Guest        | 8328124707                    | sujathau04@gmail.com           |
| 84 | GDC Kothapeta                  | CH.G.R.Jayasi          | Guest        |                               |                                |
| 85 | GDC Kothapeta                  | K.Sireesha             | Guest        |                               |                                |
| 86 | SVRK GDC,<br>NIDADAVOLE        | Dr PSS SRAVANTHI       | REGUL<br>AR  | 9493406174                    | pammisravanthi@gmail.com       |
| 87 | SVRK GDC,<br>NIDADAVOLE        | B RAJA RAJESWARI       | CONTR<br>ACT | 9573243410                    | eswaribotany87@gmail.com       |
| 88 | GDC W Palakol                  | V SIRISHA              | GUEST        | 9948451085                    | siri93401@gmail.com            |
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**Sd/- Dr. Pola Bhaskar I.A.S**  
**Commissioner of Collegiate Education**

**// ATTESTED //**



**Officer on Special Duty**  
**O/o Commissioner of Collegiate Education**

**Annexure - IV**

**Commissionerate of Collegiate Education::AP:Mangalagiri  
Five Days Training of Trainers(TOT) Single Major Subject UG Pattern -  
Botany & Microbiology Subjects from 29.02.2024 to 05.03.2024**

**Instructions to Participants**

1. The training programme is mandatory, no exemptions will be entertained
2. All the participants shall maintain decency and decorum throughout the training programme.
3. Participants are instructed to be present as per the scheduled time i.e. from 10.00AM to 05.30 PM
4. Leaving the Training Hall without proper reason and moving outside the Training Hall shall be avoided
5. Every participant must be present for all the sessions
6. No participant will be allowed to leave the training center without prior permission of the In-charge/ Programme Coordinator

**Sd/- Dr. Pola Bhaskar I.A.S**

**Commissioner of Collegiate Education**

**// ATTESTED //**



**Officer on Special Duty**

**O/o Commissioner of Collegiate Education**



**Annexure - V**  
**Commissionerate of Collegiate Education::AP:Mangalagiri**  
**Five Days Training of Trainers(TOT) Single Major Subject UG Pattern -**  
**Botany & Microbiology Subjects from 29.02.2024 to 05.03.2024**

**Timetable**

| <b>Date/Day</b>         | <b>10.00 AM -<br/>11.30 AM</b>                          | <b>11.45 AM -<br/>01.15 PM</b>                          | <b>02.00 PM -<br/>03.30 PM</b>                          | <b>03.45 PM -<br/>5.15 PM</b>                       |
|-------------------------|---------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------|
| Thursday<br>29-Feb-2024 | Inaugural Session                                       | Session by External<br>Resource Person<br>(Online Mode) | Session by External<br>Resource Person<br>(Online Mode) | Session by Key<br>Resource Person<br>(Offline Mode) |
| Friday<br>01-Mar-2024   | Session by External<br>Resource Person<br>(Online Mode) | Session by Key<br>Resource Person<br>(Offline Mode)     | Session by External<br>Resource Person<br>(Online Mode) | Session by Key<br>Resource Person<br>(Offline Mode) |
| Saturday<br>02-Mar-2024 | Session by External<br>Resource Person<br>(Online Mode) | Session by Key<br>Resource Person<br>(Offline Mode)     | Session by External<br>Resource Person<br>(Online Mode) | Session by Key<br>Resource Person<br>(Offline Mode) |
| Monday<br>04-Mar-2024   | Session by External<br>Resource Person<br>(Online Mode) | Session by Key<br>Resource Person<br>(Offline Mode)     | Session by External<br>Resource Person<br>(Online Mode) | Session by Key<br>Resource Person<br>(Offline Mode) |
| Tuesday<br>05-Mar-2024  | Session by External<br>Resource Person<br>(Online Mode) | Session by Key<br>Resource Person<br>(Offline Mode)     | Session by External<br>Resource Person<br>(Online Mode) | <i>Valedictory</i>                                  |

**Sd/- Dr. Pola Bhaskar I.A.S**  
**Commissioner of Collegiate Education**

**// ATTESTED //**

  
**Officer on Special Duty**

**O/o Commissioner of Collegiate Education**

## Training of Trainers (TOT) - 05 days

### Non-residential Training Programme at Nodal Resource Centres (NRCs)

Thursday, Feb 29, 2024 to March 05, 2024, 9:30 AM - Hosted by JKCMC: CCE, AP



### **Single Major subjects Botany and Microbiology**

29-02-2024 to 05-03-2024

Day-01

Date: 29-02-2024

#### Day wise Schedule

|                                     |                                                                                                             |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Session I<br>10.00 am to 11.30 am   | Inaugural Session<br><b>Hon'ble Commissionerate of Collegiate Education</b><br><b>Dr. Pola Bhaskar garu</b> |
| Session II<br>11.45 am to 01.15 pm  | DNA Replication and Repair<br><b>Prof Mrunal Bhattacharya, UOH</b>                                          |
| Session III<br>02.00 pm to 03.30 pm | Genome Editing in Crop Plants<br><b>Dr. Satendra, Scientist, IRRI</b>                                       |
| Session IV<br>3.45 am to 5.45 am    | Bio startups-BioNest and IKP<br><b>Knowledge Resource Persons of NRC</b>                                    |

### REGISTRATION OF PARTICIPANTS AT NRC TANUKU –

A total of 16 participants were allotted to NRC Tanuku for a Five-day Residential training program.

| Commissionerate of Collegiate Education, A.P.: Mangalagiri<br>Day Non-residential Training of Trainers (TOT) Programme @ NRC, TANUKU, W.G. Dist.,<br>Batch 1 |                                      |                        |                                    |                                     |                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------------------------|------------------------------------|-------------------------------------|-------------------------------|
| S.No                                                                                                                                                         | Name & Place of the GDC              | Name of the Faculty    | Registration of Faculty<br>Subject | Dated : 2024/02/29<br>Mobile Number | Signature of the participants |
| 1                                                                                                                                                            | Kothapeta V.K.V. Govt Degree College | D. Devi Simintha       | Department of Botany               | 7893484178                          | D. Sai Smita                  |
| 2                                                                                                                                                            | Sri ASNM GDC(A) Rajahmundry          | P. Srinivasa Rao       | Botany                             | 9441083387                          | P. Srinivasa Rao              |
| 3                                                                                                                                                            | Sri ASNM GDC(A) Rajahmundry          | Srinivaas V            | Botany                             | 9918451085                          | Srinivaas V                   |
| 4                                                                                                                                                            | BSVR GDC(M) Nizampet                 | Dr. P.S.S. Srinivasulu | Botany                             | 9493406174                          | Dr. P.S.S. Srinivasulu        |
| 5                                                                                                                                                            | S.V.R GDC(M) Nizampet                | B. Rajarajeswari       | Botany                             | 959243410                           | B. Rajarajeswari              |
| 6                                                                                                                                                            | GDC, Rajahmundry                     | P. Srinivasa Rao       | Botany                             | 9493174355                          | P. Srinivasa Rao              |
| 7                                                                                                                                                            | GDC, Rajahmundry                     | V. Sujatha             | Botany                             | 832812467                           | V. Sujatha                    |
| 8                                                                                                                                                            | GDC, Kothapeta                       | Ch. G.R. Jayaram       | Botany                             | 814221777                           | Ch. G.R. Jayaram              |
| 9                                                                                                                                                            | GDC, Chittalapudi                    | V. Madan Mohan Rao     | Botany                             | 8247449666                          | V. Madan Mohan Rao            |
| 10                                                                                                                                                           | GDC, Rajahmundry                     | H. Hemalatha           | Botany                             | 7977873151                          | H. Hemalatha                  |
| 11                                                                                                                                                           | GDC, ELURU                           | T.V.S. Padmavathi      | Botany                             | 9441781221                          | T.V.S. Padmavathi             |
| 12                                                                                                                                                           | GDC, Eluru                           | Dr. Y.V. Srinivasulu   | Botany                             | 944004180                           | Dr. Y.V. Srinivasulu          |
| 13                                                                                                                                                           | GDC, Tadipatri                       | A.N. Suresh Babu       | Botany                             |                                     | ? NAAC Reviewer               |
| 14                                                                                                                                                           | GDC, Tadipatri                       | B. Pandu               | Botany                             |                                     | B. Pandu                      |
| 15                                                                                                                                                           | GDC, ASNM Palakurthi                 | V. Srinivas            | Botany                             |                                     | currently not working         |
| 16                                                                                                                                                           | GDC, Alimaganam                      | K. Lakshman Rao        | Botany                             |                                     | currently not working         |
| 17                                                                                                                                                           | GDC, Jagaridiguda                    | T. Jhansi Devi         | Botany                             |                                     | Medical Leave                 |
| 18                                                                                                                                                           | Sri DNR GDC (W) Palakurthi           | Dr. V. Madan Mohan Rao | Botany                             | 9494893260                          | Dr. V. Madan Mohan Rao        |
| 19                                                                                                                                                           |                                      |                        |                                    |                                     |                               |

**SESSION I (10:00 am to 11:30 am)- INAGURAL SESSION BY HON'BLE COMMISSIONERATE OF COLLEGIATE EDUCATION, DR. POLA BHASKAR GARU**

**Dr.P.Anil Kumar,OSD CCE** has welcomed the session and Invited our Honourable Commissioner sir, **Dr. Pola Bhaskar garu** to give his opening remarks for this five day ToT program. Sir highlighted the need and importance of faculty training. He stated that the UGC has launched Madan Mohan Malaviya Mission Teacher Training Programmes with an aim of improving the quality of education at all levels by infusing quality and excellence in the teachers and their teaching. In this connection the Commissionerate of Collegiate Education (CCE) has approached the HRDC/MMTC, University of Hyderabad(UOH), Hyderabad to train identified faculty as Key Resource Persons.

In continuation to this Five-Day Non-residential Training of Trainers (TOT) Programme was initiated at NRCs to all the Regular, Contract and Guest Botany & Microbiology Faculty working in the GDCs on the curriculum of Single Major Subject - Botany & Microbiology streams. Sir had instructed all the faculty to participate actively and wished everyone to make this training a success.



**SESSION II (11:45 am to 1:15 pm)- DNA Replication and Repair by Prof. Mrinal K Bhattacharya, UoH**

**Highlights of the session:**

Meselson and Stahl Experiment • Hayflick • Telomere length

Direct repair, Excision repair, Mismatch repair Recombination repair

MGMT, Non mutagenic pathway, NHEJ

Meeting info: Layout Meeting info

Participants: NRC - PVKN GC A... (Unverified), NRC@Tanuku (Unverified), JKMC :: CCE, AP (Unverified), Sateendra Kumar M... (Unverified)

Viewing Minnal Kanti Bhattacharyya's shared content

100%

Problem

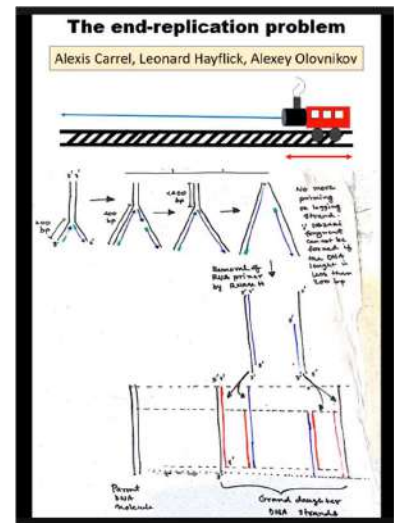
Consider Meselson-Stahl experiment:  
 1. cell grown in  $^{15}\text{N}/^{15}\text{N}$  containing medium. Also assume that genomic DNA is fragmented at least in 100 pieces during isolation. 100 at the table below:

| Generations       | $^{15}\text{N}/^{15}\text{N}$ | $^{15}\text{N}/^{14}\text{N}$ | $^{14}\text{N}/^{14}\text{N}$ |
|-------------------|-------------------------------|-------------------------------|-------------------------------|
| 0th               | 100%                          | 0%                            | 0%                            |
| 0.5 <sup>th</sup> |                               |                               |                               |
| 1 <sup>st</sup>   |                               |                               |                               |
| 1.5 <sup>th</sup> |                               |                               |                               |
| 2 <sup>nd</sup>   |                               |                               |                               |

At 0<sup>th</sup> generations when the medium is changed from  $^{15}\text{N}$  to  $^{14}\text{N}$ , a substance X is added. After approximately 3 generations time, 32% of the DNA is hybrid. After many hours, still only 32% of the DNA is hybrid. What does X probably do?

Video stopped

Connect audio Start video Share Participants Chat Content



Meeting info: Layout Meeting info

Participants: NRC - PVKN GC A... (Unverified), NRC@Tanuku (Unverified), JKMC :: CCE, AP (Unverified), FDA R.Y. (Unverified)

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Problem

1. If not DNA replicates satisfactorily, the replicon must be made of both replication forks is 40 minutes. Explain then how the replication fork of 40 is only 20 minutes (showing that) and cells can divide every 20 minutes.

2. The origin of the 8 chromosomes is shown in the genetic map. The physical map is also shown. You observed that the frequency for the replication of genes is through it is sufficient? suggest an explanation.

3. Design an experiment to prove that the polymerase is a bidirectional DNA polymerase, not the RNA polymerase. It is also a DNA dependent DNA polymerase, bidirectional in transcription, which makes the primer for proteinase synthesis during translation.

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Connect audio Start video Share Participants Chat Content

Meeting info: Layout Meeting info

Participants: NRC - PVKN GC A CHITTOOR (Unverified), Minnal Kanti Bhattacharyya (Unverified), JKMC :: CCE, AP (Unverified)

Viewing Minnal Kanti Bhattacharyya's shared content

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Video stopped

Connect audio Start video Share Participants Chat Content

Meeting info: Layout Meeting info

Participants: NRC DKW GDC NELL... (Unverified), Sateendra Kumar Mangrautha (Unverified), NRC VIJAYAWADA (Unverified), NRC Dr VSKGDC Visa... (Unverified), NRC GCM(A)-KADAPA (Unverified)

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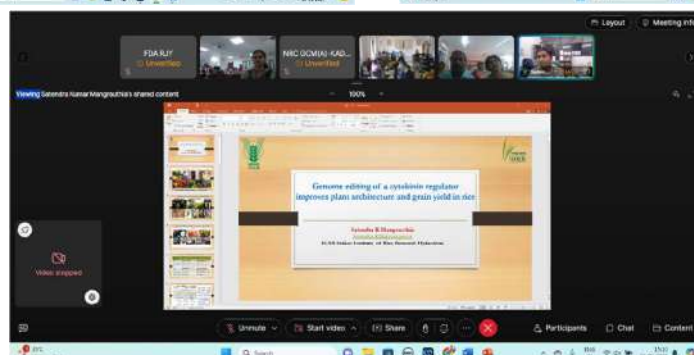
Connect audio Start video Share Participants Chat Content



## SESSION III (2:00 pm to 3:30 pm)- Genome Editing in Crop Plants by Dr.Satendra, Scientist IIRRI

### Highlights of the session:

- Phase I-Random Hybridization • Mutagenesis • Phase II- Precise genome engineering • Transgenics and Cis genics • Challenges ahead –climate change and limited resources Site Specific Nucleases involved in Gene Editing- SDN1, SDN2 and SDN3 • Critical aspects in genome editing of crop plants- target cultivar, target gene and target trait • SWOT analysis for Samba Masuri rice cultivar • Cytokine oxidase role in grain production • Kamala mutant trasplantation • Breaking yield barriers • NUE-Nitrogen usage efficiency WUE- Water usage efficiency



**SESSION IV (3:45 pm to 5:15 pm)- Bio Startups-Collaborative Approach KRPs- Smt.P.Chamundeshwari Devi and Dr.Ch.Chaitanya**

**Highlights of the session:**

Bio Startups

Need for Bio Startups

Bio NEST- Artho Biotech

TBI, TIDE

IKP-Genome valley

Some college level feasible start ups



**Attendance consolidation of all four sessions**

| Commissionerate of Collegiate Education, A.P.: Mangalagiri                                                                                        |                            |                                       |            |                        |          |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------|------------|------------------------|----------|----------|
| Five Days Training of Trainers(TOT) Single Major Subject UG Pattern - Botany & Microbiology Subjects from 29.02.2024 to 05.03.2024 @ NRC, TANUKU, |                            |                                       |            |                        |          |          |
| Batch 1                                                                                                                                           |                            | Attendance of Faculty                 |            | Date: 29/02/2024 FN/AN |          |          |
| S.No                                                                                                                                              | Name & Place of the GDC    | Name of the Faculty(Dr /Sri/Smt./Kum) | Signatures |                        |          |          |
|                                                                                                                                                   |                            |                                       | Session1   | Session2               | Session3 | Session4 |
| 1                                                                                                                                                 | GDC Ravulapalem            | Smt.M.Hemalatha                       |            |                        |          |          |
| 2                                                                                                                                                 | GDC, Razole                | P.Sunitha                             |            |                        |          |          |
| 3                                                                                                                                                 | GDC, Razole                | U.Sujatha                             |            |                        |          |          |
| 4                                                                                                                                                 | GDC Kothapeta              | CH.G.R.Jayasi                         |            |                        |          |          |
| 5                                                                                                                                                 | GDC Kothapeta              | Sireesha                              |            |                        |          |          |
| 6                                                                                                                                                 | SVRK GDC, NIDADAVOLE       | Dr PSS SRAVANTHI                      |            |                        |          |          |
| 7                                                                                                                                                 | SVRK GDC, NIDADAVOLE       | B RAJA RAJESWARI                      |            |                        |          |          |
| 8                                                                                                                                                 | GDC ASNM Palakol           | Sri P. Srinivasa Rao                  |            |                        |          |          |
| 9                                                                                                                                                 | GDC ASNM Palakol           | Kum V. Saijee Srinisha                |            |                        |          |          |
| 10                                                                                                                                                | GDC Bhimavaram             | Sri K.LAKSHMANA RAO                   |            |                        |          |          |
| 11                                                                                                                                                | SCIM GDC, TANUKU           | Dr.Y VIJAYA KUMAR                     |            |                        |          |          |
| 12                                                                                                                                                | GDC Tadepalligudem         | A.N.Sudheer Babu                      |            |                        |          |          |
| 13                                                                                                                                                | GDC Tadepalligudem         | B.Pandu                               |            |                        |          |          |
| 14                                                                                                                                                | GDC Jangareddigudem        | Smt T.Jhansi Rani                     |            |                        |          |          |
| 15                                                                                                                                                | Govt. Degree Collge, Eluru | Smt.T.V.S.Padmavathi                  |            |                        |          |          |
| 16                                                                                                                                                | GDC,CHINTALAPUDI           | V.MADAN MOHAN RAO                     |            |                        |          |          |
| 17                                                                                                                                                | GDC W Palakol              | Dr Mani mala .                        |            |                        |          |          |
| Key Resource Persons                                                                                                                              |                            |                                       |            |                        |          |          |
| 18                                                                                                                                                | SCIM GDC, TANUKU           | Ch. Devi Palaka                       |            |                        |          |          |
| 19                                                                                                                                                | GDC Ganapavaram            | Dr.Ch.Chaitanya                       |            |                        |          |          |

Activity of the Day

Crossword Puzzle





# Commissionerate of Collegiate Education

MANGALAGIRI, GUNTUR(DT), ANDHRA PRADESH

NRC- CHITTOR (DT)

## BOTANY CROSSWORD PUZZLE

RESOURCE PERSON- DR. P SUJANA

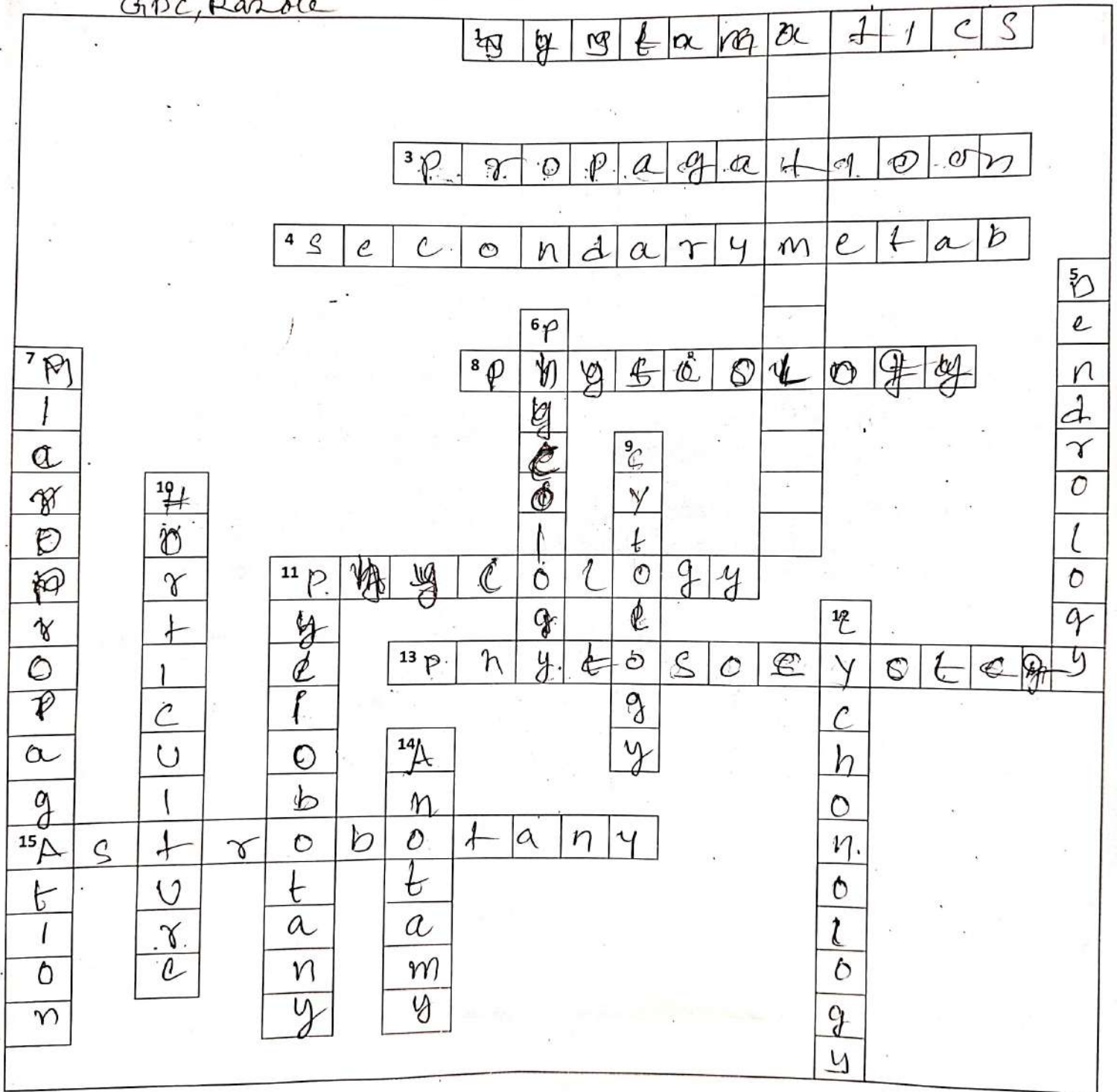
LECTURER IN BOTANY,

GOVT, DEGREE COLLEGE, PUTTUR

TIRUPATI (DT), A. P.

U. Sujatha  
GDC, Razole

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NRC- CHITTOR (DT)

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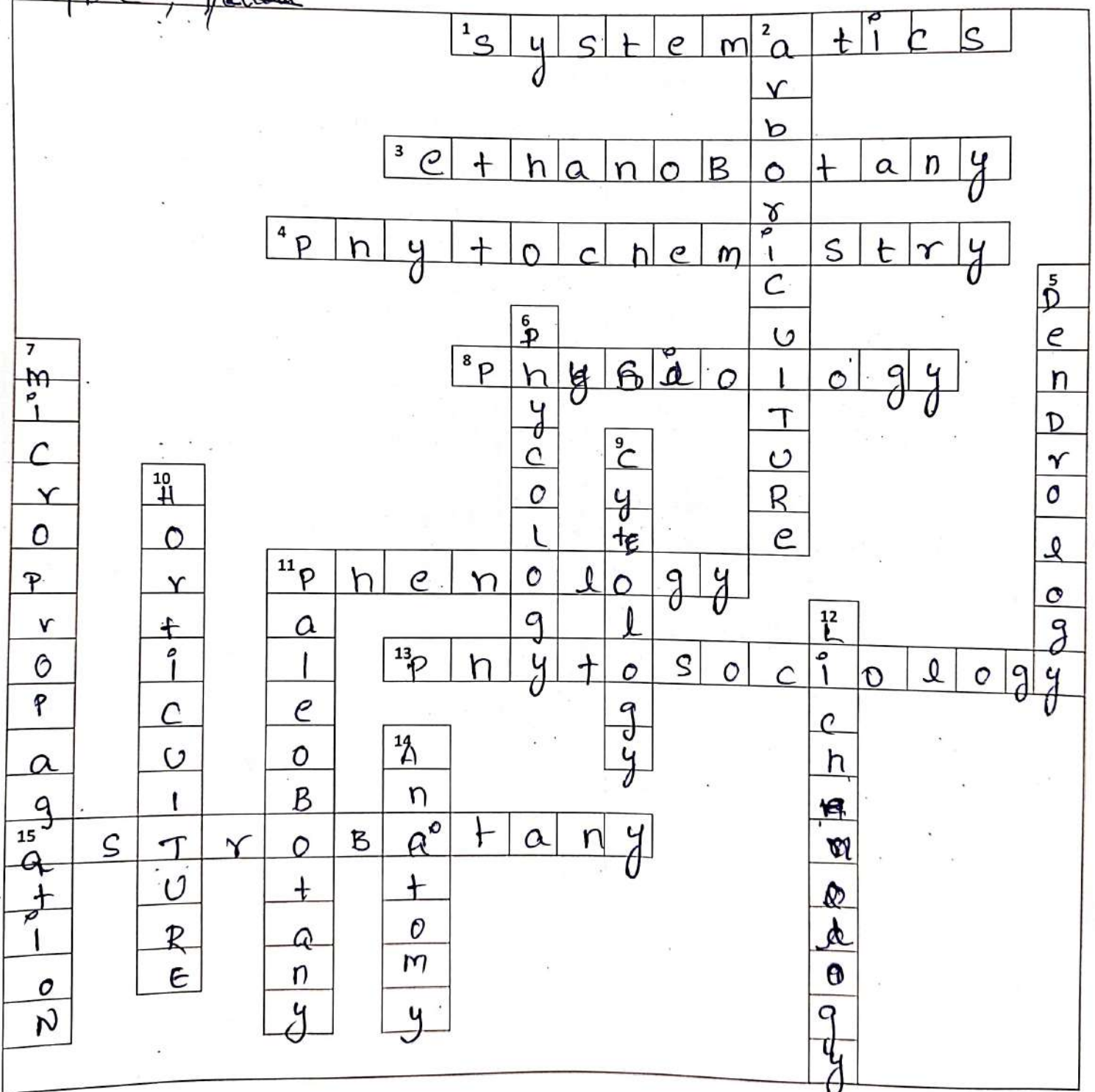
RESOURCE PERSON- DR. P SUJANA

LECTURER IN BOTANY,  
GOVT, DEGREE COLLEGE, PUTTUR  
TIRUPATI (DT), A. P.



T. Padmanavathi,  
Lecturer in Botany.

GDC, ELURU BRANCHES OF BOTANY



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TIRUPATI (DT), A. P.

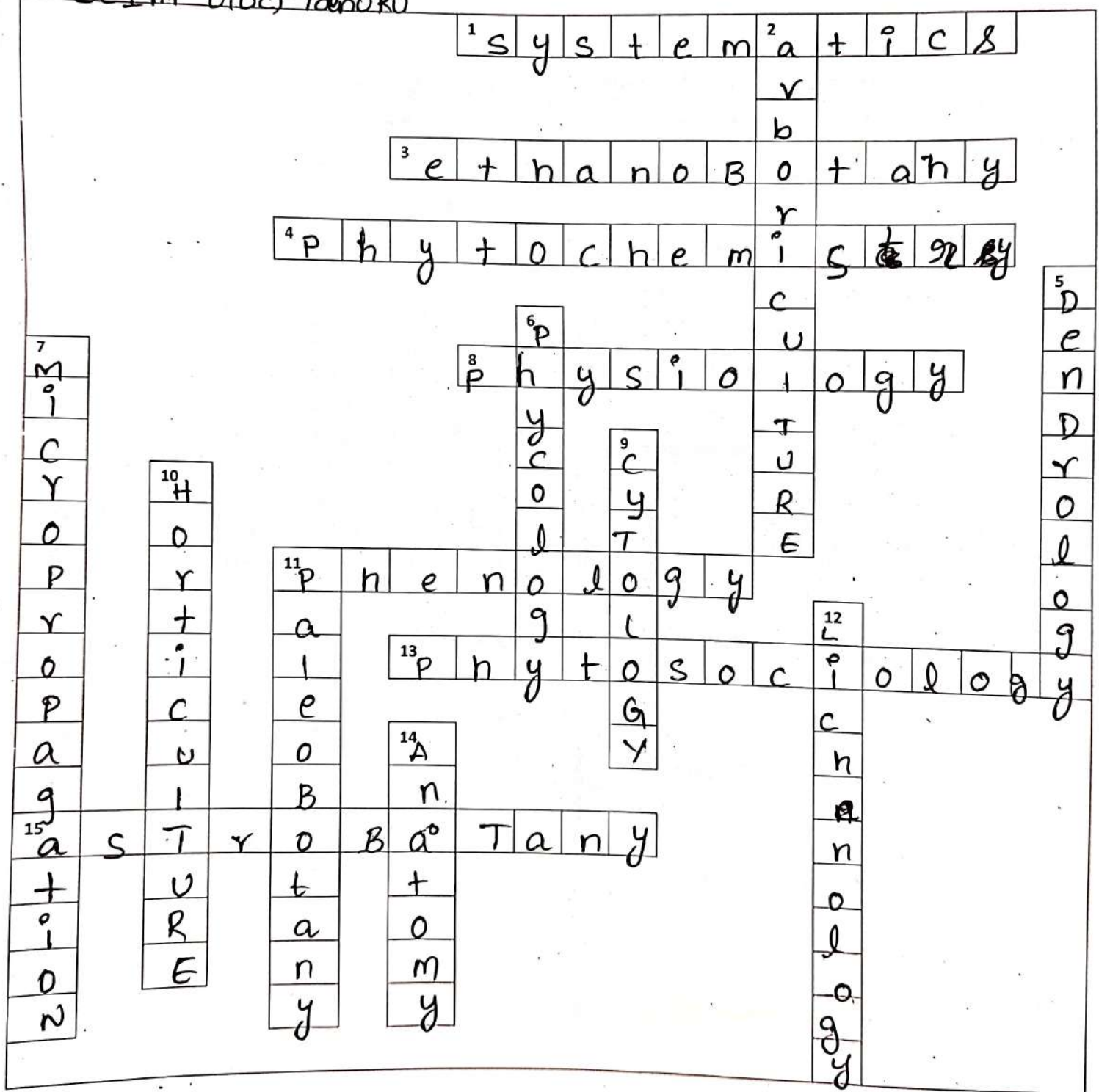


Dr. Y. Vijaykumar

Lecturer in Botany

SCIM (MDC) Taduku

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Ch. G.R. Jayar

GDC Kothapeta



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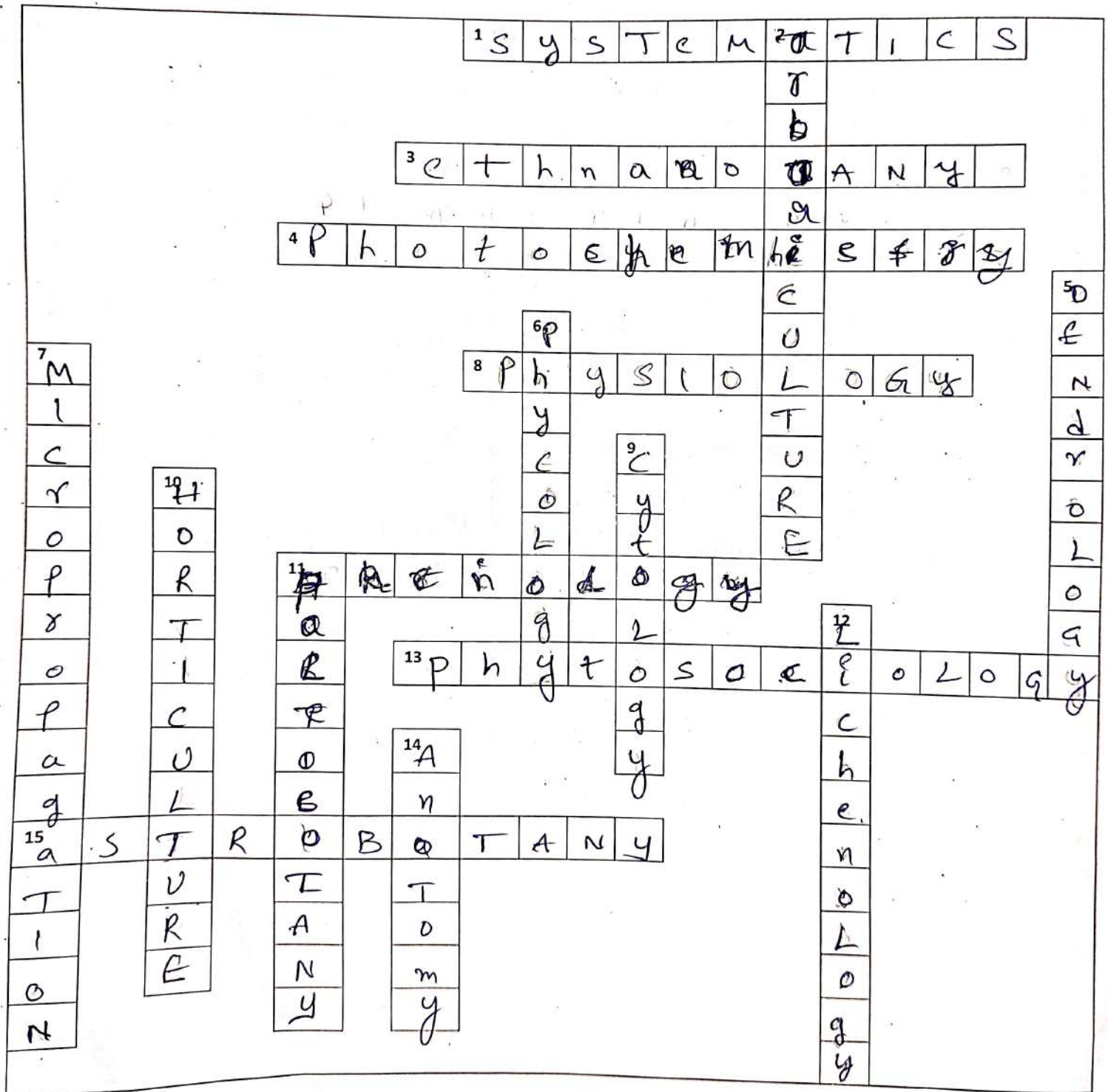
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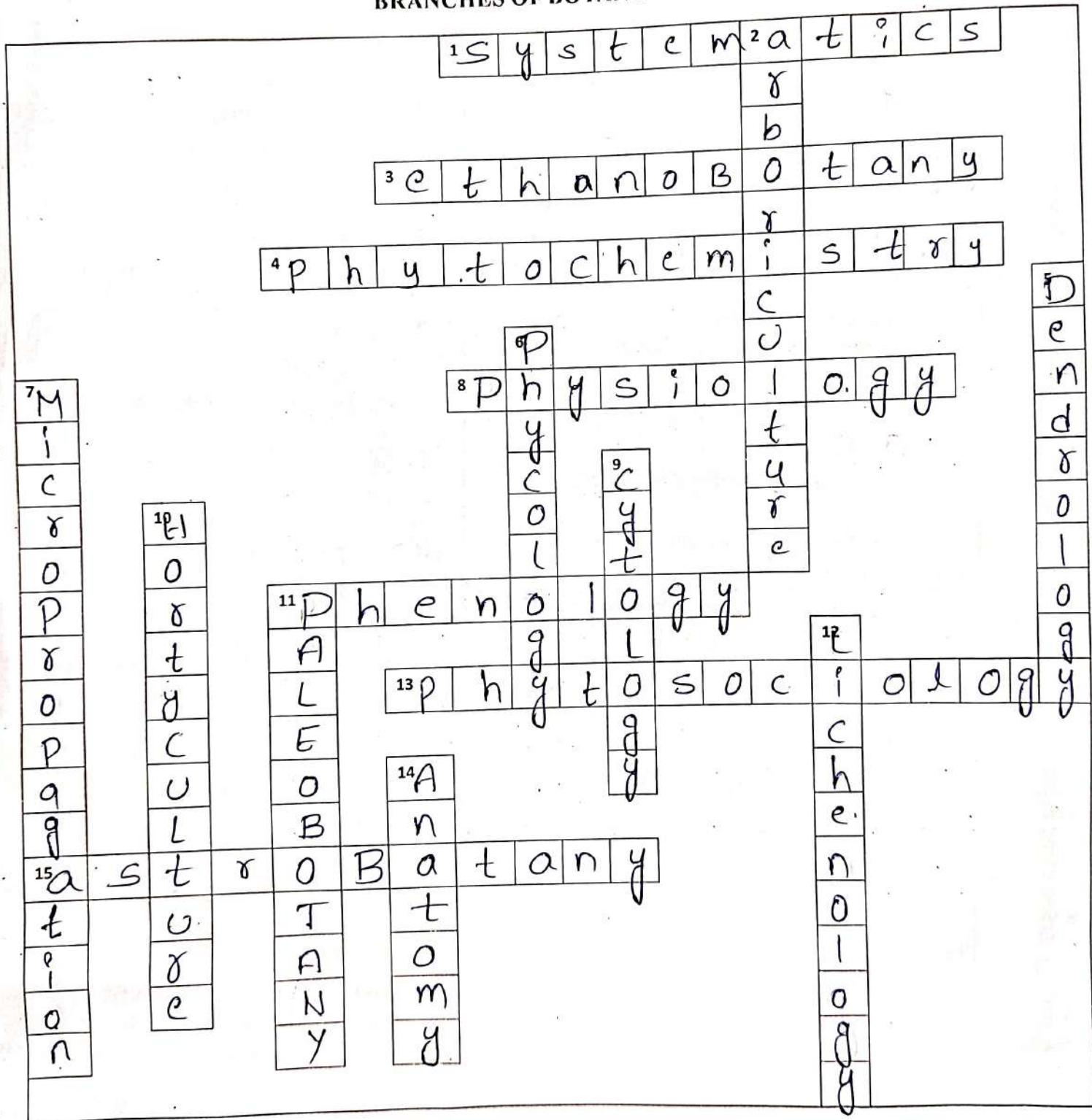
RESOURCE PERSON- DR. P SUJANA

LECTURER IN BOTANY,  
GOVT, DEGREE COLLEGE, PUTTUR  
TIRUPATI (DT), A. P.



D. Devi Siva  
V.K.V GDC Kothapeta.

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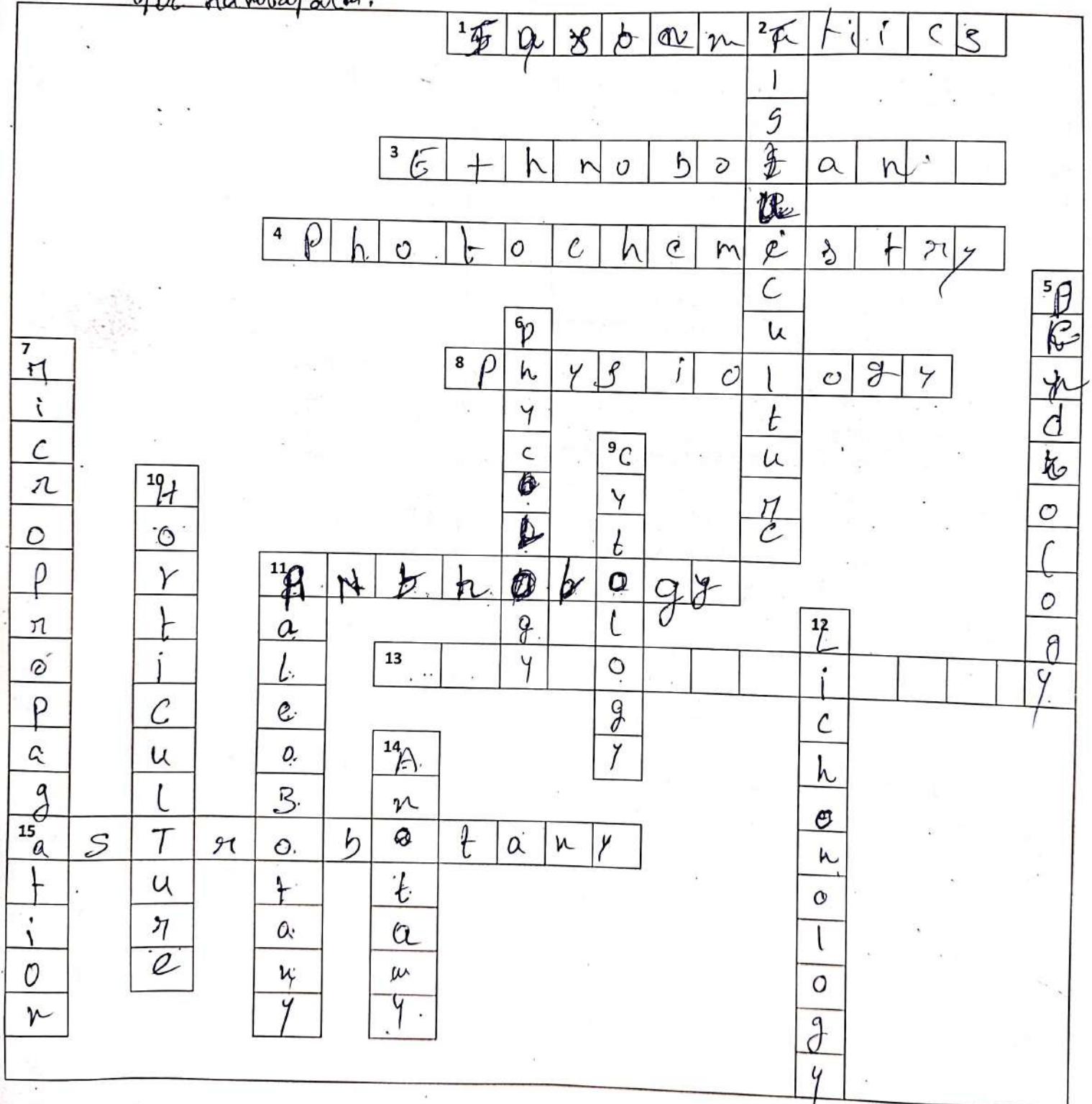
GOVT, DEGREE COLLEGE, PUTTUR

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M. Hemalatha.  
GDC Ramabalam.

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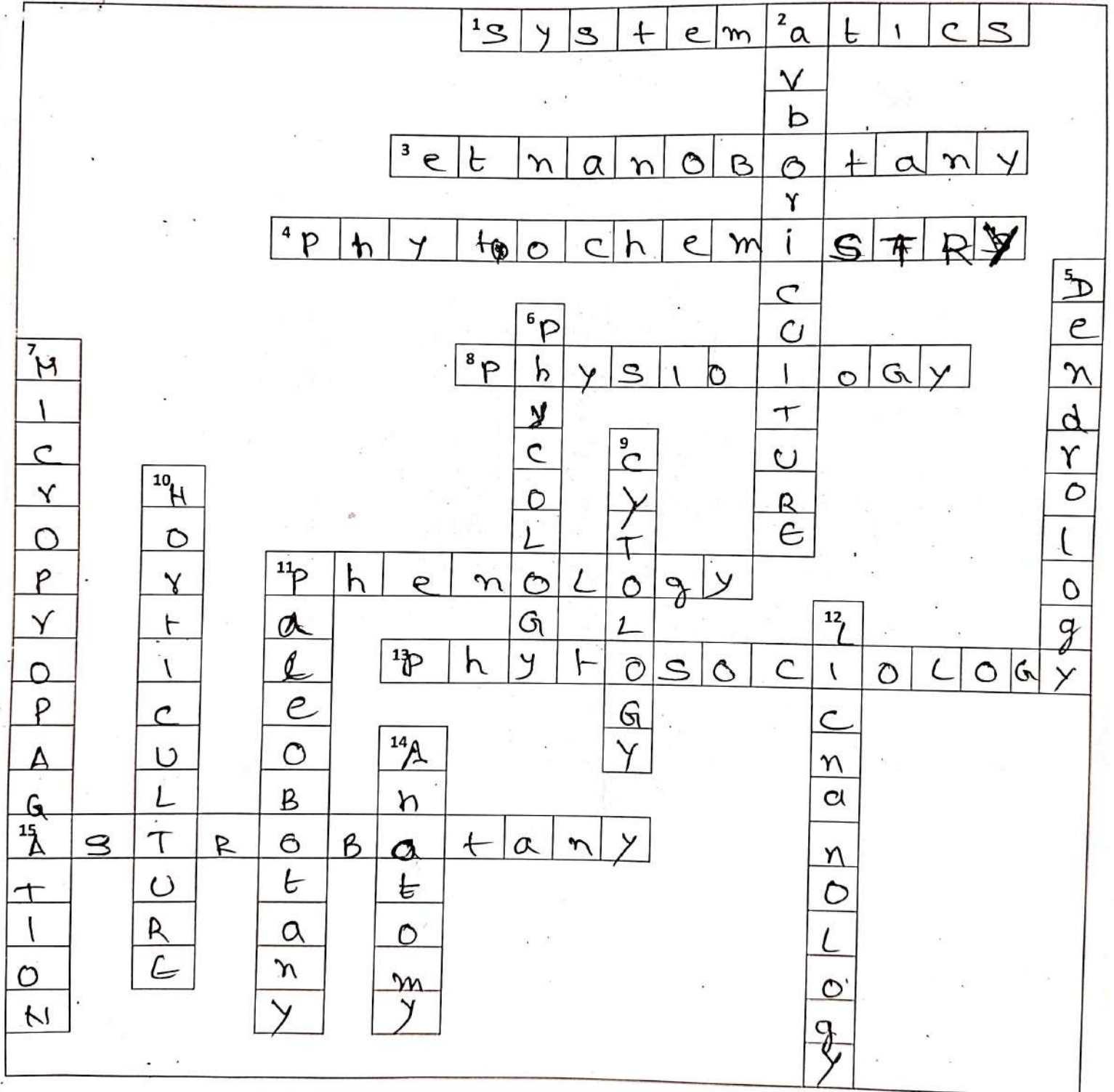
TIRUPATI (DT), A. P.



V. Sirisho.

Sri. ASNMGDC, Palakol.

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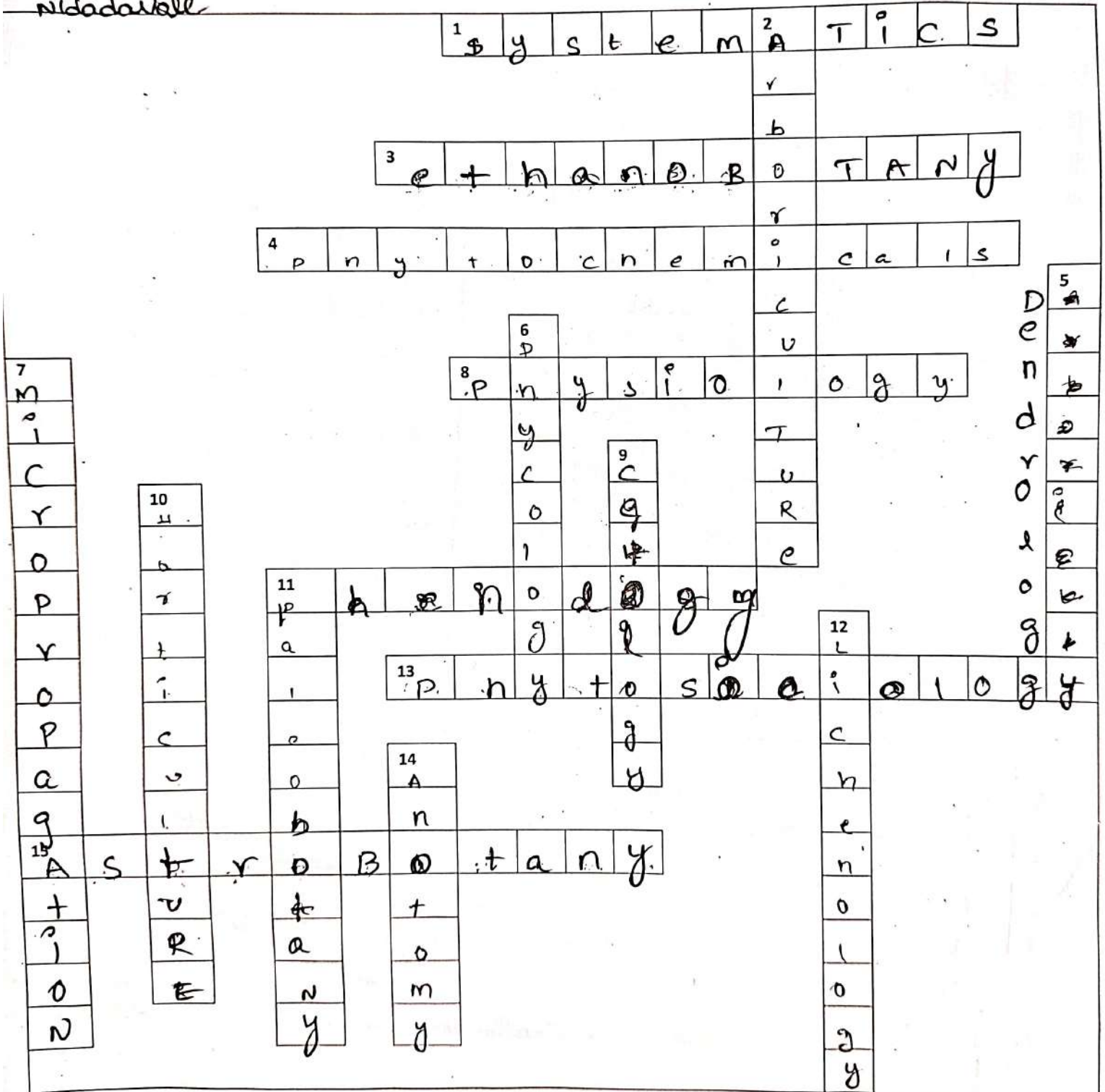
LECTURER IN BOTANY,

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B. Raja Rajeswari  
S.V. RK GDC (M)  
Nidadavolu



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LECTURER IN BOTANY,

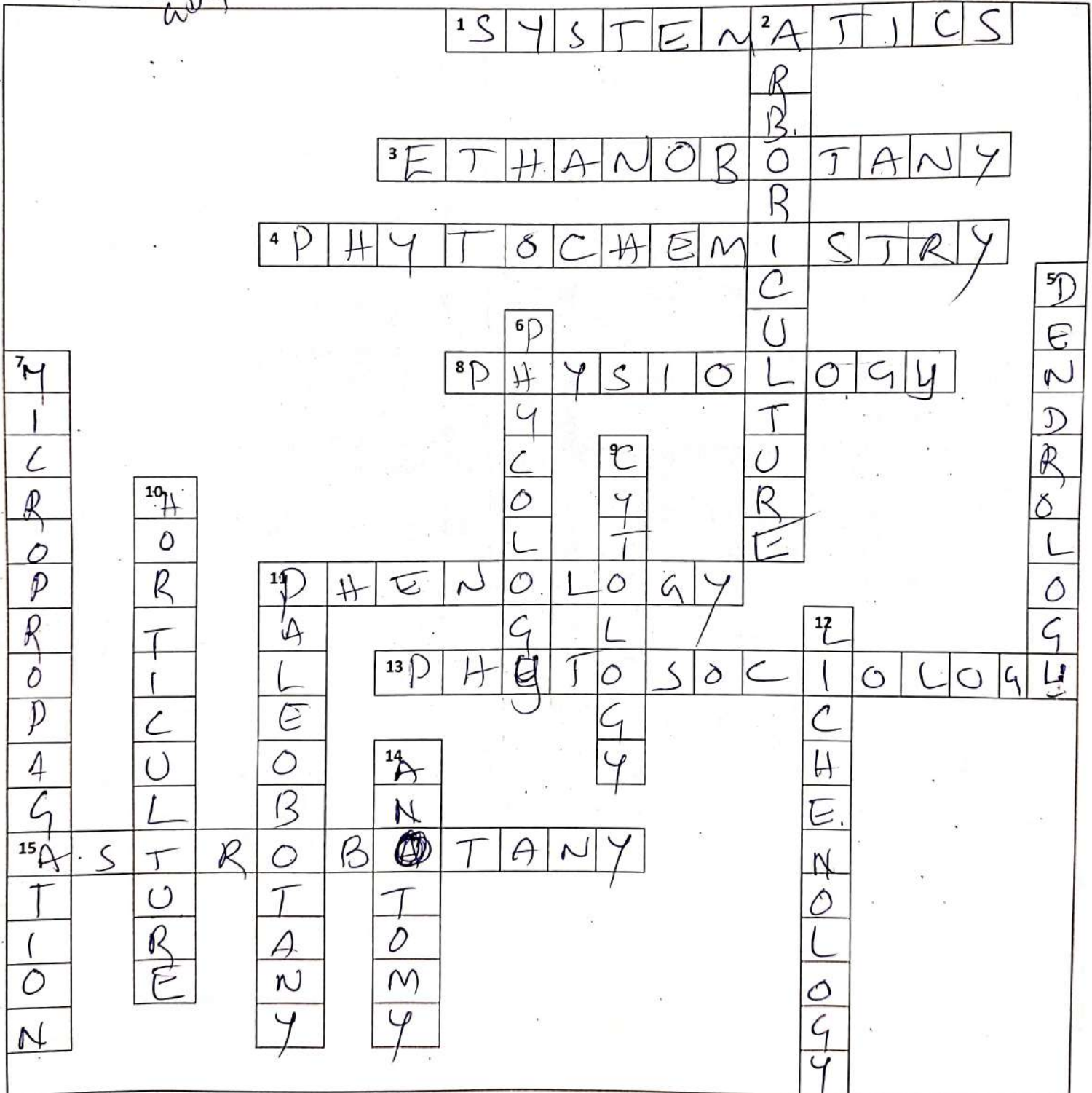
GOVT, DEGREE COLLEGE, PUTTUR

TIRUPATI (DT), A. P.



*V. Madan Mohan  
Lecturer in Botany  
ADC, Chittorapudi*

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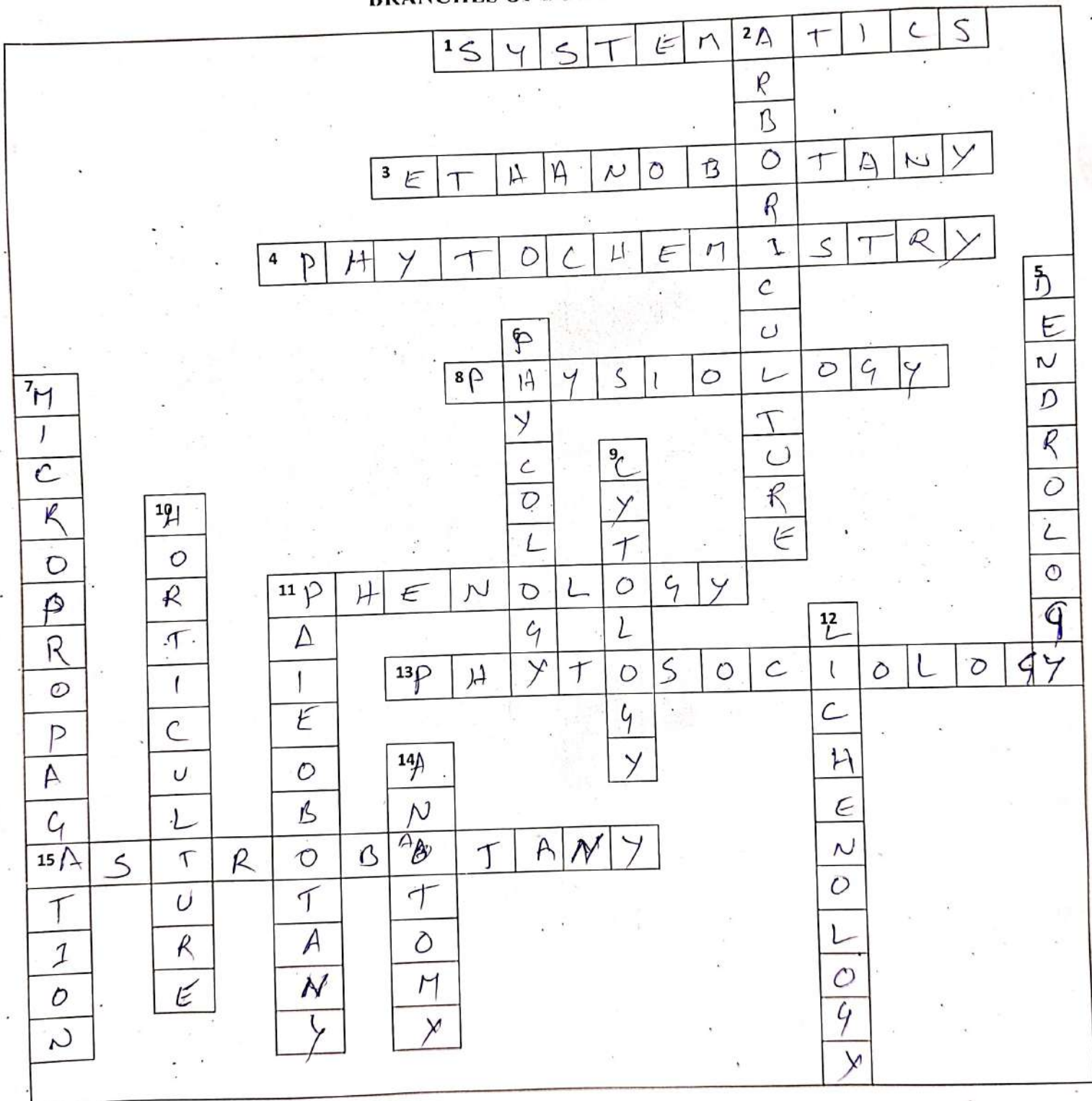
LECTURER IN BOTANY,  
GOVT, DEGREE COLLEGE, PUTTUR  
TIRUPATI (DT), A. P.

P. SRINIVASARAO

SRI. AS NM. GDC (A)

Palekal, w. g. dt.

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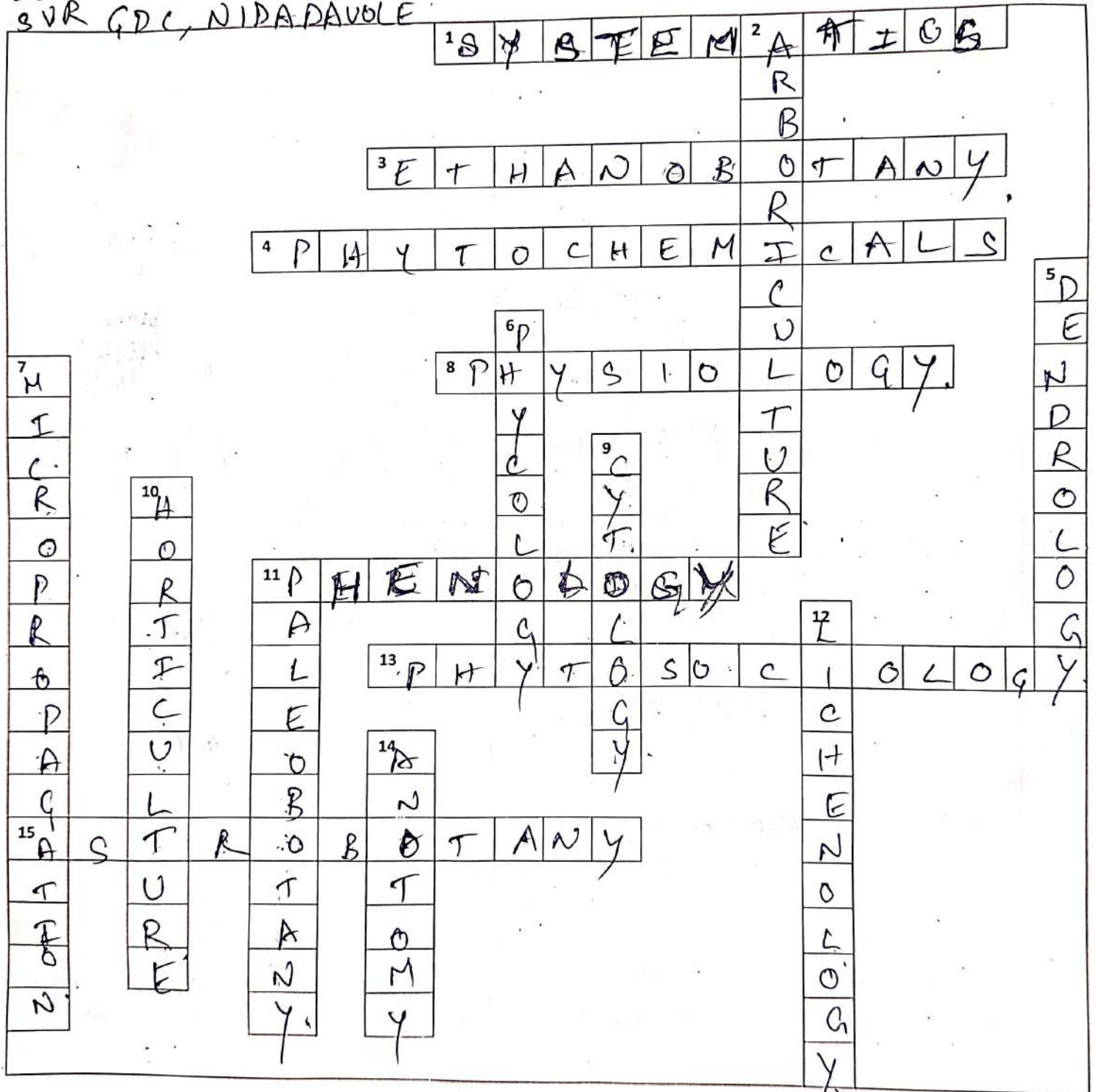
## BOTANY CROSSWORD PUZZLE

RESOURCE PERSON- DR. P SUJANA

LECTURER IN BOTANY,  
GOVT, DEGREE COLLEGE, PUTTUR  
TIRUPATI (DT), A. P.



Dr. P. S. S. BRAVANTHI  
LECTURER IN BOTANY  
SVR GDC, NIDADAVOLE



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LECTURER IN BOTANY,

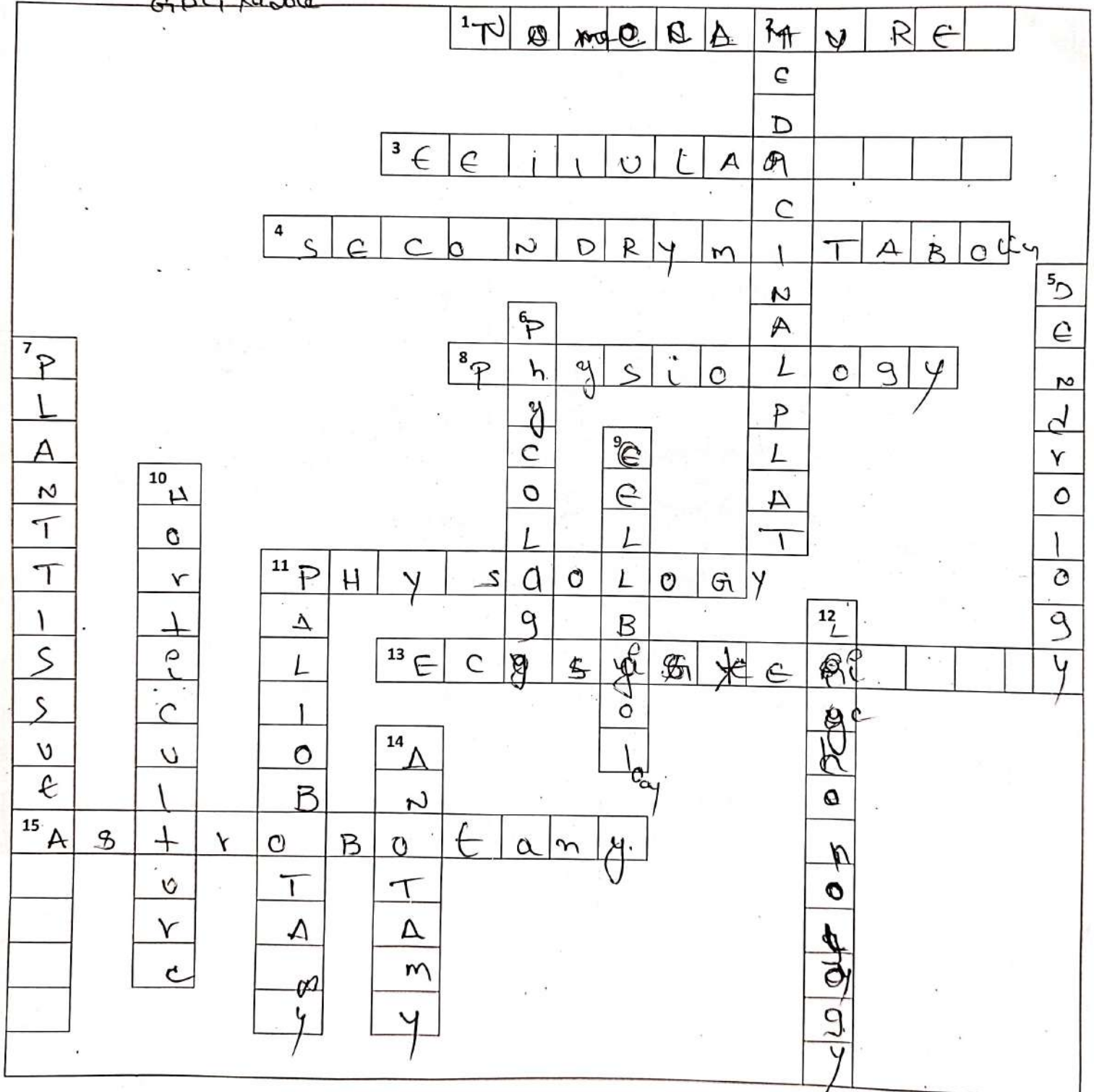
GOVT, DEGREE COLLEGE, PUTTUR

TIRUPATI (DT), A. P.



P. Sujana  
Lect. in Botany  
G.D.C. Ra. 306

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LECTURER IN BOTANY,

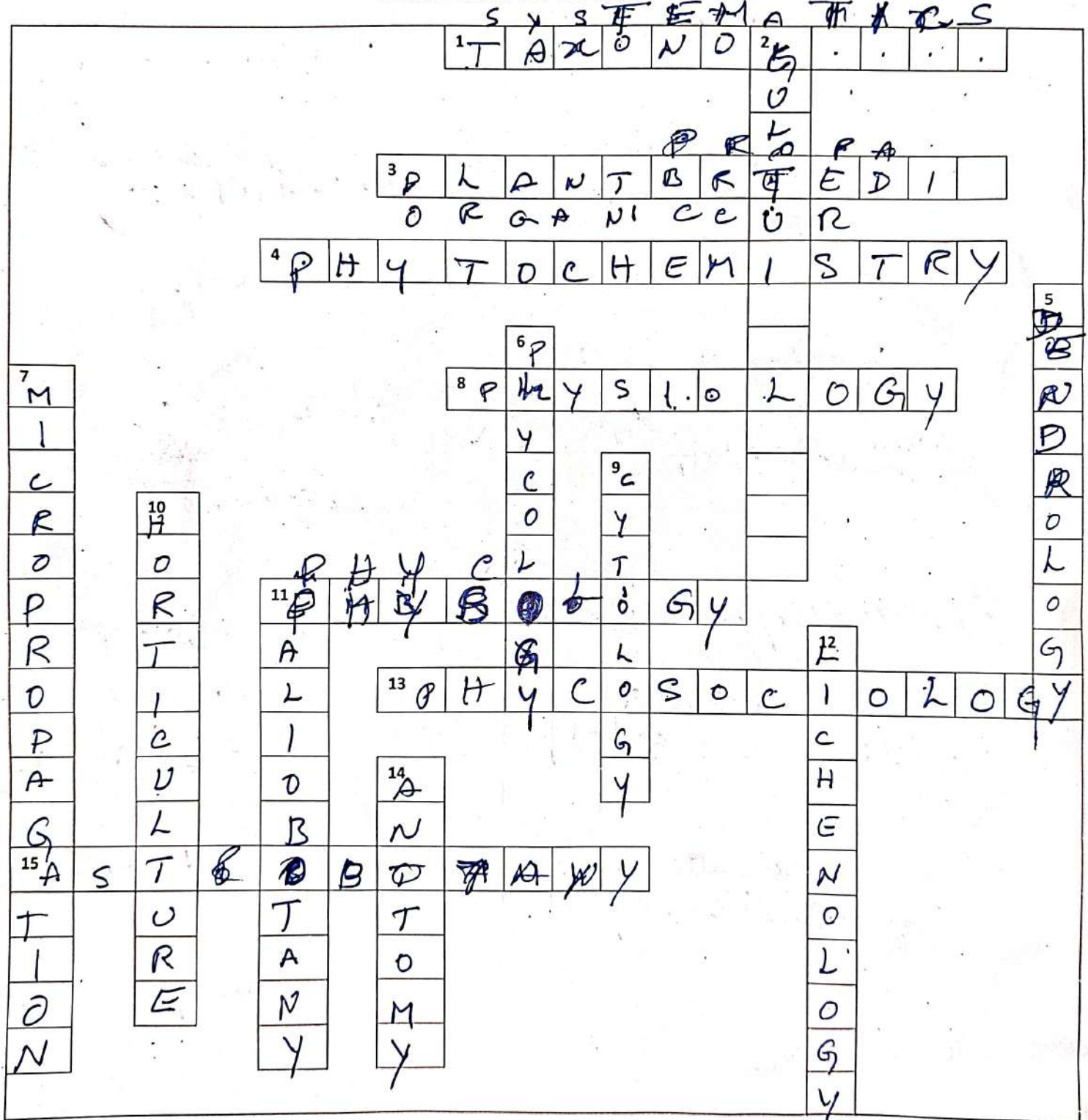
GOVT, DEGREE COLLEGE, PUTTUR  
TIRUPATI (DT), A. P.



Dr. N. Mani

DR. N. Mani

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## DAY -02



### Single Major subjects Botany and Microbiology

29-02-2024 to 05-03-2024

Day-02

Date: 01-03-2024

### Day wise Schedule

|                                     |                                                                                           |
|-------------------------------------|-------------------------------------------------------------------------------------------|
| Session I<br>10.00 am to 11.30 am   | Transcription<br><b>Prof. Sunanda Bhattacharya, UOH</b>                                   |
| Session II<br>11.45 am to 01.15 pm  | Ethnobotany and Traditional plant Medicines<br><b>Knowledge Resource Persons of NRC</b>   |
| Session III<br>02.00 pm to 03.30 pm | Transgenics Technology: Real Game Changer?<br><b>Prof T Chandra Sekhar, YV University</b> |
| Session IV<br>3.45 pm to 5.15 pm    | Plants and Microbes<br><b>Knowledge Resource Persons of NRC</b>                           |

### **SESSION I (10:00 am to 11:30 am)- Transcription, Prof.Sunanda Bhattacharya,UoH**

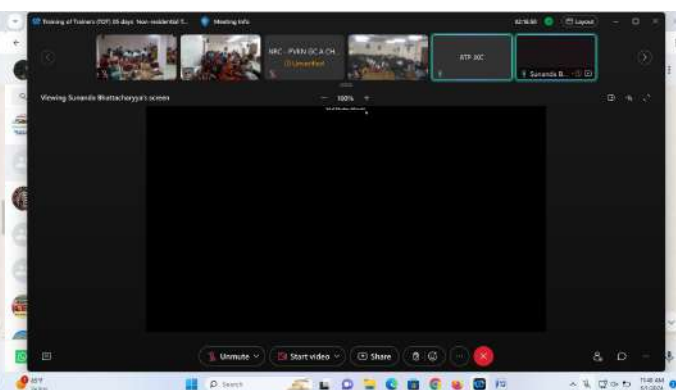
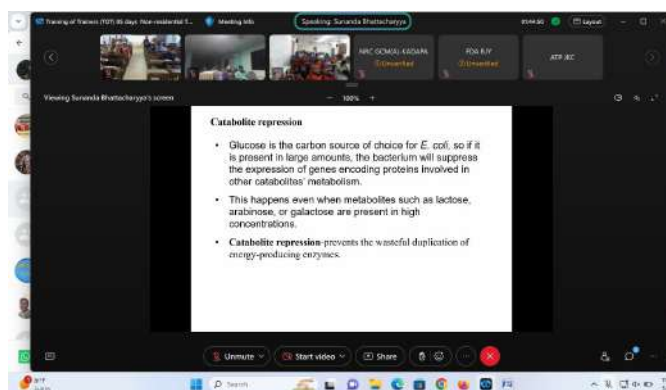
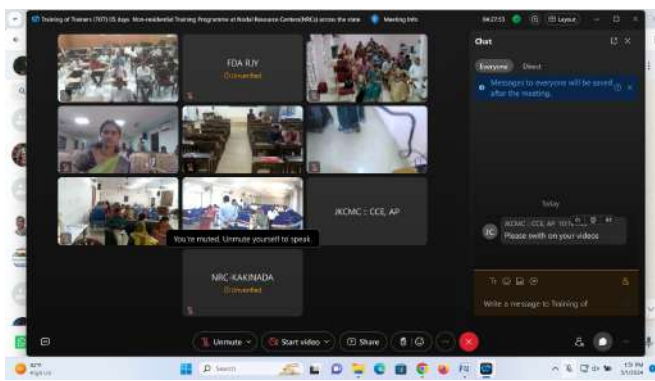
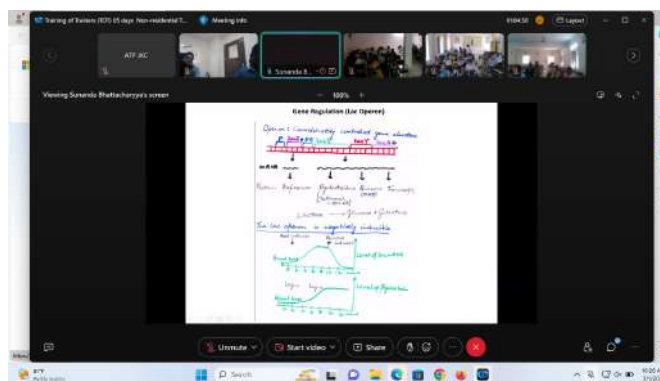
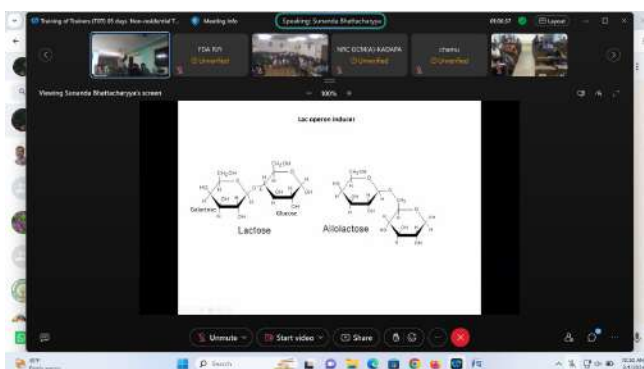
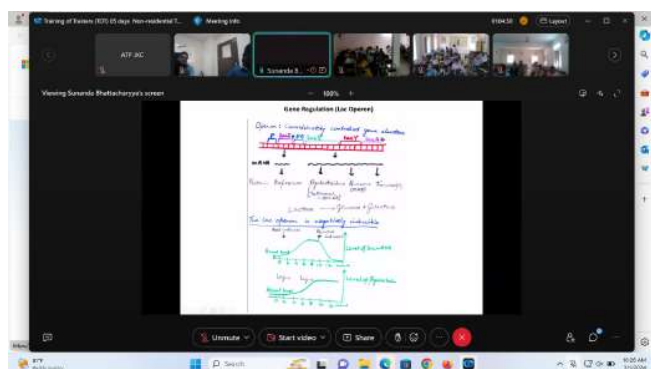
Basics of Transcription- coding and non coding strand

Promoters or the Trans elements

Mutant Experiments to understand the transcription and gene expression

Lac operon

Trp operon



## SESSION II (11:45 am to 1:15pm)-Ethanobotany and Traditional Plant Medicine by KRP- Smt.P.Chamundeswari Devi and Dr.Ch.Chaitanya

### Highlights of the session:

EthanoBotany- Definition and Scope

Ethnobotany- Interdisciplinary subject

Need for Ethanobotanical Studies

Various Examples of Ethanomedicinal Plants





## SESSION III (2:00pm to 3:30 pm)- Transgenics Technology: Real Game Changer? by Prof.T.Chandra Shekar, YV University

### Highlights of the session:

What is Transgenic Technology?

Steps involved in developing a Transgenic Organism

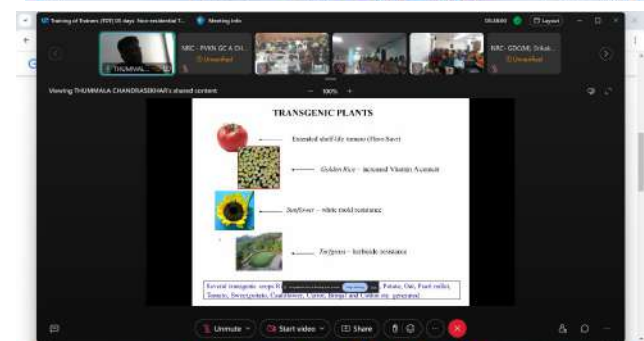
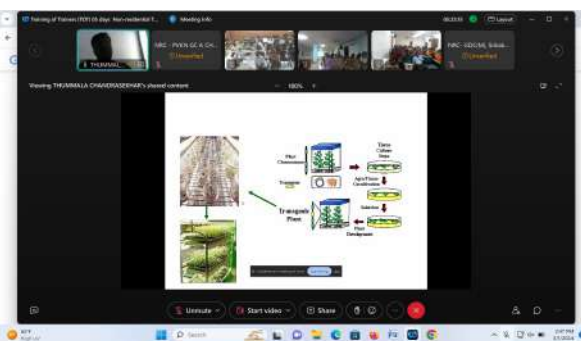
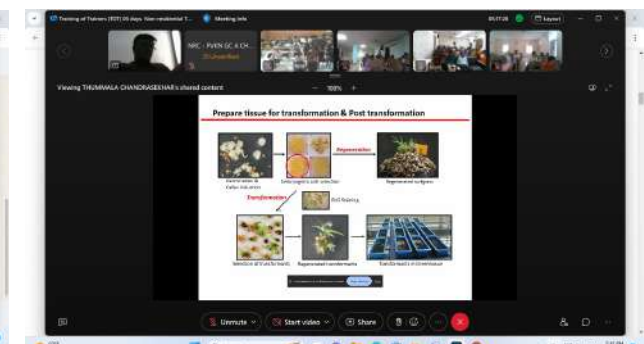
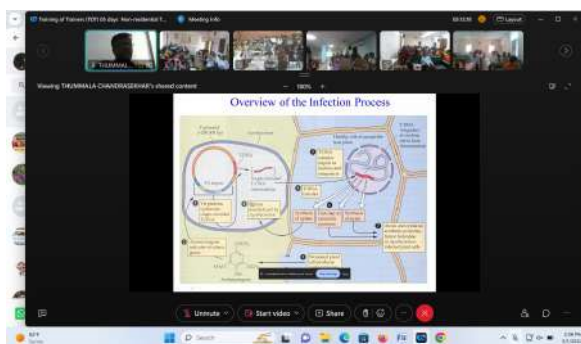
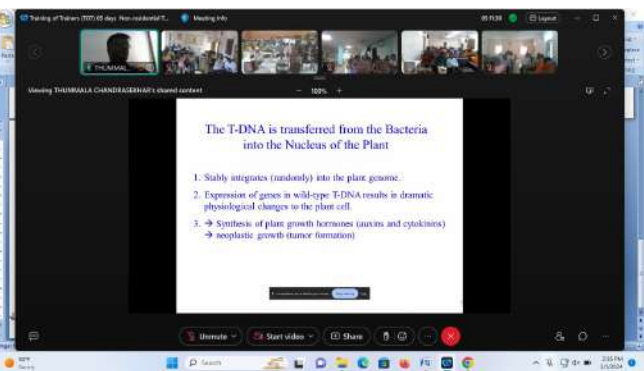
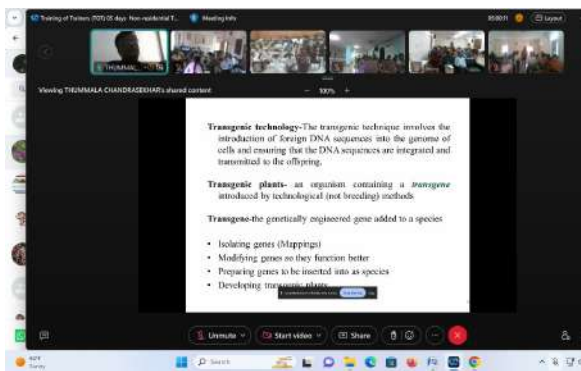
Transformation methods- Physical- Gene Gun, Biological- *Agrobacterium* mediated

Practical issues while generating transgenic plants- time and money

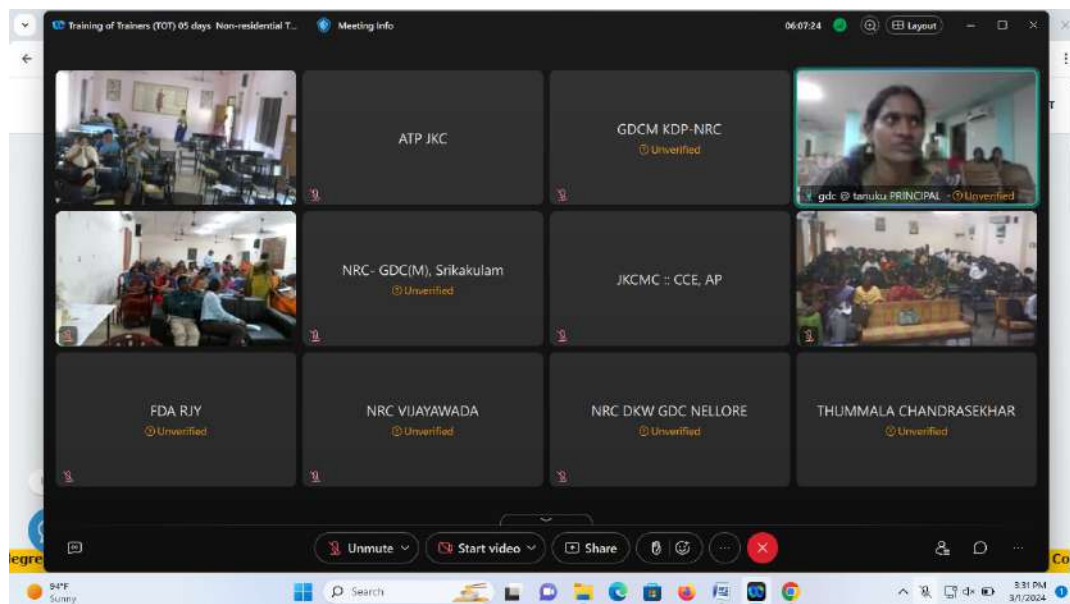
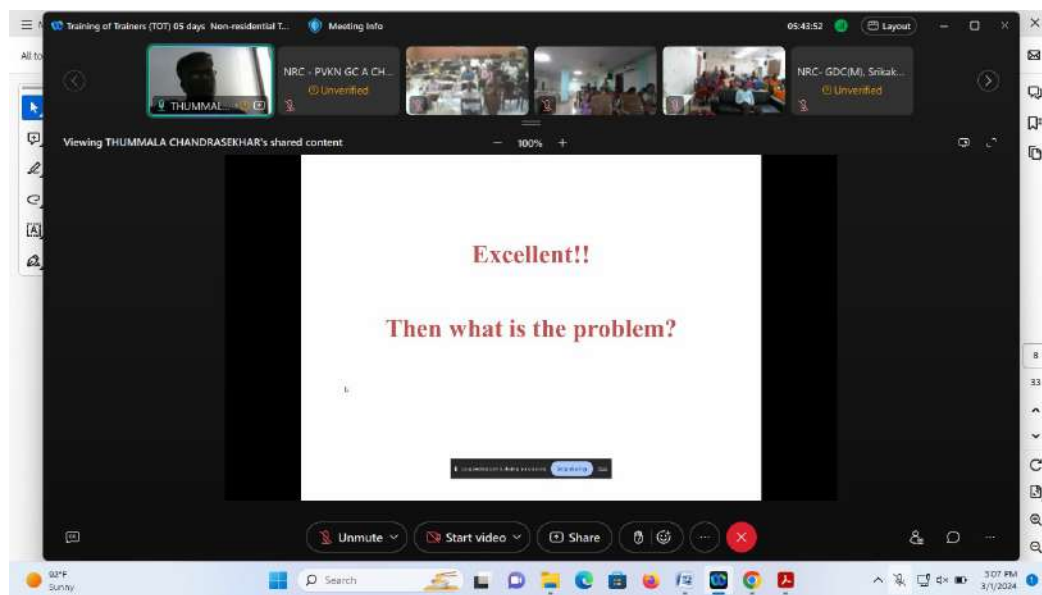
Various examples of Transgenic Plants

Bt Cotton- cry genes

Policy matters and laws- and stigma towards acceptance of transgenic organisms







## SESSION IV (3:45pm to 5:15 pm)- Plants and Microbes by KRPs- Smt.P.Chamundeshwari Devi and Dr.Ch.Chaitanya

How plants and microbes co exist

Various plant microbe interactions- neutralism, commensalism, mutualism, amensalism etc

Good microbes and bad microbes- examples

Importance of research on plant microbial interaction

Plant diseases and symptoms

Molecular level interactions and cell signalling

PAMP- PARR- plant immunity and susceptibility

nod factors, myc factors- chemical composition – LCOs

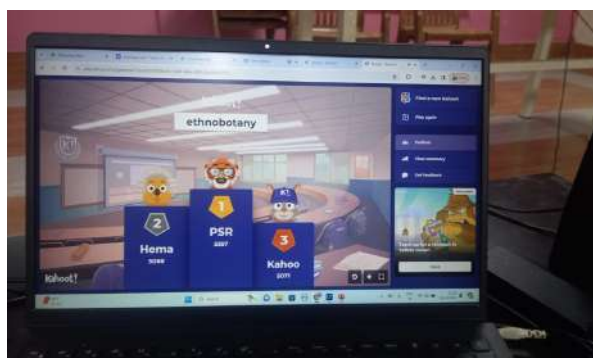
recent research trends in plant microbial interactions



**Attendance consolidation of all four sessions**

| Commissionerate of Collegiate Education, A.P., Mangalagiri                                                                                        |                           |                                        |                       |          |                   |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|----------------------------------------|-----------------------|----------|-------------------|----------|
| Five Days Training of Trainers(TOT) Single Major Subject UG Pattern - Botany & Microbiology Subjects from 29.02.2024 to 05.03.2024 @ NRC, TANUKU. |                           |                                        |                       |          |                   |          |
| Batch-1                                                                                                                                           |                           |                                        | Attendance of Faculty |          | Dated: 01/03/2024 |          |
| S.No                                                                                                                                              | Name & Place of the GDC   | Name of the Faculty (Dr./Sr./Smt./Num) | Signatures            |          |                   |          |
|                                                                                                                                                   |                           |                                        | Session1              | Session2 | Session3          | Session4 |
| 1                                                                                                                                                 | GDC Ravulapalem           | Smt. M. Hemalatha                      |                       |          |                   |          |
| 2                                                                                                                                                 | GDC, Razole               | P. Sunitha                             |                       |          |                   |          |
| 3                                                                                                                                                 | GDC, Razole               | U. Sujatha                             |                       |          |                   |          |
| 4                                                                                                                                                 | GDC Kothapeta             | CH.G.R.Jayasi                          |                       |          |                   |          |
| 5                                                                                                                                                 | GDC Kothapeta             | B.Sireesha                             |                       |          |                   |          |
| 6                                                                                                                                                 | SVRK GDC, NIDADAVOLE      | Dr PSS SRAVANTHI                       |                       |          |                   |          |
| 7                                                                                                                                                 | SVRK GDC, NIDADAVOLE      | B.RAJA RAJESWARI                       |                       |          |                   |          |
| 8                                                                                                                                                 | GDC ASNM Palakol          | Sri P. Srinivasa Rao                   |                       |          |                   |          |
| 9                                                                                                                                                 | GDC ASNM Palakol          | Kum V. Sairame                         |                       |          |                   |          |
| 10                                                                                                                                                | GDC Bhimavaram            | Sri K. LAKSHMANA RAO                   |                       |          |                   |          |
| 11                                                                                                                                                | SCIM GDC, TANUKU          | Dr.V.VIJAYA KUMAR                      |                       |          |                   |          |
| 12                                                                                                                                                | GDC Tadepalligudem        | A.N.Sudheer Babu                       |                       |          |                   |          |
| 13                                                                                                                                                | GDC Tadepalligudem        | R. Pandu                               |                       |          |                   |          |
| 14                                                                                                                                                | GDC Jangareddigudem       | Smt.T.Jhansi Rani                      |                       |          |                   |          |
| 15                                                                                                                                                | Govt Degree Collge,Eluru  | Smt.T.V.S.Padmavathi                   |                       |          |                   |          |
| 16                                                                                                                                                | GDC,CHINTALAPUDI          | V.MADAN MOHAN RAO                      |                       |          |                   |          |
| 17                                                                                                                                                | GDC W. Palakol            | Dr Mani mala                           |                       |          |                   |          |
| Key Resource Persons                                                                                                                              |                           |                                        |                       |          |                   |          |
| 18                                                                                                                                                | SCIM GDC, TANUKU          | Ch. Devi Palaka                        |                       |          |                   |          |
| 19                                                                                                                                                | GDC Ganapavaram           | Dr Ch. Chaitanya                       |                       |          |                   |          |
| 20                                                                                                                                                | GDC Tanuku (Microbiology) | GDC Tanuku (Microbiology)              |                       |          |                   |          |

## Activity of the Day



## Kahoot Quiz on Ethnobotany



## Day 3



### Single Major subjects Botany and Microbiology

29-02-2024 to 05-03-2024

Day-03

Date: 02-03-2024

#### Day wise Schedule

|                                     |                                                                                                               |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Session I<br>10.00 am to 11.30 am   | <b>Molecular Systematic in Plants</b><br><b>Dr. Siddarthan, UOH</b>                                           |
| Session II<br>11.45 am to 01.15 pm  | <b>OMICS</b><br><b>Knowledge Resource Persons of NRC</b>                                                      |
| Session III<br>02.00 pm to 03.30 pm | <b>Molecular Cloning /Gene Editing/Knockout Approaches</b><br><b>Dr. Rahul Kumar, UOH</b>                     |
| Session IV<br>3.45 pm to 5.15 pm    | <b>Laboratory Protocols &amp; Amrutha University Virtual Labs</b><br><b>Knowledge Resource Persons of NRC</b> |

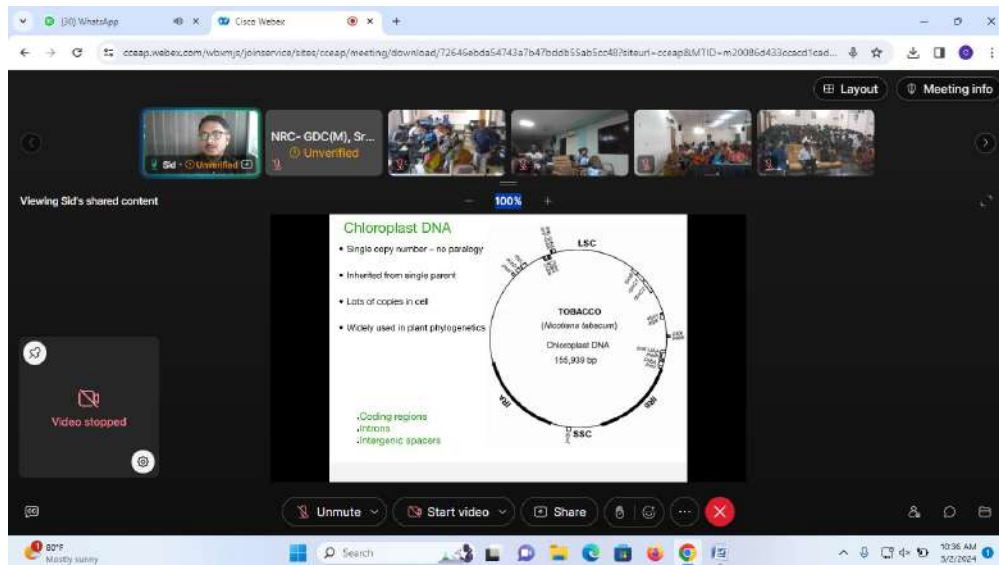
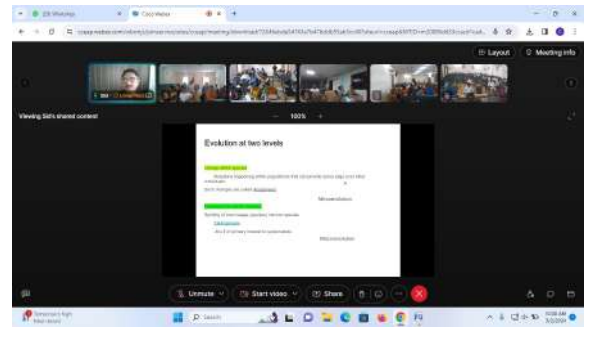
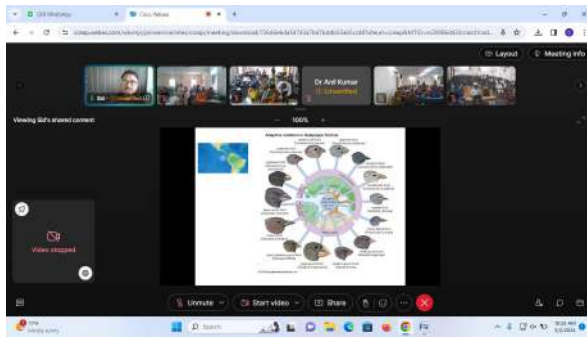
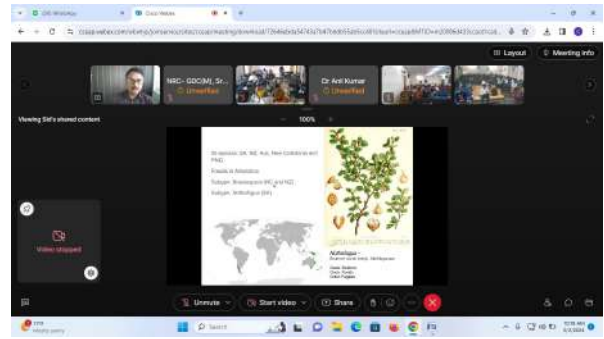
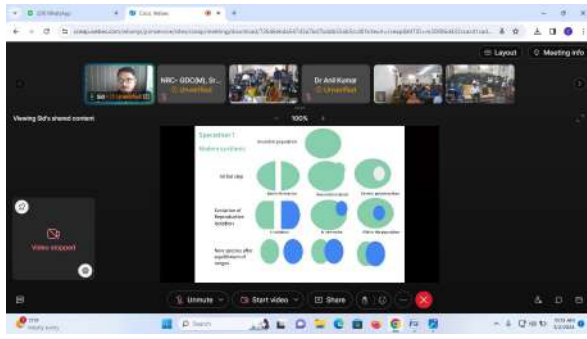
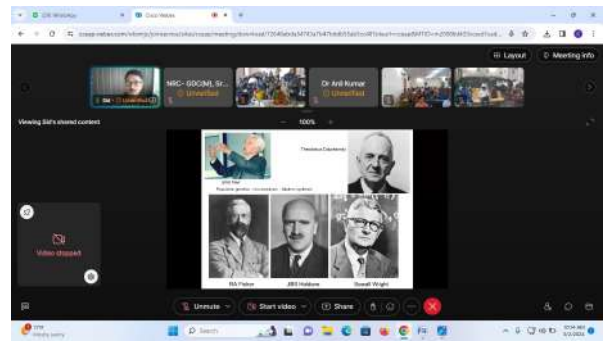
**SESSION I (10:00 am to 11:30 am)- Molecular Syatematics in Plants, Dr.Siddarthan Survereswaran UoH**

#### Highlights of the session

- Concept of Species
- Speciation –reasons and uses
- Sympatric- *M.lewisii* and *M.cardinalis*, reproductive isolation, rapid radiation or adaptive radiation
- allopatric and parapatric speciation
- Evolution at two levels- **anagenesis** and **cladogenesis**
- Plant Barcoding- internal transcribed spacer region (ITS), White et al., 1990
- ITS – not selective therefore they can accumulate more mutations, can detect hybridization
- Chlp genome- single copy number, inherited from single parent, lots of copies in cell
- Phylogenetics of *Spiranthes*

#### Concept of cryptic species

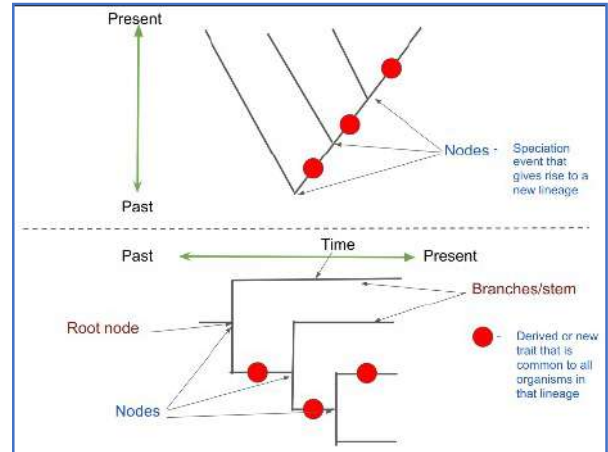
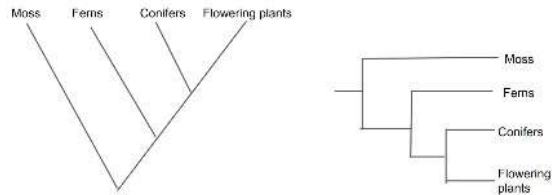




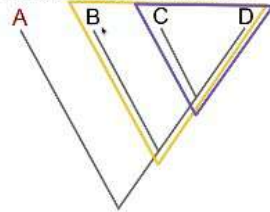
## Phylogenetics

The evolutionary history of relationships between all living things.

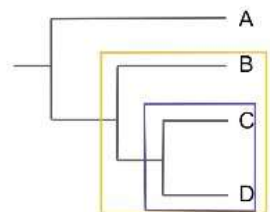
- All living things evolved from a common ancestor



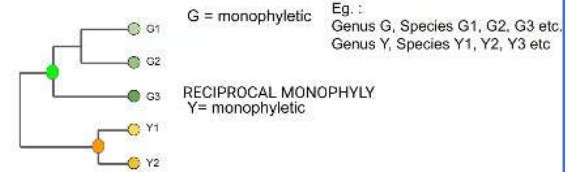
Phylogenetic trees or Cladograms



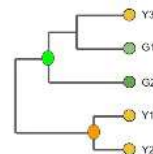
**Clade** - all evolutionary descendants of a common ancestor



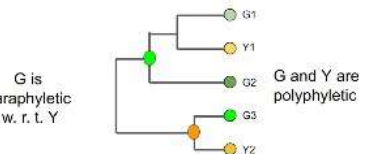
**Sister** - two species that are closest relatives



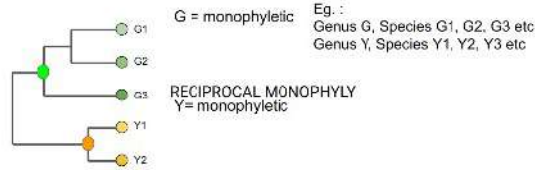
Monophyletic



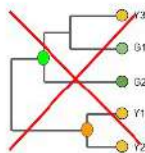
Paraphyletic



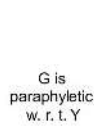
Polyphyletic



Monophyletic



Paraphyletic



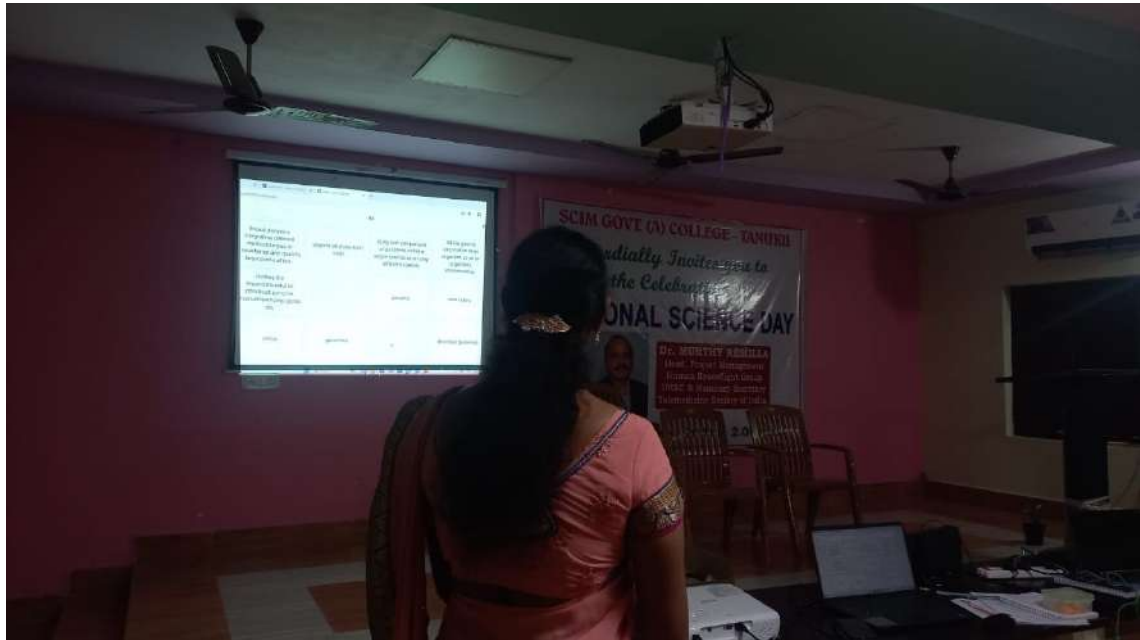
Polyphyletic

## Species concepts

- MSC
  - Morpho-species concept
- BSC
  - Biological species concept
- ESC
  - Ecological Species concept
- PSC
  - Phylogenetic species concept









## SESSION III (2:00pm to 3:30 pm)- Plant Biotechnology-approaches by Dr.Rahul Kumar, UoH

History of plant genetics

Gene manipulation of plants- add a gene, delete, insert or deletion,

Forward genetics

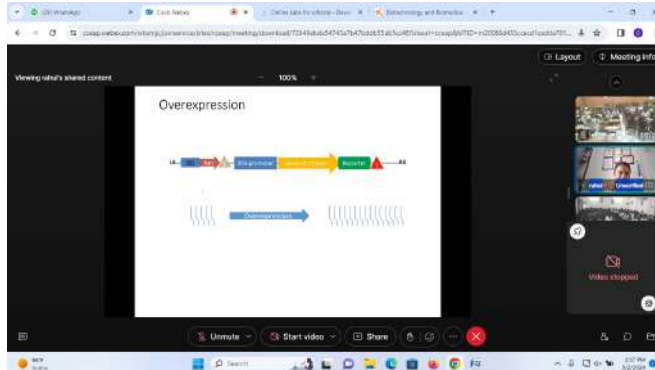
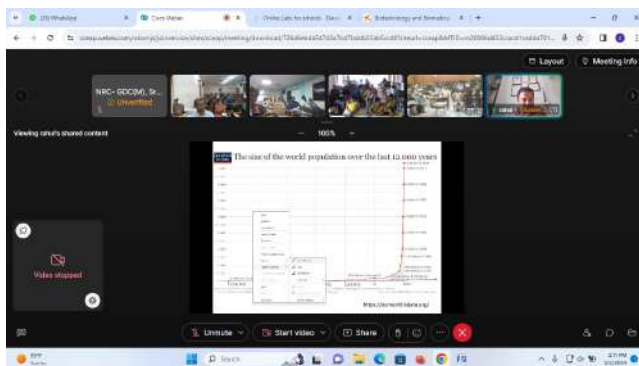
Reverse genetics approach-Over expression, gene silencing, gene knock out

Examples of plant biotechnology- Golden Rice, Flavr savr tomato

Gene Editing technologies- knockout/site specific nucleases

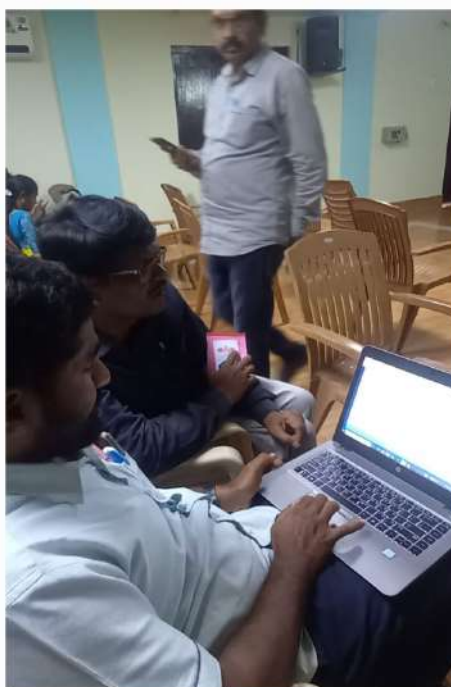
Target DNA strand – target DNA is defined and identified- synthetic guide-an enzyme to excise-replacement of target DNA

Site specific nucleases- cas 9- how it works





**SESSION IV (3:45pm to 5:15 pm)- Laboratory protocols and Amrita Virtual Labs by KRPs- Smt.P.Chamundeshwari Devi and Dr.Ch.Chaitanya**





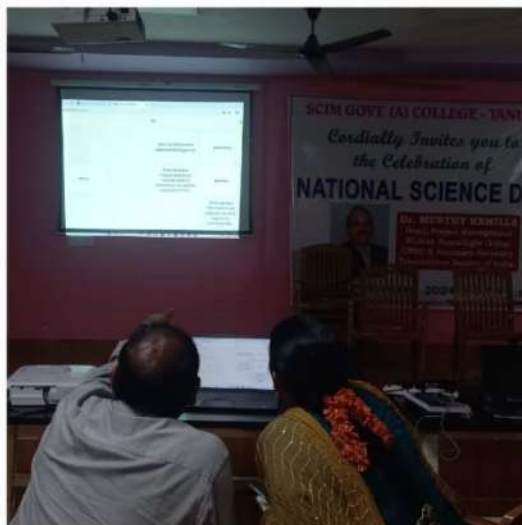
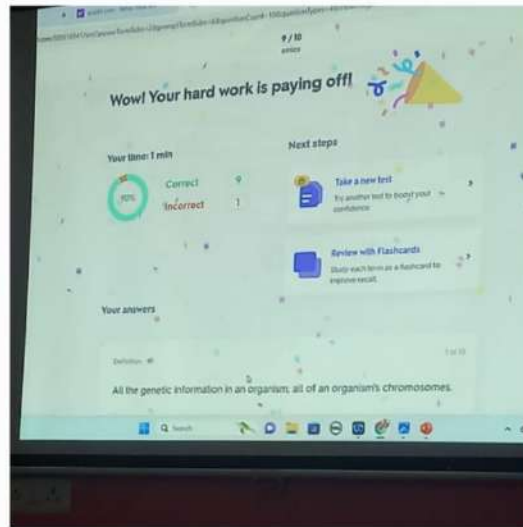
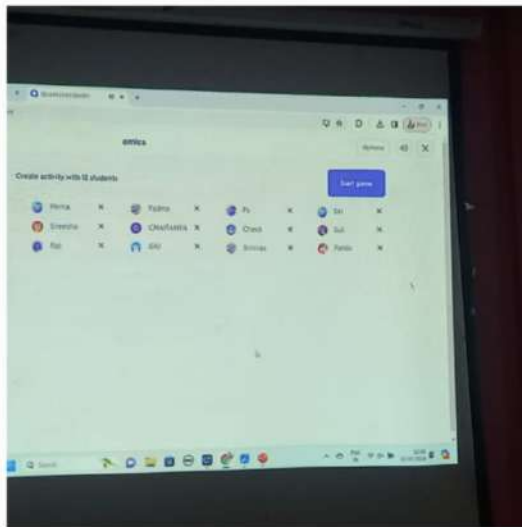


## ATTENDANCE CONSOLIDATION

| Commissionerate of Collegiate Education, A.P.: Mangalagiri                                                                                        |                          |                                   |            |                         |          |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------------------|------------|-------------------------|----------|----------|
| Five Days Training of Trainers(TOT) Single Major Subject UG Pattern - Botany & Microbiology Subjects from 29.02.2024 to 05.03.2024 @ NRC, TANUKU. |                          |                                   |            |                         |          |          |
| Batch 1                                                                                                                                           |                          | Attendance of Faculty             |            | Dated :02/03/2024 FN/AN |          |          |
| S.No                                                                                                                                              | Name & Place of the GDC  | Name of the Faculty(Dr./Smt./Mum) | Signatures |                         |          |          |
|                                                                                                                                                   |                          |                                   | Session1   | Session2                | Session3 | Session4 |
| 1                                                                                                                                                 | GDC Ravulapalem          | Smt.M.Hemalatha                   |            |                         |          |          |
| 2                                                                                                                                                 | GDC, Razole              | P.Sunitha                         |            |                         |          |          |
| 3                                                                                                                                                 | GDC, Razole              | U.Sujatha                         |            |                         |          |          |
| 4                                                                                                                                                 | GDC Kothapeta            | CH.G.R.Jayasi                     |            |                         |          |          |
| 5                                                                                                                                                 | GDC Kothapeta            | P.Sireesha                        |            |                         |          |          |
| 6                                                                                                                                                 | SVRK GDC, NIDADAVOLE     | Dr PSS SRAVANTHI                  |            |                         |          |          |
| 7                                                                                                                                                 | SVRK GDC, NIDADAVOLE     | B RAJA RAJESWARI                  |            |                         |          |          |
| 8                                                                                                                                                 | GDC ASNM Palakol         | Sri P. Srinivasa Rao              |            |                         |          |          |
| 9                                                                                                                                                 | GDC ASNM Palakol         | Kum V. Saisree                    |            |                         |          |          |
| 10                                                                                                                                                | GDC Bhimavaram           | Sri K.LAKSHMANA RAO               |            |                         |          |          |
| 11                                                                                                                                                | SCIM GDC, TANUKU         | Dr.Y.VIJAYA KUMAR                 |            |                         |          |          |
| 12                                                                                                                                                | GDC Tadepalligudem       | A.N.Sudheer Babu                  |            |                         |          |          |
| 13                                                                                                                                                | GDC Tadepalligudem       | B.Pandu                           |            |                         |          |          |
| 14                                                                                                                                                | GDC Jangareddigudem      | Smt T.Jhansi Rani                 |            |                         |          |          |
| 15                                                                                                                                                | Govt.Degree Collge,Eluru | Smt.T.V.S.Padmavathi              |            |                         |          |          |
| 16                                                                                                                                                | GDC,CHINTALAPUDI         | V.MADAN MOHAN RAO                 |            |                         |          |          |
| 17                                                                                                                                                | GDC W Palakol            | Dr Mani mala                      |            |                         |          |          |
| Key Resource Persons                                                                                                                              |                          |                                   |            |                         |          |          |
| 18                                                                                                                                                | SCIM GDC, TANUKU         | Ch. Devi Palaka                   |            |                         |          |          |
| 19                                                                                                                                                | GDC Ganapavaram          | Dr.Ch.Chaitanya                   |            |                         |          |          |
|                                                                                                                                                   |                          |                                   |            |                         |          |          |
|                                                                                                                                                   |                          |                                   |            |                         |          |          |

## ACTIVITY OF THE DAY

## QUIZLET ON OMICS





## DAY 04



### Single Major subjects Botany and Microbiology

29-02-2024 to 05-03-2024

Day-04

Date: 04-03-2024

### Day wise Schedule

|                                     |                                                                                                                                                        |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Session I<br>10.00 am to 11.30 am   | "Crisis in Antarctica: How changing floristic patterns doom an impending catastrophe of the continent?"<br><b>Dr. Felix Bast, University of Punjab</b> |
| Session II<br>11.45 am to 01.15 pm  | funding agencies for biological sciences and Project Proposals<br><b>Knowledge Resource Persons of NRC</b>                                             |
| Session III<br>02.00 pm to 03.30 pm | Statistical Methods for Biological Systems<br><b>Dr. Moumitha Sharay, UOH</b>                                                                          |
| Session IV<br>3.45 pm to 4.45 pm    | Advances in Rice Agronomy and farming Systems Research<br><b>Dr. Manukonda Srinivas ,RARS</b>                                                          |
| Session V<br>4.45 pm to 5.15 pm     | Bioethics and IPR<br><b>Knowledge Resource Persons of NRC</b>                                                                                          |

**SESSION I (10:00 am to 11:30 am) - Crisis in Antarctica: How changing floristic patterns doom an impending catastrophe of the continent, Dr.Felix Bast,University of Punjab**

### **Highlights of the session**

History of the formation of

Maitri station (1998)

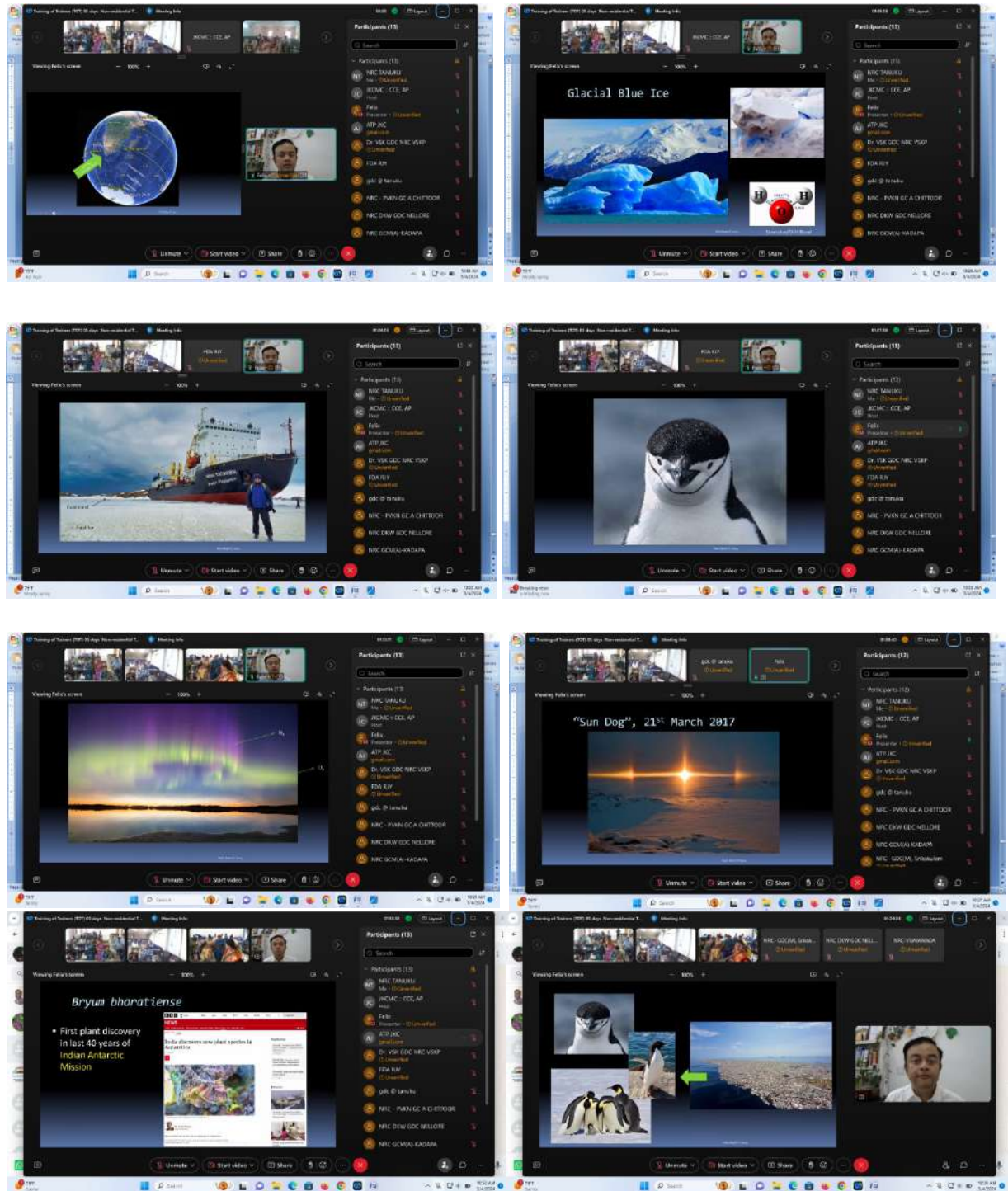
Bharati Station (2012), Larsemann Hills

Sun Dog, 21<sup>st</sup> March 2017

Antarctica – 6 months summer and 6 months winter

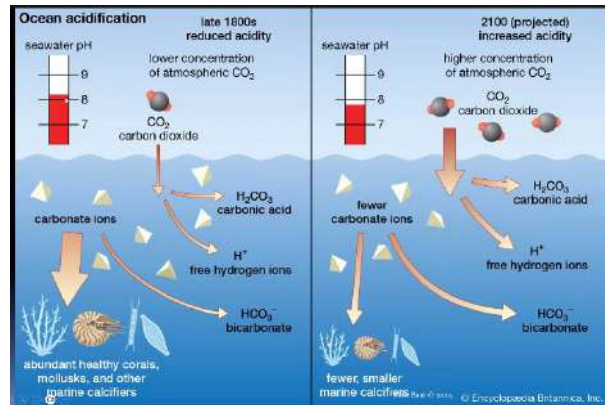
Microplastics- accumulation in oceans

## Albedo effect



Sustainable life style

No to plastics



### Complete collapse of Antarctica within 50 years?!

- Up to 30 meters raise in sea-level
- Shift in earth's axial tilt, slows down earth's rotation, days will increase, runaway global warming.



### Solutions for plastic pollution and EDC exposure? Lifestyle Changes

- For plastic pollution
  - Say NO to takeaway plastic disposables
  - Carry reusable cutlery, water bottle, and reusable tote everywhere
- For minimizing EDC exposure
  - Avoid food, especially hot oily food, in plastic containers
  - Make sure your water bottle/food containers etc are BPA & BPS Free
  - Learn more about RIC: Resin Identification Codes.

### Solutions for climate change? Sustainable Lifestyle

- Owning no car. I commute by cycle.
- Have no more than 2 children!
- Minimize flights, especially international flights
- While travelling, stick with public transportation
- Buy less, that leads to waste less. = anti-consumerist lifestyle. Aim towards **Zero Waste**

- No fast fashion. Reuse and Repair. I also buy mostly local seasonal produce, no exotic stuff
- Season-appropriate clothing, instead of depending on ambient heating/cooling. I never buy fast fashion.
- I vote for the party that stands for environment
  - Building walkable cities, public transportation, and renewable energy



<http://bit.ly/bastf>









**SESSION II (11:45 am to 1:15pm)-Funding agencies for Biological sciences and project proposals by KRPs- Smt.P.Chamundeshwari Devi and Dr.Ch.Chaitanya**

Different Funding Agencies- CRG-Competitive research grant

LSRB-Life Science Research Board, SERB Power Research Grant, BIONEST

SBIRI, CEFIPRA

Standard Model or Basic Proposal outline

Title, Introduction,Hypothesis,Review of Literature, Methods, Time or plan of work, Contingency Plans, Proposed outcomes etc.



## SESSION III (2:00pm to 3:30 pm)- Statistics methods in Biological systems by Dr.Moumitha Saharay UoH

Importance of bio statistics

P-test

Null hypothesis

Rejection of null hypothesis

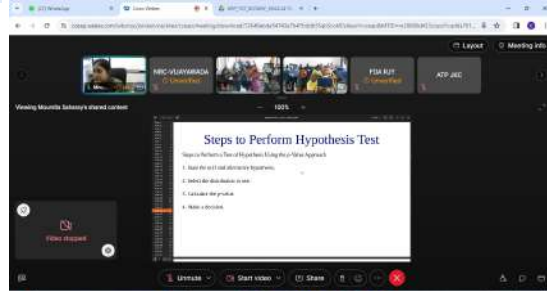
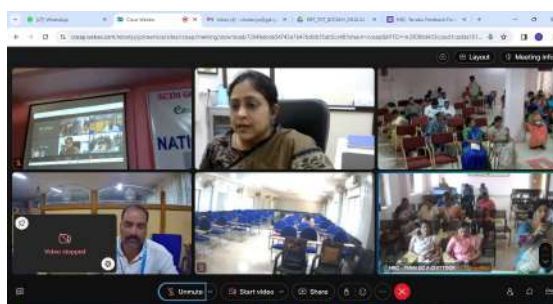
Tails of test- left and right

Normal Distribution

One way ANNOVA

Chi square test

Linear regression, Spearmans correlation



### Null and Alternative hypothesis

**Example :** Let  $\mu$  be the mean amount of soda in all cans. The company's claim will be true if  $\mu=12$  ounces. Thus, the null hypothesis will be written as,  
 $H_0: \mu=12$  ounces (The company's claim is true)

The null hypothesis can also be written as  $\mu \geq 12$  ounces because the claim of the company will still be true if the cans contain, on average, more than 12 ounces of soda.

Thus, for Null hypothesis, we can use both  $=$  and  $\geq$  signs.

The company will be accused of cheating the public only if the cans contain, on average, less than 12 ounces of soda.  
Thus, alternative hypothesis  
 $H_1: \mu < 12$  (The company's claim is NOT true)

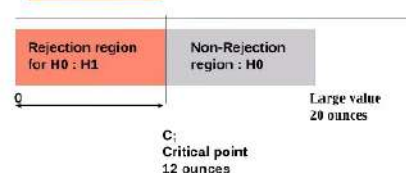
### Null and Alternative hypothesis

**Type I error:**  
A Type I error occurs when a true null hypothesis is rejected. The variable ' $\alpha$ ' represents the probability of committing this type of error. The value of  $\alpha$  represents the **significance level** of the test.

**Type II error:**  
A Type II error occurs when a false null hypothesis is not rejected. The value of  $\beta$  represents the probability of committing a Type II error; that is,  
 $\beta = P(H_1 \text{ is not rejected} | H_1 \text{ is false})$   
The value of  $(1 - \beta)$  is called the power of the test. It represents the probability of not making a Type II error.

## Null and Alternative hypothesis

Rejection and Non rejection Region:

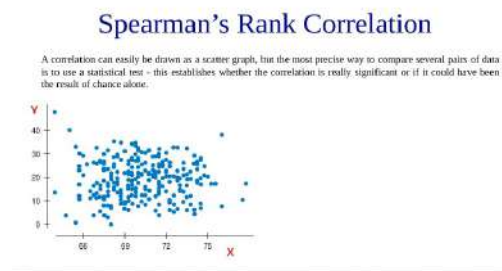
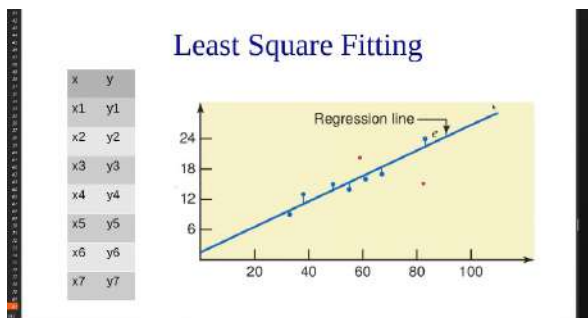


### Null and Alternative hypothesis

**Example :** Let a soft-drink company claims that, on average, its cans contain 12 ounces of soda. In reality, this claim may or may not be true.

However, we will initially assume that the company's claim is true (that is, the company is not guilty of cheating and lying). To test the claim of the soft-drink company, the null hypothesis will be that the company's claim is true.

Let  $\mu$  be the mean amount of soda in all cans. The company's claim will be true if  $\mu=12$  ounces. Thus, the null hypothesis will be written as,  
 $H_0: \mu=12$  (The company's claim is true)



**Spearman's Rank Correlation**

The correlation coefficient (R<sub>s</sub>) is a statistic which can be used to determine the strength and direction (positive or negative) of a relationship between two variables.

The formula for R<sub>s</sub> is:

$$R_s = 1 - \frac{6 \sum d^2}{n(n^2 - 1)}$$

Where:

- $d$  = the difference between the ranks of corresponding data points
- $n$  = the number of data points

**Comparison between Two Correlation Coefficients**

- 1. The Pearson correlation coefficient (r) is based on the actual values of the variables, while the Spearman correlation coefficient (R<sub>s</sub>) is based on the ranks of the values.
- 2. The Pearson correlation coefficient (r) is more sensitive to outliers than the Spearman correlation coefficient (R<sub>s</sub>).
- 3. The Spearman correlation coefficient (R<sub>s</sub>) is more robust to outliers than the Pearson correlation coefficient (r).
- 4. The Pearson correlation coefficient (r) is more appropriate for continuous data, while the Spearman correlation coefficient (R<sub>s</sub>) is more appropriate for ordinal data.

**SESSION IV (3:45pm to 5:15 pm)- Advavnces in Rice Agronomy and Rice farming syatems by Dr.Manukonda Srinivas, RARS**

**ACHARYA N.G. RANGA AGRICULTURAL UNIVERSITY**

Five-Day Non-Residential Training of Trainers (TOT) by SCIM Govt. College, Tanuku

**RECENT ADVANCES IN RICE AGRONOMY & FARMING SYSTEMS RESEARCH**

by **Dr. Manukonda Srinivas**  
 953-1441111  
 Professor, Department of Agriculture, RARS  
 All India Institute of Rice Research  
 National Agricultural Research Station  
 MAHABUBNAGAR-504 122, W.G. Road, A.P.  
 E-mail: [manukonda@rars.org](mailto:manukonda@rars.org)  
 Mobile: +91 98430 99905

Meeting Info: 08:07:58

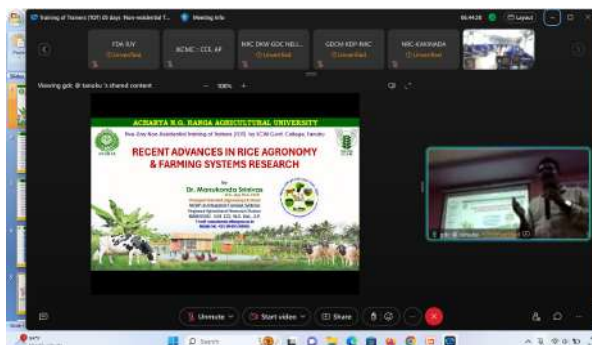
Participants:

- NRC TANUKU (Unverified)
- NRC- GDC(M), Srikakulam (Unverified)
- gdc @ tanuku (Unverified)

Unmute Start video Share

3:26 PM 3/4/2024







## Attendance Consolidation

| Commissionerate of Collegiate Education, A.P:- Mangalagiri                                                                                        |                              |                                       |            |                         |          |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------------|------------|-------------------------|----------|----------|
| Five Days Training of Trainers(TOT) Single Major Subject UG Pattern - Botany & Microbiology Subjects from 29.02.2024 to 05.03.2024 @ NRC, TANUKU, |                              |                                       |            |                         |          |          |
| Batch 1                                                                                                                                           |                              | Attendance of Faculty                 |            | Dated :04/03/2024 FN/AN |          |          |
| S.No                                                                                                                                              | Name & Place of the GDC      | Name of the Faculty(Dr./Sri/Smt./Kum) | Signatures |                         |          |          |
|                                                                                                                                                   |                              |                                       | Session1   | Session2                | Session3 | Session4 |
| 1                                                                                                                                                 | GDC Ravulapalem              | Smt.M.Hemalatha                       |            |                         |          |          |
| 2                                                                                                                                                 | GDC, Razole                  | P.Sunitha                             |            |                         |          |          |
| 3                                                                                                                                                 | GDC, Razole                  | U.Sujatha                             |            |                         |          |          |
| 4                                                                                                                                                 | GDC Kothapeta                | CH.G.R.Jayasi                         |            |                         |          |          |
| 5                                                                                                                                                 | GDC Kothapeta                | K.Sireesha                            |            |                         |          |          |
| 6                                                                                                                                                 | SVRK GDC, NIDADAVOLE         | Dr PSS SRAVANTHI                      |            |                         |          |          |
| 7                                                                                                                                                 | SVRK GDC, NIDADAVOLE         | B.RAJA RAJESWARI                      |            |                         |          |          |
| 8                                                                                                                                                 | GDC ASNM Palakol             | Sri P. Srinivasa Rao                  |            |                         |          |          |
| 9                                                                                                                                                 | GDC ASNM Palakol             | Kum V. Saikree                        |            |                         |          |          |
| 10                                                                                                                                                | GDC Bhimavaram               | Sri K. LAKSHMANA RAO                  |            |                         |          |          |
| 11                                                                                                                                                | SCIM GDC, TANUKU             | Dr.Y.VIJAYA KUMAR                     |            |                         |          |          |
| 12                                                                                                                                                | GDC Tadepalligudem           | A.N.Sudheer Babu                      |            |                         |          |          |
| 13                                                                                                                                                | GDC Tadepalligudem           | B.Pandu                               |            |                         |          |          |
| 14                                                                                                                                                | GDC Jangareddigudem          | Smt.T.Jhansi Rani                     |            |                         |          |          |
| 15                                                                                                                                                | Govt.Degree Collge,Eluru     | Smt.T.V.S.Padmavathi                  |            |                         |          |          |
| 16                                                                                                                                                | GDC,CHINTALAPUDI             | V.MADAN MOHAN RAO                     |            |                         |          |          |
| 17                                                                                                                                                | GDC W Palakol                | Dr Mani mala                          |            |                         |          |          |
| Key Resource Persons                                                                                                                              |                              |                                       |            |                         |          |          |
| 18                                                                                                                                                | SCIM GDC, TANUKU             | Ch. Devi Palaka                       |            |                         |          |          |
| 19                                                                                                                                                | GDC Ganapavaram              | Dr.Ch.Chaitanya                       |            |                         |          |          |
| 20                                                                                                                                                | P.Sunitha<br>27th GDC TANUKU | P.Sunitha                             |            |                         |          |          |

## Activity

### Cross Word Puzzle

## DAY 05



### Single Major subjects Botany and Microbiology

29-02-2024 to 05-03-2024

Day-05

Date: 05-03-2024

#### Day wise Schedule

|                                     |                                                                                                   |
|-------------------------------------|---------------------------------------------------------------------------------------------------|
| Session I<br>10.00 am to 11.30 am   | Eukaryotic Genome Organisation Structure and Functions<br><b>Prof. Sreenivasulu Kurukuti, UOH</b> |
| Session II<br>11.45 am to 01.15 pm  | Gene editing Technologies<br><b>Knowledge Resource Persons of NRC</b>                             |
| Session III<br>02.00 pm to 03.30 pm | Strategies To Cultivate Microorganisms<br><b>Prof. CH. Venkata Ramana</b>                         |
| Session IV<br>3.45 pm to 5.15 pm    | Herbarium Techniques-BSI<br><b>Dr. J. Swami Scientist C, BSI, Kolkata</b>                         |

**SESSION I (10:00 am to 11:30 am) – Eukaryotic Genome Organization Structure and Functions, by Prof.Sreenivasulu Kurukuti, UoH**

Regulated gene expression in Animal development

Stem cell and lineages

Organization of DNA

Transcription of the genes

Active and Repressive genome compartments

Spectral Karyotyping

Chromosomal Conformation techniques- 2C, 3C , 4C

Hierarchial organization of chromatin and

Topological associated domains



NRC @Tanuku session I

Training of Trainers (TOT) 05 days Non-residential T... Meeting Info 55:42 Layout

JKCMC - CCE, AP

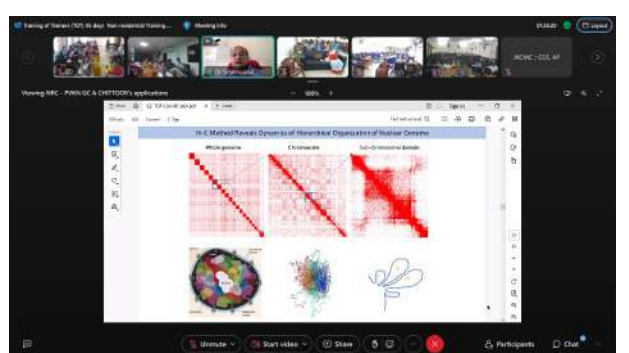
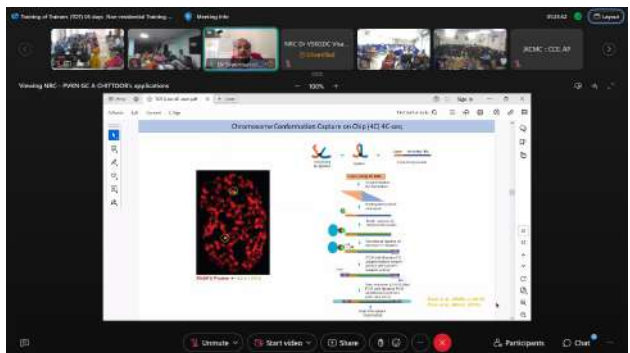
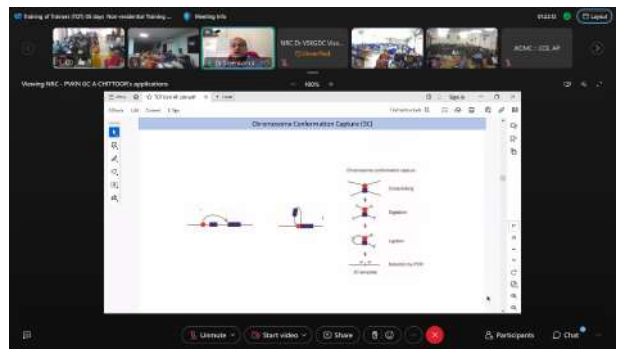
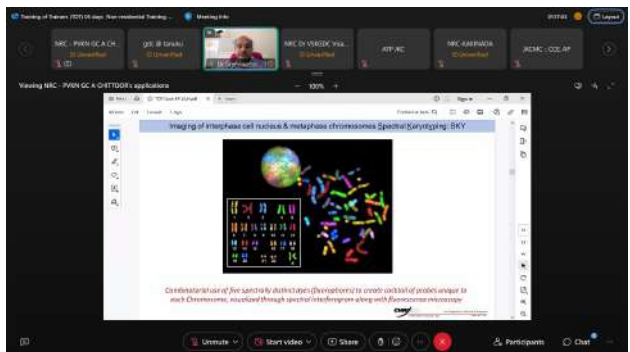
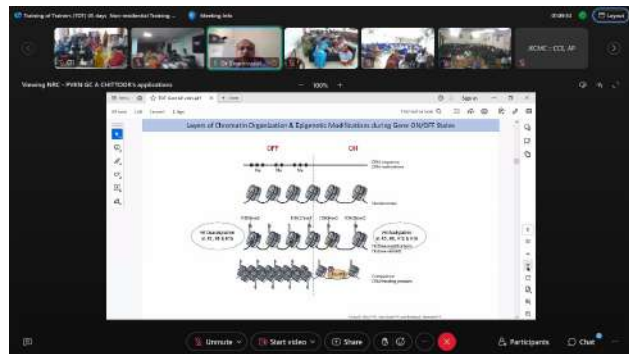
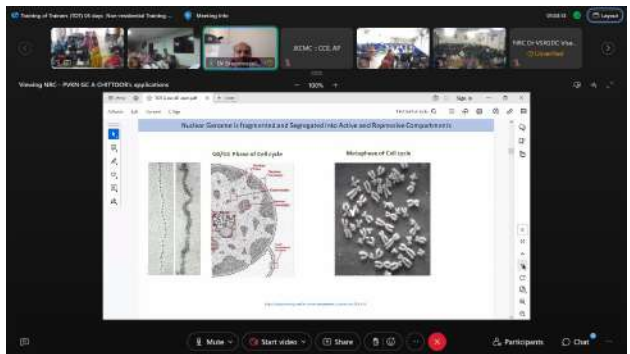
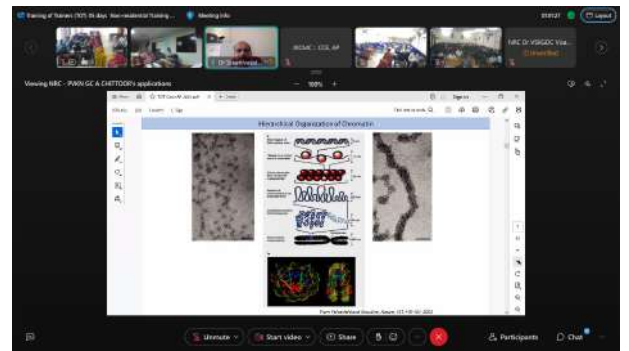
Viewing NRC - PVKN GC A CHITTOOR's applications

Regulated Gene Expression Accompany Animal Development

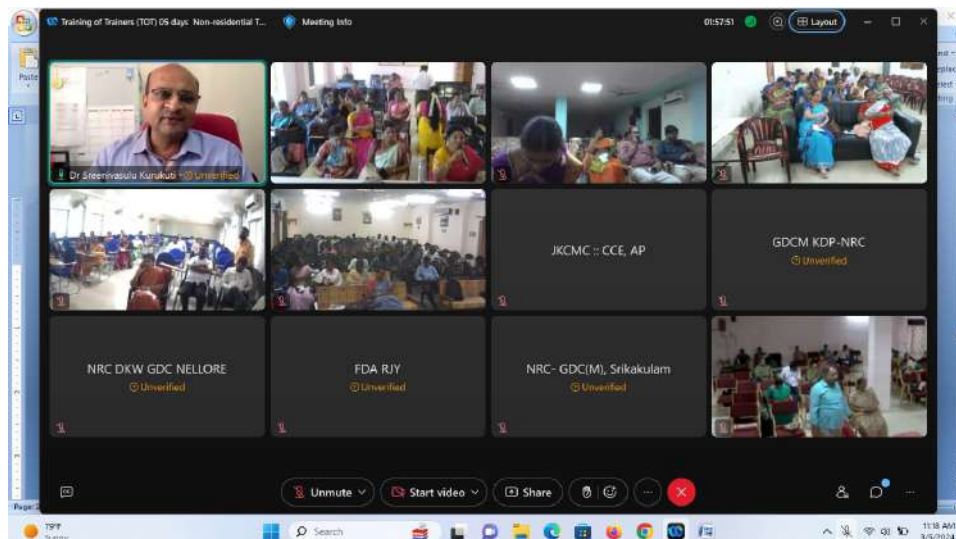
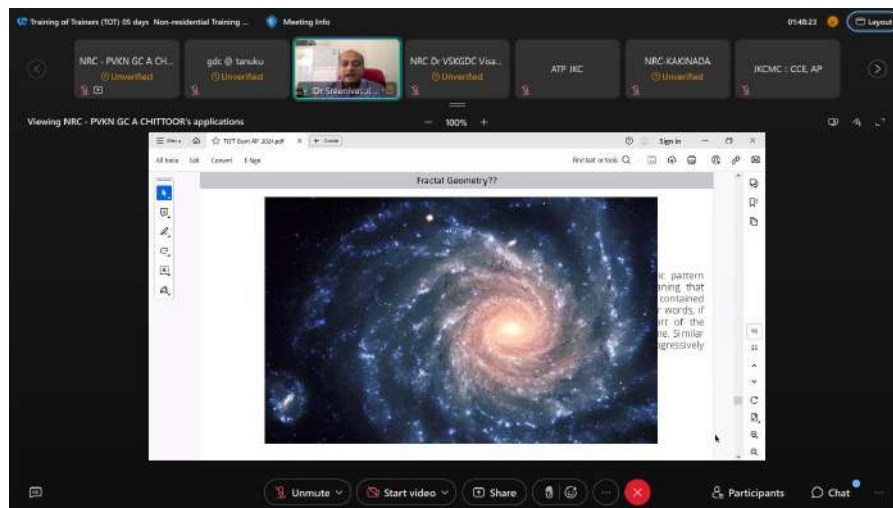
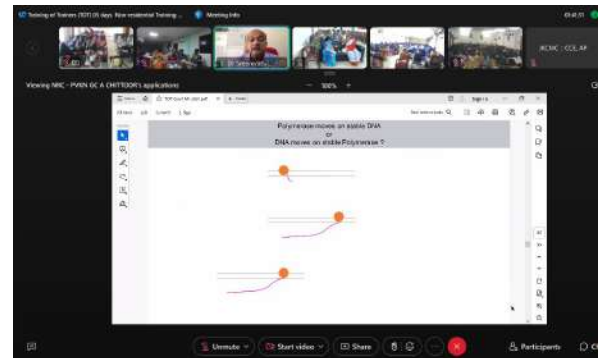
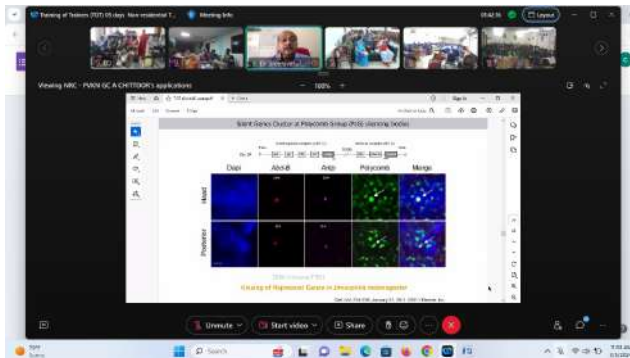
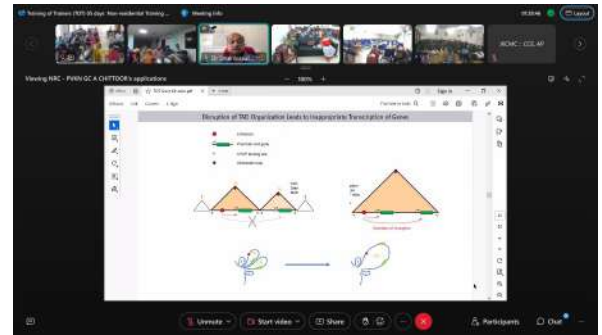
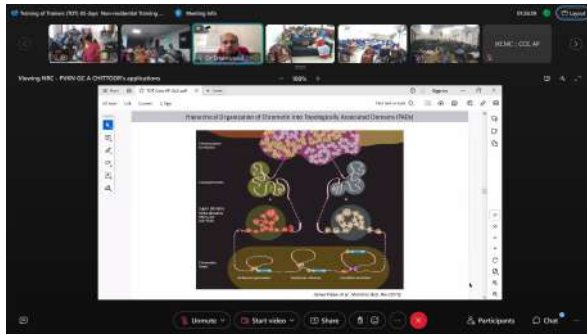
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70°F Sunny Search 10:16 AM 3/8/2024









**SESSION II (11:45 am to 1:15pm)-Gene Editing Technology by KRPs-  
Smt.P.Chamundeshwari Devi and Dr.Ch.Chaitanya**

History of Gene Editing

Previous tools- ZFNs and TALENs

CRISPAR Cas9-latest

Guide RNA, PAM sites (NGG), Target DNA sequence

Double strand breaks and repair mechanism

NHEJ and HDR



## SESSION III (2:00pm to 3:30 pm)- Strategies to cultivate Microorganisms by Prof.CH.Venkata Ramana,UoH

Microbes- a immense wealth

Classical cultivation strategies and methods

Five categories of big phyla extensively cultured in India

Reasons for Unculturability- VBNC

New Techniques for Cultivation

Identification of microbes

Microbiological quality check- purity of a culture

The collage consists of three screenshots from a video conference. The top-left screenshot shows a presentation slide titled "Bacterial contamination in Kerala is an example of failure of our industry" with images of a polluted beach and a dead cow. The top-right screenshot shows a presentation slide titled "Classical cultivation strategies and methods" with diagrams of various cultivation techniques. The bottom screenshot shows a presentation slide titled "The five big phyla extensively studied in India" with a diagram of five phyla: Pseudomonadota, Bacillota, Actinomycetota, Bacteroidota, and Cyanobacteria. A "Take home message" box is also visible.

**The five big phyla extensively studied in India**

- 01 *Pseudomonadota* - Eg. *Pseudomonas* and related members; *Pseudomonads*
- 02 *Bacillota* - Eg. *Bacillus* and related members
- 03 *Actinomycetota* - Eg. *Streptomyces* and related members
- 04 *Bacteroidota* - Eg. *Bacteroides* and related members
- 05 *Cyanobacteria* - Eg. *Spirulina* and related members

**Take home message:**

1. The five are not the ultimate, diversification should be the future goal.
2. Choosing the easy and leaving the difficult will not pave way for novel discoveries.

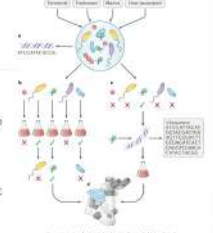


Viewing of Webinar (2021-25 days Non-residential Training) - Meeting Info

Viewing Webinar's Collection M480 01-1-2024

### New techniques for cultivation

- High-throughput isolation and cultivation
  - Scaling-up the number of cell isolations to increase the chance of isolating a species
- Targeted isolation
  - Selectively isolate organisms with specific functional characteristics



Lewis et al. 2020, Nat. Rev. Microbiol.

Viewing of Webinar (2021-25 days Non-residential Training) - Meeting Info

Viewing Webinar's Collection M480 01-1-2024



- Cell sorting-based cultivation
- Membrane diffusion-based cultivation
- Microfluidic systems for cultivation

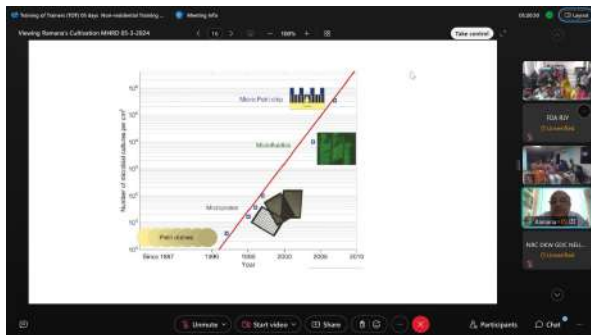
Viewing

Key lines used to cultivate members of under-sampled or poorly characterized groups are as they related to experience

Key lines used to cultivate less members of groups for which there are already established experience

The strategy applied is good as principle requires to cultivate or select members of under-sampled

Lewis et al. 2020, Nat. Rev. Microbiol.



Viewing of Webinar (2021-25 days Non-residential Training) - Meeting Info

Viewing Webinar's Collection M480 01-1-2024

### Other terminology used in place of VBNC

- Dormant
- Quiescent
- Ultramicrobacterial
- Minicell
- Cryptically growing
- Slow growing
- Resting cells
- Sleeping cells





### Limitations of Gram-staining

- Some Gram-positive bacteria may lose the stain easily and therefore appear as a mixture of Gram-positive and Gram-negative bacteria (Gram-variable).
- When over-physiolysed, even Gram-positive bacteria may appear pink and when under-physiolysed, even Gram-negative bacteria may appear Gram-positive.
- The Gram reaction also depends on the age of the cell. Old cultures of Gram-positive bacteria may lose the stain due to the loss of their cell wall structure.
- Gram-positive cells affected by cell wall active agents such as lysozyme or antibiotics may become Gram-negative.
- Gram-positive bacteria, such as *Actinomyces*, *Actinobaculum*, *Coriobacterium*, *Mycobacterium* and *Rhodocyclidium*, do not stain satisfactorily positively by change during cell division, resulting in Gram-negative staining of these cells.
- In cultures of *Bacillus* and *Clostridium*, a decrease in peptidoglycan thickness during cell growth may cause some of them to appear Gram-negative.
- Certain groups of bacteria can display variable response to the stain which can be due to growth phase (e.g., virulence factors, flagella, etc.), or resistance (high levels of a number of non-staining, gram-negative cells in a gram positive culture) but growth requirements are not known for their gram variability.
- Some bacteria tend to appear Gram-negative when grown in acidic medium.
- Loss of cell walls in Gram-positive bacteria may render them Gram-negative (L-forms).
- Bacteria totally devoid of cell wall (Mycoplasmas) are always Gram-negative.
- Species such as *Mycobacterium* have extra easy content in their cell wall and are difficult to stain.
- Small and slender bacteria such as *Treponema*, *Chlamydia*, *Rickettsia* are often difficult to stain by Gram's method.

### Prokaryotes(Bacteria) does not satisfy the criteria for species concept

- Bacteria's are morphologically identical but physiologically they are different.
- They keep on changing their genetical composition.
- They can easily acquire the characteristics of other bacteria. By taking their genetic material.
- They are very flexible at releasing and picking the genes of other bacteria.
- They lack true sexual reproduction but it occurs through another process known as Recombination.
- Their biochemical functions are totally different even the individuals belong to the same genus.



### Defining prokaryotic species by a rRNA gene sequencing approach

- Isolates that have >97% (recent, 98.7%) 16S rRNA gene sequence (>1400 nt) identity and might or might not meet the 70% DDH criterion.
- Species distinguished based on the above concept are defined as **genomospecies** i.e species having >97% (recent, 98.7%) 16S rRNA gene identity and < 70% DDH.

### How are Bacteria classified?

```

graph TD
    Protobacteria --> Alphaproteobacteria
    Protobacteria --> Betaproteobacteria
    Protobacteria --> Gammaproteobacteria
    Protobacteria --> Deltaproteobacteria
    Alphaproteobacteria --> Enterobacteriales
    Alphaproteobacteria --> Chromatiales
    Alphaproteobacteria --> Pseudomonadales
    Enterobacteriales --> Enterobacteriaceae
    Enterobacteriales --> Vibrionaceae
    Enterobacteriales --> Pasteurellaceae
    Enterobacteriaceae --> Escherichia
    Enterobacteriaceae --> Shigella
    Enterobacteriaceae --> Salmonella
    Enterobacteriaceae --> Clostridium
    Enterobacteriaceae --> Klebsiella
    Enterobacteriaceae --> E.coli
    Enterobacteriaceae --> Serratia
    
```

### Polyphasic Taxonomy

| Expressed Characteristics       | Genotypic Characteristics | Phylogenetic Characteristics |
|---------------------------------|---------------------------|------------------------------|
| Colony morphology               | Base % G+C                | Size, RFLP                   |
| Size                            | RFLP                      | Alignment                    |
| Color                           | 16S rRNA sequencing       | Phylogeny                    |
| Cell morphology                 | DNA-DNA hybridization     | Phylogeny                    |
| Gram Staining                   |                           | Phylogeny                    |
| Shape                           |                           | Phylogeny                    |
| Motility                        |                           | Phylogeny                    |
| Biochemical                     |                           | Phylogeny                    |
| Enzymology                      |                           | Phylogeny                    |
| Antigen Production              |                           | Phylogeny                    |
| Oxidation - Fermentation        |                           | Phylogeny                    |
| Whole cell protein analysis     |                           | Phylogeny                    |
| Utilization of Carbon compounds |                           | Phylogeny                    |
| Antibiotic sensitivity          |                           | Phylogeny                    |
| Chemotaxonomic                  |                           | Phylogeny                    |
| Lipids                          |                           | Phylogeny                    |
| FAME                            |                           | Phylogeny                    |
| Isoprenoid quinones             |                           | Phylogeny                    |
| Mycotoxins                      |                           | Phylogeny                    |
| Pigments                        |                           | Phylogeny                    |
| Peptidoglycan                   |                           | Phylogeny                    |
| Cell wall rigidity              |                           | Phylogeny                    |



### Preservation of Microbial Cultures

- Periodic Transfer and Refrigeration
- Mineral Oil Slant
- Freezing in Growth Medium (with Glycerol)
- Lyophilization
- Ultradry Freezing (with liquid nitrogen)

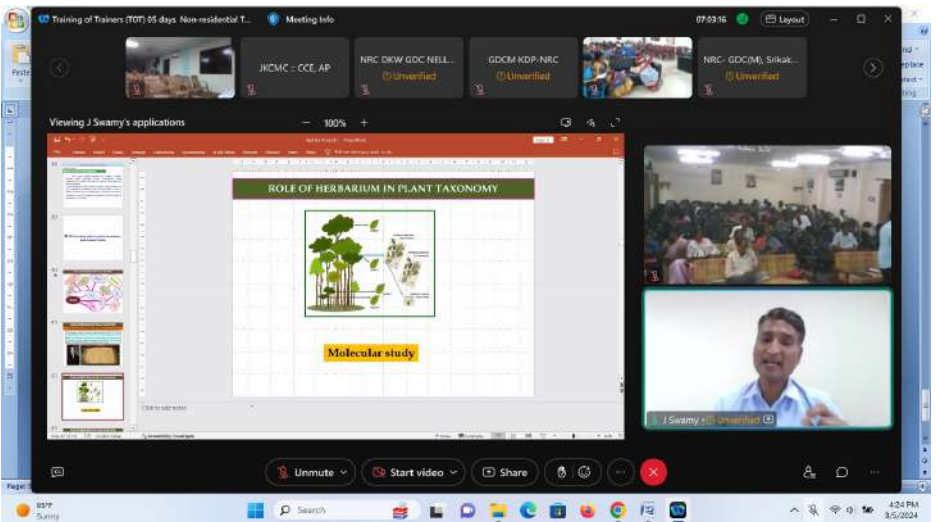
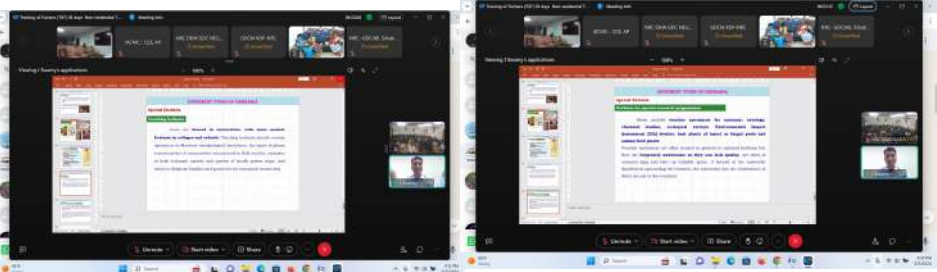
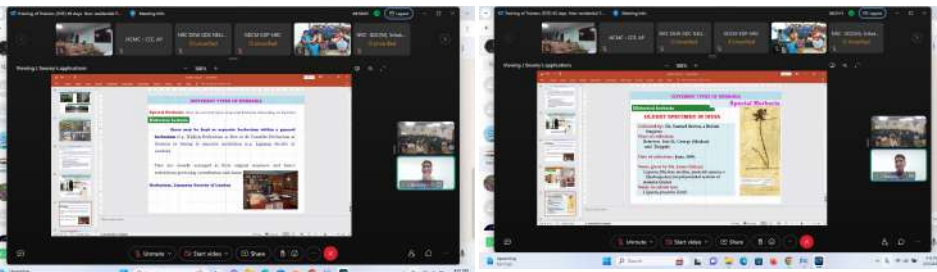
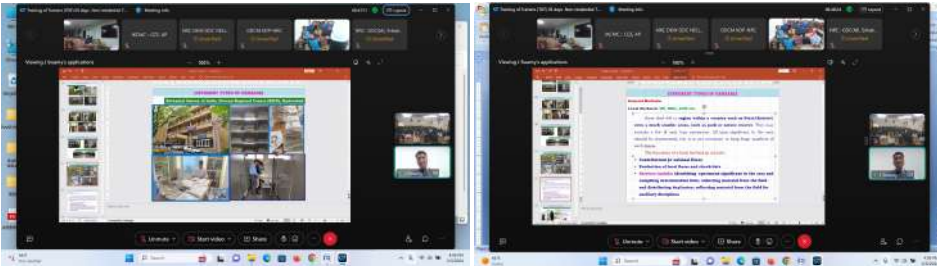
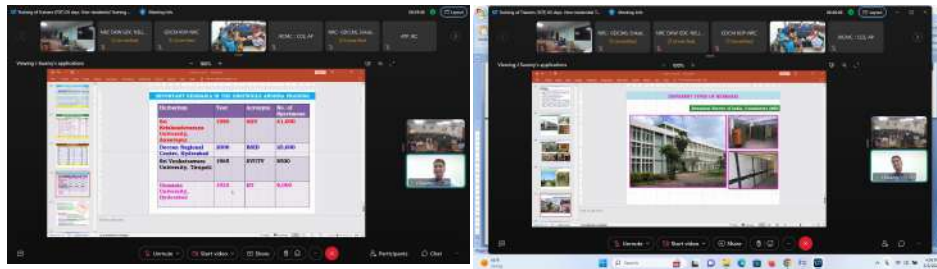
## SESSION IV (3:45pm to 5:15 pm)- Herbarium Techniques- BSI/PBR by Dr.J.Swami, Scientist C, BSI Kolkatha

History of the art of Herbarium

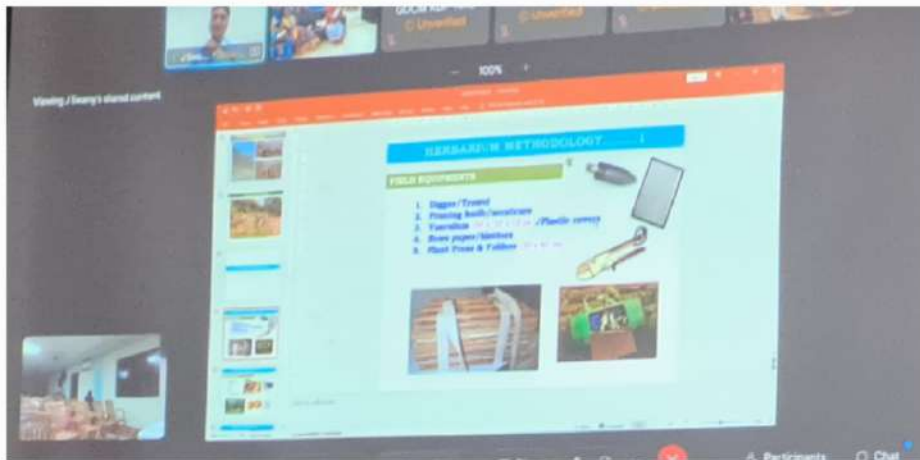
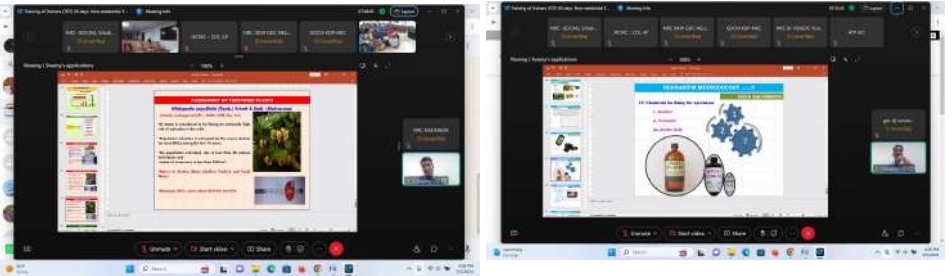
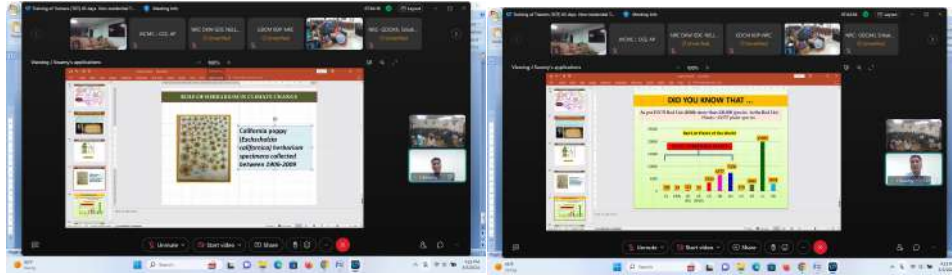
Herbaria at National and International Level

The collage consists of six screenshots from a Zoom meeting. The top-left screenshot shows a grid of participant video feeds. The top-right screenshot shows a presentation slide titled "SIGNIFICANT EVENTS IN THE HISTORY OF HERBARIUM SCIENCE". The middle screenshot shows a large video feed of Dr. J. Swami speaking. The bottom-left screenshot shows a presentation slide titled "INDEX HERBARIORUM". The bottom-middle screenshot shows a presentation slide titled "HERBARIUM GEOGRAPHY IN THE WORLD" with a world map. The bottom-right screenshot shows a presentation slide titled "WORLD HERBARIA" with a table of data.

| Country | Number of Species | Number of Genera | Number of Families | Number of Orders | Number of Classes | Number of Divisions | Number of Sections | Number of Subsections | Number of Tribes | Number of Subtribes | Number of Genera | Number of Species |
|---------|-------------------|------------------|--------------------|------------------|-------------------|---------------------|--------------------|-----------------------|------------------|---------------------|------------------|-------------------|
| India   | 10,000            | 2,000            | 1,000              | 500              | 200               | 100                 | 50                 | 25                    | 10               | 5                   | 1,000            | 10,000            |
| USA     | 15,000            | 3,000            | 1,500              | 750              | 300               | 150                 | 75                 | 37                    | 15               | 7                   | 1,500            | 15,000            |
| UK      | 12,000            | 2,500            | 1,250              | 625              | 250               | 125                 | 62                 | 31                    | 12               | 6                   | 1,250            | 12,000            |
| France  | 11,000            | 2,200            | 1,100              | 550              | 220               | 110                 | 55                 | 27                    | 11               | 5                   | 1,100            | 11,000            |
| Germany | 10,500            | 2,100            | 1,050              | 525              | 210               | 105                 | 52                 | 26                    | 10               | 5                   | 1,050            | 10,500            |
| Japan   | 10,000            | 2,000            | 1,000              | 500              | 200               | 100                 | 50                 | 25                    | 10               | 5                   | 1,000            | 10,000            |
| China   | 9,500             | 1,900            | 950                | 475              | 190               | 95                  | 47                 | 23                    | 9                | 4                   | 950              | 9,500             |
| Italy   | 9,000             | 1,800            | 900                | 450              | 180               | 90                  | 45                 | 22                    | 9                | 4                   | 900              | 9,000             |
| Spain   | 8,500             | 1,700            | 850                | 425              | 170               | 85                  | 42                 | 21                    | 8                | 4                   | 850              | 8,500             |
| Sweden  | 8,000             | 1,600            | 800                | 400              | 160               | 80                  | 40                 | 20                    | 8                | 4                   | 800              | 8,000             |







## Attendance Consolidation

| Commissionerate of Collegiate Education, A.P.: Mangalagiri                                                                                        |                          |                                    |            |                         |          |          |
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| Batch 1                                                                                                                                           |                          | Attendance of Faculty              |            | Dated :05/03/2024 FN/AN |          |          |
| S.No                                                                                                                                              | Name & Place of the GDC  | Name of the Faculty(Dr /Smt./Kum.) | Signatures |                         |          |          |
|                                                                                                                                                   |                          |                                    | Session1   | Session2                | Session3 | Session4 |
| 1                                                                                                                                                 | GDC Ravulapalem          | Smt.M. Hemalatha                   |            |                         |          |          |
| 2                                                                                                                                                 | GDC, Razole              | P Sunita                           |            |                         |          |          |
| 3                                                                                                                                                 | GDC, Razole              | U.Sujatha                          |            |                         |          |          |
| 4                                                                                                                                                 | GDC Kothapeta            | CH.G.R.Jayasi                      |            |                         |          |          |
| 5                                                                                                                                                 | GDC Kothapeta            | K.Sireesha                         |            |                         |          |          |
| 6                                                                                                                                                 | SVRK GDC, NIDADAVOLE     | Dr PSS SRAVANTHI                   |            |                         |          |          |
| 7                                                                                                                                                 | SVRK GDC, NIDADAVOLE     | B.RAJA RAJESWARI                   |            |                         |          |          |
| 8                                                                                                                                                 | GDC ASNM Palakol         | Sri P. Srinivasa Rao               |            |                         |          |          |
| 9                                                                                                                                                 | GDC ASNM Palakol         | K.V.S. Sireesha                    |            |                         |          |          |
| 10                                                                                                                                                | GDC Bhimavaram           | Sri K.LAKSHMANA RAO                |            |                         |          |          |
| 11                                                                                                                                                | SCIM GDC, TANUKU         | Dr.Y VIJAYA KUMAR                  |            |                         |          |          |
| 12                                                                                                                                                | GDC Tadepalligudem       | A.N.Sudheer Babu                   |            |                         |          |          |
| 13                                                                                                                                                | GDC Tadepalligudem       | B.Pandu                            |            |                         |          |          |
| 14                                                                                                                                                | GDC Jangareddigudem      | Smt T.Jhansi Rani                  |            |                         |          |          |
| 15                                                                                                                                                | Govt.Degree Collge,Eluru | Smt.T.V.S.Padmavathi               |            |                         |          |          |
| 16                                                                                                                                                | GDC,CHINTALAPUDI         | V.MADAN MOHAN RAO                  |            |                         |          |          |
| 17                                                                                                                                                | GDC W Palakol            | Dr Mani mala                       |            |                         |          |          |
| Key Resource Persons                                                                                                                              |                          |                                    |            |                         |          |          |
| 18                                                                                                                                                | SCIM GDC, TANUKU         | Ch. Devi Palaka                    |            |                         |          |          |
| 19                                                                                                                                                | GDC Ganapavaram          | Dr.Ch.Chaitanya                    |            |                         |          |          |

## Concluding Remarks

Online sessions were concluded by Sri.R.Phanidar, Lecturer in mathematics has thanked our Commissioner Dr.Pola Bhaskar garu, Commisionerate of Collegiate Education, Mangalgiri AP, for arranging this visionary program.Sir also thanked Dr.Anil Kumar garu, OSD, and CCE AP. Sir also conveyed his special thanks to all the KRPs for co-ordinating and organizing the program successfully.







### Valedictory Session at NRC Tanuku

Sri.R.Phanidar, Incharge Principal of SCIM GDC Tanuku, Dr.K.Raveendra Babu, NRC Co-ordinator, Tanuku has attended the Valedictory session for the five day non residential ToT program in Botany. Key resource persons Smt.P.Chamundeswari Devi, Lectuer in Botany, SCIM GDC Tanuku and Dr.Ch.Chaitanya, Lecturer in Botany, SCHVPMR GDC Ganapavaram and all the 13 participants from government degree colleges under NRC tanuku and NRC Tadepalligudem have participated.

