Name : SUBHASH KANTI ROY

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ACADEMIC

1988 : Madhyamik (Secondary) Exam. W.B.B.S.E.
Marks obtained: 60.2% **Class: First**

1990 : Higher Secondary Exam, W.B.C.H.S.E.
Marks obtained: 56.1% **Class: Second**

1993 : B.Sc., City College, Calcutta University
Subject: **Botany (Hons.),** Chemistry & Zoology (Pass)
Marks obtained: 58.6% **Class: Second**

1995 : M.Sc., Calcutta University
Subject: **Botany**; Specialization: **Experimental Pharmacognosy**
Marks obtained: 62.4% **Class: First**

2003 : Ph.D., Kalyani University (thesis submitted on 11th July, 2001; awarded on 2nd September, 2003)

Title of the Thesis: Survey and assessment of Neem and tissue culture of certain economically important tree plants (*Azadirachta indica* A. Juss., *Anacardium occidentale* L., *Dalbergia sissoo* Roxb. ex Dc., *Cassia fistula* L.)

Research Areas : Plant Molecular biology and Biotechnology

RESEARCH ACTIVITIES

1. **Understanding the molecular factor(s) behind sex expression in plants** - Functional genomics and proteomics approach has been undertaken in *Trichosanthes dioica*, a dioecious angiosperm (Current Science, 2008, 94 (3): 381 – 385). Differentially expressed cDNA AFLP fragments from male and female floral buds at uniform developmental stage have been identified, isolated, cloned, sequenced and submitted in GenBank database (Accessions EF192055 - EF192076, EF198868 - EF198876). Two-dimensional gel electrophoresis of male and female floral buds of uniform developmental stage has also revealed some unique protein spots.

   The sex of *Carica papaya*, an angiosperm and *Cycas circinalis*, a gymnosperm was studied using ISSR and RAPD techniques in pre flowering stage. One female- specific band generated from ISSR profile using primer $(GACA)_4$ was detected in papaya, which seems to have importance from agricultural point of view. The sequencing of a male-specific band (PCR with RAPD primer OPB 01) in *Cycas circinalis* revealed homology with putative retro elements of diverse plants probably indicating its use in detection of male *Cycas circinalis* in future (Current Sc., 2007, 92 (4): 524 – 526). The sequence has been submitted in database as *Cycas circinalis* clone CCM1 male-specific RAPD marker genomic sequence (NCBI Accession DQ386640).

2. ***Agrobacterium* mediated plant transformation:**

   A protocol for Agrobacterium-mediated transformationof a local 'elite' Indian variety (Queen) of pineapple [Ananus comosus (L.) Merr, family Bromeliaceae] has been established using a standard transformation vector (pCAMBIA 1304). High transformation efficiency, expressed as the mean percentage of transgenic microshoots regenerated from initial callus explants (20.6%) was achieved using a novel encapsulation-based, antibiotic

selection procedure. The Agrobacterium-infected microshoots derived from callus explants survived selection in high concentration of hygromycin (60 mg l-1 and beyond) in encapsulated alginate beads. The integration of transgene in hygromycin-resistant shoots and plants was confirmed by histochemical GUS assay, PCR amplification and Southern hybridization. It is possible to eliminate false antibiotic positives in pineapple transformation program to a large extent following this procedure (Plant Cell Tissue Organ Culture 2009, 97: 295-302).

3. **Micropropagation:**

Establishment of efficient and reproducible protocols for micropropagation of *Azadirachta indica* A. Juss., *Anacardium occidentale* L., *Dalbergia sissoo* Roxb. ex Dc., *Cassia fistula* L. In the quest for suitable eco-friendly matrix for plant tissue culture media, coir was used in lieu of agar. Using this alternative matrix large number of micro corms were produced *in vitro* in *Gladiolus*, an important plant of floricutural interest (African Journal of Biotechnology 2006, 5 (12): 1204-1209).

4. **Somatic embryogenesis :**

Induction of somatic embryogenesis in *Dalbergia* sissoo

5. **Callus culture :**

Establishment of callus culture of *Dalbergia sissoo* Roxb. ex Dc. and *Cassia fistula* L using different source of explants

6. **Resource survey and phytochemical analysis**

Phytochemical resource survey and analysis of azadirachtin, the main active ingredient of Neem (*Azadirachta indica*) of six districts of West Bengal having variability in agro climatic condition followed by clonal propagation of the selected 'elite' neem plant with high azadirachtin content (Plant Cell Biotechnology and Molecular Biology, 2007, 8 (1&2): 33-38).

TECHNIQUES KNOWN

1. Genomic and Plasmid DNA isolation
2. Cloning and sequencing of DNA
3. Fingerprinting by RAPD, ISSR and AFLP
4. Native PAGE for isozymic analysis and one dimensional SDS-PAGE of protein
5. Two dimensional gel electrophoresis of protein
6. RNA isolation and cDNA-AFLP
7. Evaluation of both herbal and chemical drugs as per standard Pharmacopoeia
8. Plant tissue culture
9. Chromatography – TLC and HPLC
10. Morphological and anatomical techniques including SEM.

PUBLICATIONS

(Journals with Impact Factor)

1. **Roy, S.K**., Gangopadhyay, G. and Mukherjee, K.K. 2010. Is stem twinning form of *Basella alba* L. a naturally occurring variant? **Current Science** 98 (10): 1370 - 1375.

2. **Roy, S.K**., Bakshi, D and Mandal N.C. 2010. Effect of Bavistin and Blitox on root nodule Bacteria and the antagonistic effect of these bacteria on two plant pathogenic fungi. **J. Bot. Soc. Bengal** 64 (1):39-46.

3. **Roy, S.K**. and Gangopadhyay, G .2009. Sex Determination in Plants: Genetic and Molecular Aspects. **Advances in Plant Biology** (Debidas Bhattacharya Birth Centenary Commemorative Volume) Eds. S. Mandal and S. Bhattacharya, Visva- Bharati, Santiniketan , India : 416-432.

4. Singh, S. K.**, Roy, S.K**. and Bag, A. K. **2009**. Two New and noteworthy records of thalloid Liverwort from Andaman Islands, India. **Indian journal of Forestry** 32(2): 327-330.

5. Gangopadhyay, G., **Roy, S.K.** and Mukherjee, K.K. **2009**. Plant response to alternative matrices for in vitro root induction. **African Journal of Biotechnology** 8 (13): 2923-2928.

6. Gangopadhyay, G., **Roy, S.K.**, Gangopadhyay, S.B., and Mukherjee, K.K. 2009 *Agrobacterium*-mediated genetic transformation of pineapple var. Queen using a novel encapsulation-based antibiotic selection technique **Plant Cell Tiss Organ Cult** 97: 295-302.

7. **Roy, S.K**., Gangopadhyay, G., Ghose, K., Dey, S., Basu, D. and Mukherjee, K.K. **2008**. A cDNA-AFLP approach to look for differentially expressed gene fragments in dioecious pointed gourd (*Trichosanthes dioica* Roxb.) for understanding sex expression. **Current Science** 94 (3): 381 - 385.

8. **Roy, S.K**., Pal, B.C. and Ghosh, P.D. **2007**. In vitro propagation of elite neem (*Azadirachta indica* A. Juss) of Gangetic plain with high azadirachtin content. **Plant Cell Biotechnology and Molecular Biology** 8 (1&2): 33-38.

9. Gangopadhyay, G., **Roy, S.K**., Ghose, K., Poddar,R., Bandyopadhyay, T., Basu,D. and Mukherjee, K.K. **2007**. Sex detection of *Carica papaya* and *Cycas circinalis* in pre flowering stage by ISSR and RAPD. **Current Science** 92 (4): 524 – 526.

10. **Roy, S.K.**, Gangopadhyay, G., Bandyopadhyay, T., Modak, B.K., Datta, S. and Mukherjee, K.K. **2006**. Enhancement of in vitro micro corm production in *Gladiolus* using alternative matrix. **African Journal of Biotechnology** 5(12): 1204-1209.

11. Gangopadhyay, G., **Roy, S.K.** and Mukherjee, K.K. **2005.** Plant Biotechnology: New Horizon for Crop Improvement. **Proceedings of UGC Sponsored State Level Seminar: emerging Trends in Biotechnology: A Symbiosis with Conventional Technology**, organized by Sripat Singh College, Jiaganj, Murshidabad, WB, India, pp. 18 – 27.

12. Bandyopadhyay, T., Gangopadhyay, G., **Roy, S.K**., Datta, B.K. and Mukherjee, K.K. **2005**. *Nypa fruticans* of Sundarban Biosphere Reserve, West Bengal, India – Its genetic diversity and an approach for conservation. **Phytomorphology** 55 (1&2): 39-47.

13. Saha, H., **Roy, S.K.** and Ghosh, P.D. **2004.** High Frequency of Plant Regeneration of Java Citronella (*Cymbopogon winterianus* var. *manjusha*) in *in-vitro* Condition. **Green Tech**. vol.6:90-97.

14. Mandal, S., **Roy, S.K.** and Ghosh, P.D. **2002**. Primary evaluation of certain promising Cashew (*Anacardium occidentale* L.) germplasms in West Bengal condition. **National Botanical Society** 56: 33 – 42.

15. Mandal, S., **Roy, S.K.**, Ghosh, P.D. and Ghoshal, K.K. **2001.** Studies on the genetic variability in Cashew nut (*Anacardium occidentale* L.). **Perspectives in Cytology and Genetics** 10: 383 – 391.

16. **Roy, S.K.** Mandal, S. and Ghosh, P.D. **2001**. *In vitro* response of certain Cashew germplasm. **The Cashew** XV (2): 21 – 27.

17. **Roy, S.K.** Ghosh, P.D. and Mandal, S. **2000**. Tissue culture studies in *Azadirachta indica* and *Cassia fistula*. **Recent trends in Spices and Medicinal Plant Research**. 133 – 139.

SUBMISSIONS TO GenBank, NCBI DATABASE

- **Roy, S.K.,** Gangopadhyay, G., Ghose, K., Dey, S., Basu, D. and Mukherjee, K.K. **2006**. Understanding sex exprssion in *Trichosanthes dioica* Roxb. **GenBank Accessions EF192055 - EF192076, EF198868 - EF198876.**

- Gangopadhyay, G., **Roy, S.K.,** Ghose, K., Poddar, R., Bandyopadhyay, T., Basu, D. and Mukherjee, K.K. **2006**. *Cycas circinalis* clone CCM1 male-specific RAPD marker genomic sequence. **NCBI Accession DQ386640**.

- **Roy, S. K.**, Gangopadhyay, G. and Mukherjee, K. K. **2009** *Zamia fischeri* clone ZFM1 male specific and *Zamia fischeri* clone ZFF1 female specific RAPD marker genome sequence. **NCBI Accession GQ 141708 and GQ 141709**

Place: Kolkata Dr. Subhash Kanti Roy