



UNIVERSITY OF CALCUTTA

Department of Botany

FACULTY ACADEMIC PROFILE/ CV

Full name of the faculty member: Dr. Sandip Mukhopadhyay

Designation: Professor

Specialization : Plant Biotechnology, Molecular Biology & Cytogenetics



Contact information :

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Academic qualifications:

College/ university from which the degree was obtained	Abbreviation of the degree
University of Calcutta	B.Sc.
University of Calcutta	M.Sc.
University of Calcutta	Ph.D.

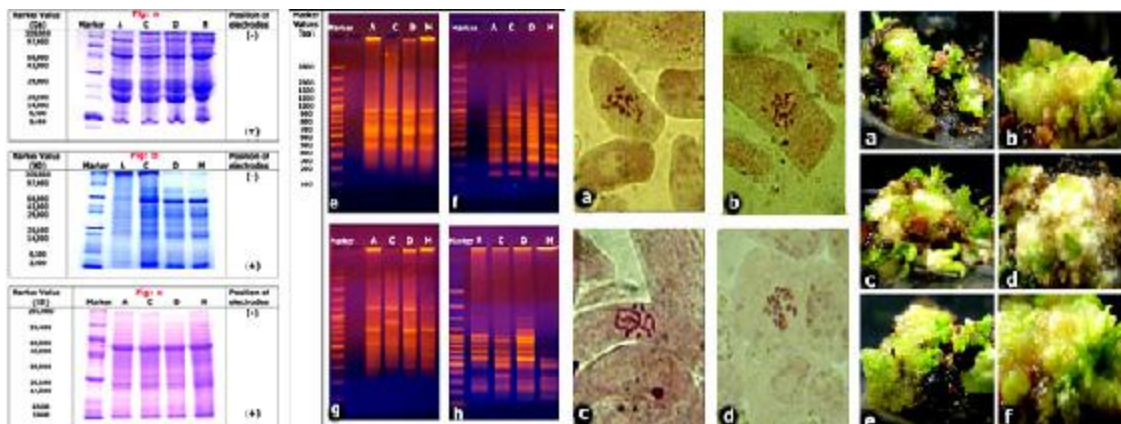
Positions held/ holding:

November, 2012 to current	Professor	University of Calcutta
May, 2007 to Oct, 2012	Associate Professor	University of Calcutta
May, 2004 to April, 2007	Reader	University of Calcutta

Sept, 1999 to April, 2004	Senior Lecturer	University of Calcutta
Sept, 1995 to August, 1999	Lecturer	University of Calcutta
January, 1991 to August, 1995	Research Associate	CRH, Department of Plant Science, Université Laval, Québec, Canada.
August, 1989 to December, 1990	Visiting Professor	Biology Department, Université Laval, Québec, Canada.

Research interests:

- Genome analysis of different medicinal plant species, varieties and populations of great economic importance utilizing cytological, cytochemical and molecular parameters to evaluate the genomic diversity.
- Comparative analysis of different *in vitro* plant regeneration systems for efficient clonal propagation of different medicinal plants and studies of both physical and chemical factors responsible for organogenic and embryogenic responses for plant regeneration. Effects of *in vitro* environment on chromosome status, total protein profile and isozyme activities of the regenerates during organogenic and embryogenic responses.
- *In vitro* propagation of different medicinal plants using different systems to standardize efficient, simple and cost effective protocol for conservation and improvement of medicinal principle contents by manipulating culture regimes and by addition of precursor molecules/elicitors during growth in culture to identify elite clones. Also, hairy root induction following transformation with *Agrobacterium rhizogenes* and subsequent root culture are also being carried out to compare the active principle contents of pharmacological importance of these plants with the values of normal culture methods adopted, for improvement. The clones regenerated through different systems are compared with their mother plants with respect to their chromosomal status, total protein pattern and genomic DNA profiles.
- The effects of genome diversity on *in vitro* responses during growth and development of these plants in culture are also being analyzed.



Research guidance :

Number of researchers awarded Ph.D. degree : 8

Number of researchers pursuing Ph.D. degree : 4

Projects :

Completed projects :

- UGC Major Research Project on “A comparative investigations”, implemented on August, 1998 [3 years]
- CSIR Scheme on “*In vitro* clonal characterizations”, implemented on April, 1999 [3 years]
- DST, Government of India, project on “Genome analysis*Asparagus*”, implemented on February, 2000 [3 years]
- CSIR Scheme on “*In vitro* conservation”, implemented on December, 2002 [3 years]
- UGC Major Research Project on “Chromosomal clones” April, 2007 [3 years]
- CSIR Scheme on “Cyto-molecular ----- conservation”, January, 2011 [3 years]

Current projects :

- UGC Major Research Project on "Cytological ----- conservation", April, 2013 [3 years]

Select list of publications:

a) Journals:

- Lahiri K, Mukhopadhyay MJ and **Mukhopadhyay S** (2016). Karyotype analysis and 4C nuclear DNA estimation in different cultivars of *Clitoria ternatea* L. *Cytologia* **81**(1):19-23.
- Samanta D, Lahiri K, Mukhopadhyay MJ and **Mukhopadhyay S** (2015). Cyto-morphological analysis and *in situ* 4C nuclear DNA estimation in species and varieties of *Tabernaemontana*. *Nucleus* (DOI 10.1007/s13237-016-0166-3).
- Samanta D, Lahiri K, Mukhopadhyay MJ and **Mukhopadhyay S** (2015). Karyomorphological analysis of different varieties of *Tabernaemontana coronaria*. *Cytologia* **80**(1) 67-73.

- Kumari, A, Lahiri K, Mukhopadhyay MJ and **Mukhopadhyay S** (2014). Genome analysis of species of *Calathea* utilizing chromosomal and nuclear DNA parameters. *Nucleus* 57(3):203–208 [DOI 10.1007/s13237-014-0121-0].
- **Mukhopadhyay S** and Ray S (2013) Chromosome and marker-based genome analysis of different species of *Asparagus*. *Cytologia* 78 (4): 425-437.
- Ray A, Ray S, **Mukhopadhyay S** and Ray M (2013). Methylglyoxal with glycine or succinate enhances differentiation and shoot morphogenesis in *Nicotiana tabacum* callus. *Biologia Plantarum* 57 (2): 219-223.
- Lahiri K, Mukhopadhyay MJ and **Mukhopadhyay S** (2012). Simple and efficient plant regeneration following somatic embryogenesis in *Mucuna pruriens* var. *pruriens*, a natural source of L-DOPA. *J. Trop. Med. Plants* 13(1): 43-49.
- Lahiri K, Mukhopadhyay MJ and **Mukhopadhyay S** (2012). Rapid and stable *in vitro* regeneration of plants through callus morphogenesis in two varieties of *Mucuna pruriens* L. – An anti-Parkinson's drug yielding plant. *Nucleus* 55(1): 37–43. [DOI: 10.1007/s13237-012-0051-7(Published online on May 12, 2012)].
- Roy D and Mukhopadhyay S (2012). Enhanced rosmarinic acid production in cultured plants of two species of *Mentha*. *Ind. J. Exp. Biol.* 50 (11): 817-825.
- Lahiri K, Mukhopadhyay MJ and **Mukhopadhyay S** (2011). Enhancement of L-DOPA production in micropropagated plants of two different varieties of *Mucuna pruriens* L., available in India. *Plant Tissue Cult. & Biotech.* 21(2): 115-125.
- Lahiri K, Mukhopadhyay MJ and **Mukhopadhyay S** (2010). Karyotype analysis and *in situ* 4C nuclear DNA quantification in two varieties of *Mucuna pruriens* L. *J Trop Med Plants* 11(2): 219-225.
- Ray S, Mukhopadhyay MJ and **Mukhopadhyay S** (2010). Phylogenetic relationship among 6 available species of *Asparagus* utilizing RAPD, ISSR and isozyme polymorphism. *Biores Bull* 3: 153-160.
- Mukhopadhyay MJ, Lahiri K and **Mukhopadhyay S** (2008). *In vitro* microtuberization and enhanced colchicine accumulation in two species of *Gloriosa*. *Cytologia* 73: 357-363.
- Mukhopadhyay MJ and **Mukhopadhyay S** (2008). High Frequency *in vitro* propagation through somatic embryogenesis of *Iphigenia indica* Kunth et Benth, an endangered medicinal colchicine yielding herb of commercial interest. *Cytologia* 73: 97-103.
- Mukhopadhyay MJ and **Mukhopadhyay S** (2008). A biotechnological approach for enhancement of colchicine accumulation in *Iphigenia indica* Kunth. *J Plant Biochem Biotech* 17 (2): 185-188.
- Mukhopadhyay MJ, Sengupta P, **Mukhopadhyay S** and Sen S (2005). *In vitro* stable regeneration of onion and garlic from suspension culture and chromosomal instability in solid callus culture. *Sci Hort* 104: 1-9.
- Mukhopadhyay MJ, Sengupta P, **Mukhopadhyay S** and Sen S (2004). Comparative study on plant regeneration from semisolid and suspension cultures of *Allium cepa* L. and *A. sativum* L. *Bangladesh J Bot* 33(1): 59-62.
- Dasgupta (Nag) C, Mukhopadhyay MJ and **Mukhopadhyay S** (2003). Regeneration of a tetraploid clone from callus culture of *Asparagus officinalis* L through somatic embryogenesis. *Cytologia* 68: 219-223.
- **Mukhopadhyay S**, Overney S, Desjardins Y and Yelle S (2002). Regeneration of transgenic plants from electroporated protoplasts of *Asparagus officinalis* L. *J. Plant Biochem Biotech* 11: 57-60.

- Mukhopadhyay MJ, **Mukhopadhyay S** and Sen S (2002). *In vitro* propagation of *Iphigenia indica* (Kunth.), an alternative source of colchicine. *Plant Cell Tiss Org Cult* **69**(1): 101-104.
- Letchamo W and **Mukhopadhyay S** (1997). Variability in chromosomes, herb yield, essential oil content and potentials of horehound for North American commercial production. *J Hort Sci* **72**(5): 741-748.
- Benmoussa M, **Mukhopadhyay S** and Desjardins Y (1997). Factors influencing regeneration from protoplasts of *Asparagus densiflorus* cv *Sprengeri*. *Plant Cell Rep* **17**: 123-128.
- Letchamo W, **Mukhopadhyay S** and Gosselin A (1996). Variability in herb yield and potentials of Horehound in North America. *Acta Hort* (ISHS) **426**: 601-614.
- Benmoussa M, **Mukhopadhyay S** and Desjardins Y (1996). Optimization of callus culture and shoot multiplication of *Asparagus densiflorus* cv *Sprengeri*. *Plant Cell Tiss Org Cult* **47**: 91-94.
- **Mukhopadhyay S** and Desjardins Y (1994). Direct gene transfer to protoplasts of two genotypes of *Asparagus officinalis* L. by electroporation. *Plant Cell Rep* **13**: 421-424.
- **Mukhopadhyay S** and Desjardins Y (1994). A comparative study on plant regeneration from protoplasts of two genotypes of *Asparagus officinalis* L. *Plant Sci* **100**: 97-104.
- **Mukhopadhyay S** and Desjardins Y (1994). Plant regeneration from protoplast-derived somatic embryos of *Asparagus officinalis* L. *J Plant Physiol* **144**: 94-99.
- **Mukhopadhyay S** and Desjardins Y (1994). Electroporation mediated gene transfer to protoplasts of *Asparagus officinalis* L Presented at Northeast Regional Meetings of ASHS, Quebec, Canada, January 1994.
- **Mukhopadhyay S** (1993). Investigation on localization of DNA in the nucleolus-associated bodies of *Pisum sativum* L. *Cytologia* **58**: 267-272.
- **Mukhopadhyay S** and Mukhopadhyay MJ (1992). Cytochemical characterization of two types of nuclear bodies in *Cicer arietinum* L. *Eur J Cell Biol* **59**: 296-303.

b) *Books/ book chapters* :

c) *Conference/ seminar volumes*:

- Lahiri K, Samanta D, Sengupta P, Mukhopadhyay MJ and **Mukhopadhyay S** (2011). Stable plant regeneration through somatic embryogenesis in two species of *Allium*. In. Proceedings of the International Convention 2010, Kolkata.: “Botanicals in Integrated Health Care”. The Agri Horticultural Society of India, pp. 174-176.
- Ray S, Mukhopadhyay MJ and **Mukhopadhyay S** (2011). Assessment of phylogenetic relationship in species of *Asparagus*. In. Proceedings of the International Convention 2010, Kolkata.: “Botanicals in Integrated Health Care”. The Agri Horticultural Society of India, pp. 177-181.
- Lahiri K, Mukhopadhyay MJ and **Mukhopadhyay S** (2009). Study of somatic chromosomes, estimation of 4C and 2C nuclear DNA contents and RAPD analysis of two varieties of *Mucuna pruriens* L. *Pers Cytol Genet* **14**: 193-198.
- Ray S, Mukhopadhyay MJ and **Mukhopadhyay S** (2009). Assessment of phylogenetic relationship among 4 species of *Asparagus* utilizing chromosomal and molecular markers. *Pers Cytol Genet* **14**: 185-192.

- Halder A and Mukhopadhyay S (2009). *In vitro* rapid propagation of *Glycyrrhiza glabra* L. through shoot bud multiplication. *Pers Cytol Genet* **14**: 229-234.

d) **Other publications :**

Membership of Learned Societies:

- International Society for Horticultural Science – Member.
- Indian Science Congress Association - Life Member.
- Society for Plant Biochemistry and Biotechnology - Life Member.
- All India Congress of Cytology and Genetics - Life Member.
- Botanical Society of Bengal - Life Member.
- Probir Chatterjee Research Foundation – Life Member
- East Himalayan Society for Spermatophyte Taxonomy - Life Member
- Bangiya Bijnan Parishad - Life Member

Invited lectures delivered:

- Visited Horticultural Research Center, Department of Plant Science, Laval University, Québec, Canada for 3 weeks, as Invited Guest, to visit as well as to deliver an invited lecture on October, 2000.
- Delivered an Invited Lecture in a Seminar on ‘*Current Advances in Plant Biotechnology of the Millennium*’ in the Department of Botany, Lady Brabourne College, Calcutta on February, 2001.
- Delivered Invited Lecture in UGC sponsored 1st Refresher Course in Botany on 17th January 2003 at the Department of Botany, Vidyasagar University, Midnapore-721102, W.B..
- Delivered Invited Lecture in UGC sponsored 2nd Refresher Course in Biotechnology on 28-29 March, 2004 at the Department of Botany, Patna University, Patna-800 005.
- Delivered a Invited Lecture at the National Symposium on “Present status ---- plants in India, held on 26th –28th April, 2007 at BCKV, Mohanpur, West Bengal.
- Delivered an Invited Lecture, as a Resource Person, at the Workshop for Young Biochemists (Oct 6-13, 2009), organized by Lady Brabourne College, Calcutta on October 6, 2009.
- Delivered an Invited Lecture at UGC sponsored National Seminar on “Recent Advances in Plant Sciences - Diversity, Conservation & its Applications” in RBC College, Naihati, 24-Pgs (N), WB, on 19th November 2011.
- Delivered an Invited Lecture at Asutosh College, Kolkata during 100 years Celebration of the Institute on January, 2016.
- Delivered an Invited Lecture at Serampur College, Serampur, Hoogly, WB on 26th February 2016.

Awards :

- Visiting Professor, Laval University, Quebec, Canada in 1989.
- Fellow: Botanical Society of Bengal (2014)

Name of Present Research Fellows:

- Dr. Kotisree Lahiri, (NET-LS, GATE), Women Post-doctoral Fellow, UGC.
- Ms. Dipu Samanta, UGC Project Fellow (Registered).
- Ms. Anamika Kumari, (GATE), Honorary Fellow (Registered).
- Ms. Sagarika Lahiri, Honorary Fellow (Registered).
- Ms. Samadrita Deb, Honorary Fellow.

Other notable activities :

- Reviewer Editor, Elsevier Publication
- Reviewer Editor, Springer Journals