

RESUME of Dr. Nirmal Joshee



NAME: NIRMAL JOSHEE
RANK: ASSISTANT PROFESSOR (Plant Science)

AFFILIATION:

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EDUCATION

Ph. D. Botany 1986 North-Eastern Hill University, Shillong, Meghalaya, India.
M. Sc. Botany 1980 Kumaun University, Naini Tal, Uttarakhand, India.
B. Sc. Biology 1978 Kumaun University, Naini Tal, Uttarakhand, India.

UNDERGRADUATE THESIS / GRADUATE STUDENT COMMITTEE

- i) **Pokhrel, S.** 1997-1998. Comparative *in vitro* studies for rapid multiplication of a medicinal plant *Scutellaria discolor* Colebr., an approach to conservation. (Requirement for B.Sc. (Honors) in Kathmandu Univ., Nepal).
- ii) **Ayse Tascan** Served in the graduate committee at Clemson University, SC. Ms Thesis on *Scutellaria* biotechnology (Graduated in May 2007).
- iii) Serving in the graduate committee of **Mr. Arsine Similien** studying at Auburn University, AL. Research on *Scutellaria* (2007- 2008)

SYLLABUS DEVELOPMENT

Agri - Technology of Medicinal Plants (HORT- 4873)

Assisted Prof. A K Yadav, FVSU, in developing new course that has been recently approved for offering

during the fall semester 2003. Students from both agriculture instruction and biology departments will acquire valuable scientific knowledge of this emerging discipline including global status of plant medicines, ethnobotany, biodiversity, bioprospecting, biotechnology and genetic improvement, phytochemical isolation and evaluation, and bioactivity valuation for human health.

RESEARCH EXPERIENCE

Post Doctoral and Other Research Appointments

Experience

July 1, 2001- June 30, 2006	Research Professional (Hort.), Fort Valley State University
Nov. 1, 1998- June 30, 2001	University of Nebraska Med Ctr, Omaha, NE 68131, Liposome mediated gene transfer in animal cells (Post Doctoral)
Sept. 1991-March 1995	Biotechnology Institute, Ogata, Akita. Japan. Molecular biology of water stress induced genes (Post Doctoral)
Jan.1989 - July 1991	Senior Res Scientist. Research Lab for Agricultural Biotechnology & Biochemistry, Kathmandu, Nepal. Tissue culture of trees and crop plants.
July 1987 - Dec. 1988	Research Associate, Directorate of Cinchona and other medicinal plants, Darjeeling, West Bengal, India. Tissue culture of medicinal plants (<i>Dioscorea</i> , <i>Ipecac</i> , <i>Cinchona</i>).
Oct.1986 - Mar. 1987	Senior Research Fellow, Botanical Survey of India, Shillong, Meghalaya, India. Flora collection and identification of Namdapha tiger Sanctuary, Arunachal Pradesh, India.

INDUSTRY EXPERIENCE

1. Managed '**Research and Development**' section in a commercial tissue culture company, Nepal Biotech Nursery (NBN) in Kathmandu, Nepal during 1995-1998.
2. The NBN company is involved in the tissue culture and trade of plantation crop (banana), ornamentals (orchids, carnation, chrysanthemum, African violet), trees for agroforestry programs (ficus), and other important plants.
3. Developed protocols for the commercial propagation of banana, orchids, *Scutellaria*
4. Supervised staff of 15 scientists and technicians at NBN
5. Planned and procured equipment, tools and supplies for NBN as needed
6. Conducted management workshops for researchers coming from Government and industry sector

7. Established cooperative linkages with farmers in order to market plantation crops

JOURNAL/MS REVIEWER ACTIVITY

HortScience

Plant, Cell Reports

Plant, Cell, Tissue, and Organ Culture

Journal of Environmental Monitoring and Restoration

BOOK REVIEW (Elsevier)

T. Kozai, F. Afreen, S M A. Zobayed (Eds.), Photoautotrophic (Sugar-Free Medium) Micropropagation as a New Micropropagation and Transplant Production System, Springer Press, 361 pp., \$ 149.00, ISBN 1-4020-3125-4. **Plant Science 170: 415. 2006.**

INVOLVEMENT IN PROFESSIONAL SOCIETIES

A. 2005 In Vitro Biology Meeting, June 5 - 8, 2005, Baltimore, Maryland

Convened Session : "Where Do We Go After Getting New Molecules?"

B. Vice-Chair, Herbs, Spices and Medicinal Plants Working Group (2004-2005)

American Society for Hort. Sciences (ASHS)

C. Chair, Herbs, Spices and Medicinal Plants Working Group (2005-2006), American

Society for Hort. Sciences (ASHS) Organizing 1-day long pre-congress symposium on medicinal plants on July 26, 2006.

D. Co-convenor. ISHS International Symposium on Medicinal and Nutraceutical

Plants, Macon, GA., March, 2007.

RESEARCH INTERESTS AND TECHNICAL EXPERTISE

RESEARCH AREAS

Medicinal Plants Research:

- Tissue culture and conservation of medicinal plants
- Reproductive biology, plant tissue and protoplast culture, anther and microspore culture, Development of transgenic plants with desirable traits (Cold tolerance, CBF genes).
- Hairy root culture for secondary metabolite biosynthesis.
- Phytochemical screening for bioactive flavonoids.
- Evaluation of bioactive molecules in animal cell lines for apoptosis/necrosis using prostate, breast, and glioma cells.
- Plant germplasm conservation and artificial seed production,
- Regulation of stress induced genes in plants.

Micropropagation Research:

Forest trees - pine, *Ficus*, *Artocarpus*

Orchids- symbiotic and asymbiotic seed germination (*Dendrobium*, *Dactylorhiza*, *Vanda*)

Medicinal- *Scutellaria*, *Solanums*, *Centalla*, *Bacopa*

Ornamentals- african violet, carnation, chrysanthemum

Plantation crop- banana and

Cereal crop- rice, anther and protoplast culture

Molecular Biology Research:

Bioactivity evaluation of medicinal plant using animal cancer cell lines (apoptis/necrosis and suppression of signaling molecules like Interleukins and TGF- β)

Isolation, sequencing, and characterization of water-stress induced genes

Generation of transgenic plants and hairy root induction

Liposome mediated gene transfer in cancer cell lines for gene therapy

In vitro production of recombinant proteins (bovine core-2)

HONORS / AWARDS

- A \$500 travel grant to attend 'Specialty Crops Regulatory Initiative (SCRI) Stakeholders' workshop, Nov 21-22, Washington, DC, **2005**.
- Postdoctoral fellowship (Akita Prefecture, **Japan**); Sept.1991- March **1995**.
- Short term training fellowship from Rockefeller Foundation to work on rice anther culture at International Rice Research Institute, Philippines (April 1990-July 1990).
- University grants commission fellowship during Ph.D.

GRANTSMANSHIP

1. **2006 "Unifying Cross Disciplinary Genomic Platforms Using Model Genetic Organisms for Teaching Biotechnology" (Capacity Building Teaching Grant, Funded)**
2. **(\$300,000)** for two years. **2005- *Educating the Educators: With Further Advances in Agricultural Biotechnology Education Enrichment for K-12 School Teachers***. Capacity Building Grants Teaching Project. Co-PI.
3. **(\$300,000.00)** for three years. **2004- *"Application of In Vitro Plant Regeneration and Agrobacterium-Mediated Genetic Transformation to Enhance Cold Hardiness in Guava"*** Capacity Building Grants Research Project (GEOX-2004-02595). Co- P. I.
4. **(\$200,000.00)** for two years. **2003- *Educating the educators: 'The future is now' through ag-biotechnology education enrichment for K-12 school teachers***. USDA-CSREES 1890 Capacity

Building Grants [Teaching Project \(GEOX-2003-03704\)](#).- *Co- P. I.*

5. (\$300,000.00) for two years. 2002- *Harnessing Agri-Biotechnology to Establish Scutellaria as a Medicinal Crop*. USDA-CSREES 1890 Capacity Building Grants [Research Project \(GEOX-2002-02989\)](#). *Co- P. I.* 09/15/2002-09/14/2002.
6. Agronomical, biotechnological, and clinical investigations on medicinal plants in Georgia (Station project). Jan1, 2002- Dec. 31, 2006 (USDA, GEOX-5211). *Co-Investigator*.
7. Ecology, seasonal behavior and growth characteristics of earthworms at ICIMOD trial and demonstration farm, Godavari. Funded by- International Center for Integrated Mountain Development (ICIMOD), Kathmandu, Nepal. **June 1998- May 2000. P. I.**
8. (\$ 10,000). Micropropagation of two endangered orchids of Nepal and the role of mycorrhiza in seed germination and seedling establishment, Agreement # H/2703-1- International Foundation for Science (IFS), Sweden. **Oct. 1997- Oct.'98. P. I.**
9. *Ex-situ* conservation of high altitude medicinal plants of Manang: funded by King Mahendra Trust for Nature Conservation (KMTNC). **Oct. 1996- Oct. 1998. P. I.**
10. *In vitro* conservation of a few endangered orchid of Nepal: a project funded by WWF Nepal Program for the period, **July 1996 - May 1997. P. Investigator**

GRANTS SUBMITTED (2007)

Type of proposal: NIH R21

Effective dates: 07/01/2008 to 06/30/2010

Title: Modulation of Tumor-Mediated Immune Suppression by *Scutellaria*.

P. I. : Dr Prahlad Parajuli

SEMINARS, SYMPOSIA AND WORKSHOPS

- 2007 'Bioenergy 101', Fort Valley State University, October 29-Oct 30.
- 2007 3rd Annual grantsmanship institute training conference. Fort Valley State University, October 25.
- 2007 Southeast Bioenergy Conference, Tifton Campus Conference Center, Tifton, GA, July 31- Aug 2.
- 2007 SIVB, Indianapolis, IN, USA.
- 2007 ISHS, International Symposium on Medicinal and Aromatic Plants, March 19-23. Macon, GA, USA.
- 2006. American Society for Hort Sci annual meeting. New Orleans.
- 2006. Enhancing small farm profitability with medicinal plants. May 13. Dalton. GA. USA.
- 2006. Agricultural biotechnology research for public goods and private goods: The roles of university-

industry relationships. May 1. Jurys Hotel. Washington, DC. USA.

- **2006.** "The Labiatae: Advances in Production, Biotechnology and Utilisation" 22-25 February. Sanremo, **Italy**.
- **2005.** 'Specialty Crops Regulatory Initiative (SCRI) Stakeholders' workshop, Nov 21-22, Washington, DC.
- **2005.** ASHS meeting. Las Vegas. USA
- **2005.** In Vitro Biology Meeting, June 5 - 8, 2005, Baltimore, Maryland.
- **2005.** International Conference - Quality and safety issues related to Botanicals. August 15-18, University, MS, USA.
- **2005.** 1st European Ayurveda Congress, April 23-24, Castrop-Rauxel, **Germany**.
- **2005-** 86th American Farm Bureau Federation's Annual Convention, Charlotte, NC, Jan 9-12.

LIST OF PUBLISHED BOOK/ BOOK CHAPTERS

1. **Joshee, N, D. R. Bastola, V. P. Agrawal, and A. K. Yadav. 2002.** Lakoocha: A multipurpose tree of warm climates. In: Jules Janick (editor), **Perspectives on New Crops and New Uses**, American Soc Horticultural Science Press, Alexandria, VA, pp. 390-391.
2. Mentreddy, S. R., A. I. Mohamed, **N. Joshee**, and A. K. Yadav. **2002.** Edamame: A nutritious vegetable crop. In: J. Janick (editor), **Perspectives on New Crops and New Uses**, American Society Hort. Science Press, Alexandria, VA, pp. 422-428.
3. Vaidya, B, Shrestha, M, **Joshee, N. 2000.** Report on Nepalese orchid species with medicinal properties. Proceedings of Nepal-Japan joint symposium-2000. pp. 146-152.
4. **Joshee, N** and Joshee, L, **1999.** Role of farm level biotechnology in Nepal. In: NEPAL- Nature's Paradise: Insight into diverse facets of Topography, Flora and Ecology (Editor: Prof. TC Majupuria), M. Devi, Gwalior.
5. **Joshee, N. 1999.** Biotechnology for natural resource management (NRM). In: Trainers Resource Book. Recent concepts, knowledge, practices, and new skills in participatory integrated watershed management. Pp. 87-96 (ICIMOD / PWMTA, FAO-UN / Dept. Soil Conservation and Water Management, HMG Nepal).

PUBLISHED REFEREED PAPERS

1. Tascan A., Jeff Adelberg, **Nirmal Joshee**, A K Yadav, and M, Tascan. **2007.** Liquid culture systems for *Scutellaria* spp. Acta Hort. 756:163-170.

2. **Joshee, N**, D. Harris., A. Yadav., and A. K. Yadav. **2007**. Influence of explant selection and culture conditions on organogenesis and germplasm conservation in *Bacopa monnieri* (L) Wettst. *Acta Hort.* 756: 119-128.
3. **Joshee, N**, S R Mentreddy, and A K Yadav. **2007**. Mycorrhizal fungi and growth and development of micropropagated *Scutellaria integrifolia* plants. *Industrial Crops and Production* 25(2):169-177.
4. Yadav, A., **Joshee, N.**, and A. K. Yadav. **2007**. Regeneration of multiple shoots from immature seeds and mass multiplication of datura (*Datura metel* L.). *Acta Hort.* 756:199-210.
5. **Joshee, N.**, B. K. Biswas, and A. K. Yadav. **2007**. Somatic embryogenesis and plant development in *Centella asiatica* L., A highly prized medicinal plant of tropics. *HortScience* 42(3):633-637.
6. Biswas, B K, **Joshee, N**, Yadav, A, Yadav, A K. **2007**. Development and application of biotechnology in Guava: a nutraceutical fruit. *Acta Hort* 744: 267 - 276.
7. **Joshee, N**, Mutua, M, Zee, F., and Yadav, A. K. **2004**. *In vitro* shoot bud induction and plantlet regeneration in guava as influenced by genotype. *Acta Hort (ISHS)* 632:279-285.
8. **Joshee N**, Bastola D, and Cheng P-W. **2002**. Transferrin-facilitated lipofection gene delivery strategy: characterization of the transfection complexes and intracellular trafficking. ***Hum. Gene Therapy*** 13:1991-2004.
9. **Joshee, N**, T. S. Patrick, Rao, S. Mentreddy, and A. K. Yadav. **2002**. Skullcap: Potential medicinal crop. In: Jules Janick (editor), **Perspectives on New Crops and New Uses**, American Society Hort. Sci. Press, Alexandria, VA, pp. 581-587.
10. Bastola, D R, Agrawal, V P, and **Joshee N.**, **2000**. *In vitro* propagation of a Himalayan pine- *P. wallichiana* A. B. Jacks. ***Curr. Sci.*** 78(3):338-341.
11. Sinha, S, Pokhrel, S, Vaidya, B, **Joshee, N**, **1999**. Rapid *in vitro* micropropagation and callus induction in *Scutellaria discolor* Colebr.- A medicinally important plant of Nepal. ***Indian J. Pl. Genetic Resources*** 12 (2/3):219 -223.
12. Li, C, **Joshee, N**, Adler, K B and Cheng, P-W, **1999**. Development of monoclonal antibodies against bovine mucin core-2 β -6 N-acetylglucosaminyltransferase. ***Glycoconjugate Journal*** 16: 555-562.
13. **Joshee N**, Kisaka H, and Kitagawa Y, **1998**. Isolation and characterization of a water- stress specific genomic gene, pws18, from rice. ***Plant Cell Physiol.*** 39 (1): 64 -72.

14. Vaidya B, Malla S, and **Joshee N, 1997**. *Arundina graminifolia* LDI. (Bamboo leaf orchid) from Shivapuri watershed and wildlife reserve. (Short communication). **NAHSON Bulletin, Nepal** 7 (1-4): 35.
15. Chauhan YS, and **Joshee N, 1997**. Differentiation of female fertile and female sterile pistil (Carpellodia) in *Solanum khasianum* Clarke. **Plant Structure and Morphogenesis** pp. 43-52.
16. Takahashi R., **Joshee N.** and Kitagawa Y, **1994**. Induction of chilling resistance by water stress, and cDNA sequence analysis and expression of water stress regulated genes in rice. **Plant Mol. Biol.** 26: 339-352.

MANUSCRIPTS UNDER PREPARATION / IN PRESS

1. Tascan Ayse, Jeffrey W. Adelberg, Mevlut Tascan, **Nirmal Joshee**, and Anand K Yadav. 2007. Polyester fiber controlled hyperhydricity for three species of *Scutellaria*: Medicinal plant. (Acta Hort).
2. Joshee, N and Yadav, A. K. *In vitro* micropropagation of *Scutellaria montana* Chapman and *S. ocmulgee* Small, two threatened skullcaps from Georgia (Plant Cell Reports)
3. Parajuli, P., Joshee, N., Rimando A. M., Yu, P., Mathupala, S., and Yadav, A. K. 2007. Anti-tumor mechanisms of various *Scutellaria* extracts and constituent flavonoids- An in vitro comparative study.

LECTURES (Oral Presentations)

1. **N. Joshee**, A. K. Yadav. **2006**. Medicinal plants: Conservation and production in a forest based farm. **In: Enhancing small farm profitability with medicinal plants.** May 13, 2006. Dalton. GA. USA.
2. **N. Joshee**, A. K. Yadav. **2006**. Plant micropropagation and conservation of medicinal skullcaps. "The Labiatae: Advances in Production, Biotechnology and Utilisation" 22-25 Feb Sanremo, Italy.
3. **Joshee, N**, P. Parajuli, A M Rimando and A K Yadav. **2005**. Establishing traditional medicinal plant *Scutellaria* in modern medicine: Biotechnology and Biomedical Perspectives. 1st European Ayurveda Congress, April 23-24, Castrop-Rauxel, Germany.