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BIO-sketch of Dr. Ashutosh K. Shukla





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Objective

- To make a meaningful contribution towards the better understanding of the regulation of secondary metabolic pathways in medicinal and aromatic plants with a focus on plant alkaloidomics.



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Academic Awards/Fellowships

- In ICSE (X Standard, 1989) **topped the school** securing 86.34%marks.
- **National Scholarship Award** – 1994 given by the Ministry of Human Resource Development, Department of Education, Government of India, N. Delhi on the basis of merit position in the B.Sc. examination of 1994 conducted by the University of Lucknow, Lucknow.
- **First rank in the all India entrance examination** (1994) for M.Sc. (Biochemistry) course of the University of Lucknow, Lucknow.
- **Rai Saheb Sheo Shanker Memorial Scholarship** for securing highest marks and first position in M.Sc. I (Biochemistry) examination conducted by the University of Lucknow, Lucknow in 1995.
- **Prof. P.S. Krishnan Memorial Gold Medal** for securing first position in order of merit in the M.Sc. (Biochemistry) examination conducted by the University of Lucknow, Lucknow in 1996
- **Best Poster Award** for poster titled, “Differentially expressing peroxidases from *Artemisia annua*” by Priya Nair, Ajit K Shasany, Madan M Gupta, Anil K Gupta and Ashutosh K Shukla presented at the National Convention and Seminar on Leveraging Aromatic and Medicinal Plants and Products (LAMP-2014), organized by MAPSI at CSIR-CIMAP and Biotech Park, Lucknow, during 8–9 March, 2014



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Academic Awards/Fellowships

- Qualified the **National Eligibility Test (NET)** for lectureship conducted jointly by the CSIR-UGC in June 1999, on the basis of which I was awarded research fellowship to work towards a Ph.D. degree in Biochemistry at CIMAP, Lucknow.
- **First prize at the Bangalore Bio 2007** Poster Session – *Walkway of Discovery* (7th to 9th June, 2007) for the poster titled, “EST-based tissue-specific transcriptome analysis in *Catharanthus roseus*” by Ashutosh K Shukla, Ajit K Shasany and Suman PS Khanuja.
- **First prize in the Science and Innovation Quiz organized by UK Trade and Investment at Bangalore Bio 2007** (7th to 9th June, 2007), which also found a mention in the June-July, 2007 issue of *Britain Today*.
- **CIMAP Day Award 2007** in recognition of contribution towards enabling CIMAP to achieve the Biotalent Award at Bangalore Bio 2007 – *Walkway of Discovery* for the work “EST-based tissue-specific transcriptome analysis in *Catharanthus roseus*”.
- **Award for the Highest Impact Factor Publication of CIMAP during 2006-07** on the occasion of CIMAP Day (11 August 2007) for the publication titled, “Transcriptome analysis in *Catharanthus roseus* leaves and roots for comparative terpenoid indole alkaloid profiles” published in the *Journal of Experimental Botany* **57**(14): 3921-3932 (2006), by Ashutosh K Shukla, Ajit K Shasany, Madan M Gupta and Suman PS Khanuja.



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Academic Awards/Fellowships

- **BioTalent Award at the Bangalore Bio 2008** Poster Session – *Walkway of Discovery* (24th to 26th April, 2008) for the poster titled, “Molecular tagging of specific chemotypes of *Papaver somniferum* using functional genomics approach towards development of non-narcotic poppy” by Ashutosh K Shukla, Vanee BIRTHAREY, Nidarshana Chaturvedi, Raj K Lal, Ajit K Shasany and Suman PS Khanuja.
- **Best Research Paper Award 2007** given by the Alumni Association of the Department of Biochemistry (AADB), University of Lucknow, at the annual general body meeting (GBM) of the association held at the department on 25 January 2009 for the publication titled, “Transcriptome analysis in *Catharanthus roseus* leaves and roots for comparative terpenoid indole alkaloid profiles” published in the *Journal of Experimental Botany* 57(14): 3921-3932 (2006), by Ashutosh K Shukla, Ajit K Shasany, Madan M Gupta and Suman PS Khanuja.
- **Second prize for the poster** titled, “Impact of promising genotypes of *Papaver somniferum* developed for beneficial uses” by Mridula Singh, Nidarshana Chaturvedi, Ajit K Shasany and Ashutosh K Shukla, presented at the First International Symposium on Papaver organized by the Central Institute of Medicinal and Aromatic Plants (CSIR) and the International Society for Horticultural Science (ISHS) at CIMAP, Lucknow during 7-11 February, 2011.
- **Awarded the Indo-US Research Fellowship for the year 2012** by the Indo-US Science and Technology Forum (IUSSTF) and Department of Science and Technology (DST), Government of India for conducting advanced research in the area of Life Sciences for 12 months with Dr. Toni M. Kutchan at the Donald Danforth Plant Science Center, St. Louis, Missouri, USA.



ISSN: 2327-5162

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Selected Publications

- ✓ **Ashutosh K Shukla**, Ajit K Shasany, Suman PS Khanuja, 2005. Isolation of poly (A)⁺ mRNA for downstream reactions from some medicinal and aromatic plants. *Indian Journal of Experimental Biology* **43**, 197-201.
- ✓ Ajit K Shasany, Mahendra P Darokar, Sunita Dhawan, Anil K Gupta, Soni Gupta, **Ashutosh K Shukla**, Nirmal K Patra, Suman PS Khanuja, 2005. Use of RAPD and AFLP markers to identify inter- and intraspecific hybrids of *Mentha*. *Journal of Heredity* **96**, 542-549.
- ✓ Ajit K Shasany, **Ashutosh K Shukla**, Soni Gupta, S Rajkumar, Suman PS Khanuja, 2005. AFLP analysis for genetic relationships among *Mentha* species. *Plant Genetic Resources Newsletter* **144**, 14-19.
- ✓ **Ashutosh K Shukla**, Ajit K Shasany, Madan M Gupta, Suman PS Khanuja, 2006. Transcriptome analysis in *Catharanthus roseus* leaves and roots for comparative terpenoid indole alkaloid profiles. *Journal of Experimental Botany* **57**, 3921-3932.
- ✓ Amita Misra, Ajit K Shasany, **Ashutosh K Shukla**, V Sundaresan, Seetal P Jain, Guru D Bagchi, Janardan Singh, Suman PS Khanuja, 2007. AFLP-based detection of adulterants in crude drug preparations of the 'Safed Musli' complex. *Natural Product Communications* **2**, 93-97.
- ✓ Ajit K Shasany, **Ashutosh K Shukla**, Mahendra P Darokar, Megha Saraiya, Nidarshana Chaturvedi, Lankeshwar Tewari, Suman PS Khanuja, 2007. An alpha-1 antitrypsin genetic variant from India. *Indian Journal of Biochemistry and Biophysics* **44**, 176-178.
- ✓ Abdul Samad, PV Ajayakumar, Mahesh K Gupta, **Ashutosh K Shukla**, Mahendra P Darokar, Bharat Somkuwar, Mansoor Alam, 2008. Natural infection of periwinkle (*Catharanthus roseus*) with *Cucumber mosaic virus*, subgroup IB. *Australasian Plant Disease Notes* **3**, 30-34.
- ✓ Mukesh K Dubey, Ajit K Shasany, Om P Dhawan, **Ashutosh K Shukla**, Suman PS Khanuja, 2009. Genetic variation revealed in the chloroplast-encoded RNA polymerase β' subunit of downy mildew-resistant genotype of opium poppy. *Journal of Heredity* **100**, 76-85.



ISSN: 2327-5162

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Selected Publications cont...

- ✓ Mukesh K Dubey, Ajit K Shasany, Om P Dhawan, **Ashutosh K Shukla**, Suman PS Khanuja, 2010. Lipid peroxidation and antioxidant activities involved in resistance response against downy mildew in opium poppy. **Journal of Phytopathology 158**, 88-92.
- ✓ Mukesh K Dubey, Ajit K Shasany, Om P Dhawan, **Ashutosh K Shukla**, Suman PS Khanuja, 2010. AFLP studies on downy-mildew-resistant and downy-mildew-susceptible genotypes of opium poppy. **Journal of Genetics 89**, 9-19.
- ✓ **Ashutosh K Shukla**, Ajit K Shasany, Ram K Verma, Madan M Gupta, Ajay K Mathur, Suman PS Khanuja, 2010. Influence of cellular differentiation and elicitation on intermediate and late steps of terpenoid indole alkaloid biosynthesis in *Catharanthus roseus*. **Protoplasma 242**, 35-47.
- ✓ Amita Misra, Ajit K Shasany, **Ashutosh K Shukla**, Mahendra P Darokar, Subhash C Singh, V Sundaresan, Janardan Singh, Guru D Bagchi, Shital P Jain, Dharmendra Saikia, Suman PS Khanuja, 2010. AFLP markers for identification of *Swertia* species (Gentianaceae). **Genetics and Molecular Research 9**, 1535-1544.
- ✓ Mukesh K Dubey, Ajit K Shasany, Om P Dhawan, **Ashutosh K Shukla**, Karuna Shanker, Suman PS Khanuja, 2010. Detection of DNA polymorphism in *Papaver somniferum* genotypes differing in straw morphinan alkaloid content. **Plant Biosystems 144**, 513-517.
- ✓ Amita Misra, **Ashutosh K Shukla***, Ajit K Shasany, V Sundaresan, Shital P Jain, Subhash C Singh, Guru D Bagchi, Suman PS Khanuja, 2010. AFLP markers for identification of *Aconitum* species. In: AM Husaini (Ed.) Medicinal Plants of the Himalayas: Advances and Insights. **Medicinal and Aromatic Plant Science and Biotechnology 4 (Special Issue 1)**, 15-19.
- ✓ Abdul Samad, S Panda, Mahesh K Gupta, PV Ajayakumar, **Ashutosh K Shukla**, 2011. Molecular identification of a phytoplasma associated with Ajwain (*Trachyspermum ammi*) in India. **European Journal of Plant Pathology 130**, 1-4.
- ✓ Uzma Faridi, Brijesh S Sisodia, **Ashutosh K Shukla**, Rakesh K Shukla, Mahendra P Darokar, Upendra N Dwivedi, Ajit K Shasany, 2011. Proteomics indicates modulation of tubulin polymerization by l-menthol inhibiting human epithelial colorectal adenocarcinoma cell proliferation. **Proteomics 11**, 2115-2119.



ISSN: 2327-5162

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Selected Publications cont...

- ✓ Shaifali Pal[†], Shefali Singh[†], **Ashutosh K Shukla**, Madan M Gupta, Suman PS Khanuja, Ajit K Shasany, 2011. Comparative withanolide profiles, gene isolation, and differential gene expression in the leaves and roots of *Withania somnifera*. **The Journal of Horticultural Science & Biotechnology** **86**, 391-397.
- ✓ Ashutosh Awasthi, Nidhi Bharti, Priya Nair, Rakshpal Singh, **Ashutosh K Shukla**, Madan M Gupta, Mahendra P Darokar, Alok Kalra, 2011. Synergistic effect of *Glomus mosseae* and nitrogen fixing *Bacillus subtilis* strain Daz26 on artemisinin content in *Artemisia annua* L. **Applied Soil Ecology** **49**, 125-130.
- ✓ Abdul Samad, Seema Dharni, Mridula Singh, Sneha Yadav, Asifa Khan, **Ashutosh K Shukla**, 2011. First report of a natural infection of *Stevia rebaudiana* by a group 16SrXXIV phytoplasma in India. **Plant Disease** **95**, 1582.
- ✓ Nagawara Seshagirirao Ravindra, Srinivas Iyer Ramesh, Mahesh Kumar Gupta, Tripta Jhang, **Ashutosh K Shukla**, Mahendra Pandurang Darokar, Raghavendra Narayanrao Kulkarni, 2012. Evaluation of somaclonal variation for genetic improvement of Patchouli (*Pogostemon patchouli*), an exclusively vegetatively propagated aromatic plant. **Journal of Crop Science and Biotechnology** **15**, 33-39.
- ✓ **Ashutosh K Shukla**, Ajit K Shasany, Suman PS Khanuja, 2012. cDNA-AFLP-based numerical comparison of leaf and root organ cDNAs in *Catharanthus roseus*. **OMICS: A Journal of Integrative Biology** **16**, 397-401.
- ✓ Rashmi Tiwari[†], Ashutosh Awasthi[†], Maneesha Mall[†], **Ashutosh K Shukla**, KVN Satya Srinivas, KV Syamasundar, Alok Kalra, 2013. Bacterial endophyte-mediated enhancement of *in planta* content of key terpenoid indole alkaloids and growth parameters of *Catharanthus roseus*. **Industrial Crops and Products** **43**, 306-310.
- ✓ **Ashutosh K Shukla**^{*}, Maneesha Mall, Santosh K Rai, Shefali Singh, Priya Nair, Gaurav Parashar, Ajit K Shasany, Subhash C Singh, Vinod K Joshi, Suman PS Khanuja, 2013. A transcriptomic approach for exploring the molecular basis for *dosha*-balancing property-based classification of plants in Ayurveda. **Molecular Biology Reports** **40**, 3255-3262.
- ✓ Priya Nair, Amita Misra, Alka Singh, **Ashutosh K Shukla**, Madan M Gupta, Anil K Gupta, Vikrant Gupta, Suman PS Khanuja, Ajit K Shasany, 2013. Differentially expressed genes during contrasting growth stages of *Artemisia annua* for artemisinin content. **PLoS One** **8(4)**, e60375. (doi:10.1371/journal.pone.0060375).



ISSN: 2327-5162

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Selected Publications cont...

- ✓ Nidarshana Chaturvedi, Sharad K Singh, **Ashutosh K Shukla**, Raj K Lal, Madan M Gupta, Upendra N Dwivedi, Ajit K Shasany, 2014. Latex-less opium poppy: Cause for less latex and reduced peduncle strength. ***Physiologia Plantarum* 150**, 436-445.
- ✓ Nidarshana Chaturvedi[†], Mridula Singh[†], **Ashutosh K Shukla**^{*}, Ajit K Shasany, Karuna Shanker, Raj K Lal, Suman PS Khanuja, 2014. Comparative analysis of *Papaver somniferum* genotypes having contrasting latex and alkaloid profiles. ***Protoplasma* 251**, 857-867.
- ✓ Birendra Kumar, **Ashutosh K Shukla**, Abdul Samad, 2014. Development and characterization of the menthofuran-rich inter-specific hybrid peppermint variety CIMAP-Patra. ***Molecular Breeding* 34**, 717-724.
- ✓ Mahendra P Darokar, Sunita S Dhawan, **Ashutosh K Shukla**, Sanjog T Thul, Raj K Lal, Ajit K Shasany, Suman PS Khanuja, 2014. Assessment of genetic relatedness among selected cultivars of opium poppy (*Papaver somniferum* L.) through DNA profiling. ***Acta Horticulturae (ISHS)* 1036**, 21-28.
- ✓ Sharad K Singh, **Ashutosh K Shukla**, Om P Dhawan, Ajit K Shasany, 2014. Recessive loci *Pps-1* and *OM* differentially regulate *PISTILLATA-1* and *APETALA3-1* expression for sepal and petal development in *Papaver somniferum*. ***PLoS One* 9(6)**, e101272. (doi: 10.1371/journal.pone.0101272).

Review Articles

- ✓ Alka Singh, **Ashutosh K Shukla**, Ajit K Shasany, Mahendra P Darokar, Suman PS Khanuja, 2008. Impact of genomics on aroma research. ***Journal of Medicinal and Aromatic Plant Sciences* 30**, 276-280.
- ✓ Mridula Singh[†], Nidarshana Chaturvedi[†], Ajit K Shasany, **Ashutosh K Shukla**^{*}, 2014. Impact of promising genotypes of *Papaver somniferum* L. developed for beneficial uses. ***Acta Horticulturae (ISHS)* 1036**, 29-41.



ISSN: 2327-5162

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Patents

- ❑ Strain of *Bacillus* as a bioinoculant. **US Patent No. 7,211,428 (May 1, 2007). Granted**

- ❑ Primers and a screening method for identification of artemisinin producing plants. **US Patent No. 7,473,768 (January 6, 2009). Granted**

- ❑ A new, high seed and silymarin yielding plant of *Silybum marianum*, 'CIM-LIV'. **Ref. No.: 36NF2005. Filed in USA**



ISSN: 2327-5162

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Membership of Scientific Societies and Scientific Responsibilities

- Life member of the Indian Science Congress Association, Kolkata.
- Life member of the Medicinal and Aromatic Plant Society of India, Lucknow.
- Life member of the Society of Biological Chemists (India), Bangalore.
- Life member of the Alumni Association of Department of Biochemistry, University of Lucknow, Lucknow. Also Executive Committee member of the same since January 2012.
- Member, Scientific Committee, First International Symposium on Papaver organized by the Central Institute of Medicinal and Aromatic Plants (CSIR) and the International Society for Horticultural Science (ISHS) at CIMAP, Lucknow during 7-11 February, 2011. Co-chaired a session on the theme, “*Genetic Resources and Crop Improvement*”, as well as the poster session.
- Editor, *Journal of Medicinal and Aromatic Plant Sciences* (CIMAP, India) (2010 onwards)



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Membership of Scientific Societies and Scientific Responsibilities

- Reviewer for *Protoplasma* (Springer, Austria), *Journal of Plant Physiology* (Elsevier, Netherlands), *OMICS: A Journal of Integrative Biology* (Mary Ann Liebert, Inc., USA), *Plant Genetic Resources* (Cambridge University Press, UK), *African Journal of Biotechnology* (Academic Journals), *Journal of Medicinal and Aromatic Plant Sciences* (CIMAP, India), *Natural Product Communications* (USA), *Plant Cell Reports* (Springer, Germany), *PloS ONE* (Public Library of Science, USA), *Journal of Genetics* (Indian Academy of Sciences, India).
- Recognized as research guide for PhD students of CIMAP-JNU PhD programme.
- Member, Local Organizing Committee, 80th Annual Meeting of the Society of Biological Chemists (India) on the theme “Metabolic pathway modulations – Applications in health and agriculture” organized by CSIR-CIMAP at CIMAP, Lucknow during 12-15 November, 2011.



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citations

Publication	Number
Number of papers presented as abstracts in seminar/symposia	34
Number of laboratory manuals edited	2
Number of scientific projects involved in (as PI, Co-PI, Investigator)	14
Number of conferences / seminars / meets/ workshops / schools / trainings participated / contributed in	48
Number of lectures delivered in schools / workshops / institute seminars	20
Number of schools / trainings convened	3
Number of MSc / MTech dissertations guided	11
Number of research scholars (Project Assistants / JRFs / SRF in various projects tenable at CIMAP) guided	12



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