

## Dr. NITISH KUMAR

### Dr. Nitish Kumar

Senior Assistant Professor  
Department of Biotechnology  
Central University of South Bihar,  
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### Academic profile:

- ✦ B.Sc. (Agriculture-First Class), Gujarat Agricultural University, Anand, Gujarat, India, (2001)
- ✦ M.Sc. (Agri. Biotech-First Class), CSK Himachal Pradesh Agricultural. University, Palampur, HP, India (2003)
- ✦ Advanced PG Diploma (Bioinformatics), University of Pune, Pune, MH, India (2005)
- ✦ Ph.D. (Botany), CSIR-CSMCRI/Bhavnagar University, Bhavnagar, Guj, India (2009)

### Area of Specialization:

- ✦ Plant Tissue Culture, Genetic Transformation of Plants, Molecular Marker development, Mutation Breeding and Microbial Biotechnology

### Professional Experiences:

- ✦ Assistant Professor (2010-Contd.): Centre for Biological Sciences (Biotechnology), Central University of Bihar, Patna, India
- ✦ Research Associate (2009-2010): Anand Agricultural University, Anand, Gujarat, India
- ✦ Senior research Fellow (2008-2009): CSIR-CSMCRI, Bhavnagar, Gujarat, India.
- ✦ Junior research Fellow (2005-2008): CSIR-CSMCRI, Bhavnagar, Gujarat, India.
- ✦ Research Intern (2004): CSIR-CIMAP, Lucknow, UP, India

### Research Project: 3

Sr. No.	Title of Project	Funding Agency	Budget	Duration
1	Molecular assessment of microbial diversity and their role in arsenic transformation and mobilization in arsenic contaminated groundwater of middle Ganga plain, Bihar, India. <b>(PI)</b>	UGC, New Delhi	6 Lakhs	2014-16
2	Molecular Characterization of Molecular Diversity in Makhana ( <i>Euryale ferox</i> ) <b>(PI)</b>	DST, New Delhi	23 Lakhs	2014-17
3	Genetic Improvement of Makhana ( <i>Euryale ferox</i> Salisbury) through Gamma Radiation <b>(PI)</b>	DAE-BRNS, Mumbai	23 Lakhs	2014-17

### Award /Fellowship

- ✦ Fast-track Young Scientist from DST, Govt. of India
- ✦ DBT-JRF (Biotechnology) qualified.

- ✚ CSIR-UGC-NET (Life Science) qualified.
- ✚ ICAR-NET (Agri. Biotechnology) qualified
- ✚ GATE (Life Science) qualified
- ✚ DBT fellowship during Advanced PG Diploma in Bioinformatics
- ✚ DBT fellowship during M.Sc. (Agricultural Biotechnology)
- ✚ CSIR Diamond Jubilee Research Intern Award-CSIR-Central Institute of medicinal and Aromatic Plants (CSIR-CIMAP)-Lucknow
- ✚ National talent scholarship in Agriculture through ICAR, New Delhi during B.Sc. (Agriculture)

### Academic responsibilities:

1. Teaching Postgraduate classes for Biotechnology
  - ✚ Microbiology- 3 credits (1<sup>st</sup> semester)
  - ✚ Enzymology - 3 credits (2<sup>nd</sup> semester)
  - ✚ Plant Biotechnology -3 credits (3<sup>rd</sup> semester)
  - ✚ Lab 1- 3 Credit (1<sup>st</sup> semester)
  - ✚ Lab 5- 3 Credit (3<sup>rd</sup> semester)
2. Teaching Graduate classes for Life Science
  - ✚ Animal Taxonomy- 4 Credit (First Semester)
  - ✚ Animal Taxonomy- 4 Credit (3<sup>rd</sup> Semester)
  - ✚ Fermentation Technology- 4 Credits (5<sup>th</sup> Semester)

**No. M.Phil-Ph.D. student's registered: 2**

**No. of M.Sc. dissertation guided: 30**

### Reviewer of research journals:

Planta, Plos One, Gene, Molecular Biology Reports, Industrial crops and Products, Acta Physiologiae Plantarum, Indian Journal of Biotechnology, Journal of Crop Science and Biotechnology, Journal of Plant Biochemistry and Biotechnology etc.

### Members/Editor:

1. Associate editor of Journal 'GENE' (SCI Impact Factor: 2.4)
2. Editorial Board member of Journal "American Journal of Plant Biology"
3. Life member of Indian Science Congress Associations
4. Life member of Indian Society of Plant Physiology
5. Life Member of The Biotech Research Society, India
6. Life Member of Indian Botanical Society, India
7. Life member of the Society for Plant Biochemistry and Biotechnology, India

**Total Publications: 60**

**Total Citations: 1077**

### Research papers: 37

1. **Kumar N\***, Rani S, Kumar G, Kumari S, Singh IS, Gautam S, Choudhary BK (2019) Physiological and biochemical responses of Makhana (*Euryale ferox*) to gamma irradiation. Journal of Biological Physics. 45: 1-12 (Springer Publishing).
2. Mishra SK, **Kumar N**, Kumar G, Kashav T, Prakash K (2018) Recombinant human interferon regulatory factor-1 (IRF-1) protein expression and solubilisation study in *Escherichia coli*. Molecular Biology Reports. 45: 1367-1374 (Springer Publishing).

3. Modi A, Suthar K, Thakkar P, Mankad MC, Kumari S, Naraynan S, Singh AS, **Kumar N\*** (2018) Evaluation of sex specific RAPD and SCAR markers linked to papaya (*Carica papaya* L.). Biocatalysis and Agricultural Biotechnology. 16: 271-276 (Elsevier Publishing)
4. Mahto KU, Shaheen A, Kumari S, Singh IS, **Kumar N\***(2018) DNA polymorphism analysis of Indian germplasms of *Trapa natans* using RAPD molecular Marker. Biocatalysis and Agricultural Biotechnology. 15: 146-149 (Elsevier Publishing)
5. N Sadaf, **N Kumar**, M Ali, V Ali, S Bimal, R Haque (2018) Arsenic trioxide induces apoptosis and inhibits the growth of human liver cancer cells. Life science, 205: 9-17 (Elsevier Publishing)
6. GK Satyapal, SK Mishra, A Srivastava, RK Ranjan, K Prakash, R Haque, **Kumar N** (2018) Possible bioremediation of arsenic toxicity by isolating indigenous bacteria from the middle Gangetic plain of Bihar, India. Biotechnology Reports, 17: 117-125 (Elsevier Publishing)
7. Kumar N, Shikha D, Kumari S, Choudhary BK, Kumar L, Singh IS (2018) SSR-Based DNA Fingerprinting and Diversity Assessment Among Indian Germplasm of *Euryale ferox*: an Aquatic Underutilized and Neglected Food Crop. Applied Biochemistry and Biotechnology. 185: 34-41 (Springer Publishing)
8. **Kumar N\***, Kumar H, Kumari S (2017) Extraction of High Quality Genomic DNA for Genetic Diversity and Molecular Marker Studies from Leaves of Makhana (*Euryale ferox*). Journal of Biodiversity. 8(2): 87-92 (Taylor & Francis Publishing)
9. Kumar H, Priya O, Singh N, Kumar M, Choudhary BK, Kumar L, Singh IS, **Kumar N\*** (2016) RAPD and ISSR markers based comparative evaluation of genetic diversity among Indian germplasm of *Euryale ferox*: An aquatic food plant. Applied Biochemistry and Biotechnology. 180:1345–1360 (Springer Publishing)
10. Satyapal GK, Rani S, Kumar M, **Kumar N\*** (2016) Potential Role of Arsenic Resistant Bacteria in Bioremediation: Current status and future prospects. Journal of Microbial & Biochemical Technology. 8: 256-259.
11. Desai P, Gajera B, Mankad MC, Shah S, Patel A, Patil G, Narayanan S, **Kumar N\*** (2015) Comparative assessment of genetic diversity among Indian bamboo genotypes using RAPD and ISSR markers. Molecular biology Reports. 42: 1265-1273 (Springer Publishing).
12. Sandal I, Koul R, Saini U, Kaur D, Mehta M, **Kumar N**, Ahuja PS, Bhattacharya A (2015) Development of transgenic tea plants from leaf explants by the biolistic gun method and their evaluation. Plant Cell Tissue Organ Culture. 123: 245-255 (Springer Publishing).
13. **Kumar N\***, Singh AS, Kumari S, Reddy MP (2015) Biotechnological approaches for the genetic improvement of *Jatropha curcas* L.: a biodiesel plant. Industrial Crops and Products. 76:817-828 (Elsevier publishing).
14. Singh AS, Kumari S, Modi AR, Gajera BB, Narayanan S, **Kumar N\*** (2015) Role of Conventional and Biotechnological Approaches in Genetic Improvement of Castor (*Ricinus communis* L.). Industrial Crops and Products. 74: 55-62. (Elsevier publishing)
15. Gandhi VP, Priya Anshu, Priya Suman, Daiya V, Keshari J, Prakash K, Jha AK, Kumar K, **Kumar N\*** (2015) Isolation and Molecular Characterization of Bacteria to Heavy Metals Isolated from Soil Samples of Bokaro Coal Mines, India. Pollution. 1: 287-295

16. Mishra SK, Suman P, Sharma PK, **Kumar N**, Prakash K (2015) human interferon regulatory factor-2 (irf-2): chimeric protein and expression analysis. *International Journal of Biology, Pharmacy, and allied Sciences*, 4: 5990-6002
17. Bhattacharya A , Saini U, Joshi R, Kaur D, Pal AK, **Kumar N**, Gulati A, Mohanpuria P, Kumar S, Kumar S, Ahuja PS (2014) *Osmotin* expressing transgenic tea plants have improved stress tolerance and quality parameters. *Transgenic Research* 23:211-23 (Springer Publishing).
18. Kumar A, Prakash K, Sinha RK, **Kumar N\*** (2013) In vitro plant propagation of *Catharanthus roseus* and assessment of genetic fidelity of micropropagated plants by RAPD marker assay. *Applied Biochemistry and Biotechnology*. 169: 894-900 (Springer Publishing).
19. **Kumar N\***, Bhattacharya A, Gulati A (2013) L-glutamine and L-glutamic acid facilitate the establishment of cell-cell contact between *Agrobacterium* and recalcitrant leaves of important tea cultivars. *Applied Biochemistry and Biotechnology*.70:1649-64 (Springer Publishing).
20. Modi AR, Patil G, **Kumar N\***, Singh AS, Subhash N (2012) A Simple and efficient in vitro mass multiplication procedure for *Stevia rebaudiana* Bertoni and analysis of genetic fidelity of in vitro raised plants through RAPD. *Sugar Tech*. 14:391–397 (Springer Publishing).
21. **Kumar N\***, Reddy MP (2012) Thidiazuron (TDZ) induced plant regeneration from cotyledonary petiole explants of elite genotypes of *Jatropha curcas*: A candidate biodiesel plant. *Industrial Crops and Products*. 39: 62-68 (Elsevier publishing)
22. Sharma S, **Kumar N**, Reddy MP (2011) Regeneration in *Jatropha curcas*-Factors affecting the efficiency of in vitro regeneration. *Industrial Crops and Products*. 34: 943-951. (Elsevier publishing)
23. **Kumar N\***, Vijayanand KG, Reddy MP (2011). Plant regeneration in non-toxic *Jatropha curcas* - impacts of plant growth regulators, source and type of explants. *Journal of Plant Biochemistry and Biotechnology*. Vol. 20: 125-133 (Springer Publishing).
24. **Kumar N\***, Vijayanand KG, Reddy MP (2011) In vitro regeneration from petiole explants of non-toxic *Jatropha curcas*. *Industrial Crops and Products*. Vol. 33: 146-151. (Elsevier publishing)
25. **Kumar N\***, Reddy MP (2011) In vitro Plant Propagation: A Review. *Journal of Forest Science*. Vol. 27: 61-72.
26. Singh AS, Patel MP, Patel TK, Delvadia DR, Patel DR, **Kumar N**, Naraynan S, Fougat RS (2010) Floral biology and flowering phenology of *Jatropha curcas*. *Journal of Forest Science*. Vol. 26: 95-102.
27. Gajera BB, Kumar N\*, Singh AS, Punavar BS, Ravikiran R, Subhash N, Jadeja JC (2010). Assessment of genetic diversity in castor (*Ricinus communis* L.) using RAPD and ISSR markers. *Industrial Crops and Products*. Vol. 32: 491-498 (Elsevier publishing)
28. **Kumar N\***, Vijayanand KG, Reddy MP (2010). In vitro plant regeneration of non-toxic *Jatropha curcas* L: direct shoot organogenesis from cotyledonary petiole explants. *Journal of Crop Science and Biotechnology*. Vol. 13: 189-194. (Springer Publishing) ``
29. **Kumar N\***, Modi A, Singh AS, Gajera BB, Patel AR, Patel MP, Subhash N (2010) Assessment of genetic fidelity of micropropagated date palm (*Phoenix dactylifera* L.) plantlets by RAPD and

ISSR markers assay. *Physiology and Molecular Biology of Plants*. Vol: 16: No. 2: 207-213. (Springer Publishing)

30. **Kumar N\***, Singh AS, Modi AE, Patel AR, Gajera BB, Subhash N (2010). Genetic Stability Studies in Micropropagated Date Palm (*Phoenix dactylifera* L.) Plants using Microsatellite Marker. *Journal of Forest Science* Vol: 26: 31-36.
31. **Kumar N\***, Vijayanand KG, Pamidimarri DVNS, Sarkar T, Reddy MP, Kaul T, Reddy MK, Sopori SK. (2010) Stable genetic transformation of *Jatropha curcas* via *Agrobacterium tumefaciens*-mediated gene transfer using leaf explants. *Industrial crops and products*. Vol. 32: No. 1: 41-47. (Elsevier publishing)
32. **Kumar N**, Vijayanand KG, Reddy MP (2010) Shoot regeneration from cotyledonary leaf explants of *Jatropha curcas*: a biodiesel plant. *Acta physiologiae Plantarum*. Vol: 32. No.5. 917-924. (Springer Publishing)
33. **Kumar N**, Reddy MP (2010) Plant regeneration through direct shoot bud induction from petiole explants of *Jatropha curcas*: a biofuel plant. *Annals of Applied Biology*. Vol. 156:No.3:367-375. (Wiley-Blackwell Publishing)
34. **Kumar N**, Vijayanand KG, Reddy MP, Singh AS, Subhash N (2009) *Agrobacterium tumefaciens*-mediated genetic transformation: mechanism and factors. *Journal of Forest Science*. Vol 25: No. 3:195-204
35. **Kumar N**, Kaur M, Pamidimarri DVNS, Boricha G, Reddy MP (2008) Comparative response of callus and seedling of *Jatropha curcas* L. to salinity stress. *Journal Forest Science*. Vol. 24:No.3:69-77.
36. **Kumar N**, Pamidimarri DVNS, Kaur M, Boricha G, Reddy MP (2008) Effects of NaCl on growth, ion accumulation, protein, proline contents and antioxidant enzymes activity in callus cultures of *Jatropha curcas* L. *Biologia*: Vol 63: No. 3:378-382. (Springer Publishing)
37. **Kumar N**, Pandey S, Bhattacharya A, Ahuja PS (2004): Do leaf surface characteristics affect *Agrobacterium* infection in tea (*Camellia sinensis* (L.) O. Kuntze)? *J. Bioscience*: Vol. 29: No.3:309-317. (Springer Publishing)

#### **Book Chapters: 14**

1. **Kumar N**, Reddy MP (2013) *Jatropha* tissue culture: A critical review on present scenario and future prospects. In "Jatropha, Challenges for a New Energy Crop: Vol 2: Genetic Improvement and Biotechnology" edited by Bir Bahadur., Sujatha M., Nicolas Carels., pp: 513-523, (Springer Publisher).
2. **Kumar N**, Reddy MP, Sujatha M (2013) Genetic Transformation of *Jatropha curcas*: Current status and future prospects. In *Jatropha, Challenges for a New Energy Crop: Vol 2: Genetic Improvement and Biotechnology*" edited by Bir Bahadur., Sujatha M., Nicolas Carels., pp: 535-546, (Springer Publisher).
3. Modi A, **Kumar N** and Subhash N (2016) Transcript quantification of genes involved in steviol glycoside biosynthesis in *Stevia rebaudiana* Bertoni by Real Time Polymerase Chain Reaction (RT-PCR). In "Protocol for invitro cultures and secondary metabolite analysis of aromatic and medicinal plants "edited by Mohan Jain., pp: 289-301. Springer Publisher

4. **Kumar N\***, Modi A, Patil G, Singh AS, and Subhash N (2016) Micropropagation and Biomass production of True-to-Type *Stevia rebaudiana* Bertoni. In "Protocol for invitro cultures and secondary metabolite analysis of aromatic and medicinal plants" edited by Mohan Jain., pp: 113-123. Springer Publisher
5. Modi A, Gajera B, Subhash N, Singh AS, **Kumar N\*** (2017) Evaluation of clonal fidelity of micropropagated Date palm (*Phoenix dactylifera*) by Random Amplified Polymorphic DNA (RAPD). In "Date Palm Biotechnology Protocols" edited by Al-Khayri JM and Jain M. pp: 81-89. Springer Publisher.
6. **Kumar N\***, Modi A, Gajera B, Subhash N (2018) Development of simple methodology for assessment of clonal stability of tissue culture raised date palm plant using inter simple sequence repeat (ISSR) marker. In "Plant Systematics & Biotechnology: Challenges & Opportunities" edited by Chourasia HK & Mishra DP. pp: 235-244. Today and Tomorrow's Printers & Publishers, New Delhi.
7. Modi A, **Kumar N\*** (2018) TDZ-Induced Regeneration in *Stevia rebaudiana* Bertoni: An Important Natural Sweetener. In "Thidiazuron: From Urea Derivative to Plant Growth Regulator" edited by Ahmad N & Faisal M. pp 351-358. Springer Publisher
8. **Kumar N\***, Vacha, Mastan SG, Reddy MP (2018) TDZ-Induced Plant Regeneration in *Jatropha curcas*: a promising Biofuel Plant. In "Thidiazuron: From Urea Derivative to Plant Growth Regulator" edited by Ahmad N & Faisal M. pp 419-428. Springer Publisher
9. **Kumar N** (2018) Genetic engineering of Crop plant for insect pest control: current status and future prospects. In "Human implications of Biotechnology" edited by Haque r, Srivastava a & Kumar N. pp 36-61. Shree Publishers & Distributors, New Delhi
10. Modi A, **Kumar N** (2018) Conventional and Biotechnological Approaches to Enhance Steviol Glycosides (SGs) in *Stevia rebaudiana* Bertoni. In "Biotechnological Approaches for Medicinal and Aromatic Plants: Conservation, Genetic Improvement and Utilization" edited by Kumar N. pp 53-62. Springer Publisher
11. Sharma A, **Kumar N**, Mishra IG (2018) Role of Molecular Marker in the Genetic Improvement of the Medicinal and Aromatic Plants. In "Biotechnological Approaches for Medicinal and Aromatic Plants: Conservation, Genetic Improvement and Utilization" edited by Kumar N. pp 557-567. Springer Publisher
12. Kumari S, Shashikant, **Kumar N**, Trivedi MP (2018) In Vitro Culture and Production of Secondary Metabolites in *Centella asiatica*. In "Biotechnological Approaches for Medicinal and Aromatic Plants: Conservation, Genetic Improvement and Utilization" edited by Kumar N. pp 157-173. Springer Publisher
13. Singh RS, Chattopadhyay T, Thakur D, **Kumar N**, Kumar T, Singh PK (2018) Hairy root culture for in vitro production of secondary metabolites: a promising biotechnological approach. In "Biotechnological Approaches for Medicinal and Aromatic Plants: Conservation, Genetic Improvement and Utilization" edited by Kumar N. pp 235-250. Springer Publisher
14. Mastan SG, Rathore MS, Reddy MP, **Kumar N\*** (2019) Genetic engineering for improvement oil content in *Jatropha curcas*: a promising a biofuel plant. "Jatropha, Challenges for a New Energy Crop: Vol 3: Genetic Improvement and Biotechnology" edited by Bir Bahadur., Sujatha M., Nicolas Carels. Pp 95-110 (Springer Publisher).

## Books: 4

1. **Nitish Kumar** (2020) Arsenic Toxicity: Challenges and Solutions. (**Springer Publisher**). Approved
2. **Nitish Kumar** (2020) Biotechnology for Biofuels: A Sustainable Green Energy Solution. 1-288, ISBN 978-981-15-3760-8, (**Springer Publisher**).
3. **Nitish Kumar** (2018) Biotechnological Approaches for Medicinal and Aromatic Plants: Conservation, Genetic Improvement and Utilization. 1-654, ISBN 978-981-13-0535-1 **Springer Publisher**)
4. Haque R, Srivastava A, **Kumar N** (2018) Human implications of Biotechnology, Shree Publishers & Distributors, New Delhi

## Patent filed: 2

1. M.P.Reddy, **Nitish Kumar**, K.G.Vijayanand, Aneesha singh, Sweta singh (2008) A media composition for micropropagation of *Jatropha curcas* plants from leaf explants (**Application No. 2537/DEL/2008 A**)
2. M.P.Reddy, Aneesha Singh, Sweta singh, K.G.Vijayanand, **Nitish Kumar** (2009) A media composition for micropropagation of *Jatropha curcas* plants from shoot tip and nodal segments (**Application No.657/DEL/2009 A**).

**Sequence submitted to NCBI:** 8 (Accession No. KM029957 to KM029964)

## Participation/Presentation to Symposium/Conference/Seminar/Workshop/Trainings

1. Kumar N. 2012. Plant regeneration of non-toxic *Jatropha curcas*- impacts of plant growth regulators, source and type of explants. National Seminar on Recent Trends in Life Sciences, Patna University, Patna, (Oral Presentation), 30<sup>th</sup> May 2012.
2. Kumar N. 2012. 5<sup>th</sup> Science Conclave, IIT Allahabad, (Participation), December 8-14.
3. Attained training course on application of nanotechnology in Agriculture organized under world Bank Funded NAIP-ICAR project at Central Arid zone Research Institute, Jodhpur from March 10 to 19, 2014.
4. Organized International Conference on “Human Implications of Biotechnology” at the level of Organizing Secretary, Centre for Biological Science (Biotechnology), Central University of South Bihar, Patna from 12/02/2016 to 14/02/2016
5. Chair session in “International Conference on “Human Implications of Biotechnology”, Central university of South Bihar, Patna from Centre for Biological Science (Biotechnology), Central University of South Bihar, Patna from 12/02/2016 to 14/02/2016
6. Attained 71<sup>st</sup> orientation course at Academic Staff College, Patna University, Patna from 12/05/2015 to 08/06/2015.
7. Attained Refresher course at Human Resources Developmental Centre , Saurashtra University, Rajkot from 19/12/2016-08/01/2017
8. Attained One day symposium on International Diaspora Literature at Human Resources Developmental Centre , Saurashtra University, Rajkot, on 30/12/2016
9. Organized National Conference on “Current trends in Life Sciences ” at the level of Organizing Member, Centre for Biological Science Life Science), Central University of South Bihar, Patna from 20/02/2017 to 21/02/2017
10. Participated In the International Conference on “Fifty years of Discovery of Triple helical Structure of Collagen: Progress & Perspectives”, January 21-22, 2005

11. Participated in Training on “application of Bioinformatics in agricultural and Biotechnology based Research”, January 10-12, 2004.
12. Organized Training cum workshop on Basic Tools and Technique in Biotechnology at the level of Organizing Secretary, Centre for Biological Science (Biotechnology), Central University of South Bihar, Patna from 24/11/2016 to 30/11/2016
13. Deliver an invited lecture in a National Level Conference on “Plant Systematics & Biotechnology: Challenges & Opportunities”, Nov., 28-30, 2017.