

## MUKESH KUMAR SINGH

Scientist (OPCW)

Institute of Pesticide Formulation Technology

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**PERSONAL:** Male; Married; Indian National; Born 09 August 1981



### ACADEMIC QUALIFICATION:

Intermediate	1999	(BIEC Patna)	First Class (67% Marks)
B.Sc (Honours) Chemistry	2002	(LNMU Darbhanga)	First Class (65% Marks)
M.Sc. Agrochemical Pest management.	2007	(Delhi University)	First Class (60% Marks)
PhD (Chemistry)	2013	(Kolhan University Chaibasa)	- Pursuing -

### PROFESSIONAL EXPERIENCE

**Research experiences:-** 10 years

**Teaching experience:**

- Teaching Post graduate diploma in analytical chemistry programme (PGDAC) as an Academic Counselor at IGNOU from March 2015 till date.

### JOB EXPERIENCE:

- Scientist, Organization for the Prohibition of Chemical Weapons (OPCW) at Institute of Pesticide Formulation Technology, Gurgaon, Department of Chemicals & Petro-Chemicals, **Ministry of Chemicals and Fertilizers**, Government of India, from 2<sup>nd</sup> March to till date.
- Worked as an **R&D Scientific Officer** (Organic Synthesis and Analytical Development) at **Bharat Rasayan Limited**, 2 km, Stone, Madina Mokhra Road, Mokhra, Maham (Rohtak, Haryana) India from 13<sup>th</sup> August 2007 to 31<sup>st</sup> December 2008.
- Worked as a Junior Research Fellow (JRF) in DBT funded project entitled “**Chemo-enzymatic synthesis of environmental friendly amphiphilic co-polymer for the crop protection**” at Division of Agricultural Chemicals, Indian Agricultural Research Institute, New Delhi, India from 2<sup>nd</sup> Feb 09 to 14<sup>th</sup> May 2010.
- Worked as a Senior Research Fellow (SRF) in Ministry of Chemicals and Fertilizer sponsored project entitled “**Studies on pesticide formulation from Basil and Turmeric oil for household and Agricultural purposes**” at Institute of Pesticide Formulation Technology, Gurgaon, Haryana, India from 11<sup>th</sup> June 2010 to 11<sup>th</sup> Aug 2011.

- Worked as a Research Associate in Ministry of Agriculture and Corporation funded project entitled “**Monitoring of pesticide residue at a national level**” at Division of Agricultural Chemicals, Indian Agricultural Research Institute, New Delhi, India from 12<sup>th</sup> August 2011 to 1<sup>st</sup> March 2012.

#### **PUBLICATION:**

1. N. A. Shakil, Manish K. Singh, Jitendra Kumar, M. Sathiyendiran, Gaurav Kumar, **Mukesh K. Singh**, Ravi Prakash Pandey, Alka Pandey, V. S. Parmar.(2010) Microwave synthesis and antifungal evaluations of some chalcones and their derived diaryl-cyclohexenones. *Journal of Environment Science and Health, Part B*, 45: 6, 524 - 530.
2. Jitendra kumar, Najam A. Shakil, Manish K. Singh, Pankaj, **Mukesh K. Singh**, Alka Pandey, Ravi P. Pandey.(2010) Development of controlled release formulations of Azadirachtin-A employing poly (ethylene glycol) based amphiphilic co-polymers *Journal of Environment Science and Health, Part B*, 45: 4, 310 - 314.
3. Najam A Shakil, Alka Pandey, Manish K. Singh, Jitendra Kumar, Satish K. Awasthi, Pankaj, Chitra Srivastava, **Mukesh K. Singh** and Ravi P. Pandey.( 2010) Synthesis and bioefficacy evaluation of new 3-substituted-3,4-dihydro-1,3-benzoxazines. *Journal of Environmental Sciences and Health, Part B*, 45: 2, 108 - 115.
4. Najam Akhtar Shakil, **Mukesh K. Singh**, Alka Pandey, Jitendra Kumar, Pankaj, Virinder S. Parmar, Manish K. Singh, Ravi P. Pandey and Arthur C. Watterson. (2010) Development of Poly (ethylene glycol) based Amphiphilic copolymers for controlled release delivery of Carbofuran. *Journal of Macromol. Sci., Pure & Appl. Chem., Part A*, 47:3, 241 – 247.
5. Pankaj, Najam Akhtar Shakil, Jitendra Kumar, **Mukesh K. Singh** and Khajan Singh. (2012) Bioefficacy evaluation of controlled release formulations based on amphiphilic nano-polymer of carbofuran against *Meloidogyne incognita* infecting Tomato. *Journal of Environmental Sciences and Health, Part B*, 47:6, 520-528.
6. Prasant kaushik, Najam Akhtar Shakil, Jitendra kumar, **Mukesh K. Singh**, Manish K. Singh and Shiv kumar Yadav. (2012) Development of controlled release formulation of Thiram employing amphiphilic polymer and their bioefficacy evaluation in seed quality enhancement studies. *Journal of Environmental Sciences and Health Part B*, 48:8, 677-685.
7. L. K. Thakur, Sunita Roy, Rajmani Prajapati, **Mukesh K. Singh** S. K. Raza, B. D. Mangave, Alka Singh and Sanjay Jha. (2014) Development and evaluation of environmental user Friendly Turmeric oil Emulsifiable concentrate formulations for post harvest quality and life in Rose Cv. poison. *International Journal of Recent Scientific Research*, 5:1, 178-185.

8. L. K. Thakur, Sunita Roy, Rajmani Prajapati, **Mukesh K. Singh**, S. K. Raza. (2014) Development and evaluation of Basil oil Emulsifiable concentrate *African Journal of Science and Research*, 3:1, 06-09.
9. L. K. Thakur, **Mukesh K. Singh**, Kuldeep Ravivanshi, Savita Yadav, S. K. Raza. (2014) Solubilization of Eugenol and Methyl eugenol in single and mixed micellar solution and their evaluation. *Journal of Multidisciplinary Scientific Research*, 2: 4,04-08.
10. K. K. Krishnani, V. Kathiravan, N. A. Shakil, Manish Kumar Singh, M. P. Brahmane, K. K. Meena, Biplab Sarkar, K. Choudhary, **Mukesh Kumar Singh**, Jitendra Kumar.(2015) Bactericidal activity of Nanopolymers against shrimp pathogenic bacterium *Vibrio harveyi*, *Proc. National Academy of Sciences India, Section B, Biological Science* .
11. Sudeep Mishra, Mahesh K Saini, **M.K. Singh**, S. Alam, L. K. Thakur, S. K. Raza, Shibendu Mukharjee.(2015) Method development and validation for identification of 2-phenyl phenol in Ciapton 10L by GC –MS. *World Journal of Pharmacy and Pharmaceutical Sciences*, 4 : 12, 783-789.
12. Sudeep Mishra, Vinod Deotale, Mangesh Pandey, Mahesh K Saini, **M.K. Singh**, S. Alam , B. S. Sehrawat, L. K. Thakur, S.K.Raza.(2016) GC-MS Analysis of multiclass pesticide residue found in farmland water of Haryana districts, *World Journal of Pharmaceutical Research*, 5 :8 744-752.
13. Sudeep Mishra, Vinod Deotale, Mahesh K Saini, **M.K. Singh**, Mangesh Pandey , S. Alam, L. K. Thakur, B. S. Sehrawat, S. K. Raza.(2017) Monitoring of multiclass pesticide residues in farmland soil from different district of Haryana by GC-MS. *Agriculture Research Journal*, 54 :1 47-52
14. Sudeep mishra, Neelam Richhariya, Akriti agarwal, Lalitesh k. Thakur, **Mukesh k. Singh**, Rachana Rani (2017) Method Validation For Determination Of 23 Organophosphorus Pesticide Residues In Chilli By Gas Chromatography. *World Journal of Pharmaceutical Research*, 6:6 1183-1197.

#### **ABSTRACT AND PAPER PRESENTATION:**

- Najam Akhtar Shakil, Jitendra Kumar, **Mukesh K. Singh**, Alka Pandey, Manish Kumar Singh, Ravi Kumar Pandey, Pankaj and A. K. Dikshit. Nanoscience for ensuring food security: development of amphiphilic nanopolymers for controlled release delivery of pesticides. Poster presentation in International Conference on Materials for the Millennium Matcon- 11<sup>th</sup>-13<sup>th</sup> January 2010 at Kochi, Kerala, India.
- L.K.Thakur, **Mukesh K. Singh**, Kuldeep Ravivanshi and Savita Yadav. Solubilization of some insect attractants in single and mixed micellar solution and

their physico-chemicals studies poster presentation in 15<sup>th</sup> ISCB International Conference 4<sup>th</sup> -7<sup>th</sup> February 2011 at Rajkot, Gujarat, India.

- L.K.Thakur, Sunita Roy and **Mukesh K. Singh** Development of Environmental Friendly Emulsifiable concentrate from Basil Oil and its physio chemicals studies poster presentation in 15<sup>th</sup> ISCB International Conference , 4<sup>th</sup> -7<sup>th</sup> February 2011 at Rajkot, Gujarat, India
- L.K.Thakur, Sunita Roy and **Mukesh K. Singh** Development of Environmental Friendly Emulsifiable concentrate from Turmeric oil and its physio chemical studies poster presentation in 3<sup>rd</sup> ISC International Conference 11<sup>th</sup> - 15<sup>th</sup> June 2011 at Bangkok
- L.K.Thakur, Najam Akhtar Shakil, **Mukesh K. Singh**. Antifungal evaluation of water based microemulsion of Eugenol and Methyl Eugenol against *Rhizoctonia solani* and *Sclerotium rolfsii* poster presentation in IUPAC Sponsored 2<sup>nd</sup> International Conference on Agrochemicals protecting crops health and natural environment role of chemistry and sustainable agriculture 15<sup>th</sup>-18<sup>th</sup> Feb 2012 at IARI, New Delhi-12, India
- **Mukesh Kr. Singh**, Manish kr. Singh, N. A. Shakil, Jitendra Kumar and Shiv Kr. Yadav. Effect of nanoencapsulated Thiram on seed quality enhancement of soybean seed poster presentation in IUPAC Sponsored 2<sup>nd</sup> International Conference on Agrochemicals protecting crops health and natural environment role of chemistry and sustainable agriculture 15<sup>th</sup>-18<sup>th</sup> Feb 2012 at IARI, New Delhi-12, India.
- Prashant Kaushik, N. A. Shakil, Jitendra Kumar and **M. K. Singh** functionalized amphiphilic polymers of potential pesticide delivery system of Thiram poster presentation in IUPAC Sponsored 2<sup>nd</sup> International Conference on Agrochemicals protecting crops health and natural environment role of chemistry and sustainable agriculture 15<sup>th</sup>-18<sup>th</sup> Feb 2012 at IARI, New Delhi-12, India.
- **Mukesh K. Singh**, Sudeep Mishra, Ompal Singh, L. K. Thakur and S. K. Raza. Analysis of pesticide residue in water from different sources in Delhi and NCR region 7<sup>th</sup>-9<sup>th</sup> December, 2012 at BCKV Kalyani, Kolkata, India
- S. Mishra, M. K. Saini, V. D. Deotale, **M. K. Singh**, M. Pande, S. Alam, L. K. Thakur, S. K. Raza and S. B. Sehrawat. Monitoring of multiclass pesticide in farmland soil from different district of Haryana by Gas chromatography mass spectroscopy, National Conference on Green Technique, 11-12 July, 2014 at Department of chemistry Mewar University Chittorgardh , Rajasthan, India
- **M. K. Singh** N. A. Shakil, S. K. Raza, L. K. Thakur. Antifungal evaluation of water based insect attractant microemulsions against *R.solani* and *S.rolfsii* December 15-17<sup>th</sup>, December, 2014. in 33<sup>rd</sup> Annual Conference Indian Council of Chemists at Indian School of Mines Dhanbad, India
- Sudeep Mishra, Vinod Deotale, Mahesh K Saini, **M. K. Singh**, Mangesh Pande, S. Alam, L. K. Thakur, B. S. Sehrawat, S. K. Raza. Analysis of multiclass pesticide

residues in farmland water samples from different district of Haryana by Gas Chromatography and mass spectrometry in National Conference on Interdisciplinary Approaches in Chemical Science IACS-2015, on 16<sup>th</sup> December 2015, at Jamia Milia University Delhi, India

- **Mukesh K. Singh**, Mahesh K Saini, Vinod D Deotale, Mangesh A Pande, Sudeep Mishra, Samsul Alam, L. K. Thakur and S. K. Raza. Method development and validation for the residue studies of Difenconazole 25% EC in Chilli and Siol in the 3<sup>rd</sup> International IUPAC Conference on Agrochemicals Protecting Crops and Natural Environment 6<sup>th</sup> -9<sup>th</sup> April, 2016, New Delhi, India
- Mahesh K Saini, Vinod D Deotale, Mangesh A Pande, **Mukesh K. Singh**, Sudeep Mishra, Samsul Alam, L. K. Thakur and S. K. Raza Determination of persistence and dessipation behaviour of Azoxystrobin residues in grapes berries and field soil by LC-MS/MS. in 3<sup>rd</sup> International IUPAC Conference on Agrochemicals Protecting Crops, and Natural Environment 6<sup>th</sup> -9<sup>th</sup> April, 2016, New Delhi, India
- Sudeep Mishra, Mahesh K Saini, Vinod D Deotale, Mangesh A Pande, **Mukesh K. Singh**, Samsul Alam, L. K. Thakur and S. K. Raza. Residual fate and dissipation of Fipronil 80% WG in grapes berries and field soil. in the 3<sup>rd</sup> International IUPAC Conference on Agrochemicals Protecting Crops, and Natural Environment 6<sup>th</sup> -9<sup>th</sup> April, 2016, New Delhi, India (*first prize winner in poster presentation*)
- **Mukesh Kumar Singh**, Sudeep Mishra , Neelam Richarya, Samsul Alam, Lalitesh K.Thakur, P.K. Patanjali. Method Development and Validation for Pesticide Residues in Chilli by GC-ECD and GC-MS, Biophysika-2017 ,March 16th, 2017, Jamia Milia Islamia, New Delhi

#### **PATENT FILED:**

N. A. Shakil, J. Kumar, **M. K. Singh**, K. M. Loha, T. Adak, P. Kaushik, A. Roy chowdhury, D. J. Sarkar and Pankaj. (2012) Development of slow release nano formulations of bioactive molecules and method of preparation thereof. Indian Patent Application 257/ DEL/2012

#### **JOB PROFILE:**

- Synthesis of precursors, degradation products and by products of scheduled chemical
- Derivatives of CWC related chemicals via Silylation, Methylation, Thiolation
- Identification and confirmation of compounds, mainly by gas , liquid chromatography and Gas chromatography - mass spectroscopy
- Qualitative analysis of CWC related from different matrices like Soil, Water, Organic etc. using GC (NPD,FPD) and GC-MS and their report preparation during OPCW PT

- Qualitative and quantitative analysis of pesticides formulation as well as Technical using GC, HPLC, UV and Classical methods.
- Multi Pesticide Residue analysis from Food, Grains, Vegetables, Soil, Water etc. using GC and GC-MS.
- Maintenance of Instruments and other assignment (calibration, testing, record maintenance, PT, ILC) as per NABL requirement.
- Generation of pesticides residues data of field trail crops samples from different Industry sponsored projects and their report preparation
- Method development for the analysis of pesticides formulation, Technical, pesticide residues.
- To provide training on qualitative and qualitative analysis of pesticides and their formulations to trainee from Indian pesticide industries and abroad.
- To provide training on pesticide residue analysis to trainee from Indian pesticide Industries and abroad.
- To take theory as well as practical classes to the trainees during the Skill development programme organised by the division.
- Developments of synthetic pesticide and Bio- pesticide conventional as well as new generation formulation( GEL, Microemulsion, Emulcifiable concentrate) and Their Physio- chemical and Bio-efficacy studies.
- Extraction, Isolation and Bio efficacy of plants extracts and their development of Nanoformulation
- Synthesis, purification and structural elucidation of organic compound.
- Process development of Agrochemicals (tech), Intermediates and Pharmaceuticals Intermediates
- Search literature through Sci-Finder and Chemical abstracts.
- Taking synthesis batch through mili gram to scale up.
- Pilot Plant Operation.
- Autoclave reaction (High Pressure)
- Bio-efficacy evaluation (Antifungal), Seed coating & Encapsulation of bioactive molecules.

## **SEMINAR & CONFERENCE,WORKSHOP ATTENDED**

- Oral presentation in Biophysika-2017 ,March 16th, 2017, Jamia Milia Islamia, New Delhi
- Participated orientation program for academic counsellors, on during 21<sup>st</sup> -22<sup>nd</sup> October 2016 at MCI, Sec-8, Dwarka Delhi
- Participated at Sensitization workshop on LGP (Good Lab Practices) from 17-18<sup>th</sup> October 2016, at India Habitat Centre Delhi.
- Two days workshop on“ Analytical Techniques in Food Safety from 14<sup>th</sup> -15<sup>th</sup> July 2016 at Institute of Pesticide Formulation Technology ( IPFT), Gurugram
- Oral presentation in the 3<sup>rd</sup> International IUPAC Conference on Agrochemicals Protecting Crops and Natural Environment from 6<sup>th</sup> -9<sup>th</sup> April, 2016, at NASC complex, New Delhi, India.
- Participated at sensitization workshop on LGP (Good Lab Practices) on 29<sup>th</sup> January 2016 at IIHMR, Dwarka, Delhi.
- Participated at sensitization workshop on LGP (Good Lab Practices) from 11-12<sup>th</sup> September 2014, at INSA Delhi
- Attended awareness program on Reference material producer (RMP) on 26<sup>th</sup> may 2014 organized by NABL at India Habitat Centre, Delhi.
- Paper presentation in International symposium on food security dilemma plant health and climate change issue from 7<sup>th</sup> -9<sup>th</sup> December 2012 at BCKV Kalyani ,west Bengal
- 2<sup>nd</sup> International Conference on Agrochemicals protecting crops health and natural environment role of chemistry and sustainable agriculture 15<sup>th</sup>-18<sup>th</sup> Feb 2012 at IARI, New Delhi-12, India.
- International Conference on Materials for the Millennium Matcon- 11<sup>th</sup>-13<sup>th</sup> January 2010 at Kochi, Kerala, India.
- Paper presented in 15<sup>th</sup> ISCB international conference 4<sup>th</sup> - 7<sup>th</sup> February 2011 at Rajkot, Gujarat, India.
- 1<sup>st</sup> International conference on Agrochemicals protecting crops health and natural environment role of chemistry and sustainable agriculture 8<sup>th</sup>-11<sup>th</sup> January 2008 at IARI, New Delhi-12, India.
- Inter college Quiz completion on AIDS 30<sup>th</sup> -1<sup>st</sup> December 2008, University of Delhi-07 , New Delhi, India

- Workshop on “Substance Abuse” 10<sup>th</sup> -11<sup>th</sup> September 2008, University of Delhi-07. New Delhi, India

#### **ANALYTICAL SKILLS:**

- GC-MS, LC-MS/MS, GC, HPLC, IR, UV etc.
- Polarimeter, Karl –Fischer Titrator, Flash point apparatus and Classical Analysis

#### **ACADEMIC PROJECT:**

- Synthesis of Trifluoromethylated Traizino Indole Hydrazone as potential Agrochemicals for the fulfillment of M.Sc. degree, at University of Delhi, New Delhi.

#### **INDUSTRIAL PROJECT:**

- Pesticide Residue data generation of different Industry sponsored project like Imidacloprid in paddy, Imidacloprid in tomato, Difenconazole in paddy, Difenconazole in chilli, Bifenthrin in paddy, Bifenthrin in cotton, Cypermethrin in cotton, Gibberellic acid in brinjal, chlorthalonil in potato, Gibberellic acid in grapes etc.
- Extraction and Isolation of Azadirachtin-A from Neem seed. & Development of emulsifiable concentrate (EC) formulation
- Synthesis of commercial Technical pesticide like Phenthoate, Clodinafop propargyl, Chlorpyrifos methyl/ethyl, Triclopyr butotyl, Pendimethaline, Imidacloprid, Acetamiprid, Dimethyl thiophosphoryl chloride (DMTC), 3- Cyano propanoic acid (3-CPA), 3-CPAC, & Hydroxy phenoxy propanoic acid (D-HPPA)

#### **TRAINING:**

- Training on CWC analysis from 29<sup>th</sup>-30<sup>th</sup> March 2016 at DRDE Gwalior
- Training on reference material producers organized by EU-Indo capacity building initiative for trade development (CIDT) with collaboration of NABL from 24<sup>th</sup> -26<sup>th</sup> November 2014 at Hotel Royal Plaza, New Delhi.
- Training on pesticide residue analysis and basics operation of GC, GC-MS, HPLC from July 7<sup>th</sup>-11<sup>th</sup> 2014 at Punjab Agricultural University Ludhiana (Punjab)
- Training on use of fire fighting equipments and systems on 19<sup>th</sup> December 2012. at IPFT Gurgram, Haryana, India
- Training on Laboratory quality management system and Internal Audit NABL/ ISO :IEC 17025:2005 from 4<sup>th</sup>-7<sup>th</sup> September 2012 at Indian Institute of quality management Jaipur, Rajasthan, India
- Training on Inter lab comparison proficiency testing(ILC-PT) and evaluation of Z-score from 26- 27<sup>th</sup> September 2013 at BIS Kolkata, West Bengal, India



- NAIP sponsored training on extraction and Analysis of Nutraceuticals from vegetables, fruits nonfood crops from 22<sup>nd</sup> - 24<sup>th</sup> November 2012 at division of agrochemicals, IARI, New Delhi, India
- Two days training on basics of GC from 8-9<sup>th</sup> December, 2011 at Shimadzu Analytical India Pvt. Ltd, Rajendra Nagar, New Delhi, India.
- Two days training on basics of GC-MS from 12-13<sup>th</sup> July 2011 at Shimadzu Analytical India Pvt. Ltd, Rajendra Nagar, New Delhi, India.
- Training on **Monitoring of pesticide residue** from 22-26<sup>th</sup> November 2011 at PCC cell in I.A.R.I. PUSA New Delhi-12, India.

#### **OTHER ACADEMIC QUALIFICATION:**

- Post M.A diploma in Adult Education and Continuing Extension from University Delhi, India.
- Polytechnic in Computer Science and Application (1year) from New Government Polytechnic Patna, India.
- Short term course in Science and Sports Journalism from University of Delhi 110007, India.
- Short term course in Counseling and Guidance from University of Delhi- 110007, India.
- Short term course in Research Methodology from Delhi University Delhi-110007, India.

#### **COMPUTER SKILLS:**

- Training in Basic computer concepts, MS-word, MS-Power Point, Internet Email Database concepts MS-access Data modeling with Oracle9i MS-Excel, Linux, from University of Delhi- 110007, India.

#### **STRENGTHS:**

- Objectivity, Team spirit, Self motivated, Open to take responsibilities, Successfully completed projects in Organic chemistry, Excellent analytical hand, Good written & communication skills, can work under pressure and able to meet deadlines.

Mukesh Kr. Singh

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