

Dr. Bijendra Kumar Singh**Assistant Professor**

Department of Botany, Feroze Gandhi College, Raebareli-229001, Uttar Pradesh, India.

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**Educational Qualifications:**

S. No.	Degree	Institution	Year
1.	B.Sc. (Hons.) in Botany	Banaras Hindu University	2015
2.	M.Sc. Botany	Banaras Hindu University	2017
3.	Ph.D.	Banaras Hindu University	2022

Ph.D. Topic: “Post-harvest fungal and mycotoxin contamination of selected millets and their control by plant essential oils”

Area of Specialization:

Development of plant-based preservatives for stored food products. The isolation and characterizations of essential oils from plants that could be used for the preservation of stored food commodities from fungal infestation and mycotoxin contamination. A group of bioactive compounds present in essential oils could be used against the food borne pathogens, mycotoxin production, and oxidative damage caused by lipid peroxidation leads to loss of organoleptic properties. Nanoencapsulation of essential oils and their bioactive compounds into natural biopolymers to increase its shelf-life and applicability on large-scale. The prepared nanoemulsions could also used as coating materials for fruits and vegetables to enhanced their shelf-life and essential vitamins, fiber, minerals, and other nutrients.

Awards/ Fellowships:

- Council of Scientific & Industrial Research (CSIR) - Junior Research Fellowship, 2018
- Department of Biotechnology (DBT) - Junior Research Fellowship, 2018
- Best Poster Presentation award at XLII All India Botanical Conference on the Indian Botanical Society and National Symposium.
- Council of Scientific & Industrial Research (CSIR) - Senior Research Fellowship, 2020.
- **Doctor of Philosophy (Ph.D.)** entitled “**Post-harvest fungal and mycotoxin contamination of selected millets and their control by plant essential oils**” under supervision of Prof. N. K. Dubey, Department of Botany, Banaras Hindu University, Varanasi, India.

Life member of “The Indian Botanical Society”.

Work Experience:

01/2017 - 6/2017: Dissertation on topic “Effect of elevated CO₂ on the Phytochemistry of *Lagenaria vulgaris*”.

04/08/2018 - 26/10/2019: Junior Research Fellow in DBT Project entitled “Microbial roles in yield management of scented rice of North East India” under supervision of Prof. N. K. Dubey, Dept. of Botany, BHU, Varanasi.

28/10/2019 - 30/10/2021: Junior Research Fellow (CSIR) in Ph.D. entitled “Post harvest fungal and mycotoxin contamination of selected millets and their control by plant essential oils”. under supervision of Prof. N. K. Dubey, Dept. of Botany, BHU, Varanasi.

1/11/2021 - 06/06/2022: Senior Research Fellow (CSIR) in Ph.D. entitled “Post-harvest fungal and mycotoxin contamination of selected millets and their control by plant essential oils”. under supervision of Prof. N. K. Dubey, Dept. of Botany, BHU, Varanasi.

From 07/06/2022 – Assistant Professor at Department of Botany, Feroze Gandhi College, Raebareli-229001, Uttar Pradesh, India.

Research Publications:

1. Chaudhari, A. K., Singh, V. K., Das, S., **Singh, B. K.**, & Dubey, N. K. (2020). Antimicrobial, aflatoxin B1 inhibitory and lipid oxidation suppressing potential of anethole-

based chitosan nanoemulsion as novel preservative for protection of stored maize. *Food and Bioprocess Technology*, 13(8), 1462-1477.

2. Tiwari, S., **Singh, B. K.**, & Dubey, N. K. (2020). Encapsulation of essential oils-a booster to enhance their bio-efficacy as botanical preservatives. *Journal of Scientific Research*, 64, 175-178.

3. Dwivedy, A. K., Singh, V. K., Das, S., Tiwari, S., **Singh, B. K.**, Kedia, A., Prakash, B., Dubey, N. K., (2020). Nanoencapsulation technology for management of postharvest biodeterioration of stored food commodities. In *Biotechnology for Plant Disease Diagnostics and Management*. edi. Trivedi, P. C. (pp. 233-252).

4. Chaudhari, A. K., Das, S., **Singh, B. K.**, Prasad, J., Dubey, N. K., & Dwivedy, A. K. (2020). Herbal medicines as a rational alternative for treatment of human diseases. In *Botanical Leads for Drug Discovery* (pp. 29-49). Springer, Singapore.

5. **Singh, B. K.**, Tiwari, S., & Dubey, N. K. (2021). Essential oils and their nanoformulations as green preservatives to boost food safety against mycotoxin contamination of food commodities: a review. *Journal of the Science of Food and Agriculture*, 101(12), 4879-4890.

6. Das, S., Singh, V. K., Upadhyay, N., **Singh, B. K.**, Prasad, J., Tiwari, S., & Dubey, N. K. (2021). Secondary metabolites of higher plants as green preservatives of herbal raw materials and their active principles during postharvest processing. In *Evidence Based Validation of Traditional Medicines* (pp. 261-277). Springer, Singapore.

7. Maurya, A., Kumar, S., **Singh, B. K.**, Chaudhari, A. K., Dwivedy, A. K., Prakash, B., & Dubey, N. K. (2021). Mechanistic investigations on antifungal and antiaflatoxigenic activities of chemically characterized *Carum carvi* L. essential oil against fungal infestation and aflatoxin contamination of herbal raw materials. *Natural Product Research*, 1-6.

8. Tiwari, S., **Singh, B. K.**, Kishore, V., & Dubey, N. K. (2021). Boosting modern technologies with emphasis on biological approaches to potentiate prevention and control of aflatoxins: recent advances. *Toxin Reviews*, 1-11.

9. **Singh, B. K.**, Tiwari, S., Maurya, A., Kumar, S., & Dubey, N. K. (2022). Fungal and mycotoxin contamination of herbal raw materials and their protection by nanoencapsulated essential oils: An overview. *Biocatalysis and Agricultural Biotechnology*, 39, 102257.

10. Tiwari, S., Upadhyay, N., **Singh, B. K.**, Singh, V. K., & Dubey, N. K. (2022). Chemically characterized nanoencapsulated *Homalomena aromatica* Schott. essential oil as

green preservative against fungal and aflatoxin B1 contamination of stored spices based on in vitro and in situ efficacy and favorable safety profile on mice. *Environmental Science and Pollution Research*, 29(2), 3091-3106.

11. Tiwari, S., Upadhyay, N., **Singh, B. K.**, Singh, V. K., & Dubey, N. K. (2022). Facile Fabrication of nanoformulated *Cinnamomum glaucescens* Essential Oil as a Novel Green Strategy to Boost Potency Against Food Borne Fungi, Aflatoxin Synthesis, and Lipid Oxidation. *Food and Bioprocess Technology*, 1-19.

12. Tiwari, S., Upadhyay, N., **Singh, B. K.**, Dubey, N. K., Dwivedy A. K. & Singh V. K. (2022). Nanoencapsulated *Lippia origanoides* essential oil: physiochemical characterisation and assessment of its bio-efficacy against fungal and aflatoxin contamination as novel green preservative. *International Journal of Food Science and Technology*, 57(4), 2216-2225.

13. Prasad, J., Tiwari, S., **Singh, B. K.**, & Dubey, N. K. (2022). Phytoextraction of heavy metals: Challenges and opportunities. *Phytoremediation Technology for the Removal of Heavy Metals and Other Contaminants from Soil and Water*, 173-187.

14. **Singh, B. K.**, Chaudhari, A. K., Das, S., Maurya, A., Tiwari, S., Singh, V. K. & Dubey, N. K. (2022). Chitosan encompassed *Aniba rosaeodora* essential oil as innovative green candidate for antifungal and antiaflatoxigenic activity in millets with emphasis on cellular and its mode of action. *Frontiers in Microbiology*, 13:970670.

15. **Singh, B. K.**, & Dubey, N. K. (2022). Bioactive Components and Biological Properties of *Zingiber officinale* Roscoe Essential Oil. In *Bioactives and Pharmacology of Medicinal Plants* (pp. 391-401). Apple Academic Press.

16. **Singh, B. K.**, Chaudhari, A. K., Das, S., Tiwari, S., Singh, V. K. & Dubey, N. K. (2022). Preparation and characterization of a novel nanoemulsion consisting of chitosan and *Cinnamomum tamala* essential oil and its effect on shelf-life lengthening of stored millets. *Pesticide Biochemistry and Physiology*, 105214.

17. **Singh, B. K.**, Tiwari, S., Maurya, A., Das, S., Singh, V. K. & Dubey, N. K. (2023). Chitosan-based nanoencapsulation of *Ocimum americanum* essential oil as safe green preservative against fungi infesting stored millets, aflatoxin B₁ contamination and lipid peroxidation. *Food and Bioprocess Technology*, 1-22.

18. Soni, M., Maurya, A., Das, S., Prasad, J., Yadav, A., Singh, V. K., **Singh, B. K.**, Dubey, N. K. and Dwivedy, A. K. (2022). Nanoencapsulation Strategies for Improving Nutritional Functionality, Safety and Delivery of plant-based Foods: Recent Updates and Future

Opportunities Nanoencapsulation Strategies for Improving Nutritional Functionality, Safety and Delivery of plant-based Foods: Recent Updates and Future Opportunities. *Plant Nano Biology*, 100004.

19. Chaudhari, A. K., Das, S., **Singh, B. K.**, Dubey, N. K. (2023). Green facile synthesis of cajuput (*Melaleuca cajuputi* Powell.) essential oil loaded chitosan 2 film and evaluation of its effectiveness on shelf-life extension of white button mushroom. *Food Chemistry*, 134114.

20. Das, S., Chaudhari, A. K., Singh, V. K., **Singh, B. K.** and Dubey, N. K. (2022). High speed homogenization assisted encapsulation of synergistic essential oils formulation: Characterization, *in vitro* release study, safety profile, and efficacy towards mitigation of aflatoxin B₁ induced deterioration in rice samples. *Food and Chemical Toxicology*, 169, 113443.

21. Tiwari, S., **Singh, B. K.**, Dubey, N. K., (2022). Aflatoxins in food system: recent advances in toxicology, biosynthesis, regulation and mitigation through green nanoformulations. *Journal of the Science of Food and Agriculture*, 103(4), 1621-1630.

22. **Singh, B. K. and Maurya, A.** (2023). Antioxidant Activity of Essential Oils: A Mechanistic Approach. *Plant Essential Oils: From Traditional to Modern-day Application* (pp.59-76). Springer Nature Singapore.

23. Kumar, M., **Singh, B. K.**, Dwivedy, K., Dwivedy, K., Tilak, R., & Dubey, N. K. (2023). In vitro and in situ efficacy of *Cymbopogon khasans* sobti, *Cyperus scariosus* r. Br. and their combination against two important dermatophytes. *Journal of Scientific Research*, 67(2).

24. Das, S., Maurya, A., Singh, V. K., Chaudhari, A. K., **Singh, B.K.**, Dwivedy, A, K., and Dubey, N. K. (2024). Chitosan nanoemulsion incorporated with *Carum carvi* essential oil as ecofriendly alternative for mitigation of aflatoxin B₁ contamination in stored herbal raw materials. *International Journal of Biological Macromolecules*.

Conferences/ Seminars/Symposia attended

1. Presented poster entitled “**Assessment of chemically characterized *Aniba rosaeodora* essential oil as green preservative against fungal and aflatoxin contamination of selected millet samples**” in XLII All India Botanical Conference on the Indian Botanical Society and National Symposium on ‘Innovation and Inventions in Plant Science Research (Nov. 06-08, 2019) held at Department of Botany, University of Calicut, Kerala.

2. Attended and participated in the Workshop on “**Intellectual Property Rights**” Organized by Intellectual Property Right Cell Banaras Hindu University on March 18, 2019.
3. Presented paper entitled “*Cinnamomum tamala* essential oil as a green preservative against post-harvest fungal and mycotoxin contamination of selected millet samples” in National Seminar on Recent Advances in fungal diversity, Plant-Microbe Interaction and Disease Management (Feb. 28-29, 2020) Department of Botany, BHU, Varanasi.
4. Attended “**A Ten Days Workshop in Mathematical Sciences for Practicing Research**” held at DST-Centre for Interdisciplinary Mathematical Sciences, Institute of Science, Banaras Hindu University, during February 3-12, 2020.
5. Presented a paper entitled “**Assessment of nanoencapsulated *Cinnamomum tamala* seed essential oil as a novel food preservative against fungal and mycotoxin contamination of stored millets**” in XLIII All India Botanical Conference of the Indian Botanical Society at CSIR-National Botanical Research Institute, Lucknow Sustainable Development of Plant Resources and Conservation of Threatened Plants in Botanic Gardens (March 19-21, 2021) held at CSIR-National Botanical Research Institute, Lucknow-226 001, Uttar Pradesh.
6. Presented a paper entitled “*Nelumbo nucifera* essential oil encapsulated into chitosan matrix as a novel preservative for stored millets against fungal and aflatoxin contamination” in XLIV all India Botanical Conference of The Indian Botanical Society on Plant Science Research in Present Scenario: Opportunities and Challenges (October 18-20, 2021) held at Department of Botany (UGC-CAS), Jai Narain Vyas University, Jodhpur, Rajasthan.
7. Presented a paper entitled “**Chitosan-based nanoencapsulation of *Ocimum americanum* essential oil as safe preservative against fungi, aflatoxin B1 secretion, and lipid peroxidation in millets**” in XLV all India Botanical Conference of The Indian Botanical Society on Climate Change: Biodiversity, Adaptation and Mitigation (October 14-16, 2022) held at Department of Botany, University of Lucknow, Lucknow, Uttar Pradesh.
8. Presented a Paper entitled “**Phenyl ethyl alcohol as green and safe preservative: cellular and molecular mechanism of action against *Aspergillus flavus* and aflatoxin B1 secretion**” in International Conference on Emerging Trends in Microbiology (February 28-March 1, 2023) held at Department of Botany, MLK PG College, Balrampur, Uttar Pradesh in association with Microbiologist Society, India.