RESUME

Name : **Dr. Alka Verma**

Date of Birth : 31st March, 1982

Father's Name : (Late) Mr. Ravindra Kumar Verma

Mother's Name : Mrs. Sarla Verma

Husband's Name : Mr. Prakash Chandra Mani

Husband's Occupation **:** Service
(Assistant Professor in IIT (BHU), Varanasi)

Permanent Address : House No B-56, Ashokpuram Colony, Thana- Lanka, Daffi, Varanasi-221011

Postal Address : W/O Mr. P.C. Mani, Assistant Professor, Department of Mechanical Engineering, IIT (BHU) Varanasi, Varanasi -221005 (U.P.), INDIA

Nationality : Indian

Religion : Hindu

Gender : Female

Marital status : Married

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EDUCATION **: Ph.D** in **Life Sciences (Agricultural Microbiology)**

EXAMINATION PASSED	YEAR OF PASSING	INSTITUTE / UNIVERSITY	SUBJECTS	% OF MARKS	DIVISION
High School	1997	L.P.S. , Lucknow/ U.P. Board , Allahabad	Hindi, English, Maths-2, Science-2, Social Science, Biology.	74.33	First
Intermediate	1999	N.P.S. , Lucknow/ U.P. Board , Allahabad	Gen. Hindi, English, Physics, Chemistry, Biology.	72.00	First
B.Sc.	2003	Navyug Kanya Degree College, /Lucknow University,	Zoology, Botany, Chemistry.	74.00	First
M.Sc.	2005	Lucknow University	Botany.	64.70	First
Ph.D.	2014	CSJM University, Kanpur	Life Sciences (Agricultural Microbiology)	-	Degree Awarded

Training : Training in computer applications

- Certificate in Computing (CIC).
- Diploma in DOS.
- Windows.
- MS Office.
- Internet from "Institute of Electronics (IoE)".

Seminar : Seminar on "Pathogenesis".

Field of interest : Agricultural Microbiology and Ecology

QUALIFICATIONS/ SCHOLARSHIPS

- SBI Scholarship winner
- CSIR (JRF and SRF): JRF fellowship in CSIR funded project on 25/02/2008 upgraded to SRF.

TEACHING EXPERIENCE

- Worked at Department of Microbiology, IBSBT, CSJM University, Kanpur
- Working as an assistant professor at Dr. Ghanshyam Singh P.G. college, Varanasi since 18th October 2021

RESEARCH EXPERIENCE

1. Worked as a Senior Research Fellow (SRF) at Department of Microbiology, in project entitled **"Revelation of mechanism and metabolites for biocontrol of deadly phytopathogens by plant growth promotory bacteria, designing reliable technology for future bioformulation and sustainable agriculture"** funded by Council of Scientific and Industrial Research (CSIR), New Delhi.
2. Worked as a Junior Research Fellow (JRF) at Department of Microbiology, , in project entitled **"Revelation of mechanism and metabolites for biocontrol of deadly phytopathogens by plant growth promotory bacteria, designing reliable technology for future bioformulation and sustainable agriculture"** funded by Council of Scientific and Industrial Research (CSIR), New Delhi.

RESEARCH INTERESTS

Work was done in the field of agricultural microbiology and biotechnology. This includes isolation, screening and study of mechanisms of interactions of potentially useful rhizospheric bacteria. Effect of interaction and coinoculation on leguminous crops was done *in vitro* as well as *in vivo*. Bioinoculants production by utilizing different carriers, for combined application of beneficial bacterial isolates into the soil for plant growth enhancement in fields.

MEMBERSHIP OF LEARNED BODIES/SOCIETIES

- Life Member of Association of Microbiologists (AMI) of India.
- National Service Scheme (NSS)

SEMINARS/ CONFERENCES/ WORKSHOPS ATTENDED

- 1st Lucknow Science Congress "Innovations in Science for better tomorrow" organized by Babasaheb Bhimrao Ambedkar University, Lucknow, India from March 20-21, 2013.
- 5th All India student's conference on science and spiritual quest "Bridging Science and Spirituality" organized by MNNIT Allahabad from January 15-17 2010.
- 50th Annual conference of Association of Microbiologists of India on "Third Golden Era of Microbiology" organized by Association of Microbiologists of India, Pune Unit, National Chemical laboratory, Pune, Department of Microbiology, University of Pune, India from December 15-18, 2009.
- 49th Annual Conference of Association of Microbiologist of India on "*International Symposium on Microbial Biotechnology: Diversity, Genomics and Metageomics"* organized by Department of Zoology, North Campus and Department of Microbiology, South Campus, University of Delhi, India from November 18-20, 2008.
- "National Workshop on current trends in computing and bioinformatics" organized by Department of Computer Science and Engineering and Department of Bioinformatics, University Institute of Engineering and Technology, CSJM University, Kanpur from February 23-24 2007.
- National Conference on "*Scope and Application of Microbes in Agriculture & Environment"* Organized by Department of Microbiology, CSJM University, Kanpur from 19th-21st February, 2007.

PUBLICATIONS:

JOURNALS

- Arora NK, Khare E, Verma A and Sahu RK (2008). *In vivo* control of *Macrophomina phaseolina* by chitinase and β-1,3-glucanase producing pseudomonad NDN_1. *Symbiosis* 46: 129-135.

RESEARCH ARTICLES

- Arora NK, Khare E and Verma A (2007). Biofertilizer technology for economical as well as environmentally viable agricultural production. *The Monthly Journal "Kurukshetra", Ministry of Rural Development* 55(4): 20-24.

PRESENTATIONS

- Verma A and Arora NK (2024), Synergistic Interaction Study of *Sinorhizobium meliloti* and *Pseudomonas aeruginosa* on Medicinal Legume *Trigonella foenumgraecum* International journal of basic and applied biology (2024), 11 1-8 p-ISSN:2394-5820, e-ISSN: 2349-5839
- Verma A, Sood D and Arora NK (2007). Enhanced growth of mustared (*Brassica campestris*) on Co-inoculation of rhizobia and pseudomonads. in National Conference on "Scope and Applications of Microbes in Agriculture and Environment. pp. 42.
- Vineet Kumar Singh, Alka Verma, Poonam and Anupama Singh (Sep. 2024). The Journey of education system from Ancient Guru-Shishya parampara to digitalized advanced classrooms. (Oral Presentation in National Conference on The Indigenous Education System of Bharat: From Gurukuls to Digital Classrooms in Sunbeam Womens College Varuna, Varanasi sponsored by Indian Council of Historical research.)
- Faculty Development Programme on NEP Implementation: Emerging Issue in Higher Education". Inter University Centre for Teacher Education, BHU Varanasi 221005. (August 17th- 22nd 2023).
- NEP-2020 Orientation & Sensitization Programme. Under UGC-MMTTP, Organized by joint collaboration with MMTTC, Department of Education, MGKVP, Varanasi and Teacher Education Department and Teachers Reskilling Cell , T.D.P.G. College, Jaunpur.(November 10th-18th 2025)
- Verma A and Arora NK. Rhizobia associated with wild *T. foenum-garecum* plants growing in the tropical region of India. International Conference on *"Conserving Biodiversity for sustainable development INCCBSD 2013"* organised by Department of Biotechnology and Medical Engineering, National Institute of Technology, Rourkela, Odisha, India in association with Post Graduate Institute of Science, University of Peradeniya, Sri Lanka and CAFET-INNOVA Technical Society, Hyderabad, India from August 16-18, 2013.
- Verma A and Arora NK. Enhancement of plant growth of *Trigonella foenum-graecum* in pots and field by coinoculation of *Rhizobium galegae* and *Pseudomonas sp.* 50th Annual conference of Association of Microbiologists of India "Third Golden Era of

Microbiology" organized by Association of Microbiologists of India, Pune Unit, Natinal Chemical laboratory, Pune, Department of Microbiology, University of Pune from December 15-18, 2009.

- Verma A and Arora NK. Positive interaction between *Rhizobium* and *Pseudomonas* results in better crop production. 49th Annual Conference of Association of Microbiologist of India "*International Symposium on Microbial Biotechnology: Diversity, Genomics and Metageomics"* organized by Department of Zoology, North Campus and Department of Microbiology, South Campus, University of Delhi, India from 18th-20th, November, 2008.

- Khare E, Verma A, Arora N and Arora NK. Sawdust based bioformulation of PGP *Rhizobium* and *Pseudomonas* as the best option for enhancement of plant productivity. National Conference on " *Scope and Application of Microbes in Agriculture & Environment"* Organized by Department of Microbiology, CSJM University, Kanpur from 19th-21st February, 2007, pp. 44.

CONFERENCE/ WORKSHOP ORGANIZER:

Associated with National Workshop "Hands-on Practical Experience in Recombinant DNA Techniques, bioinformatics and Cheminformatics as Organizer in Dr. Ghanshyam Singh Mahavidayalaya, Varanasi.

Associated with Workshop "Instrumentation Enrichment: Tools for Basic Science Research (IETBSR) as Organizer r in Dr. Ghanshyam Singh Mahavidayalaya, Varanasi.

TEACHING EXPERIENCE:
Assistant Professor in Department of Botany, Dr. Ghanshyam Singh Mahavidayalaya, Varanasi, affiliated to M.G.K.V.P. Varanasi, from 18 October 2021 till now.

Work Done:

The plant rhizosphere is an important site of intense interactions between plant, bacteria and other microorganisms, involves colonization by microorganisms in and around the roots which may result in symbiotic, associative, neutralistic or parasitic relations. Microorganisms associated with roots, have the ability to increase plant growth and productivity. Microbial interactions play very important roles in sustainable agriculture through the integrated nutrient supply. The microbes growing in rhizosphere bacteria that forcefully colonize roots are termed as rhizobacteria, having ability to increase plant growth and inhibit plant pathogens, they are known as Plant Growth Promoting Rhizobacteria (PGPR). Rhizobia are a group of rhizobacteria that are well known to acts as the primary symbiotic fixer of nitrogen and are involved in interaction with leguminous plants to form N_2-fixing nodules as well as with other microbes present in the soil to

enhance the productivity. The inoculation of symbiotic N_2 fixing rhizobia in seeds enhances the nodulation capacity of plant roots of legumes and thereby promotes the plant yields and N availability in soil. Research using rhizobia as PGPR with leguminous plants can also make rapid progress. The advantage of using rhizobia as PGPR and biocontrol agent for legumes comes from its safety, as indicated by the absence of any potential risk associated with its use with legumes for many decades. Rhizobia are used as bio-inoculants to reduce the harmful effects of chemical and synthetic fertilizers. Bio-inoculant is a formulation containing one or more beneficial bacterial is an easy use and economical carrier material that are means of transport of the bacterial culture to fields. Only 15% of legumes species have ever been examined for their ability to form nodules with their symbiotic bacteria. Among them only about 400 plants are used in regular production of Ayurvedic, Unani, Siddha and tribal medicine, only less than 20% are cultivated. Rhizobia also interact with other microbes present in the soil to form the nodules in the legumes and how they survive in that atmosphere to form nodules is also important. The mechanism of interaction has to be examined. The strains were isolated from wild and medicinal legumes and were morphologically, physiologically and biochemically characterized. The rhizobial strains were checked for antagonistic activity and their ability to produce secondary metabolites. Molecular characterization and identification of the strains were done by 16S rRNA sequencing. The rhizobial strains were checked for nodulation ability on different leguminous plants. The interaction study of the rhizobial strains were done *in vitro* and *in vivo*. Production of Bio-inoculants using different carriers and their impact on plant growth was done *in vitro* and *in vivo*. Effect of interaction and coinoculation on leguminous crops was done in field study.

Future prospects:

It is important to study the rhizobial strains from wild and medicinal legumes because very less attention has been paid towards them. Unfortunately as far as tropical regions are concerned very less (only 15%) research regarding the taxonomic studies of rhizobia-legume relationship has been carried out so far. It would be interesting to know about the plant growth promotory ability of rhizobia from wild medicinal legumes for growth enhancement of agricultural crops. It is important to characterize the plant growth promotory ability of rhizobia from wild medicinal legumes for growth enhancement of agricultural crops and they also positively interact with other microbes present in the soil. Microbial inoculants have long been incorporated into field practices worldwide, with satisfactory results, especially for rhizobia.

As beneficial effect of rhizobia on legumes in terms of biological nitrogen fixation is well known, it can be used as PGPR as well as biocontrol agents both. These include availability of inoculation and well established field oriented inoculums production technologies, availability of tools to identify strains in soil and nodules and rhizobia are ecofriendly being used for many years with legumes without causing harm to environment or its users. An additional challenge is

to develop improved carriers that consistently provide higher bacterial numbers under field conditions, extended shelf life, protection against the soil environment, convenience of use, and cost effectiveness. The enhancement in nodulation as well as productivity is possible by the coinoculation of selected rhizobial strain with the rhizospheric plant growth promoting bacteria through suitable carrier. The enhancement in nodulation as well as productivity is possible by the coinoculation of selected rhizobial strain with the rhizospheric plant growth promoting bacteria through suitable carrier.

In future, I want to explore my research work in field of agriculture to enhance the production by treating seeds with combined inoculation of rhizobia and other microbes. As it is closely related to agricultural field, it became important to mankind and to other living organisms to save from the hazardous effects of synthetic chemicals. I want to do work on application of my work in agricultural fields for betterment of farmers. As application of naturally occurring rhizobacteria can enhance the productivity and yield, so that it could fulfill the demand of food requirement in India. I have to develop respective laboratories to cultivate the beneficial bacteria and to produce bio-formulations for the research work and the application of respective research in our field for the betterment of our practical life. These laboratories will also facilitate as a central facility for the research activities and for the benefits of research scholars and students.

Date:

(Dr. Alka Verma)

Place: