

Tête-à-tête with Dr. Kewal Krishan Sharma

**INSPIRING LEADER AND
RENOWNED LAC
ENTOMOLOGIST DR. KEWAL
KRISHAN SHARMA SPEAKS
TO IE ASSOCIATE EDITOR
MR. RAJGOPAL N. N. ABOUT
HIS EVENTFUL JOURNEY OF
THREE DECADES FROM
SCIENTIST TO DIRECTOR OF
A NATIONAL INSTITUTE.**



Dr. Kewal Krishan Sharma hails from a rural background and did his schooling from a Govt. High School, Kalanwali (Sirsa, Haryana). After completion of graduation from Sirsa, he joined Kurukshetra University, Kurukshetra to pursue his post-graduation in Zoology. His fascination and interest towards insects since childhood encouraged him to choose Entomology over Fisheries in M.Sc. (Zoology) with cytogenetics as specialization and completed Master's degree in 1983. Inspired by his father, who was a teacher by profession, he dreamt to become a teacher like him and obtained degree in education (B.Ed.) from CR College of Education, Hisar (Haryana) in 1985. During his Master's degree, their struggle to motivate the University to retain Entomology as a major paper in PG programme sustained his interest to become a researcher. That episode destined him to turn into a successful, altruistic and eminent

scientist in Entomology and Director of ICAR- Indian Institute of Natural Resins and Gums (ICAR-IINRG). Dr. Sharma has contributed significantly to the field of Lac Entomology and worked for the prosperity and growth of the small farmers. Dr. Sharma started his journey at the then Indian Lac Research Institute (later rechristened as Indian Institute of Natural Resins and Gums in 2007), Ranchi as Scientist, S-1 in March 1986. Later he completed his Ph.D. in 1995 while in-service from CCS Haryana Agricultural University, Hisar and continued to work in the same Institute. Before taking charge as Director of the Institute, he spent nearly three decades in IINRG. During his last 33 years of experience in research and extension, he has published over 150 research publications with three patents filed in his name. By guiding two Ph.D. and three M.Sc. students he also proved that he is a good teacher too. The focus of his research

has been on understanding lac insect and host plant interactions, development of improved lac insect breeds, new lac insect-host plant combinations, technologies of lac cultivation; he also contributed to lac insect and host-plant diversity studies, new lac insect and associated faunal studies. During his tenure as Head, Lac Production Division, Director, ICAR-IINRG and Project Coordinator, All India Network Project on Conservation of Lac Insect Genetic Resources, Dr. Sharma has the credit of developing Field Gene Banks of lac insects and host plants, which later on developed into National Lac Insect Germplasm Centre. Dr. Sharma is conferred with Fellow of Entomological Society of India, IARI, New Delhi and is serving as President of Society for Advancement of Natural Resins and Gums, IINRG, Ranchi

Rajgopal N. N. (RNN): What made you to choose Entomology as a subject of interest while pursuing Master's degree in Zoology?

Kewal Krishan Sharma (KKS): I had fascination for insects since my childhood. As I spent my formative years in a village, frequently visiting the agricultural fields was common where insects were part of life. While watching dragon flies hovering like a helicopter, dung beetle making bolls of cow dung and disappearing in sand, bees making honey from flowers, fire flies emitting light, occurrence of larvae in apparently undamaged pods, I wondered how such small creatures could be so dominating in such varied environments. This interest grew stronger with time. Consequently, I opted Entomology over fisheries and cyto-genetics as specialization during my post-graduation in Zoology. I give full credit to these tiny

insects for my metamorphosis from Zoologist to Entomologist.

RNN: Who has impacted you the most in your life as an inspiring personality.

KKS: We learn something or other from each person whom we meet, especially teachers. Therefore, it is difficult to name one. The most inspiring personality is my father, who was a school teacher by profession and had significant impact on my life. He commanded huge respect not only from his students but also from their parents. He treated all his students as his own children and parents of the children also considered him as foster father of their children. I inculcated many qualities from him like – serving selflessly without expecting anything in return, putting service before self and morality above materialism, carrying out duty sincerely with dedication and treating all human beings at par. He always advocated that being ‘imperfectly perfect’ is always better than being ‘perfectly imperfect’. Irrespective of what you are going through, you should always keep on doing what you are supposed to do.

RNN: Growing up, did you always dream to be a scientist?

KKS: Since my father was a teacher who greatly influenced and molded lives of many, I also wanted to be a teacher like him. That is why; I obtained degree in education also. Simultaneously, my interest in insects was ticking me to take research as career and explore the unexplored. There is an interesting story that happened while doing PG studies that reinforced my interest in research. During second year of PG, University administration decided to replace entomology as special paper with Limnology. It came as a bolt from blue to

me and almost ruined my dream because I wanted to pursue career in entomology. It took lot of efforts to persuade the university to restore entomology as special paper. This episode changed my course of becoming a teacher to a researcher.

RNN: Why have you restricted to Lac Institution, what drives you to stay here for long time?

KKS: I had studied about beneficial insects during my PG studies and when I joined the then Indian Lac Research Institute, I found lac insect interesting to work with. Despite being a plant pest, it is an important source of livelihood for small farmers especially in rain-fed farming system. Lac producing states of our country especially Jharkhand, Chhattisgarh, Odisha *etc.* are water deficit states in terms of availability of water for irrigation, where rain-fed agriculture is the dominating source of food. The situation is exacerbated by adverse biophysical growing conditions and poor socio-economic infrastructure in many areas. Levels of productivity, particularly in rain-fed areas are low but opportunities do exist to diversify land use and raise the productivity. Lac cultivation offers an excellent opportunity under such situation, which can be easily integrated with agriculture. Lac host plants based agro-forestry models have proven their potential in rain-fed agriculture. Likewise, late maturing varieties of pigeon-pea and bushy lac host plant, *Flemingia semialata* are proven plants for enhancing income through integration with agriculture. While surveying different parts of country for collection of lac insect and host plants during my early career, I realized the importance of lac cultivation in geographically handicapped areas and its potential application in diverse fields. I

surveyed more than 100 districts of 19 states for lac insect biodiversity; established Lac Insect and Lac Host Field Gene Banks which later on developed into National Lac Insect Germplasm Centre, identified new lac insect species, developed new varieties of lac insects, introduced new concept of lac insect-host plant combinations and host plant indices for sustainable yield, initiated work on lac insect and host plant interaction towards quality lac production. Lac being an insect commodity, it is an entomologists paradise to shape and advance his / her career.

RNN: What is the most challenging thing about being a lac entomologist and how you dealt with it?

KKS: Lac insect is very fascinating as well as frustrating to work on. Since, lac insect is phyto-succivorous and sedentary in habit, it is not amenable for certain laboratory experiments. We have to work in a semi-field condition where it is difficult to manage / simulate the rearing environment. Intra-specific variations in host plants that affect quality and quantity of lac produced, identification of elite host plants and their mass multiplication, improving industrial quality of lac, nutrient management for better and sustainable yield, climate change affecting host plant as well as associated pests are some of the most challenging areas confronting a lac entomologist.

Biochemical and physiological characterization of lac host plants to explore their nutritional requirement of lac insect, habitat manipulation and biocontrol of insect pests, exploration/establishment of suitable lac insect-host plant combinations, vegetative propagation of good host plants and study of weather parameters affecting lac insect as well as associated fauna have

provided meaningful insights in managing these challenges.

RNN: Tell me about your proudest achievement

KKS: Starting a journey from the lowest ladder of scientific cadre and reaching to the top of hierarchy in the same institution where I joined as a scientist gives me a lot of satisfaction. It reinforced my belief that in a fair and equitable system, attainments/achievements are the by-product of one's sincere and untiring efforts.

“as a Director, one can always contribute to science by mentoring budding scientists, sharing experiences, designing and implementing newer ideas”

RNN: Are there any research gaps in lac, and how to narrow down them in future actions

KKS: Natural Resins and Gums (NRGs) including lac are inherently vulnerable to climatic conditions leading to fluctuations in supply and price, both of which are important for achieving a sustainable demand. All the R&D efforts will have to be made to achieve higher and sustainable productivity with optimal inputs, ensuring high quality of NRGs and development of novel and specialty applications especially in low-volume high value products; emergence of new frontier areas are likely to trigger paradigm shift in application domains. Therefore, biotechnological tools have to be used for harnessing genes for mass production of useful molecules in bio-

factories. Such production systems would complement rather than replace the conventional production systems; drastic changes will have to be introduced for raising highly organized plantations with advanced parameter monitoring, automated management systems and precision farming for sustainable production. Taxonomic studies including numerical and molecular approaches, rearing of lac insect on synthetic diet under laboratory setup, identification of resin, dye and wax synthesizing genes, are some of the important areas which merit attention for future studies.

RNN: How would you like to see IINRG in future?

KKS: Being the only institute of its kind in the world, onus lies on us to develop IINRG as institution of world repute. The pace of technological strides has tremendously increased in recent decades and this trend is likely to continue during the forthcoming decades as well. The institute should in future take lead in related new areas such as biopolymers, derived especially from agro-wastes, ushering new domains of research. Newer application areas and products based on natural resins and gums have commercial advantage in terms of being eco-friendly and have immense potential.

The well-being of the rural poor depends on fostering fair and equitable access to productive resources. Therefore, proper sequencing of interventions, building up of technical and organizational capacity of local communities to internalize and sustain interventions will be required.

I would like to see IINRG emerging as global leader in research and development aspects related to NRGs.

RNN: What is the difference between being a Director and a Scientist?

KKS: I see Director as a scientist with additional responsibility of managing the administration for better science. Though lot of time is diverted towards management responsibilities as Director, one can always contribute to science by mentoring budding scientists, sharing experiences, designing and implementing newer ideas, offering new concepts and showing right direction to the colleagues.

RNN: Many a time administration job demands lot of time; how do you manage time?

KKS: It is true that under ever evolving challenges of managing administration, time is the most precious commodity. Delegating research and administrative responsibility not only provides some room but also grooms colleagues as future leaders. Moreover, if one has accepted to assume responsibilities, one should always be prepared to put in extra efforts and time.

RNN: What advice might you have for early career researchers trying to carve their own path?

KKS: My sincere advice to the young scientists would be to take research as passion and not as career. Be systematic and objective in your approach and work sincerely. The ultimate aim of science is to unravel the truth and creation of knowledge. Respect seniors in the system-learn from them at every opportunity; don't sit in cubicles, go to fields. The importance of field work will be realized once you reach mid-ladder of your career.

RNN: Your suggestions / views and opinion on "Indian Entomologist" magazine?

KKS: While going through the first issue of the 'Indian Entomologist', I found it very interesting carrying a lot of information useful for both experts as well as amateurs. As Albert Einstein once said, 'If you can't explain it to a six-year-old, you don't understand it yourself.' the magazine aptly exemplifies it. I am sure, 'Indian Entomologist' will motivate the students to pursue career in science and I hope, the combination of experienced seniors and youth in editorial team bodes well for bright future of the magazine. Bringing out special issues on insects of agricultural importance, eminent entomologists, current aspects of entomology will increase the relevance of the magazine further.

The interview is conducted by Mr. N. N. Rajgopal. He is working as Scientist at Lac Production Division, ICAR- IINRG, Ranchi. He is working in the field of Taxonomy especially Lac insects and Leafhoppers. He is also an Associate Editors of IE.

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