

## Tributes to Professors N.N. Bhandari and H.Y. Mohan Ram

Prof. NARINDER NATH BHANDARI (1935-2018)

Professor N.N. Bhandari passed away on 24 April 2018 after a brief period of hospitalization.

As I sit writing this, I am transported to that Monday morning of 10 January 1972 when I first met him. Having just arrived from Poona (now renamed Pune) after completing my M.Sc in Botany, I was reporting to Professor B.M. Johri, the then Head of the Department of Botany at the University of Delhi to join as a CSIR Doctoral Fellow. Coming from a small place, and still wet behind the ears, I entered the portals of the then well-known Department – also Centre of Advanced Study in Plant Morphology and Embryology – with great trepidation. It was there in the Head's Chamber that I first met Dr Bhandari, then a young and handsome lecturer in the department, and was assigned to work with him. After the preliminaries were over, Professor Johri advised me to work on a comparative study of antipodal cells in grasses and dismissed me with these words: “Young man, you now have a research problem, and you have a guide. So go ahead and work”.

I later learnt that by the time I joined, Dr Bhandari had put behind him more than 13 years of service as lecturer after completing his B.Sc. (1956) and M.Sc. (1958) degrees from the Punjab University, Chandigarh. Work for his Ph.D. degree (1963) focused on the embryology of primitive flowering plants and he had already published several papers on taxa from Ranunculaceae, Magnoliaceae, Winteraceae, and Viscaceae singly and together with his students in reputed journals. Just at that time his scholarly review on ‘Embryology of the Magnoliales and Comments on their Interrelationships’ had just been published in the *Journal of the Arnold Arboretum* (1971, vol. 52: 1-39, 285-304). I remember how well it was received by his peers.

The custom then prevailing in the department was that most staff members had to share laboratory space with other colleagues. I soon settled into a laboratory which was shared by seven teachers. Thus began my relationship with Dr Bhandari lasting several years.

In August 1972, within a few months of my joining, in Dr Bhandari was awarded the prestigious Alexander von Humboldt Stiftung Fellowship and went off to what was then West Germany for 14 months. After a couple of false starts, my research interest had settled on a study of the nutrition of the embryo employing histochemical techniques that had come into vogue then. During a botanical excursion to Nainital, I selected *Scrophularia himalensis* Royle (Scrophulariaceae), a species common in the Western Himalaya between 1500m and 2400m altitude, and started working on it. When he returned from Germany, I explained these changes and he was happy with the same. Interestingly, this plant has endosperm haustoria at both the chalazal and micropylar ends, the four-celled micropylar haustorium being highly branched and very aggressively involved in nutrient absorption. From the viewpoint of nutrition, we were able to demonstrate a sequential activation of tissues within the seed during post-fertilization development.

Life was quite simple and unpretentious those days. Like several other teachers, Dr Bhandari used to arrive daily at the department on a bicycle from his home in Model Town. I remember borrowing his bicycle a few times to collect *Orobanche* from the mustard fields in Wazirabad (I am not sure if any mustard fields remain there anymore). Meanwhile, I was appointed as lecturer in SGTB Khalsa College and continued working in the lab during afternoons. In due season, he was promoted to Reader (1977) and by that time, other younger students joined his group and I became their senior and big brother. With fresh winds blowing in the University and the department by then, new policies were being put into place. Dr Bhandari was allotted a laboratory of his own. This was on the top floor of the new block and was unbearably warm during the summer months but none of us was complaining! Since much of our work required photomicrographs, we converted one of the cupboards into a dark room for photography and I remember working inside it, often with sweat pouring down my face.

During this period, Dr Bhandari worked in overseas laboratories on visiting fellowships, e.g., UNESCO Fellowship to USSR (1969), Alexander von Humboldt Stiftung Fellowship to Germany (1972-73, 1978-79, 1987). In Germany, his work with Professor Barbara Haccius and her group at the Institut für Spezielle Botanik der Universität Mainz on morphogenetic studies on induction of androgenic haploids in *Nicotiana tabacum* (Haccius B, Bhandari NN 1975. *Betr. Biol. Pflanzen* 51: 53-56) is particularly noteworthy. He was also able to demonstrate the *in vitro* transformation of ovules into rudimentary pistils in the same species (Haccius B, Bhandari NN, Hausner G 1974, *Journal of Experimental Botany* 25: 685-704).

The 1980's and '90s were a very productive period in Dr Bhandari's academic life. This was also when he was promoted to professor's position (1983). As his group expanded, so did the scope of the work: In addition to investigating the histochemical underpinning of reproductive development, his students were busy studying the process of cellularization of the female gametophyte, free nuclear and helobial endosperms in various plants, ultrastructure of the endosperm and its haustoria, process of sporulation in free nuclear sporangia of fungi, as well as effect of mutagens on chromosomal structure and study of the karyotype by Giemsa banding technique. These led to a series of publications in prestigious journals such as *Annals of Botany*, *Beiträge zur Biology der Pflanzen*, *Canadian Journal of Botany*, *Cytologia*, *Phytomorphology* and *Protoplasma*. In all, Dr Bhandari and his co-workers have published over 100 scientific papers greatly enhancing our understanding of the above areas. Not surprisingly, the accumulated knowledge on the structure and function of haustoria culminated in a book (Bhandari NN and Mukerji KG 1993. *The Haustorium*. Pp 308. Research Studies Press, Taunton, Somerset, England; Wiley, New York). His other proven expertise and skill in microtechniques also resulted in a second book (Bhandari NN 1997. *Staining Techniques – A Manual*. Ultimate Printers, Lajpat Nagar, New Delhi). With such solid work behind him, he was naturally invited to present papers and overviews across several laboratories in India and overseas. Keeping up with the times, he also graduated from the bicycle first to a Bajaj scooter and later still, a car.

In 1985 Dr Bhandari was invited to take over the editorship of *Phytomorphology*. With focus on quality and an eye for detail he dedicated his best efforts towards

bringing out the journal on time, a responsibility he discharged with distinction and devotion over the next 15 years. The USSR Academy of Sciences awarded him its prestigious Sergy G. Navashin Medal in 1990 in recognition of his outstanding contributions to plant embryology. He served as Head of the Department of Botany (1991-94), Dean Faculty of Science (1991-92) and as President of the International Society of Plant Morphologists (2000-2004).

Soon after I started teaching in 1975, I was obliged to move out of the hostel and take a house on rent in Model Town. By some coincidence it happened to be about five or six houses removed from where the Bhandaris lived. I remember visiting them in their home and meeting Mrs. Bhandari and their two lively and bright boys. Mrs. Bhandari was a very charming and gracious hostess.

In 1984 I moved to the Department of Science & Technology, Government of India and, shortly thereafter, to the Department of Biotechnology and got busy doing different things. Gradually, my sphere of activity widened and took me away from the university. My visits to the Botany department became fewer and far between and then almost ceased. Once in a while, I would talk to Professor Bhandari and exchange notes. When he superannuated in 2000, his students gathered together to organize a farewell symposium in his honour at the Zakir Husain College. The inaugural function was graciously chaired by Professor H.Y. Mohan Ram. I remember that several of Professor Bhandari's peers, friends and well-wishers turned up to speak. The last I met him personally was at my daughter's wedding reception nearly six years ago. We did speak on the telephone a few times after that.

Throughout my association with him, Professor Bhandari encouraged me to think and work independently. I shall always remain grateful to him for this. After the initial years, he treated me more like a younger colleague than a student. When I close my eyes, I can still see him: a handsome man with a tough demeanour but a very soft core; an incisive scholar with extraordinary clarity of thought and expression; an upright colleague ever ready to defend what he felt was right; an exacting teacher who never suffered sloppy work by students; a rigorous researcher with unparalleled skill and expertise in the areas of his interest; an astute administrator; a very fine human being; a caring friend and a great family man.

It is tough to believe that Professor Bhandari is physically no more. I wish I had been in closer touch with him. Alas, it was not to be. Life has no rewind button. However, I am not truly worried. Teachers, like parents, have a permanent residence in our hearts – loving us, encouraging us, cheering us and guiding us. I shall always find him there.

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It is hard to accept that Professor N.N. Bhandari is no more. Professor Bhandari was not only my guide (carried out my M.Phil, Doctoral and Post-doctoral research under his guidance) but was also a father figure to me when I was in hostel. I probably am the student who worked for the maximum period (1981-1991) in his lab.

I met Prof. Bhandari when I joined the Department of Botany, University of Delhi, as a post graduate student in 1979. He taught us embryology in M.Sc. previous, and I opted for his special paper on Microtechniques in M.Sc. final. Subsequently, I joined his lab for M.Phil. and Ph.D. research. Professor Bhandari was very meticulous and sincere in his work, and did not tolerate sloppy work. He gave us, his students, complete freedom to choose our research problem and work on it the way we wanted (the reason why I joined his lab), guiding us only when he thought we were going wrong. He even encouraged us to go out of the way and experiment. And he expected nothing less than the best effort from us. Though a hard taskmaster, he was a very kind person. He never showed any favouritism, and treated senior and junior students in the same

I am greatly beholden to my friends R. Geeta, Rita Khosla, Mrinal Bhargava, P Chitralekha, Anuradha Mal, Darshan Kaur Cheema, and Binny Mathur for helping me with information about Professor Bhandari.

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manner. I remember that soon after taking over as Head of department, he made sure that all the senior teachers who were teaching on temporary/adhoc basis for many years were given permanent appointments first.

Professor Bhandari was very good with microscopic techniques and had a good collection of excellently prepared slides, many of which he kindly gave to me. I wanted to photograph them and get them published but regret that I never got round to doing it.

I have learnt a lot from Prof. Bhandari; academic honesty is one of them. He would never let any fact, unsubstantiated by evidence (even the most likely ones according to me), or badly turned out work to be reported. I will always be grateful to him for this. I also learnt photography from him as he used to personally photograph the slides we prepared, and would repeat till he got photos of the quality that he wanted. I will really miss him.

P. CHITRALEKHA,  
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## Prof. H.Y. MOHAN RAM (1930-2018)

When I rejoined Professor H.Y. Mohan Ram's lab in 1986 after completing my Ph.D and taking up a teaching position at Miranda House, University of Delhi, he was busy finalizing Ms Vidyashankari's Ph.D work on *Griffithella hookeriana*, a member of the unusual, aquatic angiosperm family, Podostemaceae. He was intrigued by the highly reduced, polymorphic, thalloid plant body (that deviated from the classical root-shoot model typical of angiosperms) and resembled an alga, lichen or a bryophyte. Besides structural reductionism, Podostemaceae is an embryologically interesting family as well. It lacks antipodals, triple fusion, endosperm, and shows the presence of single fertilization and pseudo embryo sac. At that time, not much was known about their structural, developmental and adaptive features. Since Vidyashankari (1987) had successfully germinated seeds of *G. hookeriana* in vitro using the ingenious technique of placing the seeds on small polystyrene foam (thermocool) cubes floating on nutrient medium and was also able to follow early seedling development, Prof. Mohan Ram suggested that we could start investigating the life history of Indian Podostemaceae. Of the 260 species of Podostemaceae worldwide, India has 20 (18 endemic) that are mainly concentrated in the Western Ghats.

Thus started our frequent field trips to various parts of Kerala, Karnataka, Maharashtra including picturesque Silent Valley National Park. *Indotristicha tirunelveliana* - an endangered species - was collected after a gap of twenty years by Dr. Prem Uniyal, senior research fellow. Prof. Mohan Ram accompanied his students and associates during most of the field trips with great enthusiasm and would go on the slippery rocks to collect plants - podostemads occur under waterfalls, in fast-flowing rivers or streams and grow firmly attached to rocks, boulders and pebbles. Not only Prof. Mohan Ram, but his wife Dr. Manasi Ram, my colleague and senior at Miranda House, was also an ardent admirer of plants. She had made plans to come with us on one of our field trips to Silent valley (Palakkad, Kerala), but just prior to the trip fell sick. Despite repeated requests made to her to cancel the railway tickets; she did not budge from her decision. Unfortunately, she could not come after all, as the illness became serious and we eventually lost her. Nevertheless, I will always remember her words and salute her spirit as she said "Anita, even if I have to

die, I might die collecting the plants than otherwise". After the loss, Professor Mohan Ram immersed himself in more and more work.

We published an introductory paper to Podostemaceae highlighting its remarkable growth habit, perplexing polymorphism, marked structural reductionism and unique embryological features. The technique devised by Prof. Mohan Ram and Vidyashankari became the basis for the research work conducted not only by us but by researchers in the other parts of the world as well. The mature podostemad embryo lacks an identifiable shoot apical meristem and a root apical meristem. In the absence of the two apical growing points, how, when and from where does a thalloid plant body arise and what is its morphological nature, were some of the questions that our research sought to answer for several years. We succeeded in germinating and tracing the early seedling biology in seven members of Indian Podostemaceae. *Indotristicha ramosissima* (subfamily Tristichoideae), the only Indian species that seems to correspond to the classical root shoot (CRS) model was not only raised from the seed but also brought to flowering for the first time under axenic conditions in our laboratory. Other Podostemoideae members did not form roots on germination (only unicellular hairs developed from the radicular pole), while a they did form a post-germinally formed 'plumule' or 'primary axis' but to a limited extent. In the absence of root and shoot apical meristems, the plant body would have stopped growing - except for a hypocotyledonary protuberance formed endogenously that further developed into a thalloid plant body. The origin as well as location of the plant body primordium is extraordinary and is a developmental novelty not seen in any other angiosperm (Aquatic Botany 1997).

The next logical step was to determine the morphological nature of the ribbon like, thalloid plant body that had remained controversial for long. It was viewed as a creeping root/ shoot/ or a combined shoot (leaf and stem) structure. In order to determine the organ identity of the plant body, we traced its origin from the seed during germination. On the basis of origin, structure and function, we concluded that the plant bodies of *Hydrobryopsis sessilis*, *G. hookeriana* and *P. stylosum* can be interpreted as dorsiventrally flattened stems. Having studied early plant development

and organ identity, we focussed our attention on the structure of flower, seeds, pollination and breeding system in some podostemads. The pollination mechanism ranged from xenogamy, geitenogamy or autogamy in a chasmogamous flower (*P. stylosum*) to complete autogamy in a cleistogamous flower (*G. hookeriana*).

Angiosperms are characterized by the occurrence of double fertilization. However, Podostemaceae is considered an exception with the presence of only single fertilization (syngamy) though two male gametes are formed conventionally. To determine the cause for the failure of double fertilization, we tracked the path of the two sperm cells from the time of their formation in the pollen tube to the time of entry into the megagametophyte to affect fertilization. The mature megagametophyte is 3-nucleate/ 3-celled consisting of two synergids and an egg cell. A central cell is formed

during female gametophyte development, but degenerates prior to the entry of the pollen tube into the synergid. Thus the mature female gametophyte lacks a central cell at receptivity with which the second male gamete could fuse. Therefore, of the two male gametes, one fuses with the egg cell resulting in syngamy whereas the other male gamete eventually degenerates confirming the occurrence of single fertilization and resulting in sperm selection.

Through this account of our work on Podostemaceae, I pay tribute to the memory of my beloved teacher, mentor and philosopher- Professor H.Y. Mohan Ram whose joy, dedication and commitment towards research work will continue to inspire the coming generations.

ANITA SEHGAL

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My association with Prof. H.Y. Mohan Ram, an inspiring and compassionate mentor, started when he persuaded me to do a dissertation instead of taking an elective course that he was teaching in my final year of M.Sc. Botany.

We settled on *Ipomoea fistulosa* a woody, fast growing weed that tended to grow in the ditches around Delhi. We collected plants in the fields and I used the cuttings to study the effects of various growth hormones. I had great help from the older students in the lab, Usha Mehta and Anita Kapoor (as they were then) and Vijay Laxmi Nayyar and Ratna Mazumdar. I enjoyed the camaraderie in the lab, especially the tea time in the afternoon and all HYM's stories, including his interactions with his mentor F.C. Steward, the father of tissue culture, who established the property of totipotency of plant cells. It so happened that Professor Steward and his wife came visiting and we spent a lovely Sunday at the Delhi Zoo.

At my oral examination, one of the questions was "So what do you plan to do next on this project?" My answer was that I was not planning to continue as I was not going to go in for Ph.D. This despite my being a recipient of the Science Talent Scholarship that would have funded me through Ph.D.

So, what did my mentor think about this? I wanted to work a little bit – teach, and not get bogged down for the four years that a Ph.D. would take, and I would

not be able to use it anyway! As the new academic year started in 1975, I applied and was selected as Lecturer at Daulat Ram College. I was ecstatic, I loved teaching, plant physiology, ecology, general botany and the accompanying labs. Then, the University Grants Commission raised the salaries of all lecturers with the condition that we completed a Ph.D. in five years. Reluctantly, I went back to the lab. HYM understood my dilemma. He counselled me to start anyway, and said he would not feel offended if I gave up. So, instead of working full time on my research with a scholarship, I worked full time teaching and the rest of the time in the lab, working twice as hard. Instead of finishing in four years, it took me eight.

They were very fulfilling eight years, I grew a lot in my teaching and loved the long discourses in the lab. We discovered my talent for editing English, my eagle eye for typos, and I helped with the publications from the lab, including the B.M. Johri Commemoration Volume. HYM honed our writing and speaking skills, while he shared stories about his family, his illustrious mother, and his brother Shourie (Sharada Prasad who was Media Director to Prime Minister Indira Gandhi). We commiserated with him when young Rahul injured his eye, defending Ravana? I also got to know and love Manasi Ram, who helped a lot with my research on the water plant *Limnophila*. There was the field trip to Jaipur, Rajasthan, to collect more *Limnophila*. The original marshy spot where the plant had been

collected was now dry, so we (Usha, I.V.R. Rao and Gautam Sarath) ended up going to Mount Abu where we were able to collect the water plant and transported it back home in buckets. Heady times. It was not very practical to grow the plants outside, so I set up an old aquarium by the window. As the days got shorter in the fall, I was amazed as the leaves changed shape, as the shoots grew out of the water to flower. I was able to catch the transition and study it anatomically. Some great “Aha” moments.

Most of the research on *Limnophila* was done in tissue culture, where I germinated the seeds and grew the excised nodes under a variety of conditions trying to transition the morphology of the leaves to the aerial form. On the way, I had my own little bit of totipotency moment, when root tips cultured by themselves in liquid medium developed buds that turned into whole plants (Can J. Bot, 1981). I tried all the known plant hormones, as well as water stress to induce the aerial form. Finally, I obtained a sample of abscisic acid from Dr. Konar’s lab through Sushma Kitchlue and achieved this transition, the aerial leaves in a liquid medium that went on to flower, and totally

suppressed the aquatic form (Planta 1982). My fellow lab mates Gita Mathur, Geeta Chandra and Rina Sett and I formed a mutual support group.

My journey since Ph.D. has taken me far away from Botany and Delhi University into the molecular biology of plants and finally, type 1 diabetes especially in children in Denver, Colorado, where I enjoy looking at the tree line and alpine plants in the Rocky Mountains.

After marriage, I stayed with my mother-in-law in Bangalore, where HYM visited us; he and my mother-in-law had a grand time as they knew so many people in common. Afterwards, she often sent me newspaper cuttings of HYM’s activities that she found in the local press. Of course, there are many more memories, and regrets that I did not better keep in touch. H.Y Mohan Ram touched many of us with his love of Botany, nature, life and his humanity.

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I write this obituary from the student’s point of view, looking at Professor Mohan Ram as a teacher, and as a research guide/advisor. So, in a way, this is also about me, as an obituary should be, for it is from my eyes and my mind that I write. Even at 64, I remain Mohan Ram’s student as one is to a teacher, as true as I remain a child to my parents.

I joined the Department of Botany, University of Delhi, as a BSc (Hons) student, and though this was not my first choice, I stayed on since there were many inspiring teachers. Nuanced teachers. Storytelling, captivating teachers. Teachers who always had time for students. The Mohan Ram kind of teachers.

Mohan Ram was a great teacher. A professor. Profess (*verb*) (Webster Dictionary): “to present to knowledge of, to proclaim one’s self versed in; to make one’s self a teacher or practitioner of, to set up as an authority respecting; to declare one’s self to be such.” To my mind, a person who professes, is a professor. I always felt that a professor should be a Professor by what they did over a lifetime of work, rather than just by the title Professor, a common commodity today. Mohan Ram was a professor and a Professor. Both. One who fires up the minds of the youngest students. A person

with great depth of botanical knowledge combined with the ability to inspire by his teachings (lectures), that each student pictured him in their minds as the kind of person they wanted to be. I did.

I did my M.Sc. thesis with Mohan Ram. He suggested I work on cut flowers. Much of the support was from Usha, my senior in the lab, who later became my wife. Mohan Ram was busy as the Head of the Department of Botany. I continued with him for my Ph.D. But what is a Ph.D? The full form of Ph.D. is Doctor of Philosophy, with philosophy broadly defined as “the rational investigation of the truths and principles of being, knowledge, or conduct”, and with respect to science, specifically, as “the critical study of the basic principles and concepts of a particular branch of knowledge, especially with a view to improving or reconstituting them”. Both the broad and the specific are important.

Mohan Ram chose to do this through detachment.

Essentially, the student had to discover, learn, organize, figure out the methodology, do the experiments and research. A hard task indeed, doing this alone.

Sometimes with seniors in the lab. Many students reached the finishing line, some like me nearly gave up, and a couple left after years of work. After two and a half years of work, I had reams of data, wrote computer programs to statistically analyse it, but had no clue what I was looking for. And there was no one who could give answers. That is when I decided to give up the pursuit of a Ph.D. and sought a job with a friend for Rs. 2500 a month. He offered me Rs. 2000/month which I did not accept. Divine intervention! Then came the annual trip that allowed to children of diplomats to spent time with your parents in a far land. This time, the land was Bulgaria.

I had faithfully carried my data with me, and hand plotted them on to large 4x2 feet graph papers. In Bulgaria, I had a room all to myself including the bed; the wall I stared at when lying in the bed was blank. What the heck, I thought, and stuck the large graph papers on the wall. So here was I, staring at my data when going to bed and waking up, looking at what seemed like representations of mountain ranges. Then, one day, there was this 'Eureka' moment, and it all came together! Could not wait to get back and then did further experiments to confirm my hypothesis that explained the data. My thesis got completed by the 4<sup>th</sup> year, my two external examiners, Professor F.C. Steward and Professor Buinsma gave their nod, and I got the degree. I also received the Indian National Science Academy's Young Scientist Medal from the Prime Minister for my work. The Indian Academy of

Sciences made me a Young Associate, the first from the Department of Botany and probably the University itself. Miracles do happen. And I did become a Doctor of Philosophy as is defined. But just think, a couple of years before, I was clueless, rudderless, and was leaving all my work. What if?

When in 10<sup>th</sup> grade, I wrote a piece on "Single Man, Multiple Man" after reading of a Literature Nobel Prize winner write of how the loneliness in the mountains as a little girl shaped her as a person and her writing in the years to come. Your only companion are thought, reflection and introspection. The opposite is being with others. May be being "alone" in the figurative sense, a "Single Man", shaped me too. I never ceased to research, write, innovate, invent and enjoy the wonder of science and the scientific method.

For all this, for making me what I am without knowing he was doing so, I am grateful to Mohan Ram for helping me discover science and the scientific method, and develop my ability to do so by his detachment. Had he not given this space, I could not have grown.

I remember him well as an inspirational teacher, a good botanist, and a caring human being. Rest in peace he certainly will.

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Professor H.Y. Mohan Ram ("guruji") was not only my teacher, guide and Ph.D. supervisor; he was much more. He was keenly interested in my study of *Lantana camara* to elucidate the significance of flower colour changes which included behavioral studies on thrips (insects), chemical analysis of pigments, pollination biology and floral ecology. We designed a series of experiments as the story gradually unfolded. He was a tough task master but at the same time was very affectionate, considerate and understanding. He gave a part of himself to every student. His 32 Ph.D. students' theses were like 32 doctorates for him. He had a tremendous capacity to bring out the best in his students. I have personally grown into what I am today under his guidance. He encouraged me to write a chapter in a school book he was editing and trained me to write for children in a simple style without diluting technical content.

My research papers and Ph.D. thesis writing polished my writing skills. Later, in 2014, we jointly wrote a chapter on "Blue Colour in Plants" for a book for general readers edited by Kapila Vatsyayan. We spent hours together during finalization of this chapter and all through I learnt something new from him.

His enthusiasm and eye for minute details in nature were exemplary. He would encourage us to read original papers and held discussions in the lab every evening when we reported about what we had read or observed that day. In late 70's and early 80's there were no computers and research data compilation and graphic depiction were all done on paper. Guruji was very particular about the selection of appropriate words and illustrations for anything to be published. Dictionaries and thesaurus were always there on his table. He was a perfectionist in all he did, had a deep

sense of commitment to work and was a dedicated scholar. He had unlimited stamina for working till late hours and believed in punctuality to meet deadlines. It is an honour for us to have been mentored by such an outstanding personality.

He used to be busy with classes and meetings, so whenever he wanted to communicate something to his research scholars he used to send yellow slips with a message. Most scary were his yellow slips which read 'see me'. We had to leave a card with our whereabouts when we went out of the lab for a long time. He would give his typical I-know-all smile when any card read "Central Science Library".

Professor Mohan Ram was a true botanist with deep understanding of and passion for plants. He not only knew the botanical names of plants but always told very interesting stories about their origin, distribution and economic uses. He was a true Guru, knowledgeable, hard working, and at the same time approachable, affectionate, humble and caring. He led by example and at times would not only advise but also sit with us while recording observations, or studying

Prof H.Y. Mohan Ram (Sir), an epitome of affection, was my 'Guruji', mentor and teacher, all I am today is because of him. During my Ph.D. he was the Head, Department of Botany, University of Delhi and an active member of various national and international scientific organisations that kept him busy in long hours of meeting and extensive travelling. In spite of his busy schedule he used to snatch time to guide us, his students, from time to time. I always admired his patience and long hours of working and his witty smile.

His students were engaged in diverse fields of research that reflected his broad interests; I worked with a high yielding, dwarf male sterile line of *Ricinus communis*. The problem was how to maintain pure lines in this male sterile variety. We induced fertile male flowers in the male sterile inflorescence by injecting different concentrations of gibberellic acid and raised viable seeds after pollinating with pollen from induced flowers, and thus propagation of the line.

During the last days of my thesis submission, I used to have marathon sessions with Sir working round the clock, he being a highly critical perfectionist. I spent the entire day in the lab and the night in his

on the microscope or performing experiments. He would always smile and keep the work environment pleasant for the research scholars. He had a holistic personality with a unique sense of humour. He was a real phenomenon in himself.

He built strong bonds with everyone he interacted with. The respect he commanded was evident during the memorial meeting organized after his passing. The auditorium was full of people, many who were associated with him as members of various academic committees, some from the music world he was involved with, in addition to his colleagues, students, family and friends. All present there felt that he was closest to them. Such was his capacity to influence anyone who came in contact with him. He was such a kind, caring and magnanimous person who will continue to be a guiding light through his blessings and teachings.

GITA MATHUR,  
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Probyn Road bungalow which used to be a makeshift lab (things in 1981 were tough without computer facilities). Amid this hectic schedule he noticed my red eyes and, without my knowledge, asked Tuni, his daughter, a young school-girl at that time, to get eye-drops from nearby Kamla Nagar market. The story didn't end here - for the next two days he made sure that I applied the drops at regular intervals and sat with my eyes closed for a bit. This is the type of fatherly affection that I, along with many of his students, had the privilege to receive.

My story will be incomplete without mentioning about the motherly care of our beloved Madam (Dr. Mansi Ram) with whom I and other students used to share the black and grey patches of our academic and personal life. She always welcomed all of us with hot cups of tea and delicious snacks. Sir's Probyn Road bungalow was an open house for all of us at any time of the day. Our beloved guruji will always be remembered as a fountain of knowledge and an excellent human soul.

RINA MAJUMDAR,  
Associate Professor, Maitreyi College,  
University of Delhi

We look back with admiration to our excellent teachers, but with gratitude to those who touched our human feelings. Guruji, as he was fondly called by many of us, was my favourite teacher in undergraduate and post-graduation courses and I was fortunate to be able to pursue M.Phil and Ph.D. under his able guidance. I will always remember him for his affable, kind and affectionate nature. I recall an incidence when four students went with him and Madam (Dr. Manasi Ram) to Osmania University to attend the Science Congress. Though he could have easily travelled by air, he chose to travel in the second class compartment of the train along with the students. One of the berths was allotted in another compartment. At night, I volunteered to go and sleep there. He came with me and ensured that I was comfortably settled on the top berth. Next morning when I woke up my co-passenger told me that your father came several times to check if you were comfortable.

During the final stages of my Ph.D. thesis compilation I joined the hostel as I stayed quite far away in South

Professor Mohan Ram was a leading figure and outstanding Botany scholar in all of India. His leadership and dedication reached so many lives and was important in so many ways. He set an example that all who study science should follow. He was excited by discovery and he tied to share this with all people he met and also the people of India from school children to research scholars. He was careful, methodical and persistent in his research on plants. He was always asking questions of the plants he studied,

Delhi. Sir being an active member of many scientific organizations, used to keep busy for long hours during the day. He used to sit with me for checking the drafts of the thesis in the early hours of morning and later in the evenings. Guruji would bring coffee and biscuits at 5:30 am and knock on the window of my room with his walking stick ensuring that I was up. After a walk he would sit in the Lab and correct the drafts.

His house was always open for all his students and we enjoyed many tea parties warmly hosted by Madam, Sushmita and Rahul, as Guruji celebrated birthdays of all his students. He wrote letters of encouragement on successful completion of our experiments. I hold him in high esteem as a mentor who taught not just Botany but also greater lessons in life.

GEETA MEHTA,  
Associate Professor, Gargi College,  
University of Delhi

always listened carefully to students and colleagues and then offered practical suggestions. Mohan Ram was a great leader in Indian Botany, he worked for the benefit and good of his colleagues and their advancement. He was open and sharing of himself and his resources. I value always his friendship and respect and admire his scholarship.

DAVID DILCHER,  
Indiana University Bloomington, Indiana, USA

## A PLANT SCIENTIST EXTRAORDINAIRE

**Prof H.Y. Mohan Ram: *A symphony of friend, philosopher, colleague, mentor and much more***

I am deeply saddened, but glad to record my words of appreciation of the outstanding contributions of Holenarasipur Yoganarasimham Mohan Ram, generally known as HY Mohan Ram, to research and education in Plant Sciences. I had the privilege of knowing him since 1966 and more closely during the international seminar “Physiology of Sexual Reproduction in Flowering Plants” held in December 1976 at PAU, Ludhiana where I shared some memorable moments with him. Later we spent a fortnight together at Pune University to organise various departments, and I started appreciating his unusual abilities, creativity, great accomplishments in research that extended across wide areas of plant sciences including floral biology, plant physiology, insectivory and the family Podostemaceae and his special passion for the flora of Amazon and Malabar (Kerala). His other major research contributions include those on flower colour, sex expression in flowering plants, and in vitro culture of bamboo and aquatic angiosperms which are widely acclaimed at national and international forums. He examined three of my PhD students and I was inspired by his personality and wide knowledge of general botany.

A firm believer in science communication and an ardent populariser of science, he took interest in science communication at different forums. The equanimity and exuberance with which he delivered lectures spoke volumes of his passion, zeal and laudable contributions to Indian botany. He chaired several of my lectures and vice versa and I observed in him an extremely charismatic and courteous person. Mohan Ram was an unassuming botanist and an extremely thoughtful,

hard working teacher who was fascinated by nature. He continued to remain active with his work schedule till the end at the Shriram Centre for Industrial Research as a Research Professor of the INSA. HYM was a great humanist with varied interests, beyond botany - classical music, photography, cricket and travel. May the departed soul rest in peace.

## A WORD ABOUT MY FRIEND

### A committed botanist with a vision

I had a three decades long close association with Prof Narinder Nath Bhandari (Prof. N.N. Bhandari) son of Dr Mela Ram Bhandari, renowned physician of Kapurthala. He received school and college education in Punjab and then moved to Delhi in 1960 to work under the guidance of Prof. P. Maheshwari, FRS. He joined DU as lecturer and later headed the department.

We studied together and completed B.Sc and M.Sc (Hons.) from Punjab University. In 1986 I invited him to deliver lectures on Cytochemistry, Ultrastructure in Plants at Botany Department, PAU, Ludhiana. I recall his seminal contributions as a magnificent teacher, a proficient researcher, visionary leader and a person with great human values. His contributions in editing Phytomorphology are enormous. He also served as President of ISMP. He was elected Fellow of ISPM in 2014. Narinder had great sense of humour and was very good singer. His departure is a tragic loss to the Plant Sciences community, who have lost a very valuable and diligent scientist. The entire Fellowship mourns his demise and prays for the departed soul.

C.P. MALIK,  
President,  
ISPM, Delhi

