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Lalit Mohan Srivastava (1931–2012): a highly-respected authority on plant growth, hormones, and environment

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ABSTRACT

Lalit Mohan Srivastava (1931–2012) was a well-known plant developmental biologist. He was an authority on the molecular basis of the action of gibberellins and on the physiology, and biochemistry of the seaweeds. Here, we honor him by presenting a glimpse of his life and research; he had authored more than 60 research papers, of which we mention only a few.

1. Early life, education, and research (1931–1965)

Lalit was born on September 7, 1931, in Gonda, Uttar Pradesh, India. He obtained his B.Sc. (Chemistry, Botany, and Zoology) in 1951, and M. Sc. (Botany) in 1953, both in the first division (and first position in his class) from the University of Allahabad, India. He served as a Lecturer in the Department of Botany at the University of Allahabad for a few years. According to Sandra Djwa, his wife, Lalit attributed his later success to comprehensive training at Allahabad. He received a scholarship from the University of California Davis, (UC Davis) to pursue his Ph.D. under the mentorship of Professor Katherine Esau (1898–1997), a highly distinguished and an internationally acclaimed plant anatomist. Lalit received his Ph.D. in 1962 on “*Secondary phloem in Pinaceae*” [1,2]. Then, he joined Harvard University (Boston, MA, USA) as a postdoctoral researcher (1962–1965) in the laboratory of Professor Irving Widmer Bailey (1884–1967), one of the topmost authorities in “Plant Anatomy” [3,4]. During this time, Lalit authored review and research articles covering the anatomy, the chemistry, and the physiology of bark of trees [5], as well as the structure of “cambium” in the American Ash and in the Pine [6,7].

Fig. 1 shows an informal portrait of Lalit, taken around 2000.



Fig. 1. Lalit Mohan Srivastava.
Source: Sandra Djwa.

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2. Research, teaching, and administration at Simon Fraser University (SFU)

When Lalit was at Harvard, he was invited, in 1965, to join the Faculty of the Department of Biology at the newly founded SFU (Burnaby, BC, Canada) as its charter member. He chose to teach “plant development, plant physiology, and plant biochemistry”; later, he taught “introductory biology”. In addition, Lalit was a sought-after administrator. He served SFU in various administrative positions, which included, being (i) Associate Dean of Science, 1969; (ii) Acting Vice-President (Academic), 1969–1970; (iii) Chair of the Department of Biology, 1985–1990. While teaching at SFU, his public service included being Chairman of the Board at what was then Capilano College, and there, he successfully helped the development of a Ph.D. program. During this period, among the many research projects he was involved in, we mention a special one, since we know that he was quite proud of deciphering the structure of the embryo of *Lactuca sativa*, the garden lettuce [8,9].

3. Selected research in the 1980s and 1990s: soluble protein receptors binding to gibberellins, and physiological chemistry of seaweeds

Lalit’s work established the presence of soluble protein receptors in several plants which bind specific gibberellic acids (GAs) with high affinity [10,11]. His research group was successful in obtaining pure preparations of the GA receptors that allowed study of the molecular interaction between the hormone and the receptor, on the one hand, and the hormone-receptor complex and the regulatory sequences of the responsive genes on the other. Lalit was also heavily involved in exploiting “seaweeds” for the benefit of all of us. His team studied various physiological processes in seaweeds (kelps) (e.g., carbon fixation, nitrogen fixation, transport of photo-assimilated products, iodine uptake and transport), and their impact on the overall nutritional composition year-around. For nitrate physiology of *Macrocystis*, a brown alga, see [12] and, for fatty acids as antimicrobial substance in certain brown algae, see [13]. During the last years of his research career, his group studied floridoside phosphate synthase from *Nori*, a commercially important seaweed [14,15].

4. Post-retirement

After his retirement in 1998, Lalit focused, with great enthusiasm, on his major book “*Plant Growth and Development: Hormones and Environment*” [16]. This book provides key information on the synthesis of plant hormones, how their concentrations are regulated, and how they modulate various plant processes. For the general reader, this book shows how plants sense and tolerate abiotic stress such as drought, salinity, and cold temperature. Lastly, it was a pleasant surprise to us that Lalit, a scientist, had translated into English, Premchand’s famous Hindi novel *Karmabhumi* (in 2006), which had been inspired by Mohandas Karamchandra Gandhi.

One of us (Govindjee) has known Lalit since his student days (1950–1954) at the University of Allahabad. Lalit was a year senior to him; after finishing his MSc in Botany, in 1953, Lalit had served as a Lecturer there. All who have ever met Lalit have marveled his independent attitude, his excellent spoken and written English as well as the elegant style of his attire. Warm-hearted and full of life, he will be

greatly missed by his family and friends in Canada, USA, and India. He is survived by his wife Sandra Djwa, his first wife Jane Srivastava and their immediate family: Sanjay, Sonia (& Aaron Roxburgh) and stepson Phillip Djwa (& Lisa Hartley), and four grandchildren, Owen and Adam Roxburgh and Emma and Lucy Djwa. Lalit is fondly remembered by his first PhD student Mirielle Amet (St. Gervais, France), his long time research technician Mia Bonnettmaker (Vancouver, Canada) and one of his long time friend Dr. Raghbir Raj Prasad, (who knew Lalit from his Allahabad days, at UC Davis, and later they both worked in BC, Canada). Lastly, the entire scientific community in Plant Biology, worldwide, will miss this great leader and an extraordinary spokesman for all aspects of Biology.

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Declaration of Competing Interest

The authors report no declarations of interest.

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