G. S. Venkataraman – A tribute in memorium

Gopalasamudram Sitaraman Venkataraman was a remarkable person who hailed from an obscure village in southern India and made a mark as a farm scientist and one of the most illustrious persons this country has ever produced. Born on 1 February 1930 at Tenkasi in Tirunelveli district of Tamil Nadu, Venkataraman had his early education in his native village. His father G. R. Sitaraman, a freedom fighter and a lover of books had his own personal library which made an impact on young Venkataraman who developed a love for books at quite an early age. After completing his matric in the village school, and his intermediate in St. Xavier's College, Palayamkottai, he obtained his B Sc Degree at A. C. College, Karaikudi, where he came under the influence of S. Doraisamy, an algologist and a student of the great doyen of algology, M. O. P. Iyengar. He completed his master's degree at the Banaras Hindu University (BHU) with merit and joined Y. Bharadwaja for his doctorate, with a GOI fellowship of Rs 200 p.m. 'BHU days were the happiest days', he used to say 'since it provided opportunities and challenges'. He utilized both of them to his advantage and took his Ph D and DSc from BHU.

On 28 December 1956 he joined the Indian Agricultural Research Institute (IARI) as Assistant Botanist. He initiated and organized algal research in an agricultural institution. There he came in contact with M. S. Randhawa, then Vice-President of the Indian Council of Agricultural Research and a renowned algologist. Together they published a series of papers and books. The algal section of IARI soon attracted the attention of the nation and received international recognition. Venkataraman used to say that he owed a great deal to Randhawa who treated him as his son.

His colleagues at IARI were wondering about the connection between algae and agriculture. However, he soon established algae as a source of biologically fixed nitrogen in rice cultivation. This concept spread throughout the country and outside as well. International organizations such as FAO took cognisance of this phenomenon and his advice was sought by many institutions and organizations both within and outside the country. Although sporadic reports were published earlier about the potential of blue-green algae (BGA) in increasing fertility of the tropical rice soils, it was Venkataraman who transformed it from an academic curiosity to agronomic reality.

In this process, he realized two major lacunae, namely (a) the lack of trained manpower in agricultural algology, and (b) a centre for authentic algal cultures. Therefore, he developed a major course in agricultural algology leading to master's and doctorate degrees. He also established with munificent grant from the Department of Biotechnology (DBT),

GOI a National Facility for collection and distribution of authentic cultures of BGA – a legacy for posterity.

In 1976, the Department of Science and Technology sponsored an All India coordinated project on 'Algae for fertilizer, feed and fuel' under his directorship. He organized extensive research and extension programmes throughout the country in collaboration with Agricultural Universities, State Departments of Agriculture and Directorate of Extension. His dedication, commitment and tireless endeavour made this project a great success; with the result that every farming community in India came to know and understand the benefits of blue-green algal biofertilizers.

His scientific contributions cover a wide range of basic and applied aspects of biological nitrogen fixation by BGA. One of his important contributions is the demonstration of the transfer of fixed nitrogen from algae to rice plants using ^{15}N. He also showed that strain selection is an important aspect since the strains vary not only in their ability to fix nitrogen but also in their adaptability to conditions in their soil niche, their resistance to pesticides and their insensitivity to extraneous sources of nitrogen such as NO_3^- and NH_4^+.

The success of the BGA biofertilizer technology created the problem of mass production of the algae. Venkataraman solved it by making every farmer produce his requirement of BGA in his own field. The farmer gets the algal inoculum only once to inoculate his production unit, subsequently he can use his own material for further production and application. He had also worked out the energetics and economics of this technology, which is very favourable to the farmer. In the DBT project on BGA Biofertilizer which he directed from the School of Biological Sciences, Madurai Kamaraj University, he further improved this technology and also demonstrated the yield increase in rice with pure cultures of BGA grown on solid organic substrate. This he did in spite of his failing health in the last few years. The farming community should be grateful to him for having a wonderful biofertilizer technology for their crops.

Author of 6 books and 170 publications, Venkataraman was the recipient of several awards and honours. Notable among them are the Vaswic Award (1978), Sanjay Gandhi Award for Science and Technology (1982) and Om Prakash Bhasin Award for Science and Technology in Agriculture and Allied Sciences. He was a Fellow of the Indian Academy of Sciences, Indian National Academy of Sciences, National Geographical Society and Phycological Society, India, which he founded and served as secretary for several years. He was Editor-in-Chief of the *Journal of Phycology* and served on the editorial board of *Biological Wastes* and *MIRCEN Journal of Applied Microbiology and Biotechnology*. He was the Editor of Publications (Biological Sciences) of the Indian

National Science Academy (1983–1986) and a member of the Academy's Council and Sectional Committee. He also served as a member of the Policy Advisory Committee on Microbiological Nitrogen Fixation at the IRRI Manila, Philippines. His services and advice were sought by many organizations such as Agricultural Universities, DST, DBT, CSIR, and DNSE. He was also the Director of the Indo-US Science and Technology Collaborative Programme in Agriculture.

Venkataraman was a multifaceted personality. He was erudite in Hindu Philosophy, Vedas and scriptures and gave scientific interpretations of ancient Hindu thoughts and concepts which would otherwise be considered as superstitions. A lover of literature and poetry, he himself was a poet, which very few persons knew. He was awarded the Australian Bicentennial 1988 International medal by the Melbourne Poetry Society for a collection of forty of his poems published in 1986 entitled *Reactions*.

Indeed, Padma Shree Venkataraman was an institution by himself. In his passing away on 3 October 1998 we have lost a person of exemplary qualities, an eminent scientist, a lover of art and music and a modest and kind-hearted person. I personally lost a good friend.

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MEETINGS/SYMPOSIA/SEMINARS

TROPMET 2000: National Symposium on Tropical Meteorology

Date: 1–4 February 2000
Place: Cochin

Topics and papers: Improved methods of *in-situ* observations and remote sensing of ocean and atmosphere; Coastal ocean dynamics and coastal zone management; Ocean circulations, acoustics; Numerical modelling of the ocean and the atmosphere; Climate change and variability; Chaos and predictability; Ocean waves, tides and sea level; Monsoons; Weather forecasting; Environmental meteorology; Natural disasters and their mitigation; Hydrology.

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Annual Conference of The Society of Statistics, Computer and Applications

Date: 28 November–1 December 1999
Place: Arunapuram

Themes include: Computer applications in exploratory data analysis and forecasting; Use of statistics and computer for technological research; Official statistics; Gaps, problems and publicity.

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National Seminar on Tropical Sericulture

Date: December 1999
Place: Bangalore

Technical sessions: Mulberry genetics and breeding; Mulberry production; Silkworm genetics and breeding; Silkworm egg production; Silkworm rearing technology; Silkworm diseases and pests; Non-mulberry sericulture; Silk technology and byproducts; Sericulture economics and extension.

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International Conference on Mathematical Modelling of Nonlinear Systems

Date: 9–11 December 1999
Place: Kharagpur, India

Topics include: Dynamical systems and chaos; Complex engineering systems; Control systems; Fractals; Deterministic models; Non-deterministic models; Numerical methods; Computer simulation; Wavelets; Nonlinear functional analysis; Nonlinear optimization; Biomechanics; Nonlinear mechanics; Nonlinear optics.

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