Yash Pal Abrol (1935–2020)

Prof. Yash Pal Abrol, a renowned plant physiologist and the doyen of Indian nitrogen research and nature conservation is no more. He passed away peacefully on 28 July 2020, which was incidentally the World Nature Conservation Day. His professional legacy lives on in the Society for Conservation of Nature (SCON) and the Sustainable India Trust (SIT), which he established and nurtured throughout, till the last day. A pioneer in crop physiology and biochemistry, he retired in 1995 as the Head of Plant Physiology Division, ICAR-Indian Agricultural Research Institute (IARI), New Delhi. He later served as CSIR Emeritus Scientist (1996–2000), INSA Senior Scientist (2001–2005) and INSA Honorary Scientist (2006–2015). Born in Lahore (now in Pakistan) on 23 December 1935, he did his BSc from Punjab University; MSc from Banaras Hindu University and PhD from University of Chicago in 1963 and worked as Post-Doctoral Fellow in University of California, USA, before returning to India. He was also a Visiting Scientist at McMaster University, Hamilton, Canada (1983–1985) and Consultant to FAO (1971–1993).

He mentored many young scientists and published over 250 research papers and over 15 books. His students went on to become team leaders, directors of state and national institutions, apart from excelling in other government and industry agencies. He is best known for his pioneering work on cyanogenic glycosides, screening of wheat varieties for roti and chapati during green revolution years and his N balance sheet for wheat and barley, which formed the basis for optimal N fertilizer recommendations for farmers in India. He also worked later on nitrate assimilation in rice and vegetables.

His most recent contribution was the Indian nitrogen assessment[1], which led India to pilot the first ever UN resolution on Sustainable Nitrogen Management in March 2019. This unusual feat was achieved in citizen science mode without any government-funded or privately funded project. His intellectual reputation and gentle personality drew many scientists to deliberate on N-scenario of the country since the late nineties and prepare critical input on the need for interdisciplinary coordination on understanding the nitrogen cycle. This led to the formation of the Indian Nitrogen Group in 2006, under the aegis of the Society for Conservation of Nature, a registered non-governmental organization that he founded in 1998 in New Delhi. A couple of workshops led to a book on agricultural N use[2], followed by a wider collection of review articles for a special issue of *Current Science* in its platinum Jubilee year[3].

These highly cited articles documented the growing problem of reactive nitrogen pollution of our water and air and its impacts on our health and biodiversity apart from climate change, as well as the gaps in our knowledge for informed interventions. These activities also brought the Indian Nitrogen Group in contact with the International Nitrogen Initiative and the establishment of its South Asian Nitrogen Centre under the Society for Conservation of Nature in New Delhi. It also hosted the fifth triennial International Nitrogen Conference in 2010, during which a series of 20 technical bulletins on reactive nitrogen in different sectors were published under Abrol's leadership. This set the stage for the first ever comprehensive Indian Nitrogen Assessment[1], only second in the world after the European Nitrogen Assessment.

Prof. Abrol founded the Sustainable India Trust in 2014 to highlight sustainable nutrient management, as a part of which another special section in *Current Science* was brought out on Sustainable Phosphorus Management[4]. This Trust also highlighted the Indian Nitrogen Assessment during the World Environment Day (2018) hosted by the Indian government in New Delhi. It was followed by the Trust's advocacy and facilitation of India piloting the nitrogen resolution successfully during the 4th United Nations Environment Assembly in 2019. As a result, the Sustainable India Trust has recently been accredited with UN Environment Programme (UNEP) as an NGO under the category of Science and Technology Community.

Prof. Abrol was a Fellow of all the four major Indian Science Academies–National Academy of Sciences, India (1984); Indian National Science Academy (1986), Indian Academy of Sciences (1986) and the National Academy of Agricultural Science (1991), apart from being Full Member of Sigma Xi, USA, and the Indian Society for Plant Physiology. He served as INSA Honorary Scientist (2006–15), Adjunct Professor at the Hamdard University, Chairman, Research Council, Institute of Himalayan Bioresource Technology (1991–1993), and Member, Academic Council, Guru Gobind Singh Indraprastha University, New Delhi (2006–2008). His awards/honours include: Dhiru Morarji Memorial Award (Fertilizer Association of India, 1977); ICAR R.D. Asana Endowment Fund Prize (1974–77); National Fellow, ICAR (1978–84); IARI Sukumar Basu Award, (1980); FICCI Award (1990); Vasvik Award (1993); Platinum Jubilee Lecture Awardee, Indian Science Congress (1995); T.M. Das Memorial Lecture Award (2002) and Birbal Sahni Medal (Indian Botanical Society, 2008).

Prof. Abrol is one of those rare persons of eminence in Indian science, who not only did world class science in his professional career, but went on to bring science to the service of the society, government and intergovernmental bodies through his post-retirement work in the civil society. He is survived by his wife, Dr Mridula Abrol (Nee) Suri and his two sons, Amar and Manav. The Indian nitrogen community pays homage to this great personality.

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Edited by S. K. Satheesh, and printed & published by G. Madhavan for Current Science Association, Bengaluru 560 080.
Typeset by WINTECS Typesetters (Ph: 2332 7311), Bengaluru and Printed at Lotus Printers Pvt Ltd, Bengaluru (Ph: 2320 9909)