

N. S. Narasimhan (1928–2018)

Professor Nurani Sivaramakrishna Narasimhan, an extraordinary teacher and researcher, passed away on 20 August 2018.

Born on 11 November 1928 at Nurani, Palakkad district, Kerala, Narasimhan was compelled to have his school education at various places, including the Hindu High School, Chennai in Tamil medium. In 1950, he stood first in his B Sc (Hons) in Chemistry examination at Presidency College, Madras University, Chennai, a degree which in those days was considered equivalent to M Sc. He then joined the prestigious group of Prof. T. R. Govindachari for research, worked in the field of natural products and obtained Ph D degree in 1954 for his work on the structure elucidation of the piperidino-lactone alkaloids, namely carpaine and ω -carpaine isolated from *Carica papaya*. Later, he became a senior scholar, working independently in Govindachari's group and initiated work on tetranor-triterpenoids nimbin and nimonol isolated from *Azadirachta indica*. Narasimhan joined the University of Pune as a Reader in Organic Chemistry in 1958, declining a postdoctoral fellowship with Prof. E. J. Corey at Harvard University, USA. Subsequently, he was appointed as Professor in 1977. After superannuation in 1988, he was honoured as Professor Emeritus by the University of Pune. He was briefly Director, SPIC Research Centre, Chennai after retirement.

During his illustrious career, Narasimhan was a postdoctoral fellow with Prof. Hans Schmidt at Zurich University, Switzerland during 1971–72. He was a Fellow of both the Indian Academy of Sciences and Indian National Science Academy. In October 1988, he went to Japan as Visiting Scientist under the exchange scheme of UGC, New Delhi.

To begin his independent research career, Narasimhan initiated work in the novel field of heteroatom-directed lithiation reactions and later contributed in the fields of natural products, synthetic organic chemistry and heterocyclic chemistry.

Working with poor facilities and depending heavily on NCL Pune, particularly for spectral data during initial stages, he persuaded UGC to grant IR and NMR facilities to the Department of

Chemistry, impressing the Commission with his excellent research. Narasimhan's work regarding mechanistic studies on heteroatom-directed lithiation reaction using substituted benzenes, naphthalenes, biphenyls, quinolines and isoquinolines provided opportunities to his group to develop novel and convenient methods for the synthesis of naturally occurring and novel carbocyclic and heterocyclic compounds having significant biological activities. New methods were developed for the synthesis of 7,8-dimethoxyphenanthridine, quinoline, isoquinoline, furoquinoline, carbazole, pyridocarbazoles, protoberberine alkaloids and phthalide isoquinoline alkaloids.



The oxygen heterocyclic compounds synthesized included naturally occurring coumarins, isocoumarins, linear and angular benzocoumarins, linear and angular furocoumarins, benzofurans, linear and angular naphthofurans, phthalides and naphtho (1,8-bc) pyrans. The methods developed for these alkaloids and oxygen ring compounds involved regiospecific introduction of functional group required for construction of heterocyclic rings in an efficient and shorter manner. Furoquinoline alkaloids synthesized included dictamnine, pteleine, kokusaginine and y-fagarine. The protoberberine alkaloids included tetrahydropalmatine, canadine, stylopine and sinactine. Expedient methods were also developed for the synthesis of 6-methyl-11-demethylellypticine, estrone, 4-ary-1,2,3,4-tetrahydroisoquinoline, naphthalene lignan lactones, equilenin, iso-

equilenin, anibine, phthalide isoquinoline alkaloids, pyridocarbazoles, ellipticine analogues and latifine dimethyl ether. Though several interesting syntheses came from Narasimhan's group, the elegant synthesis of estrone was his best contribution.

Narasimhan also contributed to the field of isolation and structure elucidation of natural products. His group completed the isolation and structure determination of ten carbazole alkaloids such as mahanimbine and koenimbine from *Murraya koenigii* (curry leaf). His contribution to postgraduate teaching was phenomenal. He introduced the semester system for M Sc classes and regularly modified the syllabus to include advances in the subject. He always admired his students and publicly acknowledged their contribution to his success. Through his untiring efforts, the University of Pune got a donation from Garware Education Trust to set up the Garware Research Centre for research in organic chemistry. To felicitate his outstanding contribution to teaching and research, his students and well-wishers established the 'Professor N. S. Narasimhan Research and Education Trust' in 1988, which honours outstanding research workers in organic chemistry under the age of 45 years. In recent years, this award has earned the reputation as a 'prelude' to the prestigious Bhatnagar Award. The Trust also gives scholarships to M Sc students and supports many other academic activities that benefit postgraduate students.

Due to his sincerity of purpose and devotion to the cause of education, Narasimhan is an icon to the younger generation of organic chemistry students. He was a person who followed simple living and high human values. He never mixed issues and was always frank and straightforward throughout his life. He also had a liking for light and classical music.

He is survived by his wife, son, two daughters and grandchildren.

R. S. MALI

*Quality Cell,
Savitribai Phule Pune University,
Ganeshkhind Road,
Pune 411 007, India
e-mail: rsmali@rediffmail.com*