

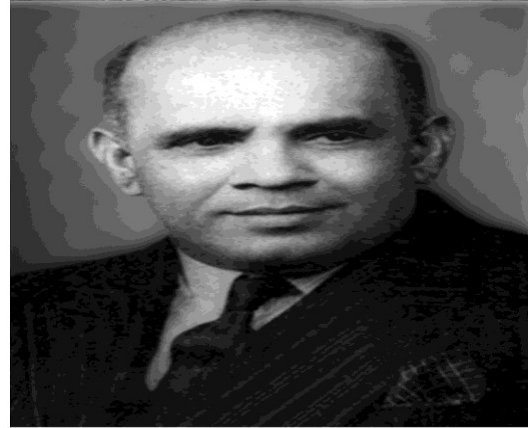
Dr. E. S. Narayanan Contributions in the Field of Entomology

Sujatha, G. S., Sagar, D. and Sachin S. Suroshe

Dr. Ennapada Sundaram Ayyaar Narayanan was one of the eminent scientist who worked on a wide base of subjects in the field of entomology. His major contributions are in the field of biological control with specialization in Hymenoptera. He was very fond of saying “If entomology is the basis for earning one’s bread, sanskrit literature and scriptures are food for the brain and soul”.

Glimpses Towards his Journey

Dr. E. S. Narayanan was born on 15th February 1904. He was educated from Government Victoria College, Palghat (Kerala) and Presidency College, Madras, acquiring M. A. degree with Zoology as major subject. He joined the Imperial Agricultural Research Institute, Pusa in 1930 and was privileged to work under Thomas Bainbrigge Fletcher. After few years of service at Pusa, Dr. E.S. Narayanan travelled to England and joined the Imperial College of Science, Technology and obtained Doctor of Philosophy from University of London. He also underwent postgraduate training in Biological control of insect pests and noxious weeds under professor W. R. Thompson (F.R.S) during the summer vacation. During his Ph. D., he spent three months in a bee farm in Kent to acquaint himself with the realistic elements of the technology and exercise of bee keeping especially the breeding of queen bees;



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additionally, he surpassed all the exams of the British Bee-keepers Association.

Professional Career

After his return back to India, he joined Imperial Agricultural Research Institute, New Delhi. After independence he was appointed as imperial entomologist. Later, he was embellished as Head, Division of Entomology and he held this position for 15 years, the longest ever by any Englishman or Indian. In 1955, Dr. Narayanan visited the United States of America including Hawaii and Canada to study the progress of work in the biological control of insects and noxious weeds. On his return, he was appointed as Principal, Central College of Agriculture, Delhi as an additional assignment, later, he was appointed as Dean, School of Agriculture and Forestry in November 1955.

On his retirement from Indian Agricultural Research Institute in June 1962, Dr Narayanan was appointed as Director in Sericulture Research Institute, Mysore. He was entrusted with the task of planning new research laboratories, recruitment of necessary staff and initiation of research programmes. He retired from the directorship in 1967. In his 5 years of stay at the sericulture research institute, he carried out a number of experiments in genetics and manipulation of genes culminating in the evolution of several new races of silkworms with superior commercial characters.

Dr. Narayanan was a senior fellow of Indian National Science Academy and the Indian Academy of Sciences. He was a founder member of the Entomological Society of India and was president for 4 terms from 1953-1960. He was elected president of the Agricultural Sciences section of the Indian Science Congress Association held at Calcutta in 1957. Dr. Narayanan has published more than 150 papers that include memories, bulletins, books etc.

Areas of Research

Dr. Narayanan contributions are in the field of insect taxonomy (mites), genetic study (silkworm races), biology and anatomy of insects and majorly on biological control with specialization in Hymenoptera. His first work was on mass multiplication of *Stenobracon deesae* (Cam.) which is major parasitoid of sugarcane and maize stem borer (Narayanan and Venkatraman, 1952). He described different Tribes namely Gliptini, Lissonottni, Banchini of sub family Banchinae, family Ichneumonidae based on morphological characters (Narayanan and Lal, 1954). He identified parasitoid complex

of *Bracon hebetor-brevicornis* and *Hymenia recurvalis* (Narayanan *et al.*, 1957 and 1958) and studied the biology of pea leaf miner, *Phytomyza atricornis* (Meigan) parasitoids (Narayanan *et al.*, 1956). He has also contributed in the field of acarology which led to the identification of new species of mites majorly predatory mites. He recorded and identified the incidence of mango bud mite, *Aceria mangiferae* Sayad along with Swaraj Ghai for the first time. Even identified a new predatory species, *Typhlodromus roshanlali* and described three other predatory mites as predators on mango bud mite (Narayanan and Ghai, 1961). Also, identified some new records and a new species of mite associated with mango malformation. Apart from this he has identified a new species of *Melichares* (Blattisocius) (Aceosejidae) associated with the fig insects and did experiment on superparasitism in *Trichogramma evanescens minutum* riley, which is the efficient parasitoid of stem borers. He conducted superparasitism experiments in *Trichogramma* field colonisation and results showed that progenies from the superparasitism will not be effective, as parental parasitoids leads to defective, ill developed wings, and remains inactive due to poor nutrition in host (Narayanan and Chacko, 1957). He worked on host selection and oviposition response in *Apanteles angaleti* Muesebeck (Braconidae: Hymenoptera) and did work on *Aholcus euproctiscidis* Mani (Scelionidae: Hymenoptera), an egg parasitoid of *Euproctis lunata* Walker. In addition to field of biocontrol and acarology he also worked on morphology, biology and genetics of insects. He described the univoltine new races of silkworm suitable for Deharadun and Kashmir based on hatchability, hibernating egg, percentage of silk, content

of shell and filament length (Narayanan and Tikoo, 1969). After 1940, many taxonomists contributed to National Pusa Collection (NPC) and E S Narayanan is one of them for Hymenopteran collections. He has published research papers in reputed journals viz., Oriental science, Indian Journal of Entomology, Indian Journal of Plant Protection, Bulletin of Entomology, Proceedings of the Indian Science Congress, Current Science, Proceedings of the Indian Academy of Sciences etc.

E. S. Narayanan as A Mentor

Dr. Narayanan was born with a golden tongue and a silver pen; he was a great speaker and writer. His lectures were simply brilliant and up to date with many anecdotes. A voracious reader with a capacity to remember anything he read, he could fluently quote the writings of some early great entomologists. He took charge of the imperial entomologist to the Govt. of India at a very crucial period when partition of the country was taking place and only economic entomology was considered necessary and other fundamental studies and research including systemic entomology was looked up as a luxury. In spite of some hard looks and pessimistic view of administrators, he did his utmost to convince bureaucrats that systemic entomology is the basis of any economic entomology and encouraged the young entomologists of the division to take up taxonomic studies important group of insects like Ichneumonidae (Hymenoptera) and neglected group like Acarina. As one of the long reigning head of the division, Dr. Narayanan was responsible for implementing five-year plan projects during Proceedings of the Indian Academy of Sciences-Section B, 45(3): 122-128.

his tenure. Though, he eventually believed in the biological control of insect pests and weeds, nonetheless he encouraged and supported many other sections of entomology without any reservation. He was extremely helpful to students and he always kept in touch with them.

Honours

Dr. Narayanan was bestowed with many awards and honours for his significant research contributions; he was Fellow Academy of Science, Fellow of Entomological Society of India, Fellow of Nautical Institute, Fellow of Royal Entomological Society. He made two endowments in the entomological society of India for the award of two medals for the most outstanding research paper published in the Bulletin of Entomology and the Indian Journal of Entomology, respectively, to perpetuate the memory of his beloved mother and his dear wife Late Srimati Sita Narayanan. This is the first time in the annals of the society that such an endowment has been made by a member for the advancement of research in pure and applied entomology in India.

Dr. Narayanan came from a family of Sanskrit scholars and naturally he turned his attention to Sanskrit scriptures and literatures. He was highly respected educationalist and philanthropist, he left for heavenly abode on 23rd January 1991.

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AUTHORS

Sujatha, G. S. (Corresponding author), **Sagar, D. and Sachin S. Suroshe**, Division of Entomology, ICAR-Indian Agricultural Research Institute, New Delhi- 110 012, India
email: sujigowda2709@gmail.com
