

Biography

Professor Chavali Kameswara Rao



Professor Chavali Kameswara Rao (born on December 24, 1937) earned his B.Sc., B.Sc. (Hons.) 1960, M.Sc. 1961, and Ph.D. 1977, degrees from the Andhra University, Waltair (Visakhapatnam). For his doctoral thesis he worked on Morphological, cytological and chemosystematic studies on some Indian Galegeae (Fabaceae).

He began his academic career as a Demonstrator (1961–62) and Lecturer (1965) in Botany at Andhra University and later served at Bangalore University from June 1967 to May 1998. He was the Chairman of the Department of Botany (September 1992–September 1994) and the Department of Sericulture (August 1992–November 1994). Professor Rao had nearly six decades of professional teaching and research

experience in biological sciences. His scientific work and contributions were focused on five major areas: a) Plant systematics, b) Lectins and saponins and their application in medicine, c) Medicinal plants, d) Dual Use Research of Concern, and e) Agricultural biotechnology. He received a postgraduate merit scholarship (1960–61), a CSIR Junior Research Fellowship (1962–64), and a UGC Junior Research Fellowship (1966–67).

Professor Kameswara Rao taught Plant Taxonomy and Systematic Botany, Plant Anatomy, Gymnosperms, Pteridophytes, Cytology, Genetics, Economic Botany, and Ecology at Andhra and Bangalore Universities for over 37 years, along with other areas of plant sciences. He was a resource person at UGC refresher courses for college and university teachers across India and delivered more than 100 lectures on Plant Taxonomy, Phytochemistry, Computer Applications in Botany, Medicinal Plants, and related topics in India and abroad.

He produced a punched computer card-based identification package for the South Indian Dicot families, at a time when computers were not much heard of, outside sophisticated industry in India. He developed innovative teaching and research methodologies in different areas of plant sciences and was conferred with Bangalore University Research Award for the year 1980.

On a Commonwealth Academic Staff Fellowship (1980–81) and a Royal Society and Nuffield Foundation Bursary (1983–84), Professor Rao worked at the British Museum (Natural History), London, and the Royal Botanic Gardens, Kew, UK, besides other international institutions in

London, Edinburgh and Paris. There, he produced a computer key to the world's monocot families, published by the British Museum (Natural History). Online versions of both these keys were produced subsequently, facilitating the direct use of computers for family identification and were distributed to educational institutions. These keys have now been converted to suit the present-day computer systems, but their distribution is hampered by the closure of colleges on account of the Corona pandemic problem.

Professor Kameswara Rao served as the President of the Indian Association for Angiosperm Taxonomy (IAPT) for 1999. He was awarded the 'Professor Y.D. Tyagi Gold Medal' by the IAAT in November 2015, for his outstanding contributions to plant systematics. In his honour, 'The Professor Chavali Kameswara Rao Annual Endowment Lecture' was instituted by his former students to be delivered annually during IAAT conferences. The inaugural lecture was held in November 2019.

From 1987 to 2002, Professor Rao and his research students worked on Indian medicinal plants, with financial support from the Department of Forests and Ecology, Government of Karnataka, and SynPhar Laboratories, Edmonton, Canada. Their 458-page volume, '*Database of Medicinal Plants*' (2000), was jointly published by the Karnataka State Council for Science and Technology and the Department of Forests and Ecology, Government of Karnataka. The entire contents, along with profiles and photographs of 90 species of Indian medicinal plants was made publicly accessible through a website in 2002 (www.medicinalplants-kr.org), which he maintained at personal expense. His students made significant contributions to the study of lectins and saponins in food and medicinal plants. The demonstration of saponins in pollen of numerous species, an important factor in human allergy, was a notable achievement from his laboratory.

Professor Kameswara Rao lectured extensively on the scientific evaluation of Indian medicinal

plants and Biopharming (developing genetically engineering plant species to contain genes for therapeutically important chemical compounds), at several institutions in India and at the Universities of Cornell (US), Basel (Switzerland) and at the Asian Institute of Technology, Bangkok (Thailand). His services to the cause of indigenous medicine were recognized by the Open International University for Alternative Medicine, Colombo (established by the authority of the Sri Lankan Parliament), which awarded him a D.Sc. (*h.c.*) in 1997. The Lama Gangchen World Peace Foundation, Beijing (affiliated to the UN) awarded him a Certificate of Merit in 2001, for services to alternative systems of medicine.

During his service years Professor Kameswara Rao has published about 70 papers on diverse aspects of plant sciences. He has worked as much, or even more, after his retirement in May 1998.

Professor Kameswara Rao was a member of the Programme Advisory Committee of Botanical Survey of India and Zoological Survey of India (2001-04), and a Member of the Multi-disciplinary Expert Committee, Botanical Garden of the Indian Republic (2005-06), both under the Ministry of Environment and Forests, Government of India. He was a member of the Indian Subcontinent Plant Specialist Group, under the Species Survival Commission of the International Union for Conservation of Nature and Natural Resources (IUCN), Gland (Switzerland) (1997-2003). Professor Kameswara Rao has compiled, from IUCN publications, the '*Red List of Threatened Vascular Plants in India*', published by the Botanical Survey of India, Ministry of Environment and Forests, Government of India, which distributed the book free of cost.

He served as Chief Consultant for a two-volume gardeners' encyclopedia with focus on the Indian subcontinent and wrote the introductory chapters. This work, which deals with over 20,000 horticultural plants, was titled '*Flora*', published by the Global Book Publishing

PVT., Ltd., Willoughby, Australia, in 2004. Professor Kameswara Rao has served on several international committees of the US National Academies of Sciences, US National Institutes of Health and World Health Organization, on biosecurity. He was on the Expert Panel on Agricultural Biotechnology, Council for Biotechnology Information, Washington DC. He was Member of the European Federation of Biotechnology, and European Association of Pharma Biotechnology. He has served on several national policy Committees of the Department of Biotechnology and Department of Science and Technology (TIFAC's Advisory committee of Environmental Technologies). He was a Member of the Karnataka State's Expert Group on Agricultural Biotechnology.

Professor Kameswara Rao was a member of international committees with focus on 'Dual Use Research of Concern' (DURC), the modern interdisciplinary research in such areas as microbiology, genetics and biotechnology, the products of which can be misused as weapons in bioterrorism and biowarfare, by mischievous elements. As a member of the 'Committee on advances in technology and the prevention of their application to next generation biowarfare threats', of the US National Academies of Sciences, Washington, USA., he co-authored two reports. This Committee met five times in Washington and once in Cuernavaca (Mexico), to draft and finalize these reports, published by the Institute of Medicine and National Research Council of the US National Academies of Sciences, Washington, DC, USA. Several other international organizations constituted committees and conducted conferences and meetings focusing on DURC.

Professor Kameswara Rao was an invited speaker at the meetings/conferences organized by the US National Institutes of Health (twice at Bethesda, USA, and The Hague, Netherlands), World Health Organization (at Geneva, Switzerland and Bangkok, Thailand), Organization for

Economic Co-operation and Development, Paris (at Budapest, Hungary and Vienna, Austria), Institute of Microbiology, Chinese Academies of Science (at Beijing). Apart from reports of the policy recommendations made at each of these DURC meetings, the participation of Professor Kameswara Rao in the work of these committees resulted in a recommendatory document on global management of infectious diseases.

Professor Kameswara Rao was one of the founder members and Secretary of the Foundation for Biotechnology Awareness and Education, Bangalore, founded in January 2001. Ever since, he has been its Executive Secretary working tirelessly for over two decades to promote biotechnology, particularly agricultural biotechnology. He was a member of several national and international committees on biotechnology and extensively travelled internationally for the work of these committees. He has authored several books, research articles and a large number of blogs on plant sciences and agricultural biotechnology.

He has written and spoken extensively on genetically engineered crops. He has conducted a very large number of workshops and conferences focusing on students and teachers of biotechnology, agricultural scientists, government officers, judiciary and the farmers. He has written over 150 blogs and technical articles on agricultural biotechnology and circulated them via emails to over 200 scientists and other stakeholders and also posted them on www.plantbiotechnology.org.in, www.fbae.org, www.agbioworld.org and AgBioIndia Forum, besides several other websites. He worked hard to counter the mischievous antitech propaganda of the activist groups, in articles published in magazines, newspapers and blog posts and participated in TV debates with the activist groups.

Professor Kameswara Rao worked hard to promote the acceptance of genetically engineered crops, more particularly Golden Rice and *Bt* brinjal, in India. He had conducted a very large number of

focused meetings on these two transgenic crops, which show promise of great benefits to India. He spoke on Golden Rice over 20 times in India and at the Universities of Cornell and Princeton in the US, Basel (Switzerland) and the Asian Institute of Technology, Bangkok (Thailand), and conducted several technical meetings on *Bt* brinjal. He was an invited speaker at the international conferences on agricultural biotechnology held at Brussels (Belgium), Cambridge (UK), Brighton (UK), Bangkok (Thailand), and Tripoli (Libya), besides a very large number of them in India. He has written several critical articles countering antitech activist propaganda against agricultural biotechnology such as the Terminator gene, Biopiracy, Precautionary Principle, Substantial Equivalence and others. His more important publications on agricultural biotechnology are listed below (7 to 9, 13-22). Some are extensive reviews of issues in special volumes, published by such reputed publishers as the Cambridge University Press and Wiley Blackwell.

As the Chairman of the Central College Botany Department Alumni Charitable Trust, which observed and celebrated 2019 as the Centenary Year of the department, Professor Kameswara Rao has conceptualized the 'Central College Botany Department Centenary Lecture Series', as a programme continuing beyond the Centenary Year. In about a year (2019), he conducted 22 special lectures in colleges, by experts on diverse issues in plant sciences. The topics covered are usually outside the purview of the class room teaching and aimed at familiarizing students and teachers, with the current and emerging concepts of importance to human welfare. The 22nd lecture was on Golden Rice, delivered by him at the St Joseph's College, Bangalore, on February 29, 2020. The lecture series programme is currently on hold due to the closure of colleges on account of the Corona pandemic.

The Karnataka Academy of Science and Technology, of the Ministry of Science and

Technology, Government of Karnataka, has recognized his contribution to plant sciences by the 'Life Time Achievement Award' in 2019. Outside science, he obtained a Diploma in Kannada from Bangalore University in 1972 and received a Gold Medal from the Indian Red Cross Society for donating blood over 45 times. He has published a booklet '*Glimpses into Bhaaratheeya Samskrithi*' in 2022 and a collection of 30 short stories and discourses entitled '*Jalagandam and other Narratives*' in 2024. He had prepared a note on *Tharavaani annam*, a product of '*Bhaaratheeya saankaethika vignanam*' (technology). *Kanva prakriya* (fermentation) which is a good example of ancient biotechnology. It is a traditionally processed homemade food which he ate during his school days and also practiced till last year. Professor Rao intended to get its geographical tag through Andhra Pradesh Biodiversity Board. Additionally, he wanted to propose *Pesarattu, Pesaratla Koora, Pesara Punukulu, Paatuvaali, Dibba Rotti, Gongoora Pachhadi (chutney), Korivikaaram, Allam-chinthapandu Pachhadi, Gongoora Pappu and Menthi Koora Pappu* the iconic traditional food items of Andhra Pradesh and Telangana ('Thelengana' as spelt by Prof. Rao).

With the demise of Prof. Kameswara Rao, we have lost an innovative teacher, a true botanist with vast knowledge in many areas of botany and crusader of GM food crops in India. Prof Rao is survived by his wife Dr Mamata Rao (former Associate Professor of Botany at the Bangalore University passed away exactly three months of his passing away). They are survived by a son and a daughter.

Professor Kameswara Rao mentored six doctoral and 3 M.Phil. students

Doctoral thesis

RAO C.K. 1978. Morphological, cytological and chemosystematic studies on some Indian Galegeae (Fabaceae). Ph.D. thesis, Andhra University, Waltair,

Doctoral students guided

SATHYANANDA N. 1989. Studies on some legume seed lectins distribution in 61 species and purification of *Bauhinia tomentosa* L. seed lectins. Ph.D. thesis, Bangalore University, Bangalore.

BHAT P.S. 1993. *Plants with antimicrobial activity. Database and lectin distribution.* Ph.D. thesis, Bangalore University, Bangalore.

SANGEETAA W. 1994. *Lectins and Saponins in pollen and stigmas.* Ph.D. thesis, Bangalore University, Bangalore.

SHARON A. 1994. *Database of plants used in Gastrointestinal disorders and effects of plant extracts on pathogenic enteric bacteria.* Ph.D. thesis, Bangalore University, Bangalore.

SHUBHARANI R. 1995. *Plants used in dental care in India.* Ph.D. thesis, Bangalore University, Bangalore.

M.Phil Thesis

SANGEETAA W. 1991. *Lectins and Saponins in pollen and stigmas.* M.Phil., Dissertation, Bangalore University, Bangalore.

Publications

Books

SALDANHA C.J. & C.K. RAO 1975. *A punched card key to the Dicot families of South India.* Centre for Taxonomic Studies, St Joseph's College, Bangalore. 17 Pp text + 76 punched computer cards.

RAO C.K. & R.J. PANKHURST 1986. *A polyclave to the monocotyledonous families of the world: A computer generated identification key.* British Museum (Natural History), London. 59 Pp text + 235 punched computer cards.

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RAO C.K., GEETHA B. L. & G. SURESH. 2003. *Red list of threatened vascular plant species in India.* ENVIS, Botanical Survey of India, Ministry of Environment and Forests, Kolkata. 144 Pp.

RAO C.K. 2004. *Flora.* Volume I & II. Global Publishing Pvt., Ltd., Willoughby, Australia. (Chief Consultant and contributor).

Booklets

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BHAT P.S. & C.K. RAO. *Bharathiya Visha Vaidya* (in kannada). Directorate of Indian Systems of Medicine and Homeopathy, Government of Karnataka.

BHAT P.S. & C.K. RAO. *Dheergajeevaneeya moolika vignana* (in kannada). Directorate of Indian Systems of Medicine and Homeopathy, Government of Karnataka.

BHAT P.S. & C.K. RAO. *Rasa Vaidya* (in kannada). Directorate of Indian Systems of Medicine and Homeopathy, Government of Karnataka.

BHAT P.S. & C.K. RAO. *Siddha Vaidya Parichaya* (in kannada). Directorate of Indian Systems of Medicine and Homeopathy, Government of Karnataka.

BHAT P.S. & C.K. RAO. *Unani Vaidya Parichaya* (in kannada). Directorate of Indian Systems of Medicine and Homeopathy, Government of Karnataka.

Reports

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Research papers, comments, Reviews

BHAT P.S., RAO C.K. & H.N. SHANKAR 1990. A review of medicinal plants in geriatrics in Ayurveda. In: SINGH R. & G.S. SINGHAL (eds.), *Perspectives of Aging Research.* Today & Tomorrow's printers & publishers. New Delhi. pp. 205–212.

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- RAO C.K. & S. WADHWAN. Database of medicinal Plants: Profile of *Scoparia dulcis* L.
- RAO C.K. & S. WADHWAN. S. Saponins and our health.

Sanjappa M.
Director (Retd.),
Botanical Survey of India