KRISHNA RAJARAM SURANGE
(07 February 1920 – 06 January 2010)

INTRODUCTION

KRISHNA RAJARAM SURANGE, an internationally acclaimed scientist in the field of palaeobotany breathed his last at his home in Lucknow in the wee hours of 6th January 2010. I had the proud privilege of being his student and research collaborator. I got acquainted with him since my childhood as our families were known to each other for nearly six decades. I personally became closer to Dr Surange in 1964 when I joined him as a research scholar at the Birbal Sahni Institute of Palaeobotany, Lucknow. He remained my guide and mentor up to his last and was a great help to me at different phases in my research career and personal life.

FAMILY BACKGROUND AND EARLY EDUCATION

KR Surange was born on February 7th, 1920 at Ujjain, Madhya Pradesh. That year that day happened to be Mahashivratri, an auspicious day for Hindus, and Ujjain being one of the twelve “Jyotirling”, Mahakaleshwar, his birthday was considered a gift of God to the family. His close relatives and friends always greeted him on Mahashivratri day every year. His parents Shri Rajaram Dhontopant Surange and Shrimati Sita Bai Surange were very religious and simple persons. Born in an orthodox Deshastha Brahmin Maharashtrian family, he was broad minded, forward looking person and above the man-made divisions in the society.

His father served as Superintendent in the princely state of Ujjain and later moved to Gwalior in same capacity. Dr Surange was the second child amongst five brothers and one sister. His elder brother, Keshav, was a music teacher and a famous violinist in Gwalior.

Dr Surange suffered personal losses in his childhood that transformed his life in years to come. Keshav, unfortunately, lost his vision due to chickenpox at the early age of ten. All his brothers were educated and were settling down in life when a big tragedy struck the family. His younger brother Anna, after completing MBBS was undergoing house-job in the Gwalior Medical College, suddenly passed away due to jaundice. This tragedy shattered Dr Surange’s parents and the entire responsibility of the family came on Dr Surange at the very young age. The fourth brother Vasant after completing his education served in Nagda, Maharashtra. The fifth brother Shashikant, also a botanist, served as a teacher in Pune University. He witnessed
passing away all his brothers in his life time. The only sister Prabha is married to a doctor and nicely settled in Lucknow.

Dr Surange completed his early education from the Victoria College, Gwalior and passed High School in 1937 and Intermediate in 1939. Later, he moved to Lucknow to pursue further studies. He obtained Bachelor of Science degree in Botany, Zoology and Chemistry in the year 1941. Here in Lucknow, he got impressed by Professor Birbal Sahni, the then Head of Botany Department in Lucknow University and decided to take up Botany as his career. Soon after passing MSc in first division in 1943 he joined Botany Department as Research Scientist under Prof. Sahni.

Dr Surange started his research work on the “Morphology of Living and Fossil Cyclanthaceae” and was awarded degree of Doctor of Philosophy in 1947. Like his teacher, Professor Sahni who first graduated from Lahore but once again pursued Tripos at Cambridge and thereby got two degrees at graduation level, Dr Surange was double PhD. He was enrolled at the Cambridge School of Botany, U.K: for a second PhD under Professor Henry Hamshaw Thomas, his topic of research being morphology of Botryopteris and Stauropoteris.

Before leaving for England Dr Surange married Kumari Shushila Joshi in the year 1946. It was an arranged marriage. Mrs Sushila Surange, as the name implies, was a gentlest of a woman one can imagine. She was an ideal wife, looked after the entire family and home upto her last. She died in the year 1997. Dr Surange was blessed with three sons – Anil, Vijay and Sanjay, nicely settled at Lucknow. The eldest son is a medical doctor serving in Hindustan Aeronautics Limited (HAL), the second Vijay also works in HAL in a supervisory position. The youngest son Sanjay, a plant scientist serving in National Botanical Research Institute, unfortunately died of heart failure at a young age of thirty nine. It was a great loss in the family and Dr. Surange had to face all this after his retirement. He courageously looked after his daughter-in-law and granddaughter upto his last. He lead a meaningful life and performed all his duties very boldly.

**SCIENTIFIC CONTRIBUTIONS**

Dr Surange was a distinguished person in the world of Palaeobotany, specializing in the Gondwana and Tertiary fossil plants. Though, he began his research career in living plants, he soon switched over to the fascinating study of fossil plants.

*Cyclanthaceae*– Work on the morphology of the South American family Cyclanthaceae, which he published in the Transactions of the National Institute of Sciences, India is considered an outstanding contribution. The fossil member of this family was also described by him with Professor Birbal Sahni which threw important light on the presence of South American floral elements in the Tertiaries of
India. This outstanding work was a part of his doctoral thesis and published in the journal *Palaeobotanist*.

**Stauropteris and Botryopteris** – Dr Surange made a very significant and landmark contribution on the lower Carboniferous ceonopterid fern *Botryopteris* and *Stauropteris* from England. His investigations demonstrated two types of stems in the primitive *Botryopteris*, the trailing underground stem which at intervals gave rise to aerial stems, almost identical anatomically and which bore branched dorsiventral structure of a frond. In the evolution of lamina by webbing of ultimate branches, such fronds as those of *Botryopteris* might have served as intermediary stages.

The heterospory in the lower Carboniferous *Stauropteris burntislandica* was a major breakthrough discovery by him in the early land plants. One big mature and three aborted megaspores were contained in a gland like vesicle. This led to the hypothesis that seed habit in plants in the later geological period might have developed through such a structure as displayed by megasporangium of early *Stauropteris*. This work of Dr Surange was acclaimed by the palaeobotanists world over and has been widely incorporated in all the text books of Palaeobotany.

**Glossopteris Flora** – Dr Surange made very significant contribution to the Permian fossil plants known as Glossopteris Flora. In fact, he started this study with his students and published series of papers beginning in 1952. The extensive studies under this series gave important information to our major coal reserves.

In addition to a number of other fossil plant species, Surange and his research associates made important contributions to the knowledge of the widely spread and dominant form genus *Glossopteris*. Several new reproductive organs, both male and female, belonging to Glossopteridales, were discovered and described in detail. It demonstrated convincingly that a new class of Gymnosperms was flourishing in the southern hemisphere which consisted of different orders, families and genera occupying the huge supercontinent of Gondwanaland throughout the Permain period.

**Glossopteris in Stratigraphy** – Use of the form genus *Glossopteris* with its more than hundred and twenty five species in stratigraphy was well recognized by southern palaeobotanists since its inception. It was our work (Dr Surange and me) wherein we proposed strong parameters in defining the species of this enigmatic genus. Maximum number of *Glossopteris* species are widely distributed in the coal bearing horizons in India and other Gondwana countries. These could be of great use for deriving stratigraphical correlations. The speciation of *Glossopteris* is confusing which cannot give correct identification. Once again we demonstrated precisely that venation pattern of *Glossopteris* leaves could be used as fingerprints for the identification of species. After painstaking data collection, we together revised and re-defined all the described species of *Glossopteris* known from 1828 to 1979. This
resultant voluminous work was published in the form of a Monograph-2 of the Birbal Sahni Institute of Palaeobotany.

He authored a monograph on the "Indian Fossil Pteridophytes" published by CSIR has become a standard book of reference for all research workers. As the Chief Editor of "The Palaeobotanist" - official journal of the Birbal Sahni Institute of Palaeobotany, kept the high standard of papers and initiated scientists to write original papers. He was too happy to correct manuscript of his students and colleagues.

PROFESSIONAL CAREER

Dr Surange’s first appointment was as a Reader in the newly formed Palaeobotany Institute in 1949. It was fixed on a personal basis when Professor Birbal Sahni was visiting Dr Surange in Cambridge during 1948. During leisurely conversations he narrated me that how Professor Sahni had chalked out his plans for the institute and discussed at length the proposed developments for the Institute. Dr Surange never dreamt that the responsibility of realizing Sahni’s dream would fall on him following the tragic end of his teacher. Professor Sahni died in 1949 within a week of laying the foundation stone of the Institute of his dream. Surange kept his promise to his "Guru" and stood by Mrs. Savitri Sahni in nurturing the nascent Institute which was later named as the Birbal Sahni Institute of Palaeobotany. He was then appointed as the Assistant Director in 1952 in the newly formed Institute. Later, designated as Officer-in-charge in 1953 and Director in 1959. He held this coveted position till May 1980. Besides holding administrative responsibilities of the entire Institute as the Director he also remained Head of the Palaeozoic Department from 1953 to 1975.

During his entire stay at the Birbal Sahni Institute of Palaeobotany he guided several students for PhD dissertation. Some of the illustrious students he guided for PhD degree were late Dr PN Srivastava, late Dr KM Lele and Dr HK Maheshwari. After the sad demise of Dr PN Srivastava in a road accident while on field excursion, Dr Surange got all research work published in Srivastava’s name. I was his last student and got the opportunity of having research collaboration for more than fifteen years and published a number of research papers on the morphology and fructifications of Glossopteris.

In later years Dr Surange had collaborative research programme with Australian scientists. Part of the research work was published but a monographic work on Glossopteris species of Australia did not see the light of the day and still is awaiting publication.

After having retired from the Birbal Sahni Institute of Palaeobotany Lucknow, Dr Surange was offered Director’s position at the Agarkar Research Institute at Pune. He assumed this position from 1st December 1980 for five years. These five years were a golden period in the Institute’s history. He put in all efforts with the same
commitment and involvement as he did in Birbal Sahni Institute of Palaeobotany. His experience, aesthetic sense, foresight and keenness on welfare of staff brought about many positive changes in Agarkar Institute. Beautification of campus, broadening of promotion channel, strict norms for evaluation of scientific work and creating a congenial atmosphere heightened the status of Agarkar Institute to a very large extent. I gathered from several colleagues that Dr Surange gave a new life to this highly dedicated Institute in several branches of science. He brought this institute to a higher level and formulated newer research programmes for the scientists.

He had the rare honour of serving two Institutes as Director. Besides the academic and administrative abilities he also established a unique museum at the Birbal Sahni Institute of Palaeobotany. This museum is one of the best scientific gallery in the world depicting plants through the ages and houses plant fossils from all over the world laying special emphasis on Indian fossil plants beautifully displayed in two halls.

**MEMBERSHIPS, AWARDS AND HONOURS**

It is difficult to enumerate all the awards and honours he received during his lifetime, still the notable amongst them are:

- Fellow of the Indian National Science Academy, 1970.
- Fellow of the Indian Academy of Science, Bengaluru.
- Fellow of the Palaeobotanical Society, Lucknow. Dr. Surange was the Founder Member of this Society along with Prof. Birbal Sahni.
- Awarded Research Fellowship, London for higher studies at Cambridge, U.K.
- Fellow of National Academy of Sciences (India), Allahabad, U.P.
- Member of the Executive Committee of the World Organization of Palaeobotany.
- Member of the International Committee for Palaeobotanical Nomenclature.
- Chairman of the Working Group in Palaeobotany and Palynology of the IUGS Sub-commission on Gondwana Stratigraphy.
- Vice-President of the XII International Botanical Congress, Leningrad, 1975.
- Vice-President of the IX International Botanical Congress at Montreal, Canada 1959.
- Member of the Executive Committee of the World Organization of Palaeobotany during 1954 to 1960.
- Awarded Ruchi Ram Sahni Prize for research work in 1947, University of Lucknow.
EXTRA CURRICULAR ACTIVITIES

Besides being an excellent and able administrator and creative scientist, Dr. Surange had many other rare qualities which kept him engaged. He had keen interest in photography, gardening, music, painting and social activities. He was ardent admirer of nature and captured in camera while on field-work and foreign tours. He preferred himself spending hours together in the dark room for making prints of desired quality for his scientific publications. For his two monographs he has made the prints himself.

He was very fond of Indian classical music and had good knowledge of "raagas", his favourite musician being Pandit Bhimsen Joshi.

He was very keen to visit museums while on foreign tours and used to admire paintings by famous painters. He disclosed me in confidence that he wanted to learn how to paint and often enquired from me the details. He expressed his desire to start painting after his retirement from active services. I never took him seriously on this count. He surprised us when he learnt some basic steps and started painting at the age of 65. He made some very good paintings and continued painting as a good hobby up to the age of 85. His zeal and patience is worth admiring and a lesson to all that no age is too late to learn anything. One can see walls of his flat decorated with his paintings.

Dr Surange loved plants and he had some very rare plants in his garden which he used to water himself early in the morning. He was also fond of pets and kept good breed of dogs all through his life.

Dr Surange being a Maharashtrian, played a very significant role in Lucknow to organize several functions for Maharashtra Samaj since 1949. He served as Secretary and later President of this Samaj for several years.

GENERAL QUALITIES

Dr Surange had many qualities that drew him close to friends and colleagues. Essentially he was a simple person with simple habits. He was always dressed in white shirt or bush-shirt and grey trousers in office. He liked to wear white dhoti and kurta at home. He had some very good friends and he always stood by them. Some of his best friends of university days were Professor TS Sadasivan, Professor TS Mahabale, Professor SC Agarwal, Professor DD Pant, Professor BS Trivedi and last but not the least Dr MN Bose. Alas! except the last two none survived to mourn his death. Dr Surange had some rare human qualities which made him respectable and likable personality. A man of few words he never lost his temper even in the gravest situation.
Krishna Rajaram Surange

LAST DAYS

Dr Surange generally kept very good health throughout his life. He did not suffer from any major health problem, though he was declared diabetic at the age of 45. For long 32 years he managed his life actively with regular exercise, meditation and controlled diet. Only during last fortnight of his life he did not keep very well and by the time his problem was detected as pneumonia he breathed his last in the intervening night of 6th January 2010.

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