University of Mysore

YUVARAJA'S COLLEGE

(A Constituent autonomous college with potential for excellence)

JLB Road , Mysore - 570 005, Karnataka, India

Azadi Ka Amrit Mahotsav

AUGUST 15 2022

CHINTHANA MANTHANA

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E-MAGAZINE

VOL - 1

August 2022

E-Magazine

Contribution of Indian scientists to science

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Yuvaraja's College (Autonomous)
(A CONSTITUENT AUTONOMOUS COLLEGE)
Mysore – 570 005

Chintana Manthana

Online science magazine

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ಮೈಸೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯ
ಯುವರಾಜ ಕಾಲೇಜು
(ವಿಶ್ವವಿದ್ಯಾನಿಲಯದ ಸಾಮರ್ಥ್ಯವರ್ಧಿತ ಉತ್ಕೃಷ್ಟಜ್ಞಾನ ಸ್ವಾಯತ್ತತಾ ಕಾಲೇಜು)
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YUVARAJA'S COLLEGE
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(Accredited 'A' Grade with CGPA 3.34 by NAAC)
JLB Road, Mysuru 570 005, Karnataka, India

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Date : 12/08/2022

I am given to understand that an online magazine – Chinthana Manthana – is being inaugurated on the occasion of the 75th anniversary of Indian independence.

I am sure the magazine will make available valuable scientific lore and information to members of the alumni and staff. This will add to our efforts in the advancement of scientific enquiry and spirit in this institution with a great tradition for this.

I wish all the very best for the magazine to be identified with the best in the news on science.

Principal 12/8/22

Principal
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From the Editor's Desk

Prof Devaki N S

During 2019, student members of Science Forum approached me and expressed their desire to bring out an online science magazine from our college. We, the members of Science Forum agreed to this. But time moved on and it took us three more years to bring into effect the desire of our students. Now we are proud and elated that we are able to launch the first issue of the online magazine during 2022 which happens to be the year of celebration of 75 years of Independence, "Azadi ka Amrutha Mahotsav".

When the members of science forum met for finalizing the name for the magazine, various names were proposed, and discussions resulted in finalizing *Chintana Manthana* as the name for our online science magazine. The name 'Chinta Manthana' indicates the act or process of thinking seriously and profoundly.

We encourage and urge the students, teachers and research scholars of our college to do science communication in this online Science magazine and help to expand the knowledge horizon of the members of this college where science education is taken up by majority of the students. We hope that this will be the new harbinger of science news, acting as a platform to share many science-related happenings, research activities of our college students and their achievements. After many deliberations, it was decided to invite articles on the contributions of Indian scientists as the theme for the launch of our first online magazine on the memorable day of August 15, 2022.

The *Chintana Manthana* is accessible to readership on a global level since it is published online. On the global platform, Indian scientists have to be recognized better. This is also an attempt to make our own readers to know more about the contributions of the accomplished scientists of our country. Our college always tries to nurture the talents of our students in diverse ways. We, the members of staff and Science Forum feel that bringing out a science magazine would contribute to student-centric activities in the college. It is imperative that new initiatives are taken each year for supporting the growth of our college in general and students in particular.This online magazine is thus launched with a positive intent to enhance scientific temper among students, to encourage them to think creatively and help them to have an excellent future.

Chintana Manthana

August 2022

Online Science Magazine of Yuvaraja's College, Mysore

Theme: Indian Scientists

Issue launched on the occasion of '*Azadi ka Amrutha Mahotsav*'

CONTENTS

Abdul Kalam : Aerospace scientist

Abdul Kalam (1931-2015)

Abul Pakir Jainulabdeen Abdul Kalam(15 October 1931 – 27 July 2015) was an Indian aerospace scientist and statesman who served as the 11th President of India from 2002 to 2007. He was born and raised in Rameswaram, Tamil Nadu and studied physics and aerospace engineering. He spent the next four decades as a scientist and science administrator, mainly at the Defence Research and Development Organisation (DRDO) and Indian Space Research Organisation (ISRO) and was intimately involved in India's civilian space programme and military missile development efforts.

In his school years, Kalam had average grades but was described as a bright and hardworking student who had a strong desire to learn. He spent hours on his studies, especially mathematics. After completing his education at the Schwartz Higher Secondary School, Ramanathapuram, Kalam went on to attend Saint Joseph's College, Tiruchirappalli, then affiliated with the University of Madras, from where he graduated in physics in 1954.He moved to Madras in 1955 to study aerospace engineering in Madras Institute of Technology. He thus came to be known as the Missile Man of India for his work on the development of ballistic missile and launch vehicle technology. He also played a pivotal organisational, technical, and political role in India's Pokhran-II nuclear tests in 1998, the first since the original nuclear test by India in 1974.

Abdul kalam have written many inspiring booksi.e., 1. India 2020: A Vision for the New Millennium-1998, 2. Wings of Fire: An Autobiography-1999,3. Ignited Minds: Unleashing the Power within India-2002,

4. The Luminous Sparks: A Biography in Verse and Colours-2004. 5. Guiding Souls: Dialogues on the Purpose of Life-2005.

6. Mission of India: A Vision of Indian Youth-2005 etc…

Dr. Kalam is one of the most distinguished scientists of India with the unique honour of receiving honorary doctorates from 30 universities and institutions. He has been awarded the coveted civilian awards - Padma Bhushan (1981) and Padma Vibhushan (1990) and the highest civilian award Bharat Ratna (1997). He is a recipient of several other awards and Fellow of many professional institutions.

Abdul kalam would visit schools and inspire the students to archive something in their life.

Madhushree.K. S

2nd Year B.Sc.

PCM

Ananda Mohan Chakrabarty : Microbiologist

Ananda Mohan Chakrabarty (1938-2020)

He was an Indian American microbiologist, Scientist and researcher, most notable for his work in directed evolution and his role in developing a genetically engineered organisms using plasmid transfer while working at GE, the patent for which led to landmark supreme court case, Diamond V Chakrabarty.

Early life of Ananda, was generally called 'A1' by scientific colleagues Chakrabarty was born in Sainthia High School, Ramakrishna Mission Vidyamandira and St. Xavier's College, Calcutta in that order- during the course of his undergraduate education. Prof.Chakrabarty received his PhD from the University of Calcutta in Kolkata, West Bengal in 1965.

Prof. Chakrabarty genetically engineered a new species of *pseudomonas* bacteria in 1971 while working for the Research and Development Center at General Electric Company in Schenectady, New York. At the time, four known species of oil-metabolizing bacteria were known to exist, but when introduced into an oil spill, they completed with each other, limiting the amount of crude oil that they degrade. The genes necessary to degrade oil were carried on plasmids, which could be transferred among species. By irradiating the transformed organisms with UV light plasmid transfer, Prof. Chakrabarty discovered a method for genetic cross-linking that fixes all four-plasmid called *Pseudomonas putida* capable of consuming oil one or two orders of magnitude faster than the previous four strains of oil eating. The new microbes which Chakrabarty called "multiplasmid hydrocarbon-degrading *Pseudomonas* "could digest about two-thirds of the hydrocarbons that would be found in a typical oil spill.

The bacteria drew international attention when he applied for a patent the first US patent for a genetically modified organism. (US utility patents had been granted to living organisms before, including two pure bacterial cultures, patented by Louis Pasteur, Chakrabarty's modified bacterium was granted a patent in the UK before the US patent came through). He

was initially denied the patent by the Patent Office because the patent code was thought to preclude patents on living organisms. The United States courts of customs and Patent appeals overturned the decision in Chakrabarty's favor

Chakrabarty was a Distinguished University Professor in the Department of Microbiology and Immunology in the University of Illinois at Chicago College of Medicine. Ananda Chakrabarty has been an advised to judges, governments, and the UN. As one of the founding members of a United Nations Industrial Development Organization committee that proposed the establishment of the International Centre for Genetic Engineering and Biotechnology, he has been a member of its council of Sellutific Advices ever since He has served the US government as a member of NIH studysections, a member of Board on Biology of the National Academy of Sciences, and the Committee on Biotechnology of the National research council.

For his works in genetic engineering technology, he was awarded the highest civilian award Padma Shree by the government of India in 2007.

-Sharoon Samuel R

2nd year BSc, BMBt

Asis Datta : Molecular Biologist

Asis Datta (1944)

Asis Datta is an Indian biochemist, molecular biologist and genetic engineer known for his research on genetically modified foods and food nutritional security the war the founding Director of the Indian National Institute of Plant Genome Research and is credited with the discovery of genes that assist in extended preservation of fruits and Vegetables. He is a recipient of the Shanthi Swarup Bhatnagar Award, the highest Indian Award in science category, and was awarded the fourth highest civilian award for Padma Shree, by the Government of India, in 1999. In 2008 he was included in the Republic Day Honours list for the third "highest civilian honour of the Padma Bhushan

Datta, born on 2 February 1944, secured a PhD from Calcutta University for his doctoral work done at Bose Institute then later followed it up by Obtaining the degree of Doctor of Science (DSC) from CalcuttaUniversity. His doctoral wort at Bose Institute was facilitated by a fellowship from the Government of India from 1964 to 1968. After this he moved to New York as a Research Associate at the Public Health Research Institute to Continue research till 1971. His next move was to the University of California, Los Angeles as assistant virologist where he spent three years returning to India in 1975, he joined Jawaharlal Nehru University (JNU)at its school of Life sciences and rose to the rank of a professor in 1978,he held several positions at JNU such as that of the Dean from 1983 to 1985 and that of the Rector from 1993 to 1996 eventually becoming the Vice Chancellor of the University in 1996. and holding the post till 2002. During this period, he also served as visiting scientist at Roche Institute of Molecular Biology for two academic years 1976-77 and 1980-81. In 2002, when the National Centre for plant Genome Research was upgraded as an autonomous institution under a new name, National institute of Plant Genome Research, Datta was appointed as its founder Director, he worked at the Institute till his superannuation in 2008.

-Sharoon Samuel R

2nd year BSc

Bhaskaracharya : Mathematician

Bhaskaracharya (1114 AD - 1185 AD)

Bhaskaracharya is the famous Indian mathematician, who's contribution to mathematics as well as astronomy is very impressive. He was born in 1114 AD in Vijjalavida in the Sahyadri mountain range, (presently Khandeshi region of Maharashtra). He was the son of the great mathematician and astrologer Maheshwara.

The Chandrika devi mandir, near his village has an inscription that offers a view on the Bhaskaracharya's ancestry. In his childhood Bhaskara was taught by his father Maheshwara himself in the traditional Guru-Shishya parampara. We can have a glimpse on his childhood as he mentioned in his book, 'Siddhanth Shiromani'. He says, I have studied 8 books of grammar, 6 texts of medicine, 6 books on logic, 5 books on mathematics, 4 Vedas, 5 books on shastras and 2 mimamsas. As he grew up, joined Ujjain – world's leading astronomical observatory at that time and started gaining prominence in the field of maths and astrology. He later went on to become the head of Ujjain observatory.

Bhaskara developed solutions and observations for calculus and secondary proof for Pythagorean theorem. While at Ujjain Bhaskaracharya wrote his legendry work the 'Siddhantha- Shiromani'. The book is 4 part series rather than a book. Each part focuses on the different topic in mathematics. The first part is 'Leelavathi',(name of his daughter , which contains mainly puzzles and riddles). The second part is the 'Beejaganitha'(which includes algebra, indeterminant equations and solutions. It also has the first ever record of positive and negative square roots of numbers). The next part is the 'Ganitadhyaya'(deals with the application of mathematics to astronomy). The last part of Siddhantha- Shiromani is 'Goladhyaya'(asthe name says, it tells about the spherical geometry, sine table along with the relation between trigonometric functions). Bhaskaracharya also developed trigonometric identities and formulas. His works on differential calculus, integral calculus, mathematical analysis areincredible. Also he wrote about gravity in his 'Surya- Siddhantha'.

Not only was he genius mathematician, he was very well in sanskrit poetry.

This is the vast contribution by the great mathematician Bhaskaracharya . His successful life ended in the year of 1185AD in Ujjain. But his ideas never end in the field of mathematics as well as physics.

Prathima Bhat

2nd year BSc (PCM)

C.R.Narayan Rao:-Zoologist

C.R.Narayan Rao(1882-1960)

C.R. Narayan Rao was an Indian zoologist and herpetologist. He was among the founding editors of the journal Current Science. In recognition of his pioneering work on Indian amphibians, the genus **Raorchestes** was named after him.

Born in 1882 in Coimbatore, he studied in Bellary and at the Madras Christian College under Professor Henderson who headed the department of zoology. After obtaining his graduate and post-graduate degrees and a gold medal for proficiency, he obtained a diploma in teaching. He taught in Coimbatore and Ernakulum, before moving to the Central College in Bangalore where he organized the department of zoology and headed it until his retirement in 1937.

For the smooth progress of science in India his contribution is much. His always gave importance on the quality education on science in the schools and colleges as well as insisted on the development of research facilities and investigations on these subjects.

His role in science and research is considered significant since he was involved in the integration of research into university education. Along with Sir Martin Onslow Forster and other Indian scientists he helped found the journal *Current Science* in July 1932 along the lines of the journal Nature. He was its first editor. In one of his first editorials, he pleaded for the coordination of scientific activities in India, a plea that helped create the Indian Academy of Sciences.

Rao's specialization subject was the study and experiment on frog and taxonomy and the segmentation and cavities of frogs that helped a lot to the students in the understanding of amphibian development of frog. He has taken up various tasks on this related issue and has done well in his experimentation. He has presided Zoology section of Indian Science congress in Lahore in 1938.

Professor Rao specialized on frogs and their taxonomy. He named and described several frog species, and his work on the Archenteric and Segmentation Cavities of frogs are regarded as important contributions to our understanding of amphibian development. He described the new Microhylid genus *Ramanella*. The genus Raorchestes is named in his honour.

Professor Rao presided over the zoology section of the Indian Science Congress in 1938 at Lahore. His account of the ovarian ovum of the slender Loris was presented to the Royal Society by James Peter Hill in the latter's Croonian Lecture.

Chaitanya

3rd year BSc, BBZ

Darshan Ranganathan :- Organic chemist

Darshan Rangana (1941-2001)

Darshan Ranganathan was an organic chemist from India who was known for her work in bio-organic chemistry, including "Pioneering work in protein folding". She was also recognized for her work in "supramolecular assemblies, molecular design, chemical simulation of key biological processes, synthesis of functional hybrid peptides and synthesis of nanotubes.

Darshan Ranganathan was born Darshan Markan on 4 June 1941 to Vidyavati Markan and Shanti Swarup in Delhi. She was educated in Delhi and received a Ph.D. in chemistry from Delhi University in 1967. First hired as a lecturer, she became head of the Chemistry Department at Miranda College, Delhi, and went on to receive an 1851 Research Fellowship from the Royal Commission for the Exhibition of 1851,to enable her to conduct postdoctoral work at Imperial College London with Professor D.H.R. Barton.

Darshan moved to London in late 1960s to work with Prof. D.H.R. Barton where she started studying cycloartenol in jackfruits. At Imperial College she pioneered work in the field of protein folding. With a passion for reproducing biochemical processes in the lab, she created a protocol for the autonomous reproduction of imidazole, an important ingredient found in antifungal drugs and antibiotics. With wealth of knowledge and experience, Darshan returned to India in 1969.

In 1970, she began research at the Indian Institute of Technology, Kanpur (IIT Kanpur). In that year, she married Subramania Ranganathan, with whom she would go on to author Challenging problems in organic reaction mechanisms (1972), Art in biosynthesis: the synthetic chemist's challenge (1976), and further challenging problems in organic reaction mechanisms (1980)—as well as editing an ongoing series titled "Current Organic Chemistry Highlights".

She began work at Regional Research Laboratory, Trivandrum in 1993, and at IICT, Hyderabad in 1998, where she became Deputy Director. During these years, she conducted ongoing collaborations with Isabella Karle at the U.S. Naval Research Laboratory .

Ranganathan's special passion was reproducing natural biochemical processes in the laboratory. She created a protocol which achieved the autonomous reproduction of imidazole, an ingredient of histidine and histamine with pharmaceutical importance. She also developed a working simulation of the urea cycle. As her career developed, she became a specialist in designing proteins to hold a wide variety of different conformations and designing nanostructures using self-assembling peptides.

Darshan Ranganathan was diagnosed with breast cancer in 1997, and died on her 60th birthday, in 2001.

The biennial "Professor Darshan Ranganathan Memorial Lecture", which is to be "delivered by a woman scientist who has made outstanding contributions in any field of Science and Technology" was established in her memory by her husband, in 2001.

Awards:- 1967: Awarded The Senior Research Scholarship of the Royal Commission for the Exhibition of 1851.

1999: Received the Third World Academy of Sciences award (TWAS) in Chemistry.

Yuvashree K
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4th semester
Int. MSc in Molecular biology

Dr. Kamal Ranadive : Cancer Biologist

Dr. Kamal Ranadive (1917-2001)

A lot of us are already aware of the significant role that women played in India's struggle for independence and the extraordinary women who served the society during our freedom struggle. Many young women especially during that time abandoned the four walls of their homes and came to support the nation in various capacities. Some of them even became soldiers by joining Netaji Subhash Chandra Bose's Azad Hind Fauj.

Those long and arduous years of freedom ignited the hearts and minds of many Indians. A lot of families decided to do away with the old ways as India needed more support in every field , be it social service, field of education, active campaigning and science. India has been home to some great female scientists going all the way back to the 19th century. These great scientists were warriors in their own right as they made a name for themselves by beating all odds and must be celebrated.

One of those scientists I'll be discussing in this article is Dr Kamal Ranadive.

Kamal Samarth, better recognised as Kamal Ranadive, was one of India's trailblazers in early cancer research. In fact, she was probably the first in the nation to propose the correlation between breast cancer occurrence and heredity – which was confirmed by later researchers.

Last year i.e., on November 8, 2021, Google dedicated a doodle to renowned Indian cell biologist Dr Kamal Ranadive to celebrate her 104th birth anniversary.

The Google Doodle, created by India-based guest artist Ibrahim Rayintakath, showing Dr. Ranadive with a microscope.

Kamal Ranadive was born on 8 November 1917 in Pune to Dinkar and Shantabai, Kamal Samarth was a genius to reckon with from early

childhood. Her family encouraged her to opt for medical education, but Ranadive was more interested in Biology.

She completes her schooling at the Huzurpaga: the H.H.C.P. High School. She started her college education at Fergusson College with Botany and Zoology. She earned her Bachelor of Science (B.SCA) degree with distinction in 1934.

Following her graduation, she obtained her Masters of Science with specialisation in cytogenetics in 1943 from the College of Agriculture, Pune. Kamal's relocation to Bombay (now Mumbai) post her marriage proved to be immensely conducive for her career, as she now had the chance to work with Dr V R Khanolkar, the founder of Indian Cancer Research Centre (ICRC). She continued her doctoral research under the Stalwart's guidance at the University of Bombay.

In 1949, as Kamal successfully added the Doctoral (Dr) epithet before her name.

Khanolkar persuaded her to opt for a postdoctoral degree at a foreign university. Kamal soon secured a fellowship at Johns Hopkins University, USA and landed the opportunity to assist Dr. George Otto Gey. It must be mentioned here that Dr Gey was a leading cell biologist hailed for his work on HeLa cell line – the 'immortal' cell line used in cancer research.

Wanting to contribute to the Indian scientific domain, she joined ICRC as a Senior Research Officer, Bombay and later served as its Director from 1966 to 1970.Because of her tireless efforts, ICRC soon boasted of having the **first Tissue Culture Laboratory** in the entire country. Soon, Kamal also founded the **Experimental Biology Laboratory and integrated new research units in Carcinogenesis, Cell Biology and Immunology.**

She was also one of the first scientists to **pioneer cancer study through animal models** which helped to provide amazing insights into the origin of leukaemia, breast cancer and oesophageal cancer. Her work on leprosy bacteria led to the discovery of the necessary upgrade on **Leprosy vaccine** in India.

She was aware of the fact that many women give up their dreams of pursuing science, being overwhelmed by the responsibilities of motherhood and family. To bring them under the ambit of science in India, the conscientious scientist, along with a few of her colleagues, founded **the Indian Women Scientists' Association** (**IWSA**) in Bombay in 1973. Today, with eleven branches all over India and more than 2,000 women scientists, the organisation remains among the top scientific associations in India

After her retirement, Dr. Kamal Ranadive worked on the **nutrition and health of tribal women and children** in Rajur in Maharashtra. This project was a huge success, providing awareness about nutrition and medical care to tribals and training women as primary health care workers.

She also has more than **200 published research papers** in her name.Some of the papers are **(1)** Betel quid chewing and oral cancer: Experimental studies on hamsters; **(2)** Effect of

Urethan on Nucleic Acids; **(3)** Influence of splenectomy on the development of leukemia in male mice of the ICRC strain; **(4)** Characterisation of mammary tumour virus of strain ICRC mouse.

Awards &Honours:

- Ranadive was awarded the Padma Bhushan (India's third highest civilian award) for Medicine, in 1982.
- She was awarded the first Silver Jubilee Research Award 1964, of the Medical Council of India.
- This award included a gold medal and a cash award of ₹15,000 (equivalent to ₹930,000 or US$12,000 in 2020).
- She was also awarded the G. J. Watumull Foundation Prize for 1964 in microbiology.

Hers was an inspiring life, lived in dedication to medicine, education and inclusiveness. With her generosity, integrity and obsession with advancement of excellence in science, Dr Ranadive made an indelible impression in our mind.

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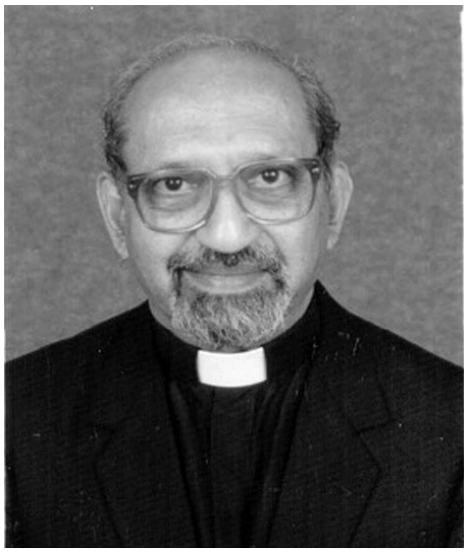
Dr. Rev. Fr. C. J. Saldanha, the Jesuit Scientist and Taxonomist of Karnataka



Dr . Rev.Fr. C .J. Saldanha(1926-2002)

Dr. Fr. C. J. Saldanha, outstanding Plant Taxonomist of Karnataka, the main author of monumental publications 'The Flora of Karnataka (Vol. I and II)' and 'Flora of the Hassan District Karnataka, India'. A good teacher, researcher, administrator, committed Environmentalist, inspired and trained many Botanists to take up the work of District and local Floras. A rare personality who shouldered unusual dual roles as a Botanist and a Catholic priest.

Cecil John Saldanha was born 27th December 1926 as second son of Aloysius Saldanha and Millie Fernandes at Bombay. Their family moved to Mangalore, Cecil studied up to Intermediate degree in Mangalore. Then joined Society of Jesus and obtained Licentiate in Philosophy from Gregorian University Rome in 1952. After returning to India passed B.SC (Honours) with gold medal from St. Xavier's college, and completed M.Sc. in Botany. Bombay. Saldanha studied Theology in Belgium and ordained at Chantilly, France in 1958. Fr. Saldanha worked on 'Taxonomic Revision of the Scrophulariaceae of Western Peninsular India' for his Ph.D. degree (1963). He started teaching Botany in St. Joseph's college, Bangaluru and became the Principal of the same college. He founded the Centre of Taxonomic Studies in the college.

Fr. Saldanha carried out the project 'Flora of Hassan district of Karnataka state' (1968-76) with the financial support of Smithsonian Institution, USA. It includes the documentation of 1,700 species of vascular plants. Fr. Saldanha did the enormous task of cataloguing and documentation of Biodiversity of Karnataka state with the support of the Department of Science and Technology, Government of India (1978-1996). The vast work the work was published in 2 volumes which includes 14,000 plant specimen collection. The Flora includes keys, illustrations, descriptions, distribution of the plants of all the districts of Karnataka state.

Fr. Saldanha has recorded and introduced one new genus and 9 new species to the world of science. The meticulously done herbarium collection is maintained in the campus of Indian Institute of Science, Bangaluru (IISc). Botanists have named plants in honour of Fr. Saldanha: *Utricularia cecilii* P. Taylor, *Diospyros saldanhae* A. J. G. H. Kostermans, and *Alchemilla cecilii* G. Panigrahi & K. M. Purohit.

Rev. Fr. Saldanha after retiring from teaching profession in 1982, rendered service at various capacities, as visiting Professor in IISc, Bengaluru (1984-86); Advisory Board, Lalbagh botanical garden, Bengaluru; handled responsibilities as member/chairperson by various State and Central Governments in Environmental commissions. Elected as Fellow of the Indian Academy of Sciences (1980) and New York Academy of Sciences. Received Rajyotsava Award from the Government of Karnataka. Being a visionary, Fr. Saldanha worked to protect the environment, specially the Western Ghats of Karnataka, Andaman, Nicobar and Lakshadweep.

Dr. Sharvani K.A.

Dept of Botany

Dr.Sagar Sengupta : Immunologist

Sagar Sengupta (23rd June 1968)

Sagar Sengupta is an Indian immunologist, cancer biologist and a scientist at the National Institute of Immunology, India. Known for his studies on tumor suppressor gene and oncogenes, Sengupta is an elected fellow of all the three major Indian science academies namely the National Academy of Sciences, India, the Indian National Science Academy and the Indian Academy of Sciences. The Department of Biotechnology of the Government of India awarded him the National Bioscience Award for Career Development, one of the highest Indian science awards, for his contributions to biosciences, in 2011.

Sengupta's research focus is on the changes in the signalling pathways during cancer development and he has carried out studies on the tumour suppressor genes and oncogenes. During his post-doctoral days at the National Institutes of Health , he undertook a project on NIH grant to study the *Determination of regulatory mechanisms for BLM helicase*.

RESEARCH WORKS:

Involved in determining the signalling and repair pathways that are altered in human cancer. The broad aim of the research program has been to study the signalling pathways which have undergone alterations during the process of cancer development. Tumor suppressors are a group of extremely specialized proteins whose mutations lead to the development of cancer. In other words they are the caretakers and gatekeepers of our body. We are focused on the mechanisms of tumour suppressor functions. For example we ask how the tumour suppressors are activated in response to DNA damage and thereby recruited to the sites of the lesions, the mechanism of their turnover, whether and how the regulation takes place via the post-transcriptional, post-translational, epigenetic mechanisms and how these proteins counteract the functions of the onco proteins, which are known to drive neo plastic transformation, immortalization and tumorigenesis. Finally effort in the group is also focused

in determining how the tumour suppressors, either directly or indirectly, help to maintain the fidelity of the genome by regulating the different repair processes, in conjunction with other tumour suppressors or with other process-specific proteins of the different repair pathways. The focus is not only on the nuclear genome maintenance – but also on the lesser-worked mitochondrial genome, specifically on the role of mitochondrial replication in the genome maintenance process.

Our primary interest lies in an unique group of proteins called RecQ helicase family. We chose this family of helicases as three of its members, *BLM, WRN* and *RECQL4*, when mutated lead to cancer predisposition syndromes called Bloom syndrome (BS), Werner Syndrome (WS) and Rothmund -Thomson syndrome (RTS) respectively. Hence these proteins (BLM, WRN and RECQL4) can be classified as caretaker tumour suppressors. Work in the laboratory is focused on the functions of BLM and RECQL4 helicases. BLM is a nuclear helicase – which has been shown to affect multiple steps in DNA damage response and DNA repair pathways. On the other hand, the lab was the first group to show that RECQL4 is a mitochondrial helicase, which play a role in the maintenance of the mitochondrial replication. The research in the near future will focus on trying to understand the mechanisms of signal transduction during genome integrity using a combination of biochemical assays, cell culture based models involving immortalized cells obtained from patients, imaging techniques, mice models and patient tumour samples.

Sengupta received the Best Thesis Award for his doctoral thesis from the Indian Institute of Science in 1991. The Department of Biotechnology (DBT) of the Government of India awarded him the National Bioscience Award for Career Development, one of the highest Indian science awards in 2011. The National Academy of Sciences, India elected him as a fellow in 2012 and he became an elected fellow of the Indian Academy of Sciences and the Indian National Science Academy in 2017. He is also a member of the Guha Research Conference.

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Int MSc in molecular biology

G N Ramachandran- A 'plot' that changed the course of Structural Biology

G N Ramachandran (1922-2001)

Proteins are an integral part of the living system and their function depends highly on their structure. Given the fact that the proteins contain hundreds of bonds that can rotate freely, the proteins can take up numerous conformations, but only one of the structures would be thermodynamically stable and functional. So how do we know what structure would be feasible? Is there a way to guess what the secondary structure a given amino acid is present in? All such questions were answered by an Indian scientist G N Ramachandran.

Gopalasamudram Narayana Iyer Ramachandran – known as G N Ramachandran is an Indian physicist, also known for his contributions in biology. His contributions in structural biology in particular is considered one of the most outstanding discoveries along with Pauling's description of α-helix and Watson and Crick's discovery of double helical structure of DNA.

G N Ramachandran was born on October 8th, 1922, in a small town near Cochin in Southern India. His father was a Professor in Mathematics at a local college. After completing his school years, he graduated in 1942 as the top ranking student in the B.Sc. Physics course of the University of Madras.

In 1942, he joined the Master's program in Electrical Engineering at the Indian Institute of Science , Bengaluru. Shortly after, he was transferred to the physics stream by the head of the Physics department , Sir C V Raman , who had foreseen Ramachandran's achievements in the field of physics. He continued his research in the areas of optics and X-Ray Topography. In 1947, he obtained his D.Sc. degree , after which he went to Cavendish Laboratories in California , which was then led by Sir Lawrence Bragg. He worked with W.A Wooster and A Lang on a crystallographic project and developed a mathematical theory for

determining the elastic constants of crystals from the measurements of diffuse X-ray reflections. He then received his Ph.D. from the Cambridge University in 1949.

After getting a Ph.D. he returned to India and worked in IISc as an assistant Professor of Physics until 1952. Sir A. L Mudaliar , who was then the vice chancellor of the University of Madras , wanted to start a division of experimental physics and was looking for a suitable person to start it. In 1952, upon the recommendation of Sir C V Raman, Ramachandran was appointed as the Professor of Physics at the young age of 29. A fully equipped modern X-ray crystallographic laboratory was now set up in the University of Madras.

During his Ph.D. in the Cambridge, Ramachandran was highly inspired by Pauling's lectures on the structures of polypeptide chains and wanted to work on biological problems. He then upon the advice of Professor J.D. Bernal who paid a visit to Madras during late 1952 and early 1953 decided to determine the structure of collagen, for which no satisfactory model had been proposed.

He then, assisted by Gopinath Kartha started working on samples of collagen from kangaroo tail fibres. They published their findings in *Nature* , (magazine) in 1954. Their proposed model said that the collagen structure consisted of three parallel left-handed helices placed side by side and packed together in a hexagonal array. They revised the model again and published it in *Nature* , in 1955. According to their model, the collagen contained 2 interchain hydrogen bonds, but the studies of Helen Berman and her colleagues , that showed the presence of 1.5 hydrogen bonds. This controversy resulted in an unfair legacy. Till now , many textbooks still discuss the triple helix form of collagen without giving G N Ramachandran the credit he deserves.

In 1963, G N Ramachandran and his colleagues came up with something called as Ramachandran plot. Ramachandran plot is a plot of torsion angles- phi ϕ and psi ψ. The specific regions of the plot depicts the most probable ,moderately possible, the least possible and the impossible torsion angles that can occur in a polypeptide. The plot also shows what torsion angles are more likely to form either a right handed $\propto$-helix , or a ß-sheet or a triple helix ,etc. Hence the plot is used to predict the secondary structure a given amino acid is present in and it can be used for evaluating the accuracy of the predicted protein structure.

He organized several international conferences on biopolymer confirmations which are referred to as 'Madras conferences' and were attended by many experts in the structural biology of that time, including many Noble laureates. He founded a Molecular Biophysics Unit [MBU] in IISC , Bengaluru in 1971. He then retired from MBU in 1978 ,but continued to as a professor of mathematical philosophy in the institute until 1989.

He has received a number of notable awards including the Shanti Swarup Bhatnagar Award for Physics in India and the Fellowship of the Royal Society of London. In 1999, the International Union of Crystallography honoured him with the Ewald Prize for his 'outstanding

contributions to crystallography'. He was also nominated for the Noble Prize for his fundamental contributions in protein structure and function.

In the early 1980s, he started showing symptoms of Parkinson's disease. His health slowly deteriorated after the death of his wife. He passed away due to cardiac arrest in early April, 2001.

G N Ramachandran was a many of many talents. He has won a number of awards and medals. He breathed science and changed the course of structural biology forever. One of his most valuable contributions- the Ramachandran plot is still being used by structural biologists. His contributions are immense and is a true inspiration to many.

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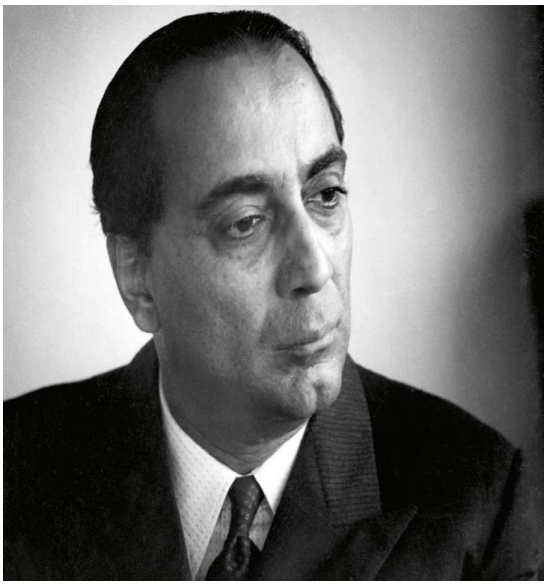
Homi Jehangir Bhabha:- Nuclear physicist



Homi Jehangir Bhabha (1906-1966)

Homi Jehangir Bhabha was an Indian nuclear physicist, founding director, and professor of physics at the Tata Institute of Fundamental Research (TIFR).] Colloquially known as "Father of the Indian nuclear programme", Bhabha was also the founding director of the Atomic Energy Establishment, Trombay (AEET) which is now named the Bhabha Atomic Research Centre in his honour. TIFR and AEET were the cornerstone of Indian development of nuclear weapons which Bhabha also supervised as director.

Homi Bhabha was awarded the Adams Prize (1942) and Padma Bhushan (1954). He was also nominated for the Nobel Prize for Physics in 1951 and 1953–1956.

EARLY LIFE AND EDUCATION

Homi Jehangir Bhabha was born into a prominent wealthy Parsi family, through which he was related to businessmen Dinshaw Maneckji Petit. He was born on 30 October 1909. His father was Jehangir Hormusji Bhabha, a well known Parsi lawyer and his mother was Meheren. He received his early studies at Bombay's Cathedral and John Connon School and entered Elphinstone College at age 15 after passing his Senior Cambridge Examination with Honours.

WORK IN NUCLEAR PHYSICS

In January 1933, Bhabha received his doctorate in nuclear physics after publishing his first scientific paper, "*The Absorption of Cosmic radiation*". In the paper, Bhabha offered an explanation of the absorption features and electron shower production in cosmic rays. The paper helped him win the Isaac Newton Studentship in 1934, which he held for the next three years. The following year, he completed his doctoral studies in theoretical physics under Ralph H. Fowler. During his studentship, he split his time working at Cambridge and with Niels Bohr in Copenhagen. In 1935, Bhabha published a paper in the *Proceedings of the Royal Society, Series A*, in which he performed the first calculation to determine the cross section of

electron-positron scattering. Electron-positron scattering was later named Bhabha scattering, in honour of his contributions in the field.

NUCLEAR POWER PROGRAMME

Bhabha is generally acknowledged as the father of Indian nuclear power. Moreover, he is credited with formulating a strategy of focussing on extracting power from the country's vast thorium reserves rather than its meagre uranium reserves. This thorium focused strategy was in marked contrast to all other countries in the world. The approach proposed by Bhabha to achieve this strategic objective became India's three stage nuclear power programme.

The total reserves of thorium in India amount to over 500,000 tons in the readily extractable form, while the known reserves of uranium are less than a tenth of this. The aim of long range atomic power programme in India must therefore be to base the nuclear power generation as soon as possible **on thorium rather than uranium**... The first generation of atomic power stations based on natural uranium can only be used to start off an atomic power programme. The plutonium produced by the first generation power stations can be used in a second generation of power stations designed to produce electric power and convert thorium into U-233, or depleted uranium into more plutonium with breeding gain... The second generation of power stations may be regarded as an intermediate step for the breeder power stations of the third generation all of which would produce more U-238 than they burn in the course of producing power.

LEGACY

After his death, the Atomic Energy Establishment at Mumbai was renamed as the Bhabha Atomic Research Centre in his honour. In addition to being an able scientist and administrator, Bhabha was also a painter and a classical music and opera enthusiast, besides being an amateur botanist. He is one of the most prominent scientists that India has ever had. Bhabha also encouraged research in electronics, space science, radio astronomy and microbiology. Bust of Bhabha at Birla Industrial & Technological Museum, Kolkata

The famed radio telescope in Ooty, India was his initiative, and it became a reality in 1970. The Homi Bhabha Fellowship Council has been giving Homi Bhabha Fellowships since 1967. Other noted institutions in his name are the Homi Bhabha National Institute, an Indian deemed university and the Homi Bhabha Centre for Science Education, Mumbai, India.

Bhabha(right) at the International Conference
on the Peaceful uses of Atomic Energy in Geneva,
Switzerland, 20 August 1955

Bhust of Bhabha at Birla Industrial and Technological Museum, Kolkata

Bhabha on a 1966 stamp of India

Janaki Ammal: Botanist and cytogenetist

Janaki Ammal (1897-1984)

Janaki Ammal was a prominent Indian botanist who primarily worked in the fields of plant breeding, cytogenetics and phytogeography. She was born in Thalassery, Kerala on 4th Nov 1987. Her father was Diwan Bahadur Edavalath Kakkat Krishnan, a sub-judge and her mother was Devi Kuruvayi. Janaki passed away on 7th Feb 1984 in Maduravoyal, Chennai.

Janaki did her primary schooling at Sacred Heart Convent in Thalassery followed by Queen's Mary College in Madras. She obtained an Honours degree in botany from the Presidency College and later moved to the University of Michigan in 1924, obtaining a Masters degree in botany in 1926 – for which she had studied with a Barbour Scholarship. She returned to India for a short period before returning to the University of Michigan as an Oriental Barbour Fellow and obtained a PhD in 1931 on her thesis titled "Chromosome Studies in Nicandra Physaloides".

Janaki Ammal worked as a professor in the Women's Christian College in the interim of her studies. Once she was awarded the doctorate, she worked as the Assistant professor of botany in the Maharaja's College of Science in Trivandrum between 1932-34. She then joined the John Innes Institute, London where she worked with D.C. Darlington. She then worked at the Sugarcane Breeding Institute in Coimbatore, concerning the production of hybrids. In 1939, she attended the 7th International Congress of Genetics, Edinburgh. Janaki then spent the next six years as an assistant cytologist to D.C Darlington and published a *Chromosome Atlas of Cultivated Plants* in 1945. The Indian government then invited her to reorganize the Botanical Survey of India and she was appointed as the first director of the Central Botanical Laboratory in Allahabad. From 1962, she served as an Officer on Special duty at the Regional research lab in Jammu. She finally settled down in Madras in 1970, working as in Emeritus Scientist at the *Center for Advanced Study (CAS)* in botany, University of Madras.

As an expert in cytogenetics, she was able to create a high yielding strain of sugarcane best suited to Indian conditions. Her research also helped analyze the geographical distribution of sugarcane in India. As a geneticist working for the Royal Horticultural Society's Garden, Wisley in 1950s, Janaki investigated the effects of colchicines on woody plants – mostly Magnolia - to produce polyploidy in the respective plants and increase their lifespan.

A variety of magnolia with white flowers was named after her due to her extensive work on them – *Magnolia kobus* Janaki Ammal. *Dravidogecko janakiae,* a species of geckos found in India are named after her. The University of Michigan awarded her an honorary LLD in 1956. The government of India conferred the Padma Shri on her in 1977. The Ministry of Environment and Forestry of India instituted the National Award in Taxonomy in her name in 2000. The John Innes Institute also offers a scholarship for PhD students from developing countries in her name.

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Lalji Singh: Father of Indian DNA Finger Printing

Lalji Singh (1947-2017)

Lalji Singh (5 July 1947-10 December 2017) was an Indian Scientist who worked in the field of DNA fingerprinting technology in India, where he was popularly known as the 'Father of Indian DNA fingerprinting'. Singh was also worked in the areas of molecular basis of sex determination, wildlife conservation forensic and evolution and migration of humans. In 2004, he received the Padma Shri in recognition of his contribution to Indian Science and Technology.

Singh founded various institutes and laboratories in India, including the Centre for DNA Fingerprinting and Diagnostics in 1995, Laboratory for the Conservation of Endangered Species (LaCONES) in 1998, and Genome Foundation in 2004, aiming to diagnose and treat genetic disorders affecting the Indian population, in particular the under-privileged people residing in rural India.

Singh served as the 25th Vice Chancellor of Banaras Hindu University (BHU) and Chairman of Board of Governors of Indian Institute of Technology (BHU) Varanasi from August 2011 to August 2014. Before his term as Vice Chancellor of Banaras Hindu University, he also served as director of the Centre for Cellular and Molecular Biology (CCMB) from May 1998 to July 2009 and Officer on Special Duty (OSD) of Centre for DNA Fingerprinting and Diagnostics (CDFD), Hyderabad, India in 1995–1999.

Lalji Singh was born and raised in a small village Kalwari in Jaunpur District of Uttar Pradesh, India. His father, Suryanarayan Singh, was a farmer and used to serve as head of the village. Singh underwent his primary education up to eighth standard at a government school in Kalwari. However, as there were no further education facilities in the village for senior classes, he was admitted at another school in the nearby village of Pratapganj 6–7 km (3.7–4.3 mi) from his village. After completing his 12th standard in the science group at school, he attended Banaras Hindu University to pursue his graduation in Zoology and cytogenetics.

Singh obtained a B.Sc. degree in 1964 from the Banaras Hindu University (BHU). Singh scored the highest marks in his Master's degree class at BHU in 1966, and won the Banaras Hindu Gold Medal for standing first in order of merit. He was awarded a Junior Research Fellowship (JRF) by the University Grants Commission (India) in 1966. Singh then worked on his doctoral research at the Banaras Hindu University receiving a degree in 1971, for his work on

"Evolution of karyotypes in snakes" in the area of cytogenetics under the guidance of professor S.P. Ray Chaudhuri . A summary of the findings from his doctoral research was published in Chromosoma . Singh received the INSA Medal for Young Scientists in 1974, for his research work in the field of cytogenetics.

Fellow of Indian Academy of Sciences (FASc), (elected in 1989), Fellow of The National Academy of Sciences, India (FNASc), (elected in 1991), Fellow of Indian National Science Academy (FNA) (elected in 1993), Fellow of Andhra Pradesh Academy of Sciences (elected in 2000), Fellow of National Academy of Agricultural Sciences (FAAS) (elected in 2001),Fellow of National Academy of Medical Sciences (FAMS) (elected in 2002),Fellow of Third World Academy of Sciences (FTWAS) (elected in 2002),Indian National Science Academy Medal for Young Scientists, (1974), Commonwealth Fellowship, (1974–1976),CSIR Technology Award 1992 and 2008 and Ranbaxy research Award (1994).

Sharoon Samuel R

M.R.S. Rao: Chromatin Biologist

Manchahalli Rangaswamy Satyanarayana Rao (21st Jan 1948)

Manchahalli Rangaswamy Satyanarayana Rao known by the abbreviation M.R.S. Rao, is an Indian scientist, born on 21 January 1948 at Mysore, India. He has been awarded the fourth highest civilian award Padma Shri in science and engineering category (year 2010) by the Government of India.

He was the President of Jawaharlal Nehru Centre for Advanced Scientific Research (INCASR) in Bangalore (2003-2013). Rao obtained his bachelor's degree (BSc) in 1966 and master degree (MSc) in 1968 from Bangalore University. He received his PhD in biochemistry from Indian Institute of Science (IISC), Bangalore in 1973. Govindarajan Padmanabhan was his doctoral advisor at Department of Biochemistry. He did his postdoctoral research at Baylor college of Medicine, Houston, Texas, USA, and was an assistant professor at the same institute. He decided to come back to India and joined the Department of Biochemistry, Indian Institute of Science (IISC).

At present, he is an Honorary Professor at Jawaharlal Nehru Centre for Advanced Scientific (JNCASR), Bangalore and actively running Chromatin Biology laboratory. He has been credited as first scientist to initiate Chromatin Biology research in India. In more than 30 years of active research career, his lab at IISC and JNCASR , has mentored more than 35 PhD students, dozens of postdoctoral follows and hundreds of research trainees.

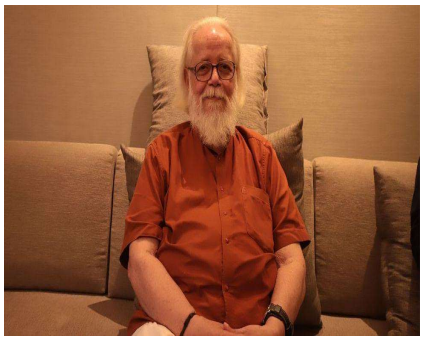
Rao is a prolific scientific researcher and the author of hundreds of peer reviewed international journal articles. Several research articles have been cited extensively throughout the world scientific community. Most of his research work has been focused on chromatin biology and cancer biology. Rao has an h-index of above 26 (as per June 2011) and its still in logarithmic phase and heading up continuously. One of his publications over colon cancer, published in cell (journal) has extensive citations of more than 2000 so far.

Rao has received several medals, awards and fellowships both in India and overseas. He has been awarded the Padma Shree(year 2010) by Government of India for his immense

contribution in science and engineering to the country. He has received the coveted Shanti Swarup Bhatnagar prize for Science and Technology (year 1988) from the Council of Scientific and Industrial Research (CSIR), the Dr. B.R Ambedkar Centenary Award from the Indian Council of Medical Research (2005), the Jawaharlal Nehru Birth Centenary Lecture award of the Indian Council of Medical research (2005), the Jawaharlal Nehru Birth Centenary award from the Indian National Science Academy (CINSA), a Rockerfeller Foundation Biotechnology Fellowship, the Om Prakash Bhasin award, the Third World award for basic medical sciences, and the Sir M. Vishveshsswariah Senior Scientific State award from Government of Karnataka. He received the Prof. N. Appaji Rao Best Mentor award (2011), an award instituted by the Indian Institute of Science Alumni Association (IISC AA), Bangalore.

Sharoon Samuel R.

Nambi Narayanan:- Aerospace engineer



Nambi Narayanan (1966)

The unsung story of S. Nambi Narayanan came into the spotlight through the movie named "Rocketry: The Nambi Effect" Directed and acted by R. Madhavan.

Until then I was also unaware of the name Nambi Narayanan, after watching the movie and reading some of the articles about the sad event occurred for a great scientist of our country, at that moment I felt ashamed of our Indian system and politicians who have dragged such a intelligent scientist into an espionage case. This article would follow the shadow of the facts showcased in the movie and this would be helpful to some of our friends who have no idea of the scientist and this dreadful, controversial incident happened to him, you can consider a homage article also.

Background Life of Sir :

S. Nambi Narayanan is an Indian aerospace engineer, In 1966 he joined at ISRO as a technical assistant at the Thumba Equatorial Rocket Launching Station.He earned a NASA fellowship and was accepted into Princeton University in 1969. He completed his master's program there in chemical rocket propulsion under professor Luigi Crocco. He returned to India with expertise in liquid propulsion at a time when Indian rocketry was still solely dependent on solid propellants.He has claimed that he had to educate Sarabhai on liquid propulsion technology in his book.

In 1974, SocieteEuropeenne de Propulsion agreed to transfer the Viking engine technology in return for 100 man-years of engineering work from ISRO. This transfer was completed by three teams and Narayanan led the team of fifty-two engineers who worked on technology acquisition from French. Other two teams worked on indigenizing the hardware in India and establishing the development facilities in Mahendragiri. The first engine, named Vikas, was tested successfully in 1985.

False Allegations and arrest in the espionage case

On 30 November 1994, Narayanan was arrested as part of an investigation of alleged espionage, by a team of Kerala police and Intelligence Bureau officials, based on the videographed statements by a colleague that he and Narayanan had received money for transferring drawings and documents of rocket engines to two Maldivian women, Mariam Rasheeda and Fauziyya Hassan, who were suspected to be spies. In December 1994, the transfer of the case to the Central Bureau of Investigation (CBI) was criticized in media and by opposition parties in Kerala. CBI was seen to be under the thumb of P. V. Narasimha Rao, then prime minister of India and some of the people named in the investigation were close to Rao and K. Karunakaran, then chief minister of Kerala.

Narayanan spent 50 days in jail. He claims that officials from the Intelligence Bureau, who initially interrogated him, wanted him to make false accusations against the top brass of ISRO. He alleges that two IB officials had asked him to implicate A. E. Muthunayagam, his boss and then Director of the Liquid Propulsion Systems Centre (LPSC). He says that when he refused to comply, he was tortured until he collapsed and was hospitalised.[18] He says his main complaint against ISRO is that it did not support him. K. Kasturirangan, who was ISRO chairman at the time stated that ISRO could not interfere in a legal matter.[citation needed] He has written that the director of CBI Vijaya Rama Rao met him in jail on 8 December (four days after the case was transferred), when he explained to the director that the drawings of rockets and engines were not classified. He has written that the CBI director wondered how the case has gotten so far and apologized in that meeting.

In April 1996, before the 1996 Indian general election, CBI submitted a closure report,saying that there was no espionage and that the testimonies of suspects were coerced by torture. In a previous order in a related case, Kerala High Court, which had seen the videos of interrogation, had dismissed allegations of torture and made critical comments about CBI's failure to follow all the leads. Amid attention on lacunae in CBI closure report, a challenge of the report in Kerala High Court by S. Vijayan, a police officer and continuing political pressure, the Kerala government revoked the permission granted previously to CBI to investigate the case and enjoined Kerala police to take it up again. But a Supreme Court bench stopped it in April 1998 saying that "the CBI found that no case had been made out" and ordered the Kerala government to pay Rs 1 lakh to each of the accused including Narayanan.In September 1999, the National Human Rights Commission (NHRC) passed strictures against the government of Kerala for having damaged Narayanan's distinguished career in space research along with the physical and mental torture to which he and his family were subjected. After the dismissal of charges against them, the two scientists, Sasikumar and Narayanan were transferred out of Thiruvananthapuram and were given desk jobs.

Remuneration and Awards Given by the Government in the replacement of the incident

In 2001, the NHRC ordered the government of Kerala to pay him a compensation of ₹ 1 crore.He retired in 2001. The Kerala High Court ordered a compensation amount of Rs 10 lakhs to be paid to Nambi Narayanan based on an appeal from NHRC India in September 2012.

After a meeting between Narendra Modi and Narayanan in Thiruvananthapuram, the Bharatiya Janata Party (BJP) took up the case and Narayanan's treatment, especially by Sreekumar, in its campaign for 2014 Indian general election.

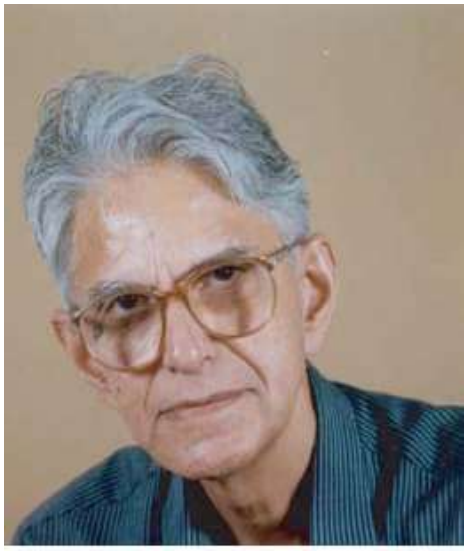
On 14 September 2018, the Supreme Court appointed a panel to probe the "harrowing" arrest and alleged torture of Narayanan. A three-judge Bench led by Chief Justice Dipak Misra also awarded Mr. Narayanan Rs. 50 lakh in compensation for the "mental cruelty" he suffered all these years. The same month, Narayanan's name was nominated for the most prestigious award of the country Padma shree and In the year 2021, Kerala government settled the case and payed a cash prize of ₹1.3 crores money.

Whatever cash prize, remuneration or award the government gives for the legendary scientist, the sad dreadful event, the struggle, the pain, the false allegations, the torture, pain for not doing anything, not even getting support from ISRO, the career damage can't be replaced we are always responsible for what has happened, it can't be corrected.

Suchethan B. S

2nd year PCM

Obaid Siddiqui:- Founder Director of the Tata Institute of Fundamental Research



Obaid siddiqui (1932-2013)

Obaid Siddiqui (1 January 1932 - 26 July 2013) was an Indian National Research professed and the Founder Director of the Tata Institute of Fundamental Research CTIFR) National center for Biological sciences. He made seminal contributions to the field of behavioral neurogenetics using the genetics and neurobiology of Drosophila the was born in Basti district of Uttar Pradesh. He received his early education at Aligarh Muslim University where he completed his MSc. He completed his Ph.D. at the University of Glasgow, under the supervision of Guido Pontecorvo. He carried out his post-doctoral research at the Cold spring Harbor Laboratory and the University of Pennsylvania. He was invited by Homi Bhabha set up the molecular biology unit at the Tata Institute of Research (TIFR) in Bombay in 1962. Thirty years later, he became the founding director of the TIRF, National Center for Biological sciences in Bangalore, where he would continue his research into his final days of life.

Siddiqi's studies in the field of neurogenetics unravelled the link between genes, behavior and the brain. In the 1970s, his work with Sey mour Benzer at Caltech led to the discovery temperature-sensitivity paralytic Drosophila mutants and the generation and transmission of neural signals.This heralded the clawn of the field of neurogenetics at TIFR, Siddiqi and his graduate student, Veronica Rodrigues, Isolated and characterized the first collection of mutants with defects & Smell and taste in Drosophila. Siddiqi's work in neurogenetics led to the foundational advances in understanding how taste and smell are detected and encoded on the brain.

Achievements:

President of the Indian Academy of sciences, member of Royal Society, London. Member of US National Academy of Sciences ,Washington. Member of third world Academy, Trieste. SirSyed Ahmed Khan 2009 International Award for life Padma Bhushan in 2006, Dr. BC Roy

Award 2004, Pride of India Award, AFMI, USA 2004, Goyal Prize 1991, Padma Bhushan 1984. Life member of Clare Hall, Cambridge.

Sharoon Samuel R
BSc 2nd year, BMBt

Prasanta Chandra Mahalanobis : Father of Indian Statistics

Prasanta Chandra Mahalanobis (1893-1972)

Prof. Prasanta Chandra Mahalanobis is also known as the father of Indian statistics. He was a physicist by training, a statistician by instant and a planner by conviction. He was born on 29th June 1893. He made pioneering studies in Arthopometry in India. He founded the Indian statistical institute, and contributed to the design of large-scale sample surveys.

P.C. Mahalanobis belonged to a family of Bengali landed gentry who lived in Bikrampur (now in Bangladesh). Prabodh Chandra (1869–1942), was the father of P. C. Mahalanobis. Mahalanobis grew up in a socially active family surrounded by intellectuals and reformers. Mahalanobis received his early schooling at the Brahmo Boys School in Calcutta, graduating in 1908. He joined the Presidency College, and then affiliated with the University of Calcutta, where he was taught by teachers who included Jagadish Chandra Bose, and Prafulla Chandra Ray. Mahalanobis received a Bachelor of Science degree with honours in physics in 1912. He left for England in 1913 to join the University of London.

He did well in his studies at King's College Chapel, but also took an interest in cross-country walking and punting on the river. He interacted with the mathematical genius Srinivasa Ramanujan during the latter's time at Cambridge. After his Tripos in physics, Mahalanobis worked with C. T. R. Wilson at the Cavendish Laboratory. He took a short break and went to India, where he was introduced to the Principal of Presidency College and was invited to take classes in physics.

After returning to England, Mahalanobis was introduced to the journal *Biometrika.* This interested him so much that he bought a complete set and took them to India. He discovered the utility of statistics to problems in meteorology and anthropology, beginning to work on problems on his journey back to India.

Indian Statistical Institute

Many colleagues of Mahalanobis took an interest in statistics. An informal group developed in the Statistical Laboratory, which was located in his room at the Presidency College, Calcutta. On 17 December 1931 Mahalanobis called a meeting with Pramatha Nath Banerji (Minto Professor of Economics), Nikhil Ranjan Sen (Khaira Professor of Applied Mathematics) and Sir R. N. Mukherji. Together they ***established the Indian Statistical Institute (ISI)*** in Baranagar, and formally registered on 28 April 1932 as a non-profit distributing learned society under the Societies Registration Act XXI of 1860.The institute was initially in the Physics Department of the Presidency College and it gradually grew with the pioneering work of a group of his colleagues,includingS. S. Bose,J. M. Sengupta, R. C. Bose, S. N. Roy,K. R. Nair, R. R. Bahadur, Gopinath Kallianpur, D. B. Lahiri and C. R. Rao. The institute also gained major assistance through Pitambar Pant, who was a secretary to Prime Minister Jawaharlal Nehru. Pant was trained in statistics at the Institute and took a keen interest in its affairs. In 1933, the Institute founded the journal *Sankhya,* along the lines of Karl Pearson's *Biometrika*.

The institute started a training section in 1938. Many of the early workers left the ISI for careers in the United States and with the government of India. In 1959, the institute was declared as an institute of national importance and a Deemed university.

The methods pioneered at the institute are now used by the World Bank and the United Nations. As Nobel Prize-winning economist Angus Deaton and co-author Valerie Kozel wrote in 2005: "Where Mahalanobis and India led, the rest of the world has followed, so that today, most countries have a recent household income or expenditure survey. Most countries, can only envy India in its statistical capacity".

Economists TN Srinivasan, Rohini Somanathan, Pranab Bardhan and another Nobel-winner Abhijit Banerjee have since argued that there is "no other instance of an entirely homegrown institution in a developing country becoming a world leader in a large field of general interest".

Contributions:

Mahalanobis distance; ***Main article: Mahalanobis distance***

Mahalanobis distance is one of the most widely used metrics to find how much a point diverges from a distribution, based on measurements in multiple dimensions. It is widely used in the field of cluster analysis and classification. It was first proposed by Mahalanobis in 1930 in context of his study on racial likeness. Mahalanobis had been influenced by the

anthropometric studies published in the journal *Biometrika* and he chose to ask the questions on what factors influence the formation of European and Indian marriages. He wanted to examine if the Indian side came from any specific castes. He used the data collected by Annandale and the caste-specific measurements made by Herbert Risley to come up with the conclusion that the sample represented a mix of Europeans mainly with people from Bengal and Punjab but not with those from the Northwest Frontier Provinces or from Chhota Nagpur. He also concluded that the intermixture more frequently involved the higher castes than the lower ones. This analysis was described by his first scientific article in 1922. During the course of these studies he found a way of comparing and grouping populations using a multivariate distance measure. This measure, denoted "D^2" and now eponymously named Mahalanobis distance, is independent of measurement scale. Mahalanobis also took an interest in physical anthropology and in the accurate measurement of skull measurements for which he developed an instrument that he called the "profiloscope".

Sample survey

His most important contributions are related to large-scale sample surveys. He introduced the concept of pilot surveys and advocated the usefulness of sampling methods. Early surveys began between 1937 and 1944 and included topics such as consumer expenditure, tea-drinking habits, public opinion, crop acreage and plant disease. Harold Hotelling wrote: "No technique of random sample has, so far as I can find, been developed in the United States or elsewhere, which can compare in accuracy with that described by Professor Mahalanobis" and Sir R. A. Fisher commented that "The ISI has taken the lead in the original development of the technique of sample surveys, the most potent fact-finding process available to the administration".

He introduced a method for estimating crop yields which involved statisticians sampling in the fields by cutting crops in a circle of diameter 4 feet. Others such as P. V. Sukhatme and V. G. Panse who began to work on crop surveys with the Indian Council of Agricultural Research and the Indian Agricultural Statistics Research Institute suggested that a survey system should make use of the existing administrative framework. The differences in opinion led to acrimony and there was little interaction between Mahalanobis and agricultural research in later years.

In later life, **Mahalanobis was a member of the planning commission** contributed prominently to newly independent *India's five-year plans* starting from the second. In the second five-year plan he emphasized industrialization on the basis of a two-sector model. His variant of Wassily Leontief's Input-output model, the Mahalanobis model, was employed in the Second Five Year Plan, which worked towards the rapid industrialization of India and with other colleagues at his institute, he played a key role in the development of a statistical infrastructure. He encouraged a project to assess deindustrialization in India and correct some previous census methodology errors and entrusted this project to Daniel Thorner.

In the 1950s, Mahalanobis played a critical role in the campaign to bring India its first digital computers. Mahalanobis also had an abiding interest in cultural pursuits and served as secretary to Rabindranath Tagore (about whom he would write in the *Journal of the Oriental Society of Australia*), particularly during the latter's foreign travels, and also worked at his Visva-Bharati University, for some time.

Mahalanobis died on 28 June 1972, a day before his seventy-ninth birthday. Even at this age, he was still active doing research work and discharging his duties as the secretary and director

of the Indian Statistical Institute and as the honorary statistical advisor to the Cabinet of the Government of India.

Honours

Mahalanobis on a 1993 stamp of India

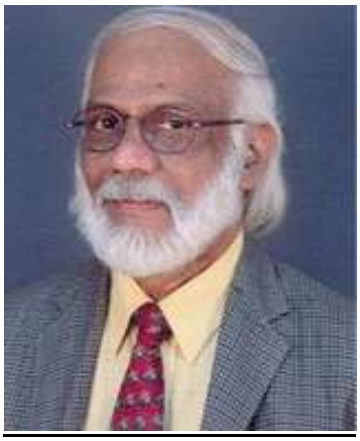
- Fellow of the Indian Academy of Sciences (FASc, 1935)
- Fellow of the Indian National Science Academy (FNA, 1935)
- Officer of the Order of the British Empire (Civil Division), 1942 New Year Honours list[3]
- Weldon Memorial Prize from the University of Oxford (1944)
- Fellow of the Royal Society, London (1945)[1][24]
- President of Indian Science Congress (1950)
- Fellow of the Econometric Society, US (1951)
- Fellow of the Pakistan Statistical Association (1952)
- Honorary Fellow of the Royal Statistical Society, UK (1954)
- Sir Deviprasad Sarvadhikari Gold Medal (1957)
- Foreign member of the Academy of Sciences of the USSR (1958)
- Honorary Fellow of King's College, Cambridge (1959)
- Fellow of the American Statistical Association (1961)
- Durgaprasad Khaitan Gold Medal (1961)
- Desikottam by Vishwa Bharati University (1961)
- Padma Vibhushan (1968)
- Srinivasa Ramanujan Gold Medal (1968)

The government of India decided in 2006 to celebrate his birthday, 29 June, as "National Statistical Day". On the occasion of his 125th birth anniversary on 29 June 2018, Indian Vice-President M Venkaiah Naidu released a commemorative coin at a program at ISI, Kolkata.

Sujith

3rd semester BSc

Professor Padmanaban Govindarajan:- Biochemist



Padmanaban Govindarajan (20 March

Padmanaban Govindarajan was born on 20 March 1938 in Bangalore, India. He is a renowned biochemist and a pioneer in Indian biotechnology. Currently , he holds the NASI-Platinum Jubilee Chair/honorary Professor at the Indian Institute of Science, Bangalore.

He completed his BSC from Presidency College , Madras University in 1958,MSC from IARI New Delhi in 1960 and PHD from IISC in 1966. He worked as Assistant Professor (1969-75),Associate Professor (1975-80) and as professor (1980 onwards) at IISC, Bangalore. He was Director of the Indian Institute of Science during 1994-98. He served as Honorary Professor /Emeritus scientist Mary's Hospital Medical School, London, UK(1969-70), senior Fulbright Scholar, University of Chicago(1973-74) and Visiting Scientist/Professor , University of Chicago for a decade(1975-86).

Prof. Padmanaban was instrumental in ushering in recombinant DNA technology in the country. Working in the area, eukaryotic gene transcription, he studied the role of heme in the transcriptional regulation of cytochrome p-450 genes in rat liver; established the multifunctional regulatory functions of heme in the living cell; studied the heme biosynthetic pathway in different eukaryotic systems and discovered the heme-biosynthetic pathway in the malarial parasite and showed it to be a unique drug target. He showed that curcumin from turmeric has anti malarial activity and embarked on clinical trials to prove the efficacy of curcumin -based combination therapies for malaria. He also guided 45 students for PhD. Prof. Padmanaban has published more than 170 highly cited articles in the journals of international repute.

Professor Padmanaban worked closely with several government agencies to further the cause of biotechnology in the country. He helped and promoted vaccine industries in the country and supported his colleagues in the development of recombinant hepatitis B vaccine and DNA rabies vaccine. He chaired several committees of the Department of Biotechnology and was part of several initiatives to promote life science research. He was a member of the WHO group on malaria for three years and served on the INSA Council (1991-92).

Professor Padmanaban was recipient of Padma Shri (1991) and Padma Bhushan (2004) from the Government of India, SS Bhatnagar Prize for Science & Technology (1983) and Jawaharlal Nehru Birth Centenary Fellowship of INSA. He was CV Raman Research Professor of INSA (1991-96). He was elected Fellow of the Indian Academy of Sciences, Bangalore, The National Academy of Sciences (India), Allahabad, Indian National Science Academy, New Delhi and Academy of Sciences for the Developing World (TWAS).

A few quotes about Prof. Padmanaban: A man of simple tastes, salary was least of his concerns. "Fully immersed in research, I did not think about a job or career," he writes. He could focus on research full time as science 'shielded' him from family commitments with his wife taking care of all domestic matters. In fact, he had not gone to a shop or bank for 30 years. "I did not want to exchange my position as professor in IISc with any other position in the world," he writes adding "I could have become the first director of International Centre for Genetic Engineering and Biotechnology (in New Delhi) or secretary of Department of Biotechnology at some point of time if I had wanted to. I would rather dig the earth than reach the stars", a metaphor that incidentally is the title for his memoir.

Srinandini K. R
YMB20113
4th semester
Int. MSc in Molecular Biology

Professor Panchanan Maheshwari:- Botanist

Panchanan Maheshwari (1904-1966)

Indian civilization is one of the oldest civilizations in the world. Vedic literature is regarded as the treasury of knowledge not only for India, but rather for the whole world. Many scientists or the Rishis of ancient time were born in the country from the Vedic to modern period. **Professor Panchanan Maheshwari** occupies an important place among those scientists. He was a great botanist. He enlightened the whole world by his discoveries in the field of plant science. Maheshwari is called as the **father of Indian Embryology**.

Prof. Panchanan Maheshwari was an eminent botanist specialising in plant embryology, morphology and anatomy, plant physiology and biochemistry. He was one of the leading plant biologists who established the technique of test-tube fertilization of angiosperms. This invention has allowed the creation of new hybrid plants that could not previously be crossbred naturally. Prof. Panchanan Maheshwari was born on 9th November, 1904 at Jaipur in the house of Shri Vijaypal who was in an ordinary clerical job.

Prof. Panchanan Maheshwari got his graduation degree from Ewing Christian College, Allahabad in 1925. Post graduate degree (M.Sc.) and the most prestigious degree, Doctor of Science (D.Sc.) were awarded to him in 1927 and 1931 respectively. Maheshwari came under the mentorship of Winfield Dudgeon, and changed his studies from medicine to science. Dudgeon taught him the basic techniques of plant morphology . He did MSc (1927) and DSc (1931) under Dudgeon's guidance.

In addition to his research achievements, Maheshwari was an educator and publisher. He joined Agra College, Agra in 1930 as a lecturer. He provided his service to Allahabad University from 1937 to 1939. During this period, he also joined Lucknow University, Lucknow as reader and H.O.D. In November, 1939, Prof. Panchanan Maheshwari joined Dhaka University, Dhaka as Head of the department of Botany.

Maheshwari founded the scientific journal Phyto-morphology (Plant Morphology) for which he served as chief editor until his death in 1966; and the more popular magazine Botanica. Prof. Maheshwari's book, '**An Introduction to the Embryology of Angiosperms**', published in

1950, is considered as a classic and is one of the most quoted biology texts. He also published another important book in botany "Recent Advances in Embryology of Angiosperms " in 1951. He is the author of the book ‘An illustrated Flora of Delhi’ - considered an excellent field guide for everyone

Maheshwari invented the technique of test-tube fertilization of angiosperms. This technique accelerated the rate of fertilization by eliminating the dormancy period of a seed. Many more flowering plants could now be crossbred.

Maheshwari’s early work include the development of gametophytes and embryo of *Boerhaavia diffusa* and causes of sterility in *Albizzia lebbek*. He reported a new type of tetrasporic , 16-nucleate embryo sac in Acalypha indica. He made a systematic and thorough study of the parasitic angiospermous families such as Loranthaceae and Santalaceae, which changed our understanding of their morphology, embryology and phylogeny. In addition to angiosperms, Maheshwari and his students studied other groups of plants such as mosses (*Physcometrium coorgens*) and gymnosperms (Pinus, Cedrus, Cupressus, Biota, Gnetum, etc).

Maheshwari has received many national and international recognitions. In 1931, Prof. Panchanan Maheshwari was awarded D.Sc. By Allahabad University. Prof. Maheshwari was elected as the President of Indian Botanical Society (IBS). The most prestigious institute at London, "The Royal Society" honoured Prof. Panchanan Maheshwari as the Fellow of Royal Society (FRS) in 1965. Prof. Panchanan Maheshwari was the second (after Sir J.C. Bose) to be honoured as FRS. Prof. Panchanan Maheshwari was awarded Birbal Sahani Medal by the Indian Botanical Society (IBS) in 1959. He was selected as the President of the National Academy of Sciences in 1963. Prof. Maheshwari demised on 18th April 1966.

Hence Maheshwari had an amazing personal qualities and a photographic memory. He was unconventional and had boundless energy. He was an outstanding scholar and teacher whose motto was ‘Work is worship’. He inspired many students to carry out research with low-cost, improvised apparatus.

Preethi K
YMB20109
4th Semester
Int. MSc in Molecular Biology

Professor Shubha Tole:- Neuroscientist

Prof Shubha Tole (1967)

Shubha Tole is an Indian neuroscientist, Professor and Principal Investigator at the Tata Institute of Fundamental Research in Mumbai, India. Her research involves investigating the development and evolution of the mammalian brain, and she has won many accolades for her work. She is known for having discovered a gene that is crucial to the proper formation of the hippocampus, amygdala , and cortex of the brain, winning the Infosys Prize in the Life Sciences category in 2014.

Tole was born on August 1967 in India. Her mother Aruna P.Tole was an occupational therapist who was responsible for the design of prostheses, aids, and appliances for cancer patients. Her father was the director of SAMEER, an Institute under the Department of Electronics, Government of India, in August 1967. After a basic education, Tole decided to go on to study life sciences and biochemistry at St. Xavier's College in Mumbai instead of pursuing medical school. Tole earned her master's and doctorate degrees at the California Institute of Technology in the US. Following the completion of her academic degrees, Tole decided to pursue post-doctoral research at the University of Chicago. In 1999, after spending more than a decade on her education in the US, Tole moved back to India and began to work at the Tata Institute of Fundamental Research. Her work involves the investigation of how the developing brain comes to be and she has published many papers and written many blogs targeted at younger audiences.

After earning her PhD, Tole sought out a Post-DOC position, finding a position studying the development of the mammalian brain at the University of Chicago. While she was doing work that interested her, she and her husband both wanted to bring their type of work to their mother country, India. After moving back to India with her husband in 1999, Tole took the next few years to set up her lab.

As she was setting up her lab in India, she began to face many problems. However, these obstacles were met and overcome, and Tole had her lab's first publication in 2000. Many publications followed in the years to come, and she currently has over 40 publications today.

She has been working to elucidate the mechanisms behind the development and diseases of certain brain structures. Her most significant contribution to the scientific world was her discovery of the regulatory gene, LHX2, that controls some aspects of how the amygdala, cortex, and the hippocampus form during early development. This gene, LHX2, is a LIM homeobox gene, and when it is deleted at early embryonic stages in rodents, the cerebral cortex itself does not form. If deleted later in development, then specific parts of the cortex such as the sensory barrels, do not form. Dr. Tole also proposed a possible mechanism for how the neo cortex may have come to be in mammals, linking it to a much older structure of the brain, the amygdala. Other discoveries of hers include finding dual developmental origins for structures that control reproductive and aggressive behaviour in the accessory olfactory bulb in mammals.

While Tole is primarily a neuroscientist, she is also an active member of a community of scientists who reach out to students to guide them in their respective fields and help to foster love for their subjects. She posts articles on www.indiabioscience.org that are aimed at a younger audience, and has many pre and post-doctoral candidates that she is mentoring.

In addition to researching and mentoring, Tole has also held a membership with academic groups such as the International Affairs Committee of the American Society for Cell Biology. She is also a Fellow of the National Academy of Sciences, India and the Indian Academy of Sciences.

Tole has received many grants and awards for her work. Some of the major accolades include :

- The Welcome Trust Senior International Fellowship (1999)
- The Swarnajayanti Fellowship from the Department of Science and Technology of the Government of India (2005)
- The National Woman Bio scientist award from the Department of Biotechnology of Government of India (2008),
- The Research Award for Innovation in Neurosciences (RAIN award) from the Society for Neuroscience, United States (2008)
- The Shanti Swarup Bhatnagar Award (2010).
- She was also awarded the Welcome Trust Flexible Travel Award grant by Stanford University for a Sabbatical year in 2008, which she took with her family.

  In 2014, Tole was awarded the Infosys Prize of 55 lakh rupees for her work done to elucidate the mechanisms and genes that are involved in the formation of the hippocampus.

Digna Mary Francis
YMB20104
4th Semester
Int. MSc Molecular biology

Professor T Govindaraju:- Prof in Bioorganic chemistry

Prof T Govindaraju (1976)

T Govindaraju has made significant contributions in the medical field. He is a Professor in the Bioorganic Chemistry Laboratory at Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangaluru. Bioorganic chemistry uses chemical methods in the study of biological processes. The researchers in the Bioorganic Chemistry Laboratory work in areas which lie at the intersection of chemistry, biology and biomaterials science, and in particular, on problems related to Alzheimer's disease, peptide chemistry, molecular probes, molecular architectonics, nano architectonics and biomimetics.

Prof. Govindaraju is from a remote village in Karnataka. As a school boy, he saw that mentally ill patients were treated cruelly .This image guided him to choose his area of research. He secured his MSC degree from Bangalore University in 2000 and PhD from CSIR-NCL. He then did post-doctoral research in the U.S and Germany.

His research was on neurodegenerative diseases and cancer.

Neurodegenerative diseases occur when cells in the central nervous system stop working.

One of the dangerous neurodegenerative disorder is Alzheimer’s disease. This occurs when the brain becomes small and the brain cells die.

Prof. Govindaraju and his team discovered a new molecule -**TGR63** which could be the future drug to treat Alzheimer disease. A Delhi based pharma company has obtained the rights to do its trial runs.

Prof .Govindaraju found the similarities between Alzheimer’s disease and cancer and this led to the discovery of **TGP 18** , another molecule-based drug. This could be used to treat lung cancer.

He was a Humboldt research fellow in Germany and a Visiting faculty at the University of Paris, France. He is also keen on raising the standards of rural schools and has been a part of outreach initiatives. He is also into bringing awareness about mental illness among school children in Karnataka and other states.

The honours and awards conferred on Prof. Govindaraju include:

- 2021 **Shanti Swarup Bhatnagar Prize** for chemical sciences.
- 2021 Fellow of **Royal Society of Chemistry** (London)
- 2019 CDRI Award for Excellence in Drug Research, CSIR-Central Drug Research Institute, Lucknow, India
- 2017 IPS-Young Scientist Award (2017), Indian Peptide Society
- 2017 MRSI Medal (2017), Materials Research Society of India
- **2016 SwarnaJayanti Fellowship (2015-2016), the Department of Science and Technology**, Govt of India
- 2015 Sir C V Raman Young Scientist Award (2014), Govt of Karnataka
- 2015 CRSI Bronze Medal, Chemical Research Society of India (CRSI) for the year 2016
- 2011 INSA Medal for Young Scientist (2011): **Indian National Science Academy,** New Delhi
- 2011 Innovative Young Biotechnologist Award: **Department of Biotechnology,** Ministry of Science and Technology, Govt of India

Srinandini K. R
YMB20113
4th semester
Int. MSc in Molecular Biology

Puspha Mittra Bharghava: Biologist

Pushpa Mittra Bhargava (1928-2017)

Pushpa Mittra Bharghava was an Indian scientist, writer and Administrator. He founded the centre for Cellular and Molecular Biology, a federal funded research institute, in Hyderabad. He was outspoken and highly influential in the development of scientific temper in India, and argued that scientific rationalism needed to be cultivated as a civic duty.

After completing PHD at Lucknow university, Bhargava moved to Hyderabad. He worked first at the central Laboratories for Scientific and Industrial Research, and then at the Osmania university, both at Hyderabad. In 1953, he went to US on a post -doc fellowship in the Mc Ardle Memorial Laboratory of Cancer Research, University of Wisconsin ,Madison(US), working in the laboratory of Charles Heidalberge. During 1956-57, he worked at National Institute for Medical Research, UK, as a special Welcome Trust Research Fellow and made a transition from chemistry to Biology. In 1958, he returned to Hyderabad and joined the same central Laboratories for Scientific and Industrial Research which was by now taken over by Council Research and Industrial Research(CSIR) and named Regional Research laboratory at Scientist B.

Bhargav set up the centre of Cellular and Molecular Biology(CCMB) in Hyderabad, Telagana. CCMB is a research organization in areas of Modern Biology. It was set up initially as a semi-autonomous centre on 1 April 1977, with the Biochemistry division of the then Regional Research Laboratory, Hyderabad forming its nucleus and Bhargav heading the new centre. During 1981-82, CCMB was accorded the status of a fall-fledged national laboratory with its own ExecutiveCommittee and Scientific AdvisoryCouncil.

Rationalism and Science Popularisation.

Bhargava has long been involved in the promotion of science and rationality and opposing superstition. He has been associated with the Association of Scientific workers in India(ASWI) which was established in 1946 as a trade union of sciences, one of the main objective of which was to develop scientific temper, incorporated as a fundamental duty of the citizens of India, in the 42nd constitutional amendment in 1976. He was one of the key architects of the widely known **'Statement on Scientific temper'** issued jointly by a group of liberal, committed and rational high achievers of the country. The statement issued in 1981, has not only been debated and discussed in several forums, but continues to be referred to in writings and speeches even today. Bhargava died on 1August 2017, aged 89 at Hyderabad India.

Sharoon Samuel R

Sanjeev Das:- Cancer biologist

Sanjeev Das (1976)

Sanjeev das was bornon 27th August 1976, is an Indian cancer biologist and a scientist at National Institute of Immunology, New Delhi, India. He is well regarded for his studies on tumor suppressor proteins. He is a recipient of the National BioscienceAward for Carrier development of the Department of Biotechnology. The council of scientific and Industrial research, the apex agency of the Government of India for scientific research, awarded him the Shanthi Swaroop Bhatnagar Prize for Science and Technology, one of the highest Indian Science awards, for his contributions to biological sciences in 2017.

The research of Sanjeev Das has been focusing on the various aspects of cancer biology which is reported to have assisted in windering the understanding of the functioning of P53 and sirtuins. He is also involved in research on tumor suppressor proteins, tumor cell metabolism and tumorigenesis, especially the impact of regulatory networks and metabolic processes. His studies have been documented by way of a number of research articles in peer reviewed journals.

Das received the NASI-SCOPUS Young scientist award jointly awarded by the National Academy of Sciences, India and Elsevier in 2014 and the National Bioscience Award for Career Development of the Biotechnology 2015. The Indian Council of Medical Research awarded him the Shakuntala Amir Chand Prize in 2016 and he received the Prof. Umakant Sinha Award of the Indian Science. The award orations delivered by him include the 2016 edition of the Prof. B.K. Bachhawlal Memorial Young Scientist Lecture of the National academy of Sciences,India.

-Sharoon Samuel R
BSc 2nd year , BMBt

Satish Amaranth:-Medical Microbiologist

Satish Amarnath (1955)

Satish Amarnath is a Medical Microbiologist associated with Manipal Hospitals. He works as the Coordinator for distance eduction in Allied and Science, Quality Management Representative for Manipal for the ISO certification, Advisor in Microbiology and chairman of the Manipal Infection Control Commitee.He is acclamied for his passion for his work despite having zero vision.

Amarnath was brought up in Bengaluru hemarried to Jyotsna and the couple have a daughter and a son. On 5 September 1998, two unidentified people threw sulfuric acid on his face as he stepped out of a tailor shop. The incident burnt his face and blinded him for life.. Fight reconstructive surgeries were performed on his face. Despite the harrowing experience, he was back to with on the 40th day of the incident.

Professional life:

After finishing his JOSE exams Amarnath enrolled for BSc in Botany and Zoology, St Joseph's college. After that he studied MBBS from Karnataka Medical College where he met his future wife Jyotsna. Amarnath went on to do this MD in Microbiology in 1983. Then he Joined JIPMER (Jawaharlal Institute of Postgraduate Medical & Research) as a president doctor and later became an associate profert. He returned to Bengaluru in 1996 to join Manipal hospitals as a Consultant Microbiologist.

Achievements:

Amarnath headed the digitization of medical and patients records in JIPMER. He published 2 scientific papers while he was in JIPMER After the less of vision, Amarnath helped Manipal Hospitals in implementing ISO 9001-2000 for quality procedures. He wrote two books and published. Several books after his vision loss.

Sharoon
Samuel R
BSc 2nd year,BMBt

Srinivasa Ramanujan Aiyangar :Mathematician

Ramanujan(1887-1920)

Srinivasa Ramanujan Aiyangar was one of the greatest mathematicians the world has ever seen. Born to a poor family in Madras on 22 December 1887, Ramanujan had almost no formal training or schooling. The only education he got was all about the traditions and rituals, vedas and puranas from his mother. Yet his contribution to mathematics especially in the field of continued fractions, number theory and infinite series is remarkable.

The child prodigy started gaining interest in mathematics when he first studied the book on advanced trigonometry by S.L. Loney and 'A Synopsis of Elementary Results in Pure and Applied Mathematics' by G.S. Carr. Influenced by the latter, Ramanujan started writing his own theorems which could not be analysed and understood by many of the mathematicians. It is also known that Ramanujan used to write his thesis on the walls and floor of Namagiri temple. With no formal schooling and related proofs all his theories were disregarded.

At this point he had no option left but to submit his research papers to a foreign mathematician and so did he. He sent some of his works to G.H. Hardy, a renowned mathematician of England. Impressed by his works Hardy welcomed Ramanujan to England and offered him a seat at the prestigious Trinity College. Along with his studies Ramanujan joined hands with Hardy and Littlewood in research and to provide proofs for his theorems. Many of his theorems were then published through G.H. Hardy.

The mathematical genius once said, "An equation for me has no meaning unless it expresses itself as a thought of God". He viewed the almighty and mathematics as the two faces of the same coin. Ramanujan's books are still kept at the library of University of Cambridge alongside Newton's Principia Mathematica and other prominent works by some of the greatest scientists and mathematicians.

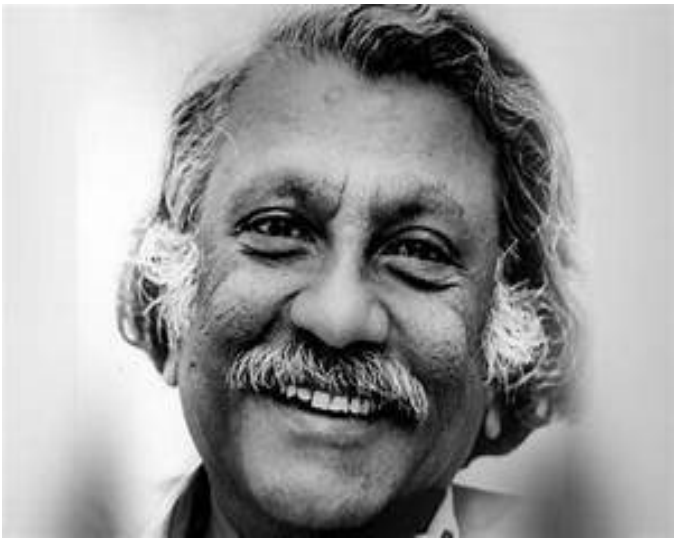
Ramanujan was bed ridden due to an unusual hazard. Amidst his illness he continued his work and published his works with proofs. He became the second and the youngest Indian to be elected as the Fellow of Royal Society and the first Indian to be elected as Fellow of Trinity College, Cambridge. He had an untimely death on 26 April 1920 at a young age of 32 and his unpublished works were left behind without their architect.

Presently, Ramanujan's birthday is celebrated as ‘National Mathematics Day’ by the Government of India and 'State IT Day’ by the Government of Tamilnadu. Stamps picturing Ramanujan were issued by the Government of India honoring the mathematician. Many colleges and universities conduct programmes named after Ramanujan.

Achal P Mayya

2nd year BSc (PMCs)

Venkataraman Radhakrishnan:- Physicist



Venkataraman Radhakrishnan (1929-2011)

He was born on 19th May 1929 in Tondiarpet, a suburb of Madras, to Nobel laureate physicist Sir Chandrashekara Venkata Raman and his wife Lokasundari Ammal. His early schooling was in madras. He graduated from Mysore University in 1950 with a BSc in Physics , from Amsterdam University conferred an honorary doctorate on him in 1996. He subsequently served as a research scholar at the IISC,Bangalore before a brief stint with British Acoustic Films,a UK company involved in scientific research into audio and video with the objective of developing better film equipment.

In 1955, aged 26, he took up a research assistant's position at Chalmers Institute of Technology in Sweden, where he focussed on the observation and measurement of neutral hydrogen in interstellar space. In 1958, he moved further West to the California Institute of Technology (Caltech), where he served as a senior research fellow. At Caltech, he worked on the Owens Valley Radio Observatory, focusing on the polarisation of radio waves and radio interferometry.He and his team were the first to calculate the magnetic field of Jupiter, caused by the rotation of its interior, from the radio signals emitted by the planet.He also worked on understanding atomic hydrogen in the Milky Way.

In 1965, he moved to the Commonwealth Scientific and Industrial Research Organisation (CSIRO) division of Radio Physics in Sydney, Australia. At the Parkes Observatory, he was involved in a nascent but big project that studied hydrogen in the universe to understand the interstellar medium.He and his collaborators also studied a pulsar called Vela. Pulsars are magnetic rotating neutron stars that emit electromagnetic radiation in pulses.In the late

1960s, pulsars had just been discovered and his work contributed to establishing that they were magnetically charged, thus leading to a better understanding of neutron stars.He carried out detailed surveys on the intergalactic space map, besides studying a huge variety of pulsars.His comprehensive work made him one of the world's leading experts on pulsars who established a solid foundation for their study.After Raman died in 1970, Raman Research Institute, Bengaluru, which he founded to continue his research after his retirement, invited him to help shape it.

He joined as director in 1972, and, under his leadership, RRI made rapid strides in building a reputation for scientific research, especially in his own field, radio astronomy, as well as liquid crystals, the area of interest for another scientist cousin, Sivaramakrishna Chandrasekhar.His legacy in RRI was to break barriers, inculcate an open and free atmosphere, encourage collaboration, and set up necessary infrastructure, especially to stop the separation of theoretical and experimental physics.He collaborated with other institutes and brought RRI to the forefront in radio astronomy.He was involved in creating the Giant Metrewave Radio Telescope (GMRT) at Pune, with important components built at RRI itself. He worked with the radio telescope at Ooty, and collaborated with the Indian Institute of Astrophysics, Bengaluru, to build the Gauribidanur (Karnataka) and Mauritius radio observatories.He stepped down from his directorship at RRI in 1994, but stayed on as professor emeritus until his death in 2011.He served on various national and international science committees as well, including a stint (1988-1994) as vice-president of the International Astronomical Union (IAU), a group of professional astronomers from around the world, and was also a foreign fellow of the US National Academy of Sciences and the Royal Swedish Academy.Growing up, he was deeply fascinated by devices and vehicles, and enthusiastic about the design and materials of boats and aircraft.

He loved sailing — while moving to Australia in 1964-65, he famously sailed from the UK, across the Atlantic and Pacific oceans, to Sydney, where immigration officers reportedly "refused to believe him".In October 2010, he announced plans to circumnavigate the world solo on a catamaran he had designed, named 'El da mer' in a nod to wife Francoise-Dominique Barnard's French roots.

Radhakrishnan worked in the Raman Research Institute. He was instrumental and closely involved with the construction of the 10.4 meter millimeter wave radio antenna in the Institute which has been used to study various astrophysical phenomena producing original contributions in pulsar astronomy as well as recombination line studies of the interstellar medium.

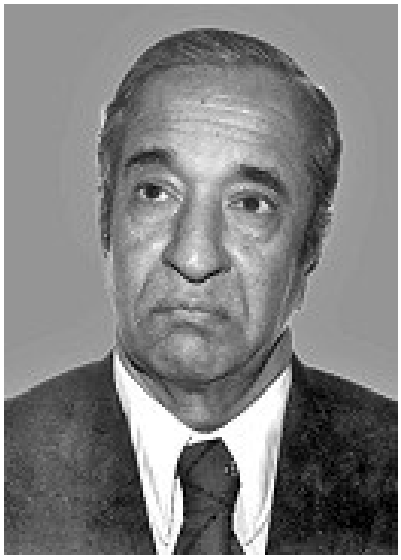
He made important contributions in various other areas. Deuterium abundance in the galaxy, Astrophysical Raman Masers, OH emission from clouds, and later on the building of the low-frequency telescopes at Gauribidanur and Mauritius were some of the hallmarks of his career.

He was invited to deliver the Milne Lecture in Oxford in 1987, and also gave the Jansky Lecture in 2000.

He was the member of International Astronomical Union (IAU) and served on many of its committees, including Division VI Commission 34 on *Interstellar Matter*, Division X Commission 40 on *Radio Astronomy*, Division XI Commission 44 *Space & High Energy Astrophysics*, Division VI *Interstellar Matter*, Division X *Radio Astronomy*, and Division IX *Space & High Energy Astrophysics*.

He passed away due to cardiac complications, two months before his 83rd birthday, on 3 March 2011.

Mandayam Jeersannidhi Thirumalachar:-Microbiologist



Mandayam Jeersannidhi Thirumalachar(1914-1999)

He was born in Bangalore on 22 September 1914. He was an Indian mycologist, microbiologist, plant pathologist and the co-founder of. After early schooling in Malleshwmaram, a neighbourhood of Bengaluru, he graduated from Central College, Bangalore before earning a Doctor of Science from the University of Mysore in 1944 and moved to the University of Wisconsin from where he secured a PhD in 1948 working under the supervision of James G. Dickson. On his return to India, he served at Banaras Hindu University as the head of the department of Mycology and Plant Pathology and at the Central College of Bangalore. Subsequently, he joined Central Potato Research Institute, Patna as the Chief Plant Pathologist but moved to Hindustan Antibiotics Limited (HAL) where he headed the R and D division. He served out his regular career at HAL, superannuating as the superintendent of research in 1975. Later, he returned to the US and served as a professor at the Department of Paediatrics of University of Minnesota Medical School where he worked on the incorporation of human insulin gene in yeast cells and also had a short stint as a visiting scientist at the Danish Institute of Seed Pathology, Copenhagen. In 1979, he founded Jeersannidhi Anderson Institute, along with his son, M. J. Narasimhan Jr., for advanced research in mycology and plant pathology and was the director of the institute till the end of his life.

He was an Indian mycologist, microbiologist, plant pathologist and the co-founder of. Jeersannidhi-Anderson Institute, California. He was the head of R&D at Hindustan Antibiotics Limited and a professor at Banaras Hindu University as well as the Central College of Bangalore. He was known for the development of antifungal antibiotics such as Hamycin, Dermostatin, Aureofungin, MYc-4 and Tetraenenin and was an elected fellow of the Indian National Science Academy. The Council of Scientific and Industrial Research, the apex agency of the Government of India for scientific research, awarded him the Shanti Swarup Bhatnagar

Prize for Science and Technology, one of the highest Indian science awards for his contributions to Medical Sciences in 1967.

Thirumalachar has placed his footprints firmly on the sands of time. His contributions were connected with monographing the rusts published jointly with BB Mundkar Narasimhanaia and Franzpetrakia along with Pavgi and Georgefisheria. Erecting Sclerophthora as a new genus of Downy Mildew for the destructive crazy top of corn and other graminaceous hosts, establishing the morphological basis of cultural studies and the studies on the life cycle of an edible rust causing malformation on *Acacia eburnean* and identifying it as *Revenlia esculenta* rediscovered sixty years after Barclay had described *Aecidium esculentum* from Maharashtra are just a few examples of his notable contributions to mycology. He described 20 new genera and 200 new species of fungi and actinomycetes. He was an inspiring teacher and had the knack of spotting unusual specimens during field collections.

During his days at Hindustan Antibiotics Limited, Thirumalachar focused on medical mycology and plant disease control. As the head of the research and development division, he led a team of scientists who developed a number of antibiotic preparations, including Antiamoebin of *Emericellopsis sp*, an antimicrobial polypeptide that has reported use as a carrier, as a pore-forming peptaibol, as a de-worming agent. He also mentored many students and B. G. L. Swamy was one among them.

Thirumalachar was one of the founders of Mycological Society of India, served as its first vice president and was a lifetime member of the society. He founded *Hindustan Antibiotics Bulletin*, the official journal of Hindustan Antibiotics Limited and was its first editor and publisher. He was the president of the Indian Phytopathological Society in 1956 and was the chief editor of *Indian Phytopathology and Applied Microbiology*, the official journal of the Society, in 1957. He was also involved with the *International Journal of Antibiotics* as a member of its editorial board and served on the council of the Indian National Science Academy during 1969–71. He was a member of the Mycological Society of America as well as Indian Microbiological Society and chaired the Agricultural section of the 37th Indian Science Congress held in Pune in 1950

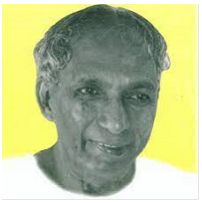
The Indian National Science Academy elected Thirumalachar as their fellow in 1956; INSA honored him again in 1967 with Sunder Lal Hora Medal. The Council of Scientific and Industrial Research awarded him Shanti Swarup Bhatnagar Prize, one of the highest Indian science awards the same year. He was also an elected fellow of Indian Phyto pathological Society, New York Academy of Sciences and Mycological Society of India and a recipient of the Polish Academy of Sciences Medal. A number of scientists have acknowledged his contributions to science. The Indian Institute of Science organizes an annual lecture, *M J Thirumalachar & M J Narasimhan Endowment Lecture* in his honor and the Mycological Society of India has instituted an award, *Dr. M.J. Thirumalachar Merit Awards for Young Scientists,* for promoting research excellence in mycology.

Professor MJT started his career as a teacher and subsequently became a researcher. He passed away on the 21st of April 1999. ‘The world of Biological Sciences has lost a veteran

researcher of over 60 years whose original contributions embraced a wide spectrum of scientific disciplines like botany, mycology, antibiotic fermentation and chemotherapy of human, animal and plant infections. Best known as an outstanding mycologist of International standing his contribution to the study of Indian fungi has been outstanding. He has inspired younger generations to develop interest towards basic biological science and in particular, mycology and microbiology.

-Neha Mehak

3rd year BSc, CBM



ಶ್ರೀ. ಬಿ.ಜಿ.ಎಲ್ ಸ್ವಾಮಿ : ಜೀವನ ಪರಿಚಯ

ಪ್ರಸಕ್ತ ಸಮಕಾಲೀನ ಜಗತ್ತು ನಮ್ಮ ಹಿಂದಿನ ಪರಿಸ್ಥಿತಿಗಳಿಗೆ ಹೋಲಿಸಿದರೆ ಬಹುವೇಗವಾಗಿ ಬದಲಾಗಿದೆ. ಮಂದವಾಗಿ ಸಾಗುತ್ತಿದ್ದ ನಮ್ಮ ಜೀವನಗತಿಗೆ ಸಾಕಷ್ಟು ವೇಗ ಸಿಕ್ಕಿದೆ. ಇದಕ್ಕೆಲ್ಲಾ ಕಾರಣ ಹುಡುಕಿದಾಗ, ವೈಜ್ಞಾನಿಕ ಕ್ಷೇತ್ರದಲ್ಲಿ ನಡೆದಿರುವ, ನಡೆಯುತ್ತಿರುವ ಅಸಂಖ್ಯ ಅನ್ವೇಷಣೆ, ಸಂಶೋಧನೆಗಳು ಈ ಎಲ್ಲಾ ಬದಲಾವಣೆಗಳಿಗೆ ಮೂಲ ಎಂದರೆ ಅತಿಶಯೋಕ್ತಿಯಾಗಲಾರದು. ಈ ಎಲ್ಲಾ ಸಾಧನೆಗಳ ಹಿಂದೆ ವಿಶ್ವಾದ್ಯಂತ ಸಾವಿರಾರು ವಿಜ್ಞಾನಿಗಳ ಅವಿರತ ಪರಿಶ್ರಮ ಹಾಗೂ ಅಖಂಡ ಜ್ಞಾನದ ತಳಹದಿ ಇದೆ. ಜಗತ್ತಿನ ಶ್ರೇಷ್ಠ ವಿಜ್ಞಾನಿಗಳ ಅಂಕಿ ಅಂಶಗಳನ್ನು ಗಮನಿಸಿದಾಗ, ಪಾಶ್ಚಾತ್ಯ ರಾಷ್ಟ್ರಗಳಿಗೆ ಹೊಲಿಸಿದರೆ ಭಾರತದಲ್ಲಿ ವಿಜ್ಞಾನಿಗಳ ಸಂಖ್ಯೆ ಕಡಿಮೆಯೇ. ಇದಕ್ಕೆ ನಮ್ಮ ಸಾಮಾಜಿಕ ಮನಸ್ಥಿತಿ, ಉತ್ತಮ ಸೌಕರ್ಯಗಳ ಕೊರತೆ ಅಥವಾ ಇನ್ನೂ ಇತರೆ ಕಾರಣಗಳಿರಬಹುದು. ಆದರೂ, ತಮ್ಮ ಅವಿರತ ಪರಿಶ್ರಮದಿಂದ, ಅಪಾರ ಶ್ರದ್ಧೆ, ಜ್ಞಾನಗಳಿಂದ ಹಾಗೂ ತಮ್ಮ ಅದ್ಭುತ ಸಾಧನೆಗಳಿಂದ ಜಗತ್ತಿನ ಶ್ರೇಷ್ಠ ವಿಜ್ಞಾನಿಗಳ ಸಾಲಿನಲ್ಲಿ ಸ್ಥಾನ ಪಡೆದಿರುವ ಹಲವಾರು ವಿಜ್ಞಾನಿಗಳನ್ನು ಭಾರತ ಕಂಡಿದೆ ಮತ್ತು ತನ್ನ ಇತಿಹಾಸದಲ್ಲಿ ಗೌರವದ ಸ್ಥಾನ ನೀಡಿದೆ. ಅಂಥ ವಿಜ್ಞಾನಿಗಳ ನಡುವೆ ಜೀವ ವಿಜ್ಞಾನ ವಲಯದಲ್ಲಿ ಪ್ರಥಮ ಸಾಲಿನಲ್ಲಿ ನಿಲ್ಲಬಲ್ಲವರು ಭಾರತದವರು ಅದರಲ್ಲೂ ಕನ್ನಡ ನಾಡಿನವರೇ ಆದ ನಮ್ಮ ಬಿ.ಜಿ.ಎಲ್. ಸ್ವಾಮಿಯವರು.

ಸ್ವಾಮಿ ಅವರದ್ದು ಒಂದು ವಿಶಿಷ್ಠವಾದ ವ್ಯಕ್ತಿತ್ವ. ಅವರ ಜೀವನವು ಬರವಣಿಗೆಗೆ ನಿಲುಕದಷ್ಟು ದೊಡ್ಡ ಸಾಧನೆಗಳ, ವಿಭಿನ್ನತೆಯ ಮಹಾಪೂರ. ಬಿ.ಜಿ.ಎಲ್. ಸ್ವಾಮಿ ಎಂದ ತಕ್ಷಣ ಬಿಳಿವಸ್ತ್ರ, ಪಂಚೆ ಅಥವಾ ಪೈಜಾಮ ತೊಟ್ಟ ಬಾಯಲ್ಲಿ ಸಿಗಾರ್ ಪೈಪ್ ಸೇದುತ್ತಿರುವ ಹಸನ್ಮುಖಿ ವ್ಯಕ್ತಿಯೊಬ್ಬರನ್ನು ನಾವು ಕಾಣಬಹುದು. ಅವರನ್ನು ಸಸ್ಯಶಾಸ್ತ್ರಕ್ಕಷ್ಟೇ ಸೀಮಿತವಾಗಿ ನೋಡುವುದು ಅಸಾಧ್ಯ. ಅವರದ್ದೊಂದು ಬಹುಮುಖೀ ವ್ಯಕ್ತಿತ್ವ. ವೃತ್ತಿಯಿಂದ ಸಸ್ಯಶಾಸ್ತ್ರ ಪ್ರಾದ್ಯಾಪಕರಾದರೂ, ಪ್ರೌವೃತ್ತಿಯಿಂದ ಅವರೊಬ್ಬ ವಿದ್ವಾಂಸ, ಚಿಂತನಶೀಲ ಬರಹಗಾರ, ಸಾಹಿತಯಾಗಿದ್ದರು. ಇತಿಹಾಸ, ಚಿತ್ರಕಲೆ, ಸಂಗೀತ, ತತ್ವಶಾಸ್ತ್ರ ಮುಂತಾದ ಅವರಿಗೆ ಸಂಬಂಧಪಡದ ವಲಯಗಳಲ್ಲಿಯೂ ಬಹುವಾದ ಆಸಕ್ತಿ ಹೊಂದಿ ಆಳವಾಗಿ ಅಧ್ಯಯನ ನಡೆಸಿದ್ದರು. ಮಹನೀಯರು ಕನ್ನಡ, ತಮಿಳು, ತೆಲುಗು, ಮಲಯಾಳಂ, ಇಂಗ್ಲಿಷ್, ಫ್ರೆಂಚ್, ಜರ್ಮನ್ ಸೇರಿದಂತೆ 9 ಕ್ಕೂ ಹೆಚ್ಚು ಭಾಷೆಗಳನ್ನು ಬಲ್ಲವರಾಗಿದ್ದರು. ಎಷ್ಟೋ ಬಾರಿ ತಮ್ಮ ಸಂಶೋಧನೆಗೆ ಬೇಕಾದ ಉಪಕರಣಗಳಿಗಾಗಿ ಬಡಗಿ ಕೆಲಸವನ್ನು ಮಾಡುತ್ತಿದ್ದರು. ಅಂದಿನ ದಿನಗಳಲ್ಲಿ ಹಿಂದೂ ದಿನಪತ್ರಿಕೆಯಲ್ಲಿ ಇವರ ಎಷ್ಟೋ ಸಂಗೀತ ವಿಮರ್ಶಾ ಲೇಖನಗಳು ಪ್ರಕಟವಾಗಿವೆ. ಹಾಸ್ಯ ಅವರ ವ್ಯಕ್ತಿತ್ವದ ಪ್ರಧಾನ ಗುಣಲಕ್ಷಣ.

ಜೀವನ – ವಿದ್ಯಾಭ್ಯಾಸ, ಸಾಧನೆ:–

ಡಾ. ಬೆಂಗಳೂರು ಗುಂಡಪ್ಪ ಲಕ್ಷ್ಮೀನಾರಾಯಣಸ್ವಾಮಿ, ಸರಳವಾಗಿ ಬಿ.ಜಿ.ಎಲ್. ಸ್ವಾಮಿ ಎಂದೇ ಪ್ರಖ್ಯಾತರಾಗಿದ್ದ ಇವರು 1916 ರ ಫೆಬ್ರವರಿ 5 ರಂದು ಕರುನಾಡು ಕಂಡ ಶ್ರೇಷ್ಠ ದಾರ್ಶನಿಕ ಕವಿ ಡಿ.ವಿ.ಗುಂಡಪ್ಪ ಮತ್ತು ಭಾಗೀರಥಮ್ಮ ದಂಪತಿಗಳಿಗೆ ಜನಿಸಿದರು. ಹಿನ್ನೆಲೆಯಲ್ಲಿ ತಂದೆಯವರ ದೊಡ್ಡ ಹೆಸರಿದ್ದರೂ ತಮ್ಮದೇ ದಾರಿಯಲ್ಲಿ ಸಾಗಿ ತಮ್ಮ ಸ್ವಂತ ವ್ಯಕ್ತಿತ್ವವನ್ನು ರೂಪಿಸಿಕೊಂಡರು. ತಮ್ಮ ಪ್ರೌಢಶಿಕ್ಷಣದವರೆಗಿನ ವಿದ್ಯಾಭ್ಯಾಸವನ್ನು ನ್ಯಾಷನಲ್ ಹೈಸ್ಕೂಲ್‌ನಲ್ಲಿ ಮುಗಿಸಿದ ಸ್ವಾಮಿಯವರು ನಂತರ ಬೆಂಗಳೂರಿನ ಸೆಂಟ್ರಲ್ ಕಾಲೇಜಿನಿಂದ 1939 ರಲ್ಲಿ

ಶ್ರೀ. ಬಿ.ಜಿ.ಎಲ್ ಸ್ವಾಮಿ : ಜೀವನ ಪರಿಚಯ

ಸಸ್ಯಶಾಸ್ತ್ರದಲ್ಲಿ ಬಿ.ಎಸ್.ಸಿ ಹಾನರ್ಸ್ ಪದವಿ ಪಡೆದುಕೊಂಡರು. ತದನಂತರ ಟಾಟಾದವರ ಐಐಎಸ್‌ಸಿ ನಲ್ಲಿ ಒಂದು ಯೋಜನೆಯ ಮೇಲೆ ಕೆಲಸ ಮಾಡಿ ಬಯೋಕೆಮಿಸ್ಟ್ರಿಯ ಮೇಲೆ ಹಲವು ಲೇಖನಗಳನ್ನು ರಚಿಸಿದರು. ಕೆಲವು ಕಾಲ ಐ.ಐ.ಎಸ್.ಸಿ. ಪಕ್ಕದಲ್ಲೇ ಇದ್ದ ಇನ್ಸ್‌ಟಿಟ್ಯೂಟ್ ಆಫ್ ವುಡ್‌ಸೈನ್ಸ್‌ನಲ್ಲಿ (Institute of Wood Science) ಸಂಶೋಧನೆ ನಡೆಸಿದರು.

ಮುಂದಿನ ದಿನಗಳಲ್ಲಿ ಪಿಎಚ್.ಡಿ. ಪಡೆಯಲು ಅನುಕೂಲಕರ ಆರ್ಥಿಕ ಪರಿಸ್ಥಿತಿ ಇಲ್ಲದಿರುವುದನ್ನು ಗಮನಿಸಿ, ಸ್ವತಃ ತಾವೇ ಕೆಲಸಕ್ಕೆ ಸೇರಿ ದುಡಿದು ಪಿಎಚ್.ಡಿ. ಪಡೆಯುವ ಇಂಗಿತವನ್ನು ಮನೆಯಲ್ಲಿ ವ್ಯಕ್ತಪಡಿಸಿದರು. ಆದರೆ ಕೊನೆಗೆ ತಂದೆ ಡಿ.ವಿ.ಜಿ ಯವರ ಸಲಹೆಯ ಮೇರೆಗೆ ಸ್ವತಃ ಸ್ವಾಮಿಯವರೇ ಮನೆಯಲ್ಲಿಯೇ ಒಂದು ಮೈಕ್ರೋಸ್ಕೊಪ್, ಮೈಕ್ರೋಟೋನ್ ಹಾಗೂ ಹಲವು ಸರಳ ಉಪಕರಣಗಳನ್ನು ಖರೀದಿಸಿ ಬಳಸಿಕೊಂಡು ಯಾವ ಮಾರ್ಗದರ್ಶಕರಿಲ್ಲದೇ ಅವರೇ ಸೀತಾಳೆ ಗಿಡದ ಭ್ರೂಣಗಳು (embryology of orchids) ಬಗ್ಗೆ ಸಂಶೋಧನೆ ನಡೆಸಿ ಕಡೆಗೆ ಮೈಸೂರು ವಿಶ್ವವಿದ್ಯಾಲಯದಿಂದ ಡಿ.ಎಸ್.ಸಿ. (D.Sc) ಪದವಿ ಪಡೆದರು. ಈ ವಿಷಯದಿಂದ ಅವರನ್ನು ಸಸ್ಯಶಾಸ್ತ್ರದ ಏಕಲವ್ಯ ಎಂದರು ತಪ್ಪಾಗಲಾರದು.

ಈ ಎಲ್ಲಾ ಸಾಧನೆಗಳನ್ನು ಗಮನಿಸಿ ಸ್ವಾಮಿ ಅವರಿಗೆ ಹಾರ್ವರ್ಡ್ (Howard) ವಿಶ್ವವಿದ್ಯಾನಿಲಯದಿಂದ ಮುಂದಿನ ಸಂಶೋಧನೆ ನಡೆಸಲು ಆಹ್ವಾನ ಬರುತ್ತದೆ. ಮುಂದೆ ಅಲ್ಲಿ ಅವರು ಪ್ರೊಫೆಸರ್ ಇರ್ವಿಂಗ್ ಬೈಲೀ (Prof. Irwin Bailey) ಅವರ ಬಳಿ ಸಂಶೋಧನೆಯಲ್ಲಿ ತೊಡಗುತ್ತಾರೆ. ತಮ್ಮ ಹಾರ್ವರ್ಡ್‌ನಲ್ಲಿನ ಸಮಯದಲ್ಲಿ ಅವರು ಹೊರಕವಚವಿಲ್ಲದ ಆಂಜಿಯೋಸ್ಪರ್ಮ್ (Vesseless Angiosperms) ಗಳ ಬಗ್ಗೆ ಕೆಲಸ ಮಾಡಿದರು. ಹೂ ಬಿಡದ ಗಿಡಗಳಿಂದ (gymnosperms) ಹೂ ಬಿಡುವ ಗಿಡಗಳು (Angiosperms) ಹೇಗೆ ವಿಕಾಸವಾದವು ಎಂಬುದರ ಮೇಲೆ ಇದ್ದ ಗೋತೆ (Gothe) ನ ಹೇಳೀಕೆಗಳನ್ನು ಸೂಕ್ತ ಪುರಾವೆ ಒದಗಿಸಿ ಸತ್ಯವೆಂದು ತಿಳಿಸಿಕೊಟ್ಟರು. ಅದಕ್ಕಾಗಿ ಅವರು ಗೊಮ್ಮಟೇಶ್ವರನ ಚಿತ್ರವನ್ನು ಉದಾಹರಣೆಯಾಗಿ ಬಳಸಿಕೊಂಡಿದ್ದರಂತೆ.

ಅಲ್ಲದೇ ಸಸ್ಯಗಳು ಬೇರಿನಿಂದ ನೀರು, ಪೋಷಕಾಂಶಗಳು ಹೀರಲ್ಪಟ್ಟು ವಿವಿಧ ಸಸ್ಯಭಾಗಗಳಿಗೆ ಸರಬರಾಜಾಗುವ ಕ್ರಿಯೆಯಲ್ಲಿ ಹಲವು ವಿಷಯಗಳನ್ನು ಕಂಡು ಹಿಡಿದರು. ಅಲ್ಲಿಯೇ 11 ವೈಜ್ಞಾನಿಕ ಪ್ರಬಂಧಗಳನ್ನು ಪ್ರಕಟಿಸಿದರು. ವಿಶೇಷವಾಗಿ 2 ಹೊಸ ಸಸ್ಯಗಳನ್ನು ಪತ್ತೆ ಮಾಡಿ ಗುರುತಿಸಿದರು. ಹಾಗೂ ಅವುಗಳಲ್ಲಿ ಒಂದಕ್ಕೆ ಆಸ್ಕಾರಿಯಾನ ಮಹೇಶ್ವರಿ (*Ascariana Maheshwari*) ಹಾಗೂ ಇನ್ನೊಂದಕ್ಕೆ ಸರಕಾಂಡ್ರ ಇರ್ವಿಂಗ್‌ಬೈಲಿ (*Saracanda Irwingbaily*) ಎಂದು ತಮ್ಮ ಇಬ್ಬರು ಗುರುಗಳ ಹೆಸರಿನಲ್ಲಿ ನಾಮಕರಣ ಮಾಡಿದರು. ಇದು ಅವರ ಗುರುಭಕ್ತಿಯ ಪ್ರತೀಕ. ಇದೇ ಸಂದರ್ಭದಲ್ಲಿ ಅಮೆರಿಕಾದ ಪ್ರಖ್ಯಾತ ವ್ಯಂಗ್ಯ ಚಿತ್ರಕಾರ ಚಿಕ್‌ಯಂಗ್ ಬಳಿ ವ್ಯಂಗ್ಯ ಚಿತ್ರಕಲೆಯನ್ನು ಕಲಿತರು.

ಶ್ರೀ. ಬಿ.ಜಿ.ಎಲ್ ಸ್ವಾಮಿ : ಜೀವನ ಪರಿಚಯ

ಹಾರ್ವರ್ಡ್‌ನಿಂದ ಹಿಂತಿರುಗಿ ಬಂದು ಅಂದಿನ ಮದರಾಸಿನ ಪ್ರೆಸಿಡೆನ್ಸಿ ಕಾಲೇಜಿನಲ್ಲಿ ಸಸ್ಯಶಾಸ್ತ್ರ ಪ್ರಾಧ್ಯಾಪಕರಾದರು. ನಂತರದಲ್ಲಿ ಸಸ್ಯಶಾಸ್ತ್ರ ವಿಭಾಗದ ಮುಖ್ಯಸ್ಥರಾಗಿ, ಕಾಲೇಜಿನ ಪ್ರಾಂಶುಪಾಲರಾಗಿ ಸೇವೆ ಸಲ್ಲಿಸಿದರೂ, ಆಗಲೇ ವಸಂತಾ ಎಂಬುವವರ ಜೊತೆ ದಾಂಪತ್ಯ ಜೀವನಕ್ಕೂ ಕಾಲಿಟ್ಟರು. ಮದರಾಸಿನಲ್ಲಿಯೇ ತಮ್ಮ ಜೀವಮಾನದ ಬಹಳಷ್ಟು ಸಂಶೋಧನೆ, ಸಾಹಿತ್ಯ ಕೃಷಿ ನಡೆಸಿ ನೂರಾರು ವೈಜ್ಞಾನಿಕ ಪ್ರಬಂಧಗಳನ್ನು ರಚಿಸಿದ್ದಾರೆ. 100 ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಡಾಕ್ಟರೇಟ್ ಪ್ರಧಾನ ಮಾಡಿದ್ದಾರೆ. 1978 ರಲ್ಲಿ ತಮ್ಮ ನಿವೃತ್ತಿಯ ನಂತರ ಮೈಸೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯದಲ್ಲಿ ಸಸ್ಯಶಾಸ್ತ್ರದ ಅತಿಥಿ ಉಪನ್ಯಾಸಕರಾಗಿ ಸೇವೆ ಮಾಡಿದ್ದಾರೆ.

ಸಾಹಿತ್ಯ ಮತ್ತು ಬಿ.ಜಿ.ಎಲ್. ಸ್ವಾಮಿ

ಇದಿಷ್ಟು ಸ್ವಾಮಿ ಅವರ ವಿಜ್ಞಾನ ಜೀವನಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ವಿಷಯಗಳು. ಸ್ವಾಮಿಯವರು ವಿಜ್ಞಾನದ ದೆಸೆಗಿಂತಲೂ ಓರ್ವ ಸೃಜನಶೀಲ ಲೇಖಕರಾಗಿ ಸಾಮಾನ್ಯ ಓದುಗರನ್ನು, ಜನರನ್ನು ತಲುಪಿದ್ದೇ ಹೆಚ್ಚು. ತಮ್ಮ ಹಿನ್ನೆಲೆಯಲ್ಲೇ ಇದ್ದ ಸಾಹಿತ್ಯ ಪ್ರೇಮಕ್ಕೆ ನೀರೆರೆದು ಪೋಷಿಸಿದ್ದು, ಹಿಂದೆ ಅವರು ಸೆಂಟ್ರಲ್ ಕಾಲೇಜಿನಲ್ಲಿ ವಿದ್ಯಾರ್ಥಿಯಾಗಿದ್ದಾಗ ಕರ್ನಾಟಕ ಸಂಘದ ಕಾರ್ಯದರ್ಶಿಯಾಗಿದ್ದಾಗಿನ ಅವರ ಅನುಭವಗಳು, ಅಲ್ಲಿಯೇ ವಿ.ಸೀತಾರಾಮಯ್ಯ, ವೆಂಕಣ್ಣಯ್ಯ, ಬಿ.ಎಂ.ಶ್ರೀ ಮುಂತಾದ ಮಹನೀಯರ ಒಡನಾಟ ಸ್ವಾಮಿಯವರನ್ನು ಬಹಳ ಪ್ರಭಾವಗೊಳಿಸಿ ಅಂದೇ 'ಪಂಚ ಕಳಶ ಗೋಪುರ' ಎಂಬ ಕೃತಿಯನ್ನು ರಚಿಸಲು ಪ್ರೇರೇಪಿಸಿದವು. ಯೌವ್ವನದಲ್ಲಿ ಅವರು ರಚಿಸಿದ ಕೆಲವು ಕೃತಿಗಳೆಂದರೆ, ಪ್ರಣಯ ತರಂಗ, ಜೇಡರ ಚರಕ, ಕದಂಬ, ಸಂತಾನ ರಹಸ್ಯ, ಅಣಕವಾಡು ಮುಂತಾದವು.

ಸ್ವಾಮಿಯವರು ಓದುಗರಿಗೆ ಆಪ್ತವಾಗಲು ಕಾರಣವಾದ ವಿಷಯಗಳನ್ನು ನೋಡಿದರೆ : ಅವರ ಲೇಖನಗಳು ಅದರಲ್ಲೂ ಪ್ರಮುಖವಾಗಿ ಅವರ ಕಾದಂಬರಿಗಳು ವಾಸ್ತವಿಕ ಜೀವನ ಹಾಗೂ ವೈಜ್ಞಾನಿಕ ತಳಹದಿಯ ಮೇಲೆ ರಚಿತವಾಗಿದ್ದರಿಂದ ಎಂದು ತೋರುತ್ತದೆ. ಇದನ್ನು ಅವರ ಹಸಿರು ಹೊನ್ನು ಕಾದಂಬರಿಯಲ್ಲಿ ಸ್ಪಷ್ಟವಾಗಿ ಕಾಣಬಹುದು. ಒಂದು ಕಾಲೇಜಿನಿಂದ ವಿದ್ಯಾರ್ಥಿಗಳ ಸಾಮಾನ್ಯ ಪ್ರವಾಸದಿಂದ ಆರಂಭವಾಗುವ ಕತೆ ಹೇಗೆ ಓದುಗರನ್ನು ಅಪರಿಚಿತ, ಅಮೋಘ ಸಸ್ಯ ಸಂಕುಲದ ಒಳಗೆ ಕರೆದೋಯ್ದು ಮಂತ್ರಮುಗ್ಧರನ್ನಾಗಿಸುತ್ತದೆ ಎಂದರೆ ಅದು ನಿತ್ಯ ಜೀವನಕ್ಕೆ ಸಂಬಂಧಿಸಿದ್ದರಿಂದಲೆ ಅದು ಸಾಧ್ಯವಾಗಿದ್ದು. ವಾಸ್ತವಿಕ ಹಾಗೂ ಕಾಲ್ಪನಿಕ ವಿಷಯಗಳನ್ನು ಅತ್ಯಂತ ಸೂಕ್ತವಾಗಿ ತಮ್ಮ ಕೃತಿಗಳಲ್ಲಿ ಅಳವಡಿಸಿದ್ದರಿಂದಲೇ ವಿಜ್ಞಾನವನ್ನು ಸಾಹಿತ್ಯವಾಗಿ, ಹಾಸ್ಯಮಯವಾಗಿ ವಿಜ್ಞಾನದ ಹಿನ್ನೆಲೆ ಇಲ್ಲದ ಸಾಮಾನ್ಯನು ಓದು ಆನಂದಿಸಲು ಸಾಧ್ಯವಾಗಿದೆ. ಅವರ ಬರವಣಿಗೆಯ ಚಾತುರ್ಯ ಇದಕ್ಕೆ ನೀರೆರೆದ ಅಂಶ ಎಂಬುದನ್ನು ತಳ್ಳಿ ಹಾಕುವಂತಿಲ್ಲ. ಹಲವಾರು ಹಾಸ್ಯಮಯ ಅಂಶಗಳನ್ನು ಅದು ಒಳಗೊಂಡಿದೆ. ಬಹುಶಃ ಅವರು ತಮ್ಮ ಜೀವನದಲ್ಲಿ ಹಾಸ್ಯಮಯ ಪ್ರವೃತ್ತಿ ಹೊಂದಿದ್ದರಲ್ಲದೇ ಅವರ ಕೃತಿಗಳಲ್ಲಿ ಹಾಸ್ಯ ರಸ ಸೇರಿಕೊಂಡಿರಬೇಕು. ಅದಲ್ಲದೆ ಅವರು ತಮ್ಮ ಪುಸ್ತಕದ ಇಡೀ ರಚನೆ ಸ್ವತಃ ಅವರೇ ವಿನ್ಯಾಸ ಮಾಡುತ್ತಿದ್ದರು.

ಶ್ರೀ. ಬಿ.ಜಿ.ಎಲ್ ಸ್ವಾಮಿ : ಜೀವನ ಪರಿಚಯ

ಸಾಧಾರಣವಾಗಿ ಅವರು ಯಾವುದೆ ಪುಸ್ತಕ ಓದಿದರೂ ಅವರ ಮುಖ್ಯವಾದ ಪುಟಗಳ ಮುಖ್ಯಾಂಶಗಳನ್ನು ಸಣ್ಣ ಪೋಸ್ಟ್‌ಕಾರ್ಡ್‌ಗಳಲ್ಲಿ ಬರೆದಿಟ್ಟುಕೊಳ್ಳುತ್ತಿದ್ದರು ಹಾಗೂ ಆ ಮಾಹಿತಿಯನ್ನು ನಂತರ ತಮ್ಮ ಕೃತಿಗಳಲ್ಲಿ ಅಳವಡಿಸಿಕೊಳ್ಳುತ್ತಿದ್ದರು. ಅವರ ಹಸಿರು ಹೊನ್ನು ಕೃತಿಯಲ್ಲಿಯೂ ಸಹ ಇಂತಹ 3500 ಪೋಸ್ಟ್‌ಕಾರ್ಡ್‌ಗಳನ್ನು ಬಳಸಿದ್ದರು.

ಮೊದಲೇ ಹೇಳಿದಂತೆ ಬಹು ಭಾಷಾ ಚತುರರಾಗಿದ್ದ ಬಿ.ಜಿ.ಎಲ್. ಸ್ವಾಮಿಯವರಿಗೆ ಕನ್ನಡ ಭಾಷೆಯ ಮೆಲೆ ಇದ್ದಂತಹ ಹಿಡಿತ ತಮಿಳಿನ ಮೇಲೆಯೂ ಇತ್ತು. ತಮ್ಮ ಜೀವಮಾನದ ಬಹು ಕಾಲವನ್ನು ಅವರು ಪ್ರೆಸಿಡೆನ್ಸಿ ಕಾಲೇಜಿನಲ್ಲಿ ಪ್ರಾಧ್ಯಾಪಕರಾಗಿ, ಪ್ರಾಂಶುಪಾಲರಾಗಿ, ತಮಿಳರ ನಡುವೆ ಜೀವಿಸಿದ್ದರಿಂದಲೇ ಇರಬಹುದು. ವಿಜ್ಞಾನ ವಿಷಯವನ್ನು ಹೊರತುಪಡಿಸಿ ಅನೇಕ ಸಾಮಾಜಿಕ ವಿಷಯಗಳನ್ನು ಕೂಡ ಗ್ರಹಿಸಬಲ್ಲ, ಅದರ ಕುರಿತು ತಾರ್ಕಿಕವಾಗಿ ಚಿಂತಿಸಬಲ್ಲ ಕುತೂಹಲ ಮತ್ತು ಚೇತನ ಶಕ್ತಿ ಅವರಲ್ಲಿತ್ತು. ಅವರ "ತಮಿಳು ತಲೆಗಳ ನಡುವೆ" ಕೃತಿಯಲ್ಲಿ ಅವರ ಅನುಭವಗಳನ್ನು ನೋಡಿದಾಗ ಅವೆಲ್ಲವೂ ಸ್ವಾಮಿಯವರಿಗೆ ತಮಿಳುನಾಡು ಹಾಗೂ ಭಾಷೆಯ ಮೇಲೆ, ಅವರ ಸಂಸ್ಕೃತಿಯ ಮೇಲೆ ಅವರಿಗಿದ್ದ ಜ್ಞಾನ ಹಾಗೂ ಅವರು ನಡೆಸಿದ ವಿಚಾರಗಳ ಆಳವನ್ನು ಪ್ರತಿಪಾದಿಸುತ್ತದೆ. ಹಾರ್ವರ್ಡ್‌ನಲ್ಲಿ ತಮ್ಮ ಅನುಭವಗಳ ದೃಷ್ಟಾಂತದಿಂದ ಅಲ್ಲಿಗೂ ನಮ್ಮ ಭಾರತದ ವಿದ್ಯಾಭ್ಯಾಸ ಕ್ರಮಕ್ಕೂ ಹಾಗೂ ವಿದ್ಯಾರ್ಥಿಗಳ ಮನೋಭಾವದಲ್ಲಿರುವ ವ್ಯತ್ಯಾಸದ ಕುರಿತು ಈ ಕೃತಿಯಲ್ಲಿ ವಿಶಾದ ವ್ಯಕ್ತಪಡಿಸಿದ್ದಾರೆ.

ಅವರ ಸಂಶೋಧನೆ ಹಾಗು ಕೊಡುಗೆಗಳು

ಎಂಬ್ರಿಯಾಲಜಿ ಆಫ್ ಆಂಜಿಯೋಸ್ಪರ್ಮ್ ವಿಷಯದ ಮೇಲೆ ಸಕ್ರಿಯವಾಗಿ ಕೆಲಸ ಮಾದಿದ್ದಾರೆ, ಹಲವಾರು ಕವಚವಿಲ್ಲದ ಆಂಜಿಯೋಸ್ಪರ್ಮ್‌ಗಳನ್ನು ಕಂಡುಹಿಡಿದಿದ್ದಾರೆ, ಏಕದಳ ಸಸ್ಯಗಳ ಭ್ರೂಣಗಳನ್ನು ಅಭ್ಯಸಿಸಿದ್ದರು, ಹೆಲೋಬಿಯಲ್ ಎಂಡೋಸ್ಪರ್ಮ್ ಗಳನ್ನು ಗುರುತಿಸಿದ ಮೊದಲಿಗರು ಸ್ವಾಮಿಯವರೇ, ಹಲವಾರು ತಪ್ಪಾಗಿ ಗುರುತಿಸಲ್ಪಟ್ಟ ಸಸ್ಯಗಳನ್ನು ಸರಿಯಾಗಿ ಗುರುತಿಸಿದರು, ಹೂವುಗಳ ಪೈಲೊಗೆನಿಗೆ ಸಂಬಂಧಿಸಿದ ಕಂಡುಪ್ಲಿಕೆಟ್ ತಿಯರಿ ಅನ್ನು ಪ್ರಸ್ತಾವನೆ ಮಾಡಿದ್ದಾರೆ, ೩೦೦ಕ್ಕೂಹೆಚ್ಚು ವಿಜ್ಞಾನ ಪ್ರಬಂಧಗಳನ್ನು ಮಂಡಿಸಿದ್ದಾರೆ, ಇವೆಲ್ಲಕ್ಕಿಂತ ಮಿಗಿಲಾಗಿ ನಿಕೊಟಿನ್ ಇಲ್ಲದ ಟೊಬಾಕೊ ಗಿಡ ಸೃಷ್ಟಿಸುವ ಅವರ ಕೆಲಸ ಮುಗಿಯುವ ಹಂತದಲ್ಲಿದ್ದಾಗಲೆ ಅವರು ಕಾಲವಾಗಿದ್ದರಿಂದ ಅದು ಪೂರ್ತಿಯಾಗಲಿಲ್ಲ, ಇಲ್ಲದಿದ್ದರೇ ಅದು ನೋಬೆಲ್ ಗೆ ಮಾನ್ಯವಾದ ಕೆಲಸವೇ ಆಗಿತ್ತು.

ಪ್ರಶಸ್ತಿ ಪುರಸ್ಕಾರಗಳು:

ಭಾರತದಲ್ಲಿ ಒಬ್ಬ ಸಸ್ಯಶಾಸ್ತ್ರಜ್ಞ ನಿಗೆ ಸಿಗಬಹುದಾದ ಉನ್ನತ ಪುರಸ್ಕಾರ ಬೀರ್ಬಲ್ ಸಹನಿ ಪ್ರಶಸ್ತಿ ೧೯೭೬ ರಲ್ಲಿ ಸ್ವಾಮಿಯವರಿಗೆ ದೊರೆಯಿತು,

ಸ್ವಾಮಿಯವರಿಗೆ ದೊರೆತ ಇನ್ನೂಹಲವು ಪುರಸ್ಕಾರಗಳೆಂದರೆ:

ಶ್ರೀ. ಬಿ.ಜಿ.ಎಲ್ ಸ್ವಾಮಿ : ಜೀವನ ಪರಿಚಯ

ಕೇಂದ್ರ ಸಾಹಿತ್ಯ ಅಕೇಡಮಿ ಪ್ರಶಸ್ತಿ,೧೯೭೮ರಲ್ಲಿ ಅವರ ಹಸುರು ಹೊನ್ನು ಕೃತಿಗೆ, ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ರಾಜ್ಯೋತ್ಸವ ಪ್ರಶಸ್ತಿ, ಕನ್ನಡ ಸಾಹಿತ್ಯಪರಿಶತ್ ಪ್ರಶಸ್ತಿ ಹಾಗು ಇನನು ಹಲವು.

ಅವರ ಶಿಷ್ಯರೊಬ್ಬರು ತಾವು ಪತ್ತೆ ಮಾಡಿ ಗುರುತಿಸಿದ ಗಿಡವೊಂದಕ್ಕೆ ಬಿ.ಜಿ.ಎಲ್ ಸ್ವಾಮಿಯವರ ಹೆಸರನ್ನೇ ಇಟ್ಟು ಗೌರವ ಸೂಚಿಸಿದ್ದಾರೆ.

ಕಡೆಯದಾಗಿ ಸ್ವಾಮಿಯವರ ಜೀವನವನ್ನೊಮ್ಮೆ ಅವಲೋಕಿಸಿದಾಗ ಅವರು ಸಾಧನೆಯ ಹಾದಿಯಲ್ಲಿರುವವರಿಗೆ ಸ್ಫೂರ್ತಿಯಾಗಬಲ್ಲರು. ಅವರು ನೇರವಾಗಿ ದಾರ್ಶನಿಕ ಪಥದಲ್ಲಿ ಗುರುತಿಸಿಕೊಳ್ಳದಿದ್ದರೂ ಪರೋಕ್ಷವಾಗಿಯೇ ಕಗ್ಗದ ಬೆಳಕಿನಲ್ಲಿ ತಮ್ಮ ಬದುಕಿನ ಜಟಕಾಬಂಡಿಯನ್ನು ಮುನ್ನಡೆಸಿ ೧೯೮೦ರ ನವೆಂಬರ್ ೨ರಂದು ದೈವಾದೀನರಾದರು.

ಡಾ. ಕೆ. ಜಿ. ಭಟ್, ಅಪರೂಪದ ಸಸ್ಯವರ್ಗೀಕರಣ ಶಾಸ್ತ್ರ ವಿಜ್ಞಾನಿ (Plant Taxonomist)

ತಮ್ಮ ಜೀವನವನ್ನು ಸಸ್ಯ ವರ್ಗೀಕರಣ ಶಾಸ್ತ್ರಕ್ಕೇ (Plant Taxonomy) ಮೀಸಲಾಗಿಟ್ಟಿದ್ದ ಅಪರೂಪದ ವಿಜ್ಞಾನಿ ಡಾ. ಕಾಕುಂಜೆ ಗೋಪಾಲ ಕೃಷ್ಣ ಭಟ್ಟರು. ಅತ್ಯಂತ ಹಳೆಯ ಮತ್ತು ಸಸ್ಯಶಾಸ್ತ್ರದ ಬುನಾದಿಯ ಭಾಗವಾಗಿರುವ ಸಸ್ಯ ವರ್ಗೀಕರಣ ಶಾಸ್ತ್ರದ ಬಗ್ಗೆ ಇತ್ತೀಚಿನ ವರ್ಷಗಳಲ್ಲಿ ಸಸ್ಯತಜ್ಞರಲ್ಲಿ ಆಸಕ್ತಿ ಕಡಿಮೆಯಾಗುತ್ತಿದೆ. ಬಹುಶಹ ಇದಕ್ಕೆ ಒಂದು ಕಾರಣ ಸಸ್ಯ ವರ್ಗೀಕರಣ ಶಾಸ್ತ್ರದ ಜೀವಾಳ 'ಕ್ಷೇತ್ರ ಕಾರ್ಯ' (Field work) ಆಗಿರುವುದು ಇರಬಹುದು.

ಕೆ. ಗೋಪಾಲಕೃಷ್ಣ ಭಟ್ಟರು 17ನೇ ಮೇ 1947ರಂದು ಕಾಸರಗೋಡಿನ ಕಾಕುಂಜೆ ಎಂಬ ಗ್ರಾಮದಲ್ಲಿ ವೆಂಕಪ್ಪ ಭಟ್ಟ ಮತ್ತು ಪಾರ್ವತಿ ದಂಪತಿಯ ಮಗನಾಗಿ ಜನಿಸಿದರು. ಸುಂದರ ಪರಿಸರದ ನಡುವೆ ಆಡಿ ಬೆಳೆದ ಭಟ್ಟರು ಗಿಡಮರಗಳ ಬಗ್ಗೆ ವಿಶೇಷ ಪ್ರೀತಿ, ಆಸಕ್ತಿಯನ್ನು ಬೆಳಸಿಕೊಂಡರು. ತಮ್ಮ ಸುತ್ತಮುತ್ತಲಿನ ಜಾಗಗಳಲ್ಲಿ ಓಡಾಡಿ ಸಸ್ಯರಾಶಿಗಳ ಪರಿಚಯ ಮಾಡಿಕೊಳ್ಳತೊಡಗಿದರು. ಶಾಲಾಭ್ಯಾಸವನ್ನು ಮುಗಿಸಿದ ಗೋಪಾಲಕೃಷ್ಣ ಭಟ್ಟರು ಕಾರ್ಕಳದ ಭುವನೇಂದ್ರ ಕಾಲೇಜಿಗೆ ಸೇರಿದರು. ಭಟ್ಟರ ಆಸಕ್ತಿಯನ್ನು ಗುರುತಿಸಿ ಸಸ್ಯ ಹುಡುಕಾಟ, ಗುರುತಿಸುವಿಕೆಯ ಹವ್ಯಾಸವನ್ನು ಪ್ರೋತ್ಸಾಹಿಸಿ ಬಿಳೆಸಿದವರು ಇವರು ಕಾಲೇಜಿನ ಗುರುಗಳು. ಬಿ. ಎಸ್ಸಿ. ಯೊಂದಿಗೆ ಕಾರ್ಕಳದ ಸುತ್ತಮುತ್ತಲಿನ ಗಿಡಮರಗಳ ಪೂರ್ಣ ಪರಿಚಯ ಮಾಡಿಕೊಂಡರು, ಗುರುಗಳು ಬೆರಗಾಗುವಷ್ಟು ಶಿಷ್ಯ ಟ್ಯಾಕ್ಸೋನೊಮಿಯಲ್ಲಿ ಬೆಳೆದಿದ್ದರು.

ವಿದ್ಯಾಭ್ಯಾಸವನ್ನು ಮುಂದುವರಿಸಲು ಎಮ್.ಎಸ್ಸಿ.ಯಲ್ಲಿ ಬಾಟನಿ ವಿಷಯವನ್ನು ಆರಿಸಿಕೊಂಡು ಕೆ.ಜಿ. ಭಟ್ಟರು ಸೇರಿದ್ದು ಮೈಸೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯವನ್ನು. ದಕ್ಷಿಣ ಕನ್ನಡದ ಸಸ್ಯವೈವಿಧ್ಯತೆಗಿಂತ ಬಿನ್ನವಾದ ಮೈಸೂರಿನ ಸಸ್ಯರಾಶಿಯ ಪರಿಚಯ ಮಾಡಿಕೊಳ್ಳತೊಡಗಿದರು. ರಜೆಯ ದಿನಗಳಂದು ಸಸ್ಯಗಳನ್ನು ಹುಡುಕಿಕೊಂಡು ಹೊರಟುಬಿಡುತ್ತಿದ್ದರು. ಇವರ ಹವ್ಯಾಸದಿಂದ ಮಾನಸ ಗಂಗೋತ್ರಿಯ ಸಸ್ಯಶಾಸ್ತ್ರ ವಿಭಾಗದ ಹರ್ಬೇರಿಯಂ (ಸಸ್ಯಗಳ ಒಣ ಮಾದರಿ ಸಂಗ್ರಹಾಲಯ) ಬೆಳೆಯತೊಡಗಿತು. 'ಟ್ಯಾಕ್ಸೋನೊಮಿ' ಸ್ವಲ್ಪ ಕಷ್ಟದ ವಿಷಯ ಎಂದುಕೊಂಡಿದ್ದ ಹಿರಿಕಿರಿಯ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಸಸ್ಯ ಮಾದರಿಯನ್ನು ಗುರುತಿಸಿ ತತ್‌ಕ್ಷಣ ಹೇಳುತ್ತಿದ್ದರು. ಇವರು ಮಾನಸಗಂಗೋತ್ರಿಯಲ್ಲಿ 'ಟ್ಯಾಕ್ಸೋನೊಮಿ ಭಟ್ಟ' ಎಂದೇ ಗುರುತಿಸಲ್ಪಟ್ಟರು.

ಎಮ್.ಎಸ್ಸಿ. ಮುಗಿಯುತ್ತಿದ್ದಂತೆ ಕೆ. ಗೋಪಾಲಕೃಷ್ಣ ಭಟ್ಟರು 1971ರಲ್ಲಿ ಉಡುಪಿಯ ಪೂರ್ಣಪ್ರಜ್ಞ ಕಾಲೇಜಿನಲ್ಲಿ ತಮ್ಮ ವೃತ್ತಿ ಜೀವನ ಪ್ರಾರಂಭಿಸಿದರು. ಮೊದಲಿಗೆ ಡೆಮಾನ್‌ಸ್ಟ್ರೇಟರ್ ಆಗಿ ನಂತರ ಉಪನ್ಯಾಸಕರಾಗಿ ಕಾರ್ಯನಿರ್ವಹಿಸಲು ಪ್ರಾರಂಭಿಸಿದರು. 1983ರಲ್ಲಿ ತಮ್ಮ ಸಹಪಾಠಿ, ಸ್ನೇಹಿತರು ಹಾಗೂ ಮೈಸೂರು ವಿಶ್ವವಿದ್ಯಾಲಯದಲ್ಲಿ ಪ್ರಾಧ್ಯಾಪಕರಾಗಿದ್ದ ಡಾ. ಸಿ. ಆರ್. ನಾಗೇಂದ್ರನ್‌ರವರ ಮಾರ್ಗದರ್ಶನದಲ್ಲಿ 'ಸೆಡ್ಜಸ್ ಅಂಡ ಗ್ರಾಸಸ್ ಆಫ್ ಕೂರ್ಗ್ ಅಂಡ್ ಸೌತ್ ಕೆನರ ಡಿಸ್ಟ್ರಿಕ್ಟ್ಸ ಆಫ್ ಕರ್ನಾಟಕ' ಎಂಬ ಮಹಾಪ್ರಬಂಧದ ಮೇಲೆ ಪಿ.ಎಚ್.ಡಿ. ಪದವಿಯನ್ನು ಪಡೆದುಕೊಂಡರು.

1973ರಲ್ಲಿ 'ಪಾರಾಕೌಟ್ಲೇಯಾ ಭಟ್ಟಿಯೈ' ಎಂಬ ಶುಂಠಿ ಕುಟುಂಬಕ್ಕೆ (Zingiberaceae) ಸೇರಿದ ಹೊಸ ಸಸ್ಯ ಪ್ರಭೇದವನ್ನು ದಾಖಲಿಸುವ ಮುಖಾಂತರ ಅಂತರಾಷ್ಟ್ರೀಯ ಸಸ್ಯ ವಿಜ್ಞಾನಕ್ಷೇತ್ರಕ್ಕೆ ಪಾದಾರ್ಪಣೆ ಮಾಡಿದರು. ಅಧ್ಯಾಪನ, ಕಾಲೇಜಿನ ಉನ್ನತೀಕರಣ, ಜೊತೆಗೆ ಮಂಗಳೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯದ ಮಾನ್ಯತೆಯೊಂದಿಗೆ 'ಟ್ಯಾಕ್ಸೋನಾಮಿ ರಿಸರ್ಚ್ ಲ್ಯಾಬ್'ನ್ನು ಪ್ರಾರಂಭಿಸಿ, ಸಂಶೋದನಾ ಕಾರ್ಯವನ್ನು ಮುಂದುವರಿಸಿದರು. 2003ರಲ್ಲಿ 'Flora of Upupi' ಪ್ರಕಟಿಸಿದರು. 2005ರಲ್ಲಿ ಪ್ರಾಧ್ಯಾಪಕ ವೃತ್ತಿಯಿಂದ ನಿವೃತರಾದರು. 'Flora of

South Kanara: Dakshina Kannada and Udupi Districts of Karnataka'ಎಂಬ ಸಸ್ಯವರ್ಗೀಕರಣ ಕ್ಷೇತ್ರಕ್ಕೆ ಅತ್ಯಮೂಲ್ಯವೆನಿಸಿಕೊಳ್ಳುವ ಪುಸ್ತಕವನ್ನು 2014ರಲ್ಲಿ ಹೊರತಂದರು. ನಿರಂತರ ಅಧ್ಯಯನದ ಮೂಲಕ ತಮ್ಮನ್ನು 'ಅಪ್ ಡೇಟ್' ಮಾಡಿಕೊಳ್ಳುವುದು ಭಟ್ಟರ ಯಶಸ್ಸಿನ ಮೂಲಮಂತ್ರವಾಗಿತ್ತು. ಇದಕ್ಕೊಂದು ಉದಾಹರಣೆ ತೀರಾ ಇತ್ತೀಚೆಗೆ ಅವರು ಪ್ರಕಟಿಸಿದ 'Flora of South Kanara'ದಲ್ಲಿ ಡಿಎನ್ಎ ಅನಾಲಿಸಿಸ್ ಆಧಾರದ ಮೇಲೆ ಅಭಿವೃದ್ಧಿ ಮಾಡಲಾಗಿರುವ ಎಪಿಜಿ (ಏಂಜಿಯೋಸ್ಪರ್ಮ್ ಫೈಲೋಜೆನಿ ಗ್ರೂಪ್') ವರ್ಗೀಕರಣ ಪದ್ಧತಿಯನ್ನು ಅಧ್ಯಯನ ಮಾಡಿ, ಅರ್ಥ ಮಾಡಿಕೊಂಡು ಅಳವಡಿಸಿಕೊಂಡಿರುವುದು.

'ಇಂಡಿಯನ್ ಎಸೋಸಿಯೇಷನ್ ಆಫ್ ಏಂಜಿಯೋಸ್ಪರ್ಮ್ ಟ್ಯಾಕ್ಸೋನೊಮಿ' (IAAT) ಯಲ್ಲಿ ಸಕ್ರಿಯರಾಗಿದ್ದ ಡಾ. ಕೆ.ಜಿ. ಭಟ್ಟರು ಅದರ ಅಧ್ಯಕ್ಷರಾಗಿಯೂ ಉತ್ತಮವಾಗಿ ಕಾರ್ಯನಿರ್ವಹಿಂದರು. ನಮ್ಮ ರಾಜ್ಯ, ದಕ್ಷಿಣ ಭಾರತ ಮಾತ್ರವಲ್ಲದೆ, ವಿವಿಧ ರಾಜ್ಯದ ಟ್ಯಾಕ್ಸಾನೊಮಿ ಆಸಕ್ತರು, ಅಧ್ಯಯನದಲ್ಲಿ ತೊಡಗಿರುವವರು ಕೆ.ಜಿ. ಭಟ್ಟರವರ ಸಲಹೆ, ಸಹಕಾರ ಪಡೆಯದವರು ಇಲ್ಲವೇ ಇಲ್ಲ ಎನ್ನುವಷ್ಟು ಅವರನ್ನು ಅವಲಂಬಿಸಿದ್ದರು.

ಟ್ಯಾಕ್ಸೋನೊಮಿಯಲ್ಲಿ ಸಸ್ಯಮಾದರಿಯನ್ನು ಗುರುತಿಸುವಾಗ ಅದರ ವಿವರಣೆಯನ್ನು ಕೊಡಬೇಕಾಗುತ್ತದೆ. ಹಾಗೇ ಕೆ. ಜಿ. ಭಟ್ಟರ ಬಗ್ಗೆ ವಿವರಿಸಿ ಎಂದು ಅವರ ಪರಿಚಯಸ್ತರನ್ನು ಕೇಳಿದರೆ ಸಿಗುವ ಕೆಲವು ನಿಶ್ಚಿತವಾದ ವಿವರಣೆ ಈ ತರಹ ಇರಬಹುದು– ವಿರಳರಲ್ಲಿ ವಿರಳರು, ಸರಳರು, ಎಲ್ಲರಿಗೂ ಎಟಕುವವರು, ಸಜ್ಜನರು, ಸ್ನೇಹಮಯಿ, ಸಹೃದಯಿ, ಮುಗ್ಧರು, ಮಿತಭಾಷಿ, ಮಂದಸ್ಮಿತರು, ನಿಗರ್ವಿ, ಅಧ್ಯಯನಶೀಲರು, ವೃತ್ತಿ ಮತ್ಸರತೆ ಇಲ್ಲದ ಸಸ್ಯ ಸಂತ. ಅನಾರೋಗ್ಯದಿಂದ ಬಳಲುತ್ತಿದ್ದರೂ ಕೊನೆದಿನಗಳಲ್ಲಿ 'Cultivated Plants of Coastal Karnataka' ಎಂಬ ಪುಸ್ತಕವನ್ನು ಹೊರತರುವ ಸಿದ್ಧತೆಯಲ್ಲಿದ್ದರು ಡಾ. ಕಾಕುಂಜೆ ಗೋಪಾಲಕೃಷ್ಣ ಭಟ್ಟರು. ಪ್ಲಾಂಟ್ ಟಾಕ್ಸಾನಮಿಗಾಗಿ ನಿರಂತರ ಕಾಣಿಕೆಯನ್ನು ನೀಡುತ್ತಾ ಬಂದ ಡಾ. ಕಾಕುಂಜೆ ಗೋಪಾಲಕೃಷ್ಣ ಭಟ್ಟರು 7–04–2022ರಂದು ನಿಧನರಾದರು.

ಸಸ್ಯಶಾಸ್ತ್ರ ಪ್ರಪಂಚ ಕೆ.ಜಿ. ಭಟ್ಟರಿಂಧ ಪಡೆದ ಕೊಡುಗೆಗಳು ಅನೇಕ, ಅವುಗಳಲ್ಲಿ ಕೆಲವನ್ನು ಇಲ್ಲಿ ಪಟ್ಟಿಮಾಡಲಾಗಿದೆ–

- 7 ಹೊಸ ಸಸ್ಯ ಪ್ರಭೇದಗಳನ್ನು ಸಸ್ಯಲೋಕಕ್ಕೆ ಪರಿಚಯಿಸಿದ್ದಾರೆ.
- ಭಾರತಕ್ಕೆ ಮೊದಲ ಬಾರಿಗೆ 4 ಸಸ್ಯ ಪ್ರಭೇದಗಳನ್ನು ದಾಖಲಿಸಿದ್ದಾರೆ.
- ಕರ್ನಾಟಕ್ಕೆ 51 ಸಸ್ಯಪ್ರಭೇದಗಳನ್ನು ಮೊದಲ ಬಾರಿಗೆ ದಾಖಲಿಸಿದ್ದಾರೆ.
- 56 ಸಂಶೋಧನಾ ಲೇಖನಗಳನ್ನು ರಾಷ್ಟ್ರೀಯ ಮತ್ತು ಅಂತರಾಷ್ಟ್ರೀಯ ಜರ್ನಲ್‌ಗಳಲ್ಲಿ ಪ್ರಕಟಿಸಿದ್ದಾರೆ.
- ತಮಗೆ ಬಂದ 4 ಪ್ರಾಜೆಕ್ಟ್‌ಗಳ ಮೂಲಕ ಸಸ್ಯಶಾಸ್ತ್ರಕ್ಕೆ ಕೊಡುಗೆ ನೀಡಿದ್ದಾರೆ
- ಎರಡು ಜಿಲ್ಲೆಗಳ (ಉಡುಪಿ ಮತ್ತು ದಕ್ಷಿಣ ಕನ್ನಡ ಜಿಲ್ಲೆ) 'ಫ್ಲೋರಾ' ಸೇರಿದಂತೆ 7 ಪುಸ್ತಕಗಳನ್ನು ಪ್ರಕಟಿಸಿರುತ್ತಾರೆ

ಡಾ. ಕೆ. ಜಿ. ಭಟ್ಟರ ಗೌರವಾರ್ಥ ಹಲವು ಸಂಶೋದಕರು ಸಸ್ಯಗಳಿಗೆ ನಾಮಕರಣ ಮಾಡಿದ್ದಾರೆ, ಅವುಗಳು ಈ ಕೆಳಗಿನಂತಿವೆ–

i. *Curcuma bhatii (R M Sm.)* Skornickova & M Sabu

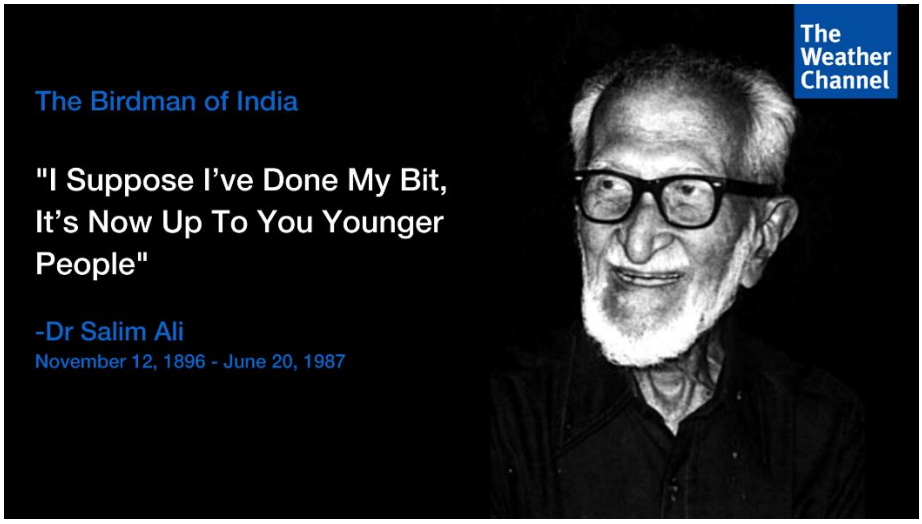
ii. *Ceropegia bhatii* S.R.Yadav & Shendage

iii. *Eriocaulon gopalakrishnanum* K.Rashmi & G.Krishnak.

iv. Canscora bhatiana K. S. Prasad & Raveendran

ಡಾ. ಶರ್ವಾಣಿ ಕೆ.ಎ., ಸಸ್ಯಶಾಸ್ತ್ರ ವಿಭಾಗ

ಭಾರತದ ಪಕ್ಷಿ ಪಿತಾಮಹ – ಸಲೀಂ ಅಲಿ



"**ಹಕ್ಕಿಗಳು, ಮನುಷ್ಯರಿಲ್ಲದೆ ಬದುಕಬಲ್ಲವು ಆದರೆ, ಮನುಷ್ಯ ಹಕ್ಕಿಗಳಿಲ್ಲದೆ ಬದುಕಲಾರ**" ಎಂಬ ಕಟುಸತ್ಯವನ್ನು ಜಗತ್ತಿಗೆ ಸಾರಿದ್ದು "ಭಾರತದ ಪಕ್ಷಿ ಪಿತಾಮಹ" ಅಥವಾ "ಹಕ್ಕಿ ಮನುಷ್ಯ" ಶ್ರೀಯುತ ಸಲೀಂ ಅಲಿಯವರು. ಇವರು ಭಾರತ ಮತ್ತು ಅದರ ಉಪಖಂಡಗಳಲ್ಲಿ ಮಾಡಿದ ಹಕ್ಕಿಗಳ ಅಧ್ಯಯನ, ಅವುಗಳ ಸಂರಕ್ಷಣೆ ಮತ್ತು ಅಭಿವೃದ್ಧಿಗಾಗಿ ಮಾಡಿದ ಕೊಡುಗೆ ಅಪಾರ.

ಸಲೀಂ ಅಲಿಯವರ ಮೂಲ ನಾಮ ಸಲೀಂ ಮೊಯಿಜಉದ್ದೀನ್ ಅಬ್ದುಲ್ ಅಲಿ. ಮುಂಬೈಯ ಮಧ್ಯಮ ವರ್ಗದ ಕುಟುಂಬದಲ್ಲಿ, ತಂದೆ ಮೊಯಿಜಉದ್ದೀನ್ ,ತಾಯಿ ಜೀನತ್ ಉನ್ -ನ್ನಿಸಾ ಅವರ 9 ನೆಯ ಹಾಗೂ ಕೊನೆಯ ಮಗುವಾಗಿ Nov 12,1896 ರಂದು ಜನಿಸಿದರು. ಒಂದು ವರ್ಷದ ಎಳೆಯ ವಯಸಿನಲ್ಲಿ ತಂದೆಯನ್ನು, ಮೂರನೆಯ ವರ್ಷದಲ್ಲಿ ತಾಯಿಯನ್ನು ಕಳೆದುಕೊಂಡ ನತದೃಷ್ಟ ಸಲೀಂ ಅನಾಥರಾಗುತ್ತಾರೆ. ಹಾಗಾಗಿ, ತಬ್ಬಲಿ ಮಗುವಿನ ಲಾಲನೆ-ಪಾಲನೆಯ ಹೊಣೆ ಮಕ್ಕಳಿಲ್ಲದ ಸೋದರಮಾವ ಅಮರುದ್ದೀನ್ ತ್ಯಾಬ್ಜಿ ಮತ್ತು ಅತ್ತೆ ಹಮಿದ ಬೇಗಂ ವಹಿಸಿಕೊಳ್ಳುತ್ತಾರೆ. ದಿನವುರುಳಿದಂತೆ, ಶಿಕಾರಿಯಲ್ಲಿ ಅಸಕ್ತಿಯಿದ್ದ ಇನ್ನೊಬ್ಬ ಸೋದರಮಾವನ ಜೊತೆಗೂಡಿ ಪುಟ್ಟ ಬಾಲಕ ಸಲೀಂ, ಶಿಕಾರಿಯನ್ನು ಆನಂದಿಸುತ್ತಾ ಶ್ರೇಷ್ಟ ಗುರಿಕಾರನಾಗಿದ್ದೂ ಉಂಟು. ಆದರೆ, ಬೇಟೆಯಾಡುವ ಮನಸ್ಸು ಪಕ್ಷಿಗಳ ಸಂರಕ್ಷಣೆಗೆ ಹೊರಳಿದ್ದು ಅತ್ಯಂತ ರೋಚಕ ಸಂಗತಿ.

ತುಂಟ ಪೋರ ಸಲೀಂ, ಹತ್ತು ವರ್ಷದವನಿದ್ದಾಗ ತನಗೆ ಸಿಕ್ಕ ಗಾಳಿ ಬಂದೂಕದಿಂದ ಗುಬ್ಬಚ್ಚಿ ಹೋಲುವ ಚಿಕ್ಕ ಹಕ್ಕಿಯನ್ನು ಹೊಡೆದುರುಳಿಸುತ್ತಾನೆ, ಮರು ಕ್ಷಣವೆ ಮನ ಕರಗಿ, ಸತ್ತ ಪಕ್ಷಿಯನ್ನು ತನ್ನ ಸೋದರಮಾವನ ಬಳಿ ಕೊಂಡೊಯುತ್ತಾನೆ. ಗುಬ್ಬಚ್ಚಿಯಂತೆ ಕಂಡರೂ ಹಳದಿ ಕೊರಳನ್ನು ಹೊಂದಿ ಕೊಂಚ ಬೇರೆ ರೀತಿಯ ಹಕ್ಕಿಯಂತೆ ಕಂಡದ್ದರಿಂದ ಸೋದರಮಾವ ಅದನ್ನು ಗುರುತಿಸಲಾಗದೆ, ಹಕ್ಕಿ ಮತ್ತು ಸಲಿಂ ರ ಜೊತೆ Bombay Natural History (BNHS) Society ಯ Secretary W. S. Mallard ರ ಬಳಿ ಹೋಗುತ್ತಾರೆ. ಅದು, ಅಪರೂಪದ ಹಳದಿ ಕೊರಳಿನ ಗುಬ್ಬಚ್ಚಿ ಎಂದು ಗುರುತಿಸಿ, ಅತ್ಯಾನಂದದಿಂದ ನಿಬ್ಬೆರಗಾಗಿ ನಿಂತಿದ್ದ ಬಾಲಕ ಸಲೀಂನ ಕುತೂಹಲ ತಣಿಸಲು ವಸ್ತು ಸಂಗ್ರಹಾಲಯದಲ್ಲಿ ಇರುವ ಇತರ ಹಕ್ಕಿಗಳನ್ನು ತೋರಿಸುತ್ತಾರೆ. ಸತ್ತ ಹಕ್ಕಿಗಳಿಗೆ ಹುಲ್ಲು ತುಂಬಿಸಿ ಒರಣವಾಗಿ ಜೋಡಿಸಿಟ್ಟ ವೈವಿದ್ಯಮಯ ಪಕ್ಷಿಗಳಿಗೆ ಮಾರು ಹೋದ ಪುಟ್ಟ ಸಲೀಂ, ಅಂದಿನಿಂದ ಮತ್ತೆ-ಮತ್ತೆ ವಸ್ತು ಸಂಗ್ರಹಾಲಯಕ್ಕೆ ಭೇಟಿ ನೀಡಲು ಪ್ರಾರಂಭಿಸುವರು. ಇದು, ಬೇಟೆಗಾರ ಸಲೀಂ ಸಂರಕ್ಷಕನಾಗಿ ಪರಿವರ್ತನೆ ಹೊಂದಿದ ಸ್ವಾರಸ್ಯಕರ ಘಟನೆ.

ಭಾರತದ ಪಕ್ಷಿ ಪಿತಾಮಹ – ಸಲೀಂ ಅಲಿ

ಯುವಕ ಸಲೀಂ ಅಲಿ ಮುಂದಿನ ವ್ಯಾಸಂಗ ಮಾಡಲು ಕಾಲೇಜಿಗೆ ದಾಖಲಾದರೂ ಕುಟುಂಬದ ಮರ-ಮುಟ್ಟು ವ್ಯಾಪಾರ ಮತ್ತು ಟಂಗಸ್ಟನ್ ಗಣಿಯ ವ್ಯವಹಾರದಲ್ಲಿ ನೆರವಾಗಲು ಬರ್ಮಾ ದೇಶಕ್ಕೆ ಹೋಗುವ ಸಂಧರ್ಭ ಒದಗಿಬರುತ್ತದೆ. ಆದರೆ ಅಲ್ಲಿಯೂ ಅವರ ಮನಸು, ಕೆಲಸ- ಕಾರ್ಯ ಗಳಿಗಿಂತ ಹೆಚ್ಚಾಗಿ ಅಲ್ಲಿನ ಕಾಡಿನಲ್ಲಿರುವ ಪಕ್ಷಿಗಳಿಗೆ ತುಡಿಯುತ್ತಿತ್ತು. ಮುಂಬೈಗೆ ವಾಪಸಾಗಿ ಪ್ರಾಣಿಶಾಸ್ತ್ರದಲ್ಲಿ ಪದವಿ ಪೂರೈಸುವ ಹೊತ್ತಿಗೆ ದೂರದ ಸಂಬಂದಿ ಜೇಮೀನ ಬೇಗಂ ಜೊತೆ 1918 ರಲ್ಲಿ ವಿವಾಹವಾಗುವುದು. ಕುಟುಂಬ ನಿರ್ವಹಣೆಗಾಗಿ "Zoological Survey of India" ದಲ್ಲಿ ಕೆಲಸ ಕೇಳಲು ಹೋದಾಗ ಬೇಕಾದ ವಿದ್ಯಾರ್ಹತೆ ಇರದ ಕಾರಣ ಕೆಲಸದಿಂದ ವಂಚಿತರಾಗುತ್ತಾರೆ. ನಂತರ Prince of Wales Museum, Mumbai (1926) BNHS ವಸ್ತು ಸಂಗ್ರಹಾಲಯದಲ್ಲಿ ಗೈಡ್ ಕೆಲಸಕ್ಕೆ ಸೇರಿಕೊಂಡು ಅಲ್ಲಿ ಬರುವ ಸಂದರ್ಶಕರಿಗೆ, ಅದ್ಯಯನಕಾರರಿಗೆ ಹುಲ್ಲು ತುಂಬಿಸಿದ, ಮೃತ ಹಕ್ಕಿಗಳ ವಿವರಣೆ ನೀಡುತ್ತಾ, ಅದರ ಸಂರಕ್ಷಣೆ ಮಾಡುವ ಕಾರ್ಯ ನಿರ್ವಹಿಸುತ್ತಾರೆ. ನೀಲಾಗಸದಲ್ಲಿ ಸ್ವಚ್ಚಂದವಾಗಿ ವಿಹರಿಸುವ ಬಾನಾಡಿಗಳ ಆಕರ್ಷಣೆ ಹೊಂದಿದ ಸಲೀಂರವರಿಗೆ ಈ ಕಾರ್ಯ ರುಚಿಸುವುದಿಲ್ಲ.

ಉನ್ನತ ವ್ಯಾಸಂಗದ ಅನಿವಾರ್ಯತೆಯ ಮನಗಂಡು ಸಲೀಂ ಅಲಿ ಜರ್ಮನಿ Berlin Natural History Museum ಹೋಗಿ ಪ್ರಖ್ಯಾತ ಪಕ್ಷಿ ತಜ್ಞ Prof Erwin Stressman ಬಳಿ ಅಧಿಕೃತವಾಗಿ ಪಕ್ಷಿಗಳ ಬಗ್ಗೆ ಆಳವಾದ ಅಧ್ಯಯನ ಮಾಡುತ್ತಾರೆ, ಮುಖ್ಯವಾಗಿ ವಲಸೆ ಹಕ್ಕಿಗಳ ಕಾಲಿಗೆ ಪಟ್ಟಿ(banding) ಕಟ್ಟುವ ಕಾರ್ಯದಲ್ಲಿ ನಿಷ್ಣಾತರಗುತ್ತಾರೆ. ಆದರೆ, ಇಷ್ಟು ವಿದ್ಯಾರ್ಹತೆ ಪಡೆದರೂ ಭಾರತಕ್ಕೆ ಮರಳಿ ಬಂದಾಗ ಮನ ಮೆಚ್ಚುವ ಕೆಲಸ ಸಿಗದೆ ನಿರಾಶರಾಗುವರು . ಜೀವನ ನಿರ್ವಹಣೆಗೆ BNHS ನಲ್ಲಿ ಕೇವಲ ಗುಮಾಸ್ತನಾಗಿ ಕೆಲಸ ಪ್ರಾರಂಭಿಸುವರು ಹಾಗೆಯೇ ಅವರಿಗೆ ಸಿಕ್ಕ ಬಿಡುವಿನ ವೇಳೆಯಲ್ಲಿ ಮಡದಿಯ ಮುಂಬೈನ ಕಡಲ ತಡಿಯ ಊರಾದ ಕಿಹಿಮ್ ನಲ್ಲಿ ಹೆಚ್ಚಿನ ಸಮಯ ಕಳೆಯುತ್ತಾ ಅಲ್ಲಿನ ಹಸಿರು, ಹಕ್ಕಿ, ಶಾಂತ ವಾತಾವರಣದಲ್ಲಿ ಕರಗಿಹೋಗುತ್ತಾರೆ. ಪಟ್ಟಣದ ಗದ್ದಲದಿಂದ ದೂರ ಪ್ರಶಾಂತ ಸ್ಥಳದಲ್ಲಿ ಪಕ್ಷಿಗಳನ್ನು ಗಮನಿಸುವಾಗ, ಗೀಜುಗನ ಹಕ್ಕಿಯ ಸಂತನಾಭಿವೃದ್ದಿ ಚಟುವಟಿಕೆ, ಸಂಗಾತಿಯ ಆಯ್ಕೆ ಇತ್ಯಾದಿಗಳ ಬಗ್ಗೆ ಆಳವಾಗಿ ಅಧ್ಯಯನ ಮಾಡಿ ತಮ್ಮ ಸಂಶೋಧನೆಯನ್ನು ವೈಜ್ಞಾನಿಕ ಪತ್ರಿಕೆಯಲ್ಲಿ ಪ್ರಕಟಿಸಿ ದೇಶದಲ್ಲೆಲ್ಲಾ ಮನ್ನಣೆ ಪಡೆಯುವರು.

ಸ್ವಾತಂತ್ರ್ಯ ಪೂರ್ವದಲ್ಲಿ ಭಾರತವನ್ನು ಹಲವು ಪ್ರಾಂತ್ಯವಾರು ಆಳ್ವಿಕೆಗೆ ಒಳಪಟ್ಟಿದ್ದು ಅಲ್ಲಿನ ಪಕ್ಷಿ ಸಂಕುಲದ ಪಟ್ಟಿ ನಡೆದಿಲ್ಲ ಎಂಬುದನ್ನು ಅರಿತ ಸಲೀಂ ಅಲಿಯವರು BNHS ವತಿಯಿಂದ ಅಲ್ಲಿನ ಹಕ್ಕಿಗಳ ಪಟ್ಟಿ ಮಾಡಲು ಪರವಾನಿಗೆ ಪಡೆಯುತ್ತಾರೆ. ದೇಶದ ಹಲವು ಪ್ರಾಂತ್ಯದಲ್ಲಿ ಅಲ್ಲಿನ ರಾಜರುಗಳ ಬಳಿ ಪಕ್ಷಿಗಳ ಅದ್ಯಯನ ನಡೆಸಲು ಅನುಮತಿ ಕೋರಿ ಬದಲಾಗಿ ವಸತಿ ಮತ್ತು ಸಾರಿಗೆ ವ್ಯವಸ್ಥೆ ಯನ್ನು ನೀಡಲು ವಿನಂತಿಸಿದರು. ಇದರ ಫಲವಾಗಿ ಎರಡು ದಶಕಗಳ ವರೆಗೆ ಹೈದರಾಬಾದ್, ಕೊಚ್ಚಿನ್, ತ್ರವನಕೋರ, ಇಂದೋರ್. ಗ್ವಾಲಿಯರ್, ಭೋಪಾಲ್, ಮೈಸೂರ್ ಮತ್ತು ಇತರ ರಾಜ್ಯದಲ್ಲಿ ಅಲೆಮಾರಿಯಂತೆ ದೇಶದ ಮೂಲೆ-ಮೂಲೆ ಅಡ್ಡಾಡಿ, ಎಲ್ಲ ಕಾಡು-ಮೇಡುಗಳ ಎಡತಾಕಿ ಹಕ್ಕಿಗಳ ಪಟ್ಟಿ ಸಿದ್ಧಪಡಿಸಿದರು. ಮುಂಬೈಯಂತಹ ಪಟ್ಟಣದಲ್ಲಿ ಬೆಳೆದಂತಹ ಸಾಮಾನ್ಯರಿಗೆ ಈ ಪರ್ಯಟನೆ ದೊಡ್ಡ ಸವಾಲೇ ಆಗಿದ್ದರೂ ಇದು ಸಲೀಂ ಅಲಿಯವರ ಜೀವನದ ಅತ್ಯಂತ ಮಧುರ ಕ್ಷಣಗಳಾಗಿದ್ದವು. ಭಾರತದ ಪಕ್ಷಿ ವೈವಿಧ್ಯತೆ ಮತ್ತು ಅವುಗಳ ಆವಾಸ ಸ್ಥಾನದ ಅಧ್ಯಯನವನ್ನು 1941 ರಲ್ಲಿ "The Book of Indian Birds" ಎಂಬ ಪುಸ್ತಕ ರೂಪವಾಗಿ ಹೊರತಂದರು. ಇದು ಬಲು ಬೇಗ ಮಾರಾಟವಾಗಿ, ಹಲವು ವರ್ಷಗಳ ಕಾಲ ಅತ್ಯಂತ ಬೇಡಿಕೆಯಲ್ಲಿತ್ತು. ಇಂದಿಗೂ ಸಹ ಪಕ್ಷಿ ವೀಕ್ಷಣೆ ಆರಂಭಿಸುವವರೆಲ್ಲರಿಗೆ ಇದು ಉತ್ತಮ ಕೈಪಿಡಿ.

ಭಾರತದ ಪಕ್ಷಿ ಪಿತಾಮಹ – ಸಲೀಂ ಅಲಿ

ಸ್ವಾತಂತ್ರ್ಯಾನಂತರ ಭಾರತದಲ್ಲಿ ಬ್ರಿಟಿಷರ ಆಳ್ವಿಕೆ ಕೊನೆಗೊಂಡಾಗ 100 ವರ್ಷ ಬಾಳಿದ BNHS ಸಂಸ್ಥೆ ಆರ್ಥಿಕ ಮುಗ್ಗಟ್ಟಿನಿಂದ ಮುಚ್ಚುವ ಪರಿಸ್ಥಿತಿಗೆ ಬಂದಿತ್ತು. BNHSನಲ್ಲಿ ಅಧಿಕಾರ ವಹಿಸಿಕೊಂಡಿದ್ದ ಸಲೀಂ ಅಲಿಯವರು, ಅಂದಿನ ಪ್ರಧಾನಮಂತ್ರಿ ಪಂಡಿತ್ ಜವಾಹರಲಾಲ್ ರನ್ನು ಭೇಟಿ ಮಾಡಿ ಆರ್ಥಿಕ ಸಹಾಯ ಕೋರಿ BNHS ಸಂಸ್ಥೆ ಉಳಿಸುವಲ್ಲಿ ಯಶಸ್ವಿಯಾಗುತ್ತಾರೆ.

ನಂತರ ಖ್ಯಾತ ಪಕ್ಷಿ ತಜ್ಞ S Dillon Riply ಜೊತೆ ಕೆಲಸ ಮಾಡಿ ಭಾರತ ಉಪಖಂಡದ ಹಕ್ಕಿಗಳು, ಅದರ ರೂಪ, ಆವಸಸ್ಥಾನ, ಸಂತನಾಭಿವೃದ್ಧಿಗೆ ಸ್ಥಳದ ಆಯ್ಕೆ, ವಲಸೆ ಕ್ರಮ ಇತ್ಯಾದಿಗಳನ್ನೊಳಗೊಂಡ ತಮ್ಮ ಹತ್ತು ವರ್ಷದ (1964-1974) ಅಧ್ಯಯನದ " Handbook of Birds of India and Pakistan" (10 Volume set) ಪ್ರಕಟಿಸಿದರು. ಹಾಗೆಯೇ, ಹಲವು ಪ್ರಾದೇಶಿಕ ಗೈಡ್ ಗಳು, 1967 ನಲ್ಲಿ "Common Birds" ಎಂಬ ಪುಸ್ತಕವನ್ನು ಮತ್ತು 1985 ರಲ್ಲಿ "The Fall of Sparrow " ಆತ್ಮ ಚರಿತ್ರೆಯನ್ನು ಬರೆದಿರುವವರು.

ಸಲೀಂ ಅಲಿಯವರ ಪ್ರಯತ್ನದಿಂದ ಇಂದು ಭಾರತದಲ್ಲಿ ಪಕ್ಷಿ ಅಧ್ಯಯನ ನಿಯಮಿತವಾಗಿ, ವ್ಯವಸ್ಥಿತವಾಗಿ ನಡೆಯತ್ತಿದೆ. ಅವರ ಹಲವಾರು ಲೇಖನ, ಪುಸ್ತಕ, ಕೈಪಿಡಿಗಳು ಪಕ್ಷಿಗಳ ಬಗ್ಗೆ ಸಾಕಷ್ಟು ಅರಿವು ಮೂಡಿಸಿವೆ, ಪಕ್ಷಿ ಗುರುತಿಸುವಲ್ಲಿ ಅತ್ಯಂತ ಸಹಕಾರಿಯಾಗಿದೆ. ಅವರು ತಮ್ಮ ಸೀಮಿತ ತಂತ್ರಜ್ಞಾನದಲ್ಲಿ ಬರೆದ ಪಕ್ಷಿಗಳ ವಿವರಣೆ ಇಂದಿಗೂ ಕಾರಾರುವಾಕ್ಕಾಗಿರುವುದು ಅಚ್ಚರಿಮೂಡಿಸುವುದು, ಇದು ಒಬ್ಬ ಮನುಷ್ಯನ ಸಾಧನೆ ಎಂದಾಗ ದಿಗ್ಭ್ರಮೆಯೆಯಾಗುವುದು.

ತೆಳು ಕಾಯದ, ಹದ್ದಿನ ಕಣ್ಣಿನ, ನೀಳ ಮೂಗಿನ, ಬೊಚ್ಚು ಬಾಯಿಯ, ನಿಷ್ಕಲ್ಮಶ ನಗುವಿನ ಸಲೀಂ ಅಲಿಯವರು ಎಷ್ಟೆಲ್ಲ ಕೀರ್ತಿ, ಗೌರವ, ಪ್ರಶಂಸೆಗೆ ಪಾತ್ರರಾದರೂ ಅವರ ಮನಸ್ಸು ಇನ್ನೂ ಹತ್ತು ವರ್ಷದ ಬಾಲಕನಷ್ಟೆ ಮುಗ್ಧವಾಗಿತ್ತು. ತಮ್ಮ ಇಳಿವಯಸ್ಸಿನಲ್ಲಿಯೂ ಅದೇ ಕುತೂಹಲ, ಉತ್ಸಾಹ, ಕಲಿಯುವ ತವಕ ಹೊರಸುತ್ತಿದ್ದರು, ತೊಂಬತ್ತನೆಯ ವಯಸ್ಸಿಗೆ, June 20,1987 ರಂದು ತಮ್ಮ ಇಹಲೋಕದ ಯಾತ್ರೆ ಮುಗಿಸಿ ಆನಂತದಲ್ಲಿ ಲೀನವಾದರು.

ಪಕ್ಷಿ ಪ್ರಿಯರಿಗೆ ಅಪರಿಮಿತ ಉಡುಗೊರೆ ಕೊಟ್ಟು ಮುಂದಿನ ಪೀಳಿಗೆಯವರಿಗೆ ಸ್ಪೂರ್ತಿ ನೀಡಿ ಆಶಾಕಿರಣವಾದ ಸರಳ, ಸಜ್ಜನಿಕೆಯ ಮೂರ್ತಿ ಸಲೀಂ ಅಲಿಯವರ ಮಹಾನ್ ಆತ್ಮ ಮತ್ತೆ ನಮ್ಮಲ್ಲಿಯೇ ಹುಟ್ಟಿ ಬರಲಿ ಎಂದು ಹಾರೈಸುತ್ತಾ ....ಪಕ್ಷಿ ಸಂಕುಲವನ್ನು ಉಳಿಸಿ, ಬೆಳಸಿ, ಸಂರಕ್ಷಿಸುವ ಅವರ ಕನಸು ನನಸು ಮಾಡುವ ಕಾರ್ಯಕ್ಕೆ ಎಲ್ಲರೂ ಕೈ ಜೋಡಿಸೋಣ.

ಸಲೀಂ ಅಲಿಯವರ ಮಹತ್ಕಾರ್ಯವನ್ನು ಗಮನಿಸಿ ಹಲವಾರು ಪ್ರಶಸ್ತಿಗಳು, ಬಿರುದು ಸನ್ಮಾನಗಳು ಅರಸಿಬಂದವು. ಹಲವು ಪಕ್ಷಿ ಪ್ರಬೇಧಗಳಿಗೆ, ಕೆಲವು ಪಕ್ಷಿಧಾಮ ಮತ್ತು ಪಕ್ಷಿ ಅಧ್ಯಯನ ಸಂಸ್ಥೆಗಳಿಗೆ ಅವರ ಹೆಸರು ಇಡಲಾಯಿತು.

ಅದರಲ್ಲಿ ಕೆಲವನ್ನು ಇಲ್ಲಿ ಪಟ್ಟಿ ಮಾಡಲಾಗಿದೆ.

- Earliest was the "Joy Gobinda Law Gold Medal"(1953) by the Asiatic Society of Bengal
- J. Paul Getty Wildlife conservation International Award (1967) received sum of 100,000 $ which he used to form the corpus of Salim Ali Nature Conservation Fund
- Golden Medal of the British Ornithology Union (1967), first Indian and first non-British to receive this award
- John Philips Memorial Award by the International Union for the Conservation of Nature and Natural Resources (1969)

ಭಾರತದ ಪಕ್ಷಿ ಪಿತಾಮಹ – ಸಲೀಂ ಅಲಿ

- USSR Academy of Medical Sciences gave him the Pavolovsky Centenary Memorial Medal (1973)
- Golden Ark from Netherlands Prince Bernhard for his excellent contribution to nature conservation (1973)
- Padma Bhushan (1958) and Padma Vibhushan (1976) award from Indian Govt
- 3 Honorary Doctorates from Aligarh, Andhra, Delhi Universities and numerous other awards
- Nominated for Rajya Sabha 1985
- His timely intervention saved Keoladeo Ghana bird Sanctury, Bharathpur, Rajasthan., Silent Valley National Park, Kerala., Ranganatittu Bird Sanctury, Karnataka.
- Salim Ali Bird Sanctuary at Goa set up in 1988
- Salim Ali centre for Ornithology and Natural History- Coimbatore in 1990 with the mission "To help conserve Indian biodiversity and its sustainable use through research, education, and peoples participation with birds at the centre stage"

ರೇಣು ಪ್ರಿಯದರ್ಶಿನಿ ಎಂ
ಸಸ್ಯ ಶಾಸ್ತ್ರ ವಿಭಾಗ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