

## S. Kedharnath (1921–2004)

In the passing away of S. Kedharnath on 6 December 2004 at Bangalore, we have lost a distinguished scientist who pioneered research on forest tree genetics in our country and a wonderful human person whose geniality and generosity endeared him to many who knew him, a scientist whose science was ever tempered by a keen sense of service without sophistication and remarkable humility.

Kedharnath was born on 10 October 1921 at Pusa, Bihar to L. S. Subramaniam and Subbulakshmi. His father served for many years as Assistant to Sir Edwin J. Butler, Imperial Mycologist and later Director of the Agricultural Research Institute at Pusa. Subramaniam is well known to mycologists from his oft-quoted seminal contribution on the genus *Cerebella*. Following retirement, I believe, the family moved to Coimbatore in what was then the Madras Presidency. Kedhar (as I used to call him) obtained his Honours degree in Botany from the Presidency College, Madras during 1939–1942. He then joined the Sugarcane Breeding Institute at Coimbatore as a Research Fellow, working on the cytogenetics of interspecific hybrids of *Saccharum officinarum*, with guidance from N. Parthasarathy, whose contributions to genetics of sugarcane are well known. Of special interest were the hybrids from crosses between *S. officinarum* and *Sclerostachys fusca*. His work at the institute earned him the Master of Science (by thesis) degree of the University of Madras in 1946.

From Coimbatore, Kedharnath moved to Delhi and joined the Indian Agricultural Research Institute (IARI) as Research Assistant in Cytogenetics (1946–51). Here he worked on the cytogenetics of *Sesamum* (*S. indicum*, *S. prostratum* and hybrids), trying to evolve plants that would be resistant to the insect pest *Antigastra catalaunalis* and also give a high yield of oil. Native, wild and exotic species were studied for crossability. During this period, he collaborated with A. B. Joshi in some of the studies. Linseed (*Linum usitatissimum*) was another crop that received his attention. The relation of morphological grouping of the Indo-Gangetic types and the peninsular types of linseed cultivated in the Deccan to coefficient of yield of seed and yield components, and yield of oil and oil quality was investigated. Such studies are obviously basic to any programme of

linseed breeding. Selection of plants with desirable yield and quality of oil required a quick and dependable method of assessment. To meet this requirement, a method was developed for determining the correlation between iodine value and refractive index of the oil obtained from a small quantity of seed material.



During the period 1951–55, Kedharnath worked as Assistant Wheat Breeder with B. P. Pal at the Institute and was involved in handling early maturing wheats. During 1955–57, on a sabbatical, he worked with R. A. Brink at the University of Wisconsin, Madison, USA. His work with Brink on mutable loci and transposable elements associated with such loci in maize earned him a Ph D degree of the University of Wisconsin.

During 1957–59, he held the position of Linseed Breeder at the IARI. In 1959, he moved to the Forest Research Institute, Dehra Dun as Forest Geneticist and Head of the Forest Genetics Branch of the Institute (1959–78). This was a challenging assignment which he held with great distinction and with a vision that is unmistakable. He was Director, Biological Research in the institute during 1978–80 and retired in October 1980, on superannuation. During 1982–86, he served as Director of the Kerala Forest Research Institute, Peechi near Trichur in Kerala. Here he brought to bear his experience in forest genetics and his management skills on the development of research and encouraged the development of sister disciplines.

Beginning with his tutelage under Parthasarathy at the Sugarcane Breeding Institute, Kedharnath was associated with a number of scientists at the IARI and elsewhere in

the area of plant genetics. In agriculture, his contributions spanned sugarcane, wheat and oilseed crops. In the field of forest tree genetics, he was a pioneer in what may be considered a challenging and difficult experimental area of which our knowledge is limited, but the potential for good is immense. Leadership in such an area calls for imagination and innovation, persistence in overcoming difficulties, and a special knack to deal with problems peculiar to forestry and to foresters. Kedharnath had in him the qualities required for such leadership in abundant measure. One of his significant contributions to forest genetics in our country is the mass production of genetically improved seeds through seed production areas and the establishment of clonal seed orchards. What he did in these areas, and its relevance to afforestation programmes and building of forest wealth is well known in forestry and to foresters, although I am not quite certain if the general scientific community and others know much about it. Forest genetics is a special and difficult area, and one with which even plant geneticists studying agricultural crops may not perhaps be too familiar.

The tree species in which genetic improvement was sought and achieved include notably, teak (*Tectona grandis*), eucalyptus and chir pine (*Pinus roxburghii*). Determination of the somatic chromosome number and selection of individual trees with desired qualities such as superior growth in height and diameter, and resistance to pests and other parameters are essential for establishing clonal seed orchards, for example, in teak. Selected trees which are called 'plus trees', came from different states where teak is grown. Similar studies were carried out for eucalyptus and pine.

Kedharnath initiated studies on inducing mutation in a number of tree species with a view to evolving better varieties. The response of air-dried seeds of a number of tree species to different doses of acute gamma-radiation was assessed, with a view to inducing mutation. Several conifer species and angiosperm tree species were tested and it was noted that the conifers were more radio-sensitive. On the other hand, the reverse was the case with chemical mutagens (ethylmethane sulphonate).

Kedharnath's standing as a scientist is reflected in his election to the Fellowships

## PERSONAL NEWS: OBITUARY

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of the Indian National Science Academy (1980), the Indian Academy of Sciences (1984) and the National Academy of Agricultural Sciences (1991).

Kedharnath's versatility as a scientist is reflected in the variety of crops he studied and his role in the development of clonal seed orchards of several forest tree species. I knew him as a college and hostel mate in Madras, as a colleague on the staff of the IARI, and as a fellow scientist with whom I had opportunities of interacting in various capacities. His simplicity and utter humility, kindness and generosity, love of family and friends, love of good things in life, and his happy-go-lucky nature were characteristic. I have always believed that a good scientist must first be a good human. Kedharnath was such a person. During our student days, on a students' excursion to the Annamalais and the Nilgiris to collect and study plants he acted as the secretary of our group, a role that brought out his organizational qualities. At Coimbatore, en route to the Nilgiris, he invited the entire contingent

for dinner to his home. That was his generosity. A few years later, when I had to appear for an interview before the UPSC in Simla, again it was Kedhar (who was then at the IARI) who fixed up my stay with a friend in Simla. When I joined the IARI, we stayed with him for several days until we could fix up a house for my stay. Kedhar, I know, extended such kindness to many a friend. And he never expected anything in return. Whenever he came to Madras, he would make it a point to see me. In the past two years we had not met and my letter to him at Coimbatore remained unanswered, which was unusual. My annual New Year Greetings remained unanswered. I was naturally shocked when I learnt from the newspapers that he had passed away on 6 December 2004. When I called up his Bangalore residence, I was further shocked to learn that his partner in life, Sitalakshmi predeceased him by a few months, having breathed her last in October 2004. The Kedharnaths formed a loving couple, supportive of each other.

In the drama of life, one has to play different parts, and what always struck me about my departed friend is the way he played the parts so well and admirably without looking for any recognition. He came and just played his part.

In the area of the genetics of our agricultural crops, we have had with us – and still have – many scientists who made significant contributions. But that, alas, is not true of forest tree genetics. Kedharnath's pioneering contributions in this area are a pointer to their relevance in the conservation of our forests and in afforestation programmes needed to sustain our forests and our environment. There is an urgent need to take the road charted by Kedharnath towards fulfilment of these objectives.

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