have spent several moments learning about the good old days of this city. He lived in Chowpatti, studied in the adjoining Wilson College, did his PhD in the Cancer Research Institute under the late Dr Khanolkar and worked with the late Dr Shanta Rao and continued to be associated with her even after she moved on to the Institute for Research in Reproduction where he continued until his last days. He married his childhood friend, Nandini, when she was his colleague at the Cancer Research Institute, brought up his only daughter, Bella, who is now a practising gynaecologist in Bombay. He was close to his family as he was with his large number of students – he produced 23 PhDs who are distributed throughout the country and abroad. I am sure the seeds sown by Sheth will reach fruition one of these days through the vast number of students he has left behind.

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Subramanyan Suryanarayanan (1927–1994)

An obituary by T. S. Sadasivan

Subramanyan Suryanarayanan was born in Kadattur, Tamil Nadu on 23 January 1927. His schooling was in the Nanjappa High School, Tirupur and he completed his Intermediate in 1944 with a first class in Natural Sciences, Physics and Chemistry from the Government Arts College, Coimbatore. In 1947 he took a BSc (Agric.) from the Agricultural College, Coimbatore and was awarded the De Silva Medal. After a spot of work in the districts as Agronomy Assistant he took up a research fellowship to work in the University Botany Laboratory under the supervision of T. S. Sadasivan and was awarded a PhD in 1956 in Plant Pathology for his thesis on the blast disease of rice. In 1964 he joined the research staff of the Centre for Advanced Studies in Botany at Madras, first as Lecturer, was later promoted to a Readership in 1968 and finally elevated to a Chair in 1984. Suryanarayanan was on the Editorial Board of the *Journal of Scientific & Industrial Research*, Member of the Indian Botanical Society, Indian Phytopathological Society, the Philippine Phytopathological Society and the Society of Biological Chemists (India). He was elected Fellow of the Indian Academy of Sciences in 1971.

For all his researches, Suryanarayanan used a model system – the 'rice blast' disease by the air-borne pathogen *Pyricularia oryzae* on its host *Oryza sativa*. Besides establishing the total and absolute vitamin heterotrophy of *Pyricularia* spp. to thiamine and biotin, the essentiality of Fe and Zn to *Pyricularia* growth *in vitro* was shown by his investigations. Suryanarayanan also worked on aspects of essentiality of Fe and Zn in the growth of the fungus *in vitro*. Another aspect of the heavy metal nutrition of this fungus was the demonstration of Fe–Cu antagonism. Suryanarayanan's major effort in the eighties was in the study of toxins elaborated by *Pyricularia* spp. which showed that except for Pyriculol, other reported toxins were not produced by Indian isolates of the fungus. Indeed, mutation and serological techniques were used to understand host/pathogen interactions in the rice blast system. Blast fungi were shown to possess, not

only O-diphenol oxidase, but also laccase. The toxin Pyriculol was shown to be present *in vivo* in one of the blast diseased graminaceous hosts (*Brachiaria mutica*). In fact, a neutral toxic fraction was identified in blast diseased leaves of rice, which was found to exert a greater toxic effect on a resistant than a susceptible cultivar. What was interesting about this toxic principle was that it could be counteracted with benzimidazole.

One of the significant contributions made in the fifties was the role of genotype–nyctotemperature interactions in the rice-blast syndrome. Low night temperatures were shown to be critical not only in host compatibility but also host range. Host-induced variability of the fungus was also demonstrated. Suryanarayanan's work at the International Rice Institute in the Philippines indicated that wettability of rice leaf surface is an important component of 'stable' (horizontal) resistance of rice blast and that this component is heritable, thus suggesting that evolution of rice varieties with highly hydrophilic leaf surfaces could considerably mitigate the incidence of the blast disease.

Suryanarayanan broke new ground when he showed that rapid lignification during early stages of infection in blast-resistant rice varieties was accompanied by increased levels of PAL (phenylalanine ammonia lyase) and peroxidases. In fact, host specificity of *Pyricularia* seemed to have involvement of both pre- and post-inoculation fungal components and it also became apparent that host–parasite relationship at the leaf surface, especially in the epicuticular wax layer, appeared significant.

Suryanarayanan and his collaborators worked on alterations in rice leaf tissue permeability which was brought about not only by toxins of *P. oryzae* but also by a $FeCl_4^+$ toxic host component. Furthermore, the toxins of *Pyricularia* were demonstrated by his group to induce 'green islands' in rice leaf tissue.

Studies on the role of Fe in the blast disease of rice indicated the importance of lipoxygenase in disease resistance and that resistance is likely to be mediated by Fe. Active monogenic resistance to blast seems to be mediated by pre- and post-infectionally formed antifungal compounds and development of resistance to such natural antifungals may be a key to evolution of physiologic race in blast fungi.

Suryanarayanan was always keen on employing the latest techniques in laboratory bioassay of plant products. In this quest for excellence he had brought to the CAS in Botany at Madras many such techniques as he worked at the International Rice Research Institute, Philippines; Departments of Biological Sciences, University of Dundee; Imperial College, London; Long Ashton Research Station, Bristol and the Prairie Regional Laboratory, Saskatoon, Canada More than using these techniques he had trained all his research associates to handle and maintain the many sophisticated instruments they had gathered together.

In the sudden passing away of Suryanarayanan on 18 June 1994 when his scientific productivity was still high, even in retirement, we have lost an able investigator in the modern field of Physiological Plant Pathology. He was a much respected academic. He leaves behind his wife and son and a host of scientific colleagues to mourn the loss.

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HISTORICAL COMMENTARY AND NOTES

From the annals of plague

C. C. Kartha and E. Jeetendra

Giovanni Boccaccio, a contemporary of Dante and Geoffrey Chaucer is the father of Italian prose. His masterpiece the *Decameron* is a collection of tales, told to one another by ten friends who terrified of an epidemic of plague, fled to an isolated villa.

A memorable description

The prologue to the *Decameron* contains a vivid portrayal of the Black Death, an epidemic of bubonic plague, worst of all times, which ravaged Europe during Boccaccio's life time[1].

> In the year of our lord 1348, in Florence, in the finest city of all Italy, there occurred a most terrible plague: either because of the influence of the planets or sent from God as a just punishment for our sins, it had broken out some years earlier in the East, and after passing from place to place and recking incredible havoc along the way had now reached the West where, in spite of all the means that the art and human foresight could suggest, such as keeping the city clear from filth, and excluding all suspected people .... Different from what it had been in the East, where bleeding from the nose suggests a fatal outcome, here there appeared tumors in the groins or under the armpits, some as big as a small apple, others like an egg. Afterwards purple spots appeared in most parts of the body ... the usual messengers of death. To the cure of this disease, neither the knowledge of medicine nor the power of drugs was of any effect, whether because the disease was itself fatal or because the physicians, whose number was increased by quacks and woman pretenders, could discover neither cause nor cure, and so few escaped They generally died the third day after the appearance without fever .... The disease grew daily by being communicated from the sick to the well .... Nor was it (necessary) to converse or even to come near the sick; even touching their clothes or anything they had touched was sufficient ....The events and similar others caused various fears among those people who survived, all tending to the same cruel and uncharitable end which was to avoid the sick and everything that had been near them .... Some felt it best to live temporately .... but others maintained free living and would deny no passion or appetite they wish to gratify .... And the public distress was such that all laws, whether human or divine, were ignored ....

The outbreak was first noticed in Sicily by early 1348, the infection carried from Asia Minor by sailors in merchant vessels which plied across the Mediterranean. Then it struck the Dorset ports and spread across Europe Within a decade about 33,000,000 people, approximately one third of the population of Europe, were estimated to have succumbed to the disease Men wore masks with pointed beaks containing vinegar and sweet smelling potions to counteract the fetid smell of dead bodies. Clerics convinced the people that the plague was a divine retribution for their sins. Crusaders in Germany took upon the sins and flagellated themselves to drive off the plague. Jews were tortured to confess that they had poisoned the wells and then persecuted.

However, sensible ways to contain the epidemic were established towards the end of the middle ages. Venice, the chief port of trade established observation centres where immigrants were made to stay for forty days, the period of quarantine (from 'quarantina', Italian for forty. The choice of this period is said to be based on the period Christ and Moses spent in isolation in the desert). A sanitary code which provided for isolation of patients, burial of the dead with their personal effects, fumigation of the place where they had