

## Dr Elisha S. Tikasingh: Life Among the Parasites

Nalini Rampersad, Shivanan Seunarine, Jo-Anne N. Sewlal and Christopher K. Starr  
Dept of Life Sciences, University of the West Indies  
St. Augustine, Trinidad, W.I.



Dr Elisha Tikasingh

Dr. Elisha Tikasingh is well known for his work on arboviruses (arthropod-borne viruses). He has described Nariva virus and was a co-describer of Restan virus both viruses were new to science. Dr. Tikasingh's greatest achievement however was the development of antibody reagents used in the identification of arboviruses.

He is also a stalwart member of the Trinidad and Tobago Field Naturalists' Club joining in the mid-1960s. He served in many roles in the Club, including serving as a member of the Management Committee during the 1970s, and as Chairman of the Centenary Celebrations Committee in 1991. He has given lectures at our Club meetings and written several articles for the Club's Journal. He has been its Editor for 15 years. This biographical article is taken from two interviews conducted in Trinidad in February and May 2014, transcribed by Jo-Anne Sewlal. The full interview is archived at the St. Augustine Campus, The University of the West Indies (U.W.I) and with the Trinidad and Tobago Field Naturalists' Club.

Born in 1927 in the village of St. Julien which is outside of Princes Town, Elisha Tikasingh and his family moved

from village to village because of his father's job as a Catechist in the Presbyterian Church. He went to primary school at the Palmyra Canadian Mission (C.M.) School and when it closed, he attended Reform C. M. School. At that time his family was living in Mt. Stewart and the daily trek to school involved a five mile hike to and from school barefooted on the hot asphalt road. After his father's death in 1940, his family moved to San Fernando where he attended Naparima College to do his Senior Cambridge. At that time one had to pay tuition fees to attend secondary school, but his entry into the school was due to the privileges allowed to children of church workers of the Presbyterian Church to attend their secondary schools for free. His mother would not have had the money to pay the tuition fees.

Shortly after the successful completion of the Cambridge School Certificate Examinations in December 1947, he got a job teaching at Fyzabad C.M. School, and taught there for about two years before going off to do his Bachelor's degree at Eastern Nazarene College in Wollaston, Massachusetts, U.S.A, at the suggestion of a friend, who said that one could work and study at this College. He was financially able to leave, thanks to his mother's thrifty nature, who saved his earnings as a teacher. Almost immediately after his arrival in college, he started earning money by washing pots and pans in the school's kitchen. His usual routine involved working in the summer and paying off for the Fall semester, borrowing part of the money for the spring semester, returning to work in the summer to repay the loan of the Spring semester and have enough money for the next Fall semester.

When he took his first undergraduate course in biology he knew that was his calling as he thoroughly enjoyed the subject. In the final year of his B.Sc. degree he was given a teaching assistant job at the College and was free from manual labour for a change. From there, with a partial scholarship from the Jessie Smith Noyes Foundation, he enrolled at Boston University, where he graduated with his M.A. in Biology. He chose the area of parasitology inspired by a paper he wrote in his undergraduate studies on the life cycle of the hookworms which fascinated him. He was awarded his Ph.D. in Zoology in 1960 from Oregon State University specializing in his favourite discipline, parasitology. At Oregon State University, he was made a Teaching Fellow which involved assisting with tutoring undergraduate laboratory courses. The stipend was suffi-

cient to live very, very modestly during the semesters but he still had to find work during the summers. However, his Major Professor, Dr. Ivan Pratt, supervising his Ph.D. research suggested that he spend at least one summer at a marine biological laboratory or inland field station to study invertebrate biology as many invertebrates are marine based or found in inland lakes and ponds. In order to spend a summer doing further studies he needed to have money. However, his Major Professor was able to arrange a scholarship from the National Science Foundation and he spent two summers at the Friday Harbor Laboratory of the University of Washington where he took courses in Advanced Invertebrate Zoology and Advanced Invertebrate Embryology. During his time there one of his professors, Dr. Dixy Lee Ray, who later went on to become the governor of the state of Washington, he remembers fondly, not only for being an excellent teacher or her annual salmon barbeque for her students, but she was also responsible for his dissertation topic. During a dredge from a boat in Puget Sound, Washington a number of animals were brought up including sea cucumbers. Dr. Ray introduced the students to the parasitic gastropod *Entoconcha* found in holothurians. *Entoconcha* was first described from the Mediterranean Sea and the idea that it had such a wide distribution appealed to Tikasingh. However, during his research he discovered that it was not *Entoconcha*, but something new to science. He ended up describing a new genus and two additional species of endoparasitic gastropods: *Comenenteroxenos parastichopoli* Tikasingh, 1961 and *Thyonicola americana* Tikasingh, 1961. He admits that he was beginning to like marine biology having spent two summers at a marine laboratory.

After graduation in June 1960, he spent the summer in Alaska working on King Crabs for the U.S. Fish and Wildlife Service. He returned to Trinidad in October 1960 and was awarded a Rockefeller Foundation Fellowship to study arboviruses at the Trinidad Regional Virus Laboratory (TRVL) which was quite fortunate as they had no post for a parasitologist. He worked there for about a year and a half after which he was appointed as a Lecturer in Microbiology, Faculty of Medicine, U.W.I. (Mona).

During the 1930s and 1940s work on the yellow fever (YF) virus was conducted at the Rockefeller Foundation Laboratory (RFL), New York and in the field in Latin America which resulted in the isolation of a number of other unknown viruses. However, not wanting to distract from their research on the yellow fever virus, the other viruses that were isolated were put in deep-freezers by the RFL for later studies. However, the development of a yellow fever vaccine by Dr. Max Theiler, which was used during World War II on soldiers, brought an end to the research on this virus. In the early 1950's work on the

viruses which were in deep-freezers were started and the Rockefeller Foundation then opened up laboratories in Johannesburg, South Africa; Poona, India; Belém, Brazil; Cali, Colombia and Port of Spain, Trinidad, the goal was to study arboviruses in each of the country they established. These laboratories also isolated a number of viruses new to science, as well as determined the ecology of some of the viruses.

The Trinidad Regional Virus Laboratory which was the forerunner of CAREC (Caribbean Epidemiology Centre) was established in 1952. It was well known for its research in the area of arboviruses and would attract visiting researchers from all over the world to Trinidad. When Tikasingh started working there in 1960, the laboratory was already established, and was coming towards the end of the exploratory stage which ended in the mid 1960's. It was also about the same time that the entomologist Dr. Thomas Aitken was due to be transferred to Belém, Brazil. This impending move resulted in Tikasingh understudying him. With this in mind, Tikasingh was put to work studying mosquitoes which are the vectors of arboviruses. The transition from parasitic gastropods to mosquitoes also involved sending him to University of California, Berkeley or a year to study entomology. Here he was offered to do an advanced degree but declined the offer in that he already held a Ph.D. and this visit concerned his job rather than personal advancement.

In 1961 the Rockefeller Foundation transferred the administration of the laboratory to the Department of Microbiology, Faculty of Medicine, U.W.I, Mona, Jamaica, as the medical school in Trinidad did not exist as yet. However, for administrative purposes, the laboratory had to sometimes deal with U.W.I, St. Augustine. Under this arrangement Tikasingh was made a lecturer and the Director, Dr. Leslie Spence, was assigned the post of senior lecturer.

Though Tikasingh is known for his involvement with research at Bush Bush Forest in the Nariva Swamp located on the eastern side of Trinidad, when he first returned to Trinidad he had no idea where it was located. Not wanting to show his ignorance to senior colleagues he found out from one of the technicians at the TRVL. The Bush Bush Forest Station was established in September, 1959 by the TRVL and Tikasingh recalled spending many nights in Bush Bush Forest by himself although the caretaker lived a short distance away. One of the most haunting sounds he ever heard at night was the call of the Common Potoo.

This interest in Bush Bush stemmed from the fact that in 1959 the yellow fever virus was isolated from a wood-cutter who had visited Bush Bush forest about two weeks before getting the fever. The TRVL suspected that Bush Bush was the "home" of the virus in Trinidad and moved

their activities from northeast Trinidad. Previously they had worked in the Rio Grande and Melajo Forests where they had isolated Manzanilla and Oropouche viruses, new to science at that time. In these forests and Bush Bush, TRVL had isolated 19 viruses new to science.

Although his current work on arboviruses was far from his doctoral research “Endoparasitic gastropods of Puget Sound Holothurians”, he thoroughly enjoyed his work and regarded it as fun, getting to go into the forests and swamps catching birds, trapping for mammals, collecting mosquitoes to test for the presence of viruses with his colleagues. But life while working at the TRVL did not involve much socializing outside of work. However, Tikasingh who was not married at the time would meet regularly with Dr Brooke Worth for dinner on weekends.

In his book entitled, “A Naturalist in Trinidad”, Dr. Brooke Worth talked about list-making, noting the former entomologist Aitken as a truly pathological list-maker. However, Tikasingh recalls that it is this personal quality that made him a great collector and which resulted in a good collection of arthropods of medical importance, plants, birds, mammals, amphibian and reptiles. The wild animals were collected to process for virus isolations. However, Tikasingh suggested that intensive collecting of rodents for viruses over a period of time may have been responsible for its population crash in Bush Bush Forest at that time.

In 1968, The Rockefeller Foundation funding to TRVL ended as they shifted their priorities from arboviruses towards agriculture in the programme called “Towards the Conquest of Hunger.” This caused retrenchment of staff as funds were not forthcoming. Then the polio outbreak came to save the day, so to speak. Over the years we had the occasional isolate as the virus was still present in Trinidad. Then in December 1971, Dr. Tikasingh recalled the TRVL made two isolates of the polio virus in one day with more reports in the following days. By this time it was regarded as reaching epidemic levels and the Ministry of Health decided on a nation-wide vaccination campaign. Although the government canvassed the population to get vaccinated, which was free of charge, many people opted not to be inoculated. Then in January 1972 when the government announced that Carnival would be postponed for that year, people immediately rushed to be vaccinated!

After the polio epidemic through the efforts of Dr. Eric Williams, the then Prime Minister of Trinidad and Tobago, the Pan American Health Organisation (PAHO) and a group of international scientists a new entity was created, the Caribbean Epidemiology Centre (CAREC) in January 1975. Its mandate automatically broadened to include surveillance of communicable diseases, all viruses and parasitic protozoans. In addition to entomology, Dr Tikasingh started the Parasitology Laboratory. Bacteriology

was a new entity. The epidemiology and surveillance of communicable diseases unit was also attached to CAREC.

However, it was the yellow fever outbreak in 1978-79 that started his involvement with the virus. During this period, the reports of monkey deaths in the Guayaguayare forest were attributed to poisoning. After this was reported in the newspaper Dr. Tikasingh wrote a memo to his boss stating that it should be treated as a yellow fever outbreak until proven otherwise. Yellow fever tends to occur as epizootics every 10-15 years. Because of these deaths, he and his colleagues visited the area and collected mosquitoes from which they isolated the virus. After alerting the Ministry of Health, an immunization programme was started as well as the spraying of insecticides to kill mosquitoes in urban areas.

CAREC has now become the Caribbean Public Health Agency (CARPHA) which is actually a larger institution. CARPHA includes the old CAREC, the Environmental Health Institute which is in St. Lucia. It includes also the Caribbean Health Research Council, the Caribbean Food and Nutrition Institute) and it includes the Food and Drug Laboratory in Jamaica.

Dr Tikasingh retired in December 1987. He has published over 100 scientific articles on arboviruses, parasitology, entomology and natural history in peer-reviewed journals. His publications on arboviruses includes the book “The Hunt for Caribbean Viruses: A History of the Trinidad Regional Virus Laboratory”. He is also the editor of the book “The Natural History of Yellow Fever in Trinidad.” His many awards for his research, include recognition as an Icon of Science and Technology of Trinidad and Tobago from the National Institute of Higher Education, Research, Science and Technology. His most recent award was the degree of Doctor of Science *honoris causa* from the University of the West Indies, St. Augustine in 2013.

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