

IN MEMORIAM
DR ROBERT EDWARD DAVIS

Dr Robert E. Davis, a research leader of Molecular Plant Pathology Laboratory in Beltsville (Agricultural Research Service of the United States Department of Agriculture) moved plant pathology to a new direction in Lithuania

Dr R.E. Davis, a world renowned scientist, passed away on 18 July 2019, at the age of 80. We, who closely knew Dr R.E. Davis, remember him saying: „ *A true scientist is the one who is able to see a phenomenon or a hidden pattern from the smallest details*“.

Dr R.E. Davis was of Lithuanian descent, his grandparients were from Balbieriskis (Lithuania). They came to the USA in the early 20th century, settling first in Pennsylvania, where they were coal miners, and then travelling to New York City 20 years later. Dr R.E. Davis was very proud of his Lithuanian origin.

Born in Brooklyn, NY, on 27 January 1939 to Robert S. and Cecelia Davis (nee Hall), Dr Robert E. Davis was raised in Warwick, RI, where attended Warwick High school. He lived with his wife Maryann Davis in Crofton, MD. He had two sons, Peter and Michael, and grandchildren Katherine, Sabrina, Zachary and Jake.

Dr Robert E. Davis received his bachelor’s degree in botany at the University of Rhode Island in 1961, a PhD in plant pathology at Cornell University in 1967, and later joined the pioneering USDA ARS Plant Virology Laboratory (later named Molecular Plant Pathology) as a postdoctoral research associate in Beltsville, MD and began a life-long career with ARS as a Research Plant Pathologist.

Dr Robert E. Davis was a research leader of the USDA – Beltsville Agricultural Research Service Molecular Plant Pathology Laboratory since early 1980’s and became a member of the National Academy of Sciences in 2005. He was responsible for re-



search on walled and wall-less bacteria and subcellular (viruses and viroids) plant pathogens. He discovered unique helical, motile, cell wall-less prokaryotes, for which he personally coined the name “spiroplasma”. His research correctly identified spiroplasmas as the causes of several plant diseases previously attributed to viruses, and opened up an entirely new field of research in microbiology. He advanced knowledge of mollicute ecology, by his discovery of spiroplasmas and mycoplasmas on surfaces of flowers; and he was a leader of the research team that advanced spiroplasma genome sequencing and functional genomics.

A significant part of Dr R.E. Davis research focused on non-helical, wall-less bacteria known as phytoplasmas, a diverse group of “unculturable” plant pathogenic microbes that have undergone massive reductions in genome size accompanied by acquisition of new capabilities for host adaptation and

pathogenicity. Dr Davis devised practical molecular methods for detecting and identifying “unculturable” plant pathogenic MLOs (phytoplasmas), introducing concept of genetic cluster-specific molecular tags for phytoplasma. Together with his research team he developed novel DNA-based tools and procedures; detected and identified phytoplasmas associated with numerous plant diseases. Later, Dr Davis’s team introduced the first scheme for classification of phytoplasmas based on molecular properties and determined molecular genetic relatedness. His team pioneered phytoplasma classification, phylogeny, and taxonomy; revealed new understanding of pseudogene formation in relation to on-going host adaptation in phytoplasma genomes; characterized numerous phytoplasmas existing as the probable causes of serious diseases of diverse plant species and put forth a new theory of phytoplasma evolution – the key role of mobile genetic elements (phage) in launching emergence of the phytoplasma clade. His team also discovered that phytoplasma infection can alter genetically preprogrammed destiny of plant stem cells, causing changes in plant growth pattern and morphology.

Importantly, we want to emphasize that Dr R.E. Davis has made huge contribution to science in Lithuania. In 1995, Dr R.E. Davis visited Lithuania, Vilnius, the Institute of Botany (now: Nature Research Centre), his scientific friend Dr Habil. Juozas Staniulis, and since that time his scientific ideas, his teaching, his style of thinking and understanding of biology and evolution has encouraged Lithuanian researchers to begin new studies that included molecular detection, identification and classification of plant pathogenic mollicutes, called phytoplasmas. Dr R.E. Davis invited several Lithuanian scientists to his Laboratory (MPPL, Beltsville, USA) to learn molecular techniques, to study bioinformatics, genomics and proteomics. The scientific collaborative agreement between MPPL (Beltsville) and the Laboratory of Plant Pathology (Vilnius) made possible the investigation of phytoplasma diseases across the country. For Dr R.E. Davis great help, the phytoplasma research area in Lithuania was significantly enriched by numerous scientific publications on detection and identification of phytoplasma diseases in economically and environmentally important plants (including sweet cherry, sour cherry, blueberry, and

pine trees) and locations (the UNESCO-protected Curonian Spit) of Lithuania as well as the discovery of novel ‘*Candidatus Phytoplasma*’ species. In recognition of his high research contributions to Lithuanian science, Dr R.E. Davis was awarded the Distinguished Presidential Rank Award from the U.S. President; the Republic of Lithuania State Decoration: Order of the Knight’s Cross from the President of Lithuania Valdas Adamkus.

As a result of the training that we and other colleagues had received from Dr R.E. Davis, we were able to establish a new research programme dedicated to phytoplasma studies at the Nature Research Centre. To date, Lithuania is famous for phytoplasma research in Europe. We are participating in international meetings, and we have numerous publications in the field of phytoplasma research in international journals.

Dr Robert E. Davis’ is personality touched our lives. He gave us many scientific ideas and impressed with his lightheartedness, his excitement and seriousness at work.

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