



Biology, Genetics and Evolution of Bees - Dedicatory Session in Honor of Brazilian Bee Research Pioneer, Warwick Estevam Kerr

Introduction by
Lionel Segui Gonçalves

Professor da Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto,
Universidade de São Paulo, Ribeirão Preto, SP, Brasil

In this special session of the journal **Genetics and Molecular Research**, we honor Dr. Warwick Estevam Kerr, a great Brazilian scientist, famous for his work on bee genetics. Known and admired by all for his astute vision of what is essential and important, Dr. Kerr has always been a tremendous promoter of cooperative research. The articles published in this session were written by his former students, many of them students of his students, as well as by collaborating researchers and admirers, and were especially prepared for this session. Dr. Kerr has dedicated nearly all of his life to science, to his country, to his neighbors, to nature, and especially to the study of bees.

Kerr's curriculum vitae is tremendously rich, so full of information and records of what he has done for this country, that it is very difficult to make an objective short review. Instead of trying to shorten a long and very interesting story, I include only a few of the more important events and facts of his life as a scientist, a teacher and an educator. Dr. Kerr always made it clear that he sees no incompatibility between science and religion, as he considers God to be the greatest of all scientists. Following this same vein, one cannot talk about Dr. Kerr's life without mentioning how hard he has worked to promote human rights, everywhere he has been. Due to his courage and his public manifestations in favor of human rights and freedom of speech, Kerr provoked powerful enemies and political persecution that resulted in his being sent to prison several times, mainly during the military regime from 1964 to 1968; despite considerable pressure, he never lost sight of his principles.

Son of Americo Caldas Kerr and Bárbara de Oliveira Kerr, Warwick Kerr was born in Santana do Parnaíba, in the State of São Paulo, on September 9, 1922. His love for nature was soon noted by his parents, so they encouraged him to study agronomy. He was strongly influenced by his tutor, ex-priest Prof. Honório José de Brito, educated in Belgium, who taught the young Kerr, then 10-12 years old, French, tupi-guarani (a native Indian language), botany and zoology, topics that were not taught in elementary school at that time; these teachings awakened him to science. Beginning in 1934, Kerr went to Mackenzie High School in São Paulo, and then went on to study Agronomy at ESALQ, in Piracicaba, where he obtained his degree in Agricultural Engineering in 1945. During his undergraduate course, he concentrated his studies on bees and published his first scientific paper in the journal “Chácara e Quintais” (Small Farms and Yards), with the title “Swarm and Bees”. During his doctorate, his interest in and dedication to science attracted the attention of the director of the Genetics Institute at ESALQ, Prof. F.G. Brieger, who invited him to continue working with bees at that institute. In 1946, Kerr was hired as a professor of Genetics at ESALQ. Kerr married Miss Ligia Sansigolo in Piracicaba; they had seven children. In 1947, when he was 25 years old, Professor Kerr concluded his doctorate, with the title: “Studies on the genus *Melipona*”, under the tutelage of Professor F.G. Brieger. His professor was a disciple, at Tuebingen University in Germany, of one of the rediscovers of Mendelian Genetics, Professor Karl Correns. Dr. Kerr was therefore part of a third generation of geneticists, after Gregor Mendel, the father of genetics. Professor Kerr has a tremendous list of contributions to various areas of agriculture, without however ever interrupting his work on bees, his main source of inspiration. Professor Kerr continued his studies at ESALQ; in 1950, he concluded his associate professor thesis in Cytology and Genetics, with the thesis title “Study on population genetics of Hymenoptera in general, with emphasis on social Apinae”. In 1951, Kerr was awarded a Rockefeller foundation fellowship, which he used to study in the laboratories of the eminent geneticists Theodosius Dobzhansky and Sewall Wright, at Columbia University in New York. In 1958, Kerr left his excellent laboratory facilities at ESALQ to start up the Biology Department of the Faculty of Philosophy, Sciences and Letters of Rio Claro, now part of UNESP (University of the State of São Paulo). In 1962, while he was still in Rio Claro, Kerr was given another tremendous task; he was invited by the governor of São Paulo, Carvalho Pinto, to be the founding director of FAPESP (Foundation for Supporting Research of the State of São Paulo), from 1962 to 1964, a position he held simultaneously with his being founding chairman of the Biology Department in Rio Claro.

In 1964, Kerr founded the Genetics Department of the University of São Paulo Medical School in Ribeirão Preto; thanks to his leadership, this was the first department with professors from several colleges of the University of São Paulo (USP). A curious detail that speaks for Kerr’s capability and prestige is that the medical school of this prestigious university asked an agronomist who was specialized in bees to found a medical school genetics department. This group currently includes more than 20 genetics professors from various colleges on the campus; the pioneering group was the Bee Genetics section. In 1971, Professor Kerr and his group of professors began a graduate program in Genetics at the Medical College of the University of São Paulo in Ribeirão Preto. Today there are more than 60 graduate students in this department, and after 38 years, more than 500 Master’s and Doctorate theses have been concluded in the various areas of genet-

ics. During his career, probably his most prestigious invitation was made directly by the president of Brazil, who asked him to be director of the National Institute for Research in the Amazon (INPA) in Manaus, a post that he held from 1975 to 1979. Years later, he was again director, to help reorganize this valuable institution. Thanks to his organizational and scientific prowess, Professor Kerr transformed INPA into a world-renowned center of tropical biology, bringing in many important scientists. In 1979, Kerr returned to Ribeirão Preto, where he remained until the end of 1980, when he retired from the University of São Paulo. Subsequently, he moved to São Luís in the State of Maranhão, where he founded the Biology Department of the Federal University of Maranhão, where he stayed until 1988. That year, Kerr was appointed as president of the State University of Maranhão, where he remained until 1989. Then, he moved to begin another research group at the Federal University of Uberlândia (UFU), where he retired a second time, this time obliged by law, as he had reached 70 years. There, he remains until today as a collaborating professor. As a scientist, Professor Kerr occupied the most prestigious scientific posts, including: President of the Brazilian Genetics Society, President of the Brazilian Society for the Progress of Science (SBPC), scientific advisor to the Brazilian National Science Foundation, CNPq, the São Paulo State Science Foundation, FAPESP, the National Technical and Scientific Funding Program, FINEP, the Organization of American States, and the International Bee Research Association.

Professor Kerr is a member of numerous academies, including the Brazilian Academy of Sciences, the Brazilian Academy of Medicine, the Third World Academy of Sciences, the Ribeirão Preto Academy of Sciences, and he was the first Brazilian to become a member of the “National Academy of Sciences” of the United States. During his career, Professor Kerr obtained dozens of titles of “Honorary Citizen” of Brazilian cities, along with numerous other honors, including the National Honor Medal, Star of the State of Acre, Honorary Professor of the University of Amazonas, Agricultural Engineer of the year in 1979, The Souza Andrade Gold Medal of the Federal University of Maranhão, Emeritus Professor of UNESP, Honorary Professor of Unicamp in 2005, and honored by the Ministry of Science and Technology in 2008 as one of the 10 most important scientists in Brazil. As a researcher, his greatest contributions have been in biology and genetics of bees, with about 500 papers published in national and international journals. Nevertheless, perhaps his greatest scientific contribution is the more than 50 Master’s and Doctoral students and hundreds of apprentice scientists he helped on the way to research on bees in Brazil and around the world. His work on bee biology and apiculture, including the work of his former students and colleagues, is known throughout the world. Dr. Kerr has an infectious enthusiasm for science. Wherever he goes, he is always teaching to students, authorities, professors, researchers, and anyone he meets along the way. It is hard not to be influenced by this amiable, remarkably humble and capable personality.

Among the many science personalities who interacted with Kerr, Martin Lindauer, William D. Hamilton and Charles Michener come to mind. Lindauer studied the communication systems of stingless bees at ESALQ in Piracicaba. Hamilton developed various of his principal theories concerning kin selection and mathematical modeling of behavior, at a critical point in his career, during his stay in Brazil, invited by Dr. Kerr. Michener included stingless and other Brazilian bees in his studies and his books on bees because of his interactions with Kerr and other Brazilian colleagues, many of whom became sci-

entists because of Kerr's influence. Certainly, anyone who has been privileged to know this great scientist comes away changed somehow by his example as a humanist and a scientist. Remarkably, at nearly 87, Kerr still participates actively in bee research at the university in Uberlândia. We salute him with this series of publications written by some of his apprentices and admirers.



Professor Warwick Estevam Kerr. Photo by Tom Wenseleers.

Session Editors:

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Universidade de São Paulo