Department of Entomology
College of Natural and Agricultural Sciences
University of California, Riverside

Presents

The 2025 Alfred M. Boyce Lecture

By

Dr. MARLENE ZUK
Department of Ecology, Evolution and Behavior

University of Minnesota

"Rapid Evolution in Silence: Adaptive Signal Loss in the Pacific Field Cricket"

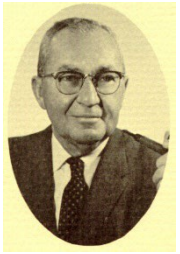
In-person and live remote seminar

Location: 1102A Genomics Auditorium
Date: Monday, June. 2, 2025
Time: 4:00 pm - 4:50 pm

For remote viewing at the same time and date

Zoom: 956 6969 9893
Passcode: 343307

A reception will follow the seminar at 5:00 p.m.
at the Department of Entomology Courtyard



Alfred M. Boyce
1901-1997

Dr. Alfred M. Boyce began his career in entomology at Cornell University where he earned his B.S. degree in 1926, and M.S. in 1927. In September 1927, he came to the UC Citrus Experiment Station, Riverside, with the appointment of junior entomologist, and he earned his Ph.D from Berkeley in 1931. Dr. Boyce remained on the UC Riverside faculty until his retirement in 1968. He became Professor of Entomology and Entomologist in the Agricultural Experiment Station in 1943. In 1940, he was appointed head, Department of Entomology; in 1952, he became Director of the Citrus Experiment Station, and in 1960, he received the honorary L.L.D. degree (Doctor of Laws Honoris Causa).

During the 1930's and 1940's, Boyce worked on all the insect and mite problems affecting the extensive walnut industry (then over 100,000 acres in southern California), and developed new and/or improved chemical control measures for many species. One of the most exhaustive studies in economic entomology ever made and published by a single entomologist up to that time was his "Bionomics of the Walnut Husk Fly, *Rhagoletis completa*," UC Hilgardia, October 1934. This species was new to science.

Boyce undertook research on insects and mites affecting the citrus industry (then over 300,000 acres) in 1928, which continued until the early 1950's. One of the early successes was the discovery and development of a new dinitrophenol compound for control of several species of mites on citrus and walnuts. This was the first commercially successful organic acaricide for foliar use. Four patents were obtained from this and other research, all dedicated to the public.

Early in his research, he foresaw the need for knowing the fate of chemicals applied to crops - what residues are left and whether they could be harmful to man and other animals. In 1932, he set up a laboratory for residue chemistry, which has since been greatly expanded at UCR.

While Head of the Department of Entomology, Boyce greatly expanded research in many areas, particularly the relatively new areas of insect toxicology, physiology and resistance to insecticides. Because of its eminence in these and other areas of entomology, the UCR Department of Entomology came to be acknowledged as one of the foremost in the world.

Boyce was also greatly interested in biological methods of controlling insect and mite pests. During 1951, he explored many parts of southern Asia, the Middle East, Africa, and Mediterranean countries for beneficial insects that might control scale insects, important pests on many tree fruit crops. He found several new species of parasites and, in conjunction with entomologists at UC Berkeley, two of these were reared and released and have provided a classical example of biological control.

During Boyce's 25 years of active research, he found many new species of insects and mites. Four were named for him when described by specialists. They are *Rhagoletis boycei*, *Parlatoria boycei*, *Cupes boycei*, and *Eriophyes boycei*.

Dr. Boyce was involved in teaching and for many years taught a course in subtropical entomology.

Dr. Boyce's national and international reputation as an entomologist and expert on pesticidal chemicals led to several high appointments: as a consultant to the President's Science Advisor in matters relating to agricultural research; as an advisor to the National Academy of Sciences on pesticides; member of the National Advisory Food and Drug Control, Department of Health, Education and Welfare; consultant to the Foreign Agricultural Service, U.S. Department of Agricultural; and The Rockefeller Foundation's board of agricultural consultants.

Boyce's autobiography was published in 1987, entitled, "Odyssey of an Entomologist - Adventures on the Farm, at Sea, and in the University."

The UC Regents established the Alfred M. Boyce Chair in Entomology at Riverside, an endowed Professorship. The chair is presently held by Dr. Ring Cardé.

Dr. MARLENE ZUK

Marlene Zuk is Regents Professor of Ecology, Evolution and Behavior at the University of Minnesota, Twin Cities. She studies the evolution of behavior, especially sexual behavior and animal communication, and is also interested in the ways that parasites and disease affect the ecology and evolution of their hosts. Most of her work has been on insects, and for the last few decades her lab has focused on the conflict between natural and sexual selection in a field cricket that is subject to an acoustically-orienting parasitoid fly. This research has revealed the rapid evolution of a silent male morph, which in turn has led to the investigation of the role of behavior in the establishment of novel traits. She is also interested in a variety of other topics in sexual selection, including sex differences in disease susceptibility and the evolution of same-sex sexual behavior. Dr. Zuk has published numerous academic papers and in 2023 received the BBVA Foundation Frontiers of Knowledge Award.

Dr. Zuk has also written and lectured extensively to a broad audience, publishing in venues such as the Los Angeles Times, the New York Times, the Chronicle of Higher Education, and New Scientist. Her TED talk "What we learn from insects' sex lives" has been viewed over 1.5 million times. She is the author of several books about animal behavior and evolution for the public, including Paleofantasy, Sex on Six Legs, and Dancing Cockatoos and the Dead Man Test. She is a member of the National Academy of Sciences and the American Academy of Arts and Sciences, and in 2022 received the Distinguished Animal Behaviorist Award from the Animal Behavior Society, of which she is also an elected Fellow.

Rapid Evolution in Silence: Adaptive Signal Loss in the Pacific Field Cricket

By nature of their conspicuousness, sexual signals can cause a conflict between natural and sexual selection, with natural selection favoring a decrease in exaggeration of an ornament and sexual selection favoring an increase. The Pacific field cricket, Teleogryllus oceanicus, is subject to an acoustically-orienting parasitoid fly where it has been introduced in Hawaii, making calling particularly risky. A novel obligately silent male morph, controlled by a single sex-linked gene, evolved within just 20 generations in some populations in Hawaii. These flatwings are protected from parasitism, but face difficulties in mate attraction and courtship. Pre-existing behavioral plasticity may have facilitated the novel morph's establishment, along with pleiotropic effects of the gene responsible. Recently, even more variants have been discovered in Hawaii, leading to an interest in phenotypic integration and the way that morphology, behavior and fitness contribute to sexual signal divergence.