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

Presents

The 2022 Alfred M. Boyce Lecture

By

Dr. ROSEMARY G. GILLESPIE

Director, Essig Museum of Entomology
University of California, Berkeley

"Adaptive radiation on oceanic islands: Isolation and connection, repeatability and serendipity"

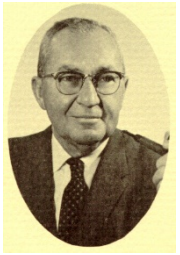
In-person and live remote seminar

Location: 1102A Genomics Auditorium
Date: Monday, Mar. 28, 2022
Time: 4:00 pm - 4:50 pm

For remote viewing at the same time and date

Zoom: 948 0131 1028
Passcode: 347039

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. Rosemary G. Gillespie

Rosemary Gillespie is a Professor at the University of California, Berkeley, where she also holds the Schlinger Chair in Systematics. She is an elected member of the *American Academy of Arts and Sciences* and served as President of the *American Genetics Association* in 2018 and previously the *International Biogeography Society*. She is an Editor in Chief for the *Journal of Biogeography* and Senior Editor for *Molecular Ecology*. Gillespie was born and educated in Scotland, receiving her B.Sc. in Zoology from Edinburgh University in 1980. She came to the U.S. to conduct graduate work on the behavioral ecology of spiders at the University of Tennessee. She started work at the University of Hawaii in 1987, initially as a postdoc, and then in 1992 as Assistant Professor in Zoology and Researcher in the Hawaiian Evolutionary Biology Program. It was during her first year in Hawaii that she discovered an adaptive radiation of *Tetragnatha* spiders and went on to work on the systematics and evolutionary ecology of the lineage. She joined the faculty at the University of California in Berkeley in 1999, where she continues her research focus on the islands of the Pacific, using islands of known age and isolation to assess the combined temporal and spatial dimension of biogeography and determine patterns of diversification, adaptive radiation, and associated community assembly and conservation challenges.

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"Adaptive radiation is one of the key drivers of species diversity, yet the mechanism through which it is achieved, and the outcome of the process, is largely unknown. The difficulty here is that multiple processes can be involved in adaptive diversification. For example, initial divergence can result from environmental or sexual selection leading to divergence of species in *different* environments with subsequent secondary contact. Alternatively, initial reproductive isolation can be associated with geographic separation in the *same* habitat in the absence of divergent selection; here, ecological divergence can develop as a result of interactions between close relatives during secondary contact. It is extraordinarily difficult to tease apart these processes which tend to have played out in the past. However, one system that can offer insights into the processes of adaptive radiation is that of the Hawaiian archipelago in which each island provides a snapshot in time of the evolutionary process, allowing the early stages of radiation to be studied in real time. Focusing largely on spiders, I identify lineages in which the abiotic environment appears to play the dominant role in adaptive diversification; in these, diversity tends to increase over time with repeated evolution of sets of taxa adapted to similar sets of environmental conditions. In contrast, species in other lineages may become reproductively isolated during geographic separation in the *same* environment; here, taxa frequently come back into contact and diverge through character displacement with repeated evolution of ecomorphs. The results reveal very clearly the multiplicity of mechanisms that can fall under the umbrella of adaptive radiation, and how we can use these differences to understand the factors shaping the diversity of life."