

## JOHN N. BELKIN MEMORIAL AWARD RECIPIENTS—WHO AND WHY?

LAWRENCE J. HRIBAR

Florida Keys Mosquito Control District, 503 107th Street, Marathon, FL 33050

**ABSTRACT.** The John N. Belkin Memorial Award is presented by the American Mosquito Control Association to scientists who have made significant contributions to our knowledge of taxonomy or biology of mosquitoes. The importance of the award and the selection process for honorees are explained in this paper. Short biographies for the 46 recipients are presented. The current state of mosquito systematics is examined.

**KEY WORDS** Award, Belkin, biology, mosquito, systematics, taxonomy

### INTRODUCTION

The American Mosquito Control Association's (AMCA's) John N. Belkin Memorial Award (henceforth Belkin Award) recognizes meritorious contributions to mosquito taxonomy and/or biology. The Belkin family established the award in honor of John, who was a world-renowned systematist specializing in mosquitoes. John Nicholas Belkin had a remarkable life, starting with his family's flight from Russia, first to France and then to the United States. John lived through World War I, the Bolshevik Revolution, and the Russian Civil War. He started his entomological life at the American Museum of Natural History, thence proceeded to the Tennessee Valley Authority, Cornell University, the United States Army, and the University of California at Los Angeles.

John's Army service was a seminal experience. He was placed in command of the 420th Malarial Survey Detachment in the Solomon Islands. It was during this time that he made extensive collections and developed the collecting, rearing, and data recording methods that are widely used today by culicidologists. In what surely must have been an unexpected turn of events, his native Russian language fluency led him to serve as the official Russian-English interpreter at the Japanese surrender at the conclusion of World War II. John Belkin's Army duty also provided him with material for his Ph.D. dissertation, which was published after his discharge (Belkin 1950). John revolutionized the field of mosquito systematics. Many modern mosquito systematists in the Americas can trace their scientific lineage and methodology to John Belkin. His careful morphological studies and integration of biological and ecological information with morphology were groundbreaking at the time. He trained a cadre of systematists who solved some of the most difficult problems in mosquito taxonomy. His three huge projects, "Mosquitoes of the South Pacific," "Mosquitoes of Middle America," and "Mosquito Studies," laid the foundation of modern mosquito systematics. These were massive undertakings, the South Pacific study resulting in a two-volume classic work (Belkin 1962), and the other projects generating a series of revisions, catalogs, and collection data (Gerberg 1980a, 1980b; Heinemann and Bryce 1980; Zavortink 1990). Among his many other works is a study of the mosquitoes

of Jamaica (Belkin et al. 1970). The genus *Johnbelkinia* is named for him (Zavortink 1979), as are the genera *Belkinus* and *Belkinomyia*, the Belkini Subgroup of *Tripteroides*, and the species *Culex belkini* Stone and Penn, *Deinocerites belkini* Adames, *Tripteroides belkini* Baisas and Ubaldo-Pagayon, and *Uranotaenia belkini* Grjebine, as well as the synonymized *Onirion belkini* Casal and Garcia (= *Onirion brucei* [Del Ponte and Cerquiera]).

The Belkin Award is presented to the honoree after a stringent selection process. The John N. Belkin Memorial Award Subcommittee of the Nominations and Awards Committee selects a proposed nominee. According to the criteria for the award, the subcommittee may consider nominations submitted by persons not on the subcommittee. Once a potential honoree is identified, supporting documentation is delivered to the full Nominations and Awards Committee for consideration. If the nomination is approved by the full committee, it is sent to the AMCA Board of Directors for their approval. Generally, one award is made per year; however, there have been four occasions when two awards were made. The year 1986 was the first time that two awards were presented in one year. Two awards were again presented in 1996, 2023, and 2024. The 2023 awards were separate awards presented to two honorees in part for their service as coeditors of a textbook for university-level medical entomology courses, published by the Entomological Society of America (ESA) (Eldridge and Edman 2000). The 2024 award was a shared award, presented to a married couple in recognition of their lifetime collaboration. In 2007, 2009, and 2016, no award was made.

As of this writing, 46 individuals have received the Belkin Award. Most of the honorees have been from the USA (30). Australia, Brazil, the United Kingdom, and South Africa are the home countries of two honorees each. The remainder are from Argentina, Canada, France, Germany, Japan, Panama, Russia, Sweden, and Thailand. Nine awards (19.6%) have been made to women. Each of the honorees has made remarkable contributions to the fields of mosquito systematics or mosquito biology. With the passage of time, the collective memory is lost as people who knew the awardees retire or die. A mere listing of the recipients tells us nothing about who they

were or why they received the award. Herein I hope to allow the reader a glimpse into who these people were and what they did to deserve such an honor. Citations to obituaries and biographies are given where I could find them. Names are listed first as they appear on the AMCA web page; in the biographical sketches are the full names as I have found them to be correct. A small number of articles written by each honoree (no more than three) is listed after each biography. Those that I have chosen to cite best represent, in my opinion, each individual's work. However, the Belkin Award is conferred based on an individual's total body of work, not for any single publication. Any eponyms are listed too; most of those for Culicidae were located in the newly published catalog by Wilkerson et al. (2021). Other eponyms were found via Google Scholar. In a few cases, eponyms for non-culicid taxa are mentioned when I felt it reasonable. I have not attempted to provide a full biography or bibliography for each award recipient. My intention is merely to give a glimpse into the work behind the names on the web. I have not written as much about honorees who are still alive, nor do I give personal information such as their birth dates. For some people, very little information was available. I have provided what I could find and that which I believed was prudent to disclose. Whenever possible I allowed each living honoree to review his or her biography prior to submission of the paper.

### 1981 B. DE MEILLON

The first recipient of the Belkin Award was the South African entomologist and parasitologist Botha de Meillon (1902–2000). Schalk Jacobus Botha de Meillon was a member of the prominent de Meillon family, which included artists and scientists. Botha worked for the South African Institute of Medical Research and did an immense amount of work on the *Anopheles* and black flies of South Africa. He also worked on bedbugs, ticks, and vectors of arboviruses and filarial worms. He was among the first, if not the first, to demonstrate the effectiveness of indoor residual spraying for malaria control. The Demeilloni Group of *Anopheles* is named for him, as are the mosquito species *Aedes demeilloni* Edwards, *Anopheles demeilloni* Evans, *Culex demeilloni* Doucet, *Heizmannia Mattingly*, and *Uranotaenia Peyton* and Rattanarithikul, and the biting midges *Alluaudomyia demeilloni* Clastrier and Wirth, *Bezzia demeilloni* (Haeselbarth), *Bothamia demeilloni* Meiswinkel, and *Leptoconops demeilloni* Clastrier and Nevill, the horse fly *Haematopota demeilloni* Stone and Philip, the subgenus *Meillonium* of *Simulium*, and the staphylinid beetle *Oxytelus demeilloni* Scheerpeltz.

*References:* Kitzmiller (1982), Coetzee (2001).

*Representative works:* de Meillon (1931, 1934, 1947).

### 1982 L. ROZEBOOM

Lloyd Eugene Rozeboom (1908–1999) was a leader in mosquito systematics, genetics, and evolution. Lloyd Rozeboom worked in Panama, the Philippines, India,

New Guinea, New Hebrides, and Molucca Islands, Indonesia, among other areas. He studied the biology, taxonomy, and genetics of insects while researching insect resistance to insecticides. Lloyd served in the US Navy as a consultant on tropical diseases to the Secretary of War and to the US Public Health Service and worked on the mosquitoes of the South Pacific islands. He received the Bailey K. Ashford Award in Tropical Medicine from the American Society of Tropical Medicine and Hygiene for his anti-malaria work in Trinidad. He was an exchange professor of parasitology at the University of the Philippines and a Guggenheim Fellow. He was a member of the faculty of Oklahoma A & M College and Johns Hopkins University. Lloyd amassed a remarkable collection of mosquitoes from all areas of the world. The mosquitoes *Aedes lerozeboomi* Reinert, *Chagasia rozeboomi* Causey, Deane, and Causey, and *Tripteroides rozeboomi* Baisas and Ubaldo-Pagayon are named for him, as was the now-synonymized *Aedes rozeboomi* Vargas (= *Aedes bimaculatus* [Coquillett]).

*References:* Anonymous undated a, Peyton et al. (1999).

*Representative works:* Rozeboom (1942, 1947, 1950).

### 1983 K. L. KNIGHT

Kenneth Lee Knight (1915–2001) was described as “one of the premier mosquito taxonomists of the 20th Century, and an outstanding officer and gentleman in the finest U.S. Navy tradition.” He was the first entomologist in the first malaria-control unit deployed to the South Pacific. He helped to revise the *Anopheles punctulatus* complex and coauthored the invaluable reference volume *A synoptic catalog of the mosquitoes of the world*. After Navy service, Knight worked at the University of Iowa, the University of Georgia, and North Carolina State University. At the suggestion of John Belkin, Ken Knight began a newsletter for systematists and taxonomists working on mosquitoes; this eventually became the refereed journal *Mosquito Systematics*. Ken was the editor of this journal from its inception until 1979. Along with Jean Lafoon, he also began the studies that eventually became the *Taxonomist's glossary of mosquito anatomy*, coauthored with Ralph Harbach (1980). Ken served as president of both the American Mosquito Control Association and the ESA, and he received the AMCA's Medal of Honor and was elected an Honorary Member of the ESA. The mosquitoes *Aedes knighti* Stone and Bohart and *Tripteroides knighti* Baisas and Ubaldo-Pagayon as well as the subgenus *Kenknightia* of *Aedes* were named for him.

*References:* Anonymous (1984a), Apperson (2002), Harbach (2003).

*Representative works:* Knight and Marks (1951), Reid and Knight (1961), Knight and Stone (1977).

### 1984 T. J. ZAVORTINK

Thomas James Zavortink was a professor of biology in the University of San Francisco and is currently a research associate in the Bohart Museum of Entomology

at the University of California at Davis. Zavortink's work encompassed many genera of mosquitoes; he produced two of the first monographs on the genus *Orthopodomyia* (his dissertation project, mentored by John Belkin), and he revised the treehole anophelines. From 1993 to 1995, he served as editor of the journal *Mosquito Systematics*. The subgenus *Zavortinkius* of *Aedes* was named for him, as was the species *Aedes zavortinki* Schick.

*Representative works:* Zavortink (1968, 1969, 1971).

### 1985 S. J. CARPENTER

Stanley Jennings Carpenter (1904–1984) is best known for his monograph *The mosquitoes of North America* (Carpenter and La Casse 1955). He spent most of his career in the US Army, but also taught at Searcy College, Arkansas, and he worked for the Arkansas State Board of Health, the National Biscuit Company (Nabisco), and the California State Department of Health. While in the Army Colonel Carpenter served “stateside” and in Panama, Iran, Iraq, and Kuwait. Much of his time in service was spent teaching mosquito identification to other soldiers, one of whom was a young EL Peyton. After his retirement from the Army, Stanley Carpenter continued to study snowmelt *Aedes* mosquitoes. He received the AMCA Medal of Honor, and the California Mosquito and Vector Control Association adopted a resolution acknowledging his many accomplishments in the field of mosquito study. The phlebotomine species *Psathyromyia carpenteri* (Fairchild and Hertig) is named for him.

*References:* Anonymous (1984b), Nielsen (1985).

*Representative works:* Carpenter (1945), Jenkins and Carpenter (1946), Carpenter and Peyton (1952).

### 1986 P. MARKS AND J. REID

Patricia Marks (1918–2002) was an Australian entomologist whose full name was Elizabeth Nesta Marks. She was called “Patricia” or “Pat” due to her having been christened at St. Patrick’s Cathedral in Dublin, Ireland. At some point, AMCA began listing her as “P. Marks” rather than “Elizabeth N. Marks” (Harbach 1993). Elizabeth was born in Dublin while her father was undertaking university studies there because there was no university in Queensland at the time. She made significant studies of the subgenus *Finlaya* and the *Aedes scutellaris* group. She retired as Principal Entomologist in the Queensland Institute of Medical Research. She described 38 species of mosquitoes as well as new species of fruit flies, true bugs, cockroaches, and ticks. At the time of her death, another 43 species of mosquitoes identified by her remained undescribed or inadequately described. In addition to her taxonomic and systematic work, she conducted a number of studies of mosquitoes as vectors of viruses. Pat received a number of awards and recognitions during her lifetime. The Queensland Institute of Medical Research appointed her an Honorary Research Associate upon her retirement. She received the Australian Natural History Medallion from the Field Naturalists’ Club of Victoria and the Queensland Natural

History Award. Furthermore, she was appointed Officer of the Order of Australia in the General Division. Before her death, Elizabeth Marks wrote her autobiography with the aid of Kathleen Cummings; it was published posthumously (Marks and Cummings 2004). The Marksae Complex of *Culex* is named for her, as are the species *Culex marksae* King and Hoogstraal, *Mimomyia marksae* Grjebine, and *Tripteroides marksae* Dobrotworsky.

*References:* Anonymous (1986a), Bryan (2006), Standfast (2006), Troyo et al. (2022).

*Representative works:* Marks (1947, 1957), Knight and Marks (1951).

John Alexander Reid (1915–1988) was a British taxonomist who worked on a number of insect groups. Most of his career was spent at the Institute of Medical Research in Kuala Lumpur, Malaysia. He is perhaps best remembered for his herculean efforts working on *Anopheles* mosquitoes in the Southeast Asian faunal subregion. His 520-page *The anopheline mosquitoes of Malaya and Borneo* (Reid 1968) remains a classic reference for both taxonomists and medical entomologists working in that part of the world. John Reid also studied vectors of filariasis and malaria of mousedeer. He was one of the first taxonomists to include chaetotaxy tables in his taxonomic work. During World War II, John spent several years interned in brutal prisoner of war camps in occupied Thailand. In addition to his work on mosquitoes, John published a number of papers on botany. The species *Anopheles reidi* Harrison, *Culex reidi* Colless, and *Heizmannia reidi* Mattingly are named for him.

*References:* Anonymous (1987a, 1987b).

*Representative works:* Reid (1953, 1962), Reid and Knight (1961).

### 1987 J. B. KITZMILLER

James Blaine Kitzmiller (1918–1995) was a professor of zoology at the University of Illinois and a professor of entomology at the University of Florida. He worked mainly on anopheline species complexes. Much of his work dealt with cytogenetics of mosquito species complexes. During his life, he studied the Latin, Greek, French, and German languages. He also was able to communicate in Italian, Spanish, and Portuguese, and could read Russian and Dutch. In a monumental effort, he compiled the derivations of every species name in the genus *Anopheles* (Kitzmiller 1982). The subgenus *Kitzmilleria* of *Culex* was named for him.

*References:* Anonymous (1986b), Baker (1995), Service (2010a).

*Representative works:* Kitzmiller (1958, 1963, 1976).

### 1988 A. STONE

Alan Stone (1904–1999) worked on mosquitoes in the South Pacific during the Second World War. He began his career at Dartmouth College but most of his time was with the US Department of Agriculture.



During World War II, he taught mosquito taxonomy to hundreds of Army, Navy, and Public Health Service entomologists. He was instrumental in the publication of the catalogs of the mosquitoes of the world and the Diptera of North America. He also published a history of Nearctic Dipterology. In addition to mosquitoes, he worked on horse flies and black flies. When no one was available to study tephritid fruit flies, Alan stepped in and produced a revision of the fruit fly genus *Anastrepha* that is still a classic reference. The biting midge *Downeshelea stonei* Wirth and the fruit flies *Celidosphenella stonei* Stuardo Ortiz, *Tomoplagia stonei* Aczél, and *Xanthaciura stonei* Aczél are named for him, as are the mosquito species *Aedes stonei* Knight and Lafont, *Culex stonei* Lane and Whitman, *Psorophora stonei* Vargas, *Tripteroides stonei* Belkin, and *Wyeomyia stonei* Vargas and Martínez Palacios, as well as the now-synonymized *Anopheles stonei* Vargas (= *Anopheles punctipennis* [Say]), *Heizmannia stonei* Mattingly (= *Heizmannia complex*), and *Uranotaenia stonei* Bohart and Ingram (= *Uranotaenia jacksoni* Edwards). The species *Aedes stoneorum* Marks was named for Alan and his wife, Louise. The subgenus *Alanstonea* of *Aedes* was named for him as well.

*References:* Anonymous (1999), Gagné (1999).

*Representative works:* Russell et al. (1943), Stone and Barreto (1969), Knight and Stone (1977).

#### 1989 P. GALINDO

Pedro Galindo Vallarino (1917–2007) was a Panamanian who worked at the Gorgas Memorial Laboratory in Panama City. He studied mosquitoes and birds in Panama. His work on mosquitoes was primarily on the biology and ecology of vectors of sylvatic yellow fever, although he also worked on other mosquitoes. Pedro Galindo published 97 papers, primarily on taxonomy and ecology, and was the director of the laboratory from 1974–1977. The mosquito genus *Galindomyia*, the Galindoi Subgroup of *Culex*, and the species *Aedes galindoi* Schick and *Culex galindoi* Komp and Rozeboom were named for him.

*Reference:* Stone and Barreto (1969).

*Representative works:* Galindo et al. (1951, 1954), Carpenter et al. (1952).

#### 1990 P. MATTINGLY

As one colleague wrote, “Mattingly was an original, and it’s a duller world now that they don’t come like him anymore.” A glimpse of Mattingly’s personality can be had by reading his third paper on mosquito eggs. After a diagram depicting his concept of the evolution of anopheline eggs, Mattingly included an additional figure with a more familiar tree diagram. He captioned that illustration, “For those who prefer arboriculture” (Mattingly 1969). Peter Frederick Mattingly (1914–1993) was a British scientist who started his career by studying amphibians. During the Second World War, he was a malaria control officer in the British Army in Africa. He taught medical entomology

to British Army officers and was known even among more senior-ranked personnel as a demanding teacher. He visited more than 40 countries during his lifetime. Peter was the “Keeper” (curator) of Culicidae at the British Museum (Natural History) later in life. He revised the genus *Tripteroides* (Mattingly 1981) and wrote a series of important papers on the morphology of mosquito eggs. He was responsible for updating the first volume of *Mosquitoes of the Ethiopian region* and served on the World Health Organization Expert Advisory Panel on Parasitic Diseases. Peter is also remembered for his work on the *Culex pipiens* complex (especially for his very strong opinions on the nomenclature of that group of species) and his prescient insights into the distribution, importance, and nomenclature of *Aedes aegypti* (L.) (Mattingly 1957, 1958). The species *Aedes mattinglyi* Hamon and Rickenbach, *Culex mattinglyi* Knight, *Eretmopodites mattinglyi* Hamon and van Someren, *Heizmannia mattinglyi* Thurman, *Mimomyia mattinglyi* Grjebine, *Uranotaenia mattinglyi* Qutubuddin, and *Wyeomyia mattinglyi* Lane are named for him, as is the subgenus *Mattinglyia* of *Heizmannia*. Another species, *Aedes mattinglyorum* Huang, is named for Peter and his wife.

*References:* Anonymous (1985), Service (1994, 2010b).

*Representative works:* Mattingly (1965, 1983), Mattingly and Brown (1985).

#### 1991 P. J. [SIC] DURET

José Pedro Duret (1913–2007) was an Argentine entomologist and medical doctor who served in the Argentine Army and was a consultant to the Pan American Health Organization. He described 53 mosquito species and had assembled the most comprehensive collection of Argentine mosquitoes ever known, as well as incorporating numerous specimens from neighboring countries. Later in life, he worked at the Carlos G. Malbrán Institute in Buenos Aires. Besides mosquitoes, he was also a taxonomic authority on fungus gnats (Mycetophilidae), and he published on Ceratopogonidae, Phlebotominae, and Tabanidae. While a student, he received the Roberto Wernicke Award from the University of Buenos Aires for excellence in doctoral work. The species *Culex dureti* Casal and García is named for him.

*References:* Harbach et al. (1990), Anonymous (1991).

*Representative works:* Duret (1950, 1953, 1971).

#### 1992 B. A. HARRISON

Bruce Arthur Harrison (1937–2018) was a medical entomologist and taxonomist who spent most of his career in the US Army. In addition to his military career, Harrison also worked as a civilian entomologist for the Army, National Academy of Sciences, and North Carolina Department of Environment and Natural Resources. He studied in detail the *Anopheles* fauna of Southeast Asia and the Middle East. Additional

taxonomic studies were conducted on the genera *Aedeomyia*, *Ficalbia*, *Mimomyia*, *Hodgesia*, *Coquillettia*, *Mansonia*, and *Uranotaenia*. He also worked on vectors of the causal agents of dengue, lymphatic filariasis, scrub typhus, plague, yellow fever, Chikungunya, Japanese encephalitis, and fly-borne diarrheal diseases; his work took him to 16 countries. After retirement, he remained a consultant to universities, research institutes, governments, and nongovernmental agencies around the world. During his lifetime, Bruce received numerous letters of commendation and awards. He was awarded the Legion of Merit, Humanitarian Service Medal, Army Superior Unit Award, and Meritorious Service Medal with two oak leaf clusters while in the Army. His civilian awards include the Hamilton W. Stevens Award from the North Carolina Mosquito and Vector Control Association, Award of Excellence from the Entomological Society of North Carolina, Outstanding Service Award and R. E. Dorer Award from the Virginia Mosquito Control Association, Roland E. Dorer Award from the Mid-Atlantic Mosquito Control Association, and Medal of Honor from the American Mosquito Control Association. The Virginia Mosquito Control Association made him an honorary member and established the Dr. Bruce Harrison Research Award to recognize peer-reviewed research conducted on Virginia mosquitoes. The species *Anopheles harrisoni* Harbach and Manguin, *Culex harrisoni* Sirivanakarn, and *Uranotaenia harrisoni* Peyton are named for him, as are the species *Verrallina harrisonica* (Reinert) and the subgenus *Bruceharrisonius* of *Aedes*.

*Representative works:* Harrison and Scanlon (1975), Harrison 1980, Harrison et al. (1990).

### 1993 E. L. PEYTON [SIC]

E L Peyton (no periods, ever; 1929–1999) was introduced to mosquito taxonomy by Stanley Carpenter and Frank Blanton while in Army service (E L had only a high school diploma). He served in Panama, Germany, and Thailand and spent the rest of his career at the Smithsonian Institution and the Walter Reed Biosystematics Unit. E L had an encyclopedic knowledge of mosquito taxonomy and a comprehensive understanding of the International Code of Zoological Nomenclature. He made many collections throughout the Americas and elsewhere and was proficient in the taxonomy of a number of mosquito genera. He fought a lifelong battle with editors, bureaucrats, and others who insisted on putting periods after his initials “E L”—evidently people could not grasp the fact that he used no periods. At the end, however, he prevailed. His gravestone in Arlington National Cemetery is inscribed, “E L PEYTON/MSG/US ARMY/KOREA/VIETNAM/MAY 1, 1929/APR 26, 1999.” I have not been able to establish exactly what E L stood for, if anything. His father was named Edgar Lee, and I once saw E L listed with the first name Edward. One of E L’s former colleagues informed me that “E L” might be on his birth certificate; according to E L, his parents were undecided about what to name him and they just used his father’s initials. The species *Aedes peytoni* Reinert, *Anopheles peytoni* Kulasekera,

Harrison, and Amerasinghe, *Culex peytoni* Bram and Rattanarithikul, and *Orthopodomyia peytoni* Leguizamón and Carpintero and the subgenus *Peytonulus* of *Sabethes* are named for him.

*References:* Harbach (1993), Ward and Harbach (2000), Service (2010a).

*Representative works:* Robert et al. (1984), Peyton (1989), Peyton et al. (1992).

### 1994 T. H. G. AITKEN

Thomas Henry Gardiner Aitken (1913–2007), Tommy to his friends, served in the US Army in World War II as an entomologist and malariologist. He served in Puerto Rico, Algeria, Egypt, Italy, and France (Corsica) working to control malaria and typhus. He received the Bronze Star for his work in Corsica. After the war, he joined the Rockefeller Foundation and worked in Italy (Sardinia), Trinidad, New York City, and Brazil. He later joined the Yale Arbovirus Research Unit in New Haven, CT. He made significant discoveries while studying the transmission of viruses by arthropod vectors, including geographic variation of vectorial capacity of *Aedes* (*Stegomyia*) mosquitoes and transovarial transmission of viruses. The American Society of Tropical Medicine and Hygiene presented him with the Richard M. Taylor Award for outstanding contributions to arbovirology and the Harry Hoogstraal Medal for outstanding achievement in medical entomology. The government of Sardinia presented him with a gold medal in recognition of his malaria control efforts, and the Università degli Studi di Cagliari conferred an honorary doctoral degree. While in Trinidad, Aitken assembled a synoptic collection of arthropods of medical importance for the Trinidad Regional Virus Laboratory (now the Caribbean Epidemiology Centre) that remains one of the finest collections in the Caribbean area; the center named its laboratory for Aitken. He served on the editorial boards of the *Journal of Medical Entomology*, the *Annals of Medical Entomology*, and *Living World*, *Journal of the Trinidad and Tobago Field Naturalists’ Club*. Further, the Horticultural Society in Trinidad presented him with the Gilt Medal. The Aitkenii Group of *Anopheles*, the mosquito *Aedes aitkeni* Schick, and the acarine genus *Aitkenius* are named for him, as are the stilt-legged fly *Metopochetus aitkeni* McAlpine and the fungus gnat *Cluzobra aitkeni* Lane.

*References:* Tikasingh (2007), Woodall (2007).

*Representative works:* Aitken (1953, 1954, 1957).

### 1995 O. P. FORATTINI

Oswaldo Paulo Forattini (1924–2007) was a Brazilian medical doctor, medical entomologist, and parasitologist. In addition to mosquitoes, he also published on Ceratopogonidae, Triatominae, Phlebotominae, and Cimicidae. Oswaldo Forattini was a polygot who spoke English, French, Italian, and Spanish in addition to Portuguese. Forattini made significant contributions to the development of medical entomology and tropical medicine in Brazil. He served as the editor of *Revista de Saúde*

*Pública* for 40 years. He published more than 200 scientific papers, 27 editorials, 13 books, and two book chapters. His four-volume series on medical entomology and two-volume treatise on epidemiology are considered classics in their respective fields. He prepared all of the illustrations for his medical entomology books. Among his many awards were the Emílio Ribas Award (Infectious Diseases Society of Brazil), José Pinto Alves Award (São Paulo Medical Association), Relevant Contribution for Research Award (Universidade de São Paulo), Jabuti Award, and Câmara Brasileira do Livro Award; the last two recognize significant books published in Portuguese. The species *Anopheles forattinii* Wilkerson and Sallum, *Sabethes forattinii* Cerqueira, and *Wyeomyia forattinii* Clastrier are named for him, as was the now-synonymized *Culex forattinii* Corrêa and Ramalho (= *Culex declarator* Dyar and Knab).

*References:* Barata (1995), Sallum et al. (2007a, 2007b), Reis (2016).

*Representative works:* Forattini (1962–1973), Forattini et al. (1986), Forattini and Gomes (1988).

#### 1996 A. R. BARR

A. Ralph (Allen Ralph) Barr (1926–1995) was a medical entomologist who discovered that cytoplasmic incompatibility in *Culex* mosquitoes was caused by infection with *Wolbachia* microorganisms. Barr joined the Navy as a young man and passed the time aboard ship by reading philosophy, something that influenced his thinking for the rest of his life. Ralph started his entomology career at the University of Minnesota, where he wrote a monograph on the mosquitoes of Minnesota, which many biologists believe to be one of the finest regional faunal treatments produced in the twentieth century. He then moved to the University of Kansas and there he wrote another classic work on the distribution of mosquitoes of the *Culex pipiens* complex. After his time in Kansas, he became the Supervisor of Vector Research in the Bureau of Vector Control of the California Department of Public Health. When the Bureau of Vector Control was transferred to the University of California, Ralph joined the faculty there. His last career move was to the School of Public Health at the University of California, Los Angeles. Ralph also was a visiting professor at the University of Singapore and the National Yang Ming Medical College in Taiwan. He was a recipient of the Memorial Lecture Award and the Meritorious Service Award from the American Mosquito Control Association and the Lifetime Achievement Award from the California Mosquito and Vector Control Association. The now-synonymized *Aedes barri* Rueger (= *Aedes euedes* Howard, Dyar, and Knab) and the microsporidian *Intrapredator barri* Chen, Kuo, and Wu are named for him.

*References:* Eldridge (1995), Eldridge and Zavorzink (1996).

*Representative works:* Barr (1958, 1980), Sweeny and Barr (1978).

#### 1996 M. W. SERVICE

Michael William Service (1933–2017) worked in the Malaria Service at the Ministry of Health in Lagos, Nigeria. He then relocated to Kaduna to work for the West African Institute of Trypanosomiasis Research. He returned to the United Kingdom after completing his Ph.D. with the University of London remotely in Nigeria. He worked for Dorset Naturalist's Trust at Brownsea Island, a National Trust property, studying biting insects, mainly mosquitoes. After that, he went to the Natural Environment Research Council's research station, Monks Wood Experimental Station, where he was funded by the World Health Organization to study the malaria vector, *Anopheles gambiae*. Professor Service joined the Liverpool School of Tropical Medicine in 1973. He lectured on all aspects of medical entomology, leading him to write his first textbook for students on medical entomology (Service 1996). Later he wrote *Mosquito ecology: field sampling methods*, the first edition published in 1976 and a second edition in 1993 (Service 1993). He received the Sir Rickard Christophers Medal from the Royal Society of Tropical Medicine and Hygiene and the Memorial Lecture Award from the American Mosquito Control Association.

*References:* Anonymous (2017a, 2017b).

*Representative works:* Service (1963, 1965, 1990).

#### 1997 C. DAHL

Christine Ida Blank Dahl is a retired biologist who worked at Uppsala University in Sweden. She also worked at the Swedish Research Council for Natural Sciences and at Lund University. Christine Dahl studied the mosquito fauna of Fennoscandia and also published on winter crane flies (Trichoceridae). She was a Fellow of the Royal Entomological Society of London and a member of the Royal Physiographic Society in Lund and coauthored chapters in the important book *Mosquitoes and their control* (Becker et al. 2003). The mosquito *Aedes dahliae* (Nielsen) and the subgenus *Dahlia* of *Aedes* are named for her.

*Representative works:* Dahl (1974, 2015), Dahl et al. (1984).

#### 1998 R. E. HARBACH

Ralph Edward Harbach had a 13-year Army career and finished as Manager of the Walter Reed Biosystematics Unit, Smithsonian Institution. He worked on many mosquito groups, and along with Kenneth Knight he produced the classic volume *Taxonomists' glossary of mosquito anatomy* (Harbach and Knight 1980). Ralph also wrote the books *Culiclopedia* (Harbach 1990), wherein are compiled scientific names of Culicidae at all classification levels, and *Composition and nature of the Culicidae (mosquitoes)*, a compendium of all biosystematics information on the Culicidae



(Harbach 2024). He also served as the editor of the journals *Mosquito Systematics* and *Systematic Entomology* and is currently an editor for the journal *Zootaxa*. He worked as a merit researcher at the Natural History Museum, London, formerly the British Natural (History Museum), until his retirement in 2018, and has continued to work there as a Scientific Associate. He is a recipient of the Memorial Lecture Award from the American Mosquito Control Association. The species *Aedes harbachi* Reinert and *Sabethes harbachi* Nascimento-Pereira, Guimãres, Lourenço-de-Oliveira, and Matta and the subgenus *Harbachius* of *Verrallina* are named for him, as is the fossil species *Burmaculex harbachi* Szadziewski, Zhang, Bojarski, Ševčík, Krzemińska, and Krzemiński.

*Representative works:* Harbach and Peyton (1993, 2000), Harbach and Kitching (2005).

### 1999 Y.-M. HUANG

Yiau-Min Huang (1938–2023) joined the Smithsonian Institution as one of the original staff members of the Southeast Asian Mosquito Project. She stayed at the Smithsonian as a Research Associate for the National Museum of Natural History and the Walter Reed Biosystematics Unit. She published more than 50 scientific publications from 1968 to 2018. Even after Yiau-Min formally retired, she continued to conduct research and publish papers for the Smithsonian as well as tutor students and emerging researchers around the world. The species *Aedes huangae* Reinert is named for her, as is the now-synonymized subgenus *Huangmyia* (= *Stegomyia*).

*Representative works:* Huang (1981, 1986, 2004).

### 2000 L. T. NIELSEN

Lewis Thomas Nielsen (1920–2014) was a professor of biology in the University of Utah. He got his start in the Zoology Department of the University of Utah, pinning mosquitoes for one of the professors. He also held a summer position with the Salt Lake City Mosquito Abatement District. Like many men his age, his career in entomology started in the military during World War II, when he served in the US Army Medical Service Corps. During his lifetime, Nielsen became the acknowledged expert on western snowmelt mosquitoes. He published more than 90 scientific papers and wrote books on the mosquito fauna of New Mexico and Utah (Nielsen and Rees 1961, Wolff and Nielsen 2007). He was a former editor of the journal *Mosquito Systematics*. Lewis Nielsen was a past president and an honorary member of both the Utah Mosquito Abatement Association and the American Mosquito Control Association. He received the Don Rees Award and the Meritorious Service Award from the Utah Mosquito Abatement Association and the Medal of Honor and the Memorial Lecture Award from the American Mosquito Control Association. The mermithid worm *Romanomermis nielsenii* (Tsai and Grundmann) may be named for him; the describers did not provide an etymology, but the worms were taken from

mosquitoes collected in Wyoming, and Nielsen worked in the western United States. *Aedes atropalpus nielsenii* O'Meara and Craig was named for him but is currently synonymized with *Aedes epactius* Dyar and Knab, and the genus-group name *Lewnielsenius* is now recognized as a subgenus of *Aedes*.

*Reference:* Dickson and Blackmore (2022).

*Representative works:* Nielsen (1957), Gardner et al. (1973), Wolff and Nielsen (1977).

### 2001 J. F. REINERT

John Francis Reinert is a retired entomologist who served in the US Army Medical Service Corps and in his early retirement worked at the United States Department of Agriculture Medical and Veterinary Entomology Research Laboratory in Gainesville, FL. He produced many revisionary studies within the genus *Aedes* (e.g., Reinert 1970, 1973) and later in life made detailed morphological studies of the female genitalia of mosquitoes. He and his coauthors unraveled the species within the *Anopheles quadrimaculatus* complex (Reinert et al. 1997). The subgenus *Reinertia* of *Aedes* is named for him, as are the species *Aedes reinerti* Rattanarithikul and Harrison and *Uranotaenia reinerti* Peyton.

*Representative works:* Reinert (1993, 2000), Reinert et al. (2009).

### 2002 R. F. DARSIE

Richard (Dick) Floyd Darsie, Jr. (1915–2014) was an entomologist who worked with the Agency for International Development and the Centers for Disease Control and Prevention. He collected mosquitoes throughout the Americas and in the Philippines and Nepal. In his later years, he studied mosquitoes while in residence at the University of South Carolina's International Center for Public Health and the University of Florida's Florida Medical Entomology Laboratory. He is probably best known for his book *Identification and geographical distribution of the mosquitoes of North America north of Mexico*, coauthored with Ronald A. Ward (2005). Dick Darsie also described the pupae of many mosquito species.

*Representative works:* Darsie (1957), Clark-Gil and Darsie (1983), Darsie et al. (1996).

### 2003 R. C. WILKERSON

Richard (Rick) Charles Wilkerson is a retired civilian entomologist who worked in the Walter Reed Biosystematics Unit and was manager there for 10 years. During the Vietnam War period, he taught medical entomology at the Medical Field Service School at Ft. Sam Houston. He has produced taxonomic and systematic works on many mosquito groups, mostly Neotropical *Anopheles* species complexes, and produced the first modern treatment of the horse fly fauna of Colombia, describing more than 50 new species. He is the senior author for the two-volume *Mosquitoes of the world*, wherein every species of mosquito described worldwide is examined

and analyzed. Based on the comprehensive taxonomic study completed by Rick and Ralph Harbach in 2023, all subspecies were eliminated from the classification of the Culicidae (Harbach and Wilkerson 2023). The species *Aedes wilkersoni* Reinert and the phlebotomine *Lutzomyia wilkersoni* Young and Rogers are named for him.

*Representative works:* Wilkerson and Peyton (1990), Wilkerson et al. (2015), Harbach and Wilkerson (2023).

#### 2004 KAZULO [SIC] TANAKA

This name is misspelled on the AMCA website; his first name was Kazuo. Kazuo Tanaka (1928–2024) worked with the US Army Medical Entomology Laboratory, Pacific in Japan, and he conducted extensive studies on the pupal taxonomy of Japanese mosquitoes. Tanaka also conducted surveys of the Ryukyu Islands, correcting a number of erroneous distribution records, and he described a number of new mosquito species. He left the Army laboratory in 1978. He spent several years in Indonesia and Thailand working with the Japan International Cooperation Agency. He also worked for a pest control company for about 16 years. For many years, Tanaka collected carabid beetles from a variety of habitats in Japan. His collection of 16,379 specimens is housed in the Insect Museum of the Institute for Agro-Environmental Sciences, NARO (National Agriculture and Food Research Organization; Yoshimatsu et al. 2018). His work on carabid beetles was the basis of his Doctor of Agriculture dissertation submitted to the Tokyo University of Agriculture. He received an award for his taxonomic work on mosquitoes from the Japanese Society for Medical Entomology and Zoology. The species *Uranotaenia tanakai* Miyagi and Toma and the subgenus *Tanakaius* of *Aedes* are named for him.

*References:* Flint (1980), Evenhuis (2020), Osawa et al. (2020), Mogi (2024).

*Representative works:* Tanaka et al. (1975, 1979), Tanaka (2003).

#### 2005 RONALD A. WARD

Ronald Anthony Ward (1929–2017) was formerly head of the Walter Reed Biosystematics Unit of the Smithsonian Institution. He got his start in professional entomology as an instructor of biology in Gonzaga University in Spokane, Washington. He then moved to the Walter Reed Army Institute of Research, studying malaria, trypanosomiasis, and mosquito taxonomy in Afghanistan, Tanzania, Thailand, and Zaire. Along with Richard Darsie, he wrote the book *Identification and geographical distribution of the mosquitoes of North America north of Mexico*. He received the Medal of Honor, Meritorious Service Award, and Memorial Lecture Award from the American Mosquito Control Association. He was editor of the journal *Mosquito News* and the replacement *Journal of the American Mosquito Control Association* from 1981 to 1996. He was a coauthor on the updated version of AMCA Bulletin No. 5, *Manual for mosquito rearing and experimental techniques*. He also

published a series of corrections, supplements, and updates to the world catalog of mosquitoes. The species *Aedes wardi* Reinert and *Culex wardi* Sirivanakarn are named for him.

*Representative works:* Ward (1963, 1966), Ward et al. (1969).

#### 2006 BILL REISEN

William Kenneth Reisen is Professor Emeritus at the University of California, Davis, School of Veterinary Medicine. Bill Reisen served as a captain in the US Air Force from 1969 to 1971, assigned to the 5th Epidemiological Flight and 1st Medical Service Wing in the Republic of the Philippines. He conducted vector-borne disease surveillance and control support on US Air Force bases in the Pacific Air Command, including Guam, Hawaii, Japan, Korea, Okinawa, Taiwan, and Thailand. After completing his Ph.D. from the University of Oklahoma, he started his academic career at the University of Maryland's Pakistan Medical Research Center in Lahore. He then joined the University of California, first at Berkeley where he was Director of the School of Public Health's Arbovirus Field Station in Bakersfield and later at Davis where he was Director of the Center for Vector-Borne Diseases. During much of his career he studied the biology, ecology, and population dynamics of mosquito vectors and epidemiology of arboviruses. His many awards include the Sigma Xi Student Research Award, Arthur T. Bragg Award for outstanding research in natural history (University of Oklahoma), Lifetime Award for Achievement in Medical Entomology (Society for Vector Ecology), Academic Federation Award for Excellence in Research (University of California), Fellow of the ESA, Distinguished Service Award (Society for Vector Ecology), Meritorious Service Award (AMCA), and Harry Hoogstraal Medal (American Society of Tropical Medicine and Hygiene, American Committee of Medical Entomology). Reisen has served on the American Society of Tropical Medicine and Hygiene's American Committee on Medical Entomology, the California Mosquito and Vector Control Association's Disease Control Subcommittee, and the California Department of Health Service's Vector Control Advisory Committee. He is a past president of the Society for Vector Ecology and a past chairman of Section D (Medical Entomology) of the ESA. In 1992, he was the leader of the People-to-People delegation of vector ecologists to the People's Republic of China. He is a past editor-in-chief of the *Journal of Medical Entomology* and has served on the editorial boards of the *Journal of Science and Climatic Change* and *Vector-Borne and Zoonotic Diseases*. He is the author of 340 scientific publications. The species *Tripteroides reiseni* Basio and Basio is named for him.

*Representative works:* Reisen and Milby (1986), Reisen et al. (1992), Reisen (2010).



## 2007 NO AWARD

### 2008 MARIA ANICE MUREB SALLUM

Anice Sallum is a Brazilian researcher in the Universidade de São Paulo. She has conducted extensive studies on the ecology and systematics of the mosquitoes of South America. Most of her work has been on malaria vectors, but she has published on several other mosquito genera, including *Mansonia* and *Culex*, especially the difficult subgenus *Melanoconion*. She is the first author on a series of four papers that provide identification keys to the *Anopheles* mosquitoes of South America (Sallum et al. 2020a, 2020b, 2020c, 2020d). The species *Aedes sallumae* González and Reyes and the subgenus *Sallumia* of *Aedes* are named for her.

*Representative works:* Sallum et al. (2005, 2008, 2020c).

## 2009 NO AWARD

### 2010 DANIEL STRICKMAN

Daniel Allen Strickman (1953–2020) had a varied career. He started in the Peace Corps as a professor at the National University of Asunción, Paraguay. Afterwards he served as an entomologist in both the US Air Force and the US Army, working in Thailand, Honduras, Korea, the Middle East, and the USA. Although Dan Strickman is best known for his work on mosquitoes, he also worked on tabanids, chiggers, and rodents. One of his more interesting papers is a study of the biology of a spider preying on dengue vectors (Strickman et al. 1997). After his military career, Dan worked for the Santa Clara County (California) Vector Control program, the US Department of Agriculture, and the Gates Foundation. In retirement, Dan volunteered at the Burke Museum of Natural History at the University of Washington. Dan published 115 scientific papers, 16 book chapters, and four books. Among those books is the two-volume set *Mosquitoes of the world*, coauthored with Richard Wilkerson and Yvonne Linton. He was elected a Fellow of the ESA and received the Dow AgroSciences Integrated Pest Management Team Award, a Bronze Medal from the US Environmental Protection Agency, and the GreenGov Award from the Office of the President. Dan was awarded a number of medals while in service; the highest were the Legion of Merit and the Bronze Star. The Society for Vector Ecology presents the Dan Strickman Memorial Award for the best student presentation at their annual meeting.

*References:* Anonymous undated b, Novak (2021).

*Representative works:* Strickman (1989), Strickman and Pratt (1989), Strickman and Kittayapong (2003).

### 2011 RAMPA RATTANARITHIKUL, PH.D.

Rampa Rattanaarithikul is retired from the US Army Medical Component, Armed Forces Research Institute of Medical Sciences, Bangkok, Thailand. She worked on the taxonomy and systematics of a number of mosquito

genera in Southeast Asia, including *Anopheles*, *Aedeomyia*, *Ficalbia*, *Mimomyia*, *Hodgesia*, *Coquillettia*, *Mansonia*, and *Uranotaenia*. She is the senior author of a six-part guide to the mosquitoes of Thailand. The species *Anopheles rampae* Harbach and Somboon and *Uranotaenia rampae* Peyton and Klein and the subgenus *Rampamyia* of *Aedes* are named for her.

*Representative works:* Rattanaarithikul (1982), Rattanaarithikul and Harrison (1988), Rattanaarithikul et al. (2006).

### 2012 MAUREEN COETZEE

Maureen Coetzee is a South African entomologist who works at the Wits Research Institute for Malaria, University of the Witwatersrand, Braamfontein, Johannesburg. Her work is primarily on the biology, systematics, and control of African malaria vectors. She has also studied the relationship between vector status and resistance to insecticides for *Anopheles* mosquitoes. She and M. T. Gillies updated the publication *Anophelinae of the Subsaharan Region* (Gillies and Coetzee 1987). She is the recipient of the Kwame Nkrumah Science Award, awarded by the African Union to recognize outstanding scientists in Africa. The subgenus *Coetzeemyia* of *Aedes* and the bacterial genus *Coetzeea* were named for her.

*Representative works:* Hunt et al. (2008), Coetzee and Koekemoer (2013), Coetzee et al. (2013).

### 2013 JOHN F. ANDERSON

John Frederick Anderson is an entomologist in the Connecticut Agricultural Experiment Station and is a Clinical Professor of Epidemiology in Yale University's School of Public Health, both in New Haven, CT. He works on the ecology of ticks and mosquitoes and the isolation and characterization of the microbial pathogens carried by those arthropods. He has made significant contributions to the study of behavior of disease vectors, especially but not limited to vectors of West Nile virus.

*Representative works:* Anderson (1970), Anderson et al. (1999, 2006).

### 2014 GRAHAM WHITE

Graham Bruce White worked at the London School of Hygiene and Tropical Medicine, was Keeper (curator) of the Culicidae at the British Museum (Natural History) and a consultant for ICI in the United Kingdom. In the USA, he was the Technical Consultant for the Deployed Warfighter Protection Research Program based at the Mosquito and Fly Research Unit, Center for Medical, Agricultural, and Veterinary Entomology, USDA Agricultural Research Service, Gainesville, FL. He studied taxonomy of *Culex* species, chemosterilization of mosquitoes, insect repellents, and taxonomy of the *Anopheles gambiae* and *maculipennis* complexes. Graham White was one of the original editors of the journal *Medical and Veterinary Entomology*. He received the Memorial Lecture Award from the American Mosquito Control Association.

*Reference:* Glaser (2009).

*Representative works:* White (1973, 1974, 1978).

## 2015 ELENA B. VINOGRADOVA

Elena Borissovna Vinogradova (1933–2021) was an entomologist working in the Laboratory of Experimental Biology and Biocontrol Theory in the Zoological Institute of the Russian Academy of Sciences. Much of her work was done on the *Culex pipiens* complex in Russia (e.g., Vinogradova and Shaikevich 2007, Vinogradova et al. 2013). She wrote two monographs on the species complex (Vinogradova 1997, 2000) and two books on diapause of flies (Vinogradova 1969, 1991) and also conducted work on Calliphoridae, including yet another book (Vinogradova 1984).

*References:* Alekseev et al. (2024a, 2024b).

*Representative works:* Vinogradova (2000, 2003), Vinogradova and Shaikevich (2005).

## 2016 NO AWARD

## 2017 DR. GEORGE F. O'MEARA

George Francis O'Meara is a retired professor of entomology in the University of Florida and past president of the Florida Mosquito Control Association. He has done a lifetime's work on *Aedes aegypti* and has also published on other mosquito species. Much of his work concerns invasive species, mosquitoes inhabiting sewage treatment plants, and basic physiology and ecology. George has studied genetics, behavior, geographic distribution, vector competence, comparative morphology, population ecology, community ecology, biogeography, taxonomy, reproductive biology, and phenology of mosquitoes. He is the only person to be a recipient of both the Maurice Provost Award and the Joseph Y. Porter Award from the Florida Mosquito Control Association.

*Representative works:* O'Meara and Evans (1973, 1977), O'Meara et al. (1995).

## 2018 LEON PHILIP LOUNIBOS

Leon Philip Lounibos is a retired professor of entomology in the Florida Medical Entomology Laboratory of the University of Florida. He previously worked at the International Centre of Insect Physiology and Ecology in Kenya. He has conducted research on tree-hole mosquitoes, container mosquitoes, and *Anopheles* malaria vectors in South America. His work has mainly been focused on the ecology of mosquitoes and mechanisms of success for invasive mosquito species. His work on the ecology of mosquitoes included editing the proceedings of a major workshop that advanced this field (Lounibos et al. 1985). Some of the diverse systems and mosquito species that were subjects of his research are summarized in a semi-biographical sketch from a workshop held in honor his retirement (Juliano et al. 2019). The Afrotropical

mosquito *Anopheles lounibosi* Gillies and Coetzee is named for him.

*Representative works:* Lounibos (1981, 2004), Lounibos et al. (2001).

## 2019 NORBERT BECKER

Norbert Becker is a German biologist working with many mosquito control programs in Europe. He was the inventor of the technique to use ice pellets to deliver *Bacillus thuringiensis israelensis* de Barjac to larval habitats. He is a professor at the University of Heidelberg and has been active and held offices in the German Mosquito Control Association, European Mosquito Control Association, and World Mosquito Control Association. Among his honors are the National Medal of the Slovenian Republic, Distinguished Service Award of the Society for Vector Ecology, Escherich-Preis of the German Society of Entomology, Order of Merit of the Federal Republic of Germany, Meritorious Service Award of the AMCA, and Distinguished Life Time Service Award of the Society for Vector Ecology. His publications have considered climate change effects (e.g., Becker 2008) and invasive species (Becker et al. 2011, 2012) on mosquito control in northern Europe.

*Representative works:* Becker et al. (1999, 2003, 2017).

## 2020 JAN CONN

Jan Evelyn Conn is a vector geneticist working at the New York State Department of Health's Wadsworth Center. She is also a professor in the Department of Biomedical Sciences at the School of Public Health, State University of New York–Albany. Jan Conn studies the population genetics of malaria vectors in the tropics and has previously studied black flies. She has produced a phytogeography of the major vector *Anopheles darlingi* Root (Conn 1998, Emerson et al. 2015) and identified a new vector of human malaria in Brazil, promoted by migration and land use changes (Conn et al. 2002). She has published ten books of poetry, most recently *Peony vertigo* (Brick Books 2023), and her paintings can be viewed at <https://laurenclarkfineart.com/collections/jan-conn>. The species *Anopheles janconniae* Wilkerson and Sallum is named for her.

*Representative works:* Conn et al. (1997), Conn and Mirabello (2007).

## 2021 KEN LINTHICUM

Kenneth James Linthicum has spent most of his career in government service, either with the US Army or with the US Department of Agriculture (USDA). After his Ph.D. at UCLA mentored by John Belkin (Linthicum 1988), he became an instructor of biology at California State University, Los Angeles. His Army career has been varied and challenging, with duty in Kenya and Thailand. His diverse research accomplishments include identification of reservoirs of Rift Valley Fever virus in infrequently flooded *dambos* in Kenya

(Linthicum 1984) and the first use of satellite imagery to detect such mosquito-borne disease reservoirs (Linthicum et al. 1987). After his Army service and prior to his work at the USDA, Linthicum was the Supervising Public Health Biologist for the Southern Region, Vector-Borne Disease Section, California Department of Health Services. He is a past president of the AMCA and a past editor of the *Journal of the American Mosquito Control Association*. He has received numerous military awards, including one from the Royal Thai Army. Among his many civilian awards is the John I. Davidson Award for Practical Papers by the American Society for Photogrammetric Engineering and Remote Sensing. He is a recipient of the AMCA's Memorial Lecture Award and Meritorious Service Award. Ken has also been a member of the American Committee on Medical Entomology, American Society of Tropical Medicine and Hygiene.

*Representative works:* Wilson et al. (1994), Anyamba et al. (2009).

## 2022 DR. CHET MOORE

Chester Gunn Moore is a retired entomologist who worked with the Centers for Disease Control and Prevention in Ft. Collins, CO, and San Juan, Puerto Rico; the University of Puerto Rico; the Walter Reed Army Institute of Research; and Colorado State University in Ft. Collins. His work has concentrated on mosquito vectors of arboviruses. Chet Moore was the lead author on a CDC document presenting guidelines for arbovirus surveillance programs (Moore et al. 1993) and is perhaps best known for tracking the spread of the invasive Asian tiger mosquito in the USA (Moore et al. 1990, 1999). He is a past president of the AMCA and the Society for Vector Ecology. Among his numerous awards are the American Mosquito Control Association's Medal of Honor and the Meritorious Service Award, the Society for Vector Ecology's Distinguished Achievement Award, Distinguished Service Award, and Presidential Order Award, the West Central Mosquito and Vector Control Association's Service Award, a Service Recognition Plaque from the Puerto Rico Department of Health, and a Secretary's Award for Distinguished Service from the US Department of Health and Human Services. The US Public Health Service recognized him with three Group Awards, two Special Recognitions Awards, and a Superior Performance Award.

*Representative works:* Moore and Fisher (1969), Eisen et al. (2008).

## 2023 JOHN EDMAN AND BRUCE ELDRIDGE

John David Edman worked at the State of Florida's Entomological Research Center in Vero Beach (currently the University of Florida's Florida Medical Entomology Laboratory), the University of Massachusetts, and the University of California, Davis. John Edman is known for his groundbreaking research on the defensive behavior of vertebrate hosts in response to attack by mosquitoes and on blood-feeding behavior of mosquitoes, and

for demonstrating a shift in feeding patterns by some *Culex* species from avian hosts to mammals, including humans, which explained patterns of seasonal transmission of St. Louis encephalitis virus in Florida. Edman has received many honors, among them the L. O. Howard Award and the Outstanding Teacher Award from the Eastern Branch of the ESA. He is a Fellow of both the ESA and the Royal Entomological Society. He is a recipient of the AMCA's Medal of Honor and Memorial Lecture Award. John received the Distinguished Achievement Award from the Society for Vector Ecology and the Harry Hoogstraal Medal from the American Committee on Medical Entomology of the American Society of Tropical Medicine and Hygiene. He is a past president of the American Mosquito Control Association. He was secretary, vice chair, and chair of Section D (Medical & Veterinary Entomology) of the ESA. He also served as president of the Society for Vector Ecology.

*Representative works:* Edman (1971), Edman and Taylor (1968), Walker and Edman (1985).

Bruce Frederick Eldridge (1933–2025) had a remarkable career that lasted nearly 70 years, starting with his first entomological employment as an inspector with the California Packing Corporation in 1953 and continuing to his affiliation with University of California (UC) Davis as an emeritus professor. His initial interest in mosquitoes developed when he worked for the Santa Clara County Health Department in San Jose. After that, he was a preventative medicine officer with the US Army, Chief of the Department of Entomology at the Walter Reed Army Institute of Research, a consultant to the Surgeon General of the Army, and an entomologist in Panama with the Atlantic-Pacific Canal Study Commission, conducting a biological survey of proposed sea-level canals in Colombia and Panama. During his Army service, Bruce was stationed in Texas, Korea, the Panama Canal Zone, and Washington, DC. After Bruce Eldridge retired from a 21-year military career in 1978, he became Professor and Head of the Entomology Department at Oregon State University, before moving to the University of California, Davis where he was Director of the university-wide Mosquito Research Program. He was instrumental in facilitating the move of the Arbovirus Research Unit from the School of Public Health at UC Berkeley to the School of Veterinary Medicine at UC Davis, essentially founding the Center for Vector-Borne Diseases. Bruce Eldridge conducted pioneering research on *Culex pipiens* complex mosquitoes, St. Louis encephalitis virus, the role of mosquito and vertebrate species in virus transmission cycles, transmission of Keystone virus, flight behavior of *Anopheles stephensi* Liston, and mosquito overwintering behavior. He published on mosquito systematics, unraveling a particularly problematic situation with the nomenclature of certain western US *Culex* species and describing two species, *Aedes washinoi* Eldridge and *Aedes clivis* Eldridge. After relocating to California, Bruce continued to conduct important research, studying arbovirus ecology in seasonal wetlands and working to improve



the state's Encephalitis Virus Surveillance Program. He frequently served as Chair of the ad hoc Entomology Study Section of Tropical Medicine and Parasitology of the National Institutes of Health. Eldridge served as the editor of the *Journal of the American Mosquito Control Association* from 1999 to 2003. Bruce was honored by several scientific societies as well as by the US Army. He was the recipient of the Paul A. Siple Award (first prize for a paper submitted to the Army Science Conference). Bruce Eldridge was a Fellow of the American Association for the Advancement of Science and the ESA. He received Meritorious Service Awards from both the AMCA and the Mosquito and Vector Control Association of California. Purdue University presented him with the John V. Osmun Alumni Professional Achievement Award. The American Mosquito Control Association presented him with its Memorial Lecture Award and its Medal of Honor. He was an honorary member of both the ESA and the Mosquito and Vector Control Association of California. He was awarded the Meritorious Achievement Award by the Society for Vector Ecology and the Harry Hoogstraal Medal for Outstanding Achievement in Medical Entomology by the American Committee of Medical Entomology of the American Society of Tropical Medicine and Hygiene. He was a past president of the American Mosquito Control Association. The species *Aedes eldridgei* Reinert and *Culex eldridgei* Adames and Galindo are named for him.

*References:* Anonymous (2007), Garvey (2025).

*Representative works:* Eldridge (1966, 1990), Eldridge et al. (1972).

## 2024 WILLIAM BRADSHAW AND CHRISTINA HOLZAPFEL

This husband-and-wife team retired from the University of Oregon. They spent more than 50 years researching fundamental biological and ecological concepts, primarily using the pitcher plant mosquito, *Wyeomyia smithii* (Coquillett) as a model organism. They demonstrated how *Wy. smithii* evolved from south to north in its dormancy strategies in North America, used phylogeographic methods to show how this species radiated from Appalachia to its current distribution in the USA and Canada, and showed how small suites of genes controlled the evolutionary transition of this species to obligate autogeny from blood feeding ancestors. During sabbaticals in the 1980s and 90s, Bradshaw and Holzapfel conducted community ecological research on tree hole mosquitoes in the southeastern USA and Europe. They have also published on other mosquito species, fish, and plants. Both Bradshaw and Holzapfel are Guggenheim Fellows and Fullbright Fellows.

*Representative works:* Bradshaw and Lounibos (1977), Bradshaw et al. (2017), Merz et al. (2013).

## 2025 FRANCIS SCHAFFNER

Francis Schaffner is a medical and veterinary entomologist who has investigated mosquitoes, biting midges,

sand flies, and other biting flies. He has also studied ectoparasites of rodents and vectors of eyeworms. Initially, he was involved with mosquito control and mosquito taxonomy in France, beginning in Alsace and then on the Mediterranean coast. From 2007 to 2013, he worked at the Institute of Parasitology, University of Zurich, Switzerland, where he developed research and surveillance programs for insect vectors. He remains an associate researcher at that institution. He also was employed by Avia-GIS, a Belgian company developing digital tools for vector surveillance. Since 2016, Schaffner has been an independent consultant (Francis Schaffner Consultancy, Riehen, Switzerland), interacting with international bodies (European Centre for Disease Control, European Food Safety Authority, World Health Organization) and national authorities to develop networking, performing needs assessments, and designing risk management plans for vector-borne diseases. He has more than 33 years of experience in Europe and in EU Overseas Countries and Territories, the Middle East, and North Africa carrying out surveillance, control, taxonomy, and ecology of insect vectors and transmission of human and animal vector-borne disease pathogens. Francis Schaffner is the current Editor-in-Chief of the *Journal of the European Mosquito Control Association*. He is a recipient of the Society for Vector Ecology's Distinguished Achievement Award. The Société entomologique de France awarded him the Prix Passet, "awarded to work most useful to general entomology" (translated from the French) and in particular work that deals with insect larvae. He also received the Prix de thèse de la Société Française de Parasitologie, an award that recognizes significant achievement during doctoral studies.

*Representative works:* Eritja et al. (2019), Schenkel et al. (2019), Schaffner and Mathieu (2020).

## Professional Trends Among Awardees and Commentary of the State of Mosquito Systematics

During the Award's first two decades (1981–2001), close to one-half ( $10/23 = 43.5\%$ ) of the recipients were regarded as primarily mosquito taxonomists. By contrast, after 2001, only 8.7% ( $2/23$ ) were identified as predominantly mosquito systematists. Such changes are associated with the decline in workers, and job opportunities, in mosquito taxonomy and the demands of diversification in modern biology, whether in academic or government employment. Zavortink (1990) remarked that few of John Belkin's students found employment as systematists. This was and continues to be unfortunate. Taxonomy (and systematics) has long been looked upon as a "blind alley" best avoided by serious zoologists (Simpson 1945). In fact, the lack of taxonomists is a serious impediment to continued progress in the biological sciences (Engel et al. 2021). As many as 86% of extant eukaryotic organisms are undescribed (Drew 2011). John Belkin himself believed that his study of mosquitoes of the South Pacific had recorded only half of the culicid fauna (Zavortink 1990). Things have not changed much since Lewis Nielsen (1980) wrote,

commenting on the state of mosquito systematics, “we still have a very long way to go.”

### ACKNOWLEDGMENTS

Many people provided information about the Belkin honorees. This survey could not have been written without their assistance. They are (in no particular order) Neil Evenhuis, Bishop Museum, Hawaii; Brian Byrd, Western Carolina University; Anice Sallum, Universidade de São Paulo; Ralph Harbach, Natural History Museum, London; Nathan Burkett-Cadena, University of Florida; Phil Lounibos, University of Florida; Rick Wilkerson, Smithsonian Institution; Peter Smithers, Royal Entomological Society, London; Max Barclay, Natural History Museum, London; Ed Saugstad, US Army (retired); Takeshi Osawa, Tokyo Metropolitan University; Kirill Makarov, Moscow State Pedagogical University; Sergey Reznik, Russian Academy of Sciences; Valentina Kuznetsova, Russian Academy of Sciences; Carina Blackmore, Florida Department of Health (retired); and Anders Lindström, Swedish Veterinary Agency. I thank Ralph Harbach and Phil Lounibos for their pre-submission reviews of the manuscript. Two anonymous reviewers provided many helpful suggestions.

### REFERENCES CITED

- Aitken THG. 1953. The Anopheline fauna of Sardinia. *Am J Hyg Monogr Ser* 20:303–352.
- Aitken THG. 1954. The Culicidae of Sardinia and Corsica (Diptera). *Bull Entomol Res* 45:437–494.
- Aitken THG. 1957. Virus transmission studies with Trinidadian mosquitoes. *West Indian Med J* 6:229–232.
- Alekseev VR, Kuznetsova VG, Narchuk EP. 2024a. In memory of Elena Borisovna Vinogradova (02.02.1933–29.12.2021). In: XII All-Russian Dipterological Symposium: Program and Abstracts. October 21–24, 2024; St. Petersburg. 83 p.
- Alekseev VR, Kuznetsova VG, Narchuk EP. 2024b. In memory of Elena Borisovna Vinogradova, an outstanding scientist and a remarkable person. *Entomol Rev* 103:174–190.
- Anderson JF. 1970. An iridescent virus infecting the mosquito *Aedes stimulans*. *J Invertebr Pathol* 15:219–224.
- Anderson JF, Andreadis TG, Main AJ, Ferrandino FJ, Vossbrinck CR. 2006. West Nile virus from female and male mosquitoes (Diptera: Culicidae) in subterranean, ground, and canopy habitats in Connecticut. *J Med Entomol* 43:1010–1019.
- Anderson JF, Andreadis TG, Vossbrinck CR, Tirrell S, Wakem EM, French RA, Garmendia AE, Van Kruiningen HJ. 1999. Isolation of West Nile virus from mosquitoes, crows, and a Cooper's hawk in Connecticut. *Science* 286:2331–2333.
- Anonymous. Undated a. Lloyd E. Rozeboom, ScD. Johns Hopkins Bloomberg School of Public Health. [accessed February 25, 2025]. Available from: <https://publichealth.jhu.edu/about/history/heroes-of-public-health/lloyd-e-rozeboom-scd>
- Anonymous. Undated b. 2016. Daniel A. Strickman, ESA Fellow (2016). Entomological Society of America [accessed February 25, 2025]. Available from: <https://www.entsoc.org/fellows/strickman>
- Anonymous. 1984a. Biography of Kenneth Lee Knight. *Mosq Syst* 16:212–225.
- Anonymous. 1984b. Biography of Stanley Jennings Carpenter. *Mosq Syst* 16:131–139.
- Anonymous. 1985. Biography of Peter Frederick Mattingly. *Mosq Syst* 17:64–81.
- Anonymous. 1986a. Biography of Elizabeth Nesta Marks. *Mosq Syst* 18:199–214.
- Anonymous. 1986b. Biography of James Blaine Kitzmiller. *Mosq Syst* 18:327–339.
- Anonymous. 1987a. Biography of John Alexander Reid. *Mosq Syst* 19:173–184.
- Anonymous. 1987b. Editor's corner. *Mosq Syst* 19:185–186.
- Anonymous. 1991. Biography of Jose Pedro Duret. *Mosq Syst* 32:66–70.
- Anonymous. 1999. *Entomologist Alan Stone dies at 95*. The Washington Post [accessed February 25, 2025]. Available from: <https://www.washingtonpost.com/archive/local/1999/03/06/entomologist-alan-stone-dies-at-95/57826ec7-f085-4b20-a675-c2afda0ee63c/>
- Anonymous. 2007. Interview. Bruce Eldridge, Ph.D. *Vector-Borne Zoonot Dis* 7:461–466.
- Anonymous. 2017a. *Professor Mike Service (1933–2017)*. Royal Society of Tropical Medicine & Hygiene [accessed February 25, 2025]. Available from: <https://www.rstmh.org/news-blog/news/professor-mike-service-1933-2017>
- Anonymous. 2017b. *Obituary: Professor Mike Service*. MalariaWorld [accessed February 25, 2025]. Available from: <https://www.malaria-world.org/blogs/obituary-professor-mike-service>
- Anyamba A, Chretien JP, Small J, Tucker CJ, Formenty PB, Richardson JH, Britch SC, Schnabel DC, Erickson RL, Linthicum KJ. 2009. Prediction of a Rift Valley fever outbreak. *Proc Nat Acad Sci* 106:955–959.
- Apperson CS. 2002. Kenneth Lee Knight. *Amer Entomol* 48:189–190.
- Baker RH. 1995. Obituary: James B. Kitzmiller 1918–1995. *J Amer Mosq Control Assoc* 11:495–496.
- Barata JMS. 1995. Belkin Prize–1995. *Rev Saúde Públ* 29:254–255.
- Barr AR. 1958. The mosquitoes of Minnesota (Diptera: Culicidae: Culicinae). Univ Minnesota Agric Exper Station Tech Bull No. 228.
- Barr AR. 1980. Cytoplasmic incompatibility in natural populations of a mosquito, *Culex pipiens* L. *Nature* 283:71–72.
- Becker N. 2008. Influence of climate change on mosquito development and mosquito-borne diseases in Europe. *Parasitol Res* 103(Suppl. 1):19–28.
- Becker N, Huber K, Pluskota B, Kaiser A. 2011. *Ochlerotatus japonicus japonicus*—a newly established neozone in Germany and a revised list of the German mosquito fauna. *Eur Mosq Bull* 29:102.
- Becker N, Jost A, Weitzel T, Rettich K. 1999. Exploiting the biology of urban mosquitoes for their control. *Proc 3rd Internat Conf Urban Pests*. Czech University of Agriculture, Prague, Czech Republic 19:425–429.
- Becker N, Petrić D, Zgomba M, Boase C, Dahl C, Lane J, Kaiser A. 2003. *Mosquitoes and their control*. New York, NY: Kluwer Academic.
- Becker N, Pluskota B, Kaiser A, Schaffner F. 2012. Exotic mosquitoes conquer the world. In: Melhorn H, ed. *Arthropods as vectors of emerging diseases*. Parasitol Res Monogr Volume 3. Springer Berlin, Heidelberg, Germany, p 31–60.
- Becker N, Schön S, Klein AM, Ferstl I, Kizgin A, Tannich E, Kuhn C, Pluskota B, Jöst A. 2017. First mass development of *Aedes albopictus* (Diptera: Culicidae)—its surveillance and control in Germany. *Parasitol Res* 116:847–858.
- Belkin JN. 1950. Mosquitoes of the genus *Tripteroides* in the Solomon Islands. *Proc US Nat Mus* 100:201–274.

- Belkin JN. 1962. *The mosquitoes of the South Pacific (Diptera: Culicidae)*. 2 volumes. Berkeley, CA: Univ. of California Press.
- Belkin JN, Heinemann SJ, Page WA. 1970. Mosquito studies (Diptera, Culicidae). XXI. The Culicidae of Jamaica. *Contrib Amer Entomol Inst* 6:1–458.
- Bradshaw WE, Burkhart J, Colbourne JK, Borowczak R, Lopez J, Denlinger DL, Reynolds JA, Pfrender ME, Holzapfel CM. 2017. Evolutionary transition from blood feeding to obligate nonbiting in a mosquito. *Proc Nat Acad Sci* 115:1009–1014.
- Bradshaw WE, Lounibos LP. 1977. Evolution of dormancy and its photoperiodic control in pitcher-plant mosquitoes. *Evolution* 31:546–567.
- Bryan JH. 2006. The role of Pat Marks in the Australasian mosquito catalogue project and future needs in mosquito taxonomy. *Austral Entomol* 33:187–192.
- Carpenter SJ. 1945. Anopheline surveys in the Fourth Service Command. *J Nat Malaria Soc* 4:115–121.
- Carpenter SJ, Galindo P, Trapido H. 1952. Forest mosquito studies in an endemic yellow fever area in Panama. *Mosq News* 12:156–164.
- Carpenter SJ, La Casse WJ. 1955. *Mosquitoes of North America (north of Mexico)*. Berkeley, CA: Univ. of California Press.
- Carpenter SJ, Peyton EL. 1952. Mosquito studies in the Panama Canal Zone during 1949 and 1950 (Diptera, Culicidae). *Amer Midl Nat* 48:673–682.
- Clark-Gil S, Darsie RF Jr. 1983. The mosquitoes of Guatemala. Their identification, distribution, and bionomics with keys to adult females and larvae in English and Spanish. *Mosq Syst* 15:151–294.
- Coetzee M. 2001. Dr. Botha de Meillon. *Ann Trop Med Parasitol* 95:219–221.
- Coetzee M, Hunt RH, Wilkerson R, Della Torre A, Coulbaly MB, Besansky NJ. 2013. *Anopheles coluzzii* and *Anopheles amharicus*, new members of the *Anopheles gambiae* complex. *Zootaxa* 3619:246–274.
- Coetzee M, Koekemoer LL. 2013. Molecular systematics and insecticide resistance in the major African malaria vector *Anopheles funestus*. *Annu Rev Entomol* 58:393–412.
- Conn JE. 1998. Systematics and population level analysis of *Anopheles darlingi*. *Mem Inst Oswaldo Cruz* 93:647–650.
- Conn JE, Mirabello L. 2007. The biogeography and population genetics of Neotropical vector species. *Heredity* 99:245–256.
- Conn JE, Mitchell SE, Cockburn AF. 1997. Mitochondrial DNA variation within and between two species of Neotropical anopheline mosquitoes (Diptera: Culicidae). *J Hered* 88:98–107.
- Conn JE, Wilkerson RC, Segura MNO, de Souza RT, Schlichting CD, Wirtz RA, Póvoa MM. 2002. Emergence of a new Neotropical malaria vector facilitated by human migration and changes in land use. *Amer J Trop Med Hyg* 66:18–22.
- Dahl C. 1974. Circumpolar *Aedes (Ochlerotatus)* species in North Fennoscandia. *Mosq Syst* 6:57–73.
- Dahl C. 2015. 17.4. Culicidae (Mosquitoes). In: Böcher J, Kristensen NP, Pape T, Vilhelmsen L, eds. *The Greenland entomofauna: an identification manual of insects, spiders and their allies*. *Fauna Entomol Scand* Volume 44, Brill, Leiden, Netherlands, Pp. 409–416.
- Dahl C, Wold S, Nielsen LT, Nilsson C. 1984. A SIMCA pattern recognition study in taxonomy: claw shape in mosquitoes (Culicidae, Insecta). *Syst Biol* 33: 355–369.
- Darsie RF Jr. 1957. Notes on American mosquito pupae II. The *Aedes (Ochlerotatus) punctor* Subgroup, with key to known Nearctic *Aedes* pupae (Diptera, Culicidae). *Ann Entomol Soc Amer* 50:611–620.
- Darsie RF Jr, Courtney GW, Pradhan SP. 1996. Notes on the mosquitoes of Nepal IV. Results of the 1994 collecting in the Midwestern region, including new country records and voucher confirmation (Diptera, Culicidae). *J Amer Mosq Control Assoc* 12:130–134.
- Darsie RF Jr, Ward RA. 2005. *Identification and geographical distribution of the mosquitoes of North America, north of Mexico*. Gainesville, FL: Univ. Press of Florida.
- de Meillon B. 1931. Illustrated keys to the full-grown larvae and adults of South African anopheline mosquitoes. *Pub South African Inst Med Res* 4:275–375.
- de Meillon B. 1934. Entomological studies—observations on *Anopheles funestus* and *Anopheles gambiae* in the Transvaal. *Pub South African Inst Med Res* 6:199–248.
- de Meillon B. 1947. The Anophelini of the Ethiopian geographical region. *Pub South African Inst Med Res* 10:1–272.
- Dickson SL, Blackmore MS. 2022. AMCA Memorial Lecture Honoring Lewis T. Nielsen, PhD. *J Amer Mosq Control Assoc* 38:299–300.
- Drew LW. 2011. Are we losing the science of taxonomy? As need grows, numbers and training are failing to keep up. *BioScience* 61:942–946.
- Duret JP. 1950. Contribución al conocimiento de la distribución geográfica de los culicidos argentinos (Diptera: Culicidae). *Rev San Militar Arg* 49:363–380.
- Duret JP. 1953. Las especies argentinas de *Culex (Melanoconion) (Diptera-Culicidae)*. 2a. parte. *Rev Soc Entomol Arg* 16:99–121.
- Duret JP. 1971. Cinco especies nuevas de culicidos neotropicales (Diptera-Culicidae). *Neotropica* 17:15–28.
- Edman JD. 1971. Host-feeding patterns of Florida mosquitoes I. *Aedes*, *Anopheles*, *Coquillettidia*, *Mansonia* and *Psorophora*. *J Med Entomol* 8:687–695.
- Edman JD, Eldridge BF, eds. 2000. *Medical entomology: a textbook on public health and veterinary problems caused by arthropods*. Dordrecht, the Netherlands: Kluwer Academic Publishers.
- Edman JD, Taylor DJ. 1968. *Culex nigripalpus*: seasonal shift in the bird-mammal feeding ratio in a mosquito vector of human encephalitis. *Science* 161:67–68.
- Eisen L, Bolling BG, Blair CD, Beaty BJ, Moore CG. 2008. Mosquito species richness, composition, and abundance along habitat-climate-elevation gradients in the northern Colorado Front Range. *J Med Entomol* 45:800–811.
- Eldridge BF. 1966. Environmental control of ovarian development in mosquitoes of the *Culex pipiens* complex. *Science* 151:826–828.
- Eldridge BF. 1990. Evolutionary relationships among California serogroup viruses (Bunyaviridae) and *Aedes* mosquitoes (Diptera: Culicidae). *J Med Entomol* 27:738–749.
- Eldridge BF. 1995. Allan Ralph Barr memorial issue. *J Amer Mosq Control Assoc* 15:91.
- Eldridge BF, Bailey CL, Johnson MD. 1972. A preliminary study of the seasonal geographic distribution and overwintering of *Culex restuans* Theobald and *Culex salinarius* Coquillett (Diptera: Culicidae). *J Med Entomol* 9:233–238.
- Eldridge BF, Zavortink TJ. 1996. Allen Ralph Barr 1926–1995. *J Amer Mosq Control Assoc* 12:150–151.
- Emerson KJ, Conn JE, Bergo ES, Randel MA, Sallum MAM. 2015. Brazilian *Anopheles darlingi* Root (Diptera: Culicidae) clusters by major biogeographical region. *PLoS ONE* 10:e0130773.
- Engel MS, Ceriaco LMP, Daniel GM, Dellapé PM, Löbl I, Marinov M, Reis RE, Young MT, Dubois A, Agarwal I, Lehmann AP, Alvarado M, Alvarez N, Andreone F,



- Araujo-Vieira K, Ascher JS, Baêta D, Baldo D, Bandeira SA, Barden P, Barrasso DA, Bendifallah L, Bockmann FA, Böhme W, Borkent A, Brandão CRF, Busack SD, Bybee SM, Channing A, Chatzimanolis S, Christenhusz MJM, Crisci JV, D'êlia G, Da Costa LM, Davis SR, De Lucena CAS, Deuve T, Fernandes Elizalde S, Faivovich J, Farooq H, Ferguson AW, Gippoliti S, Gonçalves FMP, Gonzalez VH, Greenbaum E, Hinojosa-Díaz IA, Ineich I, Jiang J, Kahono S, Kury AB, Lucinda PHF, Lynch JD, Malécot V, Marques MP, Marriss JWM, Mckellar RC, Mendes LF, Nihei SS, Nishikawa K, Ohler A, Orrico VGD, Ota H, Paiva J, Parrinha D, Pauwels OSG, Pereyra MO, Pestana LB, Pinheiro PDP, Prendini L, Prokop J, Rasmussen C, Rödel M-O, Rodrigues MT, Rodríguez SM, Salatnaya H, Sampaio I, Sánchez-García A, Shebl MA, Santos BS, Solórzano-Kraemer MM, Sousa ACA, Stoev P, Teta P, Trape J-F, Dos Santos CVD, Vasudevan K, Vink CJ, Vogel G, Wagner P, Wappler T, Ware JL, Wedmann S, Zacharie CK. 2021. The taxonomic impediment: a shortage of taxonomists, not the lack of technical approaches. *Zool J Linn Soc* 193:381–387.
- Eritja R, Arrondo I, Delacour S, Schaffner F, Álvarez-Chachero J, Bengoa M, Puig M, Melero-Alcibar R, Oltra A, Bartumeus F. 2019. First detection of *Aedes japonicus* in Spain: an unexpected finding triggered by citizen science. *Parasit Vectors* 12:53.
- Evenhuis NL. 2020. Authors of Fly Names. *A list of all authors who have proposed Diptera names at the family-level or below*. 3rd ed. Bishop Mus Tech Rep No. 70. Bishop Museum, Honolulu.
- Flint OS Jr. 1980. *Report number 5. Medical Entomology Project annual report*. US Army Medical Research and Development Command Report Number ADA086256.
- Forattini OP. 1962–1973. *Entomologia médica*. Volumes 1–4. São Paulo, Brazil: Univ. de São Paulo.
- Forattini OP, Gomes ADC. 1988. Biting activity of *Aedes scapularis* (Rondani) and *Haemagogus* mosquitoes in southern Brazil (Diptera: Culicidae). *Rev Saúde Públ* 22:84–93.
- Forattini OP, Gomes ADC, Natal D, Santos JLF. 1986. Observations on mosquito activity in primitive rain forests on plains, and epidemiological profiles for several environments in the Ribeira Valley, S. Paulo, Brazil. *Rev Saúde Públ* 20:178–203.
- Gagné RJ. 1999. Obituary. Alan Stone. 1904–1999. *Proc Entomol Soc Washington* 101:911–913.
- Galindo P, Blanton FS, Peyton EL. 1954. A revision of the *Uranotaenia* of Panama with notes on other American species of the genus (Diptera, Culicidae). *Ann Entomol Soc Amer* 47:107–177.
- Galindo P, Carpenter SJ, Trapido H. 1951. Ecological observations on forest mosquitoes of an endemic yellow fever area in Panama. *Amer J Trop Med* 31:98–137.
- Gardner CF, Nielsen LT, Knight KL. 1973. Morphology of the mouthparts of larval *Aedes communis* (DeGeer): (Diptera: Culicidae). *Mosq Syst* 5:163–182.
- Garvey KK. 2025. *Legendary Medical Entomologist Bruce Eldridge Dies at 91*. University of California, Davis [accessed February 25, 2025]. Available at: <https://entomology.ucdavis.edu/news/uc-davis-medical-entomologist-bruce-eldridge-dies-91>
- Gerberg EJ. 1980a. Obituary. John N. Belkin 1914–1980. *Mosq Syst* 12:280–281.
- Gerberg EJ. 1980b. Obituary. John N. Belkin 1914–1980. *Mosq News* 40:478.
- Gillies MT, Coetzee M. 1987. A supplement to the Anophelinae of Africa south of the Sahara (Afrotropical Region). *Pub South African Inst Med Res* No. 55.
- Glaser V. 2009. An interview with Graham White, Ph.D. *Vector-Borne Zoon Dis* 9:755–758.
- Harbach RE. 1993. John N. Belkin Memorial Award. *Mosq Syst* 25:148–149.
- Harbach RE. 2003. Mosquito systematics; from organisms to molecules—a tribute to Kenneth L. Knight. *J Amer Mosq Control Assoc* 19:452–460.
- Harbach RE. 2018. *Culiclopedia: Species-group, genus-group and family-group names in Culicidae (Diptera)*. Wallingford, Oxfordshire, UK: CABI.
- Harbach RE. 2024. *Composition and Nature of the Culicidae (Mosquitoes)*. Wallingford, Oxfordshire, UK: CABI.
- Harbach RE, Gaffigan TW, Pecor JE. 1990. The J. Pedro Duret mosquito collection. *Mosq Syst* 22:192–195.
- Harbach RE, Kitching IJ. 2005. Reconsideration of anopheline mosquito phylogeny (Diptera: Culicidae: Anophelinae) based on morphological data. *Syst Biodiv* 3:345–374.
- Harbach RE, Knight KL. 1980. *Taxonomists' glossary of mosquito anatomy*. Marlton, NJ: Plexus.
- Harbach RE, Peyton EL. 1993. Morphology and evolution of the larval maxilla and its importance in the classification of the Sabethini (Diptera: Culicidae). *Mosq Syst* 25:1–16.
- Harbach RE, Peyton EL. 2000. Systematics of *Onirion*, a new genus of Sabethini (Diptera: Culicidae) from the Neotropical Region. *Bull Nat Hist Mus Entomol Ser* 69:115–170.
- Harbach RE, Wilkerson RC. 2023. The insupportable validity of mosquito subspecies (Diptera: Culicidae) and their exclusion from culicid classification. *Zootaxa* 5303:1–184.
- Harrison BA. 1980. Medical entomology studies—XIII. The *Myzomyia* series of *Anopheles (Cellia)* in Thailand, with emphasis on intra-interspecific variations (Diptera: Culicidae). *Contrib Amer Entomol Inst* 17:1–195.
- Harrison BA, Rattanarithikul R, Peyton EL, Mongkolpanya K. 1990. Taxonomic changes, revised occurrence records and notes on the Culicidae of Thailand and neighboring countries. *Mosq Syst* 22:196–227.
- Harrison BA, Scanlon JE. 1975. Medical entomology studies—II. The subgenus *Anopheles* in Thailand (Diptera: Culicidae). *Contrib Amer Entomol Inst* 12:1–307.
- Heinemann SJ, Bryce GK. 1980. John N. Belkin—Bibliography. *Mosq Syst* 12:285–289.
- Huang Y-M. 1981. A redescription of *Aedes (Stegomyia) calceatus* Edwards and description of a new Afrotropical species, *Aedes (Stegomyia) ledgeri* (Diptera: Culicidae). *Mosq Syst* 13:92–113.
- Huang Y-M. 1986. Notes on the *Aedes (Diceromyia) furcifer* group, with a description of a new species (Diptera: Culicidae). *Proc Entomol Soc Washington* 88:634–649.
- Huang Y-M. 2004. The subgenus *Stegomyia* of *Aedes* in the Afrotropical Region with keys to the species (Diptera: Culicidae). *Zootaxa* 700:1–120.
- Hunt RH, Coetzee M, Fettene M. 1998. The *Anopheles gambiae* complex: a new species from Ethiopia. *Trans Royal Soc Trop Med Hyg* 92:231–235.
- Jenkins DW, Carpenter SJ. 1946. Ecology of the tree hole breeding mosquitoes of Nearctic North America. *Ecol Monogr* 16:31–47.
- Juliano SA, Yee DA, Alto BW, Reiskind MH. 2019. Papers from a workshop on mosquito ecology and evolution inspired by the career of L. Philip Lounibos. *J Med Entomol* 56: 299–302.
- Kitzmiller JB. 1958. X-ray induced mutation in the mosquito, *Culex fatigans*. *Exper Parasitol* 7:439–462.
- Kitzmiller JB. 1963. Mosquito cytogenetics. A review of the literature 1953–62. *Bull WHO* 29:345–355.
- Kitzmiller JB. 1976. Genetics, cytogenetics, and evolution of mosquitoes. *Adv Genet* 18:315–433.

- Kitzmiller JB. 1982. Anopheline names: their derivations and histories. The Thomas Say Foundation. Volume VIII. College Park, MD: Entomological Society of America.
- Knight KL, Marks EN. 1951. An annotated checklist of the mosquitoes of the subgenus *Finlaya* (genus *Aedes*). *Proc US Nat Mus* 101:513–574.
- Knight KL, Stone A. 1977. *A catalog of the mosquitoes of the world (Diptera: Culicidae)*. 2nd ed. Thomas Say Foundation. Volume VI. College Park, MD: Entomological Society of America.
- Linthicum KJ. 1988. A revision of the Argyritarsis Section of the subgenus *Nyssorhynchus* of *Anopheles*. *Mosq Syst* 20:101–271.
- Linthicum KJ, Bailey CL, Davies FG, Tucker CJ. 1987. Detection of Rift Valley Fever viral activity in Kenya by satellite remote-sensing imagery. *Science* 235:1656–1659.
- Linthicum KJ, Davies FG, Bailey CL, Kairo A. 1984. Mosquito species encountered in a flooded grassland dambo in Kenya. *Mosq News* 44:228–232.
- Lounibos LP. 1981. Habitat segregation among African treehole mosquitoes. *Ecol Entomol* 6:129–154.
- Lounibos LP. 2004. Genetic control trials and the ecology of *Aedes aegypti* at the Kenya coast. In: Takken W, Scott TW, eds. *Ecological aspects for application of genetically modified mosquitoes*. Wageningen UR Frontis Series Volume 2. Dordrecht, the Netherlands: Kluwer Academic Publishers. p. 33–46.
- Lounibos LP, O'Meara GF, Escher RL, Nishimura N, Cutwa M, Nelson T, Campos RE, Juliano SA. 2001. Testing predictions of displacement of native *Aedes* by the invasive Asian tiger mosquito *Aedes albopictus* in Florida, USA. *Biol Invas* 3:151–166.
- Lounibos LP, Rey JR, Frank JH, eds. 1985. *Ecology of mosquitoes: proceedings of a workshop*. Vero Beach FL: Florida Medical Entomology Laboratory.
- Marks EN. 1947. Studies of Queensland mosquitoes. Part I.: The *Aedes* (*Finlaya*) *kochi* group with descriptions of new species from Queensland, Bougainville and Fiji. *Univ Queensland Pap Depart Biol* 2: 1–66.
- Marks EN. 1957. The subgenus *Ochlerotatus* in the Australian Region (Diptera: Culicidae). II. Five new species from Western Australia. *Univ Queensland Pap Depart Entomol* 1: 111–134.
- Marks EN, Cummings KC. 2004. Mosquitoes and memories: recollections of 'Patricia' Marks. K.C. Cummings, Wights Mountain, Queensland, Australia.
- Mattingly PF. 1957. Genetical aspects of the *Aedes aegypti* problem: I.—Taxonomy and bionomics. *Ann Trop Med Parasitol* 51:392–408.
- Mattingly PF. 1958. Genetical aspects of the *Aedes aegypti* Problem: II.—Disease relationships, genetics and control. *Ann Trop Med Parasitol* 52:5–17.
- Mattingly PF. 1965. The culicine Mosquitoes of the Indo-malayan area. Part 6: Genus *Aedes* Meigen, subgenus *Stegomyia* Theobald (groups A, B and D). London, UK: British Museum (Natural History).
- Mattingly PF. 1969. Mosquito eggs III. Tribe Anophelini. *Mosq Syst News* 1:41–50.
- Mattingly PF. 1981. Medical entomology studies—XIV. The subgenera *Rachionotomyia*, *Tricholeptomysia* and *Tripteroides* (Mabini Group) of genus *Tripteroides* in the Oriental Region (Diptera: Culicidae). *Contrib Amer Entomol Inst* 17:1–147.
- Mattingly PF. 1983. The palaeogeography of mosquito-borne disease. *Biol J Linn Soc* 19:185–210.
- Mattingly PF, Brown ES. 1955. The mosquitos (Diptera: Culicidae) of the Seychelles. *Bull Entomol Res* 46:69–110.
- Merz C, Catchen JM, Hanson-Smith V, Emerson KJ, Bradshaw WE, Holzapfel CM. 2013. Replicate phylogenies and post-glacial range expansion of the pitcher-plant mosquito, *Wyeomyia smithii*, in North America. *PLoS ONE* 8:e72262.
- Mogi M. 2024. Kazuo Tanaka 1928–2024. *J Amer Mosq Control Assoc* 40:209–210.
- Moore CG. 1999. *Aedes albopictus* in the United States: current status and prospects for further spread. *J Amer Mosq Control Assoc* 15:221–227.
- Moore CG, Fisher BR. 1969. Competition in mosquitoes. Density and species ratio effects on growth, mortality, fecundity, and production of growth retardant. *Ann Entomol Soc Amer* 62:1325–1331.
- Moore CG, Francy DB, Eliason DA, Bailey RE, Campos EG. 1990. *Aedes albopictus* and other container-inhabiting mosquitoes in the United States: results of an eight-city survey. *J Amer Mosq Control Assoc* 6:173–178.
- Moore CG, Marfin AA, Mitchell CJ, McLean RG, Calisher CH, Tsai TF, Gubler DJ, Moore PS. 1993. *Guidelines for arbovirus surveillance programs in the United States*. Ft. Collins, CO: CDC.
- Nielsen LT. 1957. Notes on the flight ranges of Rocky Mountain mosquitoes of the genus *Aedes*. *Proc Utah Acad Sci, Arts Lett* 34:27–29.
- Nielsen LT. 1985. Obituary. Stanley Jennings Carpenter. *J Amer Mosq Control Assoc* 1:113–114.
- Nielsen LT. 1980. The current status of mosquito systematics. *Mosq Syst* 12:1–6.
- Nielsen LT, Rees DM. 1961. An identification guide to the mosquitoes of Utah. Univ Utah Biol Ser Volume 12, Number 3. Salt Lake City, UT: Univ. of Utah.
- Novak RJ. 2021. In Memoriam. Daniel A. Strickman 1953–2020. *J Vector Ecol* 46:1.
- O'Meara GF, Evans DG. 1973. Blood-feeding requirements of the mosquito; geographical variation in *Aedes taeniorhynchus*. *Science* 180:1291–1293.
- O'Meara GF, Evans DG. 1977. Autogeny in salt marsh mosquitoes induced by a substance from the male accessory gland. *Nature* 267:342–344.
- O'Meara GF, Evans LF Jr, Gettman AD, Cuda JP. 1995. Spread of *Aedes albopictus* and decline of *Ae. aegypti* (Diptera: Culicidae) in Florida. *J Med Entomol* 32:554–562.
- Osawa T, Yoshimatsu S, Nakatani Y. 2020. Specimen-based records and geographic locations of carabid beetles (Coleoptera) collected mainly by Dr. Kazuo Tanaka. *Ecol Res* 35:1029–1034.
- Peyton EL. 1989. A new classification for the Leucosphyrus Group of *Anopheles* (*Cellia*). *Mosq Syst* 21:197–205.
- Peyton EL, Pecor JE, Gaffigan TV, Trpis M, Rueda LM, Wilkerson RC. 1999. The Johns Hopkins University School of Hygiene and Public Health, Lloyd E. Rozeboom mosquito collection. *J Amer Mosq Control Assoc* 15:526–551.
- Peyton EL, Wilkerson RC, Harbach RE. 1992. Comparative analysis of the subgenera *Kerteszia* and *Nyssorhynchus* of *Anopheles* (Diptera: Culicidae). *Mosq Syst* 24:51–69.
- Rattanaarithikul R. 1982. A guide to the genera of mosquitoes (Diptera: Culicidae) of Thailand with illustrated keys, biological notes and preservation and mounting techniques. *Mosq Syst* 14:139–208.
- Rattanaarithikul R, Harrison BA. 1988. *Aedes* (*Finlaya*) *reinerti*, a new species from northern Thailand related to *Aedes* (*Finlaya*) *formosensis* Yamada (Diptera: Culicidae). *Mosq Syst* 20:77–96.
- Rattanaarithikul R, Harrison BA, Panthusiri P, Peyton EL, Coleman RE. 2006. Illustrated keys to the mosquitoes of Thailand III. Genera *Aedeomyia*, *Ficalbia*, *Mimomyia*,

- Hodgesia*, *Coquillettidia*, *Mansonia*, and *Uranotaenia*. *SE Asian J Trop Med Public Health* 37(S1):1–85.
- Reid JA. 1953. The *Anopheles hyrcanus* group in South-East Asia (Diptera: Culicidae). *Bull Entomol Res* 44:5–76.
- Reid JA. 1962. The *Anopheles barbirostris* group (Diptera, Culicidae). *Bull Entomol Res* 53:1–57.
- Reid JA. 1968. Anopheline mosquitoes of Malaya and Borneo. Studies from the Institute for Medical Research, Malaysia. No. 31.
- Reid JA, Knight KL. 1961. Classification within the subgenus *Anopheles* (Diptera, Culicidae). *Ann Trop Med Parasitol* 55:474–488.
- Reis JG, Kobayashi KM, Ueno HM, Ribeiro CM, Cardoso TA. 2016. Contribution of Oswaldo Paulo Forattini to public health: analysis of scientific production. *Rev Saude Publ* 50:73.
- Reinert JF. 1970. Contributions to the mosquito fauna of Southeast Asia. V. Genus *Aedes*, Subgenus *Diceromyia* Theobald in Southeast Asia. *Contrib Amer Entomol Inst* 5:1–43.
- Reinert JF. 1973. Contributions to the mosquito fauna of Southeast Asia.—XVIII. A reconsideration of *Diceromyia* Theobald with the inclusion of *Aedes nummatus* Edwards and *Aedes pseudonummatus* new species (Diptera: Culicidae). *Contrib Amer Entomol Inst* 10:22–40.
- Reinert JF. 1993. Redescription of *Molpemyia*, and its reevaluation as a subgenus of *Aedes* (Diptera: Culicidae). *Mosq Syst* 25:41–63.
- Reinert JF. 2000. New classification for the composite genus *Aedes* (Diptera: Culicidae: Aedini), elevation of subgenus *Ochlerotatus* to generic rank, reclassification of the other subgenera, and notes on certain subgenera and species. *J Amer Mosq Control Assoc* 16:175–188.
- Reisen WK. 2010. Landscape epidemiology of vector-borne diseases. *Annu Rev Entomol* 55:461–483.
- Reinert JF, Harbach RE, Kitching IJ. 2009. Phylogeny and classification of tribe Aedini (Diptera: Culicidae). *Zool J Linn Soc* 157:700–794.
- Reinert JF, Kaiser PE, Seawright JA. 1997. Analysis of the *Anopheles* (*Anopheles*) *quadrimaculatus* complex of sibling species (Diptera: Culicidae) using morphological, cytological, molecular, genetic, biochemical, and ecological techniques in an integrated approach. *J Amer Mosq Control Assoc* 13:1–102.
- Reisen WK, Milby MM. 1986. Population dynamics of some Pakistan mosquitoes: changes in adult relative abundance over time and space. *Ann Trop Med Parasitol* 80:53–68.
- Reisen WK, Milby MM, Presser SB, Hardy JL. 1992. Ecology of mosquitoes and St. Louis encephalitis virus in the Los Angeles Basin of California, 1987–1990. *J Med Entomol* 29:582–598.
- Roberts DR, Peyton EL, Pinheiro FDP, Balderrama F, Vargas R. 1984. Associations of arbovirus vectors with gallery forests and domestic environments in southeastern Bolivia. *Bull PAHO* 18:337–350.
- Rozeboom LE. 1942. Mosquitoes of Oklahoma. Oklahoma Agric Mech Coll Agric Exper Sta Tech Bull No. T-16.
- Rozeboom LE. 1947. The identity of the *Phlebotomus* associated with bartonellosis in Colombia. *Ann. Entomol Soc Amer* 40:705–714.
- Rozeboom LE, Komp WH. 1950. A review of the species of *Culex* of the subgenus *Melanoconion* (Diptera, Culicidae). *Ann Entomol Soc Amer* 43:75–114.
- Russell PF, Rozeboom LE, Stone A. 1943. *Keys to the anopheline mosquitoes of the world*. Philadelphia, PA: American Entomological Society and Academy of Natural Sciences.
- Sallum MAM, Gonzalez Obando R, Carrejo N, Wilkerson RC. 2020a. Identification keys to the *Anopheles* mosquitoes of South America (Diptera: Culicidae). III. Male genitalia. *Parasit Vectors* 13:542.
- Sallum MAM, Gonzalez Obando R, Carrejo N, Wilkerson RC. 2020b. Identification keys to the *Anopheles* mosquitoes of South America (Diptera: Culicidae). I. Introduction. *Parasit Vectors* 13:583.
- Sallum MAM, Harbach RE, Harrison BA. 2007a. Obituary. Professor Oswaldo Paulo Forattini. *Rev Bras Entomol* 51:532–533.
- Sallum MAM, Harbach RE, Harrison BA. 2007b. El hombre y la ciencia. Oswaldo Paulo Forattini. *Bol Malaria Salud Amb* 47:257–258.
- Sallum MAM, Marrelli MT, Nagaki SS, Laporta GZ, Santos CD. 2008. Insight into *Anopheles* (*Nyssorhynchus*) (Diptera: Culicidae) species from Brazil. *J Med Entomol* 45:970–981.
- Sallum MAM, Obando RG, Carrejo N, Wilkerson RC. 2020c. Identification keys to the *Anopheles* mosquitoes of South America (Diptera: Culicidae). II. Fourth-instar larvae. *Parasit Vectors* 13:582.
- Sallum MAM, Obando RG, Carrejo N, Wilkerson RC. 2020d. Identification keys to the *Anopheles* mosquitoes of South America (Diptera: Culicidae). IV. Adult females. *Parasit Vectors* 13:584.
- Sallum MAM, Peyton EL, Harrison BA, Wilkerson RC. 2005. Revision of the Leucosphyrus group of *Anopheles* (*Cellia*) (Diptera, Culicidae). *Rev Bras Entomol* 49:1–152.
- Schaffner F, Mathieu B. 2020. Identifier un moustique: morphologie classique et nouvelles techniques moléculaires associées pour une taxonomie intégrée. *Rev Francophone Lab* 524:24–33.
- Schenkel C, Kamber T, Schaffner F, Mathis A, Silaghi C. 2019. Loop-mediated isothermal amplification (LAMP) for the identification of invasive *Aedes* mosquito species. *Med Vet Entomol* 33:345–351.
- Service MW. 1963. The ecology of the mosquitos of the Northern Guinea Savannah of Nigeria. *Bull Entomol Res* 54:601–632.
- Service MW. 1965. The ecology of the tree-hole breeding mosquitoes in the northern Guinea savanna of Nigeria. *J Appl Ecol* 2:1–16.
- Service MW. 1976. *Mosquito ecology: field sampling methods*. 2nd ed. London, UK: Elsevier Applied Science.
- Service MW. 1990. *Handbook to the Afrotropical toxorhynchitine and culicine mosquitoes, excepting Aedes and Culex*. London, UK: British Museum (Natural History).
- Service MW. 1994. Obituary. Peter Frederick Mattingly (1914–1993). *Antenna* 18:54–57.
- Service MW. 1996. *Medical entomology for students*. London, UK: Chapman & Hall.
- Service MW. 2010a. Sequel to Kitzmiller's anopheline names: their derivations and histories. *J Vector Ecol* 35:213–266.
- Service MW. 2010b. The making of a medical entomologist. *Annu Rev Entomol* 55:1–17.
- Simpson GG. 1945. The principles of classification and a classification of mammals. *Bull Amer Mus Nat Hist* 85:1–350.
- Standfast HA. 2006. Dr. Elizabeth N. Marks AO: Mosquito studies 1940–1976. *Austral Entomol* 33:179–186.
- Stone A, Barreto P. 1969. A new genus and species of mosquito from Colombia, *Galindomyia leei* (Diptera, Culicidae, Culicini). *J Med Entomol* 6:143–146.
- Strickman D. 1989. Biosystematics of larval movement of Central American mosquitoes and its use for field identification. *J Amer Mosq Control Assoc* 5:208–218.
- Strickman DA, Pratt J. 1989. Redescription of *Cx. corniger* Theobald and elevation of *Culex* (*Culex*) *lactator* Dyar and Knab from synonymy based on specimens from



- Central America (Diptera: Culicidae). *Proc Entomol Soc Washington* 91:551–574.
- Strickman D, Kittayapong P. 2003. Dengue and its vectors in Thailand: calculated transmission risk from total pupal counts of *Aedes aegypti* and association of wing-length measurements with aspects of the larval habitat. *Amer J Trop Med Hyg* 68:209–217.
- Strickman D, Sithiprasasna R, Southard D. 1997. Bionomics of the spider, *Crossopriza lyoni* (Araneae, Pholcidae), a predator of dengue vectors in Thailand. *J Arachnol* 25:194–201.
- Sweeny TL, Barr AR. 1978. Sex ratio distortion caused by meiotic drive in a mosquito, *Culex pipiens* L. *Genetics* 88:427–446.
- Tanaka K. 2003. Studies on the pupal mosquitoes of Japan (9). Genus *Lutzia*, with establishment of two new subgenera, *Metalutzia* and *Insulalutzia* (Diptera, Culicidae). *Japan J Syst Entomol* 9:159–169.
- Tanaka K, Mizusawa K, Saugstad EB. 1979. A revision of the adult and larval mosquitoes of Japan (including the Ryukyu Archipelago and Ogasawara Islands) and Korea (Diptera: Culicidae). *Contrib Amer Entomol Inst* 16:1–987.
- Tanaka K, Saugstad EB, Mizusawa K. 1975. Mosquitoes of the Ryukyu Archipelago (Diptera: Culicidae). *Mosq Syst* 7:207–233.
- Tikasingh ES. 2007. Dr. Thomas Henry Gardiner Aitken (1912–2007) (Entomologist and Naturalist). *Living World, J Trinidad Tobago Field Natur Club* 2007:vi–vii.
- Troyo A, González-Sequeira MP, Aguirre-Salazar M, Cambronero-Ortiz I, Chaves-González LE, Mejías-Alpizar MJ, Alvarado-Molina K, Calderón-Arguedas Ó, Rojas-Araya D. 2022. Acknowledging extraordinary women in the history of medical entomology. *Parasit Vectors* 15:114.
- Vinogradova EB. 1969. *Diapause in blood-sucking mosquitoes and its control*. Leningrad, USSR: Nauka [St. Petersburg, Russia].
- Vinogradova EB. 1984. [The blowfly, *Calliphora vicina* as a model object for the ecological and physiological studies.] *Trud Zool Inst Akad Nauk SSSR* 118:1–272.
- Vinogradova EB. 1991. [Diapause in flies and its control.] *Trud Zool Inst Akad Nauk SSSR* 214:1–254.
- Vinogradova EB. 1997. [Mosquitoes of the *Culex pipiens* complex in Russia (the distribution, taxonomy, ecology, physiology, genetics, applied significance and the control)]. *Trud Zool Inst Akad Nauk SSSR* 271:1–307.
- Vinogradova EB. 2000. *Culex pipiens pipiens mosquitoes: taxonomy, distribution, ecology, physiology, genetics, applied importance and control*. Sofia, Bulgaria: Pensoft.
- Vinogradova EB. 2003. Ecophysiological and morphological variations in mosquitoes of the *Culex pipiens* complex (Diptera: Culicidae). *Acta Societ Zool Bohem* 67:41–50.
- Vinogradova EB, Ivshina EV, Shaikevich EV. 2013. A study of the mosquito *Culex pipiens* (Diptera, Culicidae) population structure in the Transcaucasia using molecular identification methods. *Entomol Rev* 93:14–18.
- Vinogradova EB, Shaikevich EV. 2005. Differentiation between the urban mosquito *Culex pipiens pipiens* f. *molestus* and *Culex torrentium* (Diptera, Culicidae) by molecular genetic methods. *Parazitologia* 39:574–576.
- Vinogradova EB, Shaikevich EV. 2007. Morphometric, physiological and molecular characteristics of underground populations of the urban mosquito *Culex pipiens* Linnaeus f. *molestus* Forskål (Diptera: Culicidae) from several areas of Russia. *Eur Mosq Bull* 22:17–24.
- Walker ED, Edman JD. 1985. The influence of host defensive behavior on mosquito (Diptera: Culicidae) biting persistence. *J Med Entomol* 22:370–372.
- Ward RA. 1963. Genetic aspects of the susceptibility of mosquitoes to malarial infection. *Exper Parasitol* 13:328–341.
- Ward RA. 1966. Further studies on the genetic aspects of the infection of *Aedes aegypti* with *Plasmodium gallinaceum*. *Mil Med* 131(Suppl. 9):923–928.
- Ward RA, Harbach RE. 2000. Obituary. EL. Peyton, 1929–1999. *J Amer Mosq Control Assoc* 16:48–51.
- Ward RA, Rutledge LC, Hickman RL. 1969. Cyclical transmission of *Chesson vivax* malaria in subhuman primates. *Nature* 224:1126–1127.
- White GB. 1973. Comparative studies on sibling species of the *Anopheles gambiae* Giles complex (Dipt., Culicidae). III. The distribution, ecology, behaviour and vectorial importance of species D in Bwamba County, Uganda, with an analysis of biological, ecological, morphological and cytogenetical relationships of Ugandan species D. *Bull Entomol Res* 63:65–97.
- White GB. 1974. *Anopheles gambiae* complex and disease transmission in Africa. *Trans Royal Soc Trop Med Hyg* 68:278–298.
- White GB. 1978. Systematic reappraisal of the *Anopheles maculipennis* complex. *Mosq Syst* 10:13–44.
- Wilkerson RC, Linton Y-M, Fonseca DM, Schultz TR, Price DC, Strickman DA. 2015. Making mosquito taxonomy useful: a stable classification of tribe Aedini that balances utility with current knowledge of evolutionary relationships. *PloS ONE* 10:p.e0133602.
- Wilkerson RC, Linton Y-M, Strickman D. 2021. *Mosquitoes of the world*. 2 volumes. Baltimore, MD: Johns Hopkins Univ. Press.
- Wilkerson RC, Peyton EL. 1990. Standardized nomenclature for the costal wing spots of the genus *Anopheles* and other spotted-wing mosquitoes (Diptera: Culicidae). *J Med Entomol* 27:207–224.
- Wilson ML, Chapman LE, Hall DB, Dykstra EA, Ba K, Zeller HG, Traore-Lamizana M, Hervy J-P, Linthicum KJ, Peters CJ. 1994. Rift Valley fever in rural northern Senegal: human risk factors and potential vectors. *Amer J Trop Med Hyg* 50:663–675.
- Wolff TA, Nielsen LT. 1977. A chaetotaxic study of snow-pool *Aedes* larvae and pupae with an analysis of variance of the larvae of eight species. *Mosq Syst* 9:177–236.
- Wolff TA, Nielsen LT. 2007. *The mosquitoes of New Mexico*. Albuquerque: Univ. of New Mexico Press.
- Woodall J. 2007. *Thomas H.G. Aitken (1913–2007)*. Essig Museum of Entomology People [accessed February 25, 2025]. Available at: [https://essigdb.berkeley.edu/cgi/eme\\_people\\_query?name\\_full=Thomas+H.G.+Aitken&one=T](https://essigdb.berkeley.edu/cgi/eme_people_query?name_full=Thomas+H.G.+Aitken&one=T)
- Yoshimatsu S, Ito N, Nakatani Y, Yoshitake H. 2018. A list of ground beetles (Insecta: Coleoptera: Caraboidea) in Dr. Kazuo Tanaka Collection preserved in the Insect Museum of Institute for Agro-Environmental Sciences, NARO. *Bull NARO, Agro-Environ Sci* 39:15–192.
- Zavortink TJ. 1968. Mosquito studies. VIII. A prodrome of the genus *Orthopodomyia*. *Contrib Amer Entomol Inst* 3:1–223.
- Zavortink TJ. 1969. Mosquito studies. XIX. The treehole anophelines of the New World. *Contrib Amer Entomol Inst* 5:1–35.
- Zavortink TJ. 1971. The genus *Orthopodomyia* Theobald in Southeast Asia. *Contrib Amer Entomol Inst* 7:1–37.
- Zavortink TJ. 1979. The new sabethine genus *Johnbelkinia* and a preliminary reclassification of the composite genus *Trichoprosopon*. *Contrib Amer Entomol Inst* 19:1–61.
- Zavortink TJ. 1990. Classical taxonomy of mosquitoes—a memorial to John N. Belkin. *J Amer Mosq Control Assoc* 6:593–599.