In Memoriam
From Cotton Farming to the Congressional Gold Medal: The Career and Legacy of Ernest James Harris (1928–2018)

Our quiet gentle giant of the fruit fly community left us on February 20, 2018, just three months short of his 90th birthday. Ernie was born in Arkansas on May 24, 1928, the eldest of six siblings (Fig. 1A). He grew up in Pulaski County on a modest 45-acre family cotton farm without electricity, relying on two mules for field plowing while other tasks were performed by hand with help from all the children. Every year, Ernie had to miss school until mid-November to harvest cotton, as much as 200 pounds a day, and study at night, by candlelight, from books provided by his school principal. Even while attending school, he still collected and cut wood every day after class for the stove and fireplace. He became interested in entomology at a young age, as he was assisting his mother to implement mechanical removal of pest insects in the family vegetable garden. His escape from mundane labor tasks was to watch low-flying airplanes taking off from the nearby Robinson Army Airfield, dreaming of becoming a pilot one day. After graduating from the segregated Pulaski County Training School in May 1946, Ernie joined the U.S. Marine Corps, wishing to train as a pilot or airplane mechanic. Instead, he was sent to the equally segregated Montford Point Camp, in North Carolina, assigned to low-level menial tasks.

A few months into his assignment, as the U.S. army was reducing its enrollment, Ernie readily accepted a GI Bill to sponsor further schooling, also supporting his sister's schooling. He earned a Bachelor of Sciences at the University of Arkansas in Pine Bluff (1947–1951), majoring in chemistry and zoology, greatly inspired by his botany and zoology professor, Dr. Rufus Caine, for whom he worked to support his schooling after the two-year GI Bill had expired. Having access to the lab's equipment, Ernest developed a keen interest for photography, earning additional income photographing couples at 50 cents per shot.

Following graduation, Ernie declined an offer to teach science in Oklahoma, travelling instead on a borrowed Harley Davidson motorcycle to Milwaukee. His academic background in chemistry helped him find work in a foundry, analyzing and controlling the chemical composition of ore product, which provided enough income to buy his own motorcycle (Fig. 1B) and ride extensively throughout the Midwest. In a twist of fate, shipping his motorcycle back to Milwaukee for repair after a long trip to Little Rock forced him to travel by train instead of riding. While waiting at the train station, a former schoolmate introduced him to Ms. Betty Jo Hawkins, also traveling to Milwaukee. They were married in May 1954 and would remain life-time close partners. Soon after, Ernie got his first entomology job as assistant to U.S. Forest Service entomologist Arnold T. Drooz in Minnesota.

Academic training towards an entomology career took place in 1957–59, when he was enrolled in the graduate program of the Department of Entomology at the University of Minnesota, Saint-Paul. He completed a Master of Science degree studying the ecology of *Cryptorhynchus* weevils, while living with Betty Jo and first son Mark in housing provided to veteran students. With such credentials, he accepted a job offer by Dr. Caine, teaching science back in Pine Bluff, just one day before he was contacted for a more appealing job offer to work as forest entomologist for the State of Minnesota. The real breakthrough

opportunity finally came a few years later: a call from USDA-ARS Belstville, Maryland, regarding Dr. Loren Steiner, who would become his long-time trusted mentor, and Dr. Edward F. Knipling, looking for someone to work on fruit flies in the Mariana Islands. Ernie effectively became one of the first African-American research scientists in USDA. The young family, augmented with daughter Tanya, moved to Honolulu in February 1962 (Fig. 1C), and soon after to Guam, where he successfully implemented the first-ever eradication program against fruit flies (*Bactrocera dorsalis* and *Zeugodacus cucurbitae*), using sterile insect releases and male annihilation, under the guidance of Dr. Steiner. Their cadet son, Greg, was born during that period.

Upon his return to and permanent settlement on Oahu in 1965, Ernie carried out research on fruit fly field ecology and control, applying observation approaches taught by his mother while gardening. He also enrolled as a PhD student at the University of Hawaii at Manoa, supervised by Dr. Wallace C. Mitchell. As he wished to further contribute to the international community, the family lived two years in North Africa (1969–1971), while he served as the coordinator of the USAID-supported North Africa Regional Mediterranean Fruit Fly Suppression Program, working in Tunisia and Morocco and becoming proficient in French language, a little-known side of Ernie we were to witness in later years. Data generated in that project was used to complete his PhD thesis, graduating in 1975.

From 1972 to 1985, Ernie served as research leader of the Biology and Ecology Research Unit of the Tropical Fruit and Vegetable Research Laboratory in Honolulu. He continued his research on fruit fly ecology, focusing on studies that would establish the fundamental grounds for the ongoing Mediterranean fruit fly exclusion program in California. During that time, he developed and published (Fig. 1 in Harris et al. 1971) the prototype (Fig. 1D) of a trap later referred to as the Jackson trap. He also continued providing advisory work to international programs in Pakistan, Egypt, and especially Chile, where Mediterranean fruit fly was eradicated in 1975, allowing the export of fruit-fly-free citrus fruits to this day, an approach later adopted by Peruvians.

Starting in 1983, Ernie's research focused on developing rearing methods for the fruit fly parasitoid *Fopius arisanus*, investigating sex ratio and optimal rearing conditions to increase female offspring ratio for these very hard to rear insects. Through selection, he also developed stable laboratory strains adapted to attack Mediterranean fruit fly and melon fly. These parasitoids were eventually exported to and established in Mexico, Réunion, French Polynesia, Micronesia, and Africa.

Ernie retired in February 2006 but continued coming to work every day until the USDA-ARS Honolulu lab was closed in 2009. His published research output, over 100 papers and book chapters (see supplementary online material), continued to his last published contribution in 2016, when he was 88. Although he encountered much discrimination during his career, Ernie remained the positive, kind, gentle and humble man for which he will be fondly remembered. He is a true role model for African-American scientists. In the latter part of his career and life, he received much deserved recognition for his achievements and breakthrough in science: the USDA-ARS Certificate of Merit for transfer of research technology to the California Mediterranean fruit fly eradication program in 1983, the induction into fellowship in the Royal Entomological Society of London in 1989, an official commendation from the Chilean govern-

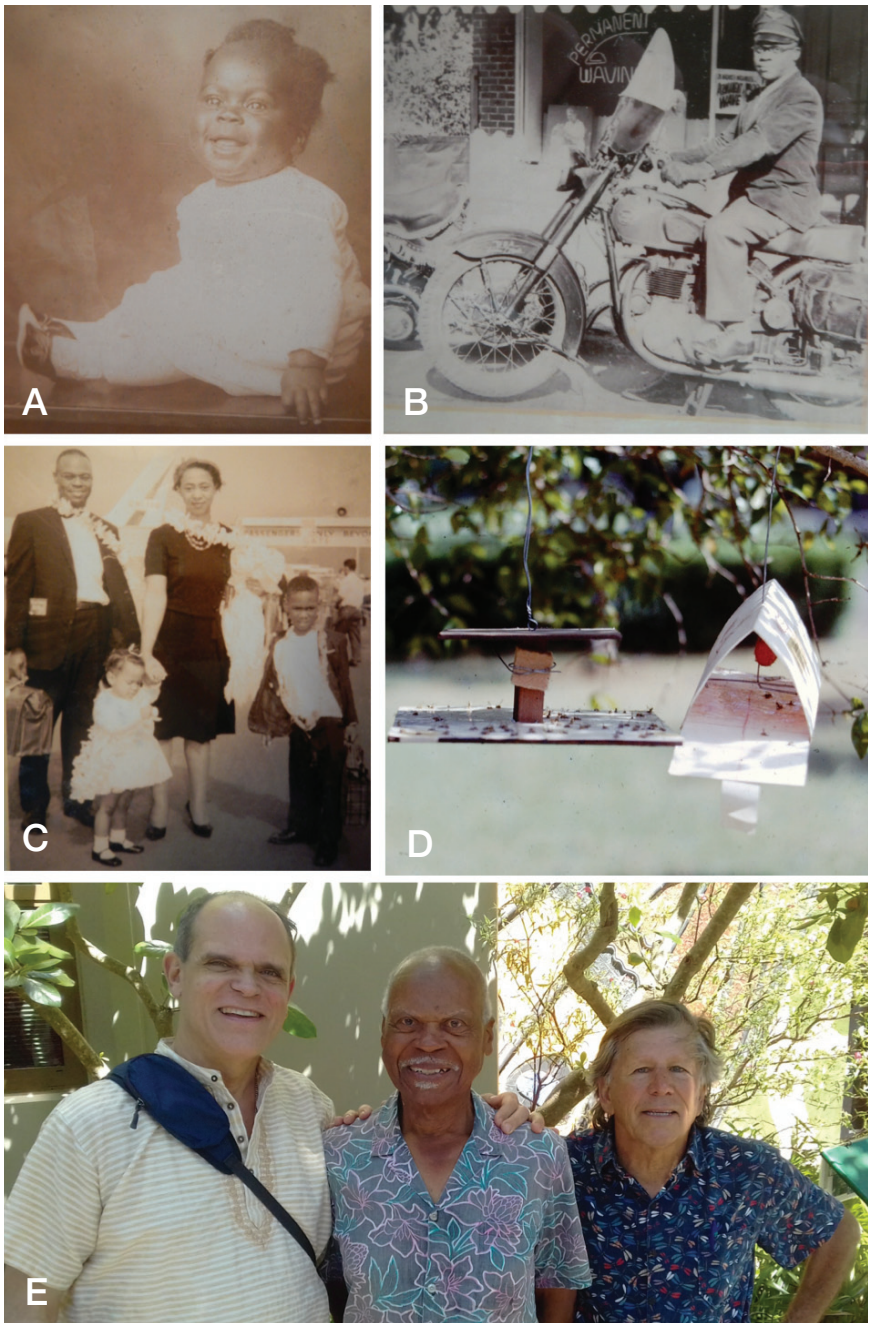

Figure 1: A–B: Ernie Harris ca. 1929 and in the early 1950s. C: Ernie and Betty Jo Harris and children Mark and Tanya arriving at the Honolulu Airport in February 1962. D: Early prototype of the Jackson trap, scanned from Ernie's private slide collection, photo dated June 1968. E: Last meeting between Ernie and the authors in March 2017.

ment for fruit fly eradication in 1996, the Certificate of Merit from USDA-ARS for the development of the "Harris strain" of *Fopius arisanus* in 1997, induction into the State of Arkansas Black Hall of Fame in 1999, the NAACP Hawaii Chapter lifetime achievement award for distinguished service in 2012 (see supplementary online material), an Alpha Phi Alpha Fraternity national award in 2015, the Outstanding Alumnus Award from the University of Hawaii College of Tropical Agriculture and Human Resources (2017), and the USDA-ARS Hall of Fame award (2017). By far the most prestigious recognition was in November 2016, when he received the Congressional Gold Medal, the highest civilian honor delivered by the U.S. Congress, for extraordinary contribution to science by a former marine assigned to Montfort Point (North Carolina).

Ernie has greatly inspired us since the day we first met him (LL in 1997, RV in 1979). This article was completed by the lead author after Roger Vargas' unexpected, tragic departure (10 July 2018). Our last gathering together was in March 2017 (Fig. 1E). This biography was compiled using information from hours of recorded interviews and discussions between Ernie and the lead author. In addition to compiling this article, my personal dedication to my prime role model is the naming of a beautiful new species of fruit fly from Vietnam after Ernie: *Bactrocera (Tetradacus) ernesti* Leblanc & Doorenweerd, 2018 (Leblanc et al. 2018).

In addition to Betty Jo, Ernie is survived by daughter Tanya Harris, sons Gregory and Mark, grandson Malachi, brothers Robert and Lewis, and sisters Cindy Wimes and Myra Preyer.

Literature Cited

Harris E.J., S. Nakagawa, and T. Urago. 1971. Sticky traps for detection and survey of three Tephritids. J. Econ. Entomol. 64: 62–65.

Leblanc, L., C. Doorenweerd, M. San Jose, H.T. Pham, and D. Rubinoff. 2018. Descriptions of four new species of *Bactrocera* and new country records highlight the high biodiversity of fruit flies in Vietnam (Diptera, Tephritidae, Dacinae). Zookeys. 797: 87–115.

Supplementary Online Material

At http://scholarspace.manoa.hawaii.edu/handle/10125/59212 is a filmed presentation delivered on 30 April 2012 by Ernie during the 1107th meeting of the Hawaiian Entomological Society, summarizing his career and achievements (filmed by Luc Leblanc); the NAACP awards ceremony to Ernie Harris, delivered 14 January 2012 in Honolulu (filmed by Luc Leblanc); and a complete list of Ernie's publications.

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