

FLUCTUATIONS IN SIZE OF CERTAIN
DROSOPHILA POPULATIONS IN THE OLA'A TRACT
HAWAII VOLCANOES NATIONAL PARK*

Hampton L. Carson
Department of Genetics
University of Hawaii at Manoa
Honolulu, HI 96822

As accessed from both sides of Wright Road, the tract yields 14 species of picture-winged Drosophila. Each is endemic to the Big Island, has had its giant chromosomes sequenced and its ancestry traced to related species on older islands. In 1971-72, as part of the International Biological Program, the relative frequency of each species was determined by using baits in a systematic manner. The procedure was repeated in 1981-82, and the two sets of data compared. The frequency of all picture-winged species combined has declined: 9.6 specimens per man-hour in 1971-72 (total 1222) compared with 8.6 per man-hour in 1981-82 (total 588). D. setosimentum, sproati and murphyi were the most frequent species in 1971; in 1981 the three most common were sproati, macrothrix and paucipuncta, with setosimentum and murphyi ranking fourth and fifth respectively. Special attention is given to variation in the numbers of the two giant species heteroneura and silvestris. Both were very rare in 1971-72: 23 specimens in 127 man-hours (0.2/man-hour). In 1976, this had increased to 198 specimens in 44 man-hours (4.5/man-hour). The numbers levelled off in 1978 and 1979 (1.3 and 1.6/man-hour respectively). The number has since declined to or below the 1971-72 levels. In 1980, only 46 specimens were caught in 63 man-hours (0.7). In 1981-82, only 1 specimen (a ♂ silvestris) has been captured in 68.5 man-hours. The December 1981 and March 1982 collections yielded an all-time low frequency, only 1.1 picture-wings per man-hour, and no heteroneura or silvestris. Vespula pennsylvanica was first recorded at these collecting sites on August 10, 1981. In 1981-82, most of the specimens were released in the forest again after counting. A common species native to the Japanese islands, D. suzukii, was first recorded in the Hawaiian Islands on Oahu on October 28, 1980. It has been abundant in Olaa tract since July 11, 1981, when it was first recorded there. Supported by NSF Grant DEB 79-26692.