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Herforth, R.S.[1], H.L. Carson[2] and L.Chang.[2]
1 Augsburg College, Minneapolis, Minnesota USNA. 2 University of Hawaii at Manoa, Honolulu, Hawaii USNA. A new arrival to the Hawaiian Islands: Drosophila cardini.

In March of 1983 a female Drosophila was collected in Honolulu near Leahi Hospital. The collection site was at the southeast corner of Kilauea Avenue and Makapuu, near property occupied by Kapiolani Community College. The fly was caught in a banana trap hung from branches of what appeared to be the cactus Cereus undatus. This female died without laying any eggs, but her external characters indicated that she was probably a member of the cardini group. These characters included: clouded crossveins; black bands on the posterior edge of yellowish-brown abdominal tergites, with the black in the lateral areas not reaching the lateral edge of the tergites and extending anteriorly and medially in the posterior tergites; brilliant orange eyes; and reddish-brown mesonotum, scutellum and pleurae. Another female was collected from the same site in August of 1983, again using a banana bait. This female was successful in laying eggs, and an isofemale line was established. Examination of males of this line showed that they lacked a protuberance on the anteroventral margin of the labellum and possessed anal plates with one or two long anteriorly directed bristles on the anteromedial corner of the plates. These features are characteristic of D.cardini Sturtevant (Stalker 1953).

Since the cardini group consists of about 16 sibling and near-sibling species, the metaphase chromosome group was determined by brain smears. This showed the presence of 6 pairs of chromosomes, including 5 pairs of acrocentrics and one pair of microchromosomes. D.cardini is the only member of the species group which has this somatic metaphase figure (Futch 1962; Heed & Russell 1971). The chromosomal and morphological features thus lead to the conclusion that these flies are members of Drosophila cardini Sturtevant. This species has been found in Florida, Mexico, Central and South America, and the West Indies but has never before been recorded from the Hawaiian Islands. In fact no other species of cardini group has been found here. D.cardini thus represents a new arrival to the Hawaiian Islands.

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Holliday, M. and J.Hirsch. University of Illinois, Urbana-Champaign, Illinois. Excitatory (Pavlovian) Conditioning.

Using a variation of Nelson's (1971) procedure for conditioning the blow fly Phormia regina, we demonstrate excitatory conditioning of the proboscis extension reflex in D.melanogaster.

The flies came from a population established by crossing the Berlin line with another produced by mixing nine Austin, TX inbred lines obtained from Birmingham, England. They were virgin males and females, 44-48 hr old, 36 hr food deprived and water satiated, when conditioned on the automated stimulating apparatus (Vargo, Holliday & Hirsch 1983; Holliday, Vargo & Hirsch 1983).

As outlined in Figure 1, the conditioning procedure presents for 5 sec to the foretarsi a 0.5-M NaCl conditioned stimulus (CS), followed after a 0.5-sec interval by a 0.25-M sucrose unconditioned stimulus (US) for 5 sec (also accessible to the proboscis for 2-3 sec), itself followed after a 170-sec interval by a distilled H_2O intertrial stimulus (ITS) for 5 sec, which, in turn, is followed after a 175-sec interval by the start of the next trial. Thus, the intertrial interval (ITI) is 6 min. The ITS serves to discharge any residual sucrose induced excitatory state (CES, Dethier, Solomon & Turner 1965) which in D.melanogaster can last at least 10 min (Vargo & Hirsch 1982a,1982b). With a 6-min ITI, it is important to discharge CES in order to avoid confounding non-associative excitation with associative responding (conditioning) to the CS.

For 111 flies Figure 2 presents average results combined from four experiments. Over nine trials, responding (1) to the CS increases significantly (regression coefficient: B=3.7,