

PRELIMINARY INVESTIGATIONS ON ADULT *ANOPHELES OCCIDENTALIS* ACTIVITY AT
COYOTE HILLS MARSH¹

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ABSTRACT

Studies on the activity of adult *Anopheles occidentalis* in the Coyote Hills Marsh area are reported. Adults reached peak numbers in August and declined thereafter and were not found after mid-October. There was a positive correlation between the numbers of larvae surveyed in the marsh and the numbers of adults recovered in red boxes. Preliminary parity studies indicate that the majority of females undergo a single gonotrophic cycle.

INTRODUCTION.—This paper summarizes studies on adult *Anopheles occidentalis* populations in the Coyote Hills Marsh. This work is being conducted as part of a large research effort whose objectives are to develop a comprehensive model of the anopheline interactions in the marsh ecosystem (Roberts et al. 1983). The information reported here was from studies started in the late spring of 1983 and is therefore only preliminary. The major objectives of this phase of the project is to describe the population dynamics of adult anophelines produced in the marsh system.

MATERIALS AND METHODS.—Adult *Anopheles occidentalis* activities were monitored with New Jersey light traps and with red boxes (dimensions 1 cubic foot) at stations set up in the vicinity of the marsh. The light traps were located in suburban areas two miles due east and three miles northeast of the marsh. They were operated on a weekly basis from mid-April through the first week in November. These traps have been operated at these sites for several years before the start of this study. One of the major purposes for these traps was to monitor *Anopheles* encroachment into residential areas.

Four areas relatively close to the marsh were chosen as sites for red box collection stations. A set of three boxes were hung about three feet from the ground in willow trees bordering the southern edge of the marsh at intervals of about 25 meters. Another set of three were positioned in a similar manner in willows along the eastern perimeter of the park, a distance of about 400 meters from the marsh. The final groups were placed on the ground on sloping rocky terrain. One group of four boxes were placed under low shrubs (*Baccharis* sp.) about 100 to 150 meters

from the marsh while the remaining five boxes were placed behind the Park Headquarters under California laurel (*Umbellularia californica*) approximately 200 meters from the marsh. Mosquitoes were collected from the boxes with a modified portable vacuum sweeper either once or twice weekly from mid-July to November and then counted and identified in the laboratory. Adult females were examined for the presence of blood and developing eggs. A total of 136 females were dissected to determine parity status. Larval populations in the marsh were assessed by taking 10 dips once a week and averaging the results.

RESULTS AND DISCUSSION.—*Anopheles occidentalis* were only found in light trap collections on two occasions during 1983. A single male was collected in mid-June from the trap two miles east of the marsh and a single female during the last week in August in the trap located three miles northeast. This would suggest that *An. occidentalis* rarely move distances of two miles or more. However, an intermediate light trap station to be located approximately one mile from the marsh and another adjacent to it planned for this season may give us a better understanding of the pattern of movement for this species.

The use of red boxes proved satisfactory for monitoring *An. occidentalis* at the marsh site. Figure (1) shows the relationship between larval densities and the recovery of adults from red boxes. There was a positive correlation between the numbers of both sexes found in the boxes and the number of larvae surveyed in the marsh. The four small peaks observed for males suggests that at least four generations occurred from July to October; however, this cannot be supported statistically. Boxes positioned on the sloping terrain to the south of the marsh contained the greatest number of mosquitoes. A total of 1,109 adults in about an equal sex ratio were retrieved between July and mid-October. Four boxes on the south slope accounted for over 75% of the adult mosquitoes recovered.

Table (1) shows the results of ovariole dissections. Unfortunately, these analyses were started late in the season and only 136 females were examined. These preliminary results indi-

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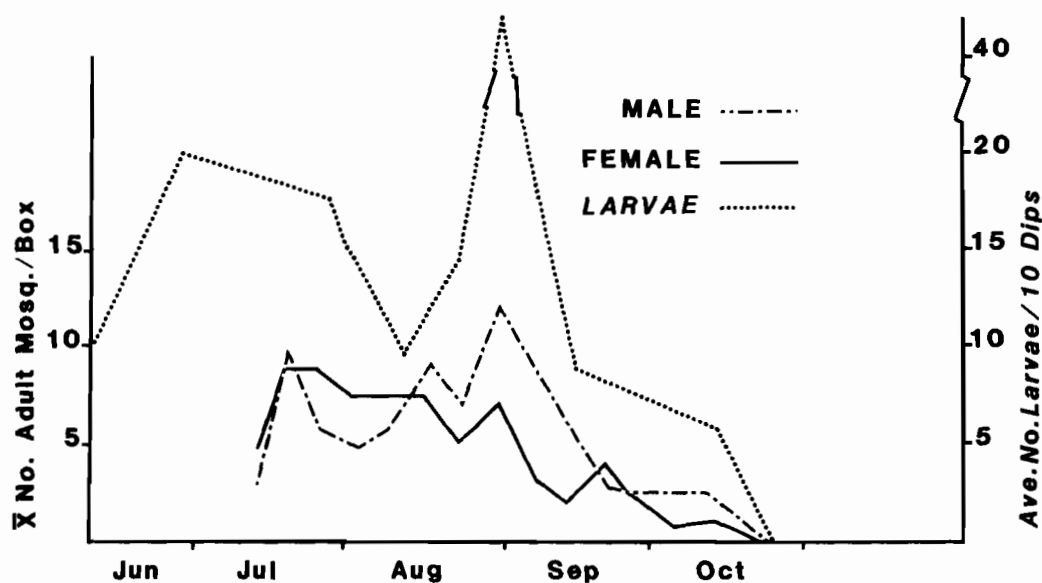


Figure 1. Comparison of adult and larval collections of *An. occidentalis* in Coyote Hills Marsh, Alameda County, 1983.

Table 1. Gonotrophic cycles of *An. occidentalis* Coyote Hills Marsh, Alameda County, Calif. 1983.

	Aug	Sept	Oct	Fat Body Develop.
Nulliparous	24	4	6	0
Parous-1	22	30	2	-
-2	0	1	0	-
-3	0	0	0	-
Gravid	24	22	1	-
Total	70	57	9	0
% Parous	66%	93%	33%	-

cate, however, that the majority of females undergo only a single gonotrophic cycle indicating that the lifespan of adults is probably not long. Much more data is required, however, before any conclusive statements regarding gonotrophic patterns and physiological age can be made for these populations of *Anopheles*.

CONCLUSION.—These preliminary studies indicate that *Anopheles occidentalis* was the only anopheline utilizing the marsh in 1983. Several generations are produced during the summer with peak populations occurring in August. Larvae

and adults were not observed after October. Examination of a relatively few females indicate that they undergo a single gonotrophic cycle during their life near the marsh. Further research is necessary to verify the preliminary information presented in this paper.

REFERENCE CITED

- Roberts, F. C., J. K. Schooley, and G. E. Conner. 1983. The Coyote Hills Marsh model, conceptual framework and directions of the research. *Proc. Calif. Mosq. and Vector Control Assoc.* 51: 65-66.