

spot plate that each contained one fourth instar *Anopheles barberi*. After one hour, 51 of the 90 *C. p. quinquefasciatus* had been devoured; after 16 hours, 86 of 90 had been consumed.

A fourth instar larva of *Anopheles barberi* was then placed in a small container with many first instar larvae of *C. p. quinquefasciatus* and observed for one hour under a stereoscopic microscope. This one *Anopheles barberi* consumed 25 larvae in the first 20 minutes, 31 in 30 minutes, 37 in 45 minutes, and a total of 46 in 1 hour. The first *C. p. quinquefasciatus* consumed passed through the digestive tract of the predator in 7 minutes, one or two were subsequently passed every 1 to 2 minutes, and 31 passed through in 1 hour. In another observation a fourth instar *Anopheles barberi* devoured 34 larvae and passed the first in 13 minutes and passed 19 in 30 minutes. Generally the fourth instar larvae of *Anopheles barberi* were observed to consume 14 to 18 first instar *C. p. quinquefasciatus* as rapidly as they could catch them; thereafter, they consumed larvae only after they had eliminated previously eaten larvae. However, several *Anopheles barberi* continued to catch and kill large numbers without consuming them after they had consumed about 15.

Fourth instar larvae of *Anopheles barberi* were also observed to consume a few second instar larvae of *C. p. quinquefasciatus*, but they were much less efficient predators of second instar than of first instar larvae. Moreover, third instar larvae of *Anopheles barberi* that occasionally attempted to prey on first instar larvae of *C. p. quinquefasciatus* were always unsuccessful.

Thus, fourth instar larvae of *Anopheles barberi* are predacious and probably consume large numbers of early instar mosquito larvae and various sized larvae of *Culicoides* spp. that breed in tree holes.

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An *Aedes vexans* GYNANDROMORPH

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When he compiled his list of gynandromorphs, Bates (1949) commented that they were "probably very rare" in proportion to the vast numbers of mosquitoes that had been examined up until that time. Brust's (1966) appended list, Taylor et al., (1966), and Meadows (1966), along with

a few more descriptions of individual specimens, substantiate the relatively infrequent occurrence of such anomalies in nature. The total number of reported gynandromorphs, and particularly the limited variety of species represented, remains small.

As a severe pest mosquito resulting from flood waters, *Aedes vexans* (Meigen) has received much attention from mosquito workers, but no sexually aberrant types have been described in the literature.

An antero-posteriorly differentiated form of *A. vexans* was collected in Salt Lake County 21 June 1968, in a New Jersey type light trap hung 5 feet above the ground in a grape arbor surrounded by shrubs and trees. The head of the specimen was entirely male with normal antennae and palpi. The tarsal claws appeared to be male. The terminal abdominal segments were characteristically female. Two ovaries were present, with no yolk in the oocytes. There was a bursa copulatrix, accessory gland, and three spermathecae. The hind gut contained six rectal papillae indicating a female digestive tract.

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NOTES ON THE BIOLOGY OF *Culex territans* WALKER¹

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In the summer of 1968 an attempt was made to colonize *Culex territans* Walker. From mid-June to late July, 8,000 fourth instar larvae were collected and identified. The identified larvae were placed in enamel pans (9" x 15" x 4") containing filtered lake water and food (Takata and Harwood, 1964) in an outdoor cage measuring 6' x 4' x 6', which had a 1/2" plywood top and bottom, was covered with white netting, and had a polyethylene sheet over one side and the top for protection from wind and rain. Frogs and 10 percent sucrose were provided. The mosquitoes blood-fed readily and laid egg rafts, but did not

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mate as determined by examination of the spermathecae.

LARVAL HABITAT. *C. territans* larvae were collected from permanent, small pools with slightly acidic water (pH 6) at the edge of Lake Costello in Algonquin Park, Ontario. *Culex restuans* (Theo.) was the mosquito species most commonly associated with *C. territans*. The dominant plants in the area were blue-joint grass, *Calamagrostis canadensis* (Michx.) Beauv.; speckled alder, *Alnus rugosa* (Du Roi); fireweed, *Epilobium angustifolium* L.; and meadow-sweet, *Spiraea alba* Du Roi.

ADULT BEHAVIOR. The females readily bloodfed on the leopard frog, *Rana pipiens* Schreber; the bullfrog, *R. catesbeiana* Shaw; the pickerel frog, *R. palustris* LeConte; and the green frog, *R. clamitans* Latreille. The frogs were suspended from the cage ceiling in a nylon stocking. The mosquitoes made no attempt to feed on a human who spent long periods of time in the cage.

Qualitative records were kept for several weeks of the mosquitoes' activity cycle. *C. territans* is crepuscular with the most intense activity just at the end of dusk and the beginning of dawn. The length of the inactive period during mid-day varied with the temperature.

Various oviposition sites were available in the cage—white enamel pans with filtered lake water, with filtered lake water plus small brown stones, and with the water from which adults had emerged containing the larval food and exuviae. Position of the pans was changed daily to eliminate bias. All egg rafts were found in the pan containing filtered lake water and dark stones, showing that even though chemical factors may be of importance in oviposition site selection (Gjullin *et al.*, 1965; Hazard *et al.*, 1967; Hudson and McLintock, 1967), a dark background is more important. The desirability of dark backgrounds for oviposition sites has been shown for *C. restuans* (Belton, 1967) and for *C. tritaeniorhynchus* Giles (Field and Matusi, 1965). Several rafts which were still white were collected during the late morning, indicating that *C. territans* does not oviposit exclusively in the dark. The time(s) of maximum oviposition was not determined.

On numerous occasions the ant, *Lasius neoniger* Emery, was observed preying on both sexes of mosquitoes. An ant would grasp the mosquito's leg in its mouth and would back away dragging the struggling mosquito. Although the captured mosquitoes may not have been as hearty as the ones which avoided capture, they did resist vigorously. In one instance a female was able to fly about 2 inches with the ant attached. Several of the captured mosquitoes were examined and none had missing appendages.

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INTERSEX OF *Culicoides circumscriptus* KIEFFER

(CERATOPOGONIDAE:DIPTERA)¹

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A number of intersexes in *Culicoides* has been reported. (Callot and Kremer 1963, Dzshafarov 1960, Smith 1966, Smith and Perry 1967). This paper describes an intersex of *C. circumscriptus* Kieffer which heretofore has been undescribed. This specimen was collected in a light trap in September 1967 in Karaj, Iran.

This specimen is mounted on a slide in phenol-balsam.

DESCRIPTION:

Head—Eyes separate as in female, with superior transverse suture; antennae with last five segments elongate as in female but number of antennal hairs more than that of female but less than that of male; maxillary palps typically female.

Wings—Size smaller than that of female, length 1.31 mm., width 0.48 mm. (average of 30 females, length 1.43 mm., width 0.61 mm.); color of spots as in male.

Terminalia (Fig. 1)—Male-like but with spermatheca; ninth tergite similar to male but smaller with no apico-lateral process, with parameres not expanded in middle like normal male; instead, gradually tapering from base to apex; aedeagus with body narrower than normal; basistyle and

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