

GYNANDROMORPHISM IN *CULEX* (LINNAEUS) MOSQUITOES COLLECTED IN THE TAMPA BAY AREA 1962 THROUGH 1964¹

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Reports of 39 cases of gynandromorphism in *Aedes taeniorhynchus* Wiedemann were summarized by Lum in 1960 and three others were added from his own laboratory cultures. Two *Culex salinarius* Coquillett which exhibited male antennae and palpi, and female genitalia, were found at Fort Gordon, Georgia, in 1943 and reported by Roth in 1948. A *Culex salinarius* collected in a light trap at Robins Air Force Base, Georgia, had female antennae and palpi and a male abdomen and genitalia, according to a report by Davis in 1957. Pratt and Sudia stated in 1964 that a specimen of *Aedes taeniorhynchus* collected in a light trap near Everglades, Florida, presented similar features, that is, female head "with two normal short palps, thread-like antennae" and with "normal male terminalia." Gynandromorphism in a *Culex tarsalis* Coquillett taken in a light trap at Yuma Proving Ground, Arizona, was found by Rigby and Blakeslee. In 1964, they reported the characteristics as "typical female antennae, palpi and proboscis, and typical male genitalia." The majority of specimens included in this study have this combination of characteristics.

DISCUSSION. From September, 1962 through December 1964, in the Tampa Bay area 411,461 mosquitoes were identified. Gynandromorphism was displayed in 20 of them. They were distributed in time as follows: 40,565 in 1962 yielded none; 136,758 in 1963 produced 3; and 234,138 in 1964 yielded 17. Out of approximately 36 species only members of

the subgenus *Culex* (*Culex*) showed this abnormality. Represented were *Culex nigripalpus* Theobald, 14 times; *Culex salinarius*, three times; and *Culex pipiens quinquefasciatus* Say, three times.

These 20 gynandromorphs were collected from their natural habitat, 18 by bird-baited lard-can traps, one by miniature light trap and one by truck trap. The type of sites included: urban, one specimen by truck trap, six by bait trap; salt marsh, two by bait trap, one by light trap; fresh water swamp or woods, ten by bait trap. Geographically they were limited to three of the four counties included in the encephalitis study area: Hillsborough (15), Pinellas (4), Manatee (1), and Sarasota (0). Collections in Sarasota County were discontinued June 1, 1964. Seasonally, they were collected in various years between 1962 and 1964 in the months of January (2), February (3), March (2), June (1), July (1), August (1), September (7), October (1), November (1) and December (1).

Thirteen of the 20 specimens (Table 1) were bi-polar with head and thorax female, abdomen and terminalia male. These characteristics probably applied to the damaged one, *Culex nigripalpus* (No. 20) which had taken a partial blood meal from an exposed chick in a lard-can bait trap. Of the remaining six, each displayed a different variation in antennal, palpal and abdominal features:

Number 3, *Culex nigripalpus*, from a bait trap, had female antennae, female right palpus and what appeared to be a left atrophied male palpus and male terminalia.

Number 4, *Culex salinarius*, from a truck trap, had a mirror image antennal arrangement, with male on the outer and

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TABLE 1.—*Culex (Culex)* spp. mosquitoes demonstrating gynandromorphism collected in 1963 and 1964.

Ser. No.	Date	Species	Site—County	Type*	Trap	Condition**		
						Antennae	Palpi	Terminalia
1	17 Aug. 1963	<i>Cu. nigrip.</i>	Big Bend, Hills	R	Bait	F	F	M
2	18 Sept. 1963	<i>Cu. nigrip.</i>	Big Bend, Hills	R	Bait	F	F	M
3	19 Sept. 1963	<i>Cu. nigrip.</i>	Palmetto, Manatee	R	Bait	F	L-M,R-F	M
4	06 Jan. 1964	<i>Cu. salin.</i>	So. D. Mabry, Hills	U	Truck	F-M	F	M
5	23 Jan. 1964	<i>Cu. pip. quin.</i>	So. D. Mabry, Hills	U	Bait	F	L-F,R-M	M
6	07 Feb. 1964	<i>Cu. pip. quin.</i>	So. D. Mabry, Hills	U	Bait	F	F	M
7	28 Feb. 1964	<i>Cu. nigrip.</i>	Sawgrass Lake, Pine	S	Bait	F	F	M
8	28 Feb. 1964	<i>Cu. nigrip.</i>	So. D. Mabry, Hills	U	Bait	F	F	M
9	05 March 1964	<i>Cu. salin.</i>	Sawgrass Lake, Pine	S	Bait	F	F	M
10	10 March 1964	<i>Cu. salin.</i>	Sawgrass Lake, Pine	S	Bait	F	F	M
11	26 June 1964	<i>Cu. nigrip.</i>	Big Bend, Hills	R	Light	L-F,R-M	F	M
12	21 July 1964	<i>Cu. nigrip.</i>	Taylor-Knight, Hills	S	Bait	F	L-M,R-F	M
13	01 Sept. 1964	<i>Cu. nigrip.</i>	Lowry Park, Hills	U	Bait	F	F	M
14	14 Sept. 1964	<i>Cu. nigrip.</i>	Fox's Corner, Hills	S	Bait	F	F	M
15	16 Sept. 1964	<i>Cu. nigrip.</i>	Fielder & Himes, Hills	R	Bait	F	F	M
16	16 Sept. 1964	<i>Cu. nigrip.</i>	High Point, Pine	R	Bait	L-M,R-F	F	M
17	29 Sept. 1964	<i>Cu. nigrip.</i>	Riverview, Hills	S	Bait	F	F	M
18	27 Oct. 1964	<i>Cu. pip. quin.</i>	Lowry Park, Hills	U	Bait	F	F	M
19	05 Nov. 1964	<i>Cu. nigrip.</i>	Boot Bay, Hills	S	Bait	F	F	M
20	22 Dec. 1964	<i>Cu. nigrip.</i>	Boot Bay, Hills	S	Bait	F	F Missing	M

* R—Rural, U—Urban, S—Swamp.

** F—Female, M—Male, L—Left, R—Right.

female on the inner portion of each antenna; both palpi were female and the terminalia male.

Number 5, *Culex pipiens quinquefasciatus*, from a bait trap, had female antennae and left palpus, male right palpus and terminalia.

Number 11, *Culex nigripalpus*, from a miniature light trap, had female left antenna, male right antenna, left atrophied male palpus, female right palpus, and male terminalia.

Number 14, *Culex nigripalpus*, from a bait trap, showed female antennae, atrophied male palpi, and male terminalia.

Number 16, *Culex nigripalpus*, from a bait trap, displayed a left antenna half male and half female, with right antenna female, left palpus male and right female, and male terminalia which had not completely rotated normally, the only one collected with this characteristic.

SUMMARY. During a three-year period, 1962-1964, a total of 411,461 mosquitoes were identified in collections made by bait, truck and light traps operating in four counties in the Tampa Bay area of Florida

in a program directed by the Encephalitis Research Center at Tampa. Of this total, representing approximately 36 species, 20 were classified as gynandromorphs. All belonged to three species of the subgenus *Culex* (*Culex*): *nigripalpus*, *pipiens quinquefasciatus*, and *salinarius*. Thirteen of the gynandromorphs showed clear bi-polar differentiation with female features anteriorly and male posteriorly. Each of the remaining six displayed different variations of sexual diversity.

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