

## CULEX CHIDESTERI DYAR (DIPTERA, CULICIDAE) AT BROWNSVILLE, TEXAS<sup>1</sup>

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*Culex chidesteri* Dyar was first reported from the United States by Fisk and LeVan (1940) when a single male of this mosquito species was taken in a light trap at Brownsville, Texas. In their paper the possibility of its being introduced by air traffic is suggested. Dyar (1928) lists its distribution as Panama (Colon), Venezuela (Maracay), and Brazil (Porto das Caixas). Randolph and O'Neil (1944) apparently are in error in a statement in their bulletin on Texas mosquitoes that *C. chidesteri* was found by Dyar in Texas.

The present paper records numerous collections of larvae and adults of *C. chidesteri* taken throughout the years 1944, 1945, and 1946 while the author was conducting an entomological surveillance program at Brownsville, Texas, for the Foreign Quarantine Division of the U. S. Public Health Service. The records included herein are thought to be the first for the adult female and larval stages of this species in the United States. Observations on the breeding habits are noted and the species is redescribed. A brief review of the literature concerning this species is also presented.

A New Jersey type light trap was kept in almost continuous nightly operation at the international airport at Brownsville throughout the calendar years 1944, 1945, and 1946. Fifteen specimens (six female and nine male) of *C. chidesteri* were captured in the light trap during this period. The series of catches is as follows: On Nov. 27, 1944, 3 ♂♂; Dec. 7, 1944, 1 ♀; Dec. 10, 1944, 1 ♀; Aug. 22, 1945, 1 ♂; Nov. 1, 1945, 1 ♂; Nov. 4, 1945, 1 ♀; Nov. 15, 1945, 1 ♂; Nov. 17, 1945, 1 ♂; Nov. 29, 1945, 1 ♀; Jan. 4, 1946, 1 ♀; May 10, 1946, 1 ♂; May 27,

1946, 1 ♂; June 15, 1946, 1 ♀. In another trap operated at the water port of Brownsville one male *C. chidesteri* was captured on Feb. 14, 1944. The light trap collections indicate that the adults are active in the Brownsville locality throughout the year.

The first larva was found by dipping in the grassy edges of a roadside pond near Brownsville, January 2, 1944. A thorough search was subsequently made to determine the location of larval breeding places. It was desired to learn more concerning the biology and occurrence of the species. The larval collections are presented in the accompanying table.

In addition to the records listed in this paper the author identified larvae collected by D. C. Pfeifer, local mosquito control inspector, at Harlingen and San Benito, Texas. These identifications were reported to the Texas State Department of Health.

The distribution of *Culex chidesteri* in the United States is apparently restricted to the lower Rio Grande Valley of Texas. Larvae were collected only in the vicinity of Brownsville, San Benito, and Harlingen, Texas. The species breeds throughout the year in this area as larvae were collected every month with the exception of July and October. With few exceptions the larvae were collected in two places, both of which appeared ideal for the breeding of this species. Specimens could be found almost anytime during the year, although at times fluctuations in the water level occasioned by the pumping of irrigation water from the river into the resacas and ponds, necessitated excessive dipping. One of the breeding places was a small pond on the Brownsville golf course. This pond had a grassy margin and was overgrown with water hyacinths. The other principal larval col-

<sup>1</sup> From the Foreign Quarantine Division, Bureau of Medical Services, U. S. Public Health Service.

TABLE 1. Larval Collections of *C. chidesteri*

Date	Specimens collected	Locality	Habitat
Jan. 2, 1944	1	Near Brownsville	Grassy roadside pool
June 11, 1944	2	Harlingen, Tex.	Drainage ditch overgrown hyacinth and cattail
Aug. 5, 1944	1	San Benito, Tex.	Grassy roadside ditch
Sept. 2, 1944	1	Harlingen	Grassy roadside pond
Sept. 12, 1944	2	Harlingen	Grassy roadside pond
Nov. 20, 1944	10	Brownsville golf course	Pond overgrown with water hyacinth
Dec. 4, 1944	45	Brownsville	Resaca overgrown with hyacinth and cattail
Mar. 17, 1945	4	Brownsville golf course	Pond overgrown with water hyacinth
May 12, 1945	4	Brownsville.	Grassy margined pond with water hyacinth
Aug. 6, 1945	8	Brownsville golf course	Pond overgrown with water hyacinth.
Aug. 8, 1945	18	NE of Brownsville	Resaca overgrown with hyacinth and cattail
Aug. 10, 1945	20	NE of Brownsville	Resaca overgrown with hyacinth and cattail
Aug. 20, 1945	110	NE of Brownsville	Resaca overgrown with hyacinth and cattail
Nov. 26, 1945	2	Harlingen	Grassy roadside pool
Dec. 7, 1945	1	Brownsville	Grassy roadside pool
Feb. 17, 1946	2	Harlingen	Grassy roadside pool
Mar. 26, 1946	1	Brownsville	Resaca overgrown with water hyacinth
Apr. 5, 1946	7	NE of Brownsville	Resaca overgrown with hyacinth and cattail
Apr. 25, 1946	1	Brownsville golf course	Grassy pond overgrown with water hyacinth
June 10, 1946	9	NE of Brownsville	Resaca overgrown with hyacinth and cattail
June 11, 1946	1	Brownsville golf course	Grassy pond overgrown with water hyacinth
June 27, 1946	1	Brownsville	Pond overgrown with water hyacinth
Dec. 4, 1946	62	Brownsville	Pond overgrown with water hyacinth
Dec. 6, 1946	76	Brownsville golf course	Pond overgrown with hyacinth and cattail
Total	389		

lecting place was located approximately one mile northeast of Brownsville on a resaca overgrown with water hyacinth and cattail. "Resaca" is the native term for the ponds or lakes formed by an old river bed. The Rio Grande has changed its course a number of times in the Brownsville area leaving a number of these resacas whose water level is maintained by rains and the pumping in of irrigation water.

The scarcity of *C. chidesteri* in the light trap catches at the Brownsville airport was no doubt largely due to the clearing activities performed within a mile radius of the airport by malaria control crews. The species apparently prefers grassy pools or resacas overgrown with water hyacinth.

A number of other species of mosquitoes were commonly found breeding in association with *C. chidesteri*. The other species frequently encountered were *Anopheles albimanus*, *Anopheles pseudo-punctipennis*, *Culex peccator*, *Culex erraticus*, *Culex salinarius*, and *Mansonia titilans*. *Culex salinarius* larvae were usually found in the greatest abundance.

In order that there would be no question as to the identification of the species, inasmuch as Dyar's description and illustration are at variance, a number of larvae were reared out to the adult stage. The identification of both larval and adult stages has been confirmed by Dr. Alan Stone of the United States National Museum. The average duration of the pupal

stage in the laboratory was found to be two or three days. Of 71 field-collected last instar larvae held for observation, one adult had emerged within 24 hours following pupation; 21 adults had emerged within 48 hours; and 49 or the remainder had emerged within 72 hours of pupation.

*Culex (Culex) chidesteri* was described by Dyar (1921) from two denuded males taken on a hospital screen at Colon, Panama, by W. S. Chidester between 7 and 8 a.m. on June 24, 1921. Bonne and Bonne-Wepster (1925) list and describe the male as known from the specimens collected at Colon, Panama. Dyar (1925) lists this species with reference to the original description and speculates as to where the larvae might live. The larva is first described and figured by Root (1927) from larvae collected in a river at a point where it was choked with vegetation, chiefly water hyacinth, at Porto das Caixas, Brazil. All head hairs were denuded in the single larval skin upon which he bases his description. He shows seven pairs of short hair tufts on the air tube all in a straight line. Dyar (1928) summarized all information on *C. chidesteri* with a description of the female, male, and larva. He also figures the male terminalia, the larval head and the larval terminal segments. His adult specimens were partially denuded, however, thus making the description incomplete. The text description of the larva is based on a specimen having the head hairs missing although the illustration, which is apparently based on different material, shows the head hairs present. The text indicates five paired tufts on the air tube, whereas the figure shows seven or possibly eight pairs. Dyar's key to the *Culex* larvae indicates that the subapical tuft is laterad out of line. Due to the above mentioned discrepancies the following description of the species as observed in specimens collected at Brownsville, Texas, is given.

Female: Medium sized species. Head: Proboscis elongate, dark scaled with bluish reflections, pale non-contrasting band in middle usually more distinct and broadly

pale on under side. Palpi short, dark. Broad dorsal region of occiput clothed with narrow pale curved bronzy scales and dark erect forked scales. Lateral region of occiput with a patch of broad white scales. Thorax: Mesonotum brown with fine narrow curved bronzy brown scales. Pleura pale brown with small groups of broad white scales. Abdomen: Tergites primarily dark scaled with bronze to metallic blue-green reflections. Basal white bands of nearly uniform width joining a pair of basal lateral white patches. Venter mostly white scaled with usually a few black scales scattered along apical margin. Legs: Dark scaled with metallic blue green reflections, inner surface of femora and tibia white scaled with white line of scales extending down inner side of first tarsal segment; femora and tibia white tipped; tibial spot broader and more distinct than femoral one. On some specimens there is a faint indication of spots or pale rings at the tarsal joints, more distinct on basal joints and on hind tarsi, otherwise tarsi dark scaled. Wing scales narrow and dark.

Male: Coloration similar to that of female but with the narrow white band on proboscis more distinct. Third segment of palp with a pale white band in the middle. Penultimate segment of palp with two ventral white spots, one basal, the other beyond its middle. Distinct apical dark band on venter of abdominal segments. Terminalia: Basistyle conical with large basal hollow, about two and one-half times as long as basal width, vestiture of numerous setae, longer on outer aspects. Subapical lobe prominent, undivided, bearing three rods somewhat hooked at tip, a broad leaf and a seta. Disistyle curved, flattened, thick at base, tapered beyond middle, with short subterminal claw. Tenth sternite crowned with numerous short pointed spines, curved basal arm. Ninth tergite: Lobes widely separated, moderately raised, each bearing several slender setae. Phallosome: Wide, tip excavate, a row of short teeth on margin, a stout tooth arising from base in middle and exceeding margin,

upper arm sheathlike, ventral arm small and thumb-shaped.

Larva: Head broad, wider than long; upper and lower head hairs multiple, feathered, upper usually six branched (6 to 8), lower three branched. Antennae spinose, curved, tuft multiple, feathered, located at outer third, the part beyond more slender. Thorax and abdomen spicular spinose. Lateral comb of eighth segment of many scales in a triangular patch, single scale narrow, fringed with long fine spines. Air tube over eight times as long as wide, slender, only slightly tapered. Pecten consists of small teeth on basal third, terminal teeth more widely spaced. Usually eight pairs (7 to 9) of short delicate four branched hair tufts in a straight line laterad on air tube, first tuft before end of pecten, length of tufts less than width of air tube. Anal segment longer than wide, pilose, ringed by dorsal plate, ventral brush posterior, dorsal tuft a long hair and a long and three shorter ones on each side, lateral hair double, anal gills not as long as the segment, narrow, tapered.

Distribution: Panama (Colon), Venezuela (Maracay), Brazil (Porto das Caixas), and the lower Rio Grande Valley of southern Texas (Brownsville, Harlingen, and San Benito). The species has thus been reported from only a few widely scattered areas but further collecting should no doubt fill in its range of distribution, although its establishment as far north as Brownsville seems unusual.

The larva of *C. chidesterei* may be easily distinguished from other United States species of *Culex* by the following combination of characters: Lateral comb of eighth segment of many scales in a triangular patch, antennae with tuft outwardly placed, part beyond more slender, thorax and abdomen spicular pilose, air

tube long about 8 to 1 with 7 to 9 short paired tufts almost in a straight line. Upper and lower head hairs multiple, spined, upper with six and lower with three branches. The larvae could usually readily be identified in the field by the fact that the abdomen appeared banded with the third and fifth segments darker than the others.

The adults are much more difficult to distinguish, especially if the specimens are denuded or damaged as is often true in much of the light trap material. They can usually be identified by the following characters: Pale banded proboscis, femur and tibia white tipped, tarsi unbanded (although on some specimens there are faint indications of spots at the joints), basal white bands of abdominal segments broadly joined with lateral white spots. Some of the females seem to fit into Matheson's (1944) description of *C. declarator* which is reported as occurring at Brownsville. The author did not find any larva of *C. declarator* in collections there.

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