

## SOME REMARKS ON TEXAS MOSQUITOES<sup>1</sup>

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The original title of this paper was "Mosquito Species Peculiar to Texas and Adjacent Areas." When I started preparing the paper, it soon became evident that the original title was much too restricted. I have consequently changed it to a more inclusive one. There are actually relatively few species of mosquitoes that are confined to Texas and adjacent areas. It is true that these few species are of considerable interest and importance, but some have been collected only a few times in the United States. Consequently, our knowledge of several of these mosquitoes is definitely limited. A few of these species will be mentioned later.

Species of plants and animals obviously pay no attention to state and national boundaries—unless these happen to be natural barriers—but because of various limitations, there has always been a tendency for workers to emphasize the species found within the state in which they live. This discussion, therefore, will emphasize those species of mosquitoes that occur in Texas.

The paper will be divided into two parts. The first part will deal with a brief comparison of the mosquito fauna of Texas with the United States as a whole and with certain other states. The second and more extensive part of the paper will consider a few species that are of interest for one reason or another.

THE TEXAS MOSQUITO FAUNA.—Texas is certainly a very strategic area for anyone interested in a study of taxonomy, specia-

tion, evolution and related problems. This statement is true not only for mosquitoes, but also for many other species of plants and animals. There are several interrelated reasons for this situation. These include the size of the state, the location with respect to other states and countries, and the climate. These facts are more or less obvious and hardly need elaboration. Let us now see how these features, and perhaps others, affect the mosquito fauna of Texas as compared with other areas.

When one cites figures as to the number of species known from any given region, it must be emphasized that these figures are only approximations. The reasons for this include the question of species versus subspecies, and the possibility of an occasional incorrect determination.

There are at present approximately 137 species of mosquitoes known from the United States. These figures, incidentally, apply only to the group that is sometimes called the true mosquitoes. By some systems of classification, this is the subfamily Culicinae. The subfamilies Chaoborinae and Dixinae, which are often combined with the Culicinae to make up the family Culicidae, are not considered in the present discussion.

Only one genus of mosquito known from the United States is not represented in Texas. This is the genus *Wyeomyia* Theobald, species of which breed in the water in pitcher plants and similar situations. Of the 137 species recorded from the United States, 73 have been reported from Texas.<sup>3</sup> The number of species of mosquitoes known from certain other states in various parts of the country might be of some interest. These include California, 66, Florida and the Florida Keys,

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<sup>3</sup> Since this paper was written, an additional species, *Culex erythrorhax* Dyar, has been reported from Texas: Mosquito News 15:235.

64, Oklahoma, 52, Illinois, 52, and New York, 52. Texas, then, has more, and perhaps better mosquitoes than any other state.

**SOME INTERESTING SPECIES THAT OCCUR IN TEXAS.**—The remainder of the paper will be devoted to a few species of mosquitoes that are of some interest, either because of their limited distribution in the United States, or because of certain problems associated with them. The first group to be mentioned are those that occur in Texas, but which have a limited distribution in the United States.

*Culex abominator* D. and K.: This mosquito is known only from Texas, but it is the only species having this distinction; other species in the state have also been collected elsewhere. This species has been collected primarily from the central and eastern part of the state. As yet, little is known of its biology.

*Culex virgultus* Theo.: This species has been known as *C. declarator* D. and K., but Lane (1951) considers that the two are the same. *C. virgultus* Theo. as the older name, therefore, has priority. The mosquito occurs in Mexico, Central American and adjacent areas, but has been reported only from Texas in the United States. It has been collected primarily along the Texas-Mexico border, and has been considered rare. However, we recently collected large numbers of this species which indicates that it is not so rare as formerly thought (Breland 1954). Relatively little is known of the biology of this species.

*Culex interrogator* D. and K.: *Culex interrogator*, so far as known, is limited in its distribution in the United States to the southeastern Rio Grande valley area of Texas. The larvae have been collected in water with a relatively high organic content such as rain barrels, tree holes and ruts. They have also been collected in seepage areas from irrigation ditches (Thurman, Ogden and Eyles, 1945).

*Aedes bimaculatus* (Coq.): This species has been collected in the United States mostly in the southeastern Rio Grande Valley area of Texas. We have collected

a few larvae, tentatively determined as this species, nearer the central part of the state. In the absence of adults for more positive confirmation, however, we prefer to regard this as a tentative report for the present.

*Deinocerites spanius* (D. and K.): This species was first reported from the United States in 1941 (Fisk, 1941) with the collection of both larvae and adults near Brownsville, Texas. It is apparently confined to the southeastern tip of the state.

A few other species of mosquitoes should be mentioned briefly with respect to their distribution in Texas and the United States.

*Deinocerites epitedeus* Knab was reported by Rueger and Druce (1950) on the basis of a single specimen from a light trap collection near Harlingen, Texas. This specimen is regarded by Carpenter and LaCasse (1955) as an intrusion from Central America, or as a misidentification. Several females of *Psorophora mexicana* (Bellardi) were collected by Joyce (1945) near Brownsville, Texas. So far as could be determined, this is the only time this species has been collected in the United States. Some workers believe that the species was accidentally introduced into Texas by ship or airplane (Carpenter and LaCasse, 1955), and that it probably is not well established in this country.

*Anopheles albimanus* Weid. and *Aedes scapularis* Rondani have been collected in the United States only from Texas and Florida. *Culex coronator* Dyar and Knab was known only from Texas in the United States for many years but it has been recently reported from Arizona (Murphy, 1953).

Until 1948 it was assumed that the subgenus *Neoculex* was represented in the United States by a single species, *Culex apicalis* Adams. Bohart (1948) found that four species were involved in this complex in the United States; *Culex apicalis* as limited in this publication was recorded only from California and Arizona in the United States. We collected larvae of this species from the Big Bend National Park in west Texas in 1953, and in the vicinity

of Alpine and Fort Davis in 1954. Adults were reared so that larval and adult features could be correlated. So far as we know, this is the first time this species has been collected from the state.

The other species to be discussed briefly are mentioned because of certain interesting features other than their distribution.

*Orthopodomyia alba* Baker: This mosquito is of interest for at least two reasons. First, until a short time ago it was considered to be a rare species, and secondly, even today there is no known feature by which the adults of *O. alba* can always be distinguished from those of *O. signifera* (Coq.).

*O. alba* is still regarded as being rare in many areas, but we have collected hundreds of larvae from several localities in central Texas. In this area it is not especially rare, but it has been recovered from only a small percentage of the tree holes that have been investigated.

We have studied hundreds of larvae of both species from this area, and have never found one that is intermediate between the two. This situation indicates to us that the two groups do not interbreed, even though the adults are indistinguishable, and even though the two are often collected from the same tree hole. We thus believe that the two are genetically distinct, and that they should retain full specific rank (Wilkins and Breland, 1951).

We regret to say that as yet we have not completed our project of rearing and studying large series of adults of both groups. The student to whom this problem was assigned was called into the armed forces before he could complete the work. We hope that he will be able to return shortly and finish this work.

*Culex stigmatosoma* Dyar and *Culex thriambus* Dyar: For many years, *C. thriambus* was considered as a synonym and as a subspecies of *C. stigmatosoma*. Galindo and Kelly (1943), however, in studying California specimens, restored *C. thriambus* to full specific rank. Some time ago we undertook a study of these two mosquitoes, since there was still some con-

fusion as to the status of the two groups as found in Texas.

Our studies of these two groups are still incomplete, but there are several things relative to the two that we would like to mention at this time. We have examined hundreds of larvae of the two species and have not found any intergrades. Neither have we found any indications of interbreeding in our studies of the adult females and the male terminalia. So far, however, we have not studied a sufficient number of adults to be sure that the differences we have found will hold for large series. Our present opinion is that the two are separate and distinct in Texas as has been found to be true in certain other areas.

Until our studies of these species had been made, there was some indication that the ranges of *C. thriambus* and *C. stigmatosoma* did not overlap in Texas. On the basis of some collections, *C. stigmatosoma* appeared to be limited to the western tip of the state, and *C. thriambus* more or less confined to the central region. Our collections have not especially changed the known distribution of *C. stigmatosoma*, but that of *C. thriambus* has been considerably modified. We have collected this species in the Big Bend National Park in Brewster County, and on two occasions, near Fort Davis in Jeff Davis County, larvae of *C. thriambus* and *C. stigmatosoma* have been collected from the same body of water. These collections show that *C. thriambus* does occur in west Texas and that its range overlaps that of *C. stigmatosoma*.

In conclusion, one additional point relative to the larvae of *C. stigmatosoma* should be mentioned. Although we have not found any intergradation between the larvae of this species and that of *C. thriambus*, we have found that, in key characters, the larvae of *C. stigmatosoma* vary tremendously. This variation was noted especially in the number and arrangement of the hair tufts of the siphon. If one checks the publications in which the larvae of *C. stigmatosoma* are described, it

will be seen that there is considerable disagreement so far as these particular features are concerned. We have only studied large series of larvae that were collected in Texas, but it is suggested that the tremendous variation of the larvae is the reason for the disagreement in the literature.

The variations noted above are such that they might not be noticed if only a few larvae are examined. The results of the studies of larval variations will be published shortly.

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