

# HOLOCONOPS IN THE WESTERN LAKE ERIE REGION

## (DIPTERA: HELEIDAE)<sup>1</sup>

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In his generic synopsis of Heleidae, Johannsen (1943) listed two Nearctic species in the Leptoconops group, which includes *Holoconops*. Both of these are from the western and southwestern states.

*Leptoconops torrens* Townsend was described from New Mexico as belonging to the genus *Tersesthes*. The first specimens were taken at an elevation of 7000 feet while biting horses, particularly around the eyes (Townsend, 1893). Hoffman (1926) reported and described *L. carteri* from the Sacramento Valley in California. There in late spring and early summer the gnats are vigorous biters, attacking exposed skin or crawling under clothing, and often causing severe itching and swelling. They are reported as being so abundant at times that work in the fields is almost unbearable. Freeborn and Zimmerman (1934) described the male of *L. torrens* and presented evidence indicating that *carteri* is a synonym of *torrens*. They incidentally mention specimens from Texas, thereby extending the known range of the species. Johannsen (1943) also mentions the occurrence of *torrens* in Colorado.

*Holoconops kerteszi* Kieffer was described in 1908 from Egypt. The species was subsequently reported from the mountainous region of Tunis and later from lower altitudes. In his revision of the genus *Leptoconops*, Carter (1921) added a variety, *americanus*, on the basis of specimens from Utah but freely admitted the absence of good distinguishing characters. Later (1934), Freeborn and Zimmerman studied California specimens which seemed to unite *americanus* with the typical *kerteszi*. In California, the species inhabits a district of wind-swept hills, salt marsh, dune, and beach (Freeborn and Zimmerman, 1934). The specimens first collected in Utah were recorded as "biting devilishly" (Carter, 1921).

On a collecting trip in 1942 along the sandy beach of Lake Erie northwest of Lakeside, Ohio, between East Harbor and West Harbor, the writer's attention was suddenly drawn to a minute punky viciously biting his lower arm. Because of its minute size, the specimen was collected separately in a one-dram vial containing grain alcohol. At the time it was thought to be a specimen of *Culicoides*. On examination in the laboratory, however, it was found to belong to the *Leptoconops* group of punkies. The closest described relative was obviously *Holoconops kerteszi*. At first it was thought to be a variant of that species but closer examination revealed differences which seemed too great to be overlooked. It was hoped that additional specimens could be located during widely spaced trips to the area but inasmuch as five years have elapsed without success the specimen is being described as representing a new species.

### *Holoconops catawbae* new species

*Female*.—Head, thorax, and abdomen nearly uniform reddish brown. Thorax unstriped. Antennae, legs, and lamellae somewhat lighter; legs tending to be lightest in metatarsal area. Frons minutely hairy (430X), with a few larger hairs at the level of the upper margin of the eyes. Eyes reniform, naked. Antennal flagellum (Fig. 2) with 11 joints; terminal joint about 2.5 times longer than wide; basal joint pyriform, all others more or less globular. Terminal antennal segment very slightly longer than three preceding segments. Palps (Fig. 1) probably with four joints but basal joint very indistinct; palps therefore appearing to be three-jointed. Ante-

<sup>1</sup>Contribution from the Franz Theodore Stone Laboratory, Put-in-Bay, Ohio.

penultimate palpal joint small, subspherical; penultimate joint elongate pyriform, with conspicuous sensory pit distinctly distad of middle; terminal joint stalked, clavate. All palpal joints with irregular, transverse rows of setulae (430 $\times$ ). Thorax with scattered hairs about as long as those of antennal flagellum. Scutellum with four distinct bristles. Wings (Fig. 5) whitish, the surface covered with microtrichia (100 $\times$ ); macrotrichia absent. Costa undeveloped except perhaps between apices of  $R_1$  and  $R_3$ . Subcostal-radial fusion fairly complete, a longitudinal vein, probably  $R_1$ , dividing the area lengthwise.  $R_5$  (designated a longitudinal fold by some authors) distinct to near wing apex. Anterior branch of media present but indistinct, posterior branch absent. Both branches of cubitus visible but evanescent apically. Halteres pale. Metatarsi moderately spiny; other tarsal joints with a few spines. Tarsal claws equal, simple, and without a basal tooth. Fourth tarsal joint on all legs shorter than fifth. Hind tarsus with proportions as follows: 13-10-5-3-4. Abdomen with minute hairs (215 $\times$ ); longer hairs confined to venter and to terminal segments dorsally. Lamellae (Fig. 3) elongate, hairy. Spermathecae (Fig. 4) lemon-shaped, rounded dorsally but showing short stalks ventrally. A small spermatheca-like body visible just posterior to second spermatheca. Wing length, 0.82 mm. Length of lamellae, 0.14 mm. Total length, including lamellae, 1.2 mm. (as measured before specimen was mounted on a slide).

Holotype female, Lakeside, Ohio, July 8, 1942, M. W. Boesel. Preserved in 95 per cent grain alcohol until 1944; then mounted on a glass slide in balsam. Type in author's collection.

#### KEY TO NEARCTIC SPECIES OF THE LEPTOCONOPS GROUP

1. Antennal flagellum with 13 joints; males. . . . . (2)
1. Antennal flagellum with 11 or 12 joints; females. . . . . (3)
2. Ninth tergite with two short fleshy lobes ventrad of termination, each bearing two long stout bristles; scutellum with six bristles. . . . . *Leptoconops torrens* ♂
2. Ninth tergite with two long finger-like terminal projections, each with a very short inconspicuous bristle near its middle; scutellum with four bristles. . . . . *Holoconops kerteszi* ♂
3. Antennal flagellum with 12 joints; scutellum with six bristles; abdomen brown, distinctly paler than thorax; total length 2.2 mm.; wing length 1.1 mm. . . . . *Leptoconops torrens* ♀
3. Antennal flagellum with 11 joints; scutellum with four bristles. . . . . (4)
4. Penultimate palpal joint with pore near middle; ultimate palpal joint slightly swollen distally; antepenultimate palpal joint elongate, cylindrical, hardly or little wider than succeeding joint; head and thorax black, abdomen dark brown; legs dark brown; veins  $R_5$  and  $M_{1+2}$  convergent apically; total length 1.5-2.1 mm.; wing length 1.1-1.3 mm. . . . . *Holoconops kerteszi* ♀
4. Penultimate palpal joint with pore distinctly distad of middle; ultimate palpal joint stalked, apical two-thirds definitely broadened; antepenultimate palpal joint subspherical, distinctly broader than base of succeeding joint; entire body uncoiled reddish brown; legs light brown; veins  $R_5$  and  $M_{1+2}$  subparallel or slightly divergent apically; total length 1.2 mm.; wing length 0.82 mm. . . . . *Holoconops catawbae* ♀

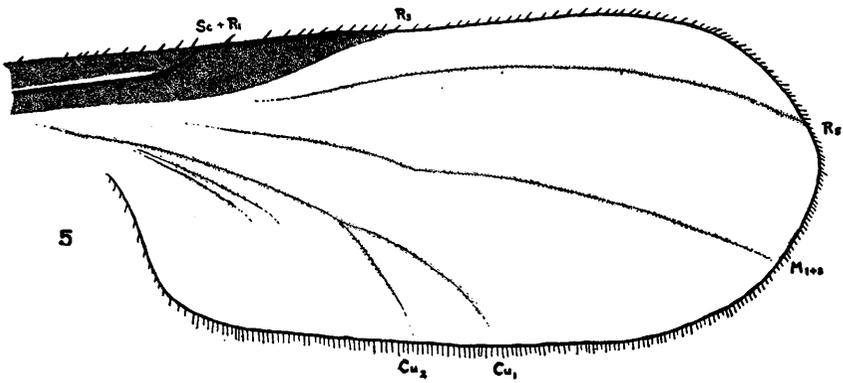
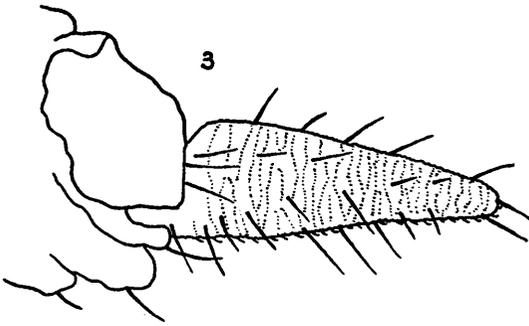
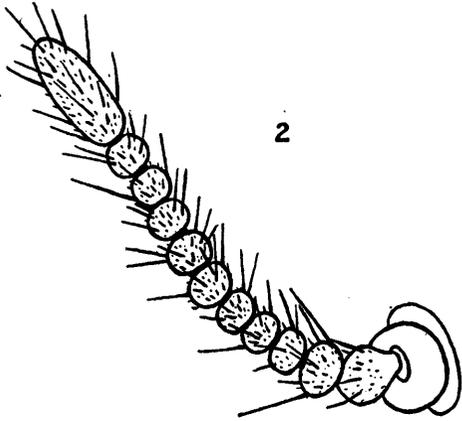
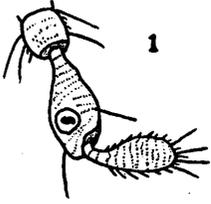
#### DISCUSSION

At first it was considered probable that the specimen collected in Ohio had been carried into the region from the western or southwestern states. There are familiar accounts of small insects being carried great distances in the air. Specifically, Freeborn and Zimmerman (1934) speak of 'black alkali' locations in California which act as foci from which these "black gnats" are blown by winds over large areas. It is interesting but perhaps not too significant to note that a southwest wind with a velocity of 36 miles per hour was recorded for Cleveland

#### EXPLANATION OF PLATE

FIGS. 1-5. Details of *Holoconops catawbae* n. sp., female.

Fig. 1. Palp. Fig. 2. Antenna. Fig. 3. Lamella, lateral view. Fig. 4. Spermathecae, lateral view. Fig. 5. Wing.



on June 30, and a south wind of 40 miles per hour was recorded for the same city on July 3, 1942. In order to have been transported from the nearest recorded locality (Utah) to western Lake Erie, the punky would have had to travel nearly 2000 miles. When the individual was carefully studied and found to differ from *H. kerteszi* in a number of respects, the theory of transmission by air currents or other means seemed much less attractive.

An argument in favor of the conclusion that *Holoconops catawbae* is perhaps breeding sparingly along the shore of Lake Erie is the apparent suitability of the environment for its development. We have little information on the life history of *Holoconops* but Painter (1926) briefly describes larvae of *H. bequaerti* Kieffer which in Honduras are said to be found nearly always burrowing in wet sand mixed with a little humus along the edges of sea or brackish water; the larvae are recorded as often occurring in beach depressions which are wet but not disturbed by waves. The microscopic nature and burrowing habits of the larvae makes their detection most difficult but it is conceivable that they occur on sandy Lake Erie beaches. It should be emphasized, however, that such beaches are comparatively rare in the region in general. Predominantly there are limestone cliffs, shelves, and pebble beaches.

#### SUMMARY

1. A single female of *Holoconops catawbae* n. sp. was collected on a sandy Lake Erie beach in the act of biting viciously.

2. *H. catawbae* differs from its closest known relative, *H. kerteszi*, in the following respects: the last palpal joint is stalked and distinctly clavate, the penultimate joint has the pore distinctly distad of the middle, and the antepenultimate joint is subspherical; the body is reddish brown, the legs light brown; veins  $R_5$  and  $M_{1+2}$  are subparallel or slightly divergent apically; total length 1.2 mm.; wing length 0.82 mm.

3. Suitability of the environment makes it seem possible that *H. catawbae* is breeding to some extent in the Lake Erie region.

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