NEW SPECIES AND SYNONYMY OF FLORIDA *CULICOIDES* (DIPTERA: CERATOPOGONIDAE)[1], [2]

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ABSTRACT

Two new species of biting midges are described from Florida; *Culicoides husseyi* and *C. torreyae*. *Culicoides khalafi* Beck is a junior synonym of *C. debilipalpis* Lutz (new synonymy).

In this paper we describe 2 new species of *Culicoides* Latreille to make the names available for a forthcoming review of the Florida biting midges. We wish to thank Miss Gloria Gordon and Miss Linda Heath for assistance with the drawings.

Antennal ratio (abbreviated AR) is the combined length of the 5 elongated distal flagellomeres (for convenience referred to as segments) divided by the combined length of the 8 shorter preceding "segments." Palpal ratio (PR) is the length of the third palpal segment divided by its greatest breadth. Proboscis/head ratio (P/H Ratio) is the length of the proboscis measured from the distal end of the labrum-epipharynx to the anterior margin of the tormae, divided by the distance measured from the anterior margin of the tormae to the median hair socket between the eyes. Wing length is measured from the basal arculus to the wing tip; costal ratio (CR) is the length of the costa measured from the basal arculus to the tip of the second radial cell (2RC) divided by the wing length.

Culicoides torreyae Wirth and Blanton, new species
(Fig. 1)

Female.—Length of wing 0.80 mm.

Head: Eyes (Fig. 1f) narrowly separated, without interfacetal hairs. Antenna (Fig. 1a) with lengths of flagellar segments in proportion of 22-20-20-20-20-20-20-20-25-28-30-30-45, AR 0.99; distal sensoria present on segments 3, 8-10, two per segment. Palpal segments (Fig. 1b) with lengths in proportion of 12-25-30-12-13, PR 2.3; third segment short and moderately swollen, with a large, irregular sensory area on distal half. Proboscis moderately long, P/H Ratio 0.80; mandible with 18-20 teeth.

Thorax: Brown; scutum with prominent pattern of large dark brown patches. Legs (Fig. 1g) dark brown, knee spots blackish; extreme bases and narrow subapical pale rings pale on fore and mid femora; tibiae with narrow sub-basal pale rings, hind tibia with broad subapical pale ring; hind tibial comb with four spines, the two nearest the spur longest, subequal (Fig. 1d).

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Wing (Fig. 1c): Pattern as figured; dark brown with distinct pattern of small, rounded, pale spots; 2RC dark to tip; pale spot over r-m crossvein moderately large, extending from costal margin to vein M; two sepa-

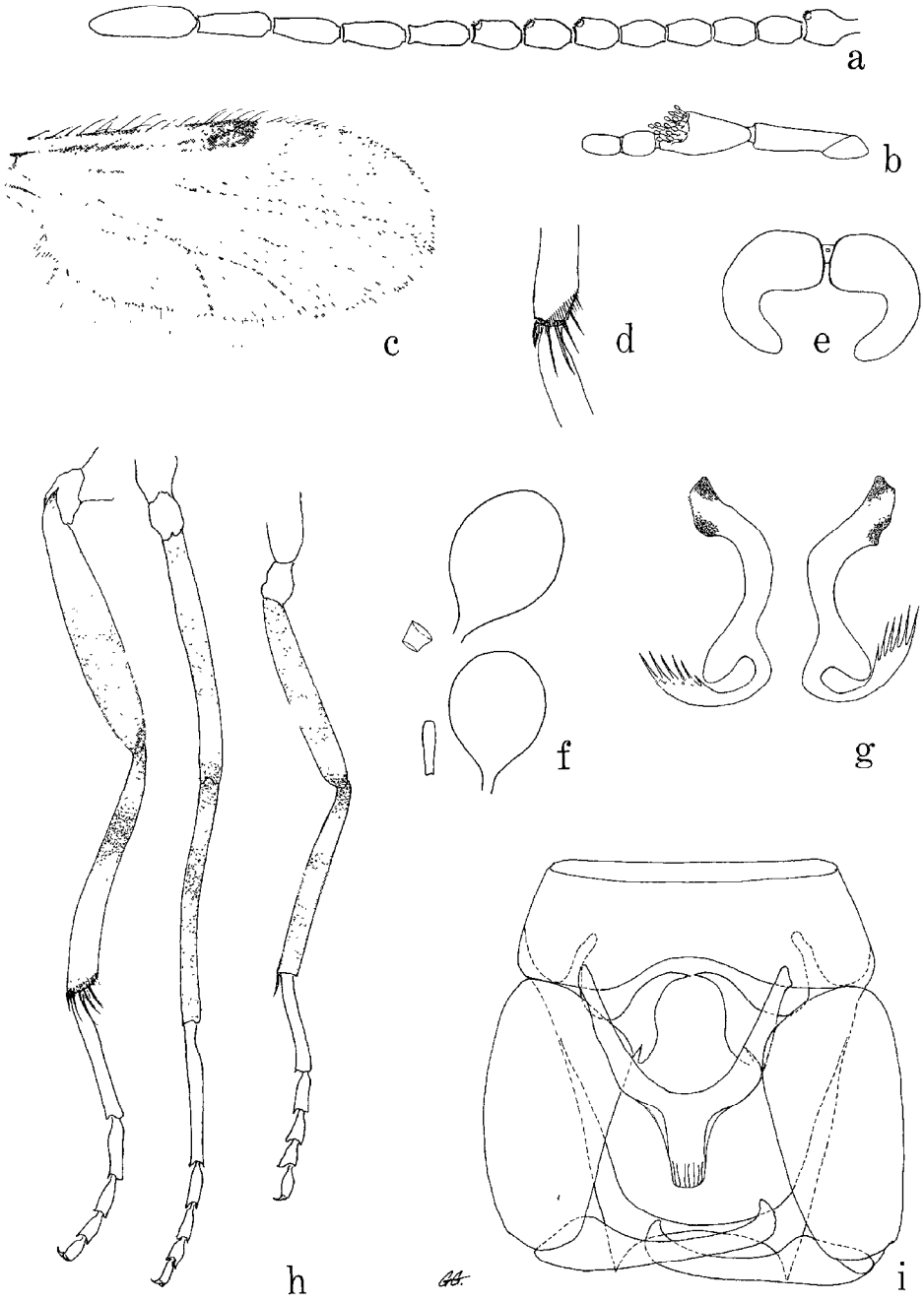

Fig. 1. *Culicoides torreyae* n. sp.; a-g female, h-i male: a, antenna; b, palpus; c, wing; d, hind tibial comb; e, spermathecae; f, eye separation; g, legs; h, parameres; i, genitalia, parameres removed.

rate, small, poststigmatic pale spots in cell R5, the posterior one located slightly proximad of the other; distal pale spot in cell R5 small and rounded, located nearly in middle of distal portion of cell; two oval pale spots in cell M1, the distal one not meeting wing margin; a pale spot at base of wing near basal arculus; cell M2 with an elongate pale spot lying just behind medial fork and a rounded one near wing margin in tip of cell; a round pale spot in midportion of cell M4 near wing margin; anal cell with a pale area near base and a single round pale spot in distal portion. CR 0.59; 2RC moderately short and broad; macrotrichia long and sparse on distal half of wing, in cell M2 not extending proximad of medial fork. Halter with stem and base of knob infuscated.

Abdomen: Dark brown. Spermathecae (Fig. 1e) two plus a rudimentary third and sclerotized ring; the functional ones oval with long, slender necks; subequal, each measuring 0.051 by 0.035 mm.

Male.—Similar to the female with the usual sexual differences; antenna with moderately short plumes; segments 4-12 fused; last three segments with lengths in proportion of 40-30-35; distal sensoria present on 3, 9-12. Genitalia (Fig. 1i): ninth sternum with shallow caudomedian excavation, the ventral membrane bare, not spiculate; ninth tergum short and tapering, with short, pointed, apicolateral processes. Basistyle with ventral root foot-shaped, the posterior "heel" well-developed, the anteromedian "toe" slender; dististyle long and slender, nearly straight, with abruptly bent, slender tip. Aedeagus short and broad, the anterior arms relatively stout and basal arch extending to about half of total length; distal process short and relatively broad with distinctly striated, truncated tip. Parameres (Fig. 1h) each with strong basal knob, proximal portion bent and moderately slender, midportion with a stout ventral lobe, distal portion abruptly narrowed past lobe, drawn out in a flattened, curved blade with slender pointed tip and subapical fringing spines.

Distribution.—Florida.

Types—Holotype, female; allotype, male; Torreya State Park, Liberty Co., Florida, 1 September 1968, F. S. Blanton, light trap (Type no. 70670, USNM). Paratypes, 1 male, 10 females, same data as type; 8 males, 9 females, Rock Springs, Orange Co., Florida, 21 April 1970, W. W. Wirth; 5 males, 18 females, Juniper Springs, Marion Co., Florida, 28 April 1970, W. W. Wirth, light trap.

Discussion.—This species is very similar and closely related to *Culicoides debilipalpis* Lutz (Lutz 1913), which also occurs in Florida, but in *debilipalpis* the eyes are more broadly separated, the palpal pit is small and deep, the pale spot in the distal portion of cell R5 is more transverse, the macrotrichia extend to the base of the wing in cell M2, and the male genitalia are more elongate, with the aedeagus having a high arch and slender tip, while the parameres are longer and more slender with a slender lobe, and the distal spines are not so flattened.

The holotype (female) of *Culicoides khalafi* Beck in the USNM was examined and found to be a synonym of *C. debilipalpis* (NEW SYNONYMY), as confirmed by the presence of a deep palpal pit and the presence of wing macrotrichia to the base of cell M2. Mrs. Beck's (1957 :104) drawing of the male genitalia of *khalafi* resembles the genitalia of *torreyae*, but it was made from an extremely flattened slide preparation and the parts appear to be greatly broadened by distortion.

Culicoides husseyi Wirth and Blanton, new species
(Fig. 2)

Female.—Length of wing 1.20 mm.

Head: Eyes (Fig. 2f) narrowly separated, without interfacetal hairs. Antenna (Fig. 2a) with lengths of flagellar segments in proportion of 30-20-20-20-20-20-20-20-40-40-44-50-67, AR 1.42; distal sensoria present on segments 3,5,7,9,11-15, inconspicuous. Palpal segments (Fig. 2b) with lengths in proportion of 15-43-46-20-20, PR 2.3; third segment short and moderately swollen, with a large, round, shallow sensory pit on distal half of segment. Proboscis moderately long, P/H Ratio 0.72; mandible with 15-18 teeth.

Thorax: Dark brown; scutum without evident pattern in slide-mounted specimens. Legs dark brown, knee spots blackish; tibiae with narrow basal pale rings; hind tibial comb with 4 spines, the second from the spur longest (Fig. 2d).

Wing (Fig. 2c): Pattern as figured; dark brown with only a trace of a pale spot over r-m crossvein and a small pale poststigmatic pale spot at end of 2RC. CR 0.58; 2RC relatively long and narrow; macrotrichia numerous over entire wing except in costal cell, very strong, appearing somewhat bristly. Halter deeply infuscated.

Abdomen: Dark brown. Spermathecae (Fig. 2e) two plus a rudimentary third and sclerotized ring; the functional ones oval without sclerotized necks, relatively large and unequal, measuring 0.070 by 0.052 mm and 0.043 by 0.036 mm.

Male.—Similar to the female with the usual sexual differences; wing macrotrichia scanty on proximal half of wing; pale spots larger over r-m crossvein and at end of 2RC, in addition with indistinct pale areas in front of mediocubital fork, in cell M4, and at tip of anal cell. Antenna with long, moderately dense, light brown plumes; segments 4-12 indistinctly fused; last 3 segments with lengths in proportion of 75-55-63; indistinct distal sensoria present on 3 and 14-15. Genitalia (Fig. 2i): ninth sternum with broad, shallow, caudomedian excavation, the ventral membrane not spiculate; ninth tergum relatively long and tapering with moderately long, pointed, apicolateral processes. Basistyle with foot-shaped ventral root, the posterior "heel" well developed; dorsal root slender; dististyle moderately curved and slender with moderately bent, pointed tip. Aedeagus with basal arch broad and rounded, extending to 0.6 of total length, the basal arms curved and slender; distal portion short, broad at base, tapering to slender, rounded tip. Parameres (Fig. 2h) each with strong basal knob, stem slender and gently curved basally, only slightly sinuate in midportion without ventral lobe, tapering distally to slender pointed tip, and bearing a subapical fringe of small appressed spines.

Distribution.—Florida, Maryland.

Types—Holotype, female; allotype, male; Torreya State Park, Liberty Co., Florida, 22 April 1967, W. W. Wirth, light trap (Type-no. 70671, USNM). Paratypes, 12 males, 45 females, as follows: FLORIDA: Same data as type but some collected in April and May, 1966-1968 by F. S. Blanton and H. V. Weems, 5 males, 9 females. MARYLAND: Snow Hill, Worcester Co., June-July, 1966, 1968, W. H. Anderson, light trap, 7 males, 34 females.

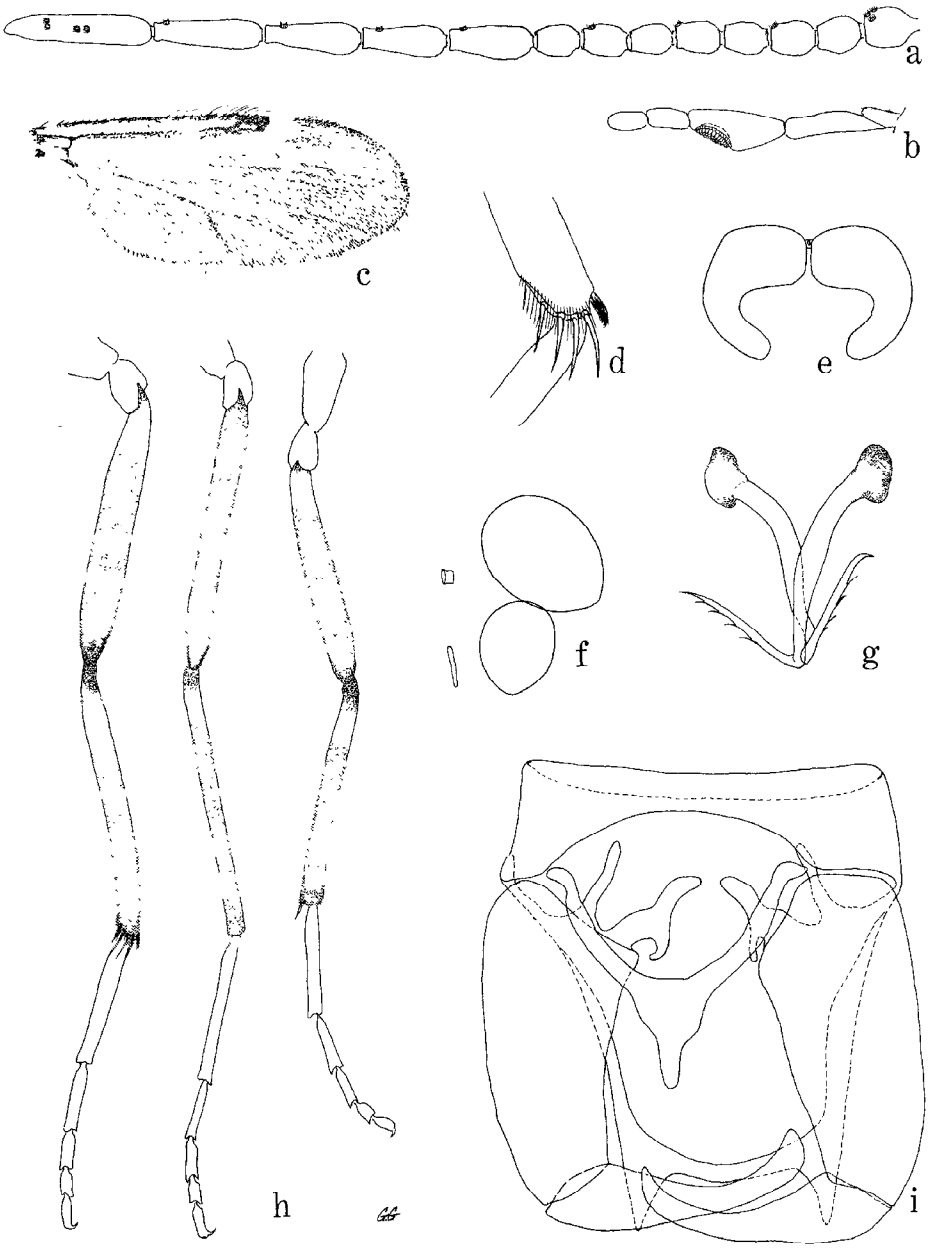

Fig. 2. *Culicoides husseyi* n. sp.; a-g female, h-i male: a, antenna; b, palpus; c, wing; d, hind tibial comb; e, spermathecae; f, eye separation; g, legs; h, parameres; i, genitalia, parameres removed.

Discussion.—Culicoides testudinalis Wirth and Hubert is closely related and very similar to *husseyi*, but generally has a more northerly distribution in the eastern U. S. (Wirth and Hubert 1962). In *testudinalis* the eyes are more broadly separated, the distal antennal segments are not so long and

tapering, the third palpal segment has a much smaller sensory pit, the wing is not so deeply infuscated, the macrotrichia are much finer and not so setiform, and the spermathecae are smaller and less unequal. In the male genitalia the aedeagus of *testudinalis* has the distal process much less tapering, but with almost parallel sides near the tip.

We are honored to dedicate this distinctive Florida species to Dr. Roland F. Hussey, in memory of his distinguished and dedicated career as a systematic entomologist at the University of Florida.

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