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Stephen W. Taber
Saginaw Valley State University

Scott B. Fleenor

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**A NEW BOT FLY SPECIES (DIPTERA: OESTRIDAE)
FROM CENTRAL TEXAS**

Stephen W. Taber¹ and Scott B. Fleenor²

ABSTRACT

The bot fly *Cephenemyia albina* (Diptera: Oestridae) is described from a relict pine forest in east-central Texas. This species presumably lives as a parasitic larva in the throat of white-tailed deer as do its two close relatives previously reported from both Texas and the Great Lakes region (*C. phobifera* (Clark) and *C. jellisoni* Townsend). Only the adult male is currently known.

While continuing a biodiversity survey in The Lost Pines forest of east-central Texas on 17 April 2004, we encountered a bee-like fly perched on Virginia broom sedge grass, *Andropogon virginicus* L., at the edge of an ephemeral pond. The time was late afternoon and the weather conditions were warm and shifting between cloudy and partly cloudy. We had previously discussed our failure to encounter any bot fly during years of study in the forests and wetlands of central Texas, and our initial impression that one had finally been sighted was confirmed after the specimen was swept from the grass, transferred into a vial, and identified to family and genus level with the aid of hand lens and literature (Wood 1987). Consultation of the key to Nearctic *Cephenemyia* species indicated that the fly cannot be referred to any of the five known species (Aldrich 1915, Hunter 1915, Townsend 1941, Bennett and Sabrosky 1962, Cole 1969), nor to any of the four Palearctic species (Zumpt 1956, 1965; Grunin 1966). The genus as currently understood comprises a mere eight taxa, one of these occurring in both the Nearctic and Palearctic regions. The status of a ninth is uncertain because it was described from the larval stage only (see Bennett and Sabrosky 1962).

Cephenemyia flies are known as “deer nose bots” because the larval stage parasitizes the pharyngeal region of members of the deer family in both the Old and New World. For some time it was believed that hovering females squirt larvae into the nasal passages of the host but there is reason to believe that they squirt the maggots onto the muzzle instead, where the tiny inhabitants of the “larval packet” begin “questing and crawling” until they enter via the mouth, not the nose (Cogley and Anderson 1981).

Cephenemyia albina Taber and Fleenor, new species

Description. Holotype male (Figs. 1, 2). Head: length 4.0 mm, width 6.0 mm, mouthparts concealed; scape reniform, covered with fine gray and brown pruinosity and bearing yellowish-white setae; pedicel fan or wedge-shaped, covered with gray and brown pruinosity and numerous yellowish-white setae surrounding a single dark seta located in the central disc of the segment; segment III reniform, devoid of setae, covered with gray pruinosity, the arista reddish brown near base but pale translucent throughout the remainder of its length; ground color of face black but mostly covered by silvery gray pruinosity, clothed with yellowish-white setae varying from erect to recumbent. Thorax: clad entirely in yellowish-white setae varying from erect to recumbent except for a small patch

¹Biology Department, Saginaw Valley State University, 7400 Bay Road, University Center, Michigan 48710.

²305 W. 35th Street #204, Austin, Texas 78705-1443.



Figure 1. *Cephenemyia albina*; male holotype, left lateral view.

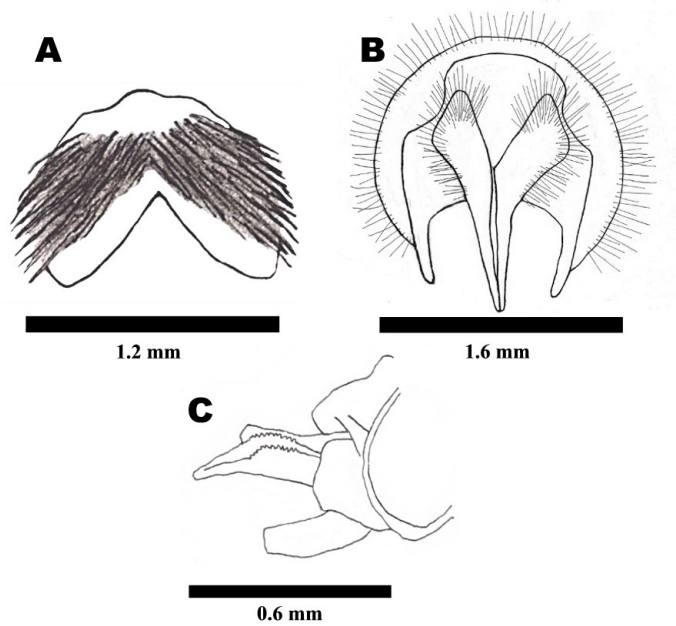


Figure 2. *Cephenemyia albina*, male holotype: (A) ventral view of sternite 5; (B) genital capsule; (C) aedeagus.

of black setae above the insertion of each wing; wing length 11.0 mm, the anterior half lightly infuscated with smoky brown except for the apical portion, the remainder of the wing hyaline; haltere dark brown; legs black except for tarsi which are only a little lighter in color, all femora with basal tuft of yellowish-white setae, tufts thickest on fore-femur and sparsest on hind-femur, distal portion of each femur with black setae, these also strongest on the front legs and weakest on the hind legs, tibia bearing mostly black setae but no tufts of any color. Abdomen: ground color of abdominal tergites black, dorsum and sides of all tergites covered with yellowish-white setae, no black bands, tufts, or streaks of any kind or size. Total body length 16.0 mm. The holotype will be deposited in the entomological collection of Texas A&M University, College Station, Texas (TAMU). The paratypes will be deposited in the entomological collection of Saginaw Valley State University, University Center, Michigan (SVSU).

Paratype males. Head: lengths 3.8 mm, 3.5 mm, 3.8 mm; widths 5.0 mm, 5.5 mm, 5.2 mm. Wing: lengths 11.5 mm, 11.0 mm, 12.0 mm. Total body lengths 15.0 mm, 15.0 mm, 14.5 mm. Coloration similar to the holotype except that due to the conditions of live capture in the confinement of a Malaise trap that was checked once per week, many of the dorsal abdominal setae were rubbed away and are thus missing.

Type Material. HOLOTYPE. Adult male, Bastrop State Park, Bastrop Co., TX, 17-IV-2004, S. W. Taber and S. B. Fleenor, (TAMU). PARATYPES. Three adult males, Bastrop State Park, Bastrop Co., TX, 26-IV-2003, S. W. Taber and S. B. Fleenor, Saginaw Valley State University Insect Collection, University Center, Michigan.

Distribution. The new species is known only from the Lost Pines forest of east-central Texas, a relict ecosystem characterized by oaks, loblolly pines, and sandy, acidic soil.

Biology. Both the female and the larval stages of *C. albina* remain to be discovered and the biology is unknown except through solid inferences drawn from knowledge of its congeners. However, the female sex is more difficult to find under wild conditions than the holotype male that we stumbled upon and the three paratypes caught by a Malaise trap in our absence. This appears to be the first report of deer bot fly capture by this method. The maggot is almost certainly a parasite of the white-tailed deer, *Odocoileus virginianus* Zimmermann, developing through three larval instars within the mammal's pharynx and throat pouches before escaping through the nostrils to pupate in soil (Bennett and Sabrosky 1962).

Both anonymous reviewers remarked that the capture of the holotype male at the edge of a pond is a notable event because males are typically encountered at summits and other high elevations rather than at low elevations. The elevation of both capture sites was 171 meters despite the fact that these sites are separated by 0.5 km of widely-varying relief. We found one "scrape" at the pond locality, a spot where a male white-tailed deer marked its territory with scratches in the soil and with secretions from its scent glands. The fly was swept from grass only a few meters away. One reviewer noted that the late afternoon encounter of the holotype was also unusual because the activity time for males is typically late morning to early afternoon. Its capture and significance stimulated the perusal of our accumulated Lost Pines material and only then did we discover the three males that were caught in our Malaise trap one year earlier.

Etymology. the specific epithet *albina* refers to the light coloration of the species, lighter than any of its Nearctic congeners.

Diagnosis. Thoracic mesonotum lacking transverse band of black hairs (Fig. 1); Dorsum and sides of abdomen covered by yellowish-white hairs with no black hairs interspersed among them; Arista pale, nearly translucent.

Remarks. The *Diagnosis* presented above will distinguish *Cephenemyia albina* from all of its congeners in the Nearctic and apparently from its Palearctic congeners as well. Its closest relative is assumed to be *Cephenemyia phobifera* (Clark) because these two species are the only members of the genus either confined or nearly confined to the eastern United States, a distribution shared by most of the animals and plants of the Lost Pines (Taber and Fleenor 2003). However, the dorsum and sides of the abdomen of *C. phobifera* are clothed entirely in black setae, or at most with only a few reddish or yellow hairs in this region of the body (Bennett and Sabrosky 1962). The opposite condition obtains for *C. albina* which is clothed entirely in yellowish-white in these same areas. Furthermore, the arista of all other *Cephenemyia* species, both Nearctic and Palearctic, is described as black or of various shades of brown except for *C. apicata* Bennett and Sabrosky and *C. pratti* Hunter which have a reddish-yellow arista (Bennett and Sabrosky 1962), whereas the arista of the new species is much lighter even than these two. It is pale and translucent throughout most of its length. *Cephenemyia apicata* Bennett and Sabrosky and *C. pratti* differ from *C. albina* even more obviously, as do *C. jellisoni* Townsend and *C. trompe* (Modeer), by the possession of a transverse band of black setae on the mesonotum. In the New World only *C. phobifera* and the new species lack a black band on the mesonotum.

DISCUSSION

The unknown larvae might be discovered by dissecting road-killed deer (Bennett 1962), females might be discovered by observing deer confined to enclosures (Anderson 1975), and adults of both sexes, including the unknown female, might be secured in numbers if a mating site is located (Catts 1964). If our males were indeed captured at such sites, then the low elevations and low relief would be remarkable according to what is currently known about mating site preferences. The patch of grass where the holotype rested only a few feet away from a pond was located in lowland, not on high ground where "hill-topping" behavior is known to draw potential mates together. Its wings were ragged, suggesting that it had eclosed some time before its 17 April capture. Perhaps it had been searching for females that search in turn for white-tailed deer whose tracks in the mud identified the pond as a watering hole for the parasite's host (Golini et al. 1968, Anderson 1975).

The Lost Pines forest is well-disposed for the discovery of new species because it is a relict of an ancient ice age expansion that brought the flora and fauna of the southeastern United States to central Texas before warming trends forced a general retreat except in those few regions where sandy, water-retaining soil allowed colonists to survive. Here in such an ecosystem we discovered the Texas long-lipped beetle (*Telegeusis texensis* Fleenor and Taber), a new species of a family never before recorded from Texas (Fleenor and Taber 2001, Taber and Fleenor 2003). Several years earlier we encountered a huge population of the rare "Texas beetle" itself (*Brachypsectra fulva* LeConte), as well as the first female of that species known to science (Fleenor and Taber 1999, 2000).

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