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Immature stages of some eastern Nearctic Tabanidae (Diptera). IX. C*hrysops beameri* Brennan and *Hybomitra trispila* (Wiedemann)

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Immature stages of some eastern Nearctic Tabanidae (Diptera). IX. C*hrysops beameri* Brennan and *Hybomitra trispila* (Wiedemann)

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Abstract. The larvae and pupae of two species of Tabanidae (Diptera), *Chrysops beameri* Brennan and *Hybomitra trispila* (Wiedemann), are described and illustrated, and their similarities and differences relative to similar species are discussed. Comments are also provided on the larval habitats and the other species of immature Tabanidae associated with larvae of each species.

Resumen. Las larvas y pupas de dos especies de Tabanidae (Diptera), Chrysops beameri Brennan y Hybomitra trispila (Wiedemann), se describen e ilustran, y sus similitudes y diferencias con respecto a otras especies similares se discuten. Los comentarios son además, en el hábitat de las larvas y de las otras especies de Tabanidae inmaduros asociados con larvas de cada especie.

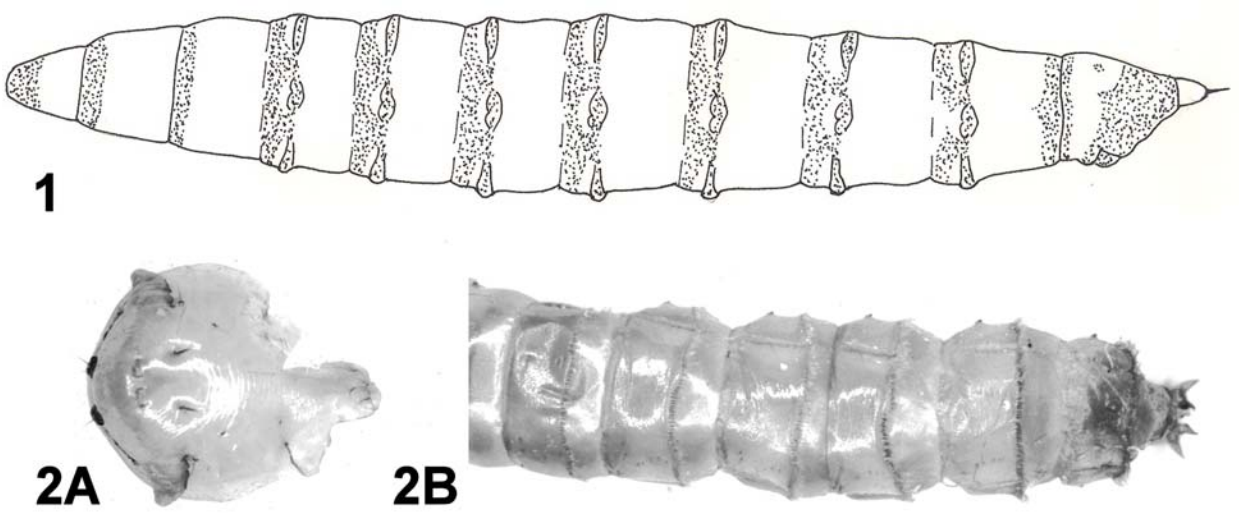
Introduction

Since early in 2000, more than 600 horse and deer fly larvae (Diptera: Tabanidae) have been collected in Texas and returned to the laboratory for rearing. Collecting and rearing techniques were essentially the same as those reported by several authors including Teskey (1969), Burger (1977), and Goodwin and Drees (1996).

Adults were obtained from approximately 40% of the larvae collected. The adults represented 29 species in seven genera, 12 species of *Chrysops* Meigen, 12 species of *Tabanus* Linnaeus, 2 species of *Hybomitra* Enderlein, and one species each of *Chlorotabanus* Lutz, *Leucotabanus* Lutz, and *Merycomyia* Johnson. The larvae and pupae of all but two of these species have been described previously. Descriptions of the larvae and pupae of the remaining two, *Chrysops beameri* Brennan and *Hybomitra trispila* (Wiedemann), are presented below.

Chrysops beameri Brennan

Mature larva (Fig. 1). Body pale yellowish; 12-14 mm long; with stigmatal spine. Head capsule length 1.4±0.05 mm; greatest width about 0.36 mm. Larval exuvium with area on each abdominal segment anterior to ring of pseudopodia with a semi-opaque, faint brownish cast that contrasts rather noticeably with adjacent areas of transparent colorless integument. Striations present on all non-pubescent aspects of body other than above-mentioned areas anterior to pseudopodia on abdominal segments, except on segments 9-10 where a few striae are visible immediately in front of lateral pseudopodia; striae more widely spaced dorsally and ventrally on segments than laterally and more widely spaced on meso- and meta-thorax than corresponding aspects of abdominal segments. Pubescence pale, more readily visible on anal segment. Anterior pubescence encircling segments 1-8, absent laterally on segment 9, and restricted to dorsal or dorsolateral, ventrolateral, and midventral patch on segment 10; prothoracic annulus broad, covering about one-half of segment laterally; meso- and meta-thoracic annuli without caudal projections, covering about 1/3 and 1/4 of segments; laterally; annuli on segments 4-8 relatively wide with the only narrow clear areas between them and pseudopodia. Posterior pubescence encircling anal and preanal segments and restricted to lateral margins on segment 9; posterior annulus of preanal segment with blunt anterior projection laterally, annulus on anal segment covering between one-half and two-thirds of segment dorsally and broadly joining pubescence of anal ridges ventrally, its anterior margin with a configuration as in Fig. 1, the semi-detached patch shown laterally may be fully detached from, or more



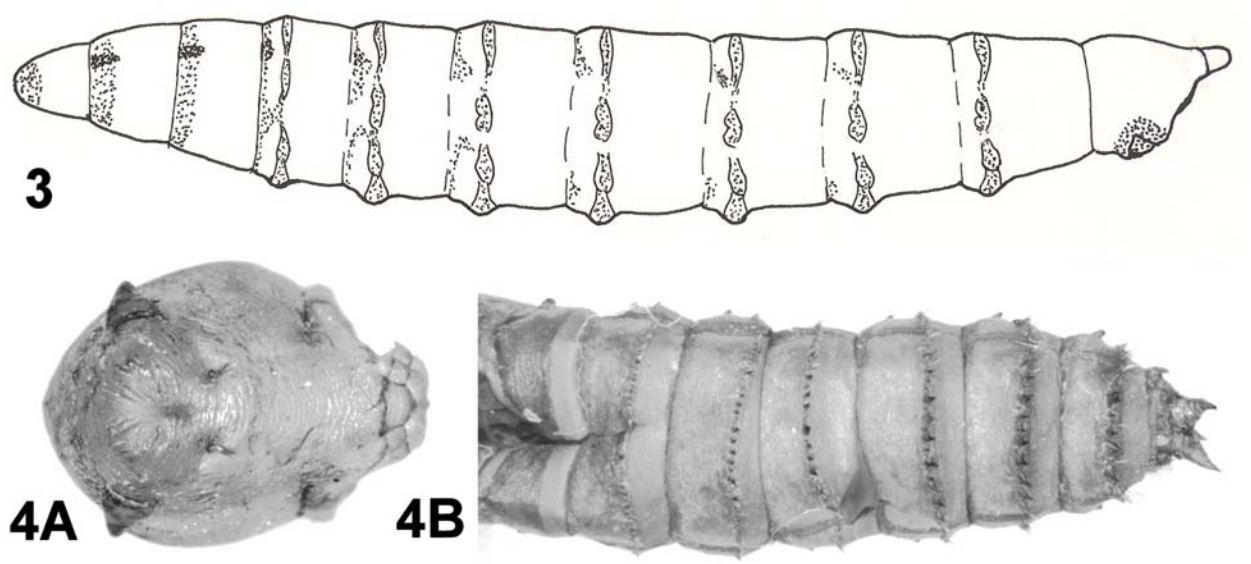
Figures 1-2. *Chrysops beameri*. **1)** Illustration of the pubescence pattern of in lateral view. **2).** Images of the pupa: **A**. ventral view of frontal plate; **B.** dorsal view of posterior segments of abdomen.

broadly joined to, posterior annulus in other specimens. Anal segment with additional pairs of small circular patches of pubescence near anterior margin dorsally and laterally.

Pupa (Fig. 2A-2B). Body 9.5-10.5 mm long. Color uniformly pale yellowish brown although mid-vertex and anterior dorsal thoracic spot often faintly darker. Antennal ridges sharply crested, each partially or almost entirely divided sublaterally; median portion elevated 0.08-0.09 mm above median cleft, usually skewed medially; outer portion less than half height of median portion. Callus tubercles elevated approximately 0.05 mm, strongly shriveled in appearance. Antennal sheaths slightly surpassing epicranial suture. Prominent grooves extending from upper basal angle of antennal sheaths to callus tubercles. Vertical and orbital setae on small tubercles. Thoracic spiracles 0.32-0.35 mm long, usually more abruptly bent near posterior third; mounted on spiracular prominences that extend anteriorly beyond dorsal margin of thorax up to 0.1 mm. Prealar setae paired. Spinous fringes present on all aspects of abdominal segments 2-7; all spines attenuate. Fringe of tergum 7 with 21-28 spines.

Collections. All larvae of *C. beameri* were found at the same location in the wetlands on the northeastern corner of Jarvis Christian College, Hawkins, Wood County, Texas (32.5904444, -95.1738888). The single collecting site is a wet area adjacent to a small stream created by the outfall from a metal culvert passing under the dam encircling a small manmade stock pond. This pond receives, in addition of precipitation and surface runoff, a continuous input of 45-60 liters per minute from the 'artesian' flow of an abandoned well. This constant input from the abandoned well causes the pond to overflow through the culvert, even in most dry periods, into the area where the larvae were collected. Due to 'artesian' inflow, the pond water and the water below the culvert are generally several degrees cooler than both standing and flowing water in other nearby standing and flowing water. The area where the larvae were found is a combination of wet, silty, highly organic 'muck' around the roots of aquatic vegetation (water pennywort, *Hydrocotyle spp.*). The area of collection remains wet year round, although the rate of flow varies depending on amount of recent rainfall. Other species of Tabanidae found in association included *Merycomyia whitneyi* (Johnson), *Chrysops celatus* Pechuman, *C. cincticornis* Walker, *C. upsilon* Philip, *C. vittatus* Wiedemann, *Tabanus nigrescens* Palisot, *T. petiolatus* Hine, *T. pumilus* Macquart, and *T. trimaculatus* Palisot.

Comments. In the key to larvae of *Chrysops* Meigen presented by Teskey, (1969), larvae of *C. beameri* key to the first choice in couplet 3. In Teskey's key the first choice leads to couplet 4 which separates *C.*



Figures 3-4. *Hybomitra trispila*. **3)** Illustration of the pubescence pattern of in lateral view. **4)** Images of the pupa: **A**. ventral view of frontal plate; **B**. dorsal view of posterior segments of abdomen.

niger Macquart and *C. calvus* Pechuman and Teskey. Below couplets 3 and 4 of Teskey's key, less his references to figures, are modified to include *C. beameri* by inserting a new couplet 4.

3. Anterior pubescent annuli on pro- and meso- thorax wide, covering approximately 1/2 and 1/3 length of segments, respectively. All thoracic annuli lack posterior pubescent projections **4**
— Anterior pubescent annuli on thoracic segments narrower and with ..... posterior pubescent projections laterally **6**

4(3). Pubescence present and relatively distinct on anterior of first seven abdominal segments and also encircling anterior of anal segment ..... ***C. beameri* Brennan**
— If pubescence is present on first seven abdominal segments, it is very pale, and anal segment lacks anterior pubescence **5**

5(4). Pubescence present, though very pale, on anterior of first seven abdominal segments .... ***C. niger* Macquart**
— Pubescence absent from first seven abdominal segments .... ***C. calvus* Pechuman and Teskey**

Pupae of *C. beameri* would key to *C. macquarti* Philip in couplet 16 of Teskey's key to pupae of *Chrysops*. If a new couplet was added to Teskey's key, because the pupae of the two species are so similar, the only point of separation found was that the callus tubercles of *C. beameri* are elevated 0.05 mm or less and those of *C. macquarti* are elevated about 0.08 mm.

The specimens on which the above descriptions are based are deposited in the Florida State Collection of Arthropods, Gainesville, FL.

Hybomitra trispila (Wiedemann)

Mature larva (Fig. 3). Body pale brown or beige; 24-28 mm long; stocky. Head capsule length 3.0-3.8 mm, greatest width 0.8-0.9 mm. Anal segment swollen. Respiratory siphon relatively small and somewhat conical; length 0.5-0.7 mm, about equal to its basal diameter. Tracheal trunks slender and gradually tapered anteriorly; diameter of each in preanal segment about 0.4 mm. Striations prominent; present on usual aspects of all segments; spaced approximately 0.08 mm dorsally and ventrally and 0.06 mm laterally on prothorax, progressively narrower on successive thoracic segments to 0.05 mm dorsally and

ventrally and 0.04 mm laterally on first seven abdominal segments, widening to 0.06 mm on all median aspects of anal segment. Anterior pubescence encircling prothorax, narrowly absent mid-dorsally and ventrally from meso- and meta-thorax, forming progressively smaller bands or patches on dorsal or dorsolateral surfaces of first three or four abdominal segments and ventral surfaces of first five abdominal segments; thoracic pubescence dark, especially on meso- and meta-thorax above dorsolateral furrows. Posterior pubescence, if present, restricted to faint area at end of anal segment.

Pupa (Fig. 4A-4B). Body 18-23 mm long; uniformly pale yellowish-brown to brown. Antennal ridges small to moderate in size with rounded crests; elevated about 0.1 mm. Frontal ridges absent. Callus tubercles very small to absent. Vertical and orbital tubercles minute or absent. Antennal sheaths relatively smooth or annulated; about 0.5 mm long and broad; reaching epicranial suture only in females. Thoracic spiracles 0.5-0.6 mm long and broad; evenly bowed or with posterior arm somewhat straightened; not exceeding anterior dorsal margin of thorax. Abdominal fringes traversing usual sclerites; essentially uniseriate on anterior sternites; biseriate elsewhere. Spines of anterior series very small on sternites, pleurites, and lateral portions of tergites; very stout and comprising bulk of spination medially on tergites, the larger spines here at least 0.13 mm broad. Posterior spines long and slender; restricted on each tergite to a submedian pair and several lateral pairs. Tergum 7 with 24-36 spines, the longer about 0.6 mm. Dorsal and sometimes lateral preanal combs reduced. Dorsal, lateral, and ventral tubercles of aster approximately 0.3, 0.7, and 0.25 mm long, respectively; dorsal and lateral pair strongly inclined dorsally, often at nearly the same angle.

Collections. All larvae of *H. trispila* were found at Holly Lake Ranch, Wood County, Texas near the west shore of the Clear Creek branch of Greenbrier Lake (32.728667, -95.185667). The collecting site is a hillside seepage area about 20 m long and 10 m. wide with a small stream about 0.5 m wide flowing through the seepage area. At the time of collection, the seepage area was a combination of wet, silty sand mixed with considerable decomposing organic material and was relatively flat even though the stream sloped gradually toward Greenbrier Lake about 40 m. downstream. Although the seepage area is usually wet year round, but the extent of the wet surface area varies depending on amount of recent rainfall. Other species of Tabanidae found in association included *Chrysops brimleyi* Hine, *C. geminatus* Wiedemann, *C. pikei* Whitney, *Tabanus atratus* Fabricius, *T. petiolatus*, and *T. trimaculatus*.

Comments. In the key to larvae of *Hybomitra* Enderlein presented in Teskey (1969) larvae of *H. trispila* would key to the second half of the final couplet, couplet 17, which identifies pupae of *H. trispila* subspecies *sodalis* (Williston). *Hybomitra sodalis* is now afforded specific rank. If an additional couplet was written, it could only note that the only difference between the larvae of these two species is that the anterior pubescence narrowly encircles the first abdominal segment in *H. trispila* whereas it is absent laterally in *H. sodalis*.

In Teskey's key to pupae of *Hybomitra*, pupae of *H. trispila* would also key to those of *H. sodalis* (Teskey's couplet 12), and no characters have been found that will separate the pupae of these two species.

The specimens on which the above descriptions are based are deposited in the Florida State Collection of Arthropods, Gainesville, FL.

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