

**The Immature Stages of *Paratendipes basidens* Townes
(Diptera: Chironomidae: Chironominae)**

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ABSTRACT: The larva and pupa of *Paratendipes basidens* Townes, 1945 are described based on material from Kansas and Florida. Data are also given concerning the species' biology.

Identification of chironomid larvae is often hampered by incomplete knowledge of the other life stages. Most species concepts in the Chironomidae have been based on characters of the adult male; thus it is often not possible to put an accurate species name on even distinctive larvae without first associating the immature stages with a previously described adult male. A case in point is that concerning the larva of *Paratendipes basidens* Townes, 1945. This larva has been known by several informal names: *Stenochironomus* sp. a (Roback, 1953:120); *Paratendipes* sp. (Mason, 1973:58) and *Paratendipes* "connectens" group in Hudson et al. (1990:36). The larva was briefly illustrated and discussed as *P. basidens* in Epler (1992:7.86). A similar larva is known from the Palearctic: *Paratendipes* "connectens No. 3" Lipina, 1926 [= *P. rheophilus* Chernovskii, 1949:165; listed as a *nomen dubium* for the Chironomini in Ashe and Cranston (1991)]. *Paratendipes basidens* is not recorded from the Palearctic, and at present the identity of the Palearctic larva remains unknown.

Townes (1945) described *P. basidens* from adults collected in New Jersey and Iowa; Dendy and Sublette (1959:53) recorded the species from Alabama. The junior author was successful in associating the immature stages of *P. basidens* from the Kansas River near Bonner Springs, Johnson Co., Kansas. Unassociated larval and pupal material from Florida in the senior author's collection was compared with the Kansas specimens and deemed to be conspecific. Adults from Kansas were compared with material (including the holotype) in the American Entomological Institute, Gainesville, FL.

While the distinctive larva has been known to benthic biologists, the equally distinctive pupa has remained unrecognized. The pupa differs from the generic diagnosis offered in Pinder and Reiss (1986) in the following (*P. basidens* in parentheses): frontal setae present (not evident, or absent); intersegmental conjunctiva III/IV and IV/V with continuous band of shagreen (no intersegmental shagreen); tergite VIII with 4 lateral lamellar setae (5 setae). Pinder and Reiss (1986:fig. 10.58) illustrate a pupa designated as ?*Paratendipes* sp. with a dorsal shagreen pattern similar to *P. basidens*, but the pupa illustrated has frontal setae, intersegmental shagreen and 4 lateral lamellar setae on tergite VIII.

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The following descriptions are based on associated specimens from Kansas and unassociated specimens from Florida. Kansas material is listed first, with Florida specimen data in brackets. All measurements are in μm unless noted. Abbreviations follow Epler (1988).

PUPA: $n = 1$ [1].

Color: Exuviae pale gray to colorless; anal comb yellowish.

Length: Total 4.58 [4.03] mm. Cephalothorax 1.25 [1.25] mm. Abdomen 3.33 [2.78] mm.

Cephalothorax: Cephalic tubercles absent; frontal setae not evident, or absent; a pair of conical warts present at base of antennal sheath (Fig. 1B). Thorax with a dorsomedial group of tubercles/blunt spines; 2 precorneal, 2(?) anteprenotal setae; Dc_1 adjacent to Dc_2 ; Dc_3 adjacent to Dc_4 . Thoracic horn apparently with 6 branches; base with single circular/oval tracheal bundle (Fig. 1C).

Abdomen (Fig. 1A): Shagreen: Sternite I with a few scattered weak spinules; S II with numerous fine spinules; S III and IV with a few fine spinules posteriorly (fewer than on S II); S V–VII with a rectangular pattern of short spinules, S VII with fewer spinules than V or VI; S VIII bare. Tergite I without shagreen; T II–V with rectangular area of coarse spinules; T VI with shagreen area shaped roughly like a broad X; T VII and VIII with a pair of small oval/elliptical anterolateral areas with fine spinules; anal lobe bare. Lateral setae: T I without lateral setae; T II–IV with 3 lateral setae; T V with 4 [3] lateral lamellar setae; T VI–VII with 4 lateral lamellar setae; T VIII with 5 lateral lamellar setae. Anal lobes with uniserial fringe of 46/48 [36] setae; a single pair of dorsal setae present. Well developed pedes spurii B on segment II; moderately developed pedes spurii A on S IV, much weaker on S V. Posterior hook row of T II with 20 [17] weak hooklets. Intersegmental conjunctiva III/IV and IV/V without spinules. Anal comb a cluster of 5–10 large spines with smaller basal spines (Fig. 1D).

FOURTH INSTAR LARVA: $n = 2$ [2].

Color: Head capsule pale yellow.

Head: Postmentum length 88 [108–115]. Dorsum of head with anteriorly widened frontoclypeal apotome, anterior margin convex (Fig. 2B). SI setae plumose, basal rings touching (Fig. 2C). Pecten epipharyngis consisting of three subtriangular spines on small basal sclerotized ridge (Fig. 3C). Premandible with 2 apical teeth; 58–65 [70–77] long (Fig. 3B), and with weak inner brush of fine setae. Mandible (Fig. 2E) length 88–90 [120–128]; with 1 dorsal tooth, 1 apical tooth and 2 inner teeth. Pecten mandibularis with 4–5 setae. Seta subdentalis simple, 20 (1) [26 (1)] long. Mentum (Fig. 2A) with 16 teeth; with 4 median teeth, central 2 median teeth higher than outer median teeth; first lateral teeth lower than median teeth and second lateral teeth; second lateral teeth higher than remaining teeth. Mentum width 67–70 [83–89]; width of 4 median teeth 12–13 [15]. Ventromental plates with numerous small striae visible in central portion of plate and with larger markings near lateral margin; 118 (1) [150 (1)] wide, 30–32 [44 (1)] long; IPD 45 [50 (1)]. Setae submenti simple, [54–72] long. Antenna (Fig. 2D) with 6 segments, with alternate Lauterborn organs apically on segments 2 and 3; length of segments 1–6: 50 [53–55]; 14 [16 (1)]; 18–19 [19 (1)]; 12–14 [15 (1)]; 7 [8 (1)]; 6–7 [7 (1)]. AR 0.74–0.79 [0.81 (1)]. Antennal blade 50–56 long; extends to segment 5; accessory blade 8–9 long; style at apex of segment 3, 10 [11 (1)] long. Foramen occipitale large and displaced anteroventrally (Fig. 3A).

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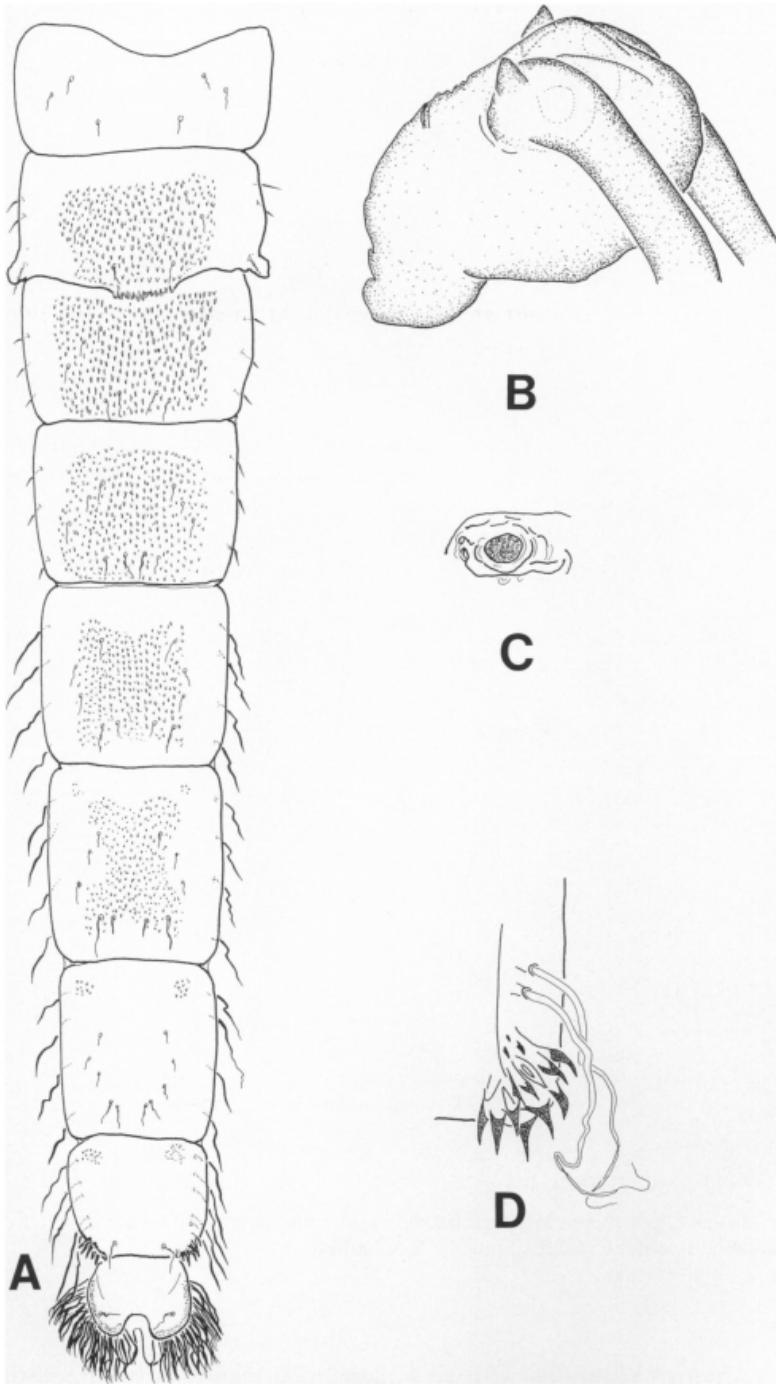


Fig. 1. *Paratendipes basidens* pupal structures. A. dorsum of abdomen; B. slightly oblique lateral view of head; C. thoracic horn base; D. anal comb.

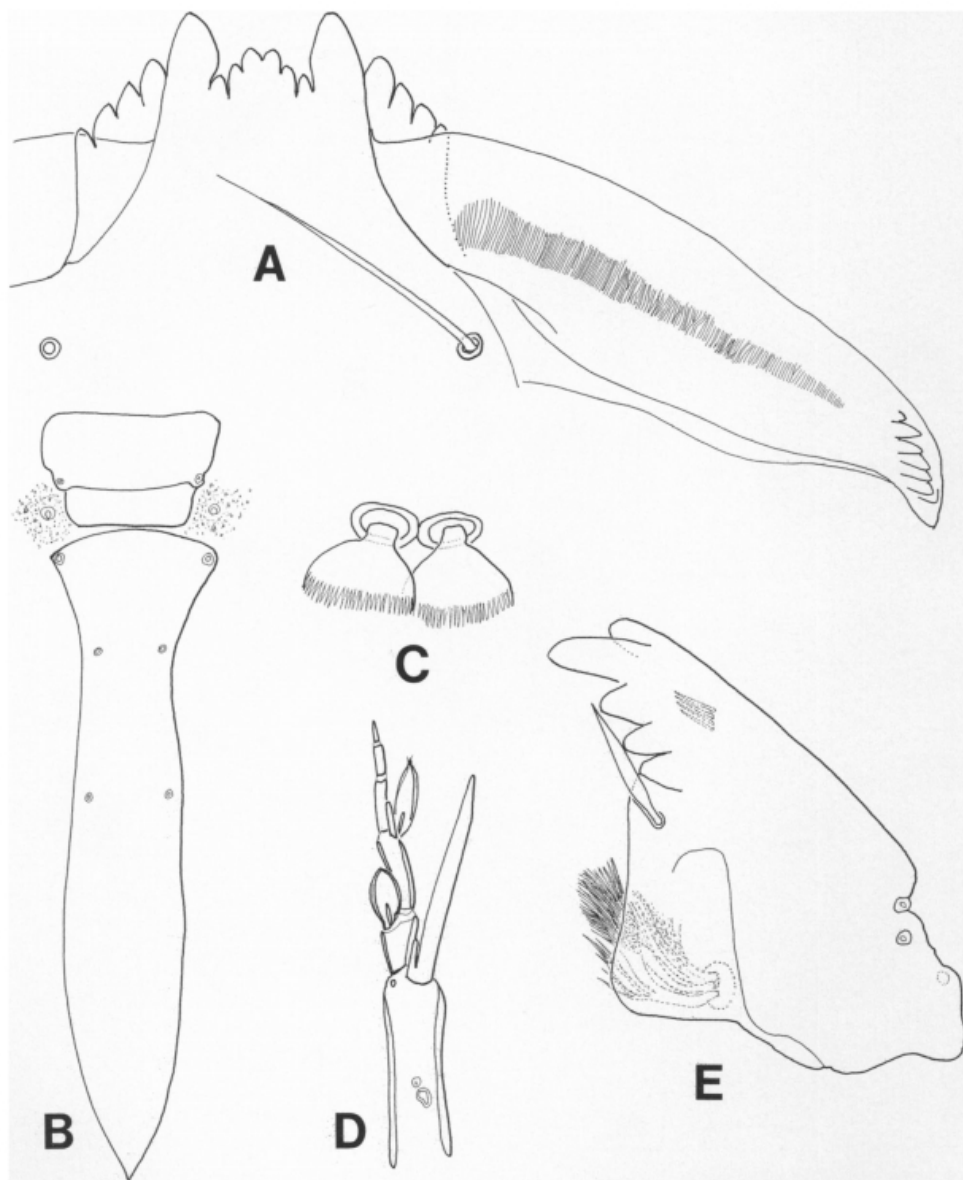


Fig. 2. *Paratendipes basidens* larval structures. A. mentum & ventromental plate; B. frontoclypeal apotome & labral sclerite; C. S I; D. antenna; E. mandible.

Body: Anterior parapods with well developed claws, most simple but some pectinate, some serrated on both margins; an area of filamentous setae present anterodorsally to claws. Body segments slender, about twice as long as wide. 2 pairs of conical ventral tubules present. Procerci well developed, with 5–8 apical setae and 2 lateral setae. Supraanal setae well developed, longer than anal tubules. All claws of posterior parapod simple.

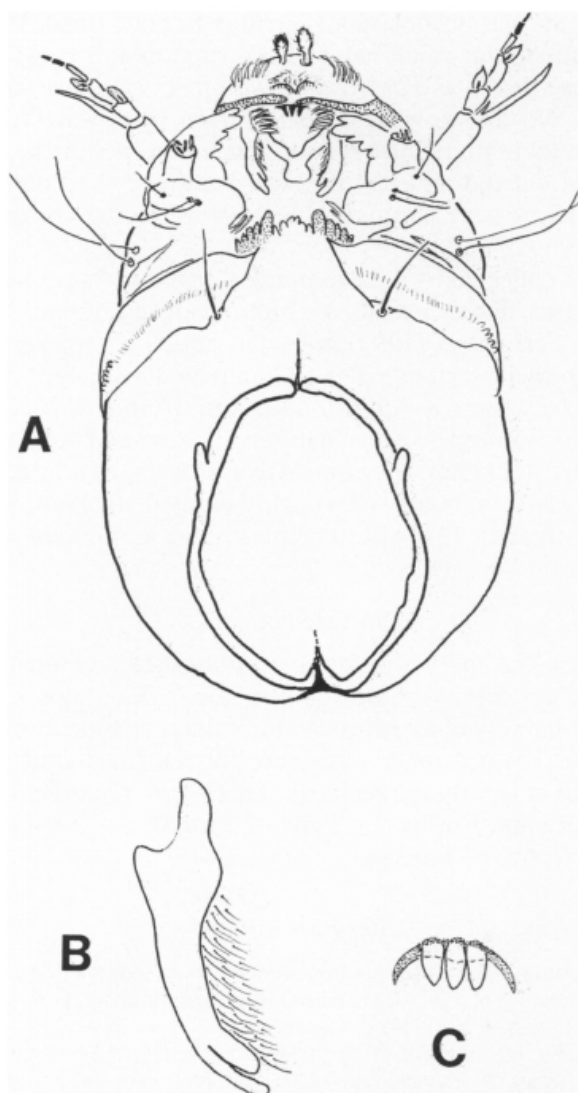


Fig. 3. *Paratendipes basidens* larval structures. A. head capsule showing foramen occipitale displaced anteroventrally; B. premandible; C. pecten epipharyngis.

Notes on Biology

Larvae of *Paratendipes basidens* are common in intermediate and larger sized rivers with shifting sand substrates. In Kansas, larvae have been collected from the Kansas, Smoky Hill, Republican, Arkansas, Cimarron, Ninnescah and Chikaskia Rivers. In Florida, larvae and pupae have been collected from the Chipola, Perdido and Suwannee Rivers. Larvae have also been seen from Rush Creek, Fairfield Co., Ohio. In addition, Hudson et al. (1990) list *Paratendipes* "*connectens*" gr. from Georgia and North Carolina. Not much is known about the larval microhabitat and population densities. In Kansas, larvae are regularly found near the edges of rivers in slack water areas where fine detrital material has lightly

accumulated over the sandy substrata (Ferrington, pers. obs.). Pupae have also been collected from similar microhabitats. Ferrington and Goldhammer (1992: 218) recorded larvae (listed as *Paratendipes* sp.) from capillary fringe habitats in the Kansas River. No larvae were collected from open-water river habitat or interface habitat in their study; however, this is not surprising because there was no accumulation of detrital material in the areas where their core samples were taken. Larval densities were estimated as 149 individuals/m² in the capillary fringe.

Adults have been collected by light trapping along sand-bottomed rivers during midsummer in Kansas, but are usually not numerically dominant in these samples. Goldhammer and Ferrington (1992) collected adults in emergence traps from open-water and epirheic regions of the Cimarron River, and estimated daily emergence to vary between 1.8–7.9 individuals/m² from epirheic habitats and 0–15.0 individuals/m² from open-water habitats in June and August, respectively. Although never very abundant, the cumulative biomass of adults emerging from open-water and epirheic habitats was roughly equivalent. However, *P. basidens* represented approximately 10% of total chironomid biomass emerging from the open-water habitat in August.

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