KEY TO POLYPEDILUM SPECIES

1. Cephalic tubercles present and large (Fig. 242-243) .................................................. 2

1’. Cephalic tubercles absent or small (Fig. 244) .................................................. 3

2(1). Frontal apotome granulose (Fig. 242); golden anal claw with main spur not reaching past segment VIII into anal lobes (Fig. 245) ................................. Polypedilum sp. 2

2’. Frontal apotome smooth (Fig. 243); golden anal claw with main spur reaching past segment VIII into anal lobes (Fig. 246) ................................. Polypedilum sp. 4

3(1’). Anal claw with apical and lateral accessory spines (Figs. 247-248) ............... 4

3’. Anal claw with only apical accessory spines (Figs. 249-250) ............................. 9
4(3). Tergites II-VI with distinct dark anterior band of shagreen (Fig. 251-253) ......... 5

4’. Tergites II-VI with light anterior band of shagreen (Fig. 254-256) ....................... 7
5(4). Tergite II with light, sparse median field of shagreen (Figs. 251, 253) ............. 6

5’. Tergite II with dark, dense median field of shagreen (Fig. 252) .... *Polypedilum* sp. 8

6(5). Tergite VII with light anterolateral patches of shagreen (Fig. 257); each anal lobe with around 30 fringe setae .................................................. *Polypedilum* sp. 5

6’. Tergite VII with dark anterior band of shagreen (Fig. 258); each anal lobe with around 21 fringe setae ................................................................. *Polypedilum* sp. 12

7(4’). Tergites II-VI with light median shagreen without fenestrations (Fig. 254-255); each anal lobe with around 16 fringe setae ......................................................... 8

7’. Tergites II-VI with dark median shagreen with large fenestrations (Fig. 256); each anal lobe with around 30 fringe setae ................................................................. *Polypedilum* sp. 13
8(7). Tergite II with continuous, ½ width hook row (Fig. 254); no distinct pigmentation of pleural area of segments ........................................... Polypedilum sp. 6

8’. Tergite II with continuous, ¾ width hook row (Fig. 255); dark brown pigmentation of pleural area of segments ........................................... Polypedilum sp. 7

9(3’). Tergite II with anterior band of light, short spines; hook row continuous, ½ width (Figs. 259-260) ................................................................. 10

9’. Tergite II with anterior band of dark, long spines; hook row continuous ¾ width (Figs. 261-263) ................................................................. 11
10(9). Tergites II-III with light, sparse median shagreen (Fig. 259); light brown anal claw and anal lobes (Figs. 264-265) ........................................... *Polypedilum* sp. 3

10’. Tergites II-III with dark, dense median shagreen (Fig. 260); dark brown anal claw and anal lobes (Figs. 266-267) ........................................... *Polypedilum* sp. 11
11(9’). Tergites III-IV with single anterior row of long spines (Figs. 268-269)

11’. Tergites III-IV with multiple anterior rows of short spines (Fig. 270)

Polypedilum sp. 9

12(11). Anal claw yellow, 3-point (Fig. 249); nose present .......... Polypedilum sp. 1

12’. Anal claw brown with one major spur and minor apical accessory spines (Fig. 250); nose absent ................................................................. Polypedilum sp. 10
NOTES ON POLYPEDILUM SPECIES

Polypedilum sp. 1

Locality: Laguna del Tortuguero 1, 2, 3 & Quebrada

Head: Cephalic tubercles absent; long frontal setae

Thorax: Thoracic horn with less than 20 branches (Fig. 142); wing sheaths with nose

Abdomen: Abdomen most like Fig. 10.61 E (Wiederholm 1986); tergite II-VI with dark anterior band of spines (single row of spines), tergite II-V with median light shagreen; tergite II with continuous, $\frac{3}{4}$ width hook row (Figs. 108, 261, 268); pedes spurii A and B present; conjunctives between tergites III-VI with band of shagreen; tergites VII and VIII with anterolateral patches of shagreen; segment VIII with 3-4 point golden anal claw (Fig. 249); complete anal fringe with 20 setae; tergites V-VI with 3 LS setae; tergites VII-VIII with 4 LS setae

Comments: Closest to Polypedilum sp. 9 and sp. 10; around 4 mm long exuviae; keys to P. (Polypedilum) illinoense, but lighter median shagreen pattern on tergites II-IV than Fig. 90 (Maschwitz and Cook 2000); anal spur close to Polypedilum (Tripodura) epomis (see Figs. 170-172, Sublette & Sasa 1994)

Polypedilum sp. 2

Locality: Laguna del Tortuguero 1 & 2

Head: Cephalic tubercles large, dark brown with 3 points; long frontal setae; frontal apotome granulose (Fig. 242)

Thorax: Wing sheaths with nose

Abdomen: Tergite I bare; tergites II-VI with anterior bands of shagreen; tergite II with median shagreen and continuous, $\frac{3}{4}$ width hook row; pedes spurii A and B present; conjunctives between tergites IV and V with band of shagreen; tergites V-VI with posterior patches of shagreen; tergite VII-VIII with anterolateral patches of shagreen; segment VIII with larger, multi-pointed golden anal claw (similar to Fig. 35, Maschwitz and Cook 2000) (Fig. 245); complete anal fringe with 27 setae

Comments: Closest to Polypedilum sp. 4; around 4 mm long exuviae; keys to Polypedilum (Tripodura) digitifer, but there is variation in the median shagreen on tergites II-V, none is visible in this specimen (see Fig. 38, Maschwitz and Cook 2000)
**Polypedilum sp. 3**

**Locality:** Laguna del Tortuguero 2

**Head:** Cephalic tubercles small; long frontal setae

**Thorax:** Wing sheaths with nose

**Abdomen:** Light, sparse median shagreen on tergites II-VI (Figs. 155, 259); conjunctives between tergites III and IV with band of shagreen; tergite VIII with small, dark anal claw (Fig. 265); anal lobes with complete anal lobe fringe with around 30 setae (Fig. 264)

**Comments:** Closest to *Polypedilum* sp. 11; keys to *Polypedilum (Uresipedilum) aviceps* (see Fig. 51, Maschwitz and Cook 2000)

**Polypedilum sp. 4**

**Locality:** Laguna del Tortuguero 1 & 2

**Head:** Frontal apotome smooth (Figs. 129, 243); cephalic tubercles large, dark brown; frontal setae present

**Thorax:** Wing sheaths with nose

**Abdomen:** Tergites III-VI with no median shagreen; conjunctive between tergites III and IV without band of shagreen; conjunctive between tergites IV and V with band of shagreen; golden, 3-4 point anal claw (Fig. 246); complete anal lobe fringe with around 30 setae

**Comments:** Closest to *Polypedilum* sp. 2; keys to *Polypedilum (Uresipedilum) aviceps*, but appears to have more median shagreen on tergite II (see Fig. 51, Maschwitz and Cook 2000)
**Polypedilum sp. 5**

**Locality:** Laguna del Tortuguero 1, 2, 3 & Quebrada

**Head:** Cephalic tubercles absent; frontal setae present (Figs. 153, 244)

**Thorax:** Wing sheaths without nose

**Abdomen:** Tergite II with dark anterior band of shagreen, light median shagreen, and ¾ width, continuous hook row (Figs. 157, 251); tergites II-VI with median shagreen with fenestrations; conjunctives between tergites III and IV with band of shagreen; space between posterior patches of shagreen on tergite IV and V; tergite VII with light anterolateral patches of shagreen (Fig. 257); segment VIII with darker brown spine with smaller spines along armature and one strong spine toward tip (Fig. 247); complete anal lobe fringe with around 30 setae

**Comments:** Closest to *Polypedilum* sp. 8 and sp. 12; keys to *Polypedilum (Polypedilum) nubeculosum*, but specimen differs in the shape and point of the anal spur (see Figs. 103-104, Maschwitz and Cook 2000)

**Polypedilum sp. 6**

**Locality:** Laguna del Tortuguero 2 & 3

**Head:** Cephalic tubercles absent; frontal setae present

**Thorax:** Wing sheaths without nose

**Abdomen:** Tergites II-VI with light anterior band of shagreen; sparse median shagreen on tergites II-VI (Fig. 254); conjunctive between tergites III and IV with band of shagreen; dark anal claw with many spines; complete anal lobe fringe with around 16 setae

**Comments:** Closest to *Polypedilum* sp. 7 and sp. 13; less than 4 mm long; keys to *Polypedilum (Pentapedilum) tritum*, but varies in tergite II-VI and number of LS setae on anal lobes (tergites II–VI without strong, prominent anterior row of spines like Oyewo & Saether 2008 or Fig. 36, Maschwitz and Cook 2000)
Polypedilum sp. 7

**Locality:** Laguna del Tortuguero 2 & Quebrada

**Head:** Cephalic tubercles small and bulbous; long frontal setae present

**Thorax:** Wing sheaths without nose

**Abdomen:** Tergite I bare; tergite II-VI with light anterior band of shagreen and light median shagreen; tergite II with ½ width, continuous hook row (Fig. 255); pedes spurii A and B present; conjunctive between tergites III and IV with band of shagreen; tergite VII with anterior and posterior shagreen; dark anal comb; complete anal lobe fringe with around 16 setae

**Comments:** Closest to Polypedilum sp. 6 and sp. 13; around 3 mm long exuviae; keys to Polypedilum (Tripodura) scalaenum, but differs in the anal spur (Fig. 39, Maschwitz and Cook 2000)

Polypedilum sp. 8

**Locality:** Laguna del Tortuguero 1, 2 & 3

**Head:** Cephalic tubercles small and bulbous; long frontal setae present

**Thorax:** Wing sheaths without nose

**Abdomen:** Shagreen on tergites II-VIII; tergites II-VI with dark, dense anterior band of shagreen; tergite II with dark, dense median field of shagreen (Fig. 252); conjunctives between tergites III and IV with band of shagreen; tergites V-VI with 3 LS setae; tergites VII-VIII with 4 LS setae; segment VIII with darker brown anal claw (Fig. 248); complete anal lobe fringe with around 30 setae

**Comments:** Closest to Polypedilum sp. 5 and sp. 12; Polypedilum subgenus; close to Polypedilum (Polypedilum) laetum, but appears to be distinction in the anal spur (Fig. 98, Maschwitz and Cook 2000)
**Polypedilum sp. 9**

**Locality:** Laguna del Tortuguero 1 & 2

**Head:** Cephalic tubercles absent; frontal setae present

**Thorax:** Wing sheaths with nose

**Abdomen:** Tergites II-VI with anterior row of spines (multiple rows of spines) (Fig. 270); tergite II with anterior band of dark, long spines; ¾ width, continuous hook (Fig. 262); segment VIII with golden anal claw; complete anal lobe fringe with around 25 setae

**Comments:** Closest to *Polypedilum* sp. 1 and sp. 10; *Polypedilum* subgenus

**Polypedilum sp. 10**

**Locality:** Laguna del Tortuguero 2

**Head:** Cephalic tubercles absent; frontal setae present

**Thorax:** Wing sheaths without nose

**Abdomen:** Tergite II with anterior band of dark, long spines; hook row continuous ¾ width (Fig. 263); tergites III-IV with single anterior row of long spines (Fig. 269); band of light anterior shagreen on tergite VIII; anal claw made up of singular dark spine and apical and lateral accessory spines (Fig. 250)

**Comments:** Closest to *Polypedilum* sp. 1 and sp. 9; around 4mm long exuviae; keys to *Polypedilum* (*Pentapedilum*) tritum, but varies in tergite VIII shagreen (Oyewo & Saether 2008) and *Polypedilum* (*Polypedilum*) prolixipartum, but varies in shagreen pattern (Fig. 137, Maschwitz and Cook 2000)
Polypedilum sp. 11

Locality: Quebrada

Head: Cephalic tubercles absent; frontal setae present

Thorax: Wing sheaths without nose

Abdomen: Tergites II-III with dark, dense median shagreen; tergite II with anterior band of shagreen light and made up of short spines and $\frac{1}{2}$ width, continuous hook row (Fig. 260); dark brown anal claw and anal lobes (like Fig. 40 I Oyewo & Saether 2008) (Figs. 121, 266-267)

Comments: Closest to Polypedilum sp. 3; close to Polypedilum (Pentapedilum) uncinatum (see Fig. 40 Oyewo & Saether 2008), but varies in the shagreen pattern on tergites II-VI (see Fig. 40 B)
**Polypedilum sp. 12**

![Image](Figure 271. Frontal apotome of Polypedilum sp. 12)

**Locality:** Quebrada

**Head:** Cephalic tubercles absent; frontal setae present; frontal apotome rounded, cone-like (most closely resembles *Polypedilum* subgenus *Cerobregma*, Sæther & Sundal 1999) (Fig. 271)

**Thorax:** Wing sheaths without nose

**Abdomen:** Tergites II-VIII with very dark anterior bands of shagreen; tergites II-VI with median shagreen; tergite II with continuous 3/4 width hook row; pedes spurii A & B present (Fig. 253); conjunctives between tergites III/IV and IV/V with band of shagreen; tergite VII with dark anterior band of shagreen; smaller spines on dark anal claw (somewhat close to Polypedilum sp. 5); tergites V-VIII with 3, 3, 4, 4 LS setae pattern; complete anal lobe fringe with 21 setae (Fig. 258)

**Comments:** Closest to *Polypedilum* sp. 5 and sp. 8
**Polypedilum sp. 13**

**Locality:** Laguna del Tortuguero 2

**Head:** Cephalic tubercles absent; frontal setae present

**Thorax:** Wing sheaths without nose

**Abdomen:** Tergites II-VI with light anterior band of shagreen and dark median shagreen with large fenestrations (Fig. 256); dark pleural lines; conjunctive between tergites III and IV with band of shagreen; tergites II-VI with extensive shagreen and large fenestrations; complete anal lobe fringe with 30 setae

**Comments:** Closest to *Polypedilum* sp. 6 and sp. 7; around 6 mm long exuviae; keys to *Polypedilum* (*Polypedilum*) tuberculum, but doesn't match shagreen pattern on tergites II-VI (Maschwitz and Cook 2000)
ADDITIONAL REFERENCES


NOTES ON **SAETHERIA** SPECIES

*Saetheria* near *tylus* Townes, 1945

**Locality:** Laguna del Tortuguero 2

**Head:** Cephalic tubercles small and apically pointed; long frontal setae present (Fig. 272)

**Thorax:** Thoracic horn made up of thick, branches (differs from generic description, Wiederholm 1986) (Fig. 273)

**Abdomen:** Tergite II with continuous hook row on projecting flap; tergite III with posterior rows of triangular spines, with a yellow base with dark brown tips (Fig. 124); caudolateral margin of segment VIII without spines (Fig. 122); tergites V-VIII with 4 LS setae

**Comments:** Represented by 1 specimen; closest to Unknown Chironomini #3; around 3.5 mm long exuviae

**ADDITIONAL REFERENCE**

KEY TO *STENOCHIRONOMUS* SPECIES

1. Tergite II with posterior hook row restricted to medial portion of tergite (Fig. 274-275); tergites VII-VIII with at least some shagreen (Figs. 277-278); subgenus *Petalopholeus* .......................................................... 2

1’. Tergite II with posterior hook row extending to lateral margins of tergite (Fig. 276); tergites VII-VIII without shagreen (Fig. 279-280); subgenus *Stenochironomus* .............................................................. 3
2(1). Tergite II hooklets on hook row very long (Fig. 275); yellow, 3-point anal claw, all points equal in length (Fig. 281) ……… *Stenochironomus (Petalopholeus) quadrinotatus*

2’. Tergite II hooklets on hook row short (Fig. 274); yellow, 5-point anal claw, middle point longer in length than posterior points (Fig. 282) ………… *Stenochironomus* sp. 5

3(1’). Male genital sheaths ending before anal lobes (Fig. 283); tergite V with continuous, dense shagreen (Fig. 285); anal claw very large and bulbous with at least 8 points (Fig. 289) …………………………………………………………………………………………………… *Stenochironomus* sp. 2

3’. Male genital sheaths extending beyond anal lobes (Fig. 284); tergite V with discontinuous, sparse spines or shagreen (Figs. 286-289); anal claw large with 2-4 points (Figs. 290-292) ……………………………………………………………………………………………………… 4
4(3’). Tergite II with dark band of thick, long anterior spines (Fig. 293); tergite V with median patch of spines (Fig. 288); around 10 mm long exuviae
........................................................................................................... *Stenochironomus* sp. 4

4’. Tergite II with dark band of thin, short anterior spines (Figs. 276, 294); tergite V with median patch of shagreen (Figs. 286-287); around 5 mm long exuviae ………………… 5
5(4’). Segment VIII with yellow, thick, 2-point anal claw (Fig. 290)
.................................................................................. **Stenochironomus sp. 1**

5’. Segment VIII with yellow, thick, 3-4 point anal claw (Fig. 291)
.................................................................................. **Stenochironomus sp. 3**
NOTES ON *STENOCHIRONOMUS* SPECIES

*Stenochironomus (Petalopholeus) quadrinotatus* Borkent, 1984

**Locality:** Laguna del Tortuguero 2

**Abdomen:** Tergite I bare; tergite II with posterior hook row restricted to medial portion of tergite; tergite II hooklets on hook row very long (Fig. 275); tergite VI with thick band of posterior shagreen; anterior and median shagreen very light; no shagreen on tergite VII; light anterolateral shagreen on tergite VIII; anal lobe with two patches of shagreen; yellow, 3-point anal claw, all points equal in length, somewhat like *Stenochironomus* sp. 3 (Fig. 281)

**Comments:** Closest to *Stenochironomus* sp. 5; around 6 mm long exuviae; Borket 1984 documented species in Costa Rica

*Stenochironomus* sp. 1

**Locality:** Laguna del Tortuguero 1 & 2

**Thorax:** Thoracic horn with several fine branches and one simple, spinose branch (Figs. 18, 132)

**Abdomen:** Tergite I bare; tergites II-V dense shagreen; posterior corners of segments II-IV not brown; tergite II with dark band of thin, short anterior spines; tergite II with posterior hook row extending to lateral margins of tergite, medial interruption of hook row (Fig. 276); tergite V with median patch of shagreen (Fig. 286); tergite VI with darker, posterior patch of shagreen, lack anterior shagreen row; tergites VII-VIII without shagreen (Figs. 134, 279-280); segment VIII with yellow, thick, 2-point anal claw (Fig. 290)

**Comments:** Closest to *Stenochironomus* sp. 3; part of *Stenochironomus* subgenus; around 5 mm long exuviae
Stenochironomus sp. 2

**Locality:** Laguna del Tortuguero 2

**Abdomen:** Tergite I with median, light shagreen; tergites II-V with dense, uniform shagreen; tergite II with posterior hook row extending to lateral margins of tergite; tergite V with continuous, dense shagreen (Fig. 285); tergite VI with anterior and posterior patches of shagreen, tergites VII-VIII without shagreen; two anterior patches of shagreen on anal lobe; male genital sheaths ending before anal lobes (Fig. 283); anal claw very large and bulbous with at least 8 points (Fig. 289)

**Comments:** Represented by 1 specimen; around 10 mm long exuviae; part of *Stenochironomus* subgenus; somewhat close to *Stenochironomus* near species "Peru", but varies from description of anal claw (Borkent 1984)

Stenochironomus sp. 3

**Locality:** Laguna del Tortuguero 1, 2 & 3

**Abdomen:** Tergite II with posterior hook row extending to lateral margins of tergite and dark band of thin, short anterior spines (Fig. 294); tergite V with median patch of shagreen (Fig. 287); tergites VII-VIII without shagreen; segment VIII with yellow, thick, 3-4 point anal claw (Fig. 291); male genital sheaths extending beyond anal lobes

**Comments:** Closest to *Stenochironomus* sp. 1; around 5 mm long exuviae; part of *Stenochironomus* subgenus

Stenochironomus sp. 4

**Locality:** Laguna del Tortuguero 2 & 3

**Abdomen:** Tergite II with dark band of thick, long anterior spines and posterior hook row extending to lateral margins of tergite (Fig. 293); tergite V with median patch of spines (Fig. 288); tergites VII-VIII without shagreen; yellow, 3-4 point anal claw (Fig. 292); male genital sheaths extending beyond anal lobes (Fig. 284)

**Comments:** Closest to *Stenochironomus* sp. 1 and sp. 3; around 11 mm long exuviae; part of *Stenochironomus* subgenus
**Stenochironomus sp. 5**

**Locality:** Laguna del Tortuguero 1 & 2

**Head:** Cephalic tubercles absent (Fig. 127)

**Abdomen:** Tergite II with posterior hook row restricted to medial portion of tergite; hook row ½ width with medial interruption and short hooklets (Fig. 274); tergite II-V with continuous shagreen; tergite VI with median shagreen; tergite VII bare, tergite VIII anterolateral patches of shagreen (Figs. 277-278); yellow, 5-point anal claw, middle point longer in length than posterior points (Fig. 282); anal lobe with anterolateral patches of shagreen

**Comments:** Closest to *Stenochironomus (Petalopholeus) quadrinotatus*; around 6 mm long exuviae; close to *S. totifuscus*, but doesn’t match tergite VIII (Borkent 1984)

**ADDITIONAL REFERENCE**

KEY TO XESTOCHIRONOMUS SPECIES

1. Anal claw yellow, small and with several small, thin points (Fig. 295)
   ............................................................ Xestochironomus subletti

1’. Anal claw light brown, moderate and with 4-6 points (Fig. 296)
   ........................................................................... Xestochironomus sp. 1

Figure 295. Anal claw of Xestochironomus subletti
Figure 296. Anal claw of Xestochironomus sp. 1
NOTES ON XESTOCHIRONOMUS SPECIES

Figure 297. Tergite II of Xestochironomus subletti
Figure 298. Tergites VII-VIII of Xestochironomus sp. 1

Xestochironomus subletti Borkent, 1984

Locality: Laguna del Tortuguero 1 & 3

Abdomen: Tergite II with continuous hook row (1/2 width) (Fig. 297); tergites VII & VIII with posterior shagreen patches; anal lobes with two patches of shagreen; one major spur with 5-6 minor spines on anal claw (Fig. 295); tergite V with 3 LS setae; tergites VII-VIII with posterior shagreen (Fig. 135); tergite VI-VII with 4 LS setae; tergite VIII with 5 LS setae

Comments: Represented by 2 specimens
**Xestochironomus sp. 1**

**Locality:** Laguna del Tortuguero 3

**Abdomen:** Tergite I no shagreen; tergites II-V with continuous, uniform shagreen; tergite II with continuous hook row (1/2 width); pedes spurii A and B absent; tergite VI with hourglass-shaped shagreen; tergites VII & VIII with thick posterior patches of shagreen (Fig. 298); anal comb with one spur and many minor spines (Fig. 296); tergites V-VII with 4 LS setae; tergite VIII with 5 LS setae

**Comments:** Represented by 1 specimen; apex of abdomen missing in voucher specimen

**ADDITIONAL REFERENCE**

KEY TO ZAVRELIELLA SPECIES

1. Anal claw small, brown with many small spines (Fig. 299); dark brown pigmentation of median and pleural areas of segments II-VI (Fig. 301); anal lobes dark brown pigmentation (Fig. 303) ……………………………………… Zavreliella nr. marmorata

1’. Anal claw small, yellow with 2 main spurs and many small spines (Fig. 300); light brown pigmentation of median areas of segments II-VI (Fig. 302); anal lobes light brown pigmentation (Fig. 304) ……………………………………… Zavreliella sp. 1

Figure 299. Anal claw of Zavreliella nr. marmorata
Figure 300. Anal claw of Zavreliella sp. 1

Figure 301. Tergite II of Zavreliella nr. marmorata
Figure 302. Tergite II of Zavreliella sp. 1

Figure 303. Anal lobes of Zavreliella nr. marmorata
Figure 304. Anal lobes of Zavreliella sp. 1
NOTES ON ZAVRELIELLA SPECIES

Zavreliella near marmorata van der Wulp, 1859

Locality: Laguna del Tortuguero 3

Head: Cephalic tubercles with bulbous base and bifurcated apical tips, frontal setae absent (Fig. 305)

Thorax: Thoracic horn with four thick branches (Fig. 140)

Abdomen: Shagreen and dark paired median patches of tergites II-IV (Fig. 139); dark brown pigmentation of median and pleural areas of segments II-VI (Fig. 301); tergites VII & VIII with posterior shagreen patches; two patches of shagreen on anal lobes; anal claw small, brown with many small spines (Fig. 299); tergite V with 3 LS setae; tergite VI-VII with 4 LS setae; tergite VIII with 5 LS setae; anal lobes dark brown pigmentation (Fig. 303)

Comments: Represented by one specimen
Zavreliella sp. 1

**Locality:** Laguna del Tortuguero 2 & 3

**Head:** Cephalic tubercles with bulbous base and bifurcated apical tips, frontal setae present (Fig. 306)

**Abdomen:** Shagreen and dark paired median patches on tergites II-VI; light brown pigmentation of median areas of segments II-VI (Fig. 302); light anterolateral patches of shagreen on tergites VII-VIII; at least 6 D setae on tergite VII and 4 D setae on tergite VIII; ventral tubercle sheath between tergite VII and VIII; anal claw small, yellow with 2 main spurs and many small spines, like *Zavreliella junki* (Reiss 1990) (Fig. 300); anal lobes light brown pigmentation (Fig. 304)

**Comments:** Represented by two specimens

**ADDITIONAL REFERENCE**

NOTES ON UNKNOWN CHIRONOMINI GENERA

Unknown Chironomini #1

Locality: Laguna del Tortuguero 2

Head: Swollen frontal apotome similar to *Endochironomus*, but no conspicuous frontal setae (Fig. 133)

Thorax: Blunt nase similar to *Paralauterborniella* (Fig. 10.54 F, Wiederholm 1986); dark pigmentation of wing sheaths

Abdomen: Pedes spurii A & B present; tergite VIII with shagreen similar to *Endochironomus* (Fig. 10.21 A Wiederholm 1986), segment VIII with anal claw bending in towards segment with at least 14 points (Fig. 136); 4 LS on tergites V-VII; 5 LS on tergite VIII

Comments: Closest to Unknown Chironomini #2; around 5 mm long exuviae

Unknown Chironomini #2

Locality: Laguna del Tortuguero 1 & 2

Abdomen: Tergite II with continuous hook row; pedes spurii A & B present; lighter anterior band of shagreen on tergite VII; lighter anterolateral patches of shagreen on tergite VIII; segment VIII with anal claw bending in towards segment (Fig. 137)

Comments: Closest to Unknown Chironomini #1
**Unknown Chironomini #3**

**Locality:** Laguna del Tortuguero 1

**Thorax:** Pale brown coloration; small protuberance on wing sheath; 4 dorsocentrals (thorax matches *Saetheria*).

**Abdomen:** Tergite II with interrupted hook row; two dark rows of spines on tergites II-IV (tergite IV smaller, about ½ size, and lighter color) (Fig. 125); tergite V with two light colored rows of spines (~1/3 size of tergites II & III); pedes spurii A & B absent; shagreen present on tergites I-VII; no anal comb; 4 LS setae on tergites V-VIII; shagreen and spine pattern on tergites I-VIII doesn't match *Saetheria* (Fig. 123).

**Comments:** Closest to *Saetheria*.

**Unknown Chironomini #4**

**Locality:** Laguna del Tortuguero 2

**Head:** Cephalic tubercles large and pointed; frontal setae present.

**Thorax:** Thoracic horn plumose (Fig. 141); circular basal ring; granulose thorax; 4 dorsocentral setae (D1 and D2 separated with distance).

**Abdomen:** Very dark abdomen; tergite I with light shagreen and scales; tergites II-V with dense, dark shagreen (somewhat hourglass-shaped); tergite II hook row continuous (3/4 width); pedes spurii A & B large and conspicuous; conjunctives between tergites III/IV and IV/V with double row of small spines; tergite VI with triangular-shaped shagreen (denser anteriorally) and scales; scales similar to abdomen of *Robackia* (Fig. 10.69, Wiederholm 1986); tergite VII with two anterior patches of shagreen and scales (Fig. 149); tergite VIII with two medial bands of shagreen and scales; large 1-point yellow anal spur; complete anal fringe, 4 LS setae on tergites V-VII; 3 LS setae on tergite VIII.

**Comments:** Closest to *Goeldichironomus*. 
KEY TO *PSEUDOCHIRONOMUS* SPECIES

1. Segment VIII with 5 LS setae (Figs. 307-308) ..................................................... 2

1’. Segment VIII with 6 LS setae (Fig. 309) ......................... *Pseudochironomus* sp. 2

2(1). Anal lobe fringe with more than 20 setae on each side (Fig. 308)
................................................................. *Pseudochironomus* sp. 1

2’. Anal lobe fringe with less than 10 setae on each side (Fig. 310)
................................................................. *Pseudochironomus richardsoni*
NOTES ON *PSEUDOCHIRONOMUS* SPECIES

*Pseudochironomus richardsoni* Malloch, 1915

**Locality:** Laguna del Tortuguero 1, 2 & 3

**Abdomen:** Overall abdomen like Fig. 10.67 C (Wiederholm 1986); sternite I with light median shagreen; tergite II with strong anterior band of shagreen and continuous hook row (1/2 width); tergites III-IV with strong anterior and posterior band of shagreen; tergites V-VI with anterior drop shaped patch of shagreen and light posterior shagreen; tergite IV with dark anterior band of color; tergites VII-VIII with anterior median circle of shagreen; several small dark spines (like Fig. 10.66 F, Wiederholm 1986); tergite V with 3 LS setae; tergites VI-VII with 4 LS setae; tergite VIII with 5 LS setae (Fig. 307); anal lobe fringe with around 8 setae per lobe (Fig. 310)

**Comments:** Closest to *Pseudochironomus* sp. 1; most common *Pseudochironomus* species

*Pseudochironomus* sp. 1

**Locality:** Laguna del Tortuguero 1

**Abdomen:** Overall dark coloration of abdomen; no shagreen on tergite I; tergites II-VI with complete light shagreen and stronger anterior bands of shagreen; tergite II with continuous hook row (2/3 width); tergite VII with anterior band of shagreen; tergite VIII with two posterolateral patches of shagreen; yellow, 3-point anal claw; complete anal fringe with around 30 setae per lobe (much more setae than *Pseudochironomus* sp. 1); tergite V with 3 LS setae; tergites VI-VII with 4 LS setae; tergite VIII with 5 LS setae (Fig. 308)

**Comments:** Closest to *Pseudochironomus richardsoni*; represented by 1 specimen; close to *Pseudochironomus prasinatus* (Staeger, 1839), but doesn't match anal comb (Wiederholm 1986)
Pseudochironomus sp. 2

Locality: Laguna del Tortuguero 2

Abdomen: Tergite V with 3 LS; tergites VI-VII 4 LS; tergite VIII with 6 LS setae; segment VIII with 2 major spines and several small spines (Fig. 309); anal lobe fringe with around 8 setae per lobe

Comments: Represented by 1 specimen; close to Pseudochironomus richarsoni, except segment VIII with 6 LS setae and anal claw differs (Wiederholm 1986)

ADDITIONAL REFERENCE

KEY TO GENERA OF TANYTARSIIN PUPAE

1. Thoracic horn with long chaetae (Fig. 311) ................. *Cladotanytarsus*

1’. Thoracic horn bare (Fig. 312) or with small spines (Fig. 313) ............... 2

2(1’). Thoracic horn bare (Fig. 312) ......................................................... 3

2’. Thoracic horn with small spines (Fig. 313) ......................................... 4

3(2). Segment VIII with anal spur (Fig. 314); tergites II-V with dark, paired point patches (Fig. 317) ................................................................. *Rheotanytarsus*

3’. Segment VIII with anal claw (Figs. 315-316); tergites II-V vary from bare, to paired point patches, to bands of spines (Figs. 318-319) ....................... *Tanytarsus*
4(2’). Frontal setae robust, thorn-like (Fig. 320); tergites III-V with dark posterior patches of spines and with dark brown median pigmentation (Fig. 322)  

……………………………………………………………….... **Unknown Tanytarsini #1**

4’. Frontal setae long, slender (Fig. 321); tergites III-V with light posterior patches of spines and without dark brown median pigmentation (Fig. 323)  

…………………………………………………………..……..**Unknown Tanytarsini #2**
NOTES ON CLADOTANYTARSUS SPECIES

Cladotanytarsus sp. 1

Locality: Laguna del Tortuguero 2

Head: Cephalic tubercles long with frontal setae (Fig. 324)

Thorax: Thoracic horn with long chaetae (Fig. 311)

Abdomen: Tergites II-VI with paired anterior point patches; tergite VII bare; tergite VIII with anterolateral patches of shagreen (Fig. 325); multi-point anal claw (Fig. 326)

Comments: Very transparent exuviae

ADDITIONAL REFERENCES


NOTES ON *RHEOTANYTARSUS* SPECIES

*Rheotanytarsus* sp. 1

**Locality:** Laguna del Tortuguero 1, 2, 3 & Quebrada

**Head:** Cephalic tubercles short; long frontal setae (Fig. 327)

**Thorax:** Thoracic horn long, slender with short apical hairs; frontal apotome granulose; wing sheaths with prominent nose

**Abdomen:** Tergite I bare; tergite II-V with anterior dark pair of patches (Fig. 317); tergite II with small patches of posterior shagreen and hook row (1/3 width); tergite VI with very light anterior and posterolateral shagreen; tergite VIII with very light anterior patches of shagreen; dark curved single spur (Fig. 314); 3/4 complete anal fringe; tergite V with 3 LS setae; tergites VI-VII with 4 LS setae; tergite VIII with 4 LS setae

**Comments:** 3 mm long exuviae

**ADDITIONAL REFERENCE**

KEY TO *TANYTARSUS* SPECIES

1. Tergites III-VI with only anterior paired point patches (Figs. 328-329) ...................... 2

1’. Tergites III-VI with some anterior paired point patches, bands of spines, or bare (Figs. 330-332) .......................................................... 7

2(1). Tergite II with anterior paired point patch (Fig. 333-334) ................................. 3

2’. Tergite II without anterior paired point patch (Fig. 335-336) .............................. 5
3(2). Tergite II with anterior paired point patches without anterolateral or median shagreen (Fig. 337) ................................................................. *Tanytarsus* sp. 6

3’. Tergite II with anterior paired point patches with anterolateral (Fig. 338) or median shagreen (Fig. 339) ................................................................. 4
4(3’). Tergite II with anterior paired point patches surrounded by anterolateral patches of shagreen (Fig. 338) …………………………………………………………….. *Tanytarsus* sp. 3

4’. Tergite II with dark brown pigmentation and median shagreen below anterior paired point patches (Fig. 339) …………………………………………………………….. *Tanytarsus* sp. 10

5(2’). Tergite II without a hook row (Figs. 336, 340) ………………….. *Tanytarsus* sp. 13

5’. Tergite II with a hook row (Figs. 335, 341) ……………………………………….. 6
6(5’). Tergite II with light posterior patch of shagreen (Fig. 335); cephalic tubercles large and pointed (Fig. 342); anal claw large, yellow with multi-points (Fig. 344)

................................................................. Tanytarsus sp. 8

6’. Tergite II with dark posterior patch of shagreen and dark brown pigmentation (Fig. 341); cephalic tubercles absent (Fig. 343); anal claw small, brown with few points (Fig. 345) ............................................................... Tanytarsus sp. 14
7(1’). Tergite II with anterior paired point patches (Figs. 346-347) …………………….. 8

7’. Tergite II without anterior paired point patches (Figs. 348-349) …………………….. 9
8(7). Tergites II-III and VI with anterior paired point patches (Fig. 346); tergites IV-V with long bands of spines (Fig. 350) .............................. Tanytarsus sp. 4

8’. Tergite II with anterior paired point patches (Fig. 347); tergite III with long bands of spines; tergites IV-V with short bands of spines (Fig. 351) .............. Tanytarsus sp. 11

9(7’). Tergites III-IV with paired long bands of spines (Figs. 352-353) ..................... 10

9’. Tergites III with paired long bands (Fig. 356-357) or short bands of spines (Fig. 355); tergite IV with short bands of spines ................................................................. 12
10(9). Tergite IV with paired, bifurcated sclerotized structure (Fig. 358)  
…………………………………………………………………………………………………….  *Tanytarsus sp. 7*

10’. Tergite IV without sclerotized structure  ……………………………………………………………. 11

11(10’). Tergite III with paired long, medially pointing parallel bands of spines (Fig. 352)  
………………………………………………………………………………………………………………………….  *Tanytarsus sp. 1*

11’. Tergite III with paired very long, medially pointing C-shaped bands of spines (Fig. 354)  …………………………………………………………………………………………………………………………….  *Tanytarsus sp. 12*
12(9’). Tergite III with paired parallel bands of spines (Fig. 355) ........... *Tanytarsus sp. 2*

12’. Tergite III with paired posteriorly divergent band of spines (Figs. 356-357) ........ 13

13(12’). Tergite III with paired thick, dark brown spines; tergite IV with paired line of short spines (Fig. 356) ................................................................. *Tanytarsus sp. 5*

13’. Tergite III with paired thin, light brown spines; tergite IV with anterior paired point patches (Fig. 357) ................................................................. *Tanytarsus sp. 9*
NOTES ON TANYTARSUS SPECIES

_Tanytarsus sp. 1_

**Locality:** Laguna del Tortuguero 1, 2 & 3

**Thorax:** Thoracic horn long, slender, and spinose (Fig. 312); wing sheaths with prominent nose

**Abdomen:** Tergite II with median bands of light shagreen, pedes spurii B, and continuous hook on projecting flap (1/2 width) (Fig. 348); tergite III with parallel dark spines pointing inward (1/2 length of segment); tergite IV with parallel dark spines slightly curved posteriorally (1/3 length) (Fig. 352); tergite V with anterior dark patch of spines; tergite VI with anterior smaller dark patch of spines; tergite VII bare; tergite VIII with small anterior patches of shagreen and dark anal claw (Fig. 315); 5 LS setae on tergite VIII; 4 LS setae on tergite VII; no LS setae on tergite V; D setae on tergite I longer than half of the segment; anal lobe with two anal macrosetae

**Comments:** Closest to _Tanytarsus_ sp. 12; around 4mm long exuviae; keys to _Caladomyia_ sp. 4 (Fig. 20 A-F, Wiedenbrug et al. 2005), close to _Tanytarsus hamatus_ Reiss, but tergite II and III varies (Fig. 20, Sanseverino & Fittkau 2006)

_Tanytarsus sp. 2_

**Locality:** Laguna del Tortuguero 1, 2 & 3

**Thorax:** Thoracic horn long, slender, and spinose; wing sheaths with prominent nose

**Abdomen:** Tergite II with anterior and posterior light patches of shagreen (Fig. 335); tergites III-IV with paired light bands of spines (Fig. 355)

**Comments:** Closest to _Tanytarsus_ sp. 5 and sp. 9; around 2 mm long exuviae; keys to _Caladomyia_ sp. 4 (Fig. 20 A-F, Wiedenbrug _et al._ 2005)
**Tanytarsus sp. 3**

**Locality:** Laguna del Tortuguero 3 & Quebrada

**Thorax:** Thoracic horn long and slender; granulose median suture; wing sheaths with prominent nose

**Abdomen:** Tergite I bare; tergite II-VI with light anterior patches surrounded by shagreen and very light anterolateral shagreen; tergite II only with continuous hook row (~1/2 width); tergite II and III with shagreen between point patches (Figs. 328, 333, 338); tergite VII bare; tergite VIII with dark, bulbous anal claw (Fig. 316); anal lobe with anterolateral patches of shagreen; 4-5 LS setae on tergite VIII

**Comments:** Closest to Tanytarsus sp. 10; 3 mm long exuviae; keys to Tanytarsus sp. 19 (Fig. 14 J-L, Wiedenbrug et al. 2005)

**Tanytarsus sp. 4**

**Locality:** Laguna del Tortuguero 2

**Thorax:** Thoracic horn long and slender; rugulose frontal apotome

**Abdomen:** Tergite II with anterior patches of shagreen (Fig. 346); tergite III with anterior paired patch points; long spines present tergite IV-V (Fig. 350); tergite VI with anterior patches of spines; 3 LS setae on tergite VI-VII; 4 LS setae on tergite VIII

**Comments:** Closest to Tanytarsus sp. 11

**Tanytarsus sp. 5**

**Locality:** Laguna del Tortuguero 1, 2 & 3

**Thorax:** Wing sheaths with prominent nose

**Abdomen:** Tergite I bare; tergite II with strong median shagreen and thin, light, continuous hook row (3/4 width) (Fig. 349); tergite III with long spines (curved outward posteriorly); tergite IV with linear, short dark spines (Figs. 330, 356); tergites V-VI with anterior patches of spines; tergite VIII with bulbous anal claw

**Comments:** Closest to Tanytarsus sp. 9; around 4mm long exuviae; keys to Caladomyia sp. 5 (Fig. 25 F-J, Wiedenbrug et al. 2005)
**Tanytarsus sp. 6**

**Locality:** Laguna del Tortuguero 2 & 3

**Thorax:** Thoracic horn short and slender

**Abdomen:** Tergite II with anterior patches of dark spines and continuous dark hook row (1/2 width) (Figs. 318, 334, 337); tergites III-VI with anterior patches of dark spines (circular shagreen patches like *Cladotanytarsus*) (Fig. 329); segment VIII with dark anal claw; anal lobe with two anal macrosetae; anal lobes with around 16 fringe setae

**Comments:** Closest to *Tanytarsus* sp. 3 and sp. 10; keys to *Tanytarsus* sp. 21 (Fig. 15 A-I, Wiedenbrug *et al.* 2005)

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**Tanytarsus sp. 7**

**Locality:** Laguna del Tortuguero 1, 2, 3 & Quebrada

**Thorax:** Thoracic horn long and slender

**Abdomen:** Tergite III with convex origin for spines; tergite IV with anterior long spines originating from several points rather than in a line and unusual sclerotized paired structures each with two points along posterior half of tergite (Figs. 331, 353, 358); pair of point patches on anterior of tergites V-VI; tergite VII bare; tergite VIII with anterolateral pair of shagreen; 5 LS setae on tergite VIII

**Comments:** Closest to *Tanytarsus* sp. 1 and sp. 12
**Tanytarsus sp. 8**

![Figure 359. Thoracic horn of Tanytarsus sp. 8](image)

**Locality:** Laguna del Tortuguero 1 & 3

**Head:** Cephalic tubercles large and point with frontal setae (Fig. 342)

**Thorax:** Thoracic horn long and thick (thicker than other *Tanytarsus* species) (Fig. 359); wing sheaths with prominent nose

**Abdomen:** Tergite II with continuous dark hook row on projecting flap (1/3 width) and small anterior and posterior patches of shagreen (Fig. 335); tergites III-VI with paired anterior circular patches; tergite VIII with large, light colored anal claw with around 8 points (Fig. 344)

**Comments:** Closest to *Tanytarsus* sp. 14
**Tanytarsus sp. 9**

**Locality:** Laguna del Tortuguero 1, 2 & 3

**Thorax:** Thoracic horn serrated on one side (Fig. 360); wing sheaths with prominent nose

**Abdomen:** Tergite II light median shagreen and continuous hook row (3/4 width); tergite III with two medially pointing bands of spines with lateral shagreen; tergite IV with two point patches of spines (Figs. 319, 357); tergite V-VI with smaller point patches of spines; tergite VII-VII bare; anal claw light brown, 4-5 point

**Comments:** Closest to *Tanytarsus* sp. 5; keys to *Caladomyia* sp. 4, but more lighter spines on tergite III, shorter spines of tergite IV, and serrated thoracic horn (Fig. 20 A-F, Wiedenbrug et al. 2005)

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**Tanytarsus sp. 10**

**Locality:** Laguna del Tortuguero 1 & Quebrada

**Thorax:** Thoracic horn long and slender

**Abdomen:** Tergite II with anterior dark patches of spines, posterior median patch of shagreen on dark segment coloration, continuous hook row on projecting flap (~1/4 width), and pedes spurii B (Fig. 339); tergites III-VI with dark anterior patches of spines; tergite VIII with small dark anal claw; 3 LS setae on tergite VI, 4 LS setae on tergites VII-VIII

**Comments:** Closest to *Tanytarsus* sp. 3; keys to *Tanytarsus amazonicus*, but there is variation from tergite II (Fig. 46, Sanseverino & Fittkau 2006)
**Tanytarsus sp. 11**

**Locality:** Quebrada

**Thorax:** Thoracic horn long and slender; wing sheath with prominent nose

**Abdomen:** Tergite II with dark anterior patches of spines, median shagreen, and continuous hook row (1/2 width) (Fig. 347); tergite III with long band of spines; tergites IV-V with dark bands of spines (Fig. 351); tergites VI-VIII bare; tergite VIII with dark, bulbous anal claw; 5 LS setae on tergite VIII

**Comments:** Closest to *Tanytarsus* sp. 4; keys to *Tanytarsus hamatus* Reiss, but varies in tergites II-IV (Fig. 20, Sanseverino & Fittkau 2006)

**Tanytarsus sp. 12**

**Locality:** Laguna del Tortuguero 2

**Thorax:** Thoracic horn long and slender; wing sheath with prominent nose

**Abdomen:** Tergite II with dense shagreen; tergite III with a pair long bands of spines pointing medially (C-shaped); tergite IV with long spines pointing medially (Figs. 332, 354); segment VIII with large, wide light brown anal claw

**Comments:** Closest to *Tanytarsus* sp. 1

**Tanytarsus sp. 13**

**Locality:** Laguna del Tortuguero 2

**Thorax:** Thoracic horn long and slender

**Abdomen:** No hook row on tergite II; pairs of spine patches on tergite III-VI; tergite II with pedes spurii B and posterior patch of shagreen (Figs. 336, 340); tergite VIII with anterolateral patches of shagreen; anal lobe with patches of shagreen; segment VIII with dark anal comb with many minor spines; anal lobe with 2 anal macroseate; 4 LS setae on tergite VIII

**Comments:** Closest to *Tanytarsus* sp. 8; keys close to *Tanytarsus* sp. 62 (Wiedenbrug *et al.* 2005)
**Tanytarsus sp. 14**

**Locality:** Laguna del Tortuguero 2

**Head:** Cephalic tubercles absent (Fig. 343)

**Thorax:** Thoracic horn long and slender; wing sheath with prominent nose

**Abdomen:** Tergite II with continuous, 1/4 width hook row and median to posterior patches of shagreen (Fig. 341); tergite III-VI with anterior patches of shagreen; segment VIII with 2-3 point anal claw (Fig. 345)

**Comments:** Closest to *Tanytarsus* sp. 8; 3 mm long exuviae

**ADDITIONAL REFERENCES**


NOTES ON UNKNOWN TANYTARSINI GENERA

Unknown Tanytarsini #1

Locality: Laguna del Tortuguero 1 & 2

Head: Frontal apotome with granulose mound; frontal setae robust, thorn-like (Fig. 320)

Thorax: Thoracic horn slender with small spines (Fig. 313); median suture of thorax with small spines; prominent nose

Abdomen: Tergite I and II bare; hook row of tergite II complete (1/3 width); tergites III-V with dark posterior patches of spines and with dark brown median pigmentation (Fig. 322); tergite III with two posterior patches of shagreen; tergite IV with one median band of shagreen and two posterior patches of shagreen; tergite V with one median band of shagreen and two posterior patches of shagreen (extending laterally) and light shagreen in pleural area; tergite VI with median band of light shagreen and light shagreen in pleural area; two small anterior patches of shagreen on tergites VII-VIII; anal spur with one main point and around 4 minor points; 3/4 complete anal fringe with 18 fringe setae per lobe (like Stempellina); pedes spurii A present and B absent; 3 LS setae on tergite V; 4 LS setae on tergites VI-VII; 2 LS setae on tergite VIII (setation like Constempellina)

Comments: Genera between Constempellina and Stempellina
Unknown Tanytarsini #2

Locality: Laguna del Tortuguero 1, 2 & 3

Head: Frontal apotome with granulose mound; frontal setae long, slender (Fig. 321)

Thorax: Thoracic horn slender with small spines; median suture of thorax with small spines; prominent nose

Abdomen: Tergite I bare; tergite II with continuous hook row (1/3-1/2 width) and minimal shagreen; tergites III-V with light posterior patches of spines and without dark brown median pigmentation (Fig. 323); tergites III with triangular dark patch and posterior row of small spines; tergite IV with triangular dark patch, median circle of shagreen and posterior row of small spines; tergite V with triangular dark patch, median circle of shagreen, and posterior row of dark, larger spines; tergite VI with shagreen in pleural area; tergite VII with two anterior lateral patches of shagreen; tergite VIII with lateral bands of shagreen; pedes spurii A present and B absent; 3 LS setae on tergite V; 4 LS setae on tergites VI-VII; 2 LS setae on tergite VIII; 3-point yellow to brown anal claw; complete anal fringe with 11 fringe setae per lobe (like Constempellina)

Comments: Genera between Constempellina and Stempellina
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