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## New species and records of *Beardius* Reiss & Sublette from Brazil

(Diptera, Chironomidae)

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Two new species of *Beardius* Reiss *et* Sublette, 1985 from Brazil are described and figured, *B. fittkai* spec. nov. as male and pupae and *B. urupeatan* spec. nov. as male only. A new record of *B. cristhinae* Trivinho-Strixino & Siqueira, 2007 from the Mato Grosso State is given. Keys to males, larvae and pupae are provided.

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### Introduction

The genus *Beardius* was erected by Reiss & Sublette (1985) based on three new species, *B. parvus* from Venezuela and Brazil, *B. breviculus* from Panama, and *B. truncatus* from Texas, USA. Later, Andersen & Sæther (1996) described three new species, *B. aciculatus* from Costa Rica and Mexico, *B. lingulatus* and *B. triangulatus* from Costa Rica; Jacobsen & Perry (2000) one new species, *B. reissi* Jacobsen from Florida, USA; Trivinho-Strixino & Strixino (2000) two new species, *B. phytophilus* and *B. xylophilus* from Brazil; and Trivinho-Strixino & Siqueira (2007) two more new species, *B. cristhinae* and *B. roquei* from Brazil. The genus thus comprises 11 species, all distributed in South and Central America or in the southern parts of USA. The larvae are associated with macrophytes or submerged wood in both standing and flowing waters (Jacobsen & Perry 2000, Trivinho-Strixino & Strixino 2000).

Recently we borrowed the *Beardius* material housed in the Zoologische Staatssammlung, Munich. Most of this material was collected by Ernst J. Fittkau during his expeditions to the Amazon in the 1960s. In the material we found two new species, which

are described and figured below. We also have additional material of one of these species from Acre State in the Amazon area and from São Paulo and Santa Catarina States in southeastern and southern Brazil. In addition, the material contained one male of *B. cristhinae* from Mato Grosso State, a species which was recently described from São Paulo State in southeastern Brazil (Trivinho-Strixino & Siqueira 2007).

### Material and methods

The specimens were mounted on slides in Euparal® following the procedure outlined by Sæther (1969). The general terminology and abbreviations follow Sæther (1980). Measurements are given as ranges, followed by the mean when more than three specimens were measured, followed by the number of specimens measured in parenthesis.

Pencil drawings were made using a Nikon microscope with drawing tube. The caudal and lateral views of the hypopygium were drawn based on temporary slides in 85 % glycerol. The drawings of the hypopygia were later inked and assembled in Adobe Photoshop 7®. The remaining illustrations were made using the software Adobe Illustrator CS2®.

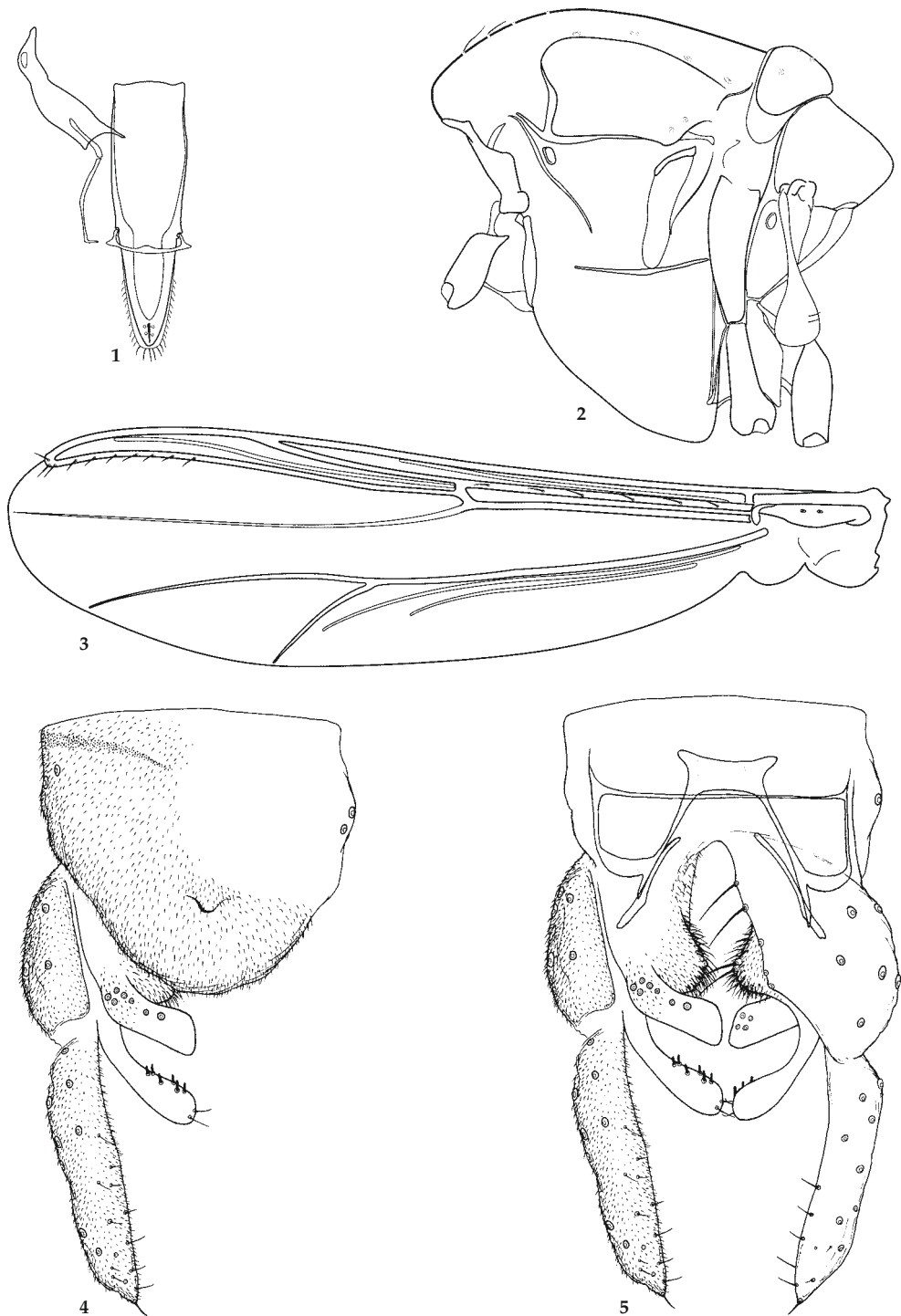
The holotype and some paratypes of *B. urupeatan* spec. nov. will be deposited in the Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil (MZSP), other paratypes are in the Zoologische Staatssammlung, Munich, Germany (ZSM), and the Natural History Collections, Bergen Museum, Norway (ZMBN). The holotype and some paratypes of *B. fittkaui* spec. nov. will be returned to ZSM, one paratype will be housed in ZMBN and another in MZSP.

**Key to males of *Beardius* Reiss & Sublette**

In Andersen & Sæther (1996) the figures of *B. triangulatus* and *B. lingulatus* were switched; in the key below this mistake is corrected.

- 1. Median volsella low, with 3-12 strong, stout setae ..... 2.
  - Median volsella well developed, needle-like to triangular or tongue-shaped, with setae and/or microtrichia ..... 4.
- 2. Superior volsella fused basally with inferior volsella. BRAZIL (Trivinho-Strixino & Siqueira 2007, Fig. 1) ..... *B. crithinae* Trivinho-Strixino & Siqueira
  - Superior volsella not fused with inferior volsella ..... 3.
- 3. Anal point well developed, triangular; acrostichals 13-16; tergal bands prominent. BRAZIL (Trivinho-Strixino & Siqueira 2007, Figs 6-7) ..... *B. roquei* Trivinho-Strixino & Siqueira
  - Anal point absent, but posterior edge of tergite IX with small prominence; acrostichals absent; tergal bands absent. BRAZIL (Trivinho-Strixino & Strixino 2000, Figs 1-4) ..... *B. phytophilus* Trivinho-Strixino & Strixino
- 4. Median volsella needle-like, without microtrichia, with one seta; scutal tubercle prominent, rounded. COSTA RICA (Andersen & Sæther 1996, Figs 3a-f) ..... *B. aciculatus* Andersen & Sæther
  - Median volsella digitiform to conical or broad, tongue-shaped to triangular, with microtrichia, with or without setae; scutal tubercle low or absent ..... 5.
- 5. Superior volsella pediform; inferior volsella with broad base; tergite IX with or without setae... 6.
  - Superior volsella digitiform; inferior volsella with narrow base; tergite IX without setae .... 7.
- 6. Median volsella triangular, with 10-15 long, apical setae; inferior volsella without knob-like

- apex, sensilla chaetica slender; tergite IX with setae; vein R without setae; acrostichals absent. MEXICO, VENEZUELA, BRAZIL (Reiss & Sublette 1985, Figs 1-14) ..... *B. parvus* Reiss & Sublette
- Median volsella short, cylindrical to coronate, with 4-6 apical setae; inferior volsella with enlarged knob-like apex, sensilla chaetica stout; tergite IX without setae; vein R with 4-8 setae; acrostichals 3-6. USA (Jacobsen & Perry 2000, Fig. 1a-c, e) ..... *B. reissi* Jacobsen
- 7. Anal point present ..... 8.
  - Anal point absent ..... 9.
- 8. Anal point triangular, well developed, projecting beyond edge of tergite IX; median volsella digitiform, with more than 30 strong setae. BRAZIL (Trivinho-Strixino & Strixino 2000, Figs 13-16) ..... *B. xylophilus* Trivinho-Strixino & Strixino
  - Anal point small, not projecting beyond edge of tergite IX; median volsella broad, bluntly triangular, with 2-3 apical setae. BRAZIL (Figs 1-5) ..... *B. fittkaui* spec. nov.
- 9. Median volsella conical with coarse microtrichia; R, R<sub>1</sub> and R<sub>4+5</sub> all with setae; acrostichals 1-6. USA (Reiss & Sublette 1985, Fig. 27) ..... *B. truncatus* Reiss & Sublette
  - Median volsella triangular or tongue-shaped, with weak, often short microtrichia; at most R and R<sub>4+5</sub> with setae; acrostichals absent ..... 10.
- 10. Median volsella triangular with pointed apex ..... 11.
  - Median volsella with broad apex, rounded or straight in dorsal view ..... 12.
- 11. AR about 0.5; apical microtrichia of median volsella comparatively long. COSTA RICA (Andersen & Sæther 1996, Figs 5a-e) ..... *B. triangulatus* Andersen & Sæther
  - AR about 1.3; apical microtrichia of median volsella very fine and short. PANAMA (Reiss & Sublette 1985, Figs 28-29) ..... *B. breviculus* Reiss & Sublette
- 12. Median volsella thick, in lateral view with apex projecting ventrad; inferior volsella slender, slightly clavate, nearly straight; tergal bands present. BRAZIL (Figs 12-19) ..... *B. urupeatan* spec. nov.
  - Median volsella thin, tongue-shaped; inferior volsella clavate, strongly curved; tergal bands absent. COSTA RICA (Andersen & Sæther 1996, Figs 4a-e) ..... *B. lingulatus* Andersen & Sæther



**Figs 1-5.** *Beardius fittkaui* spec. nov., male. 1. Tentorium, stipes and cibarial pump. 2. Thorax. 3. Wing. 4. Anal point and tegite IX and dorsal aspect of left gonocoxite and gonostylus. 5. Hypopygium with anal point and tegite IX removed, left dorsal aspect, right ventral aspect.

### Key to pupae of *Beardius* Reiss & Sublette

The key is modified from Jacobsen & Perry (2000). The pupae of *B. aciculatus*, *B. lingulatus*, *B. urupeatan* spec. nov., *B. triangulatus* and *B. xylophilus* are unknown. The description of the pupa of *B. phytophilus* given by Trivinho-Strixino & Strixino (2000) is not detailed enough to enable us to include the species in the key.

1. Tergite II shagreen points strong and uniform throughout.....2.
- Tergite II with shagreen points stronger in anterior transverse band..... 3.
2. Abdominal segment V with 4 taeniate lateral setae; conjunctive I/II with median patch of fine spinules; hook row of 46-73 hooklets (Jacobsen & Perry 2000, Figs 3a,c,e,g) .....  
.....*B. truncatus* Reiss & Sublette
- Abdominal segment V with 3 taeniate lateral setae; conjunctive I/II bare; hook row of 30-44 hooklets (Jacobsen & Perry 2000, Figs 3b,d,f, as *Beardius* sp. B; see Epler 2001) .....  
..... *B. breviculus* Reiss & Sublette
3. Paratergite VIII with strong spines along lateral margin anterior to spur; basal ring of thoracic horn elliptical; anterior branch of thoracic horn with subapical spinules.....4.
- Paratergite VIII with tiny spinules along lateral margin anterior to spur; basal ring of thoracic horn subcircular; anterior branch of thoracic horn smooth (Reiss & Sublette 1985, Figs 15-20) .....  
..... *B. parvus* Reiss & Sublette
4. Tergites VII-VIII with fine shagreen points in two distinct patches; paratergite VI with single posterior patch of fine spinules (Trivinho-Strixino & Siqueira 2007, Figs 8-12) .....  
.....*B. roquei* Trivinho-Strixino & Siqueira
- Tergites VII-VIII bare; paratergite VI bare ..... 5.
5. Paratergite V with spinules distributed from base of L1 setae almost to posterior margin; tergite VI with anterior transverse band of strong shagreen points (Jacobsen & Perry 2000, Figs 2a-h) .....  
..... *B. reissi* Jacobsen
- Paratergite V with spinules restricted to posterior margin; tergite VI with gradually weaker shagreen points reaching middle of tergite ... 6.
6. Conjunctive IV/V with spinules separated in two patches (Trivinho-Strixino & Siqueira 2007, Figs 2-5).....  
.....*B. crithinae* Trivinho-Strixino & Siqueira

- Conjunctive IV/V with single patch of spinules (Figs 6-11) ..... *B. fittkaui* spec. nov.

### Key to larvae of *Beardius* Reiss & Sublette

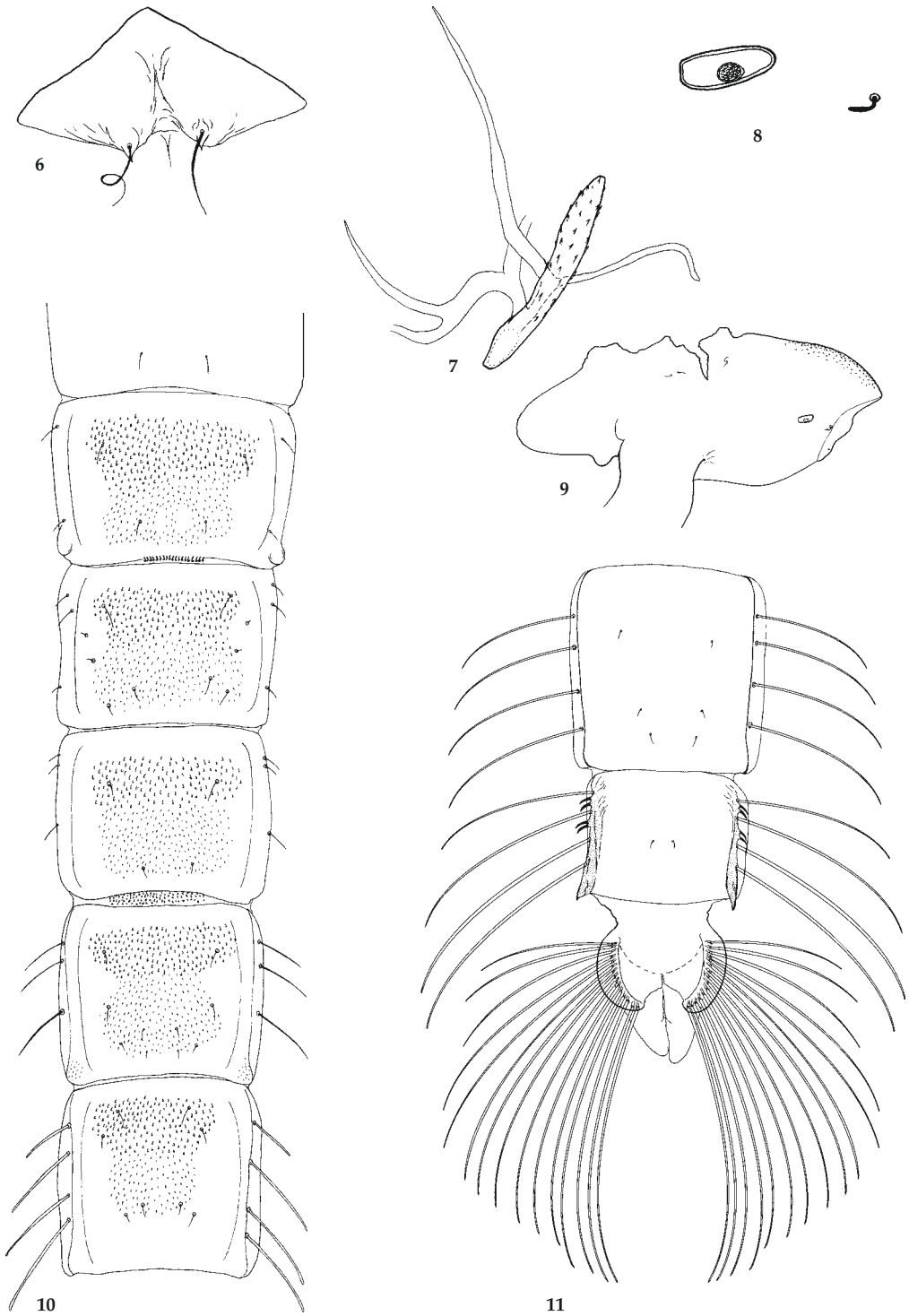
The key is modified from Jacobsen & Perry (2000). The larvae of *B. aciculatus*, *B. breviculus*, *B. crithinae*, *B. fittkaui* spec. nov., *B. lingulatus*, *B. urupeatan* spec. nov., *B. roquei* and *B. triangulatus* are unknown. Based on the descriptions we are not able to separate the larvae of *B. truncatus* (see Epler 2001) and *B. phytophilus* (see Trivinho-Strixino & Strixino 2000), and we thus key out both species in couplet 3.

1. Antenna with 7 segments, segments 2-4 can be only partially separated.....2.
- Antenna with 5 or 6 segments..... 3.
2. Clypeus distinct from frontal apotome; ventromental plates separated by a distance about equal to width of pale median tooth of mentum; procercus with 8 anal setae; AR 0.87-1.05 (Reiss & Sublette 1985, Figs 21-25) .....  
.....*B. parvus* Reiss & Sublette
- Clypeus fused with frontoclypeal apotome; ventromental plates separated by about twice the width of pale median tooth of mentum; procercus with 7 anal setae; AR 0.70-0.79 (Jacobsen & Perry 2000, Figs 5, 6d) .....  
..... *B. sp. C.* Jacobsen
3. Antenna with 5 segments  
USA (Epler 2001, Fig. p. 8.36).....  
.....*B. truncatus* Reiss & Sublette  
BRAZIL (Trivinho-Strixino & Strixino 2000, Figs 6-12) .....  
..... *B. phytophilus* Trivinho-Strixino & Strixino
- Antenna with 6 segments..... 4.
4. Antennal blade as long as flagellum; seta subdentalis reaching first inner tooth of mandible (Jacobsen & Perry 2000, Figs 2e-h).....  
..... *B. reissi* Jacobsen
- Antennal blade longer than flagellum; seta subdentalis reaching second inner tooth of mandible (Trivinho-Strixino & Strixino 2000, Figs 17-23) .....  
.....*B. xylophilus* Trivinho-Strixino & Strixino

### *Beardius fittkaui*, spec. nov.

Figs 1-11

**Types.** Holotype: ♂ with pupal exuviae, BRAZIL, Amazonas State, River Marauia, “Gebiet Endstation, Bergbach II”, locality A 500, 26-27.i.1963, E. J. Fittkau.



**Figs 6-11.** *Beardius fittkaui* spec. nov., pupa. 6. Frontal apotome. 7. Thoracic horn. 8. Basal ring of thoracic horn and precorneal seta. 9. Thorax. 10. Tergites I-VI. 11. Tergites VII-VIII and anal lobe.

(ZSM). Paratypes: 5♂♂, same as holotype, except: "etwa 350 m über dem Meeresspiegel, schattig, starkes Gefälle über Granitblöcken", 26.i.1963, light trap (ZSM, MZSP, ZMBN).

**Diagnostic characters.** See keys.

**Description**

**Male** (n=4-6, except when otherwise stated).

Total length 2.08-2.40 (3) mm. Wing length 1.10-1.23, 1.16 mm. Total length/wing length 2.08-2.40 (3). Wing length/length of profemur 1.89-2.05, 1.94. Head, abdomen and legs pale, thorax pale brown.

Head. Antennae with 13 flagellomeres; ultimate flagellomere 770-1060, 910 µm long; AR 0.79-1.03, 0.93. Temporals 8 (2). Clypeus with 11-19, 15 setae. Cibarial pump, tentorium and stipes as in Figure 1; tentorium 350 (1) µm long, 111 (1) µm wide; stipes 414 (1) µm long. Palp segment lengths (in µm): 20-30, 27; 23-30, 25; 69-123, 100; 95-130, 110; 136-193, 156. Third palpomer with 2-3 subapical sensilla clavata 9-14, 12 µm long.

Thorax (Fig. 2). Anteprepronotum without setae; acrostichals 4-6, 5; dorsocentrals 4-6, 5; prealars 2. Scutellum with 4-6, 6 setae.

Wing (Fig. 3). VR 1.24-1.45, 1.36. R<sub>2+3</sub> ending closer to R<sub>4+5</sub> than to R<sub>1</sub>. Brachiolum with 2 setae; R with 5-8, 6 setae; R<sub>4+5</sub> with 9-17, 13 setae; remaining veins bare.

Legs. Spur of foretibia 74-101, 84 µm long; of midtibia 101-138, 114 µm; of hind tibia 101-138, 118 µm long. Width at apex of foretibia 83-101, 95 µm; of midtibia 92-111, 97 µm; of hind tibia 92-120, 107 µm. Lengths (in µm) and proportions of legs as in Table 1.

Hypopygium (Figs 4-5). Anal point 18-28, 22 µm long, 28-37, 30 µm wide; anal tergum without setae, tergal bands present. Laterosternite IX with 2-3, 2 setae. Phallapodeme 129-230, 183 µm long. Transverse sternapodeme 101-175, 131 µm long. Gonocoxite 258-378, 338 µm long. Superior volsella digitiform; 157-175, 161 µm long; 46-55, 50 µm wide at base; 45-47, 46 µm wide at apex; with 5-10, 7 dorsal and 3-5, 4

ventral setae; with microtrichia in basal half. Inferior volsella curved, clavate; 193-267, 235 µm long; 27-29, 28 µm wide at base; 37-55, 51 µm wide at apex; with 2 apical, thin setae and 7-8, 7 stout, apically dissected setae. Median volsella subtriangular with broadly rounded apex; 74-157, 116 µm long; 74-157, 106 µm wide at base; 37-46, 39 µm wide at apex; with 2-3, 3 strong setae, longest 37 (2) µm. Gonostylus 368-424, 405 µm long. HR 5.61-8.29, 7.71; HV 5.63-7.02, 5.90.

**Pupa** (n=1).

Total length 2.95 mm. Cephalothorax and abdomen transparent.

Cephalothorax. Frontal apotome conical (Fig. 6), frontal seta 32 µm long. Preconal seta 1 (Fig. 8), 9 µm long. Thoracic horn with at least 6 branches; stout anterior branch with spinules in distal 2/3 (Fig. 7); basal ring elliptical (Fig. 8). Dorsocentrals 7-14, 11 µm long (Fig. 9); distance between Dc<sub>1</sub> and Dc<sub>2</sub> 5 µm; between Dc<sub>2</sub> and Dc<sub>3</sub> 109 µm; between Dc<sub>3</sub> and Dc<sub>4</sub> 16 µm. Prealars absent.

Abdomen (Figs 10-11). Tergites I, VII, and VIII without shagreen; T II-VI with anterior transverse bands of spinules stronger than posteriorly contiguous shagreen; posterior bands of spinules gradually narrower from T III to T VI. Conjunctive IV/V with single patch of spinules. Paratergite V with few spinules along posterior margin. Pedes spurii A and pedes spurii B present. Setation: segment I without L setae; II with 2 L setae; III-V with 3 L setae, VI-VIII with 4 LS setae. Segment VIII with 4 dark, curved, lateral spines 14-23, 18 µm long; spur single, 9 µm long. Anal lobe 162 µm long, with 15 taeniata setae. Genital sac overreaching apex of anal lobe by 76 µm.

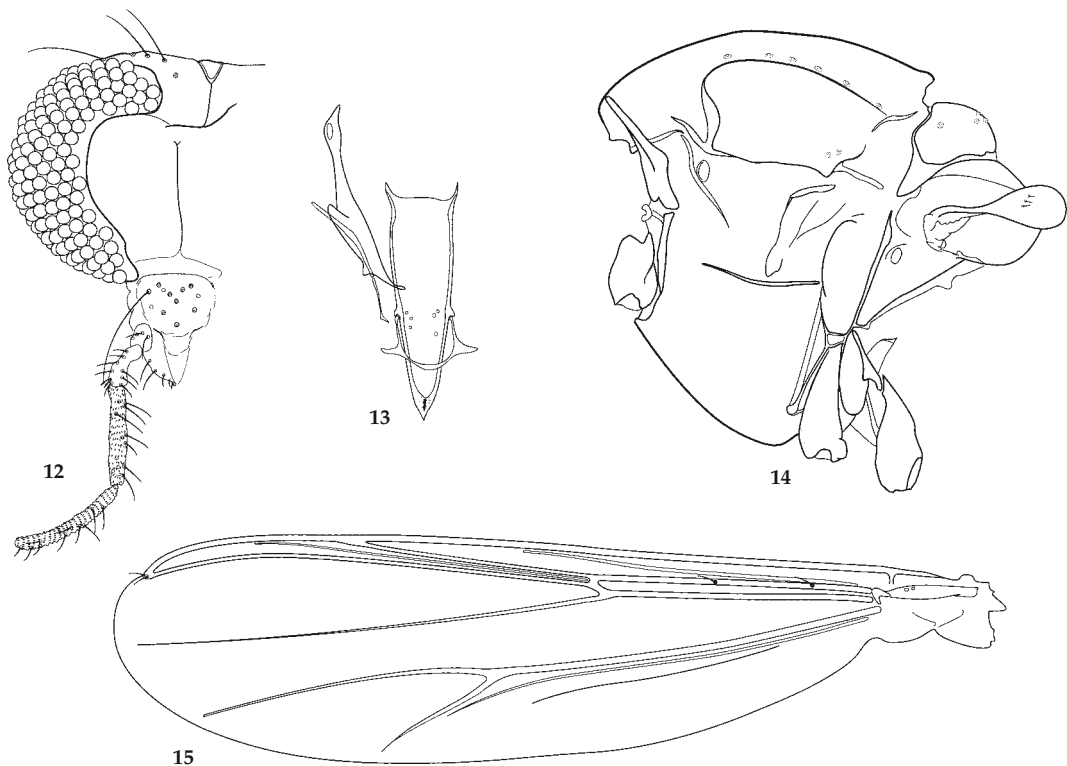
**Female and larva.** Unknown.

**Etymology.** Named in honor of Dr. Ernst J. Fittkau, who collected the specimens, and for his great contribution to the knowledge of Neotropical chironomids.

**Distribution.** Known only from the type locality, Rio Marauia in Amazonas State, Brazil.

**Tab. 1.** Lengths (in µm) and proportions of legs of *Beardius fittkai*, spec. nov., male (n=4-6).

	fe	ti	ta <sub>1</sub>	ta <sub>2</sub>	ta <sub>3</sub>	ta <sub>4</sub>
p <sub>1</sub>	461-608, 543	359-488, 410	737-902, 790	350-415, 373	295-359, 317	221-276, 242
p <sub>2</sub>	461-672, 574	368-516, 442	267-414, 341	138-193, 164	111-138, 123	46-82, 64
p <sub>3</sub>	525-727, 622	424-599, 507	286-507, 418	175-240, 229	111-212, 172	74-111, 94
	ta <sub>5</sub>	LR	BV	SV	BR	
p <sub>1</sub>	83-92, 90	1.80-1.87, 1.84	1.72-1.77, 1.75	1.21-1.33, 1.27	1.7-3.2, 2.3	
p <sub>2</sub>	32-37, 36	0.72-0.82, 0.77	3.21-3.73, 3.50	2.87-3.14, 2.99	3.0-6.2, 4.9	
p <sub>3</sub>	37-46, 42	0.67-0.85, 0.82	2.76-3.12, 2.89	2.56-3.32, 2.74	3.4-6.6, 4.4	



**Figs 12-15.** *Beardius urupeatan* spec. nov., male. **12.** Head. **13.** Tentorium, stipes and cibarial pump. **14.** Thorax. **15.** Wing.

***Beardius urupeatan*, spec. nov.**

Figs 12-19

**Type material.** Holotype: ♂, BRAZIL: Acre State, Mancio Lima, Parque Nacional da Serra do Divisor, “Igarapé” Ar Condicionado, 17.iii.06, light trap, A. R. Calor (MZSP). Paratypes: 1♂, as holotype; 5♂♂, as holotype except: “Igarapé” Amor; 2♂♂, Amazonas State, River Tonantins, Villa Nova, 29-30.viii.1961, E. J. Fittkau; 2♂♂, São Paulo State, Salesópolis, Estação Biológica Boracéia, 2nd bridge over River Claro, 23°39'02"S 45°54'43"W, 815 m a.s.l., 8.xii.2005, light trap, C. G. Froehlich et al.; 1♂, São Paulo State, Salesópolis, Estação Biológica Boracéia, Stream Venerando, 12.xii.2001, light trap, C. G. Froehlich et al.; 1♂, São Paulo State, Salesópolis, Estação Biológica Boracéia, Poço Verde, 13.xii.2001, light trap, H. F. Mendes; 2♂♂, São Paulo State, Salesópolis, Estação Biológica Boracéia, River Claro, 8.xii.2005, light trap, H. F. Mendes; 1♂, São Paulo State, Cubatão, Parque Estadual da Serra do Mar, Núcleo Cubatão, 23°54'15"S 46°28'50"W, 4.xii.2003, F. O. Roque; 1♂, Santa Catarina State, Florianópolis, Ratones, 27°30'66"S 48°29'22"W, 50 m a.s.l., 26.xii.2006, light trap near stream, L. C. Pinho (MZSP, ZSM, ZMBN).

**Diagnostic characters.** See key.

**Description**

**Male** (n = 10-16, except when otherwise stated).

Total length 2.32-3.16, 2.71 mm. Wing length 1.11-1.67, 1.34 mm. Total length/wing length 1.82-2.16, 1.99. Wing length/length of profemur 1.88-2.66, 2.11. Coloration: head, abdomen and legs pale, thorax pale brown.

**Head.** (Fig. 12) Antennae with 13 flagellomeres; ultimate flagellomere 414-599, 453 µm long; AR 1.09-1.32, 1.20. Temporals 8-13, 10. Clypeus with 9-14, 11 setae. Cibarial pump, tentorium and stipes as in Figure 13; tentorium 64-125, 83 µm long, 11-23, 18 µm wide; stipes 79-118, 99 (8) µm long. Palp segment lengths (in µm): 18-36, 24; 22-39, 27; 61-106, 77; 68-122, 90; 86-191, 130. Third palpomer with 2 subapical sensilla clavata, longest 9-23, 15 µm long.

**Thorax** (Fig. 14). Anteprepronotum without setae; acrostichals absent; dorsocentrals 4-8, 6; prealars 2. Scutellum with 2-6, 4 setae.

**Wing** (Fig. 15). VR 1.35-1.60, 1.41. R<sub>2+3</sub> ending midway between R<sub>1</sub> and R<sub>4+5</sub>. Brachiolum with 2 setae; R with 2-7, 4 setae; R<sub>4+5</sub> with 1-3, 2 setae apically; remaining veins bare.

**Tab. 2.** Lengths (in  $\mu\text{m}$ ) and proportions of legs of *Beardius urupeatan*, spec. nov., male (n=9-16).

	fe	ti	ta <sub>1</sub>	ta <sub>2</sub>	ta <sub>3</sub>	ta <sub>4</sub>
P <sub>1</sub>	451-765, 590	322-497, 407	773-1105, 876	350-497, 421	294-442, 358	221-322, 260
P <sub>2</sub>	553-783, 642	378-580, 489	313-461, 368	147-211, 181	111-147, 128	55-83, 69
P <sub>3</sub>	571-903, 707	442-700, 557	442-608, 522	221-341, 277	166-249, 209	83-129, 106
	ta <sub>5</sub>	LR	BV	SV	BR	
P <sub>1</sub>	83-120, 95	1.89-2.33, 2.10	1.46-1.76, 1.54	1.08-1.26, 1.17	2.2-5.7, 3.0	
P <sub>2</sub>	27-46, 35	0.65-0.83, 0.74	3.38-4.00, 3.67	2.83-3.59, 3.11	2.7-7.5, 4.3	
P <sub>3</sub>	28-55, 45	0.85-1.05, 0.93	2.64-2.93, 2.84	2.22-2.67, 2.44	2.8-6.8, 5.1	

Legs. Spur of foretibia 36-50, 41  $\mu\text{m}$  long; of midtibia 54-72, 61  $\mu\text{m}$ ; of hind tibia 54-72, 62  $\mu\text{m}$  long. Width at apex of foretibia 29-50, 38  $\mu\text{m}$ ; of midtibia 32-47, 39  $\mu\text{m}$ ; of hind tibia 36-50, 42  $\mu\text{m}$ . Lengths (in  $\mu\text{m}$ ) and proportions of legs as in Table 2.

Hypopygium (Figs 16-19). Anal point absent; anal tergum without setae, tergal bands present. Laterosternite IX with 2-3, 2 setae. Phallapodeme 129-230, 183  $\mu\text{m}$  long. Transverse sternapodeme 27-43, 36  $\mu\text{m}$  long. Gonocoxite 68-109, 88  $\mu\text{m}$  long. Superior volsella digitiform, without microtrichia; 36-59, 49  $\mu\text{m}$  long; 9-12, 11  $\mu\text{m}$  wide at base; 9-12, 10  $\mu\text{m}$  wide at apex; with 2-8, 4 dorsal setae and 3-6, 4 ventral setae. Inferior volsella slender, 57-89, 75  $\mu\text{m}$  long; 5-7, 5  $\mu\text{m}$  wide at base; 7-14, 9  $\mu\text{m}$  wide at apex; with 3-4, 4 apical, thin setae. Median volsella 18-34, 23  $\mu\text{m}$  long; 18-30, 24  $\mu\text{m}$  wide at base; without setae; in dorsal view subrectangular with straight posterior margin; in lateral view with apex projecting ventrad, with slightly concave posterior margin; in caudal view large, rounded. Gonostylus 83-132, 110  $\mu\text{m}$  long. HR 0.69-0.88, 0.80; HV 0.53-0.68, 0.61.

**Female and immature stages.** Unknown.

**Etymology.** From the Guarani Mbyá term “urupe atã”, meaning bracket fungus, referring to the shape of the median volsella. For euphony the name is written urupeatan. It is to be treated as a noun in apposition.

**Distribution and ecology.** Known from both the Amazon Region (Parque Nacional Serra do Divisor in Acre State, and Tonantins River in Amazonas

**Tab. 3.** Lengths (in mm) and proportion of *Beardius urupeatan*, spec. nov., males from the Amazon and the Atlantic rainforests.

	Amazon Rainforest	Atlantic Rainforest
Total length	2.32-2.51, 2.38 (6)	2.68-3.00, 2.96 (8)
Wing length	1.11-1.21, 1.17 (7)	1.47-1.67, 1.52 (7)
Antennal ratio	1.10-1.26, 1.16 (7)	1.12-1.33, 1.24 (7)

State) and the Atlantic Rainforest (Estação Biológica Boracéia and Parque Estadual da Serra do Mar in São Paulo State, and Florianópolis in Santa Catarina State). The material from the Atlantic Rainforest was collected in light traps close to low-order streams. As macrophytes were lacking close to the collecting sites, while submerged wood was abundant, the larva is expected to inhabit submerged wood.

**Remarks.** Some variation was observed between the specimens from the Amazon Region and those from the Atlantic Rainforest, mainly regarding body size (Table 3). These differences might be due to the higher temperature in the Amazon Region when compared to the localities in the southern parts of the Atlantic Rainforest. Populations of chironomid species inhabiting different habitats may show variation in voltinism (see, e.g., Tokeshi 1995), and more rapid growth can result in smaller body size. We therefore consider the size differences observed as intraspecific variation.

Due to the transverse orientation of the median volsella in relation to the gonocoxite, the dorsal aspect of the volsella varies strongly with the position of the hypopygium. In order to better understand this variation, lateral and caudal views were drawn.

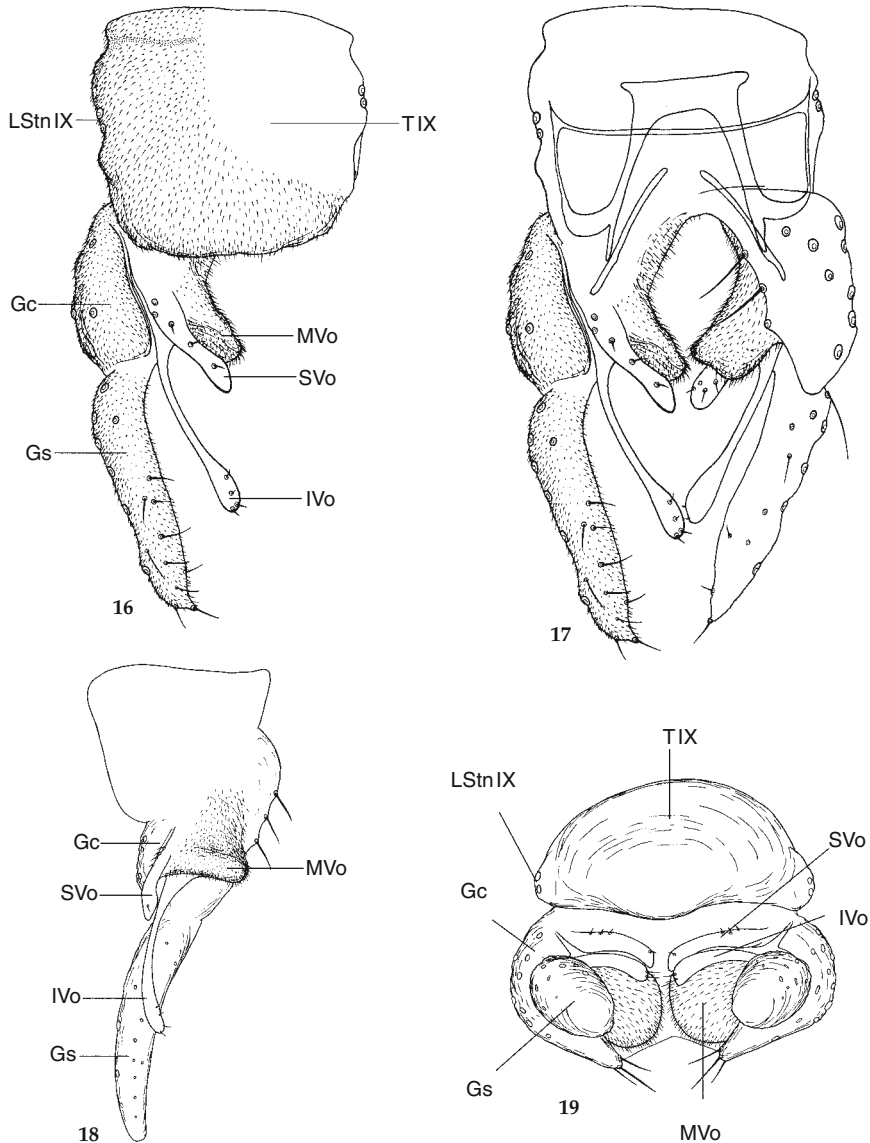
***Beardius crithinae* Trivinho-Strixino & Siqueira, 2007**

**Material examined.** Type material as in Trivinho-Strixino & Siqueira (2007). Additional material: BRAZIL, Mato Grosso State, Culuene River, “etwa 100 Flußkilometer unterhalb der Mündung des 7. Setembro”, locality A 571-1, 1♂, 30.viii.1965, E. J. Fittkau (ZSM).

**Distribution.** This species was described based on specimens from Estação Ecológica Jataí, São Paulo State, in the Atlantic Rainforest in southeastern Brazil. Now it is also recorded from the Amazon Rainforest in central Brazil.

**Remarks.** Morphologically the specimen from the Amazon does not differ from the type material from





**Figs 16-19.** *Beardius urupeatan* spec. nov., male. **16.** Tergite IX and dorsal aspect of left gonocoxite and gonostylus. **17.** Hypopygium with tergite IX removed, left dorsal aspect, right ventral aspect. **18.** Lateral view of left gonocoxite, gonostylus, and volsellae. **19.** Caudal view of hypopygium. Abbreviations: **Gc**, gonocoxite, **Gs**, gonostylus, **IVo**, inferior volsella, **LStn IX**, laterosternite IX, **MVo**, median volsella, **SVo**, superior volsella, **TIX**, tergite IX.

São Paulo. However, it is slightly smaller, with a total length of 2.8 mm (versus 3.2-3.5 mm; Trivinho-Strixino & Siqueira 2007) and a wing length of 1.3 mm (vs. 1.5-1.7 mm).

### Discussion

According to Mendes & Pinho (2007), five *Beardius* species occur in Brazil. The present paper adds two more, *B. fittkaui* spec. nov. and *B. urupeatan* spec. nov. Three of the species, *B. roquei*, *B. phytophilus* and *B. xylophilus*, are known only from the Atlantic Rainforest in southeastern Brazil (Trivinho-Strixino

& Strixino, 2000; Trivinho-Strixino & Siqueira, 2007), while *B. fittkaui* spec. nov. has been recorded only from the type locality in the Amazon. The remaining three species, *B. parvus*, *B. cristhinae* and *B. urupeatan* spec. nov., have been taken both in the Amazon and in the Atlantic Rainforest; *B. parvus* has also been recorded from Venezuela and Mexico (Spies & Reiss 1996).

The Brazilian distribution of *B. parvus*, *B. cristhinae* and *B. urupeatan* spec. nov., respectively, appears to be disjunct. The area between the Amazon and the Atlantic Rainforest consists of dryer Caatinga and Cerrado biomes, and of the wetland biome Pantanal. During the last decade the chironomid fauna in the Atlantic Rainforest have been targeted by several research projects headed by researchers from São Paulo and Santa Catarina (BIOTA-FAPESP proc. 03/10517-9 and 03/12074-9; CNPq 690143/01-0). The chironomids in the Amazon Rainforest were targeted by international researchers in the 1960s and 1970s, predominantly by Ernst J. Fittkau, Friedrich Reiss and collaborators, in cooperation with INPA. However, interest in the Amazon Rainforest has not diminished, and a recently approved project, led by Dr. Neusa Hamada, intends to continue the research on the chironomid fauna in the Manaus area and in Serra do Aracá (FAPEAM). In contrast, no projects have targeted the chironomid fauna in the Caatinga, Cerrado or Pantanal biomes, and hardly any species are recorded from the states situated between the Amazon and the Atlantic Rainforest. Thus, biogeographical assumptions concerning distribution patterns as shown by the *Beardius* species must await further collections in these biomes.

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