

***Rhagosmittia* and *Trondia*, two new genera of Orthoclaadiinae from Oceania and Australia (Diptera: Chironomidae)**

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Abstract

The genus *Rhagosmittia* gen. n. is described based on *Spaniotoma* (*Smittia*) *maculiventris* Edwards, originally collected and described from the Marquesas Islands in French Polynesia. The genus differs from all other chironomids by having a fissured tergite IX, with spatulate median acrostichals and clypeus with long and dense microtrichia. The genus apparently belongs in the *Pseudosmittia* complex of genera. *Rhagosmittia maculiventris* (Edwards) comb. n. is redescribed. The genus *Trondia* gen. n. with the single included species *Trondia anderseni* is described based on a specimen from Western Australia. The genus combines features found in *Ionthosmittia* Andersen *et* Sæther with characters found in *Pseudosmittia* Edwards.

Keywords: Chironomidae, *Rhagosmittia*, *Trondia*, new genera, *maculiventris*, *anderseni*

Introduction

As part of a revision of *Pseudosmittia* Goetghebuer the male holotype of *Spaniotoma* (*Smittia*) *maculiventris* Edwards (1935, p. 89) from French Polynesia (Marquesas), placed in *Pseudosmittia* by Cranston and Martin (1989, p. 262), was re-examined. The species turns out to represent a new genus. We also examined an additional male imago collected in Western Samoa. The new genus is erected here and a redescription of the single included species given.

In material from Western Australia identified as *Pseudosmittia* we found a species which combined some features found in one group of *Pseudosmittia* Edwards with characters unique to *Ionthosmittia* Sæther *et* Andersen. The new genus is erected here and a description of the single included species given.

Methods and terminology

The holotypes were mounted in Canada balsam on slides. The general terminology follows Sæther (1980). The holotypes are returned to CSIRO, Canberra, Australia.

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Taxonomy

Rhagosmittia gen. n.

Type species. *Spaniotoma (Smittia) maculiventris* Edwards, 1935, p. 89 by present designation and monotypy.

Diagnostic characters. The combination of fissured tergite IX, strongly microtrichiose clypeus and spatulate acrostichals on mid scutum are unique among chironomids. Additional features include lack of setae on squama, venarum ratio of 1.4–1.5, strongly sinuate Cu_1 , vestigial pulvilli and nearly complete absence of volsellae.

Etymology. From the Greek *rhagos*, split, and *Smittia*, a genus of Orthoclaadiinae, referring to male tergite IX.

Male imago. Small species with wing length 0.8–0.9 mm. Male antenna with 13 flagellomeres; AR lower than 0.5; antennal groove starting on flagellomere 4; sensilla chaetica on flagellomeres 2, 3 and one broad pair and about 20 slender sensilla chaetica on ultimate flagellomere; apical flagellomere without strong apical seta. Eyes bare, without dorsomedian elongation. Temporal setae consisting of weak inner and few, slightly stronger outer verticals. Clypeus with few setae and conspicuously long and dense microtrichia. Tentorium narrow. Palp of five segments, third palpomere with several scalpellate sensilla clavata in a sensillum capitatum.

Median lobes of antepnotum reduced, widely separated, antepnotum broad laterally, with weak seta. Dorsocentrals few, acrostichals apparently about 5 spatulate on mid-scutum, prealars few, supraalars absent. Scutellum with few setae. Wing membrane bare, punctures of microtrichia not visible at 400 x magnification. Anal lobe reduced. Costa strongly extended and false vein continuing nearly to apex. R_{2+3} runs close to R_{4+5} and ends in the middle between R_1 and R_{4+5} ; R_{4+5} ends slightly proximal to apex of M_{3+4} ; Cu_1 strongly sinuate; postcubitus extending beyond FCu; anal vein ending well proximal of FCu. VR about 1.4–1.5. Brachiolum with 1 seta, other veins bare. Squama bare. Sensilla campaniformia about 8 on base of brachiolum, 3 below seta, and 8 on apex of brachiolum; 1 at base of subcosta, 1 on FR and 1 at base of R_1 . Tibial spurs and hind tibial comb well developed. Weak pseudospurs present on all tarsomeres, sensilla chaetica not observed. Pulvilli vestigial.

Tergites with a few median setae and a transverse row of few setae. Tergite IX divided by median fissure, without anal point, with few and very weak setae. Phallapodeme with distinct apodeme lobe; transverse sternapodeme arcuate, oral projections indicated. Virga plate-like, apparently with striations on posterior half. Gonocoxite at most with faint indication of an inferior volsella. Gonostylus without crista dorsalis; megaseta well developed.

Female imago, pupa and larva. Unknown.

Systematics

Rhagosmittia resembles *Semiocladius* Sublette & Wirth in having a divided tergite IX. However, the division is more complete in *Semiocladius* (Sublette & Wirth 1980, Figure 26D; Sæther & Ferrington 1997), and the genera differ from each other in most other details. In Sæther et al. (2000) *Rhagosmittia* will key to *Pseudosmittia*, but to the more similar *Semiocladius* if the lacking pubescence of the eyes is disregarded. In the key to Holarctic Orthoclaadiinae (Cranston et al. 1989) the genus will key to couplet 92. It will not key further since there

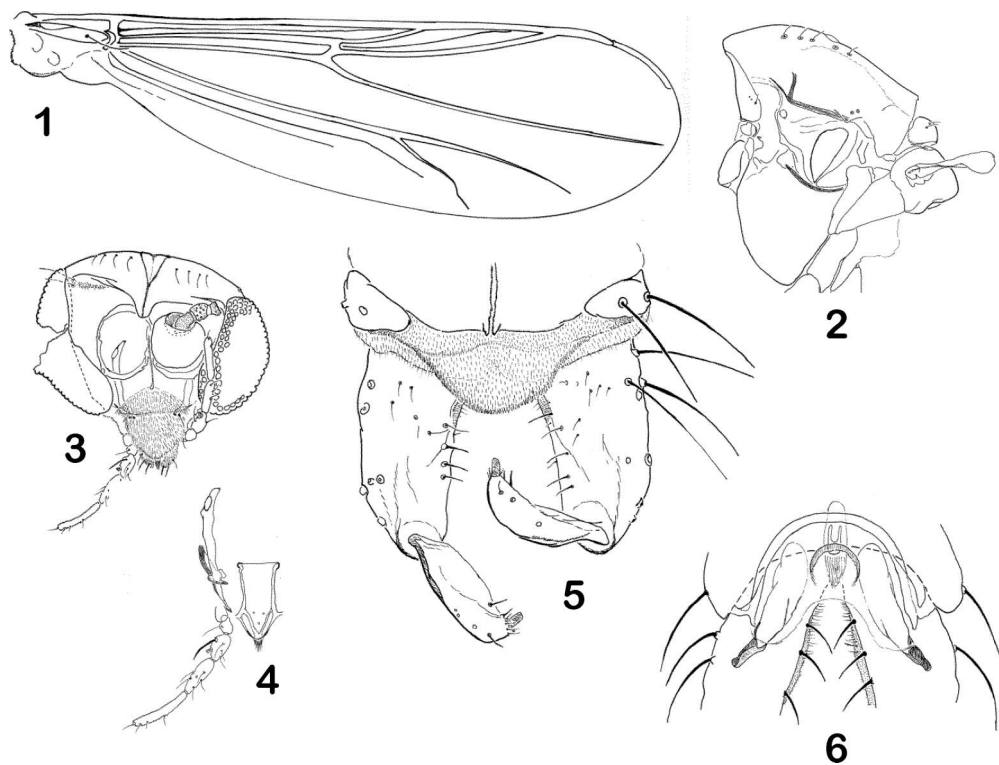
appear to be 5 spatulate acrostichals. If the presence of spatulate setae on mid-scutum are added to the second half of couplet 92 the genus will key to couplet 97. The combination of spatulate setae, a strongly extended costa and absence of an anal point will separate the genus from genera in couplets 98–105.

The genera *Botryocladius* Cranston & Edward, *Comptosmittia* Sæther, *Hanocladius* Wang & Sæther, *Paralimmophyes* Brundin, and *Unniella* Sæther all have scalpellate acrostichals situated on mid-scutum (Mendes et al. 2004). However, they all have an anal point (small in *Botryocladius*), several also have setae on squama; a strongly extended costa is found only in *Comptosmittia*, *Lerheimia* is found only Andersen & Sæther (1993), *Colosmittia* Andersen & Sæther (1994) and *Ionthosmittia* Sæther & Andersen (1993). All have a strongly extended costa, cuneiform wing and single plate-like virga. But they either have an anal point or, in *Colosmittia*, a hump-like extension of tergite IX. Although a strongly extended costa is regarded as a feature of the *Parakiefferiella* group of genera these genera as well as *Rhagosmittia* probably are more closely related to *Pseudosmittia*. Unfortunately, most of these genera are probably semiterrestrial or semiaquatic, which makes their immature stages difficult to find, and if found likely to possess reduced characteristics. Their phylogenetic position will thus be difficult to resolve even with available immatures.

***Rhagosmittia maculiventris* (Edwards) comb. n. (Figures 1–6)**

Spaniotoma (*Smittia*) *maculiventris* Edwards, 1935, p. 89.

Pseudosmittia maculiventris (Edwards), Cranston & Martin 1989, p. 262, pro parte.



Figures 1–6. *Rhagosmittia maculiventris* (Edwards), male imago: (1) wing; (2) thorax; (3) head; (4) tentorium, stipes, palps and cibarial pump; (5) external dorsal view of hypopygium and ninth tergite; (6) internal view of apodemes and virga.

(Not *Smitia postcinctura* Tokunaga, 1964, p. 533 = *Corynoneura postcinctura* (Tokunaga) comb. n., holotype examined.)

Material examined. Holotype ♂, FRENCH POLYNESIA (Marquesas), Pintatanua, Vaipae Valley, Uahuka, 880 ft., dead banana leaves, 20 IX 1929, A. W. Anderson, Pacific Entomological Survey, CSIRO Type 673.

Other material. WEST SAMOA, Puipe, shore, light, 1 ♂, 14 XII 1989, S. V. Reyakulendran (CSIRO).

Male imago ($n = 1 - 2$). Total length 1.62 mm. Wing length 0.82–0.88 mm (Figure 1). Total length/wing length 1.96. Wing length/length of profemur 3.43–3.52. Coloration yellowish with dark brown vittae, antepnotum, preepisternum, scutellum and postnotum. Front leg with coxa, femur except base, and proximal third of tibia dark brown, apical 2/3 of tibia whitish, tarsomeres stramineous. Middle and hind leg with similar but less pronounced banding. Tergites I–IV with dark brown transverse median band; tergites VI and VII mostly pale, but slightly darkened in anterior half; tergite VIII dark in anterior 4/5, tergite IX and hypopygium slightly darkened.

Head (Figure 3). AR 0.33–0.34. Ultimate flagellomere 137–144 μm long. Temporals consisting of 3–4 weak inner verticals and 2 outer verticals. Clypeus with 3–4 setae and conspicuously long and dense microtrichia (Figure 3). Tentorium 105 μm long, 11–14 μm wide (Figure 4). Stipes 80–91 μm long, 37 μm wide. Cibarial pump and cornua normal. Palpomere lengths (in μm): 18, 25–27, 37–41, 50–56, 66–75. Third palpomere with 3–7 scalpellate sensilla clavata in sensillum capitatum.

Thorax (Figure 2). Antepnotum with 1 lateral seta. Dorsocentrals 4–5, acrostichals about 5 spatulate, prealars 2. Scutellum with 4 setae.

Wing. VR 1.39–1.45. Anal lobe reduced. Costal extension 91–94 μm long.

Legs. Spur of front tibia 39–41 μm long, spurs of middle tibia 14–16 μm and 11–14 μm long, of hind tibia 41–43 μm and 15–23 μm long. Width at apex of front tibia and middle tibiae each 19–23 μm , of hind tibia 27–30 μm . Comb of 10 setae, 18–41 μm long. Lengths (in μm) and proportions of legs:

	fe	ti	ta ₁	ta ₂	ta ₃	ta ₄	ta ₅	LR	BV	SV	BR
p ₁	234-257	315-324	131-140	41-45	36	27	32	0.41-0.43	5.03-5.16	4.16-4.21	2.2
p ₂	351-378	315-342	180	72	45	32	36	0.57	4.59	3.70	2.9
p ₃	315-324	324-342	171	72	95	36	32	0.53	3.46	3.74	–

Hypopygium (Figures 5, 6). Tergite IX with 2–5 weak setae, laterosternite IX with 2 setae. Phallapodeme 57–61 μm long, transverse sternapodeme 39–48 μm long. Virga (Figure 1F) 21–25 μm long. Gonocoxite 131–139 μm long; inferior volsella only indicated by stronger setae or sometimes a slight bulge. Gonostylus 61–62 μm long, megaseta 9–10 μm long. HR 2.26, HV 2.65.

Ecology and distribution

The holotype was collected at dead banana leaves while the other specimen was collected on the shore. Williams (1944, p. 164) and Hardy (1960, p. 140) mention the species from Hawaii. However, although the distinctive markings, the hypopygium, wing and palp are approximately as described by Hardy, he also mentions that the eyes are “microscopically

haired”, i.e. pubescent. Our specimens do not have pubescent eyes and the Hawaiian specimens are thus not likely to belong in *Rhagosmittia*.

***Trondia* gen. n.**

Type species. *Trondia anderseni* sp. n. by present designation and monotypy.

Diagnostic characters. The combination of a bare, nearly transparent anal point placed forward on tergite IX; weak simple acrostichals starting in front; no costal extension, but distinct false vein; projecting anal lobe; bare squama; R_{4+5} ending slightly proximal to apex of M_{3+4} ; Cu_1 curved, but not sinuate; presence of supraalar; and long inferior volsella will separate the genus from all other orthoclaids.

Etymology. Named in honor of our friend and colleague, Trond Andersen, celebrating his 60th birthday.

Male imago. Small species with wing length 1.0 mm. Male antenna with 13 flagellomeres; AR about 1.0; antennal groove starting on flagellomere 4; sensilla chaetica on flagellomeres 2, 3 and one broad pair and about 20 slender sensilla chaetica on ultimate flagellomere; apical flagellomere with weak apical seta. Eyes bare, without dorsomedian elongation. Temporal setae consisting of apparent frontal seta, several weak inner verticals, and few stronger outer verticals and postorbitals. Clypeus with few setae Tentorium normal. Palp of five segments, third palpomere with few lanceolate sensilla clavata.

Anteprenotal lobes slightly narrowed medially, but not reduced, with lateral setae. Dorsocentrals relatively numerous; acrostichals apparently about 12 fine hair-like; starting in front; prealars numerous, in two groups; supraalar present. Scutellum with several setae. Wing membrane bare, punctures of microtrichia not visible at $400\times$ magnification. Anal lobe projecting. Costa barely extended, but with false vein continuing nearly to apex. R_{2+3} runs close to R_{4+5} and ends in the middle between R_1 and R_{4+5} ; R_{4+5} ends slightly proximal to apex of M_{3+4} ; Cu_1 curved, but not sinuate; postcubitus extending beyond FCu; anal vein ending well proximal of FCu. VR about 1.5. Brachiolum with 1 seta, R with a few setae, other veins bare. Squama bare. Sensilla campaniformia about 8 on base of brachiolum, 3 below seta, and 8 on apex of brachiolum; 1 at base of subcosta, and 1 on RM. Tibial spurs and hind tibial comb well developed. Strong pseudospurs present in the middle of mid and hind tibiae and at apex of tarsomeres 1–4, sensilla chaetica not observed. Pulvilli vestigial.

Tergites with a few median setae and an anterior transverse row of several setae. Tergite with few and very weak setae, but with strong microtrichia. Anal point without setae or microtrichia. Phallapodeme with distinct apodeme lobe; transverse sternapodeme arcuate, oral projections conspicuous, sharply pointed. Virga spine-like. Gonocoxite with long inferior volsella extending to about $2/3$ the length of gonocoxite Gonostylus without crista dorsalis; megaseta well developed.

Female imago, pupa and larva. Unknown.

Systematics

Trondia resembles *Ionthosmittia* Sæther et Andersen in having weak acrostichals starting in front, numerous inner verticals, presence of frontal setae, and rather long inferior volsella. The genera differ from each other in most other details. In the key to Holarctic Orthoclaadiinae

(Cranston et al. 1989) the genus will key to *Smittia* Holmgren (part) if the apical seta of the antenna is regarded as strong. If a strong apical seta is regarded as absent it will key to *Boreosmittia* Tuiskunen, which can be separated by the reduced inferior volsella. In Sæther et al. (2000) it will also key to *Smittia* if the apical seta is regarded as strong, near *Ionthosmittia* if regarded as absent. However, these genera differ from *Trondia* in most respects while some members of *Pseudosmittia* possess a few of the characteristics found in *Trondia*. These characters include apical seta on antenna; wing with projecting anal lobe and false vein; presence of several inner verticals; presence of supraalar; bare anal point, strong oral projections of transverse sternapodeme; long, single and spine-like virga; and long inferior volsella. These characters, however, are never found together in one or the same species, or even within one and the same species group.

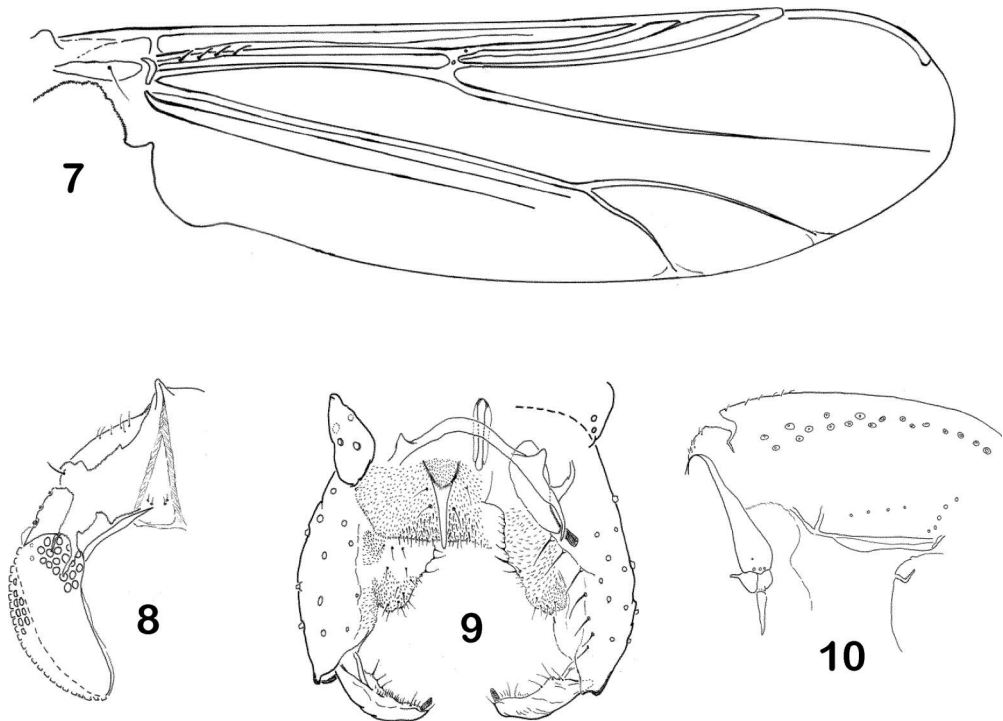
As for the preceding genus, *Trondia* probably is semiterrestrial or semiaquatic, which makes the immature stages difficult to find, and if found likely to possess reduced characteristics. Thus the phylogenetic position will likely be difficult to resolve even when immatures become associated.

***Trondia anderseni* sp. n.** (Figures 7–10)

Type material. Holotype ♂, AUSTRALIA: Western Australia, 4 km w. King Cascade, 15.38 S 125.15 E, calm site, 12–16 vi 1988, T. A. Weir (CSIRO).

Diagnostic characters. See generic diagnosis.

Etymology. See genus etymology.



Figures 7–10. *Trondia anderseni* gen.n., sp.n., male imago: (7) wing; (8) head; (9) hypopygium; (10) thorax.

Male imago ($n = 1$). Total length 1.85 mm. Wing length 0.99 mm. Total length/wing length 1.87. Wing length/length of profemur 2.54. Coloration dark brown.

Head (Figure 8). AR 0.97. Terminal flagellomere 310 μm long, weak apical seta 25 μm long. Temporal setae 11, consisting of 1 apparent frontal seta, 5 inner verticals, 3 outer verticals and 2 postorbitals. Tentorium 105 μm long, 23 μm wide. Stipes 100 μm long, Palpomere lengths (in): 25, 35, 65, 108, 130. Third palpomere with 2 lanceolate sensilla clavata.

Thorax (Figure 10). Antepronotum with 4 lateral setae. Dorsocentrals 18; acrostichals about 12 starting in front and reaching mid-scutum; prealars 9 in two groups, 4 anterior and 5 posterior, 1 supraalar seta. Scutellum with 10 setae.

Wing (Figure 7). VR 1.49. Anal lobe well developed, projecting. Costa 10 μm long, 70 μm long false vein. R_{4+5} ending slightly proximal to apex of M_{3+4} ; Cu_1 sinuous. Brachiolum with 1 seta, R with 4 setae, other veins bare.

Legs. Spur of front tibia 43 μm long, spurs of middle tibia 30 μm and 23 μm long, of hind tibia 45 μm and 25 μm long. Width at apex of front tibia 24 μm , of middle tibia 22 μm of hind tibia 33 μm . Mid and hind legs each with 2 about 25 μm long median pseudospurs; apex of tarsomeres 1–4 of mid and hind legs each with pseudospurs decreasing in length from 18 μm on ta_1 to 13 μm on ta_4 . Comb of 14 setae, 20–30 μm long. Lengths (in μm) and proportions of legs:

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR	BV	SV	BR
p_1	390	430	–	–	–	–	–	–	–	–	–
p_2	395	420	225	110	88	45	40	0.53	3.70	3.64	4.0
p_3	400	435	263	128	130	55	45	0.60	3.07	3.18	6.7

Hypopygium (Figure 9). Tergite IX with about 8 very weak setae, with strong microtrichiae. Anal point nearly transparent, without setae or microtrichiae, 38 μm long; laterosternite IX with 4 setae. Phallapodeme 55 μm long; transverse sternapodeme 63 μm long, oral projections conspicuous, sharply pointed. Virga consisting of 35 μm long single spine Gonocoxite 143 μm long, with 25 μm long inferior volsella reaching to 0.67 gonocoxite length. Gonostylus 58 μm long, without crista dorsalis, megaseta 8 μm long; HR 2.48, HV 3.19.

Female, pupa and larva. Unknown.

Distribution

The species is only known from the type locality in Western Australia.

Comments

The frontal region of the head is torn and strongly reoriented on the slide so that the coronal triangle appears more ventral than the shelf-like projection near the end of the coronal suture. Consequently, the frontal seta appears to originate lateral of and more dorsal to the inner verticals. Figure 2B shows the artefact in setal positions related to the unnatural orientation of the torn areas.

Acknowledgements

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