

On the genus *Smittia* Holmgren, 1869 from New Caledonia. I. Description of *S. maryae* sp. n. from riparian habitats located in the down basin of the River Coulée [Diptera, Chironomidae, Orthoclaadiinae]

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Keywords: Diptera Chironomidae, *Smittia maryae* sp. n., New Caledonia, conservation.

Male adult of *Smittia maryae* sp. n. is described based on material collected by swift net in lower riparian habitats bordering the down basin of River Coulée near the city of Nouméa (alt. 40 m). Some unusual morphological characters (antenna with 1 stout apical seta; anal point densely pubescent, proximal half darker; virga mushroom-like with 2 short caudal spines; inferior volsella double, dorsal side triangular, ventral side marsupial pouch shaped; gonostylus massive, crista dorsalis located apically) allowed us to consider the new species as a biogeographic representative element, which deserve greater conservation measures. At present, 2 *Smittia* species [*S. aterrima* (Meigen, 1818) and *S. retracta* Freeman 1961] have been reported from Australia and only 1 (*S. zealandiana* Moubayed-Breil & Mary, 2021) from New Caledonia. Consequently, the current description increases the total number to 2 known species from New Caledonia and to 4 from the Australasian Region. Comments on its taxonomic position with key for known species from the Australasian Region are given.

Sur le genre *Smittia* Holmgren, 1869 de Nouvelle-Calédonie. I. Description de *S. maryae* sp. n. d'habitats ripicoles du cours inférieur de la rivière Coulée [Diptera, Chironomidae, Orthoclaadiinae]

Mots-clés : Diptera Chironomidae, *Smittia maryae* sp. n., Nouvelle-Calédonie, conservation.

L'adulte mâle de *Smittia maryae* sp. n. est décrit à partir d'un matériel collecté au moyen d'un filet entomologique dans des habitats rupestres du bassin inférieur de la rivière Coulée, non loin de la ville de Nouméa (alt. 40 m). Certains caractères morphologiques inhabituels (antenne avec une soie apicale robuste ; pointe anale pubescente, moitié proximale plus sombre ; virga en forme de champignon avec 2 épines caudales courtes ; volselle inférieure double, partie dorsale triangulaire, partie ventrale en forme de poche marsupiale ; partie postérieure du gonostylus massive ; crista dorsalis insérée apicalement) permettent de considérer la nouvelle espèce comme un élément biogéographique représentatif sur le plan local qui mérite de grandes mesures de conservation. À ce jour, 2 espèces de *Smittia*, *S. aterrima* (Meigen, 1818) et *S. retracta* Freeman 1961, ont été signalées d'Australie et une seule (*S. zealandiana* Moubayed-Breil & Mary, 2021) de Nouvelle-Calédonie. La présente description porte donc à 2 le nombre total d'espèces connues de Nouvelle-Calédonie, et à 4 de la Région Australasienne. Des commentaires sur sa position taxonomique et une clé pour les espèces connues de la région Australasienne sont ajoutés.

1. Introduction

Riparian and semi-terrestrial habitats bordering streams, rivers, wetlands, wet meadows and pools represent the favourite microhabitats for larval populations of the genus *Smittia* Holmgren, 1818. On the basis of knowledge provided on the taxonomy, geographical distribution and ecology of the known *Smittia* species from the Australasian Region and other areas (EDWARDS 1929, GOETGHEBUER 1940-1950, BRUNDIN 1947, 1956, FREEMAN 1959, 1961, FREEMAN & CRANSTON 1980, CRANSTON et al. 1989, ROSSARO 1988, ROSSARO & LENCIONI 2000, MOLLER PILLOT 2008, ASHE & O'CONNOR 2012, SÆTHER & SPIES 2013, MOUBAYED & TISSOT 2019, MOUBAYED-BREIL & MARY 2021, MOUBAYED & CLEVENOT 2022, MOUBAYED et al. 2022), there are about 90 known valid species worldwide, of which 38 are reported from Europe. In this paper, a description of the male adult of *Smittia maryae* sp. n. is provided based on a large material collected in New Caledonia. Currently, the new species is only known from its type-locality at the down basin of the River Coulée near Nouméa city (southern New Caledonia), site n° 93, alt. 40 m, as reported in MOUBAYED-BREIL et al. 2021 (Table VI). Some atypical characters found in the male adult allowed us to consider this new species as local biogeographical element, which deserve a great conservation measure.

2. Material and methods

The studied male adults were collected by swift net in some riparian habitats bordering the down basin of the River Coulée (New Caledonia, alt. 40 m, Photo 1). The material was preserved in 80-85% ethanol for the taxonomic examination and description. Information on the methodology of mounting and conservation of the type material is provided in MOUBAYED & LANGTON (2019). Morphological terminology and measurements follow those of SÆTHER (1980) and LANGTON & PINDER (2007).



Photo 1. Type-locality of *Smittia maryae* sp. n. (photo N. Mary).

Photo 1. Localité type de *Smittia maryae* sp. n. (cliché N. Mary).

3. Results and description

Smittia maryae Moubayed sp. n.

Material examined. Holotype. New Caledonia, River Coulée. 1 male adult captured by swift net near the city of Nouméa (166°36'47.21"E; 22°12'49.61"S); riparian habitat with wet soils and grasses surrounding the down basin of the River Coulée (Photo 1); site N° 93 as reported in MOUBAYED-BREIL et al. 2021 (table VI); altitude 40 m; 07.XI.2012 (N. Mary leg.).

Paratype; 1 male adult, same locality and date as for holotype (N. Mary leg.).

Holotype (mounted on one slide) is deposited in the collections of the 'Musée cantonal de Zoologie, Palais de Rumine, 6 place de la Riponne, CH-1014 Lausanne (MZL), Switzerland'. The paratype is deposited in the collection of the senior author.

Etymology: the species is named "*maryae*" in honour of Nathalie Mary, who remains active as entomologist and hydrobiologist in preserving the biodiversity of aquatic habitats in New Caledonia.

Diagnostic characters

The following combination of characters will separate the new species from other *Smittia* species and related congeners. Head. Eyes bare; coronal triangle with thicker basal sutures; temporals 10 (6 inner and 4 outer verticals); antenna 525 µm long, terminal segment 195 µm, with one apical stout seta, AR 0.58; clypeus with 15 setae in 4 rows; palpomere 3 with 3 sensilla clavata and 1 needle-like sensilla coeloconica. Thorax. Lobes of anteprenotum gaping; lateral anteprenotals 3; acrostichals absent; dorsocentrals 10; prealars 3; humeral pit absent; scutellum with 6 setae. Wing. Brachiolium with 1 seta, veins and squama bare. Legs. Sensilla chaetica present only on tarsomeres ta_1 - ta_5 of PI-PIII. Tergite IX broadly semi-circular, dorsal hump absent. Anal point much wider at base, parallel-sided in its distal half, densely hairy; basal part with 12 setae placed laterally (6 on each side). Transverse sternapodeme rounded, phallapodeme racket-like. Virga mushroom shaped, with 2 short pointed caudal spines. Gonocoxite with truncate apex; superior volsella low; inferior volsella double, dorsal lobe triangular, ventral lobe, semi-circular, marsupial pouch shaped. Gonostylus massive, posterior part projecting upwards, anterior side covered with orally directed setae; crista dorsalis low lobe-like, located preapically, occupying nearly $\frac{1}{4}$ of the anterior side.

Male imago

(n = 2; Figs 1A-N)

Small sized species. Total length 1.75 mm; wing length 0.85 mm; TL/WL = 2.06. General colouration contrasting dark brown to blackish; head dark brown; antenna brownish; thorax distinctly contrasting dark brown to blackish with blackish mesonotal stripes; legs and abdomen brownish; anal segment contrasting brown to blackish. Head (Fig. 1A). Eyes bare; frontal margin with a distinct triangular tubercle; suture of coronal triangle regularly thick; coronals 2; temporals 10 including 6 inner and 4 outer verticals. Antenna 13-segmented, 525 µm long, last flagellomere (Fig. 1B) 195 µm long, stout apical seta about 35 µm long, antennal groove reaching segments 2, AR 0.58. Clypeus (Fig. 1C) 35 µm long, 40 µm maximum width, with 15 setae in 4 rows, posterior margin bilobed. Palp 5-segmented, palpomere 3 with 3 sensilla clavata and 1 needle-like sensilla coeloconica; length (in µm) of segments: 20, 25, 50, 60, 115. Thorax. Lobes of anteprenotum gaping; lateral anteprenotals 3; acrostichals absent; dorsocentrals 10 uniserial; prealars 3; humeral pit absent; preepisternum bare; scutellum with 6 setae (3 on each side of the midline). Wing. Brachiolium with 1 seta; subcosta overreaching fork of radius, costal expansion short, about 15 µm long; veins and squama bare. Legs. Length (in µm) of tibial spurs: PI, 40; PII, 25 and 20; PIII, 35,

20. Pulvilli present, tarsomere 5 of PI-PIII cylindrical; sensilla chaetica present on tarsomeres ta_1 - ta_5 of PI-PIII. Length (μm) and proportions of prothoracic (PI), mesothoracic (PII) and metathoracic (PIII) legs (n=1) as in the following table:

	fe	ti	ta ₁	ta ₂	ta ₃		ta ₄	ta ₅	LR	BV	SV	BR
PI	365	360	185	95	75		45	45	0,51	3,50	3,92	2.65
PII	375	380	210	105	95		50	50	0,55	3,22	3,60	2.25
PIII	380	410	225	125	120		55	55	0,55	2,86	3,51	2.50

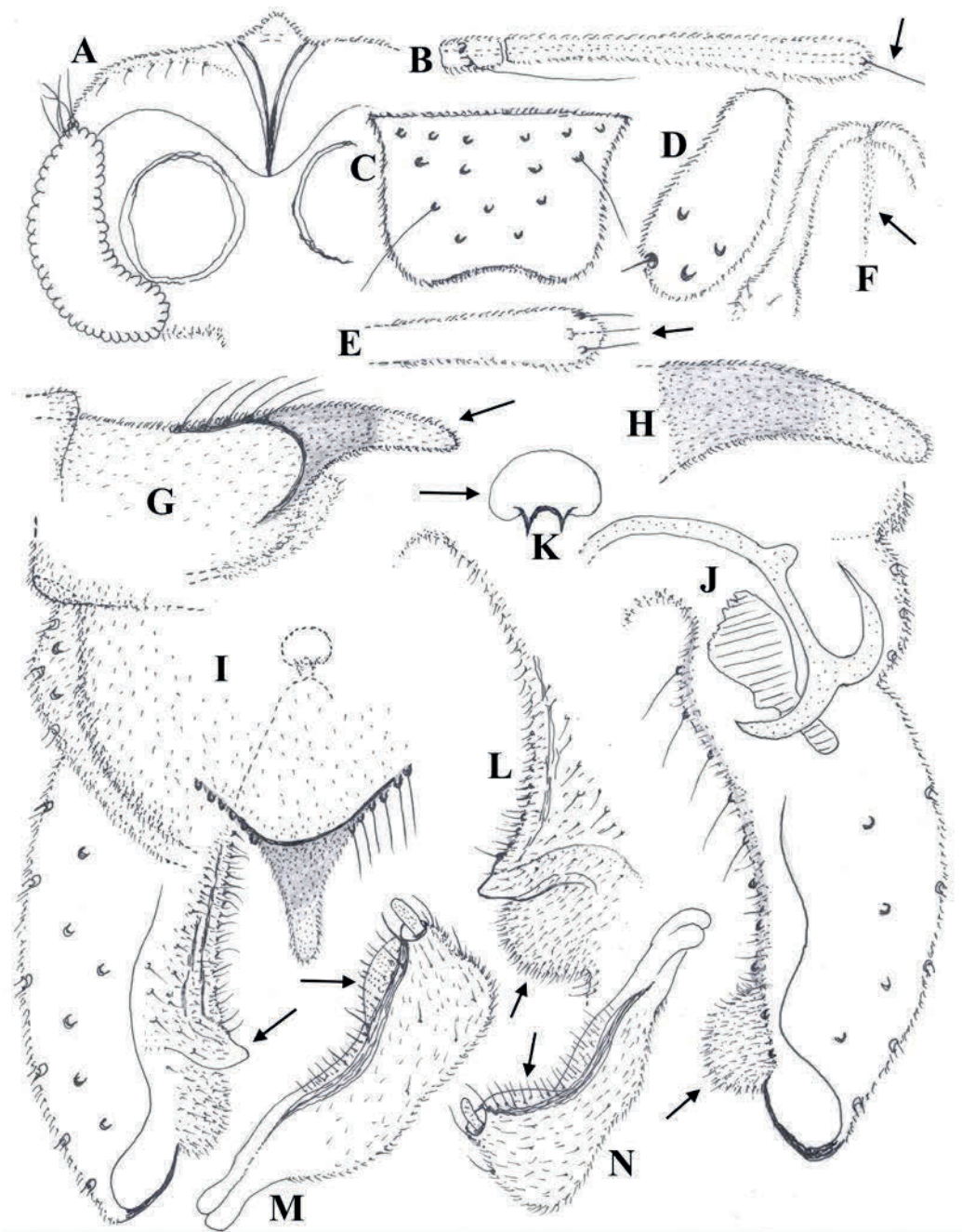
“LR = Length of tarsomere ta_1 divided by length of tibia (ti); BV = Combined length of femur (fe), tibia and ta_1 divided by combined length of tarsomeres ta_2 - ta_5 ; SV = Ratio of femur plus tibia to tarsomere ta_1 ; BR = Ratio of longest seta of ta_1 divided by minimum width of ta_1 , measured one third from apex.”

Abdomen. Hypopygium in dorsal and ventral view as in figures 1I-J (ventral view, Fig. 1J, with tergite IX and anal point omitted). Tergite IX about 110 μm maximum wide at base, broadly semicircular in its distal half, dorsal hump absent, dorsal setae absent. Laterosternite IX with 10 setae (5 on each side). Anal point (Figs 1G-H, lateral; Fig. 1I, dorsal) 40 μm long, 40-45 μm maximum width at base, median part 8-10 μm wide; enlarged at base, parallel-sided in its median and distal parts; not reaching tip of inferior volsella; densely covered with blackish curved short setae; basal part with 12 setae placed laterally close to the basal margin (6 on each side); basal margin bordered with a fine sclerotized band clearly visible in both lateral (Fig. 1G) and dorsal view (Fig. 1I). Apodemes (Fig. 1J); transverse sternapodeme semi-circular, not projecting orally; phallapodeme well-developed, racket shaped. Virga (Figs 1I, K), mushroom shaped, with 2 short pointed caudal spines. Gonocoxite 125 μm long, 70 μm maximum width, truncate apically; dorsal side (Figs 1I, L) with sclerotization along the inner proximal margin; ventral side (Fig. 1J) with 10 stout inner setae. Superior volsella low, located basally. Inferior volsella (Figs 1I-J, L), double; dorsal lobe triangular, slightly bent downwards apically, covered with short and fine setae, apex bare; ventral lobe semispherical, typical marsupial pouch shaped, located distally, covered with fine setae. Gonostylus (Fig. 1M, acute angle; Fig. 1N, obtuse angle), about 60 μm long, 15-20 μm maximum width; posterior part orally projecting, massive with rounded posterior margin; anterior side densely covered with orally directed fine setae; crista dorsalis well-developed, short lobe-like, located pre-apically, occupying about 25% of the anterior side; megaseta well-developed, located apically. HR (length of gonocoxite divided by length of gonostylus) 2.08; HV (total length divided by length of gonostylus X 10) 2.92.

Female adult, pupal exuviae and larva: unknown.

P.27. Figure 1. Male imago of *Smittia maryae* sp. n. Head (left side, dorsal), frontal area, vertex and temporal setae (A); antenna, two last segments (B); clypeus (C); palpomere 3 (D); distal part of palpomere 5 (E); lobes of antepronotum (F); tergite IX and anal point in lateral view (G); anal point, median and distal parts (H); hypopygium in dorsal (I) and ventral view (J); virga (K); inferior volsella, right side (L); gonostylus at acute and obtuse angle (M, N). The arrows indicate some distinguishing characters.

P. 27. Figure 1. Imago mâle de *Smittia maryae* sp. n. Tête (côté gauche, vue dorsale), aire frontale, vertex et soies temporales (A) ; antenne, deux derniers segments (B) ; clypéus (C) ; palpomère 3 (D) ; partie distale du palpomère 5 (E) ; lobes de l'antépronotum (F) ; tergite IX et pointe anale en vue latérale (G) ; pointe anale, parties médiane et distale (H) ; hypopyge en vue dorsale (I) et ventrale (J) ; virga (K) ; volselle inférieure, côté droit (L) ; gonostyle, angles aigu (M) et obtus (N). Les flèches indiquent quelques caractères distinctifs.



4. Remarks

At present, the genus *Smittia* is represented by only one species (*S. zealandiana* Moubayed-Breil & Mary, 2021) in New Caledonia (MOUBAYED-BREIL & MARY 2021) and by 2 species [*S. aterrima* (Meigen, 1818), *S. retracta* Freeman 1961] in Australia (FREEMAN 1961, FREEMAN & CRANSTON 1980). Consequently, the description of *S. maryae* sp. n. increases the total number to 2 known species from New Caledonia and to 4 from the Australasian Region.

In total, there are actually five emended *Smittia*-groups (*aterrima*-group, *pratorum*-group, *scutellosetosa*-group, *terrestris*-group and the *tyrrhena*-group) as documented by MOLLER PILLOT (2008), MOUBAYED-BREIL & MARY (2021) and MOUBAYED & CLEVENOT (2022). In this paper, a sixth new group (the *maryae*-group) is currently emended here, for the Australasian Region.

Nevertheless, some differentiating morphological features found in the male adult of *S. maryae* sp. n. will easily separate it from other related congeners, including the four cited above known species from Australia and New Caledonia. Accordingly, a combination of some distinguishing characters are highlighted in the following key for known *Smittia* species from the Australasian Region.

Key to known male adult of *Smittia* species from the Australasian Region

1. Anal point hairy 2
 - Anal point bare 3
2. Wing bare; anal point conical, apex rounded; inferior volsella double, dorsal lobe triangular, ventral lobe semispherical; crista dorsalis lobe shaped, located distally *S. maryae* sp. n.
 - Wing hairy; anal point linearly elongate, parallel-sided, apex spatulate; inferior volsella simple, digitiform; crista dorsalis absent..... *S. zealandiana*
3. Eyes finely pubescent; inferior volsella triangular, crista dorsalis present..... *S. aterrima*
 - Eyes bare; inferior volsella broadly bilobed, crista dorsalis absent..... *S. retracta*

5. Ecology and geographical distribution

Male adults of *S. maryae* sp. n. were captured in the down basin of the River Coulée where surrounding semiterrestrial and riparian habitats represent the most favourite microhabitats for larval populations. Emergence is observed between September and November. It is currently known from its type-locality at the potamal of the River Coulée (Photo 1, alt. 40 m), nearby of Nouméa city in southern New Caledonia, as shown in MOUBAYED-BREIL ET AL. 2021 (site n°93 in table VI). The new species could be more widely distributed in other littoral wetlands of New Caledonia, and therefore, can be considered as biogeographic local representative, which deserve greater consideration and conservation measure.

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