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**Research article**

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# New species and records of Evanioidea and Stephanoidea from New Caledonia (Hymenoptera)

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**Abstract.** Three new species of aulacid wasps, *Aulacus pascali* sp. nov., *Pristaulacus elveni* sp. nov. and *Pristaulacus villemantae* sp. nov., and a new species of gasteruptiid wasp, *Gasteruption jenningsi* sp. nov., are described and figured. Additionally, we update identification keys to New Caledonia species of aulacids and gasteruptiids. We also provide new data on New Caledonian Evaniidae, Gasteruptiidae and Stephanidae.

**Keywords.** Taxonomy, identification key, Aulacidae, Evaniidae, Gasteruptiidae, Stephanidae.

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## Introduction

New Caledonia is an archipelago in the southwest Pacific Ocean, well known to be a hotspot of biodiversity (Myers *et al*. 2000). The archipelago is composed of the main island Grande Terre, which is divided along its length by a central mountain range, as well as the Belep Islands to the North, the Loyalty Islands to the East, the Isle of Pines to the South, the Chesterfield Islands and Bellona Reefs to the West, and few islets, all with a tropical marine climate. New Caledonia has a unique geological history since it is considered a part of Zealandia, a continental fragment originating from the former Gondwana, with the addition of terranes that accreted after the breakup of Gondwana about 84 million years ago (Ma) resulting in an outstanding level of species richness and endemism (Chazeau 1993; Morat 1993; Najt & Grandcolas 2002).

The New Caledonian fauna of Evanioidea Latreille, 1802 and Stephanoidea Leach, 1815 has recently been studied, with three species of Aulacidae Shuckard, 1841 (Jennings *et al*. 2004), four species of Evaniidae Latreille, 1802 (Balhoff *et al*. 2013), five species of Gasteruptiidae Ashmead, 1900 (Jennings & Austin 2005; Jennings *et al*. 2015) and four species of Stephanidae Leach, 1815 (Aguiar & Jennings

2005) known from this territory. Additionally, a summary of the hymenopteran fauna of New Caledonia was provided by Jennings *et al*. (2013).

The family Aulacidae currently includes 310 species. Its diversity has greatly benefited from the recent descriptions of species, mostly from Africa and Asia (Smith 2001; Turrisi 2006, 2007, 2014, 2017; Turrisi *et al*. 2009; Turrisi & Madl 2013; Jennings *et al*. 2018; Smith & Turrisi 2020; Turrisi & Smith 2020). Even if previously known from three genera, aulacid wasps are now placed within two genera: *Aulacus* Jurine 1807, with 122 species, and *Pristaulacus* Kieffer 1900 (including the former *Panaulix* Benoit, 1984) with 188 species (Jennings *et al*. 2018; Smith & Turrisi 2020; Turrisi & Smith 2020). Both genera are represented in all biogeographic regions, except Antarctica, with the genus *Aulacus* unknown from the Afrotropics (Turissi 2014 and included references). The monophyly of the family is well supported (Jennings & Austin 2000; Turrisi *et al*. 2009; Li *et al*. 2018). Extant species of aulacids are known to be koinobiont endoparasitoids of wood-boring larvae of Hymenoptera Linnaeus, 1758 and Coleoptera Linnaeus, 1758 (Deyrup 1984; Gauld & Hanson 1995; Jennings & Austin 2004).

The family Gasteruptiidae comprises six extant genera (Crosskey 1962; Jennings & Austin 1997, 2002; Macedo 2009; van Achterberg & Talebi 2014; Parslow & Jennings 2018) but to date, many species, especially fossils, are placed as *incertae sedis* making it difficult to set up a species catalog. Extant gasteruptiids are placed in two extant gasteruptiid subfamilies. The subfamily Hyptiogastrinae Crosskey, 1953 has a restricted Gondwanan distribution and is currently known in Australian mainland, Tasmania, New Zealand and South America, as well as in New Caledonia, New Guinea, Fiji and Vanuatu (Jennings & Austin 1994a, 1994b, 1997, 2002). Among this subfamily, the genus *Hyptiogaster* Kieffer, 1903 is endemic to Australia, while *Pseudofoenus* Kieffer, 1902 displays an Australasian distribution (Jennings & Austin 2002). The subfamily Gasteruptiinae Ashmead, 1890, mainly represented by the genus *Gasteruption* Latreille, 1796, displays a worldwide distribution while other genera are found only in South America (van Achterberg & Talebi 2014; Macedo 2009, 2011; Zhao *et al*. 2012). As for all other extant families composing the Evanioidea, the monophyly of Gasteruptiidae is well supported (Jennings & Austin 2002; Macedo 2009; Li *et al*. 2018; Parslow *et al*. 2020). Adults of extant species of gasteruptiids are free-living insects feeding on nectar and pollen (Jennings & Austin 2004) while predator-inquiline, which mean that their larvae feed on the larval food of solitary bees, after consuming the egg or larva of the bee or solitary wasps (Malyshev 1968; Parslow *et al*. 2020; Jennings & Austin 2004).

The family Evaniidae is common, nearly cosmopolitan, and includes approximately 580 extant species in 21 genera, but its diversity is clearly underestimated (Deans 2005; Mullins *et al*. 2012). Interestingly, their larvae are considered as predators of cockroach eggs in oothecae (Huben 1995). However, the association between evaniid larvae and their prey is much more reminiscent of parasitoid behavior.

The crown wasp superfamily, Stephanoidea, is easily distinguishable from most of the other Hymenoptera in having tubercles on the vertex (Goulet & Huber 1963). The number of extant Stephanidae has been greatly increased since the last catalog of Aguiar (2004) and is now represented by 345 species (Hong *et al*. 2011) occurring mainly in subtropical and tropical forests (Vilhelmsen 1997; van Achterberg 2002). Species of Stephanidae develop as solitary idiobiont ectoparasitoids of larvae of wood-boring insect (Aguiar 2004).

Herein we describe a new species of *Aulacus,* two new species of *Pristaulacus* and a new species of *Gasteruption* from New Caledonia. Additionally, we provide new data on other Evanioidea and Stephanoidea from New Caledonia.

## Material and methods

### Taxon sampling

The material examined in this study is based on samplings carried out in 2016–17, mostly with Malaise traps, under the project "Our Planet Reviewed" – New Caledonia Expedition, 2016–17 (http://laplaneterevisitee.org/en) under the collecting permits MNHN-PNI APA-NCPS-2016-025 and MNHN-PNI - N°60912-2001-2017/JJC.

### Repositories

Specimens examined for the present study are deposited in the following collection:
MNHN = Muséum national d'histoire naturelle, Paris, France

### Specimen examination

Specimens were examined using an AMSCOPE and a Leica MZ APO stereo microscopes equipped with a micrometer, at several magnification planes. Series of photographs were taken at different focal planes using a Canon EOS 5D mark II camera mounted on a Leica MZ APO stereo microscope or an Olympus TOUGH TG-5. These series of photographs were stacked using Helicon Focus. The figures were processed with Adobe Illustrator and Photoshop software.

### Terminology and abbreviations

The general terminology follows Jennings *et al*. (2004) and Goulet & Huber (1993). The sculpture terminology follows Harris (1979).

Morphological terminology for measurements and indices includes the following abbreviations:

BL = body length
CI = cephalic index: HW / HL × 100
EI = eye index: EW / EL × 100
EL = eye length: maximum length of eye as measured normally in oblique view of the head to show full surface of eye
EW = eye width: maximum width of eye as measured normally in oblique view of the head to show full surface of eye
F = flagellomere
FWL = fore wing length
HL = head length (maximal length measured from clypeus midpoint to vertex in front view)
HW = head width
HWL = hind wing length
MSL = diagonal length of the mesosoma in lateral view from the anteriormost point of pronotal slope (excluding the collar) to the posteriormost extension of propodeal lobes
MSW = mesosoma width, in dorsal view
MTL = length of the metasoma in lateral view from the anteriormost point of tergite I to the posteriormost extension of the apical sternite
OI = ovipositor index: OL / FWL × 100
OL = ovipositor length
OOL = distance between posterior ocellus and eye
PDL = pedicel length
POL = distance between posterior ocelli
SL = scape length
T = tergite
TS = tarsomeres

## Results

Class Insecta Linnaeus, 1758
Order Hymenoptera Linnaeus, 1758
Superfamily Evanioidea Latreille, 1802
Family Aulacidae Shuckard, 1841
Subfamily Aulacinae Shuckard, 1841
Tribe Aulacini Shuckard, 1841

Genus ***Aulacus*** Jurine, 1807

See Jennings *et al*. (2018) for taxonomic history.

***Aulacus pascali*** sp. nov.
urn:lsid:zoobank.org:act:F0BE8DED-24F4-43C9-B7B5-EFF64670D469
Figs 1, 12A

### Diagnosis

Small species (BL = 2.97 mm). Head 1.23 × as wide as long; antenna with scape 1.18 × as long as pedicel, F-I 0.86 × as long as F-II; forewing with vein 2Rs+M shorter than 2Rs, discal cell elongated and narrow, second discal cell narrow; metasoma 1.11 × as long as mesosoma.

### Etymology

The specific epithet is a patronym honoring Olivier Pascal, manager of the terrestrial part of the "Our Planet Reviewed" expeditions. The species epithet is to be treated as a noun in the genitive case.

### Type material

#### Holotype

NEW CALEDONIA • ♀; Grande Terre, Province Nord, Poindimié, Katalupaik; 20°51′14.39″ S, 165°0′49.85″ E; alt. 304 m; 18 Oct.–2 Nov. 2017; E. Poirier leg.; Malaise trap n°KAT3-MAL2; MNHN.

### Description

#### Female holotype

Measurements (in mm, except CI, EI and OI). BL = 3.18; HL = 0.65; HW = 0.80; EL = 0.46; EW = 0.33; OOL = 0.16; POL = 0.11; SL = 0.13; PDL = 0.11; F-I = 0.13; F-II = 0.15; FWL = 2.42; HWL = 1.43; MSL = 1.20; MSW = 0.73; MTL = 1.33; OL = 2.35; CI = 123; EI = 71; OI = 97.

Color. Head, mesosoma and coxae II and III, ovipositor valves black; hind legs tarsomeres, tibia III, propleuron, metasoma and ovipositor brown to dark brown; palpi, pronotum, pro-coxa, trochanter white; mandibles, scape, pedicel, femora, pro- and mesotibia, pro- and mesotarsomeres yellow; flagellomeres yellow basally, gradually becoming dark brown toward apex; wings hyaline with brown veins.

Head (Fig. 1A–C). In full-face view, 1.23 × as wide as long; mandibles visible but closed [tooth number not visible]; clypeus slightly convex, with small blunt projecting tooth medially; malar space 0.58 × as long as scape, margin sinuate; antenna with 14 antennomeres, scape 1.60 × as long as wide and slightly longer than pedicel and as long as F-I, F-I slightly longer than F-II, both more than twice as long as wide; flagellum thickening toward apex, apical flagellomere longer than preceding one; subantennal groove shallow and indistinct; frons without lateral medial carina above torulus; vertex with ocelli arranged in small isosceles triangle, mid-ocellus separated from lateral ocelli by its diameter, lateral ocelli separated

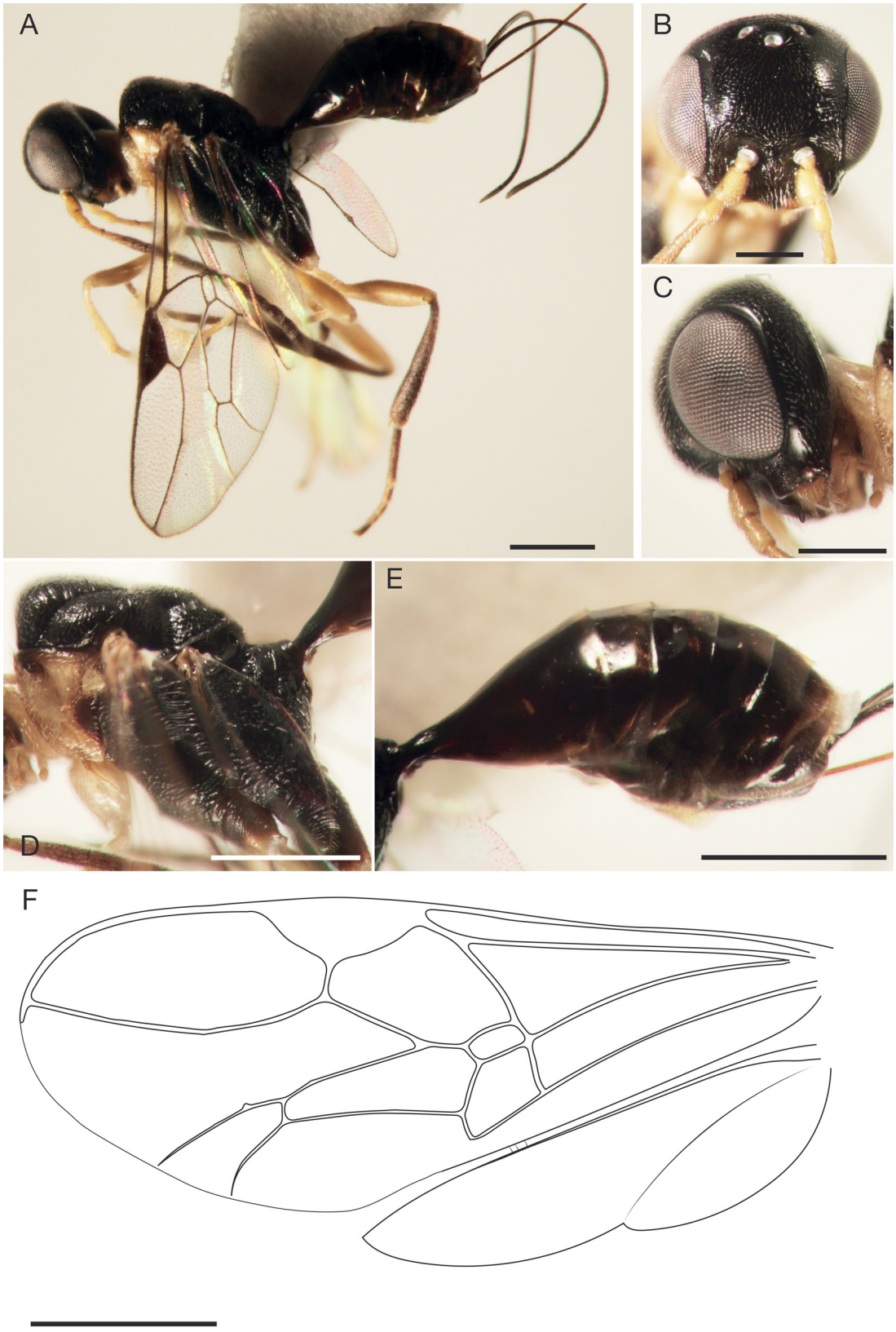



**Fig. 1.** *Aulacus pascali* sp. nov., holotype, ♀ (MNHN). **A**. Ateral habitus. **B**. Head in full-face view. **C**. Head in lateral view. **D**. Mesosoma in lateral view. **E**. Metasoma in lateral view. **F**. Line drawing of wings venation. Scale bars: A, D–F = 0.5 mm; B–C = 0.25 mm.

by twice their diameter, and by twice their diameter from eye margin; posterior margin of head slightly concave in dorsal view; occipital carina absent.

Mesosoma (Fig. 1D). Propleuron ventrolateral carina pronounced; pronotum without angular process, covered with tiny, erect and dense pilosity; mesoscutum in lateral view slightly angular anterodorsally, notauli conspicuous, parapsidal lines present; metapostnotum narrow with posterior margin strongly curved; mesepimeron broad; propodeum straight under metasomal insertion; protrochantellus present; tibial spurs formula 1-2-2 with mid- and hind-tibial spurs equal and similar in shape; hind coxa with ovipositor guide on inner surface, somewhat distal, transverse and somewhat oblique; hind femur 0.68 × as long as hind tibia; TS 1 3.20 × as long as TS 2; TS 2 1.25 × as long as TS 3; TS 3 1.60 × as long as TS 4; TS 4 0.55 × as long as TS 5; hind tarsal claw 0.35 × as long as TS 5; tarsal claws simple.

Fore wing (Fig. 1F). Pterostigma twice as wide as costal cell; marginal cell with Rs abscissae curved; sub-marginal cell with vein 2-Rs as long as 1-Rs, vein 2-Rs+M shorter than 2-Rs; veins 2r-m and 3r-m largely nebulous; discal cell rectangular, vein 1-M and 1m-cu parallel; second discal cell elongate with vein 2m-cu ending at mid-length of 3-M vein; sub-basal cell thin, 2.6 × as wide as discal cell.

Hind wing (Fig. 1F). Venation reduced, Sc+R tubular, C and A nebulous, with 3 hamuli, second and third closer to each other.

Metasoma (Fig. 1E). Clavate, slightly longer than mesosoma; T-I about 3.00 × as long as T-II; T-II to T-VI of similar length slightly shortening toward apex.

Sculpture. Head shallowly and transversally strigate except around occelli and along exterior eyes margin; gena shallowly and longitudinally strigate; malar space puncticulate-reticulate; head densely puncticulate; pronotum punctate; mesoscutum and scutellum strigose-reticulate transversally; mesepisternum punctate-reticulate; mesepimeron costulate transversally; metapleuron medially punctate-reticulate; pronotal lobes and mesoscutellum smooth; metapostnotum scrobiculate; propodeum areolate-rugose under metasomal insertion, with 2 concentric ridges originating from propodeal sides and passing above metasomal insertion; pronotum, mesoscutum and mesoscutellum shallowly punctate; metasomal sparsely and shallowly puncticulate, T-I smooth and II to VI gradually shallowly-reticulate to reticulate.

Pilosity. Tiny, erect, dense on head (including antennae and palpi), pronotum, scutum, scutellum and legs, sparse on propodeum; rest of body almost glabrous.

**Distribution**

It is known only from its type locality, Katalupaik (Fig. 12A).

**Remarks**

*Aulacus pascali* sp. nov. can be distinguished from *A. coracinus* Jennings, Austin & Stevens, 2004 by the reduced hind wing venation (R+Rs, M+Cu, Cu, r-m and 2-M absent), the pronotum white and the appendages mostly yellow, and its smaller size (3.18 mm vs 11.5 mm), from *A. emineo* Jennings, Austin & Stevens, 2004 by the presence of the transverse ovipositor guide on the inner surface of the hind coxa and from *A. burwelli* Jennings, Austin & Stevens, 2004 by its coloration (body of *A. pascali* sp. nov. mostly black vs body of *A. burwelli* black with extensive orange coloration on mesosoma and metasoma), the metasoma more clavate and its smaller size (3.18 mm vs 4.1–5.9 mm).

***Aulacus burwelli*** Jennings, Austin & Stevens, 2004
Figs 2, 12B

*Aulacus burwelli* Jennings, Austin & Stevens, 2004: 347.

**Material examined**

NEW CALEDONIA • 2 ♀♀; Grande Terre, Province Nord, Poindimié, Katalupaik; 20°51′8.99″ S, 165°0′41.68″ E; alt. 307 m; 18 Oct.–2 Nov. 2017; E. Poirier leg.; Malaise trap n°KAT3-MAL1; MNHN • 4 ♀♀; same collection data as for preceding; 20°51′11.12″ S, 165°0′34.66″ E; alt. 306 m; E. Poirier leg.; Malaise trap n°KAT3-MAL3; MNHN • 1 ♀; same collection data as for preceding; 20°51′8.17″ S, 165°0′27.64″ E; alt. 320 m; E. Poirier leg.; Malaise trap n°KAT3-MAL5; MNHN • 4 ♀♀; same collection



**Fig. 2.** *Aulacus burwelli* Jennings, Austin & Stevens, 2004, ♀ (MNHN), lateral habitus. Scale bar = 1.0 mm.

data as for preceding; 20°51′5.04″ S, 165°0′34.37″ E; alt. 305 m; E. Poirier leg.; Malaise trap n°KAT-MAL CAMP; MNHN.

**Distribution**

*Aulacus burwelli* is known from the type locality, Table Unio road (Jennings *et al*. 2004), and from Katalupaik (Fig. 12B).

**Remarks**

During the 2017 "Our Planet Reviewed" expedition, 11 females were collected in Malaise traps at Katalupaik, 110 km north-west of the type locality (Fig. 12B). These females range from 4.1 to 5.9 mm in total length. Based on these new specimens, the variability of color pattern of *A. burwelli* is: pronotum from completely yellow to yellow with the dorsal half brown; median lobe of mesoscutum from orange with a basal and transverse black stripe to orange with the basal half almost completely black; lateral lobes of mesoscutum from black to orange with a median black stripe; scutellum from black to black with two lateral orange spots; coxa III from yellow with base black to almost completely black with a variable amount of orange anteriorly and posteriorly; metasoma from largely orange with variable amount of black, especially dorsally, to almost black with some orange laterally; wings hyaline with the apex slightly infuscated; venation brown with pterostigma lighter medially.

Genus ***Pristaulacus*** Kieffer, 1900

See Turrisi *et al*. (2009) for taxonomic history.

***Pristaulacus elveni*** sp. nov.
urn:lsid:zoobank.org:act:341D295B-75B1-483C-A54C-5511C17E460D
Figs 3–4, 12A

**Diagnosis**

Light orange species with few black or dark brown markings on head, mesoscutum and metasoma. Head 1.35 × as wide as long; antenna with scape 1.58 × as long as pedicel; F-II more than twice as long as F-I. Dorsal face of propodeum in lateral view strongly concave basally then convex, with single transversal carina on convexity.

**Etymology**

The specific epithet refers to the first name of Thibault Ramage's son, Elven. The species epithet is to be treated as a noun in the genitive case.

**Type material**

**Holotype**

NEW CALEDONIA • ♀; Grande Terre, Province Nord, Poindimié, Katalupaik; 20°51′8.96″ S, 165°0′33.83″ E; alt. 306 m; 18 Oct.–2 Nov. 2017; E. Poirier leg.; Malaise trap n°KAT3-MAL4; left mid leg missing and ovipositor sheath broken; MNHN.

**Paratype**

NEW CALEDONIA • 1 ♀; same collection data as for holotype; MNHN.

**Description**

Measurements (in mm except CI, EI and OI; holotype in brackets). BL = 5.80 (6.70); HL = 1.05 (1.05); HW = 1.32 (1.42); EL = 0.71 (0.75); EW = 0.57 (0.62); OOL = 0.16 (0.18); POL = 0.20 (0.22); SL = 0.27 (0.27); PDL = 0.17 (0.17); F-I = 0.27 (0.30); F-II = 0.60 (0.62); FWL = 5.10 (5.50); HWL = 3.20 (3.50); MSL = 2.30 (2.40); MSW = 1.15 (1.30); MTL = 2.90 (3.20); OL = 5.60 (4.90); CI = 125 (135); EI = 80 (82); OI = 109 (89).



**Fig. 3.** *Pristaulacus elveni* sp. nov., holotype, ♀ (MNHN), lateral habitus. Scale bar = 1.0 mm.

**Female holotype**

Color. Light orange species; mandibles apex, pedicels and flagellae, large spot around ocelli reaching dorsal margin of eyes, transversal stripe on posterior margin of mesoscutum and hind tarsomeres black; apical ⅔rd of hind tibiae, sub-basal (sometimes absent) and sub-apical rounded spot on T-I, median rounded spot on T-II to T-VI and ovipositor brown. Fore wing with membrane yellow basally, hyaline in its apical half and infuscated apically; veins brown. Hind wing with membrane yellow basally, hyaline in its apical half and slightly infuscated apically; veins brown.

Head (Fig. 4A, C). In full-face view, 1.35 × as wide as long, vertex convex; mandibles tridentate; clypeus slightly convex, with small blunt projected tooth medially; malar space as long as scape, margin sinuate; antenna 14-segmented, scape 1.58 × as long as wide, 1.58 × as long as pedicel, and as long as F-I, F-I slightly longer than F-II, both more than twice as long as wide; flagellomeres III–XI shortening gradually toward apex; apical flagellomere slightly longer than preceding one; frons without lateral medial carina above torulus; vertex with ocelli arranged in small isosceles triangle, mid-ocellus separated from lateral ocelli by its diameter, lateral ocelli separated by nearly 3.00 × their diameter and by twice their diameter from eye margin; posterior margin of head conspicuously concave in dorsal view; occipital carina present.

Mesosoma (Fig. 4B). Pronotum without angular process; mesoscutum in lateral view slightly angular anterodorsally, notauli conspicuous and parapsidal lines present; small transverse depression between axillae, mesoscutum and scutellum; metapostnotum narrow; mesepimeron elongate; dorsal face of propodeum in lateral view strongly concave basally becoming convex distally, with transversal carina separating medially dorsal convex and concave surface, and carina surrounding metasomal insertion directed downward to hind coxa, posterior face of propodeum slightly concave under metasomal insertion; protrochantellus present; tibial spurs formula 1-2-2, protibial spurs bifid apically, with mid- and hind-tibial spurs equal and similar in shape; hind coxa with ovipositor guide on inner surface, somewhat distal, transverse and somewhat oblique; hind femur 0.63 × as long as hind tibia; TS 1 2.80 × as long as TS 2; TS 2 1.60 × as long as TS 3; TS 3 2.50 × as long as TS 4; TS 4 0.50 × as long as TS 5; hind tarsal claw 0.50 × as long as TS 5; tarsal claw with two sub-apical teeth equidistant and equal in length, apical tooth as long as preceding ones.

Fore wing (Fig. 4E). Vein 2-Rs+M very short; second discal cell elongate; vein 2r-m almost absent except for slight node on medial vein; vein 3r-m tubular in anterior quarter and posterior fifth, remainder nebulous.

Hind wing (Fig. 4F). With 2 hamuli; venation reduced in Sc+R; M+Cu, A, beginning of Cu and 2-M present; 2-M tubular in its apical ⅔rd; M+Cu and A nebulous.

Metasoma (Fig. 4D). Elongate, longer than mesosoma; T-I more than 3.00 × as long as T-II; T-II to T-VI of similar length.

Sculpture. Head, pronotum, sides of mesosoma densely puncticulate (except small transverse depression between axillae and anterior median triangle on mesoscutum). Mesoscutum (except anterior median triangle and posterior margin), axillae, scutellum with transversal ridges. Lateral depression of metanotum, metapostnotum with longitudinal ridges. Propodeum basally and medially with 3 or 4 longitudinal ridges, laterally with 3 ridges directed toward metasomal insertion and under propodeal declivity with longitudinal and oblique ridges.

Pilosity. Small, erect, dense on all the body, sparse and less conspicuous on metasoma, absent on mesoscutum anterior median triangle and T-I and T-II.

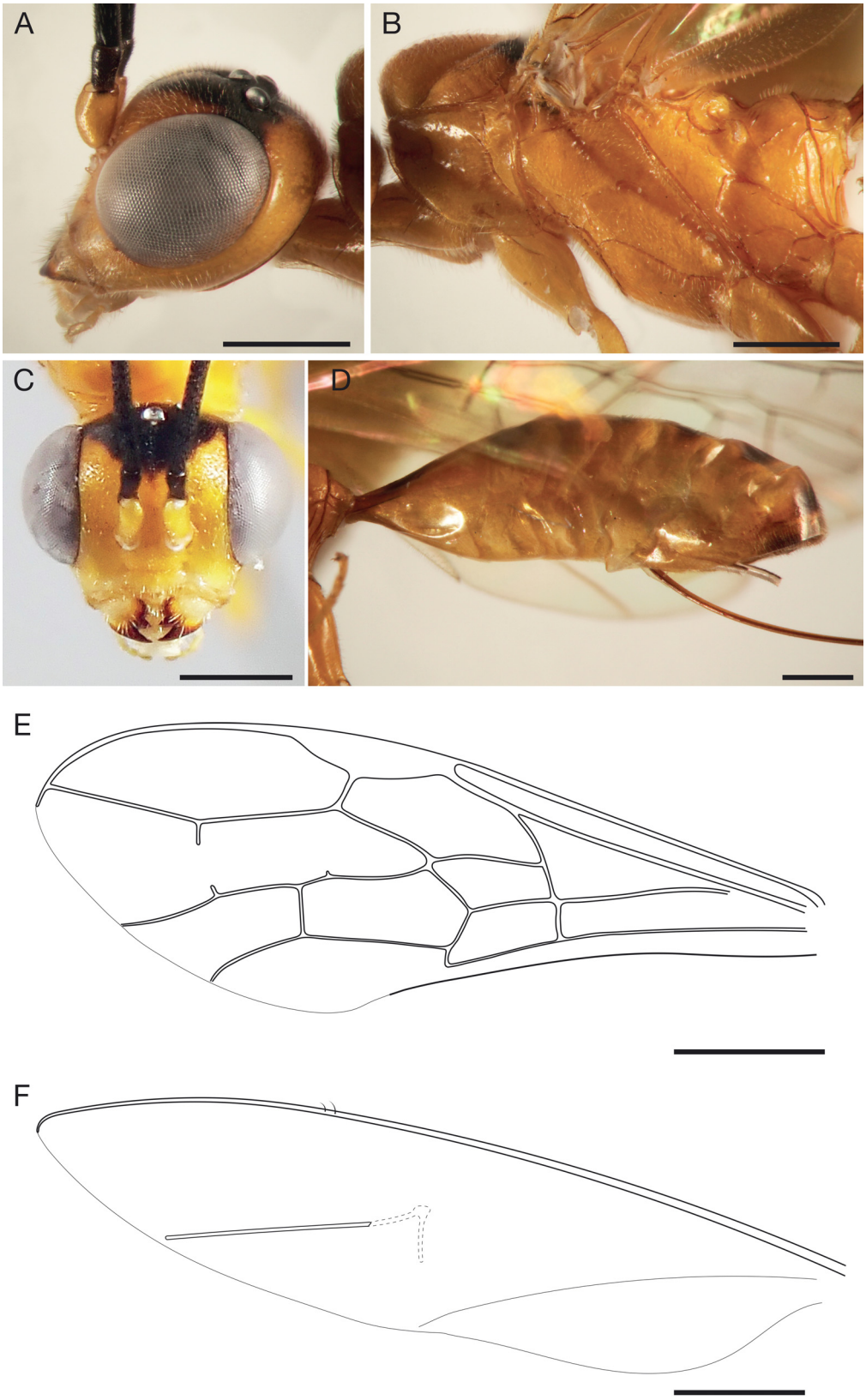



**Fig. 4.** *Pristaulacus elveni* sp. nov., holotype, ♀ (MNHN). **A**. Head in lateral view. **B**. Mesosoma in lateral view. **C**. Head in full-face view. **D**. Metasoma in lateral view. **E**. Line drawing of fore wing venation. **F**. Line drawing of hind wing venation. Scale bars: A–D, F = 0.5 mm ; E = 1.0 mm.

### Distribution

It is known only from its type locality, Katalupaik (Fig. 12A).

### Remarks

*Pristaulacus elveni* sp. nov. can easily be distinguished from *P. villemantae* sp. nov. by its yellow coloration, the stouter mesosoma, and the dorsal face of propodeum more concave basally and with the presence of a single transversal ridge on posterior half (dorsal face of propodeum shallowly concave basally and with several transverse ridges on posterior half in *P. villemantae* sp. nov.).

***Pristaulacus villemantae*** sp. nov.
urn:lsid:zoobank.org:act:3CEB16BE-DBFE-404A-96BD-5F65354B77DA
Figs 5, 12A

### Diagnosis

Mainly black species. Head 1.20 × as wide as long; antenna with scape 2.00 × as long as pedicel, F-II twice as long as F-I. Dorsal face of propodeum in lateral view shallowly concave basally then convex, with several transversal carinae on convexity.

### Etymology

The specific epithet is a patronym honoring Dr Claire Villemant (MNHN), who greatly contributes to the knowledge of Hymenoptera, especially of Ichneumonidae. The species epithet is to be treated as a noun in the genitive case.

### Type material

#### Holotype

NEW CALEDONIA • ♀; Grande Terre, Province Nord, Poindimié, Katalupaik; 20°51′5.04″ S, 165°0′34.37″ E; alt. 305 m; 18 Oct.–2 Nov. 2017; E. Poirier leg.; Malaise trap n°KAT-MAL CAMP; MNHN.

#### Paratypes

NEW CALEDONIA • 9 ♀♀; same collection data as for holotype; MNHN • 3 ♀♀; same collection data as for holotype; 20°51′8.99″ S, 165°0′41.68″ E; alt. 307 m; E. Poirier leg.; Malaise trap n°KAT3-MAL1; MNHN.

### Description

Measurements (in mm except CI, EI and OI; holotype in brackets). BL = 6.40–9.30 (7.6); HL = 0.92–1.60 (1.30); HW = 1.25–1.95 (1.56); EL = 0.70–1.10 (0.86); EW = 0.50–0.90 (0.70); OOL = 0.12–0.16 (0.14); POL = 0.23–0.29 (0.24); SL = 0.20–0.30 (0.26); PDL = 0.12–0.17 (0.13); F-I = 0.25–0.45 (0.33); F-II = 0.50–0.85 (0.66); FWL = 5.60–9 (7); HWL = 3.50–5.40 (4.50); MSL = 2.55–4.20 (3.35); MSW = 1.17–1.90 (1.40); MTL = 2.65–3.90 (3.60); OL = 4.75–7 (6); CI = 122–135 (120); EI = 0.71–81 (81); OI = 77–84 (85).

#### Female holotype

Color. Mainly black species; base of mandibles, fore and mid legs, hind protrochantellus and base of tibiae, metasomal spiracle, lateral small transverse stripe at T-I mid-length, ovipositor dark-orange. Fore wing with membrane slightly yellow basally, hyaline in its apical half conspicuously infuscated apically; veins black. Hind wing with membrane hyaline; veins black.

Head (Fig. 5A, C). In full-face view, 1.20 × as wide as long, vertex slightly convex; mandibles tridentate; clypeus slightly convex, with small blunt projected tooth medially; malar space as long as scape, margin sinuate; antenna 14-segmented, scape about 1.30 × as long as wide, 2 × as long as pedicel; F-I 1.26 ×

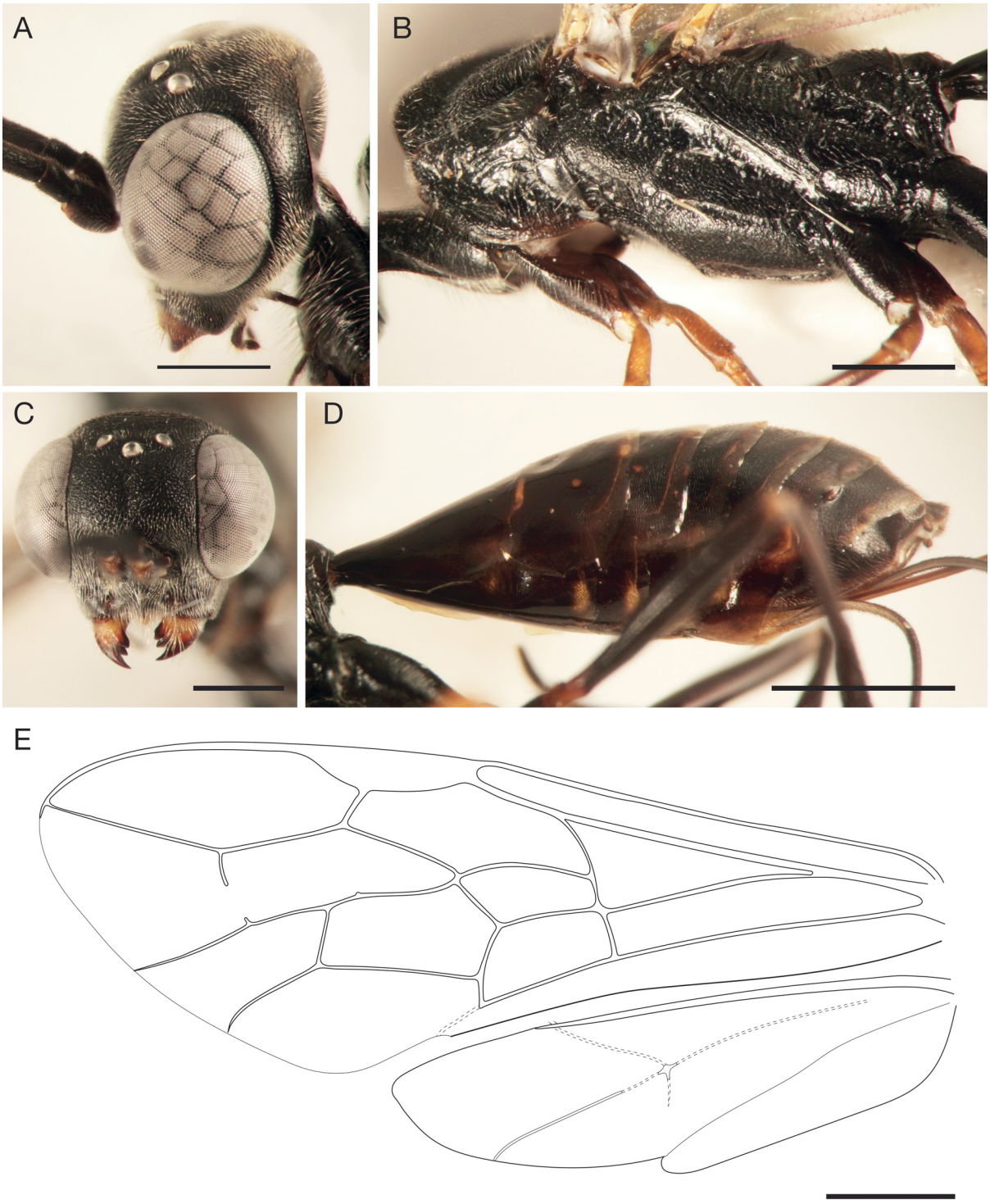



**Fig. 5.** *Pristaulacus villemantae* sp. nov., holotype, ♀ (MNHN). **A**. Head in lateral view. **B**. Mesosoma in lateral view. **C**. Head in full-face view. **D**. Metasoma in lateral view. **E**. Line drawing of wings venation. Scale bars: A–C = 0.5 mm; D–E = 1.0 mm.

as long as scape, F-II twice as long as F-I, both more than twice as long as wide; flagellomeres III-XI shortening gradually toward apex; apical flagellomere slightly longer than preceding one; frons without lateral medial carina above torulus; vertex with ocelli arranged in isosceles triangle, mid-ocellus separated from lateral ocelli by slightly less its diameter, lateral ocelli separated by slightly more than their diameter and by 1.50 × their diameter from eye margin; posterior margin of head slightly concave in dorsal view; occipital carina present.

Mesosoma (Fig. 5B). Propleuron ventrolateral carina present; pronotum without angular process; mesoscutum in lateral view slightly angular anterodorsally, notauli conspicuous and parapsidal lines present; small transverse depression between axillae, mesoscutum and scutellum; metapostnotum wide; mesepimeron elongate; propodeum in lateral view shallowly concave basally becoming convex distally, with transversal carina separating medially dorsal convex surface and carina surrounding metasomal insertion and directed downward to hind coxa, posterior face of propodeum concave under metasomal insertion; protrochantellus present; tibial spurs formula 1-2-2, protibial spurs bifid apically, with mid- and hind-tibial spurs equal and similar in shaped; hind coxa with ovipositor guide on inner surface, somewhat distal, transverse and somewhat oblique; hind femur 0.65 × as long as hind tibia; TS 1 2.88 × as long as TS 2; TS 2 1.80 × as long as TS 3; TS 3 2.50 × as long as TS 4; TS 4 0.40 × as long as TS 5; hind tarsal claw 0.40 × as long as TS 5; tarsal claw with two equidistant sub-apical teeth, basal tooth shorter than second one; apical tooth longer than preceding ones.

Fore wing (Fig. 5E). Vein 2-Rs+M very short; second discal cell elongate; vein 2r-m almost absent except for slight node on medial vein; vein 3r-m tubular in anterior $^{2}/_{5}^{th}$ and posterior $^{1}/_{10}^{th}$, remainder nebulous.

Hind wing (Fig. 5E). With 2 hamuli, venation reduced in Sc+R, r-m, M+Cu, A; beginning of Cu and 2-M present; Sc+R and 2-M tubular, others nebulous.

Metasoma (Fig. 5D). Elongate, longer than mesosoma; T-I more than 3.00 × as long as T-II; T-II to T-VI of similar length.

Sculpture. Head, mesosoma (except small transverse depression between axillae and anterior median triangle on mesoscutum) densely and slightly puncticulate. Frons and vertex with shallow ridges. Mesoscutum (except anterior median triangle and posterior margin), axillae, scutellum, dorsum of propodeum, dorsal face of mid and hind coxae with transversal ridges. Lateral depression of metanotum with longitudinal ridges. Metapostnotum, lateral and posterior face of propodeum reticulate. Tergite of metasoma micro-reticulate, reticulation becoming stronger toward apex.

Pilosity. Small, erect, dense on all the body, sparse and less conspicuous on metasoma, absent on mesoscutum anterior median triangle and T-I and T-II.

**Distribution**

It is known only from its type locality, Katalupaik (Fig. 12A).

**Remarks**

*Pristaulacus villemantae* sp. nov. can easily be distinguished from *P. elveni* sp. nov. by its black coloration, the more elongate mesosoma, and the dorsal face of propodeum less concave basally and with the presence of several transversal ridges on the posterior half (dorsal face of propodeum strongly concave basally and with a single transverse ridge on the posterior half in *P. elveni* sp. nov.).

**Key to female Aulacidae of New Caledonia (modified from Jennings *et al.* 2004 for species of *Aulacus* Jurine, 1807)**

1. Tarsal claws simple or with a small inner tooth ..... 2
– Tarsal claws pectinate ..... 5

2. Hind wing venation reduced, R+Rs, M+Cu, Cu, r-m and 2-M absent (Jennings *et al*. 2004: fig. 1) ..... 3
– Hind wing venation not reduced, R+Rs, M+Cu, Cu, r-m and 2-M present, although spectral (Jennings *et al*. 2004: fig. 2) ..... ***Aulacus coracinus*** Jennings, Austin & Stevens, 2004

3. Hind coxa with a distinct lobe on inner distal surface, extending posteriorly for a distance equal to about one third of the length of trochanter; ovipositor on posterior surface of hind coxa, guide longitudinal and backward-pointing, extending to tip of hind coxal lobe (Jennings *et al*. 2004: fig. 10) ..... ***Aulacus emineo*** Jennings, Austin & Stevens, 2004
– Hind coxa without a distinct lobe on inner distal surface; ovipositor guide on inner surface of hind coxa (Jennings *et al*. 2004: fig. 9) ..... 4

4. Mesosoma (with the exception of the pronotum) and metasoma black (Fig. 1A); fore wing with vein 2-Rs+M shorter than 2-Rs, discal cell elongated and narrow; metasoma 1.10 × as long as mesosoma; smaller species (3.18 mm) ..... ***Aulacus pascali*** sp. nov.
– Mesosoma and metasoma black with extensive orange coloration (Fig. 2); fore wing with vein 2-Rs+M as long as 2-Rs, discal cell not elongated; metasoma 1.28 × as long as mesosoma; bigger species (4.1–5.9 mm) ..... ***Aulacus burwelli*** Jennings, Austin & Stevens, 2004

5. Mostly light orange species (Figs 3–4). Head 1.35 × as wide as long; antenna with scape 1.58 × as long as pedicel. Mesosoma stouter; dorsal face of propodeum strongly concave basally; presence of a single transversal ridge on dorsal posterior half of propodeum (Fig. 4); OI index superior to 88 ..... ***Pristaulacus elveni*** sp. nov.
– Mostly black species (Fig. 5). Head 1.20 × as wide as long; antenna with scape 2 × as long as pedicel. Mesosoma more elongate; dorsal face of propodeum shallowly concave basally; presence of several transversal ridges on dorsal posterior half of propodeum (Fig. 5); OI index inferior to 86 ..... ***Pristaulacus villemantae*** sp. nov.

Family Evaniidae Latreille, 1802

Genus ***Szepligetella*** Bradley, 1908

See Deans (2005) for taxonomic history and list of synonyms.

***Szepligetella deercreeki*** Deans & Mikó, 2013
Fig. 6A

*Szepligetella deercreeki* Deans & Mikó in Balhoff *et al*., 2013: 15.

**Material examined**

NEW CALEDONIA • 1 ♀; Grande Terre, Province Sud, Yaté, Kwâkwê; 21°54′56.21″ S, 166°33′18.66″ E; alt. 834 m; 19 Oct. 2017; C. Villemant leg.; MNHN.

**Distribution**

Species known only from New Caledonia, Grande Terre, Province Sud: Col d'Amieu (400 m), Yaté (Kwâkwê) and Mt. Do (1100 m) (see detailed data in Balhoff *et al*. 2013: appendix 2).

**Remarks**

This female agrees with the description of *S. deercreeki* except for its size (7.1 mm vs 5.3–6.6 mm for the types) and the presence of the median carina of lower face. We are reluctant to describe a new species based only on the latter criteria, additional specimens from various parts of New Caledonia as well as DNA barcoding may solve this problem.

***Szepligetella irwini*** Deans & Mikó, 2013
Fig. 6B

*Szepligetella irwini* Deans & Mikó in Balhoff *et al*., 2013: 16.

**Material examined**

NEW CALEDONIA • 1 ♀; Grande Terre, Province Nord, Poya, Aoupinié; 21°10′45.44″ S, 165°16′36.80″ E; alt. 886 m; 11–26 Oct. 2017; E. Poirier leg.; Malaise trap n°AOU-MAL5; MNHN • 1 ♀; Grande Terre, Province Nord, Poindimié, Katalupaik; 20°50′0.31″ S, 165°0′24.33″ E; alt. 808 m; 14–29 Oct. 2017; E. Poirier leg.; Malaise trap n°KAT8-MAL3; MNHN.

**Distribution**

Species known only from New Caledonia. See additional data in Balhoff *et al*. (2013: appendix 2).

**Remarks**

Except for their body lengths (6.2 and 7.8 mm vs 6.5–6.8 mm for the types), these two females agree with the description of S. *irwini*.

***Szepligetella levipetiolata*** (Turner, 1919)
Fig. 6C

*Evania levipetiolata* Turner, 1919: 229.

*Szepligetella levipetiolata* – Deans 2005: 104.

**Material examined**

NEW CALEDONIA • 1 ♀; Grande Terre, Province Nord, Ponérihouen, Aoupinié; 21°10′38.67″ S, 165°17′8.37″ E; alt. 917 m; 11–26 Oct. 2017; E. Poirier leg.; Malaise trap n°AOU-MAL2; MNHN • 3 ♀♀; same collection data as for preceding; 21°10′45.62″ S, 165°16′35.07″ E; alt. 881 m; E. Poirier leg.; Malaise trap n°AOU-MAL4; MNHN.

**Distribution**

Species known only from New Caledonia, Grande Terre. See additional and detailed data in Balhoff *et al*. (2013: appendix 2).

***Szepligetella*** sp.
Fig. 6D–E

**Material examined**

NEW CALEDONIA • 1 ♂; Grande Terre, Province Sud, Thio, Bwa Bwi; 21°46′30.89″ S, 166°17′26.66″ E; alt. 893 m; 9–24 Nov. 2016; E. Poirier leg.; Malaise trap n°COM-MAL4; MNHN • 1 ♂; same collection data as for preceding; 21°46′33.20″ S, 166°17′11.43″ E; alt. 835 m; E. Poirier leg.; Malaise trap n°COM-MAL5; MNHN • 1 ♂; Grande Terre, Province Sud, Yaté, Ouinné; 21°59′56.61″ S, 166°37′30.82″ E; alt. 190 m; 15 Nov.–2 Dec. 2016; E. Poirier leg.; Malaise trap n°OUI-MAL2; MNHN • 1 ♂; same collection data as for preceding; 21°59′56.65″ S, 166°37′33.88″ E; alt. 187 m; E. Poirier leg.; Malaise trap n°OUI-MAL; MNHN • 4 ♂♂; same collection data as for preceding; 21°59′53.88″ S, 166°37′31.44″ E; alt. 190 m; E. Poirier leg.; Malaise trap n°OUI-MAL4; MNHN • 1 ♂; same collection data as for preceding; 21°59′51.97″ S, 166°37′32.08″ E; alt. 192 m; E. Poirier leg.; Malaise trap n°OUI-MAL5; MNHN • 1 ♂; Grande Terre, Province Nord, Poya, Aoupinié; 21°10′41.08″ S, 165°17′5.67″ E; alt. 912 m; 11–26 Oct.




**Fig. 6.** Evaniidae (MNHN). **A**. *Szepligetella deercreeki* Deans & Mikó, 2013. **B**. *Szepligetella irwini* Deans & Mikó, 2013. **C**. *Szepligetella levipetiolata* (Turner, 1919). **D**. Male 1 (indet.) from Malaise trap n°KAT8-MAL4. **E**. Male 2 (indet.) from Malaise trap n°KAT8-MAL3. Scale bars = 1 mm.

2017; E. Poirier leg.; Malaise trap n°AOU-MAL1; MNHN • 1 ♂; same collection data as for preceding; 21°10′43.86″ S, 165°16′35.97″ E; alt. 893 m; E. Poirier leg.; Malaise trap n°AOU-MAL3; MNHN • 3 ♂♂; same collection data as for preceding; 21°10′45.62″ S, 165°16′35.07″ E; alt. 881 m; E. Poirier leg.; Malaise trap n°AOU-MAL4; MNHN • 1 ♂; same collection data as for preceding; 21°10′45.44″ S, 165°16′36.80″ E; alt. 886 m; E. Poirier leg.; Malaise trap n°AOU-MAL5; MNHN • 1 ♂; Grande Terre, Province Nord, Poindimié, Katalupaik; 20°50′3.44″ S, 165°0′25.27″ E; alt. 783 m; 14–29 Oct. 2017; E. Poirier leg.; Malaise trap n°KAT8-MAL2; MNHN • 1 ♂; same collection data as for preceding; 20°50′0.31″ S, 165°0′24.33″ E; alt. 808 m; E. Poirier leg.; Malaise trap n°KAT8-MAL3; MNHN • 3 ♂♂; same collection data as for preceding; 20°49′58.76″ S, 165°0′23.58″ E; alt. 823 m; E. Poirier leg.; Malaise trap n°KAT8-MAL4; MNHN • 1 ♂; same collection data as for preceding; 20°49′56.17″ S, 165°0′27.64″ E; alt. 787 m; E. Poirier leg.; Malaise trap n°KAT8-MAL5; MNHN • 1 ♂; same collection data as for preceding; 20°50′6.79″ S, 165°0′25.27″ E; alt. 765 m; 30 Oct.–3 Nov. 2017; C. Villemant leg.; yellow pan trap n°KAT8-YPT1; MNHN.

**Remarks**

The unidentified males of *Szepligetella* collected during the 2016 and 2017 "Our Planet Reviewed" expeditions are listed here. Based on the identification key and diagnoses in Balhoff *et al*. (2013) these males belong to either *S. irwini* or *S. levipetiolata*. The only criteria to separate the males of these species is the presence or absence of long setae. The males examined show a great variability in head pilosity, as well as size (BL from 3.9 to 7.4 mm) or coloration of front leg (from totally black to tibia and tarsomeres orange). We prefer here to not assign these males to either *S. irwini* or *S. levipetiolata*. The use of DNA barcoding would be of great help to determine males of *Szepligetella* and redefine the species delimitations.

Family Gasteruptiidae Ashmead, 1900
Subfamily Gasteruptiinae Ashmead, 1900

Genus ***Gasteruption*** Latreille, 1796

See Crosskey (1962) and Carlson (1979) for taxonomic history and list of synonyms.

***Gasteruption jenningsi*** sp. nov.
urn:lsid:zoobank.org:act:44449614-FB69-4EFB-BD5B-154829669D83
Figs 7–8, 12C

**Diagnosis**

Mainly black species, large sub-basal ring on hind tibia and large sub-apical ring on ovipositor white. Head somewhat elongate, 1.13 × as long as wide; scape 1.77 × as long as pedicel; F-I 1.30 × as long as scape, F-II 0.90 × as long as F-I. Hind coxa punctulate, 3.67 × as long as wide. Fore wing with first discal cell absent.

**Etymology**

The specific epithet is a patronym honoring Dr John Jennings (University of Adelaide), who greatly contributes to the knowledge of Hymenoptera, including those of New Caledonia, and is to be treated as a noun in the genitive case.

**Type material**

**Holotype**

NEW CALEDONIA • ♀; Grande Terre, Province Sud, Yaté, Ouinné; 21°59′56.61″ S, 166°37′30.82″ E; alt. 190 m; 15 Nov.–2 Dec. 2016; E. Poirier leg.; Malaise trap n°OUI-MAL2; right antenna and right mid femur to TS 5 missing; MNHN.

**Description**

**Female holotype**

Measurements (in mm except CI, EI and OI). BL = 10.60; HL = 1.43; HW = 1.27; EL = 1.05; EW = 0.63; OOL = 0.17; POL = 0.13; SL = 0.23; PDL = 0.13; F-I = 0.30; F-II = 0.27; FWL = 4.95; HWL = 2.75; MSL = 2.40; MSW = 1.1; MTL = 7.40; OL = 11.20; CI = 89; EI = 60; OI = 226.

Color. Mainly black species; coxa I and tibia III dark brown; femur I brown; fore leg trochanter, base and apex of femur, inner face of tibia, TS 4–5, mid leg inner face of tibia, ovipositor orange-brown; mandible (except for apex) and mouthparts yellowish; fore leg base, outer face and apex of tibia, TS 1–3, mid leg base and apex of tibia, TS 1 (except for apex), large sub-basal ring on hind leg tibia, apex of sheath, large sub-apical ring on ovipositor white. Fore and hind wing with membrane hyaline and black veins.

Head (Fig. 8A–C). In full-face view, 1.13 × as long as wide, frontal carina very shallow, vertex strongly convex; mandibles bidentate; clypeus strongly sinuate; malar space ⅘th the width of the pedicel; antenna 14-segmented, scape about 1.90 × as long as wide, 1.77 × as long as pedicel; F-I 1.30 × as long as scape, F-II 0.90 × as long as F-I; flagellomeres III–XI shortening gradually toward apex; apical flagellomere slightly longer than preceding one; vertex with ocelli arranged in isosceles triangle, mid-ocellus separated from lateral ocelli by ⅘th its diameter, lateral ocelli separated by slightly less than their diameter and by 1.73 × their diameter from eye margin; occipital carina narrow.

Mesosoma (Figs 7, 8A, C). Propleuron as long as pronotum; pronotum with strong latero-anterior tooth; mesoscutum in lateral view rounded anterodorsally, notauli conspicuous, crenulate and somewhat U-shaped, parapsidal lines distinct; mesopleural groove broad; propodeum in lateral view shallowly convex; hind coxa elongate, 3.67 × as long as wide; hind trochanter with groove present; prefemur small, ¼th of length of trochanter; hind femur 0.68 × as long as hind tibia; TS 1 3.00 × as long as TS 2; TS 2 1.38 × as long as TS 3; TS 3 2.17 × as long as TS 4; TS 4 0.46 × as long as TS 5; hind tarsal claw 0.38 × as long as TS 5; tarsal claw simple.



**Fig. 7.** *Gasteruption jenningsi* sp. nov., holotype, ♀ (MNHN). Lateral habitus. Scale bar = 5.0 mm.

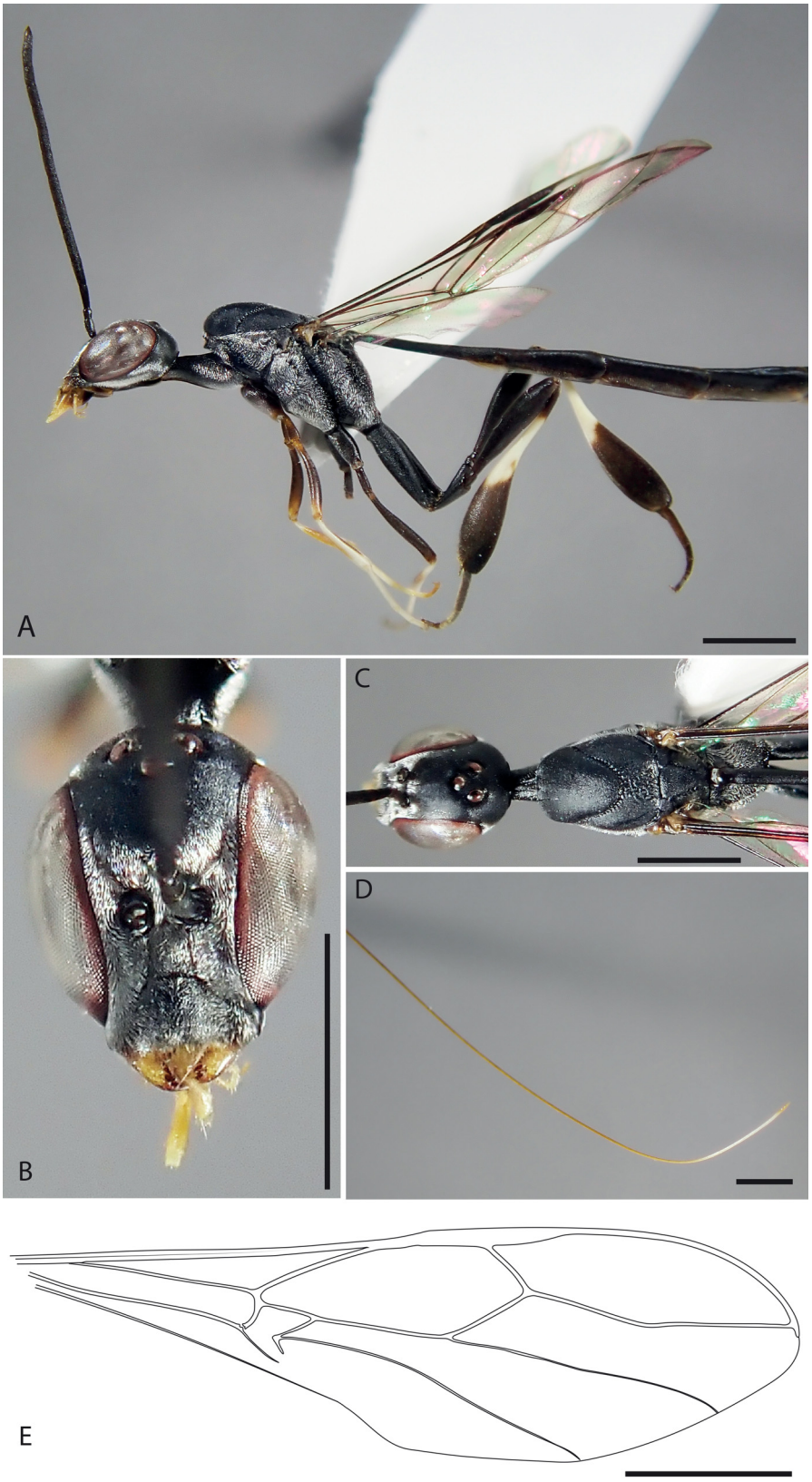



**Fig. 8.** *Gasteruption jenningsi* sp. nov., holotype, ♀ (MNHN). **A**. Mesosoma in lateral view. **B**. Head in full-face view. **C**. Mesosoma in dorsal view. **D**. Apex of the ovipositor. **E**. Line drawing of the fore wing venation. Scale bars = 1.0 mm.

Fore wing (Fig. 8E). First discal cell absent; vein 2-M tubular along all its length, thicker on its basal third.

Hind wing (Figs 7, 8A). With 3 equidistant hamuli, venation reduced with only R + Rs present.

Metasoma (Figs 7, 8A). Elongate, 3.08 × as long as mesosoma.

Sculpture. Head, mesosoma (except for posterior median spot on mesoscutum, oblique stripe on pronotum, ventral part of mesopleuron, mesopleural groove, metapleuron, propodeum), legs and metasoma punctulate. Oblique stripe on pronotum and ventral part of mesopleuron rugulose. Posterior median spot on mesoscutum, mesopleural groove and metapleuron rugose. Propodeum areolate-rugose. Lateral-posterior face of coxa II–III with shallow transverse ridges.

Pilosity. White, minute, oblique and very dense on all body, longer on mandibules, clypeus, lower face and underside of head, propleuron, pronotum, meso- and metapleuron, upper part of propodeum and coxa I.

**Distribution**

It is known only from its type locality, Ouinné (Fig. 12C).

**Remarks**

*Gasteruption jenningsi* sp. nov. can be distinguished from the three species of *Gasteruption* from New Caledonia, *G. lacoulee* Jennings, Krogmann & Parslow, 2015, *G. maquis* Jennings, Krogmann & Parslow, 2015 and *G. sarramea* Jennings, Krogmann & Parslow, 2015 (Jennings *et al*. 2015), by the absence of the first discal cell of the fore wing, its elongated hind coxa, and the presence of a white large sub-basal ring on the hind tibia and a large sub-apical ring on the ovipositor.

The absence of the first discal cell of the fore wing is a rare condition in the species of *Gasteruption*, and reported from *G. subhamatum* Pasteels, 1958 (Zhao *et al*. 2012) known from Borneo and China and from *G. tomanivi* Parslow, Stevens & Schwarz, 2018 from Fiji (Parslow *et al*. 2018). Among these two species of *Gasteruption*, *G. jenningsi* sp. nov. seems more related to *G. tomanivi* with which it shares the presence of white rings on the hind tibia and the ovipositor, as well as the black TS 1 on the hind leg. However, *G. jenningsi* sp. nov. can be distinguished from *G. tomanivi* in particular by the coloration, and the shape of the propleuron and the hind coxa.

*Gasteruption maquis* Jennings, Krogmann & Parslow, 2015
Figs 9, 12D

*Gasteruption maquis* Jennings, Krogmann & Parslow, 2015: 400.

**Material examined**

NEW CALEDONIA • 1 ♀; Grande Terre, Province Sud, Yaté, Ouinné; 21°59′46.49″ S, 166°37′32.98″ E; alt. 176 m; 15 Nov. 2016; E. Poirier leg.; MNHN.

**Description**

Measurements (in mm). BL = 17.0; MSL = 4.4; MTL = 10.5; OL = 39.0.

**Distribution**

Species known only from New Caledonia, Grande Terre, Province Sud (Fig. 12D). See additional details in Jennings *et al*. (2015: 400).

**Remarks**

Previously, *G. maquis* was known only from the holotype male collected at the Pic du Grand Kaori. During the 2016 "Our Planet Reviewed" expedition, a female was collected at Ouinné, 40 km north-west of the type locality. This female differs from the type by: hind tibia with a sub-basal small cream ring and its size (BL: 17.0 mm vs 25.7 mm for the holotype). As the female of *G. maquis* was not known, an additional character for species diagnosis is the ovipositor orange, and sheaths black with tip white. We believe this female belongs to *G. maquis* and the differences identified above to be intra-specific variations or sexual dimorphism.

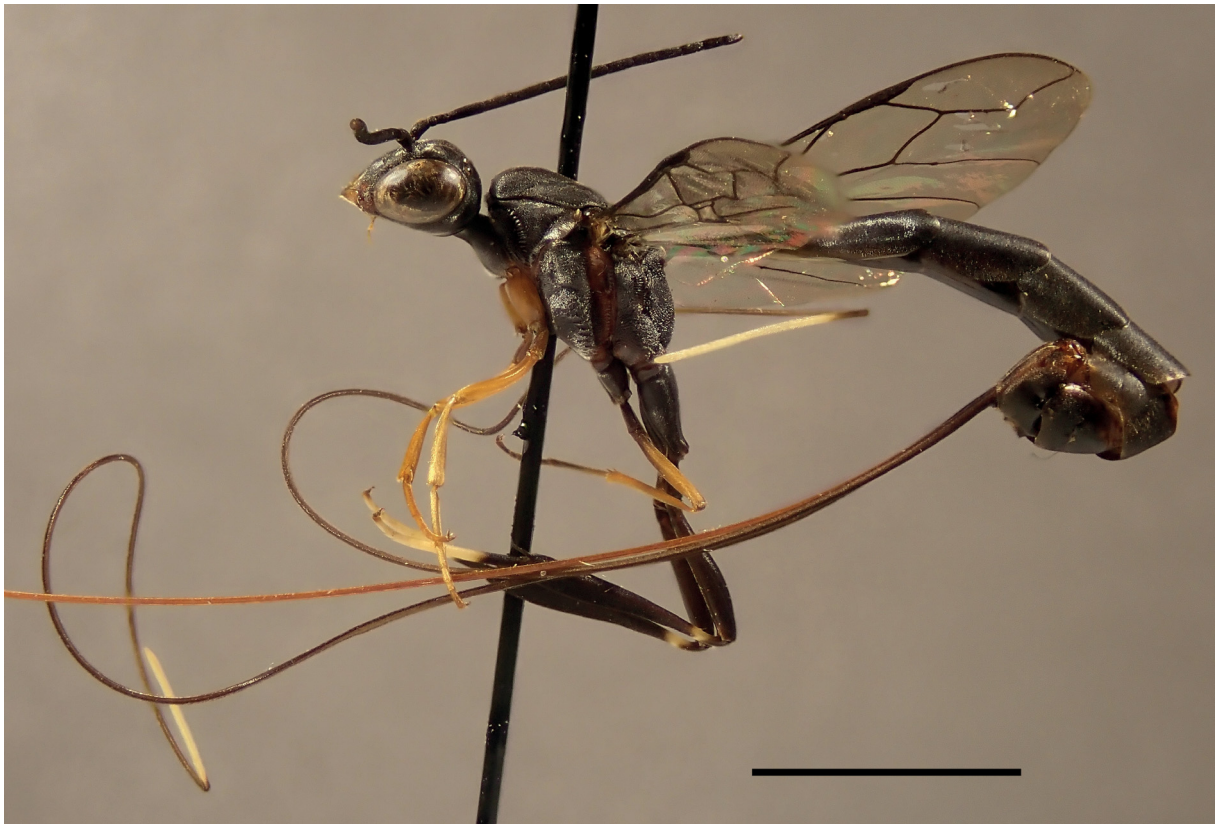


**Fig. 9.** *Gasteruption maquis* Jennings, Krogmann & Parslow, 2015 (MNHN). Lateral habitus. Scale bar = 5.0 mm.

Subfamily Hyptiogastrinae Crosskey, 1953

Genus ***Pseudofoenus*** Kieffer, 1902

See Jennings & Austin (2002) for taxonomic history.

***Pseudofoenus caledonicus*** Jennings & Austin, 2005
Figs 10, 12E

*Pseudofoenus caledonicus* Jennings & Austin, 2005: 416.

**Material examined**

NEW CALEDONIA • 1 ♀, 5 ♂♂; Grande Terre, Province Nord, Ponérihouen, Aoupinié; 21°10′38.67″ S, 165°17′8.37″ E; alt. 917 m; 10–26 Oct. 2017; E. Poirier leg.; Malaise trap n°AOU-MAL2; MNHN • 1 ♂; same collection data as for preceding; 21°10′45.62″ S, 165°16′35.07″ E; alt. 881 m; 11–26 Oct. 2017; E. Poirier leg.; Malaise trap n°AOU-MAL4; MNHN • 1 ♀; same collection data as for preceding; 21°11′42.9″ S, 165°17′58.41″ E; alt. 619 m; 24 Oct. 2017; C. Villemant leg.; sweep net; MNHN.



**Fig. 10.** *Pseudofoenus caledonicus* Jennings & Austin, 2005 (MNHN). Lateral habitus. Scale bar = 1.0 mm.

**Distribution**

Species known only from New Caledonia, Grande Terre (Fig. 12E). See additional details in Jennings & Austin (2005: 416).

**Remarks**

The eight specimens from Aoupinié differ from *Pseudofoenus ritae* (Cheesman, 1936) by the presence of a frontal carina and of two medial teeth on the mandibles, and agree with the description and measurements of *P. caledonicus*. However, they differ from *P. caledonicus* in their size and coloration, these specimens being smaller (females: 7.4–8.3 mm (vs 8.7–10.0 mm for *caledonicus*); males: 7.9–8.5 mm (vs 10.5 mm for *caledonicus*)) and brown with reddish parts (vs dark brown for *caledonicus*). The Aoupinié males have a smaller metasoma compared to the mesosoma (2.54–2.65 × as long as the mesosoma; vs 2.80 × for *caledonicus*), and the first flagellomere is 1.55–1.68 × as long as the second flagellomere in both males and females (vs 2.00–2.40 × for *caledonicus*). With the actual knowledge of the *Pseudofoenus* fauna of New Caledonia, we are reluctant to describe a new species based on these differences and consider they are intraspecific variations. Additional specimens and barcoding may solve this problem.

**Key to Gasteruptiidae Ashmead, 1900 of New Caledonia (modified from Jennings *et al*. 2015)**

1. Mandibles long and broadly overlapping when in closed position; prefemur absent; female subgenital sternite simple; ovipositor short and usually hidden .....2 (**Hyptiogastrinae** Crosskey, 1953)
– Mandibles short and not broadly overlapping when in closed position; prefemur present; female subgenital sternite notched; ovipositor exserted ..... 3 (**Gasteruptiinae** Ashmead, 1900)

2. Two distinct medial teeth on mandible; frontal carina present (Jennings & Austin 2005: figs 1–2) ..... ***Pseudofoenus caledonicus*** Jennings & Austin, 2005
– Single weak medial tooth on mandible; frontal carina absent ..... ..... ***Pseudofoenus ritae*** (Cheesman, 1936)

3. Fore wing with first discal cell absent (Fig. 8E); hind tibia with a white large sub-basal ring; ovipositor with a white large sub-apical ring ..... ***Gasteruption jenningsi*** sp. nov.
– Fore wing with first discal cell present (Jennings *et al*. 2015: fig. 3); hind tibia with at most a small sub-basal whitish ring; ovipositor without a white sub-apical ring ..... 4

4. Large species, length 25.7 mm; fore wing vein 2-M tubular in apical third, tubular portion ending with small node; hind wing with 2m+Cu melanised, 1-Cu, 1-m and r-m present (Jennings *et al*. 2015: fig. 3) ..... ***Gasteruption maquis*** Jennings, Krogmann & Parslow, 2015
– Small species, length less than 12 mm; fore wing vein 2-M tubular in apical third, tubular portion not ending with small node; hind wing with not melanised 2m+Cu, 1-Cu, 1-m and r-m absent (Jennings *et al*. 2015: figs 2–4) ..... 5

5. Head more or less quadrate, 0.94 × as long as wide when viewed dorsally; propleuron short, 0.84 × as long as pronotum; frontal carina present (Jennings *et al*. 2015: figs 6, 12) ..... ..... ***Gasteruption lacoulee*** Jennings, Krogmann & Parslow, 2015
– Head elongate, 1.48 × as long as wide when viewed dorsally; propleuron long, 1.64 × as long as pronotum; frontal carina absent (Jennings *et al*. 2015: figs 10, 16) ..... ..... ***Gasteruption sarramea*** Jennings, Krogmann & Parslow, 2015

Superfamily Stephanoidea Leach, 1815
Family Stephanidae Leach 1815
Subfamily Stephaninae Leach, 1815
Tribe Foenatopodini Enderlein, 1905

Genus ***Parastephanellus*** Enderlein, 1906

See Hong *et al*. (2011: 36) for generic diagnosis.

***Parastephanellus mouensis*** Aguiar, 2005
Figs 11, 12F

*Parastephanellus mouensis* Aguiar in Aguiar & Jennings, 2005: 10.

**Material examined**

NEW CALEDONIA • 1 ♀; Grande Terre, Province Nord, Poindimié, Katalupaik; 20°51′11.12″ S, 165°0′34.66″ E; alt. 306 m; 18 Oct.–2 Nov. 2017; E. Poirier leg.; Malaise trap n°KAT3-MAL3; MNHN.

**Distribution**

Species known only from New Caledonia (Fig. 12F). See additional detail in Aguiar & Jennings (2005: 10).

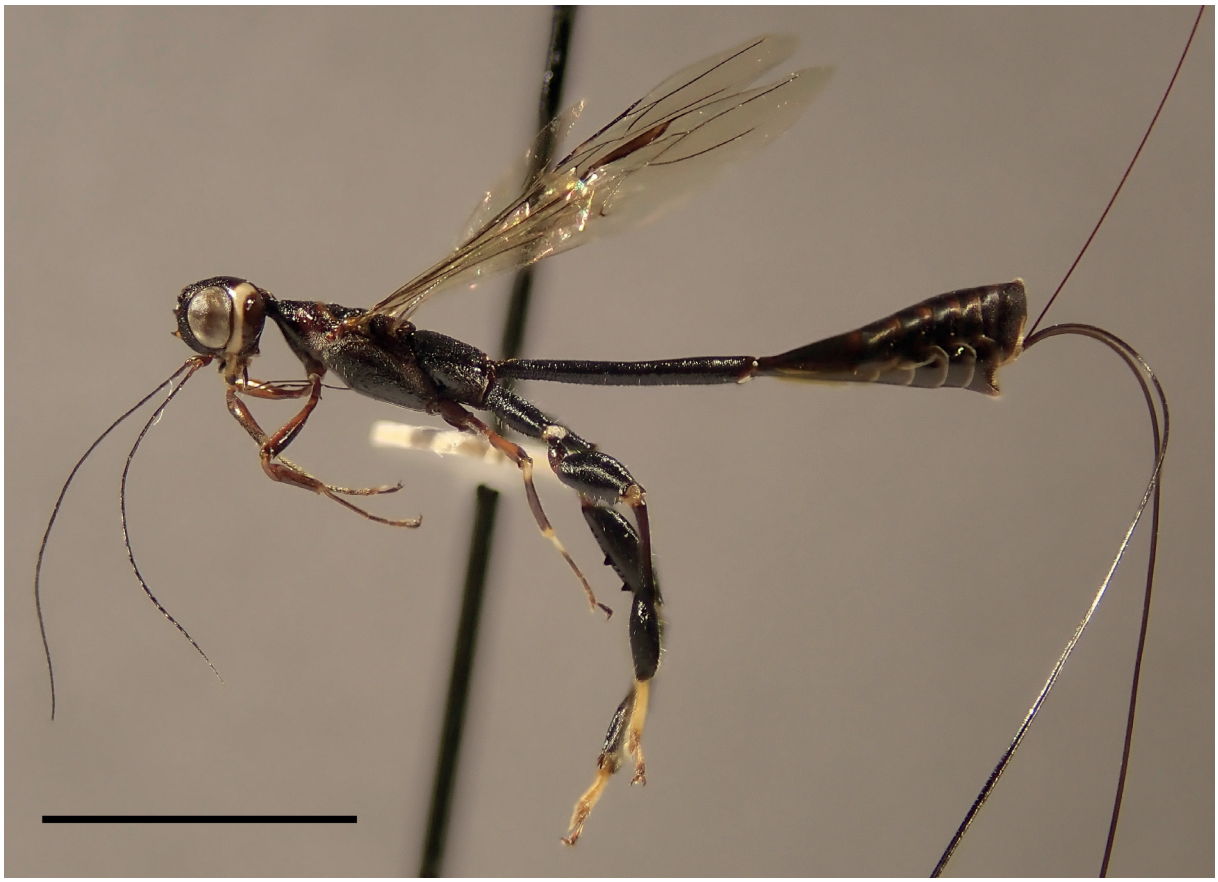


**Fig. 11.** *Parastephanus mouensis* Aguiar, 2005 (MNHN). Lateral habitus. Scale bar = 5.0 mm.

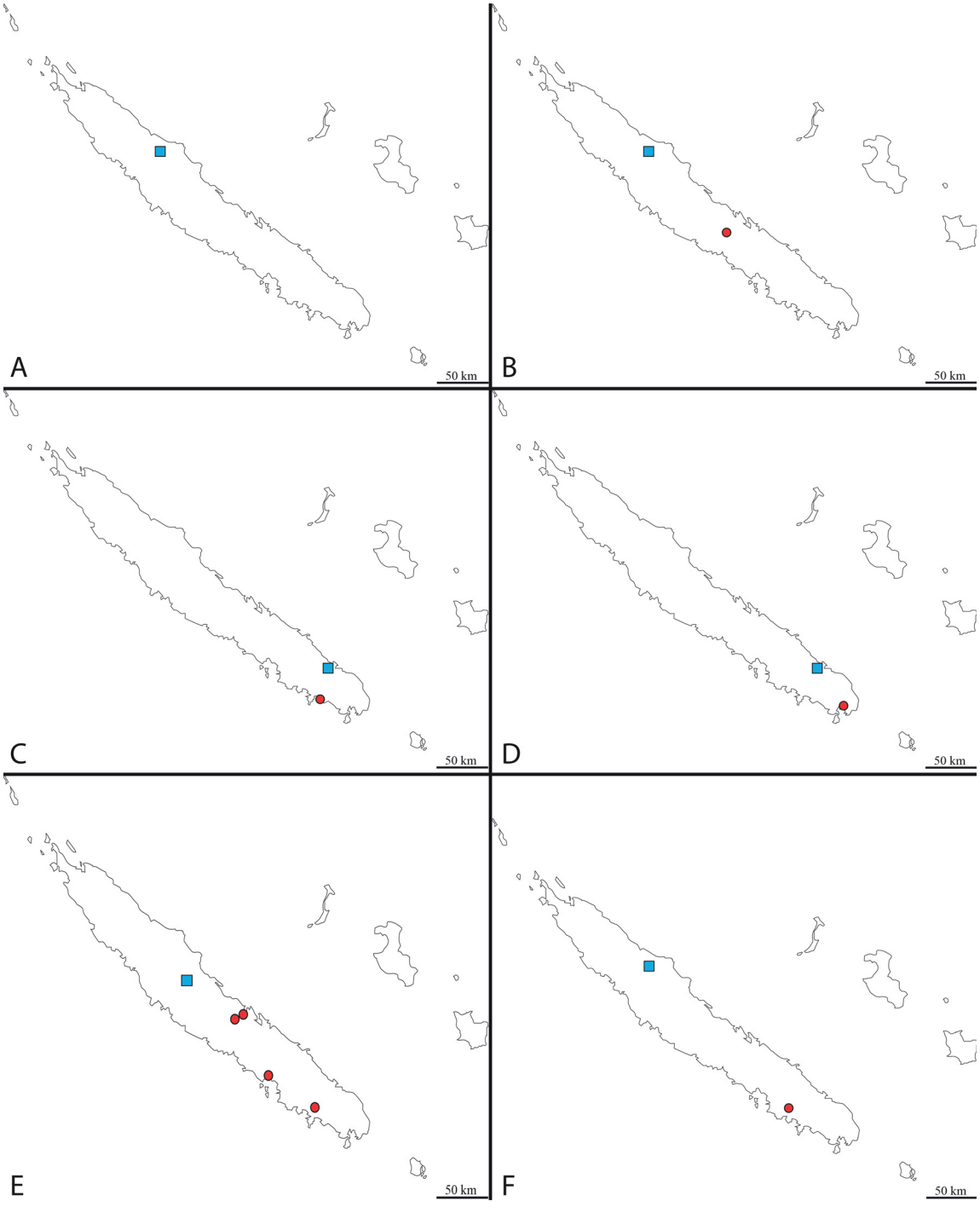



**Fig. 12. A**. Distribution of *Aulacus pascali* sp. nov., *Pristaulacus elveni* sp. nov. and *Pristaulacus villemantae* sp. nov. **B**. Distribution of *Aulacus burwelli* Jennings, Austin & Stevens, 2004; red circle = type locality; blue circle = specimens concerned by this study. **C**. Distribution of *Gasteruption jenningsi* sp. nov.; red circle = type locality; blue circle = specimens concerned by this study. **D**. Distribution of *Gasteruption maquis* Jennings, Krogmann & Parslow, 2015; red circle = type locality; blue circle = specimens concerned by this study. **E**. Distribution of *Pseudofoenus caledonicus* Jennings & Austin, 2005; red circles = localities previously published; blue square = specimens concerned by this study. **F**. Distribution of *Parastephanus mouensis* Aguiar, 2005; red circle = type locality; blue circle = specimens concerned by this study.

**Remarks**

Previously, *P. mouensis* was known only from the holotype female collected at Mount Mou. During the 2017 "Our Planet Reviewed" expedition, an additional female was collected in a Malaise trap at Katalupaik, nearly 200 km north-west of the type locality. This female is 13.5 mm long and smaller than the holotype (18.8 mm). Otherwise, it differs from the type by: antennae with 29 flagellomeres, with tyloids absent from 23rd–29th; petiole as strongly sculptured ventrally as dorsally, coarsely strigate all along its ventral surface; frons central tubercule yellow basally; genal stripes ivory, slightly narrower; hind tarsomere 1 ivory; T-III–VII apical margin brown, slightly lighter than the rest of the tergite. We believe this female belongs to *P. mouensis* and the differences described above to be intra-specific variations.

## Discussion

New Caledonia is known for its extremely high number of endemic species, most of them with narrow distribution ranges. Caesar *et al*. (2017) showed that 86% of the 1149 species concerned by publications in *Zoologia Neocaledonica* are endemic to New Caledonia. Evanioidea and Stephanoidea share high endemism rates in New Caledonia, with all native species being endemic to this territory except for *Pseudofoenus ritae* (Cheesman, 1936) which is shared with Vanuatu (Jennings & Austin 2002).

Since the publication of the checklist by Jennings *et al*. (2013) of the species of Hymenoptera of New Caledonia, 66 species have been added to this fauna (Pauly *et al*. 2013a, 2013b, 2015; Kimsey 2014; Jennings *et al*. 2015; Ramage *et al*. 2015, 2019; Breitkreuz *et al*. 2016; Smith & Villemant 2017; Taylor 2018; Ortiz-Sepulveda *et al*. 2019; Speranza *et al*. 2019; Alencar & Azevedo 2020; Contarini *et al*. 2020). Of these 66 species, 58 are endemic to New Caledonia. In 2013, Jennings *et al*. reported the genus *Pristaulacus* from New Caledonia, based on an unnamed species seen in the Waite Insect and Nematode Collection (University of Adelaide). The description of *Pristaulacus elveni* sp. nov. and *P. villemantae* sp. nov. from New Caledonia extend the distribution of this genus in the South Pacific region, as no *Pristaulacus* were described east to Australia prior to this study. The genus *Pristaulacus* has also been reported from New Guinea only recently (Jennings & Austin 2006). No aulacids are known from New Zealand, New Britain, Vanuatu or Fiji (Turrisi 2017).

The Katalupaik site itself brought three new species of Aulacidae and a second locality for *P. mouensis*, and seems to be a hotspot for aulacid diversity. It is likely that future surveys, especially in understudied areas, will lead to the discovery of new species.

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