

# Additions to the xiphydriid woodwasp (Hymenoptera, Xiphydriidae) fauna of New Caledonia

David R. Smith<sup>1</sup>, Claire Villemant<sup>2</sup>

**1** Systematic Entomology Laboratory, Agricultural Research Service, U. S. Department of Agriculture, c/o National Museum of Natural History, Smithsonian Institution, P.O. Box 37012, MRC 168, Washington, DC. 20013-7012, USA **2** Muséum National d'Histoire Naturelle, Département Origines et Evolution, UMR7205 ISYEB, CP50, 45 rue Buffon, 75005 Paris, France

Corresponding author: David R. Smith ([sawfly2@aol.com](mailto:sawfly2@aol.com))

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## Abstract

*Calexiphyda marystellae* Villemant & Smith, **sp. n.**, is described from New Caledonia. This is the sixth species of Xiphydriidae known from New Caledonia. A key to the six species is given, the female of *C. crocea* Smith is described, and a new locality for this species and for *C. caledonia* Smith is given.

## Keywords

New Caledonia, high-altitude forest, *Calexiphyda*, Xiphydriidae

## Introduction

Jennings et al. (2007) were the first to record Xiphydriidae from New Caledonia, a single male described as *Rhysacephala novacaledonica* Jennings and Austin. Smith (2008) treated five species from New Caledonia, *Lissoxiphyda tripotini* Smith and four species in the new genus *Calexiphyda*. Two of the *Calexiphyda* species were based on females and two on males. Because so many xiphydriids are based on single specimens and because of the extreme sexual dimorphism, it is difficult to associate sexes. Smith (2008)

cited a number of unassociated males which did not fit the described species and need to await confirmed association of sexes through collections of long series or by rearing.

Three additional specimens were recently collected in New Caledonia by CV. One is an undescribed species, one is the female of a previously described species, and one was previously described but from another locality. Here, we add these discoveries to the xiphydriid fauna and give an updated key to species on the island. There are now six species known from New Caledonia, five based on females and one based on a male. New Caledonia now has the largest xiphydriid fauna of any of the Pacific islands. Three are known from New Zealand (Ward and Goulet 2011), one from Lord Howe Island (Jennings and Austin 2009), and one from Fiji (Smith 2008). The only other species of Symphyta known in New Caledonia is the introduced *Phylacteophaga frottatti* Riek (Pergidae), a leafminer of *Eucalyptus* spp. (Jennings et al. 2013).

Where known, larvae of xiphydriids are wood borers in weakened or dying limbs of woody plants. Nothing is known of the biology of the New Caledonian species (Smith 2008). Two New Zealand xiphydriids, *Moaxiphia decepta* (F. Smith) and *M. duniana* (Gourlay), are recorded from *Coprosma robusta* Raoul (Rubiaceae) and *Nothofagus* spp. (Nothofagaceae), respectively (Ward and Goulet 2011).

## Materials and methods

Specimens were collected by CV in the course of the “*Our Planet Reviewed*” project (<http://laplaneterevisitee.org/en>) during the “New Caledonia 2016–2017” expedition. All are deposited in the Muséum National d’Histoire Naturelle, Paris, France.

Insect collection was performed in November 2016 in the southeastern part of the island, where the mountains exposed to the Pacific Ocean have been little explored, hence the name of “Côte Oubliée” given to the coastal massif. Three stations, two in the mountains (Comboui and Kwakwé) and one in the Ouinné Valley, were inventoried using Malaise traps placed for ten days in five plots of every station. In addition, height groups of three yellow pan traps were set up in the Comboui station in or close to the Malaise trap sites. This station was located 12 km from the coast, near Mount Bwa Bwi (1,214 m) above a forest valley whose streams flow into the Néma River. Traps were located along a transect set up from a dense scrub habitat on the Bwa Bwi slope to a tropical high-altitude forest on the crest and a dense humid forest of low and medium altitude on igneous substrate in the forest bottom (Muzinger and Bruy, pers. com.).

The three xiphydriids collected during this mission were caught in yellow pan traps located on the crest in the dense and humid high-altitude forest. This forest, showing a typical facies with lichens, bryophytes and Hymenophyllaceae, was rather low, with a canopy about 12 m high and some emerging trees up to 15 m (Muzinger and Bruy, pers. com.).

Images were acquired through an EntoVision micro-imaging system. This system included a Leica M16 with a JVC KY-75U 3-CCD digital video camera or a GT-Vision

Lw11057C-SCI digital camera attached that fed image data to a notebook or desktop computer. The program Cartograph 6.6.0 was then used to merge an image series into a single in-focus image.

Morphological terminology follows Huber and Sharkey (1993).

## Results

### Key to the Xiphydriidae of New Caledonia

- 1 Female ..... 2
- Male ..... 6
- 2 Hind wing with cells Rs and M absent; hind tarsal claw simple; mesopleuron shiny; mesonotum rugose, without carinae (antennomeres 1 and 2 orange; legs orange with apical tarsomeres black) (see Smith 2008, figs 27–30) ..... *Lissoxiphyda tripotini* Smith
- Hind wing with cells Rs and M present; hind tarsal claw with inner tooth; mesopleuron usually rugose (except *C. crocea*); mesonotum usually with longitudinal or transverse carinae (except *C. crocea*) (*Calexiphyda*) ..... 3
- 3 Black with mid and hind tibiae, mid and hind tarsi, and sheath orange (Fig. 13); anteromedian part of mesonotum and inner half of mesonotal lateral lobes with distinct longitudinal carinae (Fig. 15) ..... *C. caledonia* Smith
- Some yellow markings on head (Figs 4, 10) and sometimes thorax; legs various, all light orange, black with tibiae and tarsi light orange or almost entirely black; sheath black (Figs 1, 7); anteromedian part of mesonotum and mesonotal lateral lobes rugose, with faint longitudinal or transverse carinae or without sculpture (Figs 3, 9) ..... 4
- 4 Head with two longitudinal stripes on vertex, inner orbits, spots between antennae, and genae yellow; thorax with posterior margin of pronotum yellow; legs black with inner surfaces of tibiae reddish brown; anteromedian part of mesonotum with transverse carinae (see Smith 2008, figs 34–38) ..... *C. blanki* Smith
- Head mostly black with yellow spots on lower inner orbits and between antennae (Figs 4, 10); thorax black (Figs 3, 9); legs yellow orange or black with tibiae and tarsi yellow orange (Figs 1, 7); anteromedian part of mesonotum with punctures, longitudinal carinae, or shiny (Fig. 9) ..... 5
- 5 Anteromedian part of mesonotum shiny with very fine punctures and microsculpture (Fig. 9); legs with coxae and trochanters white, rest of legs orange (Fig. 7); white spot at base of sheath; antennomeres 1 and 2 orange (Figs 10, 12); antennae more than 2× head width, with antennomeres 2× or more longer than broad (Fig. 12); head strongly narrowed behind eyes (Fig. 11) ... *C. crocea* Smith
- Anteromedian part of mesonotum with faint, irregular, longitudinal carinae on posterior half (Fig. 3); legs black with tibiae and tarsi yellow orange

- (Figs 1, 2); antenna and sheath black; antenna about  $1.7\times$  head width, antennomeres less than  $2\times$  longer than broad (Fig. 6); head broad behind eyes (Fig. 5) ..... *C. marystellae* sp. n.
- 6 Mostly orange with black mesonotal lateral lobes; head and body shiny (see Smith 2008, figs 39–41) ..... *C. crocea* Smith
- Mostly black; mesonotum with longitudinal carinae, frons and mesopleuron rugose (see Jennings et al. 2007, figs 2–9) .....  
..... *C. novacaledonica* Jennings & Austin

***Calexiphyda marystellae* Villemant & Smith, sp. n.**

<http://zoobank.org/5E4830D4-B307-47E6-B4E4-09A590E7AD05>

Figs 1–6

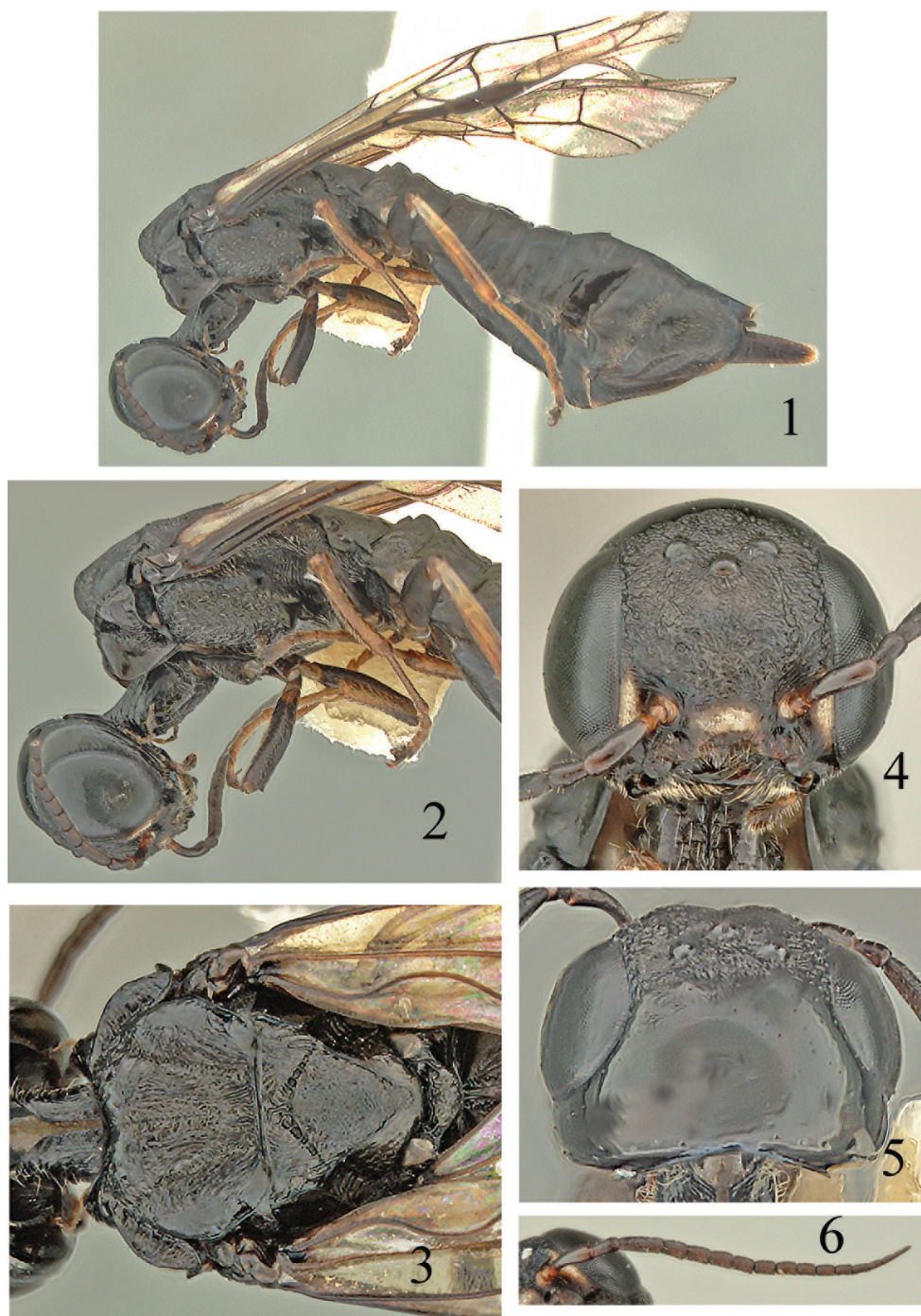
**Description.** Female: Length, 7.0 mm. Black; head with yellow spots between antenna and eye and between antennae (Fig. 4). Thorax black. Legs black with tibiae and tarsi pale yellow. Abdomen black with lateral white spots on first tergite (Figs 1, 2). Wings hyaline, veins and stigma black. *Head:* Antenna (Fig. 6) with 17 antennomeres,  $1.7\times$  head width; lengths of scape, pedicel, and first flagellomere as 1.0:0.5:0.8; flagellomeres less than  $2\times$  longer than broad. Frons, interocellar area, and area just above ocelli rugose; vertex and gena shiny, almost impunctate; few punctures on lower gena and few indistinct carinae at center of gena. Lower interocular distance subequal to eye height, in front view, eyes very slightly diverging below (Fig. 4). In dorsal view, head broad behind eyes, distance behind eyes less than  $2\times$  eye length (Fig. 5). Labial palpus with 4 palpomeres, maxillary palpus with 7 palpomeres. *Thorax:* Propleuron with fine longitudinal carinae dorsally, shiny laterally. Pronotum shiny with central area of fine carinae. Mesonotum (Fig. 3) with shallow notauli, with closely set pits; anteromedian part of mesonotum with fine longitudinal carina on posterior half, more finely rugose centrally and anteriorly; lateral lobes with fine longitudinal carinae on inner halves, shiny on lateral halves; axillae with longitudinal carinae; mesoscutellum finely rugose. Mesepisternum rugose, with narrow stripe along anterior margin shiny, impunctate; mesepimeron with cross carinae; metapleuron rugose (Fig. 2). Hind tarsal claw with small inner tooth near base, fore and mid tarsal claws with long inner tooth, more than half length of outer tooth, near center. Hind basitarsus subequal in length to remaining tarsomeres combined. *Abdomen:* Shiny with very fine microsculpture; tergum 1 duller, with denser microsculpture than rest of abdomen. Tergum 1 subequal in length to tergum 2. Sheath to basal plates as 1.0:1.8.

Male: Unknown.

**Holotype.** Female, “Nouvelle Calédonie, Province Sud, Thio, Comboui, 21.77742S, 166.29495E, 1037 m, NC-COM-YPT3 12-18.XI.2016, yellow pan trap, C. Villemant rec.”

**Etymology.** This species is described in honor of Mary-Stella Guelemé, a New Caledonian participant to the “*Our Planet Reviewed*” expedition who contributed with





**Figures 1–6.** *Calexiphyda marystellae*. 1 Lateral 2 Head and thorax, lateral 3 Thorax, dorsal 4 Head front 5 Head dorsal 6 Antenna.

another manager of the Comboui camp to maintain morale of the team when bad weather conditions retained it longer than expected on the Bwa Bwi slope.

**Remarks.** The black head and body with only three white spots on the front of the face and one white spot laterally on tergite 1, light orange tibiae and tarsi, and faint, irregular, longitudinal sculpture of the mesonotum (Fig. 3) will distinguish this species.

### *Calexiphyda crocea* Smith

Figs 7–12

*Calexiphyda crocea* Smith 2008: 35.

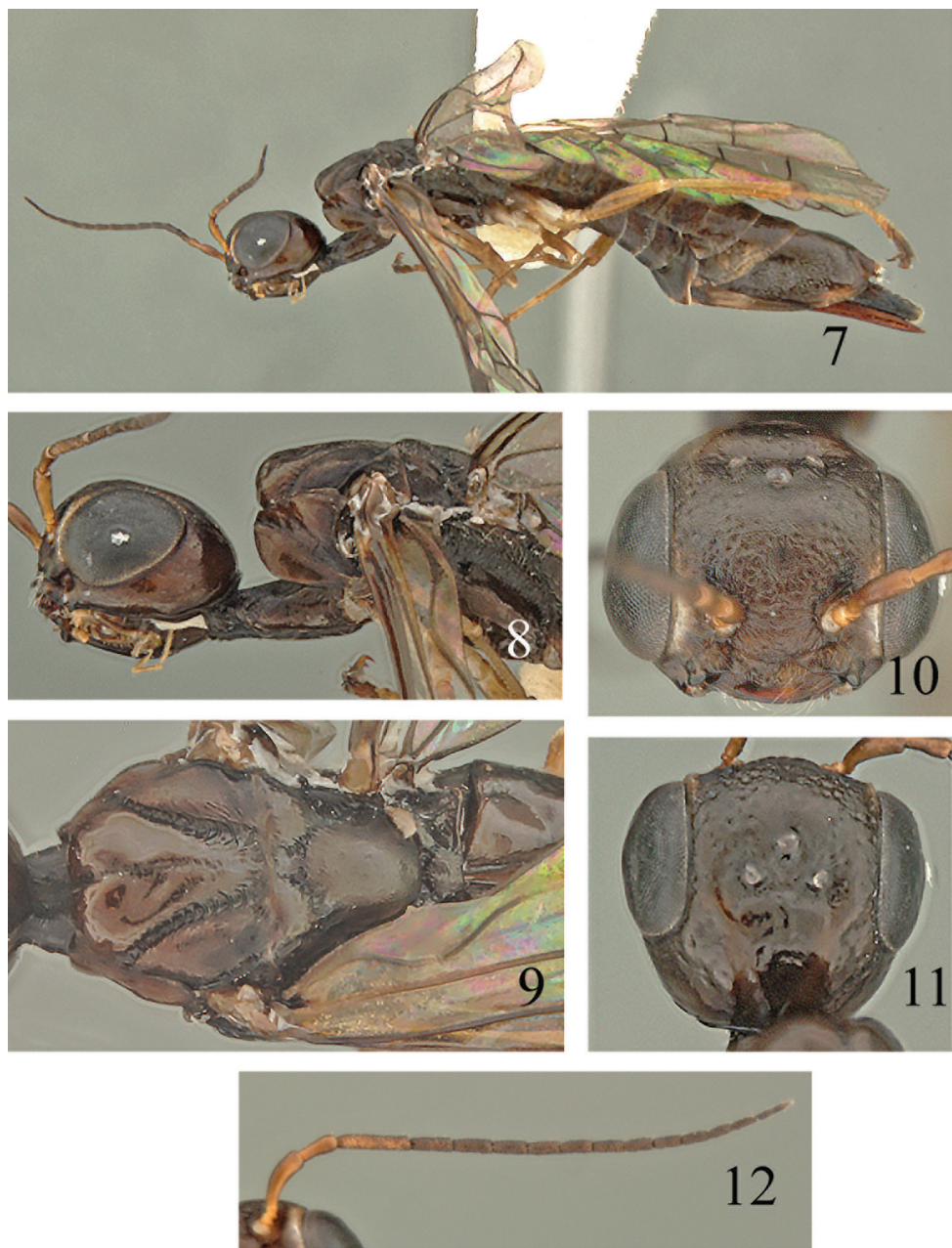
**Description.** Female. Length, 7.0 mm. Head black with lower inner orbits narrowly white and two pale orange stripes on vertex (Figs 8, 10, 11); antenna black with antennomeres 1–3 orange (Figs 8, 10, 12). Legs with coxae and trochanters white, rest of legs orange (Fig. 7). Abdomen black with white spot at base of tergum 1, indistinct white spots laterally on tergites 8 and 9, and apical white spot on 8<sup>th</sup> tergite. Wings uniformly hyaline, veins and stigma black. *Head:* Antenna (Fig. 12) 2.1× head width, with 17 antennomeres; lengths of scape, pedicel, and first flagellomere as 1.0: 0.8:1.2; pedicel more than 2× longer than broad, flagellomeres 2 to apex 2× or more longer than broad. Frons finely rugose to just above ocelli; vertex and gena shiny. Lower interocular distance 1.1× eye height; in front view, eyes slightly diverging below (Fig. 10). Head, in dorsal view, long and strongly narrowed behind eyes (Fig. 11); length behind eyes about half eye length. Genal carina distinct to top of eyes (Fig. 8). Labial palpus with 4 palpomeres, maxillary palpus with 7 palpomeres. *Thorax:* Propleuron shiny, finely rugose anteriorly and dorsally. Pronotum shiny, with central, diagonal groove, finely rugose in groove; posterior lateral corners rounded, without carinae. Anteromedian part of mesonotum shiny, finely rugose at extreme posterior portion; lateral lobes with fine longitudinal carinae on inner third, shiny on outer portions; axillae finely rugose with faint longitudinal carinae; mesoscutellum shiny, finely rugose; metascutellum rugose; notauli deep, broad, with distinct deep pits (Fig. 9). Mesepisternum smooth and shiny, mesepimeron with cross carinae; metapleuron shiny with fine microsculpture. Hind tarsal claw with small inner tooth near base, fore and mid tarsal claws with long inner tooth, more than half length of outer tooth, near center. *Abdomen:* Shiny. Tergum 1 1.3× length of tergum 2. Length of sheath to basal plates as 1.0:1.8.

Male: Length 6.5 mm. Color and structure similar to female (see Smith 2008).

**Specimen examined.** Female, “Nouvelle Calédonie, Province Sud, Thio, Comboui, 1037 m (21.77742S, 166.29495E) NC-COM-YPT-3, 12-18.XI.2016, yellow pan trap, C. Villemant rec.”

**Remarks.** Although descriptions of unassociated males are discouraged, Smith (2008) described *C. crocea* because of its unusual shiny appearance and stated that association with the female should not be difficult. The characteristics of this female are so similar to the male described as *C. crocea* that it must be the female of the species.





**Figures 7–12.** *Calexiphyda crocea*, female. **7** Lateral **8** Head and thorax, lateral **9** Thorax dorsal **10** Head front **11** Head dorsal **12** Antenna.

The shiny appearance, long antennae, rounded pronotum, deep, broad notauli with deep punctures, and the long first tergite, 1.3× length of the second tergite, are characters common to both sexes.



**Figures 13–17.** *Callexiphyda caledonia*. **13** Lateral **14** Head and thorax lateral **15** Thorax dorsal **16** Head front **17** Head dorsal.



***Calexiphyda caledonia* Smith**

Figs 13–17

*Calexiphyda caledonia* Smith 2008: 33.

**Diagnosis.** Female: Length, 21 mm. Black with mid and hind tibiae and tarsi and sheath orange, white spots laterally on first tergite (Fig. 13). Frons finely punctate to rugose; short, indistinct longitudinal carinae between antennae (Fig. 16, 17). Anteromedian part of mesonotum, inner half of mesonotal lateral lobes, and axillae with longitudinal or diagonal carinae, those on anteromedian part of mesonotum nearly entire length (Fig. 15).

Male: Unknown.

**Specimen examined.** Female, “Nouvelle Calédonie, Province Sud, Thio, Comboui, 1040 m (21.77805S, 166.29472E), NC-COM-YPT8 17-19.XI.2016, yellow pan trap, C. Villemant rec.”

**Remarks.** This species is recognized by its black color with the contrastingly orange tibiae, tarsi, and sheath (Fig. 13), and the distinct longitudinal carinae on the mesonotum (Fig. 15). This specimen represents a new record for the species. It was previously recorded from Rivière Bleue Province Park and Mt. Khogis, in Province Sud, 17 km NNE Nouméa (Smith 2008).

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