

The Aculeata of French Polynesia. I. First record of a Pompilid wasp (Hymenoptera, Pompilidae)

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Abstract. – A Pompilid wasp, *Anoplius toluca* (Cameron, 1893), is reported for the first time on Tahiti (Society Islands), which is also the first record of this family in French Polynesia. The genitalia and subgenital plate, which are key identification features, are illustrated. The potential preys of *Anoplius toluca* in French Polynesia are discussed.

Résumé. – **Les Aculéates de Polynésie française. I. Première citation d'un Pompile (Hymenoptera, Pompilidae).**

Une espèce de Pompilidae, *Anoplius toluca* (Cameron, 1893), est signalée pour la première fois de l'île de Tahiti (îles de la Société), ce qui représente également la première citation de cette famille en Polynésie française. Les genitalia ainsi que la plaque subgénitale, caractéristiques, sont illustrées. Les proies potentielles d'*Anoplius toluca* en Polynésie française sont précisées.

Keywords. – Tahiti, faunistics, new record, *Anoplius toluca*.

French Polynesia is composed of 118 islands within five archipelagos (DUPON *et al.*, 1993) located in the middle of the Pacific at least 6000 km from the nearest continent. Due to its remoteness, its terrestrial biota lacks several widespread families and genera, but those taxa that did manage to colonise gave rise to many endemic species and subspecies, with particularly large radiations within the Coleoptera and Lepidoptera (PAULIAN, 1998; GRESSITT, 1956).

The Austral, Gambier, Marquesas and Society archipelagos are mostly composed of high volcanic islands while the Tuamotu Archipelago is mostly composed of atolls. The climate in French Polynesia is largely wet tropical but varies along a latitudinal gradient, such that the northernmost islands of the Marquesas have tropical dry weather and the Austral and Gambier Islands have a temperate climate during the coolest months and a tropical wet climate during the warmest months (DUPON *et al.*, 1993).

The greatest biodiversity and most of the endemic taxa are located on the high volcanic islands in the Austral, Marquesas and Society Islands. These high islands host some specific habitats such as the high mountain rain forests.

One hundred species of Aculeata are listed from French Polynesia: 15 species of Apoidea (Apidae, Crabronidae, Megachilidae, Sphecidae), 21 species of Chrysidoidea (Bethyidae, Dryinidae), two species of Evanioidea (Evaniidae) and 62 species of Vespoidea (Formicidae, Vespidae). Formicidae (ants) contribute more than half of the Aculeata of French Polynesia, having 51 species (RAMAGE, 2014). Unfortunately this taxonomic list is seriously outdated, because the Aculeata of French Polynesia, except Formicidae, have not been reviewed since the 1930s when CHEESMAN (1928) worked on the Saint-George Collection and when WILLIAMS (1932) and FULLAWAY (1934) worked on the material collected during the Pacific Entomological Survey which lasted from 1927 to 1932.

Since these historic reviews were published, at least 15 Aculeata species have been accidentally introduced to French Polynesia (unpublished data). These species were probably introduced with plants, food (fruits and vegetables) and construction material.

Recently, the Pompilid wasp *Anoplius toluca* (Cameron, 1893) was collected on Tahiti, at a low elevation in sweet potato and tomato fields by one of the authors (JG) and at a high elevation along the trail to the summit of Mount Aorai by the first author (TR). This species appears to be well established on this island. Here we report this species, and its family, for the first time from French Polynesia.

Abbreviations. – **CFD**, Frédéric Durand's personal collection; **CTR**, Thibault Ramage's personal collection.

Family **Pompilidae** Latreille, 1804

Subfamily **Pompilinae** Latreille, 1804

Tribe **Anopliini** Ashmead, 1902

Genus *Anoplius* Dufour, 1834

Anoplius (Anoplius) toluca (Cameron, 1893)

Pompilus toluca Cameron, 1893: 195.

Material examined. – 1 ♂, Tahiti, Papara, 69.13 Gd Hyméno 1, sweep net in sweet potato field, 22.IX.2008, *J. Grandgirard* (CTR) ; 1 ♀, Tahiti, Papara, 76.11 Gd Hyméno 1, yellow pan trap in tomato field, 22.IX.2008, *J. Grandgirard* (CTR) ; 1 ♀, Tahiti, mont Aorai, 1190 m, pt 160, 17°34'57.47"S - 149°30'35.90"O, flying over anuhe [*Dicranopteris linearis* (Burm.f.)], 4.X.2012, *Th. Ramage* (CFD) ; 1 ♂, Tahiti, mont Aorai, 1260 m, pt 162, 17°35'9.63"S - 149°30'25.14"O, flying over the trail, 4.X.2012, *Th. Ramage* (CFD).

Diagnosis. – This species is the only Pompilid wasp from French Polynesia, which makes it easy to identify, even in the field. It has moderately infuscated wings, darker along the outer margin, and a black body with a strong bluish pubescence (fig. 1-2). The combination of the bluish pubescence, the shape of the genitalia (fig. 4-5), especially the shape of the subgenital plate (fig. 3), and the appressed pilosity on its base, are the key identification features of this pompilid wasp (EVANS, 1966).

Distribution. – Western North America to Central America (native range), Hawaiian Islands, French Polynesia (introduced range).

Biology. – Females have been collected visiting the flowers of Asteraceae, Liliaceae, Polygonaceae, males on the flowers of Ranunculaceae, Rosaceae, Salicaceae, Asteraceae, Fabaceae and both have been collected on Apiaceae (WASBAUER & KIMSEY, 1985).

The preys of *Anoplius toluca* seem to be exclusively Lycosidae (Araneae) (WASBAUER & KIMSEY, 1985). POWELL (1958) has seen a female bringing *Alopecosa kochi* (Keyserling, 1877) to the nest cell and ESSIG (1926) lists *Trochosa terricola* Thorell, 1856, as a prey of this species. Both prey records are from California (USA).

Observations in French Polynesia. – *Anoplius toluca* has been collected only on Tahiti, at both low and high altitude (between 0 and 50 m, 1190 m and 1260 m). The low altitude specimens were collected near agricultural fields whereas the high altitude specimens were collected along the trail of the Mont Aorai (fig. 6), where endemic fauna and flora are found. In its native range, *Anoplius toluca* is chiefly found at moderate to fairly high altitudes (2400 m) (EVANS, 1966).

Another species, the newly introduced Apidae *Amegilla (Zonamegilla) sp.* (unpublished data), has the same distribution, limited to Tahiti, and is also present at both low and high elevations (sea level to 1100 m). The altitudinal distribution of both species suggests that they have been introduced for at least one decade or two and might be present on the neighboring islands of the Society archipelago. The introduced entomofauna of French Polynesia is mostly

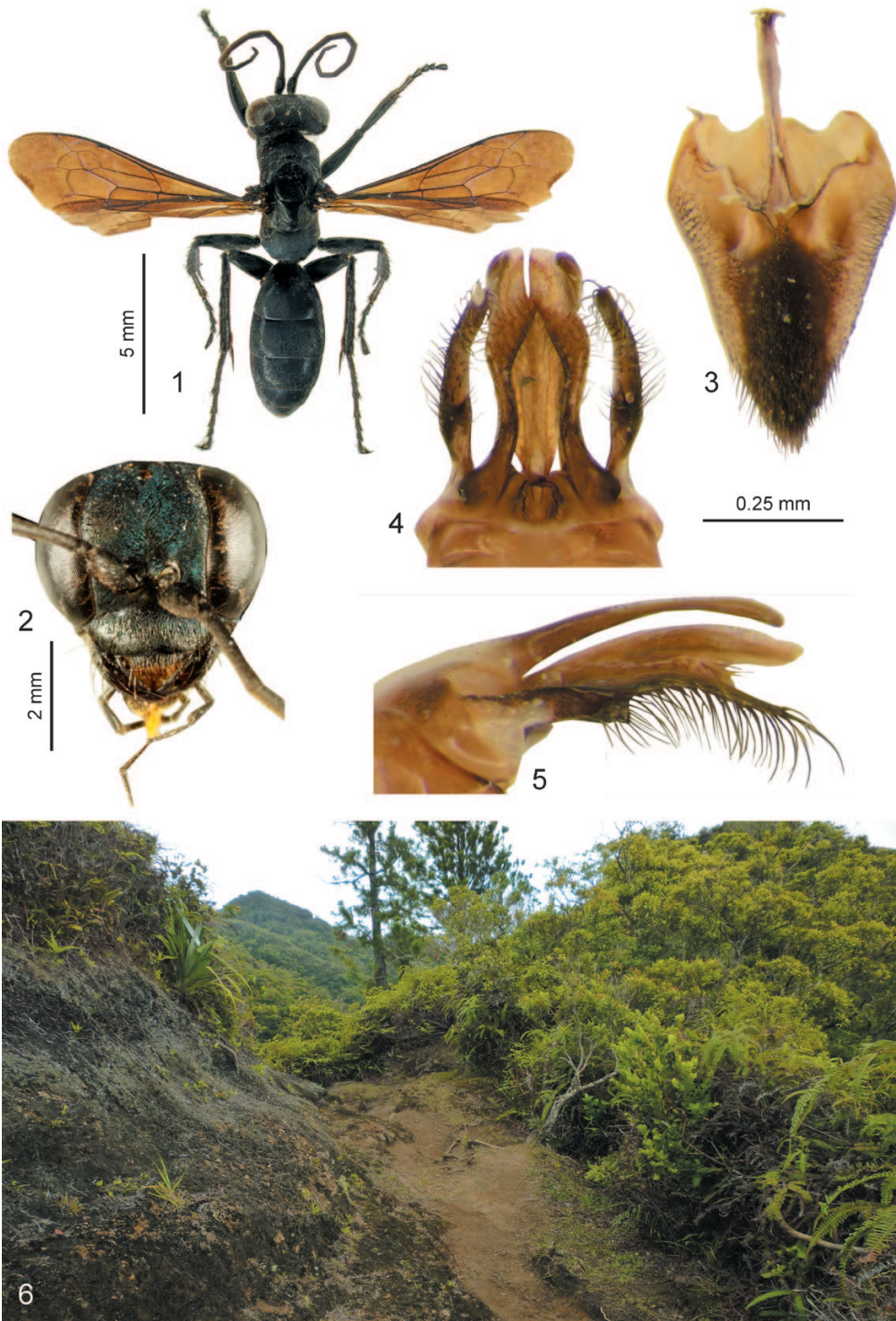


Fig. 1-6. – *Anoplius toluca* (Cameron) – 1, Habitus (♀). – 2, Face (♀). – 3, Subgenital plate (♂), ventral view. – 4-5, Genitalia (♂): 4, ventral view; 5, side view. – 6, High elevation habitat of *Anoplius toluca*, Mount Aorai, Tahiti. (Fig. 1-5: photo F. Durand; fig. 6: photo Th. Ramage).

similar to the introduced fauna of the Hawaiian Islands and both locations share most of their recently introduced Aculeata species (unpublished data).

Anoplius toluca may have some effect on native and endemic *Lycosa* fauna in the Hawaiian Islands but nobody has attempted to determine the magnitude of this effect yet (P. Krushelnycky, pers. comm.). The Lycosidae fauna in French Polynesia is limited to two species, *Hogna crispipes* (L. Koch, 1877), a Polynesian species native to French Polynesia (DIERKENS & CHARLAT, 2011) and *Artoria thorelli* (Berland, 1929) known only from the Marquesas in French Polynesia (M. Dierkens, pers. comm.). Both of these spider species may be the prey of *A. toluca*.

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REFERENCES

- CAMERON P., 1893. – Pompilides, Scoliides. *In*: Godman F. D. & Salvin O. (eds), *Biologia Centrali-Americana, Insecta, Hymenoptera*, **2** : 177-256.
- CHEESMAN L. E., 1928. – A Contribution towards the Insect Fauna of French Oceania. Part II. *The Annals and Magazine of Natural History*, **10** (2) : 169-194.
- DIERKENS M. & CHARLAT S., 2011. – Contribution à la connaissance des araignées des îles de la Société (Polynésie française). *Revue Arachnologique*, **17** (5) : 63-81.
- DUPON J.-F., BONVALLOT J., VIGNERON E., GAY J. C., MORHANGE C., OLLIER C., PEUGNIEZ G., REITEL B., YON-CASSAT F., DANARD M. & LAIDET D., 1993. – *Atlas de la Polynésie française*. ORSTOM : 250 p.
- EVANS H. E., 1966. – A revision of the mexican and central american spider wasps of the subfamily Pompilinae (Hymenoptera: Pompilidae). *Memoirs of the American Entomological Society*, **20** : 1-442.
- ESSIG E. O., 1926. – *Insects of Western North America*. New York: The Macmillan Co., 1035 p.
- FULLAWAY D. T., 1934. – New Species and Varieties of *Sierola* from the Marquesas. *Bulletin of the Bernice P. Bishop Museum*, **114** : 357-363.
- GRESSITT J. L., 1956. – Some Distribution Patterns of Pacific Island Fauna. *Systematic Zoology*, **5** (1) : 11-32.
- PAULIAN R., 1998. – *Les Insectes de Tahiti*. Paris: Boubée, 331 p.
- POWELL J. A., 1958. – Biological notes on the burrow and prey of *Anoplius ventralis tarsatus* (Banks). *Pan-Pacific Entomologist*, **34** : 53-56.
- RAMAGE Th., 2014. – Les Fourmis de Polynésie française (Hymenoptera, Formicidae). *Bulletin de la Société entomologique de France*, **119** (2) : 145-176.
- WASBAUER M. S. & KIMSEY L. S., 1985. – California Spider Wasps of the Subfamily Pompilinae (Hymenoptera: Pompilidae). *Bulletin of the California Insect Survey*, **26**: 1-130.
- WILLIAMS F. X., 1932. – The Sphegoid Wasps of the Marquesas Islands. *Bulletin of the Bernice P. Bishop Museum*, **98** : 149-153.
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