

The Aculeata of French Polynesia. II. First record of *Micromeriella marginella modesta* from Society Islands and Vanuatu (Hymenoptera, Scoliidae, Campsomerini)

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Abstract. – *Micromeriella marginella modesta* (Smith, 1855) is reported for the first time from Tahiti and Huahine (Society Islands), which is also the first record of a Scoliid in French Polynesia. This subspecies has also recently been collected for the first time in Vanuatu during the 2006 Expédition Santo. The biology of this subspecies, its distribution in the Pacific and its potential as beneficial insect in French Polynesia and Vanuatu are briefly discussed.

Résumé. – **Les Aculéates de Polynésie française. II. Premier signalement de *Micromeriella marginella modesta* et nouvelle donnée du Vanuatu (Hymenoptera, Scoliidae, Campsomerini).** *Micromeriella marginella modesta* (Smith, 1855) est signalée pour la première fois des îles de Tahiti et de Huahine (îles de la Société), ce qui représente également la première citation de Scoliidae pour la Polynésie française. Cette sous-espèce a aussi été récoltée pour la première fois au Vanuatu lors de l'expédition Santo 2006. La biologie de cette sous-espèce, sa distribution dans le Pacifique et le rôle d'auxiliaire potentiel qu'elle peut jouer en Polynésie française et au Vanuatu sont brièvement présentés.

Keywords. – Society Islands, French Polynesia, Vanuatu, new record, biological control.

Most data on the Aculeata fauna of French Polynesia were collected in the beginning of the past century. The last review was conducted in 1930, reporting 100 species. Recently another 14 Aculeata species, divided into six families, were collected in the Society Islands (RAMAGE *et al.*, 2015, and unpublished data). These species are likely to have been accidentally introduced from Hawaii (unpublished data).

The subspecies *Micromeriella marginella modesta* (Smith, 1855) is native to the Philippines and has been introduced to several archipelagoes in the Pacific during the xxth century for the control of Scarabaeoid beetle larvae (white grubs) that feed on the roots of sugar-cane and other crops (HOYT, 1957). This subspecies has been recently collected by the first two authors on two islands in the Society archipelago with an extra specimen found in 1977 on Tahiti by A. Delobel. Here we report the occurrence of this subspecies in French Polynesia for the first time, as well as its presence on Espiritu Santo in the Republic of Vanuatu; it was collected there by Frédéric Durand during the 2006 Expédition Santo organized by Pro-Natura International, IRD and MNHN.

Abbreviations. – **CTR**, Thibault Ramage's personal collection; **MNHN**, Muséum national d'Histoire naturelle, Paris, France (Claire Villemant); **RMNH**, Naturalis Biodiversity Center, Leiden, The Netherlands (Frédérique Bakker).

Genre *Micromeriella* Betrem, 1972

Micromeriella marginella modesta (Smith, 1855)

Scolia modesta Smith, 1855: 91.

Scolia (Scolia) manilae Ashmead, 1904: 8; ROHWER, 1921: 82.

Campsomeris marginella modesta (Smith); BETREM, 1928: 136.

Campsomeris (Micromeris) marginella modesta (Smith); BETREM, 1967: 313.

Micromeriella marginella modesta (Smith); OSTEN, 2005: 16.

Material examined. – FRENCH POLYNESIA: 1 ♂, Tahiti, Papara, pl[ante] hôte Poivron, 13.IX.1977, *A. Delobel* (MNHN); 1 ♂ et 4 ♀, Tahiti, Papara, sweet potato field, sweep net, 22.IX.2008, *J. Grandgirard* (CTR); 1 ♀, Tahiti, Tautira, bean field, sweep net, 3.X.2008, *J. Grandgirard* (CTR); 1 ♀, Tahiti, Papara, eggplant field, yellow pan trap, 22.IX.2008, *J. Grandgirard* (CTR); 1 ♂, Huahine, pointe Tiva, 5 m, Pt 59, 16°49'11.08"S - 150°58'59.56"W, on flower of *Tridax procumbens* L., 21.IX.2012, *Th. Ramage* (RMNH); 5 ♂ et 1 ♀, Huahine, Pohue Rahi, 360 m, Pt 83, 16°46'46.29"S - 150°58'25.92"W, 23.IX.2012, *Th. Ramage* (CTR); 1 ♀, Huahine, pointe Tiva, 5 m, Pt 59, 16°49'11.08"S - 150°58'59.56"W, yellow pan trap, 23.IX.2012, *Th. Ramage* (RMNH); 1 ♂, Tahiti, Mahina, malaise trap, 16.XI.2012, *F. Jacq* (CTR). VANUATU: 1 ♂, Expédition Santo 2006, Vanuatu, Penaourou, autour du camp, à vue, 5-19.XI.2006, *F. Durand* (MNHN); 3 ♂, Expédition Santo 2006, Vanuatu, Luganville, à vue, 1.XI.2006, *F. Durand* (MNHN).

Diagnosis. – The second recurrent vein (= vein 2m-cu) is not developed in both sexes. The female (fig. 2) is black with tergite 1 having a yellow posterior margin that is black medially, two more or less circular yellow spots laterally on tergite 2 and narrow yellow posterior margins on tergites 2-3 or 2-4. The circular spots on tergite 2 are often absent (fig. 2). Sternites 3 and 4 with a small yellow spot on the posterior corners. Vestiture and posterior fringes of metasoma white but black on the two apical segments. Females of *M. marginella marginella* (Klug) and the other subspecies are black. The male (fig. 1) is similar to the male of *M. marginella marginella* but the yellow posterior margins of tergites 2-6 are smaller. Body length: 8-10 mm.

This species can not be confused with other wasps of French Polynesia because of its specific yellow pattern on the metasoma and somewhat pilose appearance.

Distribution. – Native to the Philippines. Intentionally introduced as a biological control agent to the Hawaiian Islands and Fiji.

Biology. – *Micromeriella marginella modesta* is an ectoparasitoid of Scarabaeoid beetle larvae (white grubs). The female excavates the beetle larva and deposits an egg near the larva's head. It was found in the Philippines that a female could deposit about 50 eggs. The complete development takes about six weeks but longer in the cooler season. Hosts reported in the literature are: *Adoretus sinicus* Burmeister, 1855, *A. tenuimaculatus* Waterhouse, 1875, *A. umbrosus* Fabricius, 1792, *A. versutus* Harold, 1869, *Anomala orientalis* (Waterhouse, 1875), *Clemora smithi* (Arrow, 1912), *Holotrichia helleri* Brenske, 1894, *H. vidua* (Sharp, 1876), *Lepidiota pruinosa* (Wiedemann, 1819), *Leucopholis irrorata* Chevrolat, 1841, *Popillia japonica* Newman, 1838, *Rhopaea subnitida* Arrow, 1915, *R. vestita* Arrow, 1915, *Stephanopholis melolonthoides* (Brenske, 1896) (MUIR, 1919; VEITCH, 1922; WILLIAMS, 1947; HOYT, 1957; THOMPSON, 1958).

Biological control. – *M. marginella modesta* was introduced to Hawaii in 1915-1917, Fiji in 1917, Guam in 1950-1951 and to American Samoa in 1953 (MUIR, 1917; VEITCH, 1922;

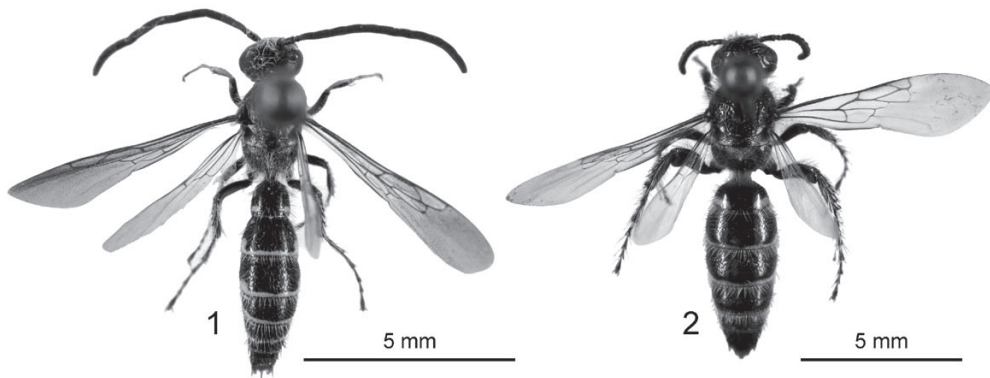


Fig. 1-2. – *Micromeriella marginella modesta* (Smith), from Tahiti. – 1, ♂. – 2, ♀. (Photos *Th. Ramage*).

HOYT, 1957; PETERSON, 1957). *M. marginella modesta* is established in all of these countries except American Samoa. The wasp has proved to be a very effective biological control agent. Introductions in New Jersey, USA failed (KROMBEIN, 1948).

Observations in French Polynesia. – The first specimen found in French Polynesia was collected on Tahiti in 1977. *M. marginella modesta* was not introduced by the French Polynesian Government for the control of white grubs and therefore must have been imported accidentally from Hawaii or other Pacific archipelagoes through international trade.

The wasp was observed visiting the flowers of two Asteraceae (*Tridax procumbens* L. and *Emilia fosbergii* Nicolson) on Huahine in September 2012.

The occurrence of *M. marginella modesta* within pineapple fields on the Hawaiian Islands is seasonal, being very abundant from November to February and occasional from March to October (SAKIMURA, 1943). No distinct seasonality of occurrence was observed in French Polynesia but the number of specimens collected until now is small. The collection of females in September/October suggests that reproduction starts at the onset of the rainy period.

Adoretus versutus Harold, 1869, and *A. sinicus* Burmeister, 1855, could be the host of this Scoliid, being the only species of known hosts that occur in French Polynesia (PAULIAN, 1998).

The adults of *Adoretus sinicus* and *A. versutus* are nocturnal, and feed on the foliage of numerous plant species, including mape (*Inocarpus fagifer* (Parkinson) Fosberg), litchi (*Litchi chinensis* Sonn.), *Citrus spp.* and taro (*Colocasia esculenta* (L.) Schott) in French Polynesia. In May 2011, J.-F. Butaud (pers. comm.) observed *Adoretus versutus* feeding on the leaves of *Grewia tahitensis* J. Nadeaud, a Malvaceae endemic to Tahiti that is nationally protected and critically endangered. On Pacific islands, *A. versutus* adults are known to attack crops of cocoa (*Theobroma cacao* L.), yam (*Dioscorea spp.*), hibiscus manihot (*Abelmoschus manihot* (L.) Medik), cutnut (*Barringtonia edulis* (Seemann) Miers), island lychee (*Pometia pinnata* J. R. Forst. & G. Forst.) and numerous ornamental plants (*Hibiscus tiliaceus* L., *Terminalia catappa* L., etc.) (BEAUDOIN *et al.*, 1995).

Observations in Vanuatu. – *M. marginella modesta* was not introduced by the Vanuatuan Government for the control of white grubs (<http://www.governmentofvanuatu.gov.vu/index.php/government/agriculture>; accessed 29.I.2014). Instead, this species was probably accidentally imported from Fiji or other Pacific archipelagoes by international trade.

The following four species of Rutelinae and Melolonthinae (Scarabaeidae) are known from Vanuatu: *Adoretus versutus* Harold, 1869, *Anomala hebridarum* Ohaus, 1916, *Parastasia montrouzieri* Fairmaire, 1883, *P. percheroni* (Montrouzier, 1860) (OHAUS, 1935; BEAUDOIN *et al.*, 1995).

It appears that *Adoretus versutus*, one of *M. marginella modesta*'s hosts, has recently become an important threat to cocoa plantations in Vanuatu (BEAUDOIN *et al.*, 1995). Therefore, monitoring the effectiveness of *M. marginella modesta* to reduce *A. versutus* populations, especially those found in cocoa plantations, would be a rewarding research topic.

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