First record of the Sclerogibbidae (Hymenoptera) from the Galapagos Islands, Ecuador

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Scientific Note

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The Galapagos Islands are of great importance due to their role at the dawn and consolidation of the Darwinian model of evolution (Sulloway 1982); their geologically recent origin and oceanic location make them a natural laboratory for the study of many evolutionary and ecological processes (Schluter 1986, Grant & Grant 2009). As a consequence, several groups of organisms, such as vertebrates, have been extensively studied (De Roy 2009, Steadman 2009); however, basic questions such as the richness of the islands require more study, and surprises continuously appear, even from the more obvious groups such as vertebrates themselves (Gentile & Snell 2009).

Arthropoda are a group for which the inventory of the islands has been unevenly developed and still requires a large effort despite the multiple expeditions conducted. According to Linsley & Usinger (1966), at the time the best compendium of entomological studies, since the pioneering visit by Charles Darwin in 1835 until 1966, around eight individual and 21 group expeditions had occurred resulting in a list of 618 species: 192 Coleoptera, 97 Lepidoptera, and 31 Hymenoptera. Several decades later, Peck (2006) reported 486 coleopteran species, Roque-Álbelo & Landry (2016) listed 311 lepidopterous species, and Heraty & Herrera (2017) compiled a total of 71 hymenopterans. Interestingly, large hymenopteran groups such as Braconidae, Pteromalidae and Encyrtidae are either not listed or are mentioned in publications with fewer than five species (Heraty & Herrera 2017).

Despite the fact that the biota of the islands may have come from earlier dispersals such as in those reported for cyrtacanthacridine locusts (Lovejoy et al. 2006), and that these newcomers served for subsequent speciation and diversification events (Parent et al. 2008, Peck 1996), current human travel may be imposing a large-scale immigration process (Bataille et al. 2009, Tullis 2006), some of which is affecting the local fauna (Kleindorfer & Dudaniec 2016). Herrera et al. (2014) listed 51 species of ants, of which 36 are introduced. Within these there are well-known examples of high-impact species such as *Solenopsis geminata* (Fabricius, 1804), *Wasmannia auropunctata* (Roger, 1863) and *Pheidole megacephala* (Fabricius, 1793) (Lubin 1984, Williams & Whelan 1991, Herrera & Causton 2008, Herrera et al. 2013). Another well-known case is the bird-parasite muscid fly *Philornis downsi* Dodge & Aitken, 1968, which is affecting populations of Darwin´s finches (Fessl & Tebbich 2002, Bulgarella et al. 2015).

Hence, a complete inventory of species with precise information on their geographic relationships is of vital importance for conservation programs. After a revision of the entomological collection of the Charles Darwin Foundation (CDF) Station, we noticed the presence of the uncommon wasp family Sclerogibbidae (Hymenoptera). Herein, we provide the pertinent record for this group in the islands and discuss its origins.

The insect collection of the Charles Darwin Research Station (ICCDRS) at Puerto Ayora (Santa Cruz Island) was sorted and identified with the help of updated keys (Fernández & Sharkey 2006). Specimens of Sclerogibbidae were identified using Olmi (2005, 2006) and later confirmed by Massimo Olmi.

Caenosclerogibba sp. (Figure 1).

Specimens Examined: 2 females; label 1: "Ecuador, Galápagos: Sta Cruz–Pto. Ayora, La Cascada, –0.7342065; –90.3126545, 16-20.I.2006 P. Lincango & E. Lomas Pitfall 2."; label 2: "/12 sp21.". ICCDRS41722, ICCDRS42723.

These two females constitute the first record of the genus and family for the Galapagos Islands. The family is distributed worldwide but is uncommonly collected. *Caenosclerogibba* Yasumatsu, 1958 is the most widespread genus in the family and has been reported from Africa, several regions of Asia, and the New World; recently, new records extended its occurrence southward into Southeast Asia (Lucañas & Olmi 2017). Only two records have been published from the New World, one from Mexico and another from continental Ecuador (Olmi 2005). The identification to species of the specimens from the Galapagos was not possible because it requires dissection of the labial palps (M. Olmi pers. comm.), and the specimens are dried and mounted on insect pins.

Sclerogibbidae are parasitoids of webspinners (Embiodea), such as *Caenosclerogibba longiceps* (Richards, 1958) reared from Oligotomidae and Embiidae (Lucañas & Olmi 2017). Two species of Embiodea have been reported from the Galapagos Islands, *Chelicerca galapagensis* Ross, 1966 and *Oligotoma saundersii* (Westwood, 1837). The former is endemic to the islands and distributed in Pinzon, San Cristobal, Santa Cruz, and Wolf Islands. This species is found in both arid and humid forests of the Galapagos feeding on detritus or lichens, and is related to the coastal species of Embiodea found in arid areas of Ecuador and Peru (Peck 2001). *Oligotoma saundersii* is a widespread species dispersed by commerce throughout the tropics; in the Galapagos this embiodean is recorded from Santa Cruz and San Cristobal Islands; in Santa Cruz it was reported around the area of Puerto Ayora (Peck 2001).

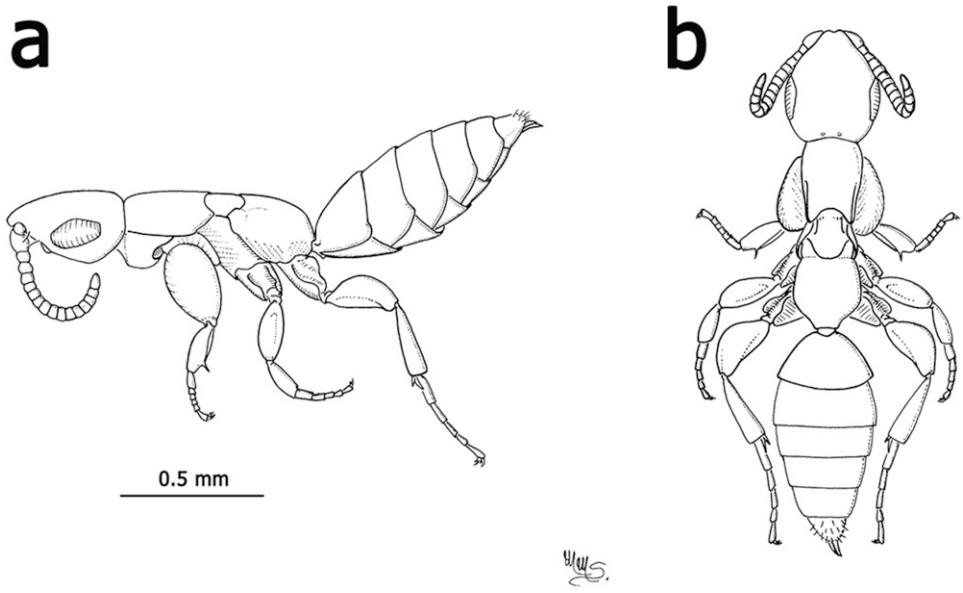

Figure 1. Habitus of the female of Sclerogibbidae found on Santa Cruz, Galapagos Islands. A. lateral view, B. dorsal view.

An extensive screening of the CDF collection conducted by the authors did not reveal additional Sclerogibbidae specimens. Thus, as has occurred with other insect species (Gonzalez et al. 2010), this report of the family on the island may be the result of either the rareness of the group and the lack of extensive sampling, or it may also be an accidental introduction through the frequent importation of wood for construction from the mainland. Embiodea often build their silken galleries in tree bark or rotten wood (Szumik 2012), and thus wood loads with webspinner colonies may serve as transportation vessels for Sclerogibbidae. In this regard, it is worth noting that the sclerogibbid specimens were collected in Puerto Ayora, the largest and most active port of the islands with heavy touristic activity. Furthermore, the recent report of *C. longiceps* in the Philippines has been interpreted as a consequence of the introduction of its hosts *O. saundersii* and *O. humbertiana* (Saussure, 1896) to the island through ancient Spanish trade routes (Lucañas & Olmi 2017).

A more intensive and focused sampling of insects of the Galapagos Islands may help to provide fresh material of Sclerogibbidae and resolve the species identity of the *Caenosclerogibba* reported here. In doing so, the origin of this taxon might be determined, and thus we may obtain a better understanding of the ecological implications of the presence of the family in the islands.

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