

Short scientific noteSubmitted: February 28th, 2018 - Accepted: May 24th, 2018 - Published: June 29th, 2018**Yet another alien: a second species of *Lepisiota* spreading across the Canary Islands, Spain (Hymenoptera: Formicidae)**Enrico SCHIFANI^{1,*}, Vincenzo GENTILE², Antonio SCUPOLA³, Xavier ESPADALER⁴¹ Section Animal Biology, Department STEBICEF, University of Palermo - Via Archirafi 18, I-90123 Palermo, Italy
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Abstract

The Canary Islands are a biologically important archipelago hosting many unique species, whose myrmecofauna is peculiarly rich in both endemic and introduced species. *Lepisiota frauenfeldi* cfr. *kantarensis* Forel, 1911 is reported for the first time from Fuerteventura and Tenerife. It is the second species of *Lepisiota* introduced in the archipelago in the last few years, and one of the few documented cases in which *Lepisiota frauenfeldi* (Mayr, 1855) s.l. acts as a successful tramp species. Comments are also given on taxonomic problems involving the *L. frauenfeldi*-group and related taxa. Finally, new additional information and comments are presented on the distribution of other alien ants species from the Canary Islands [*Lasius neglectus* Van Loon, Boomsma & Andrásfalvy, 1990, *Lepisiota capensis* (Mayr, 1862) and *Paratrechina longicornis* (Latreille, 1802)].

Key words: Macaronesia, *Lepisiota frauenfeldi* ssp. *kantarensis*, first record, myrmecofauna, exotic ants, invasive ants, tramp ants, biodiversity conservation.

Introduction

The Canary Islands are a volcanic archipelago located in the Atlantic Ocean, to the west of Morocco, ranging from 110 to 460 km at their points of minimum and maximum distance. The seven main islands have an extension ranging from 268.71 km² (El Hierro) to 2,034 km² (Tenerife), with a maximum altitude of 3718 m a.s.l. (Teide volcano, Tenerife). The archipelago is known for its numerous habitats of particular biogeographical interest (Juan et al. 2000) and for hosting an high number of endemic species of organisms (about 38% of the animals and 21% of the plants), many of which exclusive of single islands (Bramwell 1976; Arechavaleta et al. 2010). It represents one of the ten plant biodiversity hotspots in the Mediterranean region (Médail & Quézel 1997).

The only comprehensive work on the local myrmecofauna was provided by Barquin (1981). At the present time, 56 species and subspecies are counted, including 18 endemics (32% of the total) and 12-16 species (21-28%) which are considered introduced (Arechavaleta et al. 2010; Espadaler & Fernandez 2014). While most introduced ants around the world do not pose significant ecological threats, remaining limited to highly disturbed or anthropogenic areas, others are known for their dramatic impact on local

ecosystems and human activities, often including a complete displacement of native ants (Holway et al. 2002). Invasive behaviours are hard to predict *a priori* as they depend on a high number of local factors, and are also expected to vary in response to the ongoing environmental changes (e.g. Roura-Pascual et al. 2004). Therefore, the presence of such remarkably high numbers of both endemic and introduced ants species raises obvious concerns in terms of conservation, especially as the latter have continued to increase and spread across the islands during the last decades (Espadaler & Bernal 2003; Högmo 2003; Espadaler 2007; Espadaler & Fernandez 2014).

However, despite the presence of other infamous species such as *Lasius neglectus* Van Loon, Boomsma & Andrásfalvy, 1990 or *Pheidole megacephala* (Fabricius, 1793), only *Linepithema humile* (Mayr, 1868) and *Paratrechina longicornis* (Latreille, 1802) have been described as potentially threatening in the archipelago (Espadaler & Bernal 2003), and only *L. humile* has until now been observed outside anthropogenic or heavily disturbed habitats (Espadaler & Fernandez 2014).

Two brief visits in Tenerife (2015) and Fuerteventura (2017) allowed to discover seemingly well-established populations of yet another introduced ant, in the genus *Lepisiota* Santschi, 1926, belonging to the taxonomically

challenging *frauenfeldi*-group. The finding marks the second time a species of the genus is recorded in the islands after *L. capensis* (Mayr, 1862) (Espadaler & Fernandez 2014). Finally, some other new interesting observations on alien ants in the Canary Islands are also reported.

Materials and methods

Canary Islands: Tenerife, Valle Crispín, 28.30.59.918N, 16.14.10.845W, 27 Jan 2016, E. Schifani legit, cemented road in the presence of abundant *Paratrechina longicornis*. Tenerife, Puertito de Güímar, 28.17.57.7N, 16.22.23.9W, 28 Jan 2016, E. Schifani legit, between lava rocks. Fuerteventura, Molino de Antigua, Museum Garden, 28.25.49.7N, 14.00.46.8W, 7 Dec 2017, X. Espadaler legit, nesting in the soil. Fuerteventura, Museo de la Sal, 28.22.3.5N, 13.52.12.4W, 9 Dec 2017, X. Espadaler legit, soil nesting in a crack on a cemented way.

Ants were collected by direct sampling. Voucher specimens were stored in the Museo de la Naturaleza y el Hombre (Tenerife), Museu de Ciències Naturals (Barcelona) and the personal collections of Enrico Schifani, Vincenzo Gentile and Antonio Scupola.

In order to identify the species, we used the key of Santschi (1917), original descriptions, images of *Lepisiota* present on Antweb (www.antweb.org, accessed Jan 2018) and samples of *L. frauenfeldi* s.l. from Greece, Italy, Malta, Morocco and Tunisia.

Images of specimens were taken using a Canon 1300D reflex and MP-E 65mm f/2.8 1-5x Macro Photo lens, and stacked using Helicon Focus 6.7.1, method C. The photographs were edited in Adobe Photoshop 2015 CC.

Results

All the specimens are tentatively attributed to *Lepisiota frauenfeldi* cfr. *kantarensis* Forel, 1911 (Figs 1-4) (we would like to note that a syntype in Antweb cod. Casent 0909884 (loc. Kantara) is not a specimen of *L. frauenfeldi* (Mayr, 1855) s.str.; it could belong to the ssp. *kantarensis*). Here is a brief description of the examined specimens: brown head, ochraceous-red mesosoma, ochraceous-red petiole with brown dorsal side, black gaster, yellow antennae and mandibles, darker apex of scapes, yellow palpi, black coxae, brown black femora, paler or yellow on the tibial attachment and yellow tibiae and tarsi. Convex sides and straight posterior margin of head, very long and marked median frons line. Pronotum with a pair of erect and well developed black setae. Poorly developed propodeal spines. Largely concave dorsum of petiole with asymmetrical spine-shaped dorsolateral apices. Dull body surface and shiny gaster.

Measurements (mean of 3 workers, expressed in millimeters): cephalic length (mandibles excluded) = 0.718;

cephalic width (excluding the eyes) = 0.576; scape length (excluding the basal condyle) = 0.960; ocular length (measured longitudinally) = 0.211; mesosoma length (diagonal length measured in lateral view) = 1.144; maximum pronotal width (in dorsal view) = 0.434; minimum mesonotum width (in dorsal view) = 0.172; propodeal spines distance (between the apices, measured in dorsal view) = 0.255; petiolar spines distance (between the lateral apices of the petiolar dorsum, measured in frontal view) = 0.115; hind-tibia length = 1.020.

Below are some characters of particular interest that support the tentative identification: the opacity of the tegument (the similar ssp. *barbara* Santschi, 1917 and ssp. *marocana* Santschi, 1936 are less shagreened and appear subopaque), the well-marked, easily visible frontal line (Fig. 2), the peculiar shape of the petiole (Fig. 4) and the pair of long pronotal setae similar to those of the ssp. *barbara* (Figs 1-3).

Additionally, other information was gathered relevant to other alien ant species. In Tenerife a second locality of *L. neglectus* was discovered during our survey (agricultural areas near the TF-12 carriageway, Norte San Andrés-La Laguna, 28.31.54.6N, 16.15.04.4W, close to areas invaded by *L. humile* and not far from a nest of the endemic *Temnothorax cabreare* Forel, 1893), demonstrating a significantly larger presence of this species than previously known (Espadaler & Bernal 2003). Moreover, in Barranco de Guasiegro (28.9.4.255N, 16.30.51.469W) *Paratrechina longicornis* was observed to be extremely abundant even if outside an anthropogenic and highly disturbed habitat, contrary to what had been previously observed locally (Espadaler & Fernandez 2014) and is usually seen at a global scale (Wetterer 2008). Finally, in December 2017, *L. capensis* was found for the first time in Las Palmas, Gran Canaria (28.03.36.1N, 15.27.58.3W, in gardens and crops, tending Coccoidea Handlirsch, 1903 on *Senna spectabilis* (Juan Manuel Rodríguez Gil, pers. comm.), while it was only known from La Gomera (Espadaler & Fernandez 2014).

Discussion

The identification of the specimens as *Lepisiota frauenfeldi* cfr. *kantarensis* is provisional, in fact the only keys currently available for this genus, other than that of Santschi (1917), whose nomenclature is largely dated, are those of Collingwood & Agosti (1996) and Sharaf et al. (2016) on the Arabian fauna. Clearly a comprehensive and modern review of the whole *frauenfeldi*-group and of the other similar species [*L. bipartita* (Smith, F., 1861), *L. syriaca* (André, 1881), etc.] is badly needed.

The *Lepisiota* species in the *frauenfeldi* group have been rarely noted as invasive or needing some kind of control. A *L. frauenfeldi* establishment at a localized cargo container holding area from the island of Guam (Western



Figs 1-4 – *Lepisiota frauenfeldi* (cfr.) ssp. *kantarensis* Forel, 1911, specimen from Valle Crispín, Tenerife, Spain. **1**, Profile view; **2**, Head view; **3**, Dorsal view; **4**, Petiolar scale and propodeum in posterior view. Photos by Enrico Schifani.

Pacific) was eradicated with a couple of treatments (Hoffmann et al. 2011) as well as large areas up to 60 ha in Perth (Australia; Hoffmann et al. 2016). *Lepisiota* (or *Acantholepis* Mayr, 1861) species as exotic, tramp, pests or invasive are remarkably absent in key sources (Vander Meer et al. 1990; Williams 1994; Holway et al. 2002; Klotz et al. 2008). Knowledge of social structure in this ant group is extremely scarce, but published data indicate general monogyny and independent foundation (Tohmé & Tohmé 1975a, 1975b), which would represent a key social trait favourable to a possible control or eradication. This may however not be always the case, as three wingless queens have been found inside a nest of *L. frauenfeldi* in June in Sicily (Enrico Schifani, unpublished data). Further investigation on the biology of the group regarding this and other issues is surely required.

The finding of this species across multiple islands as well as distant localities in Tenerife suggests an earlier introduction in respect to the one suggested for *L. capensis* at the time of its discovery (Espadaler & Fernandez 2014). However, the new finding of *L. capensis* from Gran Canaria shows that both species are probably expanding rapidly across the archipelago, with unknown consequences.

Acknowledgements – We thank Juan Manuel Rodríguez Gil for the specimens of *L. capensis* he generously collected for us in Gran Canaria.

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