

## 14. Ants of the Pityusic Islands (*Hym. Formicidae*)

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### Introduction

Interest from a biogeographical point of view in both the flora and fauna of the Pityusic Islands, is very old. At present, not only has it not decreased, but we can even state that it has increased.

The islands represent simplified ecosystems where ecologic and evolutionary phenomena can be subjected to an easier observation and inspection than on the continent. The basic mechanisms of ecological relations between populations are more easily demonstrated in the communities previously selected by the island environment. In this way, the competition between the species is more clearly apparent due to the limited space and trophic resources of the island.

One of the taxa, Formicidae, is particularly suitable, within certain limits, to the biocenotic and biogeographic approach. Not only because of the social character of the group, but also because of the ease with which it crosses barriers due to the winged nature of its sexes. Goldstein (1975) helped to make a general analysis of ecologic niche segregation and resource using the myrmecologic community of the Timble Islands, in Connecticut, really interesting. The objective of the present work is much more modest. For the moment we simply attempt to combine what is already known with our data in order to contribute to a better understanding of the myrmecological fauna of the Pityusic Islands.

We recall that works of this kind are scarce: only Lomnicki (1925), Wheeler (1926) and Collingwood & Yarrow (1969) refer to specimens collected on Eivissa when studying the Balearic Islands as a whole or all the Iberian fauna. For the general distribution of each species our principal reference is Baroni Urbani (1971). The material studied comes from our collections as well as from samples provided by the zoologists J. A. Alcover and J. Mayol, who have given us their material, collected during frequent visits to Eivissa, Formentera and other islands, and to whom we would like to express our most sincere gratitude. A representative sample of our material has been deposited in the Department of Zoology in the University of Palma de Mallorca.

## Myrmecologic fauna and its distribution

There is a total of 29 known ant species, belonging to 17 genus distributed in four subfamilies.

### *Ponerinae*

#### *Ponera coarctata* (Latreille)

Recorded by Collingwood & Yarrow (1969) on Eivissa, without specific locality. Euroasiatic species, present in the entire Mediterranean region.

#### *Hypoponera eduardi* (Forel)

Given for the first time in Sant Miquel on Eivissa by Collingwood & Yarrow (1969). Our location is also on Eivissa, in the neighbourhood of Jesús (females in flight, August 1980).

This is a Mediterranean-Atlantic and macaronesic species common in the western Mediterranean littoral. It has been recorded on Mallorca but not on Menorca.

### *Myrmecinae*

#### *Myrmica aloba* Forel

An Iberian and north African species recorded on Eivissa, without locality, by Collingwood & Yarrow (1969).

#### *Aphaenogaster gemella* Roger

Wheeler (1926) found it in the port of Eivissa. This enigmatic species is also known on Menorca and Mallorca, although it has not been found since 1969 and seems to have been substituted by the similar species *A. senilis* Mayr.

#### *Messor bouvieri* Bondroit

Wheeler (1926) found it in Sant Antoni and Sant Josep on Eivissa and Collingwood & Yarrow (1969) found it in Serra Grossa, also on Eivissa. We collected it in several localities and on a number of the small uninhabited islands of Formentera in February 1978: Estany Pudent, la Savina, Punta Brima, Platja de Migjorn and the small uninhabited islands of Pouet and s'Espardell. We also collected it on Eivissa: on the small uninhabited islands of s'Espartar and of Na Bosc in December 1978, and in the localities of Es Molins, Es Broll, Puig des Guixer and San Rafel in October 1980.

This is the most common *Messor* in the Balearic Islands. It is easily recognized because of the long trails transporting seeds along paths, roads and

commons and because of the seed debris which accumulates near the nest opening.

It is a western Mediterranean species, present in the Iberian Peninsula, the south of France, on Sicily and Corsica.

*Messor capitatus* (Latreille)

Found on Eivissa (Lomnicki, 1925) and in Palma, Mallorca (Collingwood & Yarrow, 1969). These are the only references in the Balearic Islands, and we can add two localities on Eivissa: Jesús (August 1980) and Puig des Guixer (October 1980).

This species seems to be scarce in the Balearic Islands, perhaps because the competition with the previous species is very strong. On Corsica and Sardinia it is abundant in places under 1000 m (Casevitz-Weulersse, 1974a & b); its general distribution is Mediterranean-Atlantic.

*Messor structor* (Latreille)

Wheeler (1926) found it in Sant Antoni and in the port of Eivissa and Collingwood & Yarrow (1969) found it on Eivissa. Our material comes from Eivissa: Sant Antoni de Portmany, Ses Fontanelles (September 1978) and Es Broll (October 1980).

The nests are under stones, with superficial galleries nearly horizontal when there is enough dampness in the ground. In summer they go deeper in the ground and only the major workers appear at the opening, on guard, together with small harvesting workers. They do not form supply columns going to and from the nest looking for food, like the other *Messor* from these islands. This is a typical meadow species with a distribution, in Menorca, more inland than *M. bouvieri* (Comin & De Haro, 1980).

It is distributed throughout southern Europe, primarily in the west, if we consider *M. rufitarsis* (Fabricius) as a different species.

*Pheidole pallidula* (Nylander)

This is the 'italian ant' which is very common in the entire Mediterranean (Bernard, 1968). Nearly all the authors that have dealt with the group spoke of it in the Balearic Isles. It was found on Eivissa (Lomnicki, 1925; Collingwood & Yarrow, 1969) and in Sant Antoni (Wheeler, 1926). Our references are all on the island of Eivissa: San Rafel, Sa Talaïassa, Puig des Guixer, Es Broll, Sa Font des Tur, (October 1980), Jesús (August 1980) and Can Carrasco (April 1981).

It is easily distinguished by the presence of 'soldiers' with bulky heads. The species is opportunistic, and is not uncommonly found in gardens in villages (Map 1).

*Monomorium salomonis* (Linné)

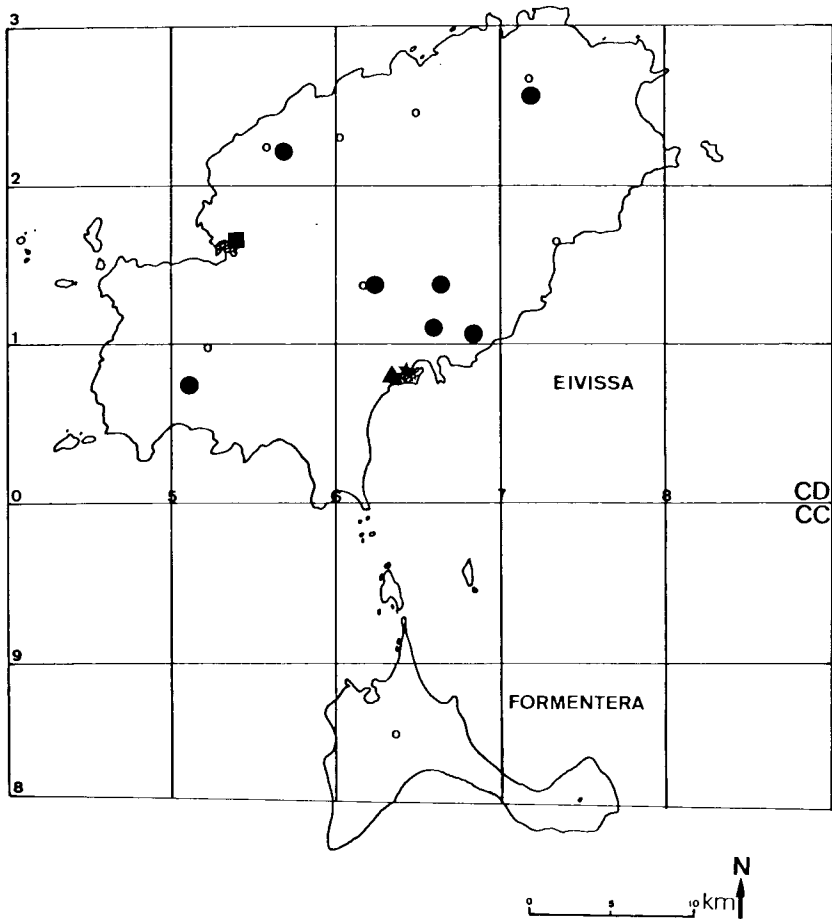
The first reference on Eivissa is that of Wheeler (1926) in Sant Josep. We found it in Jesús (August 1980).

It occurs in sandy places and along the seaboard. The nest appears in soft earth, with abundant organic material and between gramineae roots. Only during spring are they superficial (Comin & De Haro, 1980).

It is widely distributed, from Mediterranean Africa to Burma, with many subspecific forms.

*Monomorium subopacum* (F. Smith)

It was found on Eivissa in Santa Eugenia (Lomnicki, 1925), in Sant Antoni and in the port of Eivissa (Wheeler, 1926) and in Eivissa City (Collingwood & Yarrow, 1969). We found it on Formentera: Estany Pudent (February 1978)

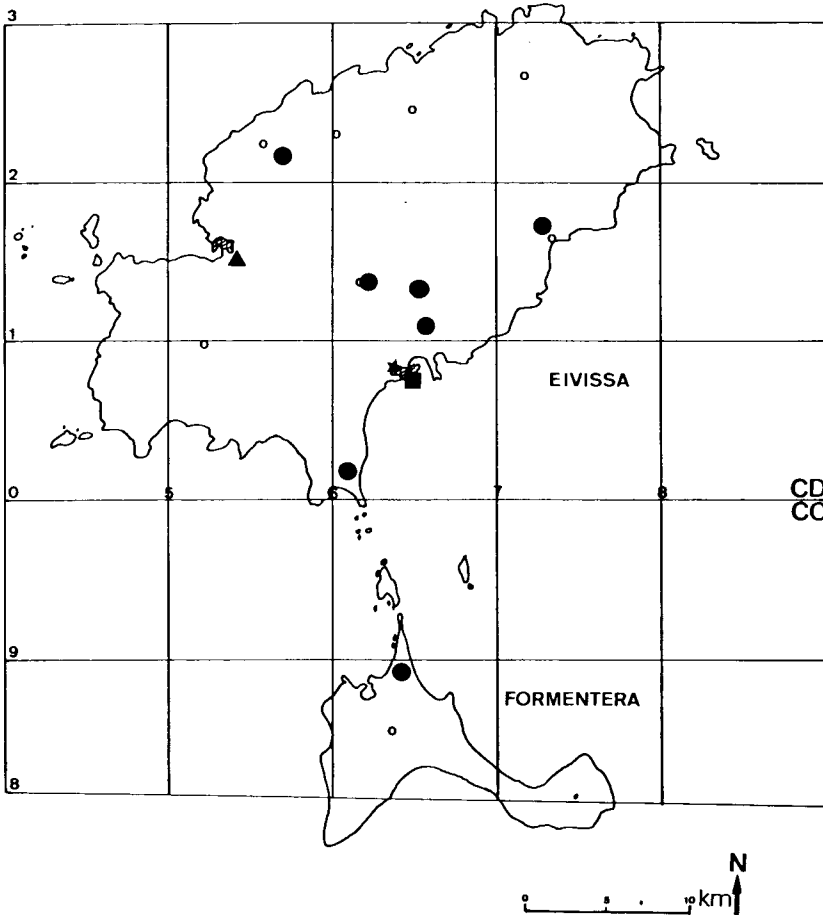


Map 1. Distribution of *Pheidole pallidula*. ▲ Lomnicki records ■ Wheeler records; ★ Collingwood & Yarrow records; ● Our records.

and in several localities on Eivissa: Sant Rafel, (August 1977), Jesús (August 1980), Santa Eulària, Sa Quintana, Es Broll (October 1980) and Ses Salines (April 1981).

It is easily confused in the country with *M. salomonis.*, not only morphologically but also because of its ecological niche and even because of the polygynic character of its colonies. However, in Menorca, it is much more abundant and presents a more inland distribution (Comin & De Haro, 1980).

Its distribution is southern Mediterranean, etiopic and macaronesic. It does not seem to have reached Corsica (Map 2).

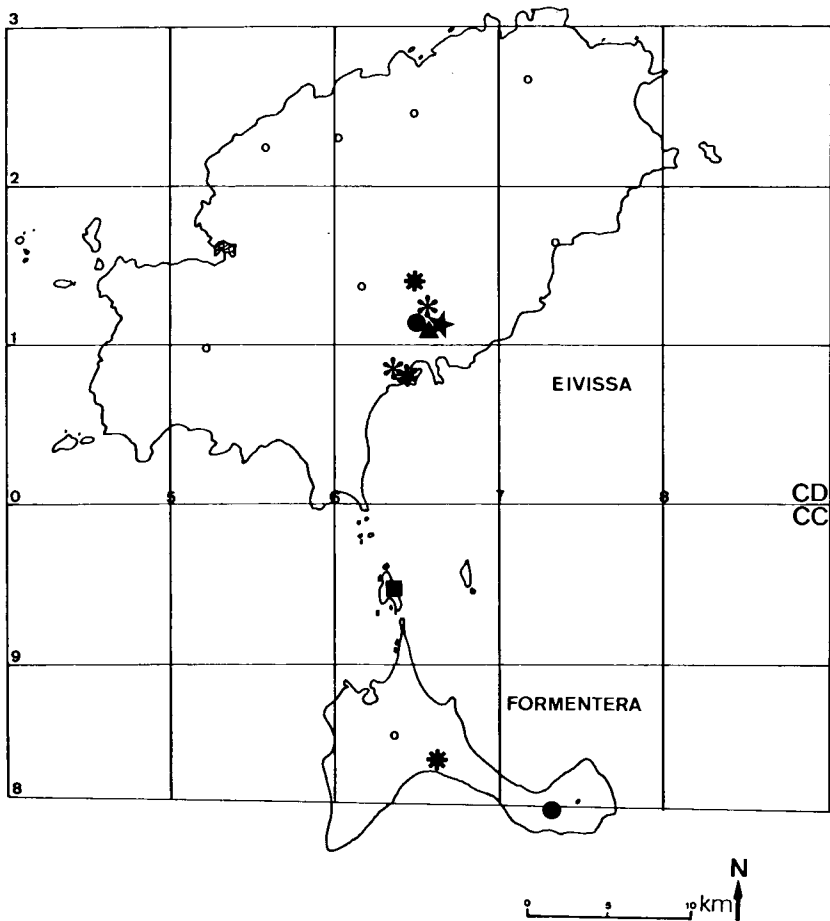


Map 2. Distribution of *Monomorium subopacum*. ▲ Lomnicki; ■ Wheeler; ★ Collingwood & Yarrow; ● Our records.

*Monomorium pharaonis* (Linné)

We located it in Jesús, Eivissa, near an official rubbish dump (August 1980). The evidence of its arrival on the Balearic Islands by way of Eivissa is interesting, as is the first Balearic record. It is a cosmopolitan species, transported by man (Map 3).

It is to be expected that it will spread all over the island and that it will even jump to the rest of the islands, as it travels as a tramp with merchandise transported by boat. Its presence is not to be feared as much as that of the



Map 3. Distribution of first Pityusic Islands records. ▲ *Monomorium pharaonis*; ★ *Diplorhoptrum*; ● *Tetramorium semilaeve*; ■ *Tetramorium caespitum*; \* *Iridomyrmex humilis*; \* *Lasius alienus*.

'argentine ant', a real pest, that has been discovered all over the Balearic Islands, assisted by the touristic phenomenon.

*Cremastogaster auberti* Emery

We found it for the first time in the Pityusic Islands. It nests on Eivissa and Formentera: Sant Mateu (August 1980) and Puig des Guixer (October 1980) on Eivissa, S'Espalmador Islet, (February 1978 and August 1980), S'Espartar, Migjorn, Punta Prima, Es Pujols and Cala Saona in Formentera (February 1978).

They always nest in ground with a certain degree of humidity. The holes of their nests appear under small stones or pebbles. Frequently, if stones are turned up, groups of larvae appear hanging from them.

It is spread throughout the south-western area of the Mediterranean basin. It was recently found on Menorca (Comin & De Haro, 1980). It is also known on Corsica and Mallorca (Bernard, 1968) (Map 4).

*Cremastogaster scutellaris* (Olivier)

With regard to Eivissa, it is found in Sant Antoni (Wheeler, 1926). Our material also comes from Eivissa: Sant Antoni de Portmany (September 1978), Es Molins, Es Broll, Puig des Guixer (October 1980) and Jesús (August 1980).

Its absence on Formentera is not surprising because it usually nests in wood (trunks, branches, under bark). It is very aggressive and at the smallest symptom of danger, starts to shake with the abdomen raised and with a small drop of whitish pheromone at the end of the gaster.

It is distributed all over the Mediterranean basin, as far as central Asia. Of course, it is well known in the Balearic Islands, on Corsica and Sardinia.

*Cremastogaster sordidula* (Nylander)

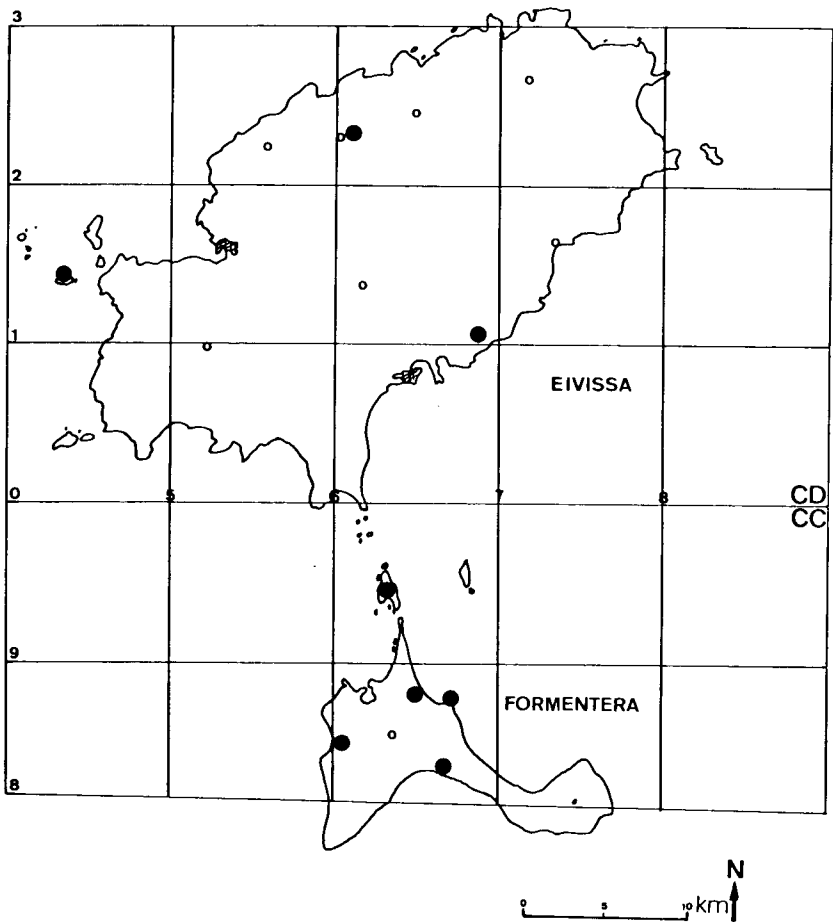
Found in Serra Grossa — Eivissa — by Collingwood & Yarrow (1969). The species exists all over the Mediterranean as far as central Asia. Our findings are on Eivissa: Jesús, Font des Cirer and Can Carrasco (April 1981) (Map 3).

*Diplorhynchus* sp.

The genus is new for the Pityusic Islands; not so for Mallorca and Menorca where *D. fairchildi* (Wheeler) is present on both islands. Our reference is in Jesús (sexes in flight, August 1980). The lack of workers and the provisional condition of the taxonomy of this genus, even taking into account the interesting revision by Bernard (1977) does not enable us to identify our material (Map 3).

*Tetramorium caespitum* (Linné)

On the Pityusic Islands we found it for the first time in S'Espalmador (February 1978). Typically opportunistic, it makes use of man in its displacements and



Map 4. Distribution of *Cremastogaster auberti*, first Pityusic Islands records.

initial hold, behaving like a tame species and later establishing itself in more natural environments. Today it can be said that it is cosmopolitan. The reference on Menorca is very recent (Comin & De Haro, in press) (Map 3).

#### *Tetramorium semilaeve* André

This species was first found on the Pityusic Islands: in Jesús (August 1980), on Eivissa (April 1981) and on Formentera: Banc Tramontana-La Mola (February 1978).

It is easily found in meadows. It always nests in earth hollowed in by gramineae, under stones and even under lumps in cultures. Its actual distribution is the Mediterranean basin and central Europe. It is very common in



Corsica (Casevitz-Weulersse, 1974a). On Mallorca the references are abundant but on Menorca they are more scarce (Map 3).

*Tetramorium meridionale* Emery

This species is known on Eivissa, without locality (Collingwood & Yarrow, 1969). Its distribution is circummediterranean, in very scattered localities. It is an uncommon species, referenced on Menorca (Comin & De Haro, 1980).

*Leptothorax specularis* Emery

We have identified this species according to the key of Collingwood (1978). We found it for the first time on the Pityusic Islands: the uninhabited island of es Vedranell and in es Canar (October 1978).

It is a very slow and timid species, difficult to find. It frequently nests between cracks and crevices of blocks of limestone filled with soil. It is distributed in northern Mediterranean Europe. Its presence in the Balearic Islands is of major interest (Map 5).

*Leptothorax lichtensteini* Bondroit

This species was found in Sant Miquel (Eivissa) by Collingwood & Yarrow (1969). It is a southern European species, more common in the west (Map 5).

*Temnothorax recedens* (Nylander)

This species was found on Eivissa in Serra Grossa by Collingwood & Yarrow (1969). We found it in Jesús (August 1980), in a dry stump.

*Dolichoderinae*

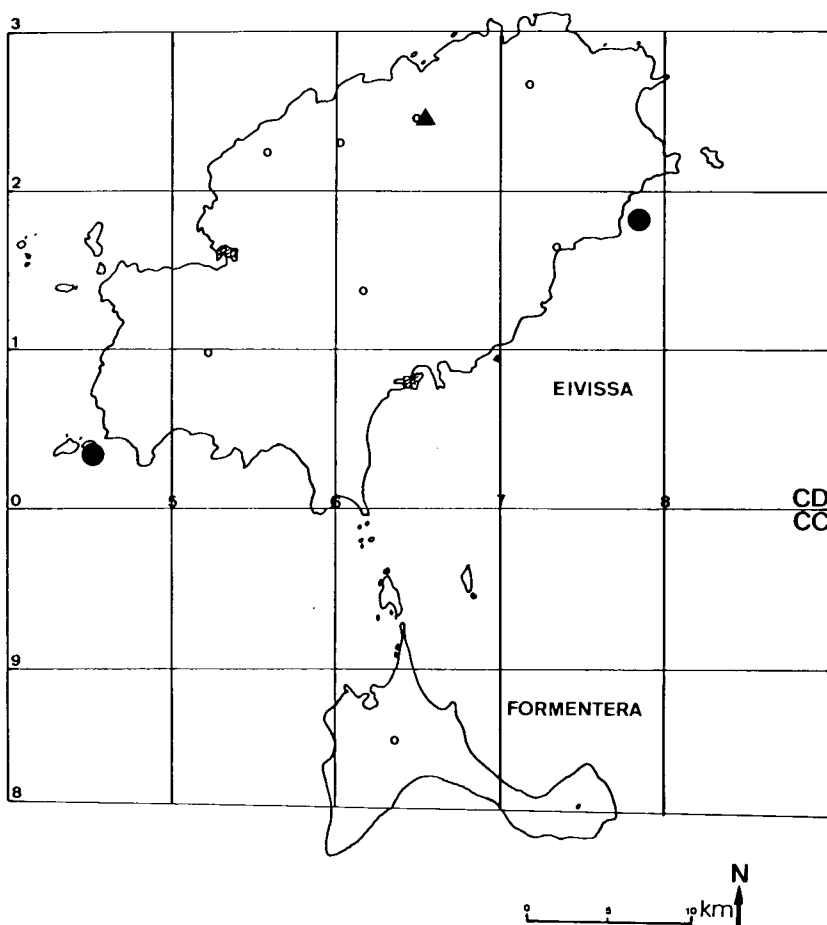
*Iridomyrmex humilis* (Mayr)

On Eivissa we found it for the first time in Jesús (August 1980) and in the town of Eivissa (October 1976). Its introduction is recent in the Balearic Islands: it arrived on Mallorca via the port of Sóller (Bernard, 1956) and on Menorca via the port of Maó (Comin & De Haro, 1980).

The arrival and expansion of this pest in the Balearic Islands coincides with the touristic phenomenon of the islands. The zones which have suffered the most are usually localities whose original biotops have been completely changed by human constructions that favour the ecological opportunism of this species. Of tropical origin, it is at present cosmopolitan (Map 3).

*Tapinoma erraticum* (Latreille)

This species was found by Lomnicki (1925) in Santa Eulària and by Wheeler (1926) in Sant Antoni and Sant Josep on Eivissa. Our material comes from Ses Salines, (April 1981). It is a southern central European species.



Map 5. Distribution of genera *Leptothorax*. ▲ *L. lichtensteini*, recorded from Collingwood & Yarrow; ● *L. specularis*, first Pityusic Islands records.

*Tapinoma nigerrimum* (Nylander)

This species has been referenced in Sant Antoni and Sant Josep (Wheeler, 1926) and in Serra Grossa (Collingwood & Yarrow, 1969). Our findings are in Jesús, Sant Mateu (August 1980) and Sant Antoni de Portmany (October 1978), all on Eivissa. We also found it on Formentera (August 1980) and in several localities on this island: Estany Pudent, Banc Tramontana-La Mola, Punta Prima and Es Pujols (October 1978).

Polygynic, edafic and omnivorous, it demonstrates a great ability for colonization and a surprising ecological plasticity. It is distributed throughout

the Mediterranean basin, and is more abundant in the western area. The species is more abundant on Menorca (Comin & De Haro, 1980).

### *Formicinae*

#### *Lasius niger* (Linné)

This species lives on the larger Balearic Islands. Wheeler (1926) found it in Santa Eulalia and Collingwood & Yarrow (1969) found it in Sant Miquel and Serra Grossa. We found it in several localities on Eivissa: Jesús (August 1980), Sa Quintana, Es Broll and Santa Eulària-Es Torrent (October 1980).

It is frequently seen in spring and summer in gardens, forming hunting columns in trunks and branches looking for aphids. It needs a certain degree of humidity in the soil in order to establish itself in a biotop. It is distributed all over the holarctic region.

#### *Lasius alienus* (Foerster)

This species was found for the first time on Formentera in Migjorn (February 1978), and on Eivissa in C'an Carrasco (April 1981). In the Balearic Islands it is known from Mallorca and recently from Menorca (Comin & De Haro, 1980). This species, like the previous one, nests in soil rich in humus, under stones.

It is present more or less abundantly, all over the Mediterranean area and islands. It is a holarctic species.

#### *Plagiolepis schmitzii* Forel

We found it for the first time in the Pityusics on the uninhabited islands of S'Espartar, Redona, Torreta and es Vedranell (December 1978), S'Espalmador (August 1980), and on Formentera in Barbaria (February 1978), Migjorn and on the uninhabited island of es Pouet (February 1978).

The presence of this species on the uninhabited islands of the Pityusics is very interesting, as *P. pygmaea* (Latreille) appears to be absent. The latter is very abundant in the eastern Balearic Isles, especially on Minorca, where it is the more common species while *P. schmitzii* is very scarce and localized (Comin & De Haro, 1980).

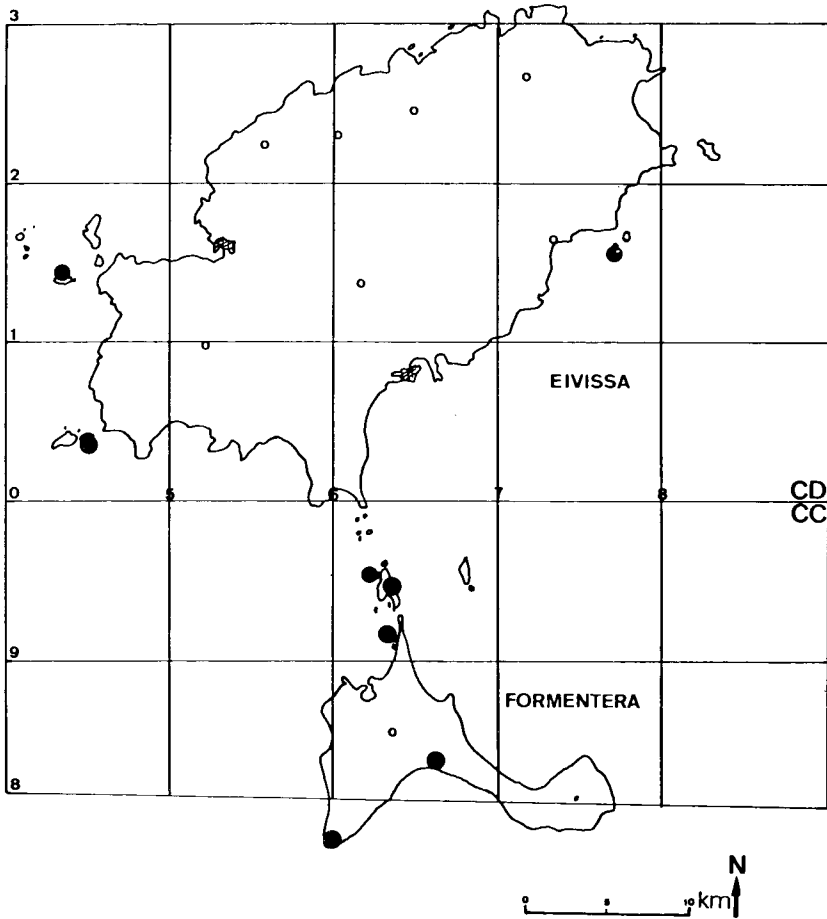
It is distributed in North Africa and the Iberian Peninsula (Map 6).

#### *Camponotus lateralis* (Olivier)

This species was found on Eivissa, without locality, by Collingwood & Yarrow (1969). Its distribution is holo-Mediterranean.

#### *Camponotus sicheli* Mayr

This species was already found on Eivissa by Lomnicki (1925) in Santa Eugenia. We found it in Sant Joan-S'Escalonada d'En Sitges (October 1980).



Map 6. Distribution of *Plagiolepis schmitzii*, first Pityusic Islands records.

It seems to be related to the pinewood in the Balearic Islands, being one of the typical arboricolous species of the archipelago. Several authors found it some time ago on Mallorca and it has recently been found on Menorca (Comin & De Haro, 1980).

It is distributed in the southern Mediterranean, in Algeria, Morocco and the central and southern Iberian Peninsula.

### Conclusions

In Table 1 we sum up the present knowledge of the ants in the Pityusic Islands.

The number of species (29) is almost equal that on Menorca (31). This last

Table 1. Present knowledge of the ants in the Pityusic Islands

	Lomnicki	Wheeler	Coll-Yarr.	Co-Esp.
<i>Ponera coarctata</i>			X	
<i>Hipoponera eduardi</i>			X	X
<i>Myrmica aloba</i>			X	
<i>Aphaenogaster gemella</i>		X		
<i>Messor bouvieri</i>		X	X	X
<i>M. capitatus</i>	X			X
<i>M. structor</i>		X	X	X
<i>Pheidole pallidula</i>	X	X	X	X
<i>Monomorium salomonis</i>		X		X
<i>M. subopacum</i>	X	X	X	X
<i>M. pharaonis</i>				X
<i>Cremastogaster auberti</i>				X
<i>C. scutellaris</i>		X		X
<i>C. sordidula</i>		X	X	X
<i>Diploroptrum sp.</i>				X
<i>Tetramorium caespitum</i>				X
<i>T. semilaeve</i>				X
<i>T. meridionale</i>			X	
<i>Leptothorax specularis</i>				X
<i>L. lichtensteini</i>			X	
<i>Temnothorax recedens</i>			X	X
<i>Iridomyrmex humilis</i>				X
<i>Tapinoma erraticum</i>	X	X		
<i>T. nigerrimum</i>		X	X	X
<i>Lasius niger</i>	X		X	X
<i>L. alienus</i>				X
<i>Plagiolepis schmitzii</i>				X
<i>Camponotus lateralis</i>			X	
<i>C. sicheli</i>	X			X
Totals	6	9	14	22

island has been studied myrmecologically in great detail and given that both islands have a similar area we believe that the appearance of many new species on the Pityusic Islands is not to be expected.

Of the 29 species, 25 (86%) exist also on Mallorca. Of the four not present (*M. pharaonis*, *T. nigerrimum*, *L. lichtensteini* and *Diplorhoptrum sp.*) *T. nigerrimum* is abundant along the Iberian Mediterranean coastline and the other three are of small size, and are easily overlooked; it is likely therefore that they will appear on Mallorca when studied more thoroughly.

23 of the 29 (79%) species are also found on Menorca. The six which are absent are: *H. eduardi*, *M. capitatus*, *M. pharaonis*, *C. sordidula*, *L. lichtensteini* and *Diplorhoptrum sp.* The more eastern situation of Menorca together with the hidric contests of its soil leads us to suspect that perhaps a number of these species will be found there in due course.

There are 21 (72%) species found on the Iberian coast nearby (provinces of Castelló, València and Murcia) and except for *A. gemella* it is probable that others will appear there when the area is studied in more depth.

Thus, the fauna of the Pityusic Islands does not differ from that of neighbouring countries and does not seem to have differentiated a specific taxon nor a subspecific one.

Among the nine species referenced for the first time, special attention should be given to *C. auberti*, *L. specularis* and *P. schmitzii* (Maps 3–6). The dominant character of the fauna has a strong western component, with holomediterranean elements. Only six species do not exhibit this tendency: *L. niger* and *L. alienus* are angaric elements that are mainly abundant in Eurasia and North America (Wilson, 1955) and *M. salomonis* is a very abundant species distributed from Mediterranean Africa to Burma. *M. subopacum* is a sub-Mediterranean species that reaches Asia Minor. Finally, *I. humilis* and *M. pharaonis* are imported species nearly all over the world, without any biogeographical significance.

## Resumen

El número de especies de hormigas conocidas en las islas Pitiusas queda ampliado a 29. Se aportan nueve primeras citas: *Monomorium pharaonis*, *Cremastogaster auberti*, *Diplorhoptum* sp., *Tetramorium semilaeve*, *Tetramorium caespitum*, *Leptothorax specularis*, *Iridomirmex humilis*, *Lasius alienus* y *Plagiolepis smitzii*, de las cuales *M. pharaonis* y *Diplorhoptum* sp. son primeras citas para las islas Baleares.

Así mismo se hace la distribución en mapas de proyección U.T.M. de las especies más interesantes encontradas.

La mirmecofauna de las Pitiusas no reviste características diferentes de la de las tierras más cercanas, y no parece haberse diferenciado ningún taxón específico ni subspecífico.

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