

The Leaf-toed gecko *Euleptes europaea* (Squamata: Sphaerodactylidae) discovered on the Lérins Islands (Alpes-Maritimes, Southeastern France)

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The European Leaf-toed gecko *Euleptes europaea* (Gené, 1839) is endemic to the Western Mediterranean and is listed in Annex II and IV of the European Habitats Directive (92/43/CEE). This small-sized nocturnal gecko is a specialist of narrow rocky crevices (Delaugerre, 2010) and is known to inhabit mostly islands in Provence (Southern France), Liguria (North-Western Italy), the Tuscan archipelago (Central Italy), Sardinia (terra typica), the Corsica and Galite Archipelago (Northern Tunisia) (Delaugerre, 1997; Nougaret and Petenian, 2003; Salvadio and Sindaco, 2006; Delaugerre, 2010; Delaugerre, Ouni and Noura, 2011) (Fig. 1). However the species is also found in mainland localities located in the Alpes-Maritimes, east of Nice (Kulesza, Delaugerre and Cheylan, 1995; Renet et al. 2008, Renet et al. 2013), Liguria between Genoa and La Spezia and along 100 km of coastline north of Monte Argentario in Tuscany (Salvadio, Lanza and Delaugerre, 2010) (Fig. 1).

The existence of the Alpes-Maritimes mainland populations suggests that island populations might occur in this area.

Within the framework of Natura2000 (Baie et Cap d'Antibes – Iles de Lérins / FR9301573), herpetological surveys were conducted in 2011 on Lérins Islands, located between the Napoule Bay and Juan Gulf (City of Cannes). This calcareous archipelago (dolomite rocks from the Liassic) is composed of two main

islands, Sainte-Marguerite (210ha) and Saint-Honorat (30ha), and their satellite islets, located on their eastern sides: La Tradelière (1.6ha) and Saint-Féréol (1.4ha) (Lefebvre, 1957; Augier, 1978).

Surveys were conducted in four night sessions by teams of two to six observers (see Table 1. for more detail). Monitoring effort (minutes x observers) was measured whether the species was detected or not.

The leaf-toed gecko was not detected on the two larger islands (Sainte-Marguerite and Saint-Honorat) despite allocating an important surveying effort on these Islands (2326 minutes, Table 1). This absence could be due to an extremely low population density or might result from the loss of suitable rupicolous micro-habitats: a consequence of semi-natural reforestation processes initiated by reforestation campaigns in the 19th century. Remnants of potential habitats are comprised of buildings and sea shore cliffs, that are highly occupied by the Moorish Gecko *Tarentola mauritanica* (Linnaeus, 1758). The Turkish gecko *Hemidactylus turcicus* (Linnaeus, 1758), which has been found only on Sainte-Marguerite island, still has a very small distribution range at this site.

However, on May the 10th 2011, a population of European Leaf-toed gecko was discovered on Saint-Féréol Islet and evidence suggesting the presence of the species (faeces) was observed on La Tradelière Islet (Fig. 1 & 2). On September 12th 2011 two adults were observed, confirming its presence on La Tradelière Island (Table 1). Three other Vertebrate species were observed on these two islets: Common Wall lizard *Podarcis muralis* (Laurenti 1768), Black rat *Rattus rattus* (Linnaeus, 1758) and Yellow-legged Gull *Larus michahellis* (Naumann, 1840).

The populations on these islets benefit from very suitable habitats (sunny rock piles with numerous cavities) that have been degraded by human activities on the larger islands.

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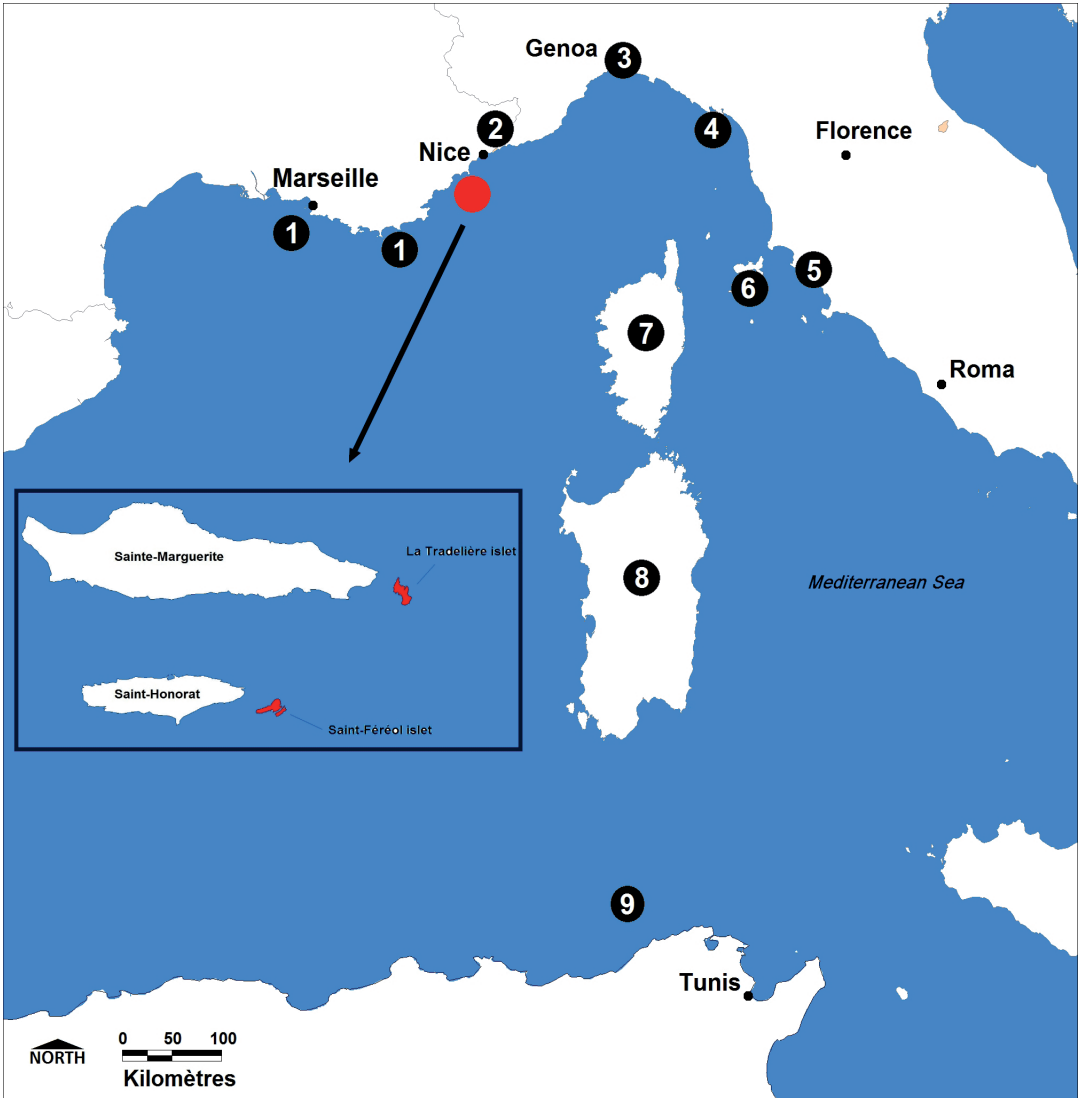


Figure 1. Distribution of *Euleptes europaea* in the Western Mediterranean: 1- Provence islands; Red dot- New localities of insular population (Lérins Archipelago); 2- Alpes-Maritimes mainland; 3- Ligurian mainland; 4- Ligurian islets; 5- Coast of Tuscany; 6- Tuscan Archipelago; 7- Corsica and satellite islets; 8- Sardinia and satellite islets; 9- Northern Tunisian islets (La Galite Archipelago)

According to the survey effort, our results suggest that leaf-toed gecko densities are rather low, at least lower than those observed on similar-sized islets elsewhere (Corsican islets in particular) (Delaugerre and Cheylan, 1992). This low population density could be attributed to strong predation by rats, considered by some authors as the cause for the decline of many insular lizard populations (Whitaker, 1973; McCallum, 1986; Cooper, Hawlena and Pérez-Mellado, 2009; Traveset *et al.*

2009). However, no direct evidence for such predation was recorded in this study.

During our observations surveys, all of the individuals we detected displayed behavior by hiding deep in cavities. This behaviour greatly contrasts with their usual easy detection on rocky habitats (Renet *et al.* 2008; Salvadio and Oneto, 2008). This secretive behaviour could be interpreted as spatial avoidance in response to the presence of rodents (Hoare *et al.* 2007).

Table 1. Summary of the prospecting effort for the occurrence of European Leaf-toed gecko *Euleptes europaea* on Lérins Archipelago.

| Island (I) or islet (i) | Locality prospected | Coordinates (wgs84) | Date | Prospecting effort (by minute x observers) | Presence of <i>Euleptes europaea</i> | Other Geckos | |
|----------------------------|---|------------------------|-------|---|---|----------------------------------|----------------------------------|
| | | | | | | <i>Tarentola mauritanica</i> | <i>Hemidactylus turcicus</i> |
| I Sainte- Marguerite | Landing stage/ village | 43, 5225° 07, 0406° | 08/05 | 98 | | X | X |
| | Fort St Marguerite | 43, 5237° 07, 0444° | 08/05 | 124 | | X | |
| | Cemetery | 43, 5214° 07, 0418° | 08/05 | 18 | | X | |
| | Private property (south dry stone wall) | 43, 5116° 07, 0509° | 08/05 | 40 | | | |
| | First aid post | 43, 5212° 07, 0371° | 08/05 | 40 | | X | |
| | East Battery | 43, 5174° 07, 0701° | 10/05 | 48 | | X | |
| | Fortin de la Convention | 43, 5169° 07, 0683° | 10/05 | 40 | | X | |
| i La Tradelière | The islet | 43, 5155° 07, 0733° | 10/05 | 354 | X (2 faeces) | | |
| | | | 12/09 | | X (2 adults) | | |
| I Saint- Honorat | Chapelle Saint- Caprais and West headland | 43, 5079° 07, 0377° | 11/05 | 60 | | | |
| | Fortified monastery and Lower dry stone wall | 43, 5059° 07, 0478° | 11/05 | 210 | | X | |
| | Surrounding wall of Abbey Lérins | 43, 5059° 07, 0468° | 11/05 | 210 | | X | |
| | East headland | 43, 5077° 07, 0550° | 11/05 | 252 | | X | |
| | East blockhaus | 43, 5069° 07, 0538° | 11/05 | 30 | | | |
| | Landing stage 1 | 43, 5092° 07, 0471° | 11/05 | 108 | | X | |
| | Landing stage 2 | 43, 5093° 07, 0438° | 11/05 | 162 | | | |
| | | | | | | | |

The nocturnal activity pattern of rats may force geckos to remain hidden in small cavities, affecting their probability of detection.

This possible avoidance behaviour in this newly discovered populations, together with similar observations on Port-Cros Island (Delaugerre pers. com.), suggests we must be cautious regarding their conservation status.

Further surveying of these new populations may allow us to characterize their population biology (demographic structure, biometry, body condition, genetics, etc.) and could lead to a better understanding of their interactions with rats. These characteristics are crucial for efficiently assessing the conservation status of these populations and implementing appropriate conservation strategies.

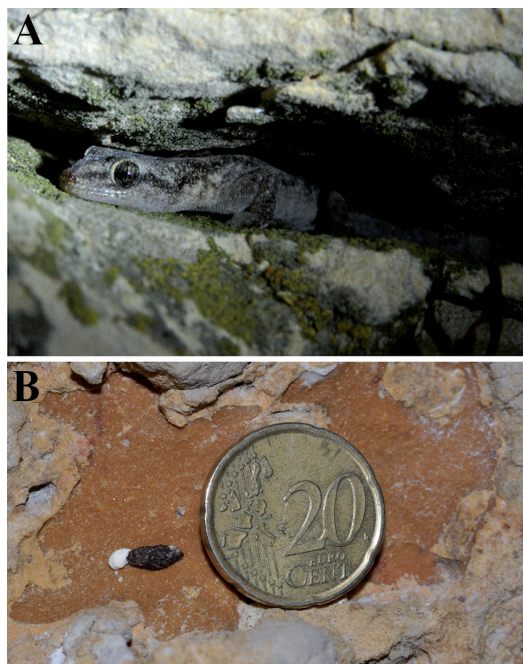


Figure 2. A) Adult European Leaf-toed gecko *Euleptes europaea* hiding in a karstic cavity, Saint-Féréol islet, Alpes-Maritimes, France. Photo: Julien Renet.

B) European Leaf-toed gecko *Euleptes europaea* faeces, La Tradelière islet, Alpes-Maritimes, France. Photo: Julien Renet.

Acknowledgments. This field work was carried out with the technical support of the nautical squad of Antibes – Juan les Pins city. For their technical and field support, we specially thank Elisée Valles (Office National des Forêts), Matthieu Gilli (municipal counsel of Antibes – Juan les Pins city), Didier Laurent (Sea and sea-shore service manager of Antibes – Juan les Pins city), Karen Joyaux (Natura2000), Sébastien Sant (CEN-PACA), Leslie Motta (CEN-PACA internship) and Maxime Morel (CEN-PACA internship). We would also like to thank Alexandre Villers (University of Turku), Michel Delaunier (Conservatoire du littoral), Dario Ottonello (University of Genoa), Sebastiano Salvidio (University of Genoa), Laurent Tatin (CEN-PACA) and Stephen Larcombe (Edward Grey Institute) for relevant suggestions and English revision.

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