

# L@CERTIDAE

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## Spring 2014 - Herpetological trip to Ibiza (Spain)

MARTEN VAN DEN BERG, MIKE ZAWADZKI and MICHAEL KRONIGER, August 2014.

### Summary

This is our fourth report in a series on our whereabouts while collecting data for a future revision of the present subspecific order of the endemic Balearic sisterspecies *Podarcis lilfordi* (GÜNTHER, 1874) and *Podarcis pityusensis* (BOSCA, 1883), which data are stored in our free accessible database at [www.pityusensis.nl](http://www.pityusensis.nl) (VAN DEN BERG & ZAWADZKI 2011 ; VAN DEN BERG et al. 2013 ; VAN DEN BERG et al. 2014). During this trip from the 22nd of May until the 6th of June 2014, we were able to collect data on various mainland Ibiza locations, as well as the following adjacent islands; Tagomago, Dau Gran, Negra Llevant, Bosc de Conillera, Conillera, Espartar, S'Espardell de S'Espartar, and Escui de S'Espartar. We also visited Escui de Cala d'Hort, and can confirm this rock is without lizards. We also introduce a simplified representation of the ventral coloration as a possible determining key.



| Date       | Location                    | Coordinates        | „subspecies”              | specimens | DNA |     |
|------------|-----------------------------|--------------------|---------------------------|-----------|-----|-----|
| 2014-05-22 | Ibiza (Sant Joan)           | 39.074644 1.52976  | <i>P. p. pityusensis</i>  | 1,0,0     | 1   | BZK |
| 2014-05-22 | Ibiza (Bosc de San Miguel)  | 39.086437 1.438093 | <i>P. p. pityusensis</i>  | 7,6,1     | 14  | BZK |
| 2014-05-23 | Dau Gran                    | 38.890298 1.451494 | <i>hybrid</i>             | 6,6,0     | 12  | BZK |
| 2014-05-23 | Negra Llevant               | 38.903015 1.440872 | <i>P. p. pityusensis</i>  | 4,1,0     | 5   | BZK |
| 2014-05-23 | Ibiza (Cala Comte)          | 38.962692 1.221564 | <i>P. p. pityusensis</i>  | 4,4,3     | 11  | BZ  |
| 2014-05-24 | Tagomago                    | 39.03652 1.641426  | <i>P. p. tagomagensis</i> | 7,4,3     | 14  | BZK |
| 2014-05-25 | Ibiza (Cala Salada)         | 39.010981 1.298532 | <i>P. p. pityusensis</i>  | 4,5,3     | 12  | BZK |
| 2014-05-26 | Bosc de Conillera           | 38.967985 1.218817 | <i>P. p. pityusensis</i>  | 4,6,3     | 13  | BZK |
| 2014-05-26 | Ibiza (Sa Talaia)           | 38.911205 1.273127 | <i>P. p. pityusensis</i>  | 4,3,2     | 9   | BZK |
| 2014-05-27 | S’Espardell de S’Espartar   | 38.957173 1.189055 | <i>P. p. frailensis</i>   | 5,4,0     | 9   | BZK |
| 2014-05-27 | Ibiza (Sa Torreta - Furnas) | 39.052052 1.519289 | <i>P. p. pityusensis</i>  | 3,1,0     | 4   | BZK |
| 2014-05-28 | Escui de S’Espartar         | 38.958741 1.201222 | <i>P. p. kamerianus</i>   | 4,2,0     | 6   | BZK |
| 2014-05-29 | Ibiza (Puig d’Es Consol)    | 38.928835 1.400928 | <i>P. p. pityusensis</i>  | 9,3,2     | 14  | BZK |
| 2014-05-29 | Ibiza (Sol d’En Serra)      | 38.94893 1.514654  | <i>P. p. pityusensis</i>  | 5,1,1     | 7   | BZK |
| 2014-05-29 | Ibiza (Puig des Falco)      | 38.848131 1.370029 | <i>P. p. pityusensis</i>  | 5,2,1     | 8   | BZK |
| 2014-05-30 | Conillera                   | 38.986305 1.211771 | <i>P. p. carlkochi</i>    | 10,7,0    | 16  | BZ  |
| 2014-06-03 | Espartar                    | 38.957874 1.197939 | <i>P. p. kamerianus</i>   | 5,8,0     | 13  | B   |
| 2014-06-05 | Ibiza (Cala d’Hort)         | 38.890866 1.22416  | <i>P. p. pityusensis</i>  | 5,5,0     | 10  | B   |
| 2014-06-06 | Escui de Cala d’Hort        | 38.889964,1.218796 | <i>no lizards</i>         |           |     | B   |

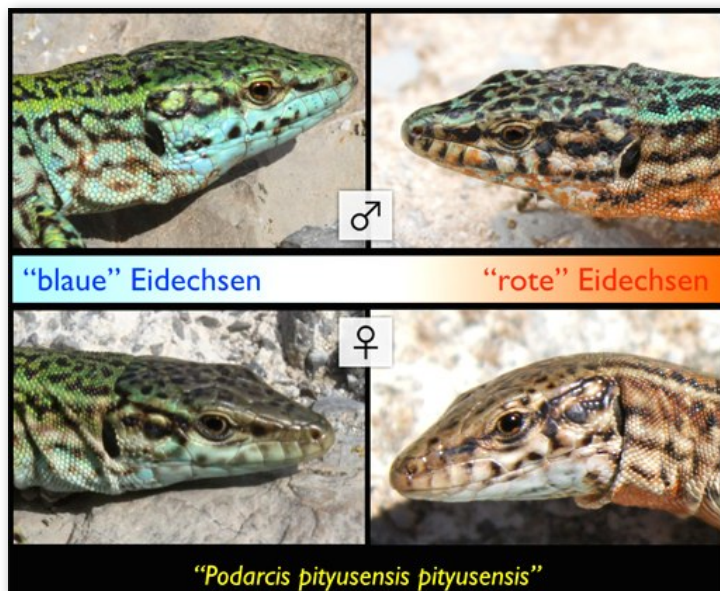
**Table 1.** Data collected on Ibiza and surrounding islands during spring 2014 (under permits CEP 26-28/2014), by B = MARTEN VAN DEN BERG, Z = MIKE ZAWADZKI and K = MICHAEL KRONIGER.

## Introduction

Describing a subspecies of *Podarcis pityusensis* in the past was easy, the only material needed were some lizards from a more or less isolated location. In some cases three lizards would suffice, like the description of *Podarcis pityusensis canensis* from the small Island Es Canar by EISENTRAUT (1928). You had to write down some measurements taken and give a brief description of the lizards appearances. Sometimes you even had to make some notes how these data compared to the other „subspecies”, but these could be cryptic, or at least vague, like this populations coloration is a little bit more obscured than the colors of that other population. Describing reproducible keys to distinguish between populations was not mainstream in those days.

This easygoing approach should have been changed after MAYR (1970) published his standard on speciation, but did it in the case of *Podarcis pityusensis*?

The current subspecific order of *Podarcis pityusensis* is still mainly based on the revision made by SALVADOR (1984). His introduction starts hopeful, commenting on the small sized series of many describers, pointing out that this might be a problem of getting the real picture of an entire population, commenting on describing populations based on preserved animals, not showing the exact coloration, and even describing populations without being there yourself, not knowing the exact location and situation. Well, we only can agree, however, this did not withhold SALVADOR from describing two new subspecies of *Podarcis lilfordi* from small series of specimens, mainly from preserved origin, and even not knowing the exact location of one of them (PÉREZ-MELLADO & SALVADOR 1988). Did SALVADOR (1984) introduce reproducible keys to distinguish between populations? At least he made an effort in doing so, but they are not very satisfying and practical, and our final conclusion can only be that we still lack a usable keychain which could justify the present day subspecies of *Podarcis pityusensis*. We even fear that this might be an operation impossible, but we keep searching for practical and reproducible methods for this purpose. One of them might be the ventral coloration of the lizards.



**Image 1.** Slide 75 from our 2014 presentation, held on the 29th of March at the annual meeting of the AG Lacertiden in Gersfeld (Rhön/Germany), showing examples of „blue lizards” (to the left = „blue bellied lizards”) and „red lizards” (to the right = „red bellied lizards”).

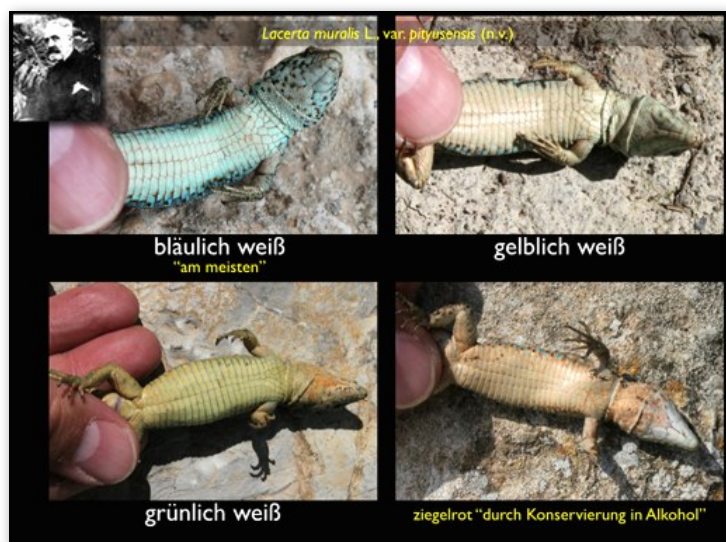
During our presentation, held on the 29th of March 2014, at the annual meeting of the AG Lacertiden in Gersfeld (Rhön/Germany), we presented our 2013 results from Ibiza, and discussed the validity of some of the subspecies in *Podarcis pityusensis*. We stated that our data collected so far did not show significant differences between most populations regarding pholidotic and metric values, and suggested that other morphological properties, like coloration and pattern, might be the only keys in discriminating between populations. We introduced the „red bellied lizard” and the „blue bellied lizard”, based on two ranges of ventral coloration, as well as the „mixed bellied lizard” showing both basic colors, as a method to describe the observed two lines of ventral coloration inside the Ibiza population, and as tool to describe and compare between other populations.

This simplified classification is compatible with the





**Image 2.** Slide 53 from our 2014 presentation, showing the locations of the new described variation of *Lacerta muralis*, now recognized as *Podarcis pityusensis*.



**Image 3.** Slide 73 from our 2014 presentation, showing the three variations of ventral color in *Podarcis pityusensis* according to BOSCA (1883): Upper-left = bluish white, the most occurring according to BOSCA (1883), upper-right = yellowish white, and lower-left = greenish white. Lower-right = brick reddish, which BOSCA (1883) assumed to be a product of conservation in alcohol.



**Image 4.** Part of slide 90 from our 2014 presentation, showing an example of a „mixed bellied lizard”.

original description of *Podarcis pityusensis* made by BOSCA (1883).

EDUARDO BOSCA i CASANOVES describes *Podarcis pityusensis* as a new variation of *Lacerta muralis*, and he is aware of the presence of these lizards not only from Ibiza itself, but also from the 5 islets on the eastern coast as shown in image 2. Besides giving some metric characteristics, BOSCA (1883) also describes coloration and patterns.

From our data gathered so far, dorsal coloration and pattern in *Podarcis pityusensis pityusensis* is almost indescribably variable in males, and varies in females from brown coloration to more or less green colors.

The ventral coloration however, even if there is a broad variety of different intensities, can be reduced to three colors according to BOSCA (1883); bluish white, which he detects in most cases, yellowish white, and greenish white. In some cases EDUARDO BOSCA encounters a brick reddish ventral coloration, but he assumes this to be an artifact of preservation in alcohol (img. 3).

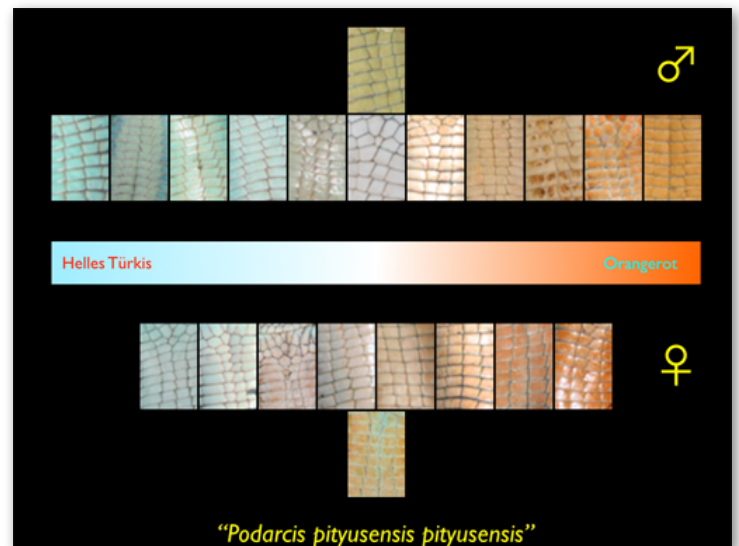
Depending on the location where EDUARDO BOSCA collected most of his specimens, his observation of mainly lizards with bluish bellies could be right. Especially the region of Ibiza town has, according to our data, more lizards with bluish bellies, so we assume this to be a good observation, although, also according to our data, this is not true for Ibiza as a whole. The lizards with brick reddish bellies that BOSCA occasionally found are not an artifact, but represent a big part of the population.

We have analyzed the ventral coloration of the lizards in our dataset and concluded that there are two color groups; lizards with bluish bellies and lizards with reddish bellies, both varying from very pale, almost white or grayish white, to light turquoise in the bluish group, and orange-red in the reddish group. BOSCA's yellowish white lizards and brick reddish lizards both are part of our reddish group. In the case of BOSCA's greenish white lizards, it turns out to be a combination of both bluish and reddish colors distributed very homogeneous. We call these lizards „mixed bellied lizards”, but in most cases the distribution of both

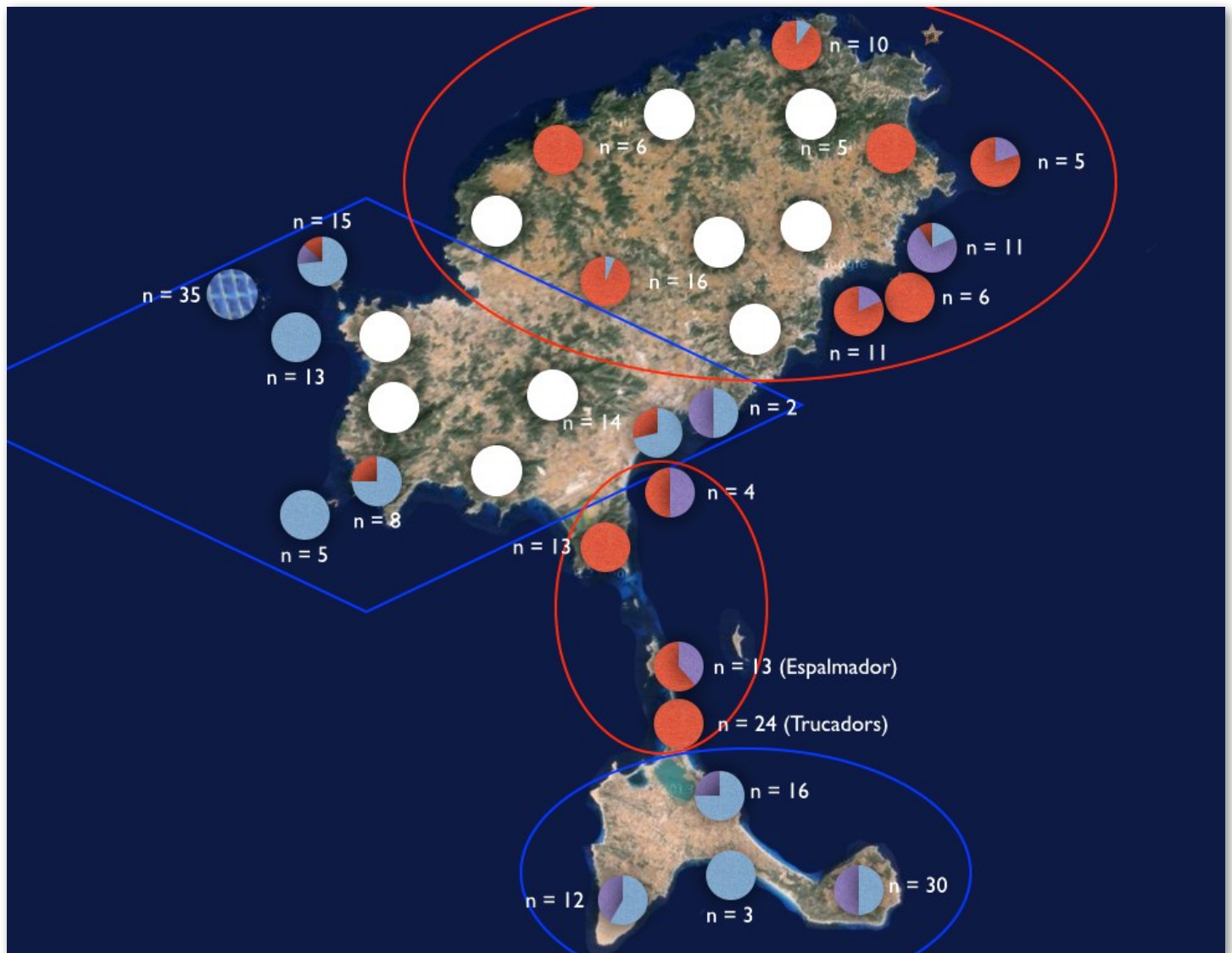
colors in this third group is more heterogeneous, giving not the overall greenish appearance (img. 4).

The range from light turquoise over palish to orange-red, as shown in image 5, applies for the Ibiza population. Within the over-all population of *Podarcis pityusensis* we find a range from deep ultra-marine blue to bright red.

Finally, near the end of our presentation, we showed a preliminary map with the distribution of this possible key on ventral coloration from most of our data up till 2013, which suggested, to our surprise, some clustering. One of our main goals of our 2014 trip was to collect data to fill the „white spots” on this map, and so we did.



**Image 5.** Slide 74 from our 2014 presentation, showing the color ranges in males and females on Ibiza. The single rectangles on top and at the bottom represents a mixed belly.



**Image 6.** Slide 246, showing the distribution of ventral colors, and suggesting some clustering. Purple represents the „mixed bellied lizards”. The white spots could confirm or contradict this suggestion, and were „filled” during our 2014 herpetological trip.



Thursday, the 22nd of May - Ibiza: **Sant Joan**

100%

n=1

After making arrangements for a visit to Tagomago at the diving center of Cala de Sant Vicent, we made a stop at the PM-811, the road to Sant Joan, in an area which is recovering from a massive wildfire back in 2011. Although weather conditions were quite good, we only caught one adult male by hand. Population density seemed a little low, but we saw lots of juveniles compared to the adult specimens.



Image 7. Juvenile.



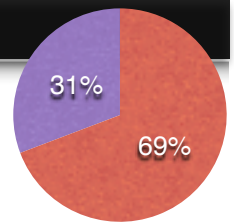
Image 8. Another juvenile.



Image 9. Recovering landscape around the PM-811 near Sant Joan.



Thursday, the 22nd of May - Ibiza: **Bosc de Sant Miquel**



n=13

Second stop this day was the former island or peninsula of Bosc de Sant Miquel, also known as Punta de Sa Ferradura, home of the former subspecies *Podarcis pityusensis miguelensis* (EISENTRAUT 1928). According to SALVADOR (1984) it is a synonym of *Podarcis pityusensis pityusensis*. At first the weather was not favorable for catching lizards, windy and cloudy, with even some drizzling, but a few hours later the sky cleared and instantaneously the lizards appeared, and saved our day. We were able to catch 7,6,1 lizards, however one of the males was not interested in getting photographed, and escaped. The vegetation at this area consists, probably due to the usage of the peninsula as resort, mostly of introduced plants. This might also explain the high density of snails, especially *Cornu aspersum*, the introduced western mediterranean brown garden snail.



Image 10. Red bellied female.



Image 11. Mixed bellied female.

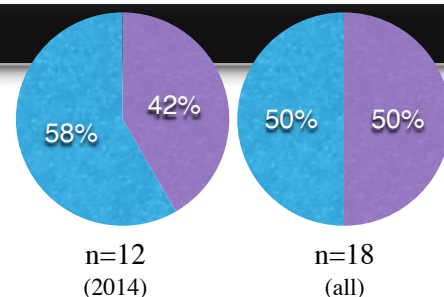


Image 12. View on Murada from the peninsula Bosc de Sant Miquel.



Friday, the 23th of May - **Dau Gran**

Our last visit to Dau Gran was already something from bygone times. For MIKE and MICHAEL it was 13 years ago, for MARTEN even a little over 30 years, therefore revisiting Dau Gran was high on our wishlist, and this year's conditions were fortunately good enough. What we encountered was beyond our expectations; the islet was green, so much different from our prior experiences. Back in 1983 the small number of plants were all withered, and there was no visible humus. During this visit we were welcomed by big patches of green thriving *Erica multiflora*, still the only plant species we observed, on bountiful humus and, probably by this improved habitat, lots of lizards. Our estimation of the present size of this by MARTIN EISENTRAUT introduced mixed population (EISENTRAUT 1930 ; BÖHME & EISENTRAUT 1981 ; ZAWADZKI & KRONIGER 2002) is about 30 specimens, of which 6,6,0 were caught by trap and investigated.



Three out of the twelve lizards showed two anal scales, which is quite uncommon. Compared to our visit in 2001, when we encountered high aggressiveness between lizards (ZAWADZKI & KRONIGER 2002), the interactions between lizards in this visit seemed much more relaxed. Only 25% of the measured lizards showed a regenerated tail. Trophic resources, other than the *Erica multiflora* and some maritime woodlice down at the spay zone, were still scarce. Only two specimens of a small ant species and a single bleached snail shell were found, the latter at exactly the same location where it was already observed in 2001, without the possibility to retrieve it out of the crevice. One nest of seagulls was observed. The presence of seagulls might be the origin of the numerous bones and fishbones lying around on the whole island.

When we compare our data from Dau Gran to the lizards from Ibiza and a cluster of lizards from Bleda Plana, Bleda Na Bosc and Bleda Na Gorra, because we still don't have data from Escull Vermell, we only find a significant difference in the number of dorsal scales between the Ibiza population and the population on Dau Gran.

[Click for watching a small video of the release of the lizards.](#)



Image 13. Landmark.



Image 14. Abundant presence of *Erica multiflora* on Dau Gran.





**Image 15.** Blue bellied male.



**Image 16.** Mixed bellied female with two anal scales.



**Image 17.** MARIANA VIÑAS TORRES, director of Espais Naturals Protegits d'Eivissa i Formentera.



**Image 18.** Female at Dau Gran.



**Image 19.** Another female at Dau Gran.



**Dau Gran**



Image 20. Juvenile.



Image 21. Dark female.





Image 22. Male.



Image 23. Male.

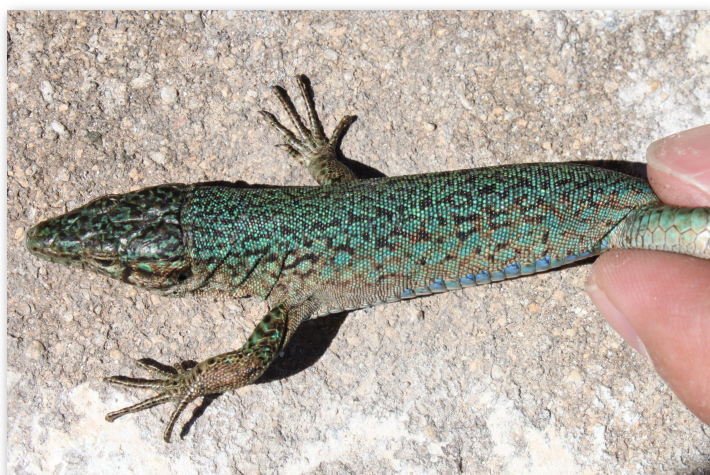


Image 24. Male.



Image 25. Male.



Image 26. Male.

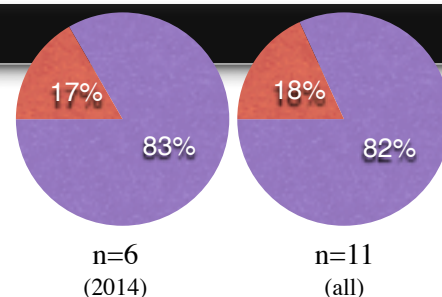


Image 27. Male.



### Friday, the 23th of May - Negra Llevant

Our second stop of the day was on Illa Negra Llevant, also one of the islands affected by the translocation experiments of EISENTRAUT in 1930. According to EISENTRAUT this islet was without a *Podarcis pityusensis* population, what was a terrible misconception, and not the only one in this experiment. The significant number of 50 specimens from Bleda Plana were released by EISENTRAUT on Negra Llevant (EISENTRAUT 1930 ; BÖHME & EISENTRAUT 1981).



SALVADOR (1984) includes the Negra Llevant population into the nominate subspecies, only mentioning some small differences with the main Ibiza population, however not mentioning the EISENTRAUT experiment in regard to this location, probably because SALVADOR (1984) was unaware of this fact, and still might be (SALVADOR 2009).

According to RODRÍGUEZ et al. (2013), islets with a documented history of introductions from populations from other islets (the EISENTRAUT experiment islands) were excluded from their study. However, from Negra Llevant, with a lizard population classified as *Podarcis pityusensis pityusensis*, probably just following the SALVADOR (1984) revision, 3 specimens still were included in their study. Although not conclusive, in the mitochondrial phylogenetic tree these 3 specimens from Negra Llevant were clustered with, among others, the melanistic populations of *Podarcis pityusensis*. This might impose the impression that on Negra Llevant a hybrid population still exists.

During our short visit of only one hour we investigated 4,1,0 specimens, not showing significant differences in pholidotic and metric values compared to the Ibiza populations nor the Bleda Plana population. Their morphological properties are within the range of the Ibiza lizards. Negra Llevant is quite well vegetated. Main species is some kind of *Allium*. Just a few and small to medium sized snails were located. Besides that, two dried woodlice.



Image 28. Negra Llevant, with the Daus islets in the background.



**Negra Llevant**



**Image 29.** Negra Llevant with the old citadel of Ibiza in the background.



**Image 30.** MIKE and MARIANA.



**Image 31.** Female.

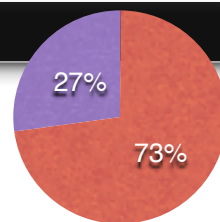


**Image 32.** Pair.



**Image 33.** Male.



Friday, the 23th of May - Ibiza: **Cala Comte**

n=11

For the more enduring among us, Cala Comte was the third stop of the day. It was a strange experience having to „work” under circumstances without the usual seclusion of the islands and other remote locations. We captured all our lizards (4,4,3) at a stone wall just behind the beach, without much effort, although the conditions were not very favorable during this afternoon. It was actually already getting a little bit too hot. We also inspected the sandy area behind this location, but the smaller number of lizards over there were all hiding inside the bushes, and these lizards were not interested at all in our traps. Images 35 and 36 are an example of some of the extremes in the „red bellied lizards” range on Ibiza.



**Image 34.** Cala Comte in front of Illa Bosc de Conillera, with a stonewall where the lizards were caught (top), just behind the beach.





**Image 35.** Obvious a red bellied male (lateral and ventral view).



**Image 36.** Almost white (and not so obvious) red bellied male.

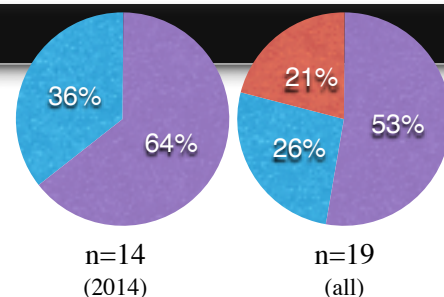


**Image 37.** Mixed bellied female.



## Saturday, the 24th of May - Tagomago

On saturday morning we had an appointment with MIKE from diving centre Mundo Azul in Cala de Sant Vicent ([www.divingcenter-ibiza.com](http://www.divingcenter-ibiza.com)). He brought us for a six hour stay to Illa Tagomago, where our MIKE caught 5 lizards last year at the freely accessible space around the Beach bar. Most of them however were red bellied lizards, so not providing a representative part of the Tagomago population, described as *Podarcis pityusensis tagomagensis* (MÜLLER, 1927).



We didn't had the intention to restrict ourselves to the bar area, and went up the path to the privately owned upper part of the island, used to facilitate the more fortunate among us for their holidays or events. By coincidence at same moment, as if it was destined, ALEJANDRO BONET, the island manager, was descending the path in leaving for Ibiza. Now we could decently ask for his permission to enter the island, which was kindly granted. That felt much better then the possible prospect of a fight with some big security guys.

Tagomago is, due to it's size, quite well vegetated. We were able to identify *Rosmarinus officinalis*, *Pistacia lentiscus*, *Daucus carota*, *Drimia maritima*, *Juniperus*, *Ulex parviflorus* and *Genista scorpius*. The Arthropod fauna seemed quite rich as well. We found two species of ants, two of spiders and several snails. Remarkable was the finding of rat traps in the area of the light house. Here the colony of breeding gulls was quite big and we observed some nestlings as well.



Image 38. Our transport provided by Mundo Azul.



Image 39. Deserted Beach bar at the landing stage.



Image 40. Tagomago mansion ([www.tagomago-island.com](http://www.tagomago-island.com)).



## Tagomago

The weather conditions, still sunny on arrival, changed not for the better, with even some drizzle later in the afternoon. Nevertheless we were able to catch 7,4,3 lizards for our study. Although not frequent, on the main part of the island we did observe some lizards looking like red bellied lizards (see images 45 and 52).

Image 41. Far de Tagomago.



Image 42. One of the more bluish lizards we encountered on Tagomago.



## Tagomago



Image 43. Male.



Image 44. Male.



Image 45. Possible red bellied male.



Image 46. Female.



Image 47. Female.



Image 48. Female.



Tagomago



Image 49. Female.



Image 50. Male.



Image 51. Juvenile.



Image 52. Possible red bellied male.



Image 53. Male.



Image 54. Male.



## Sunday, the 25th of May - Ibiza: NOAH'S GARDEN



Image 55. Noah's Garden, along the C-733.



Image 56. Snake trap.

In the morning we went to one of the imported snake hotspots of Ibiza, „Noah's Garden” garden centre, where the Ibiza environmental service is trying to eradicate the translocated snakes. While MICHAEL and MIKE were off on a snake hunt, MARTEN kept his focus on trapping lizards and the gear. Maybe there is some correlation with the presence of the snakes, anyhow the lizard density was quite low on this location, and no lizards were caught. The lizards would not suffer from low food supply, we observed 4 species of snails and several spiders, ants and other insects.

Hunting snakes was even more difficult, however MICHAEL observed a basking *Rhinechis scalaris* on the other side of the road.

During a short stop at Noah's Garden, on tuesday the 27th of May, we saw a glimpse of another *Rhinechis scalaris* on the west side of the road.



Image 57. Male next to Noah's Garden.



Image 58. Female next to Noah's Garden.



Sunday, the 25th of May - Ibiza: **Cala Salada**

100%

n=12

After a heavy rain delay we went back to the western coast and visited Cala Salada, just to the north of Sant Antoni. Accompanied by loud „music” from two party boats, we managed to catch 4,5,3 lizards for our collection. Both lizards and Audouin's gulls seemed quite accustomed to the presence of people and behaved as skilled thieves of little snacks. Natural food resources seemed quite scarce. We only found a few specimens of snails in two species. It was striking that outside the „people zone”, only a few meters landward, lizards were almost completely absent.

◁ **Image 59.** Strange smell, no success over here.



**Image 60.** Audouin's gull (*Ichthyiaetus audouinii*) in front of Cala Salada.



Monday, the 26th of May - **Bosc de Conillera**

100%

n=13

Upon our departure for Illa Bosc de Conillera we had the pleasure of meeting JOAN MAYOL SERRA, head of the Department of Biodiversity, species protection, hunting and forest management of the government, and as Secretary of the Board of the „Servei de Protecció d'Espècies” responsible for providing our CEP permits. He asked us if we could pay some attention to the possible presence of rats on the island, because they had just finished an extensive eradication program. Well, to our opinion attempting to eradicate rats on such relatively big island is quite impossible, certainly if you take the well-being of other species in consideration. Our observation of one maintained rat-sized burrow and several freshly punctured snails, which to our opinion could only been predated by rats, regrettably confirm this.



Image 61. Maintained rat-sized burrow.



Image 62. Punctured snails with still fresh tissue.



Image 63. Illa Bosc de Conillera in front of Cala Comte.



**Bosc de Conillera**



**Image 64.** Hardship of the job; attacked by a gull (again).



**Image 65.** Therefore: Never forget your wet tissues.



**Image 66.** It could have been worse.



**Image 67.** *Tarentola mauritanica* on Bosc.



**Image 68.** Same.



**Image 69.** Male *Podarcis pityusensis* on Bosc de Conillera.



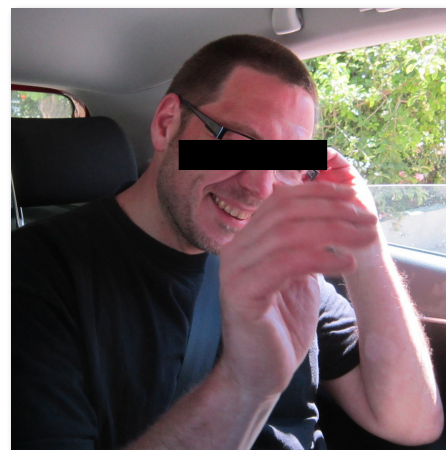
## Bosc de Conillera

According to MÜLLER (1927), when making his first description of *Lacerta lilfordi kochi* for the lizard populations of Conillera and Bosc, the lizards from Bosc are completely identical to the lizards from Conillera. Due to a conflict of names the trinomen was changed into *Lacerta pityusensis carlkochi* (MERTENS & MÜLLER, 1940). According to SALVADOR (1984) the lizards of Bosc are more closely related to *Podarcis pityusensis pityusensis*, mainly based on coloration, and therefore included in the nominate subspecies.

We managed to capture 4,6,3 specimens on Bosc de Conillera, and the coloration of these lizards are corresponding with SALVADOR (1984). His description of the ventral side as bluish or bluish-white is also compatible with our classification as mixed bellied lizards, because most of our lizards have an emphasis on blue. Our other data are not showing significant differences with either the Ibiza populations nor the Conillera population.

The lizards were quite shy and escaped quickly into the *Pistacia* shrubs when approached. This might be due to the big nesting colony of gulls, which showed quite aggressive behavior. We did find lots of snails on the island, with snails of even more than 3 cm shell diameter, which could serve as possible food supply. Additionally we were able to observe centipedes, woodlice, and a species of beetles, most probably a Tenebrid. Furthermore locusts, flies and horse flies.

Close call, but we almost had missed a translocation. During our lunch break at our base station in Can Pilot, we encountered a lizard inside the house, showing a bluish mixed bellied color. This specimen was identified as **MZMB 644**, a young female and part of our series from Bosc de Conillera, which probably entered one of the backpacks after release. This lizard was stored and taken back to Bosc de Conillera the next morning, where it was thrown ashore the EISENTRAUT way ([captured on video](#)).



**Image 70.** Suspect of an illegal translocation during interrogation.



**Image 71.** Male MZMB 641.



**Image 72.** Male MZMB 642.



**Bosc de Conillera**



**Image 73.** Male MZMB 645.



**Image 74.** Female MZMB 638.



**Image 75.** Female MZMB 639.



**Image 76.** Female MZMB 643.



**Image 77.** Female MZMB 647.



## Monday, the 26th of May - Ibiza: Sa Talaia

In the afternoon we went to the highest point of Ibiza, Sa Talaia, Catalan for watchtower, at an altitude of 475 m. We did our job near the transmission towers in a forested area, with some clearings. As expected, there was no high density of lizards, and most of the 4,32 specimens were captured around the structures.

The lizards were quite shy and not easy to approach and made a skinny impression. This was in great contrast to the rich arthropod life. We observed lots of snails belonging to two different species. Furthermore there were house centipedes (*Scutigera*), cockroaches (*Loxoptera*), woodlice, ants, termites and firebrats (*Zygentoma* ?).

The Moorish wall gecko, *Tarentola mauritanica*, was also present, but only in very low density.

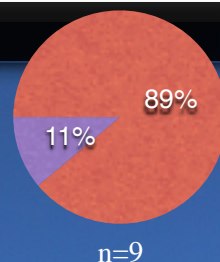
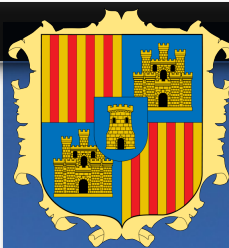


Image 80. Transmission towers at Sa Talaia.



Image 78. Wooded habitat.



Image 79. Dirt road up the hill.



Image 81. Red bellied male at Sa Talaia.



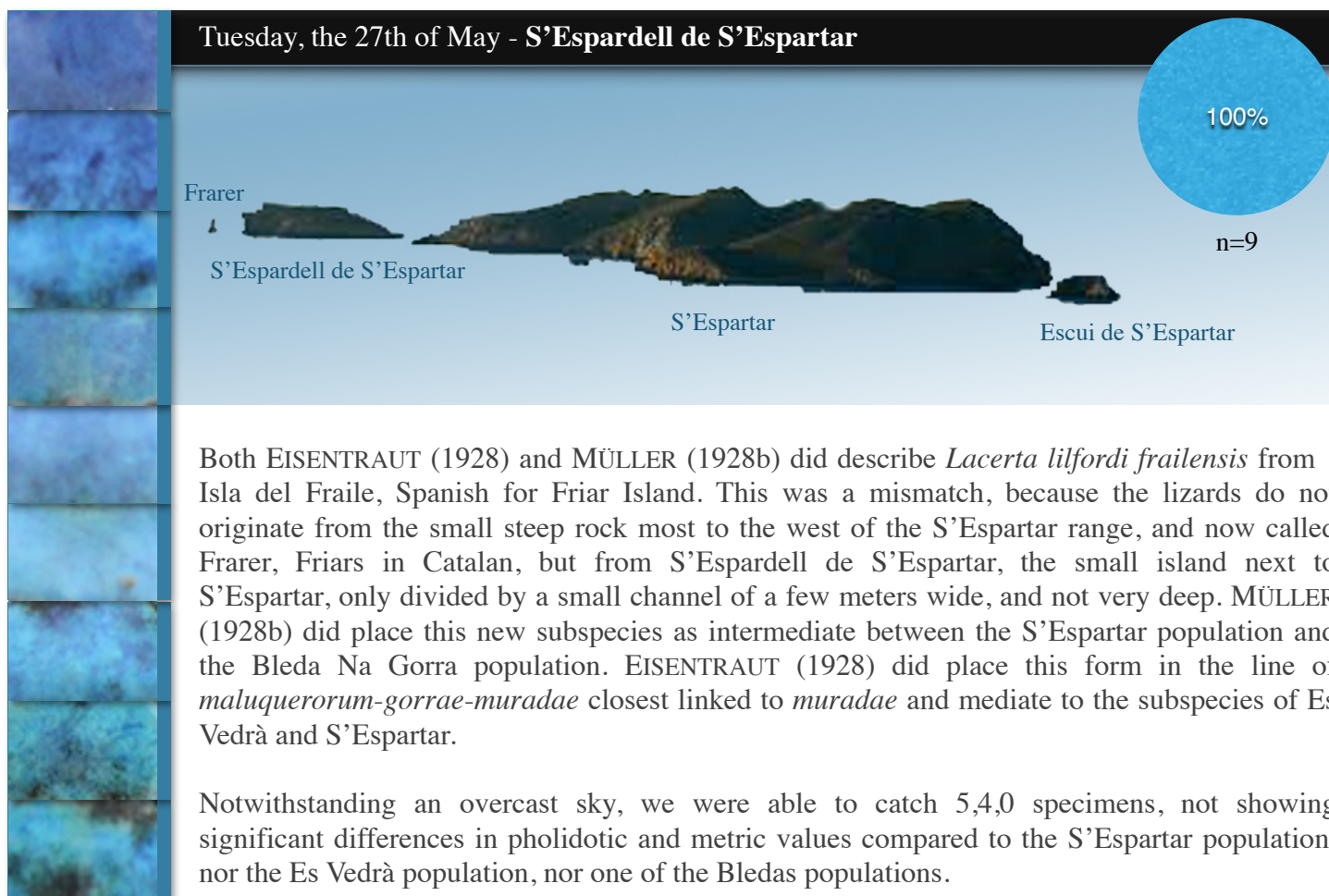


Image 82. MICHAEL on S'Espardell de S'Espartar, with S'Espartar in the background.



## S'Espardell de S'Espartar



Image 83. Female.



Image 84. Male.



Image 85. Male on S'Espardell de S'Espartar.

We observed four plant species: *Erica multiflora*, *Arthrocnemum macrostachyum*, *Limonium* sp., and *Asparagus horridus*. Most female lizards did look skinny and it is most probable that they had laid eggs recently. Possible food sources, besides the vegetation, were centipedes, house centipedes, woodlice and ants.



## S'Espardell de S'Espartar



The hummingbird hawk-moth *Macroglossum stellatarum* was observed too. We did not find many snails but many dead bleached shells, but nearly no living specimens. Additionally bones and fishbones were all over the island, as food remains of the gulls.



Image 86. Male.



Image 87. Getting buccal swabbed.



Image 88. Female on S'Espardell de S'Espartar.



## Tuesday, the 27th of May - Ibiza: Sa Torreta (Furnas)

100%

n=4

In the afternoon we drove to another high point on Ibiza, Sa Torreta (Furnas) in the north, where we measured 3,1,0 specimens. This area did not seem to be cultivated in historic times, as we did not find old stone piles or walls in the area. After the same massive wildfire as mentioned at our first collecting point (Sant Joan), the vegetation is now in recovery. *Pistacia lentiscus*, *Erica multiflora* and *Rosmarinus officinalis* are the predominant plants in the burned areas, while *Pinus* is the predominant plant in the unaffected areas. A high layer of pine-needles with embedded stones characterizes most of the area. Snails were very common and might serve as food resource to the lizards, at least two were identified: *Iberellus* and probably *Oxychilus*. Furthermore there were pill bugs, centipedes, house centipedes and ants. Although we turned lots of stones, only three *Tarentola mauritanica* were spotted. On the other hand we found an artificial pond in a nearby garden with *Pelophylax perezi* occurring at high density.



Image 89. Female.



Image 90. Measured lizards.

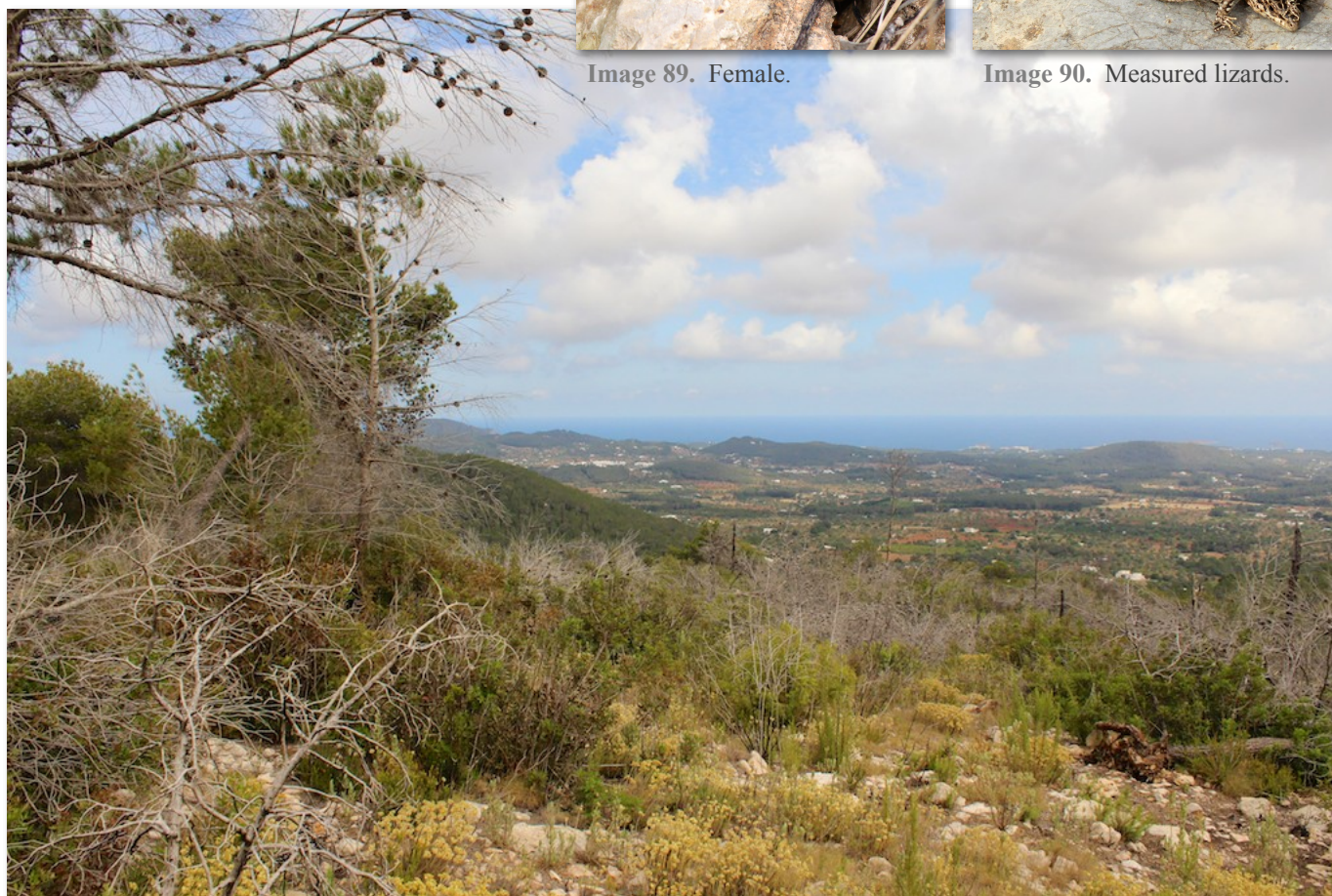


Image 91. View from Sa Torreta (Furnas).



Sa Torreta (Furnas)

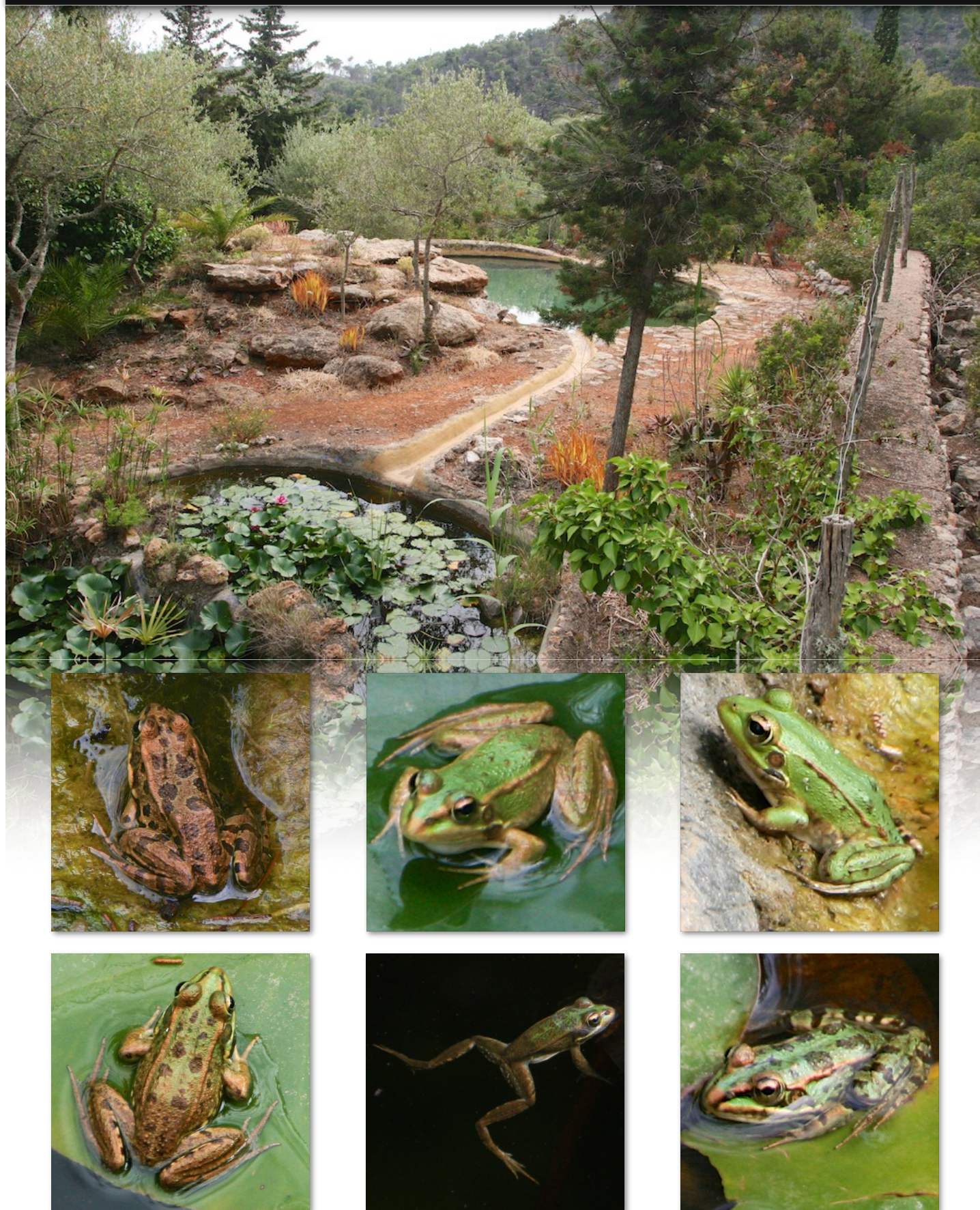
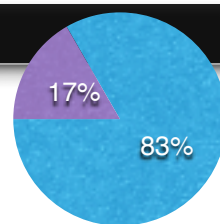


Image 92. Artificial pond in a nearby garden, with some of the residents, *Pelophylax perezii*.



## Wednesday, the 28th of May - Escui de S'Espartar

Wednesday the 28th of May was the most windy day of our trip, with a clouded sky, and the highest waves so far, not very promising. To our surprise our skipper told us we could visit Escui de S'Espartar, one of the islands high on our wish list. Of course he was right, when we arrived at the small island to the east of S'Espartar, waves at the landing zone were not that high, so we jumped out of the zodiac and started our climb up the island, which was long and steep, actually the most difficult of all. The weather on the island kept unfavorable for catching lizards, windy and not much sun, but in the end we were successful enough, having seen lots of lizards, and having caught 4,2,0 of them.



n=6



Image 93. Most challenging climb so far.



Image 94. Our transport leaving Cala Comte.



Image 95. MICHAEL, MARTEN and MIKE on Escui de S'Espartar.



## Escui de S'Espartar

The Escui de S'Espartar population was first described as *Lacerta lilfordi zenonis* (MÜLLER 1928a) and later included in *Podarcis pityusensis kamerianus* by SALVADOR (1984). There are no significant differences in our small series concerning pholidotic and metric values compared to the S'Espartar population, and to our opinion coloration is also within the range of the S'Espartar lizards, including the possible key feature of the brown hind legs.

Escui de S'Espartar is covered with the same maritime plant species as S'Espardell de S'Espartar: *Erica multiflora* (dominant), *Arthrocnemum macrostachyum*, *Limonium* sp., and *Asparagus horridus*. Just a few snails, firebrats and spiders were spotted, as well as pill bugs and two different species of beetles.



Image 96. Male on Escui de S'Espartar.



Image 98. Male on Escui de S'Espartar.



Image 97. Female on Escui de S'Espartar.



Image 99. Juvenile on Escui de S'Espartar.



**Escui de S'Espartar**



Image 100. Male.

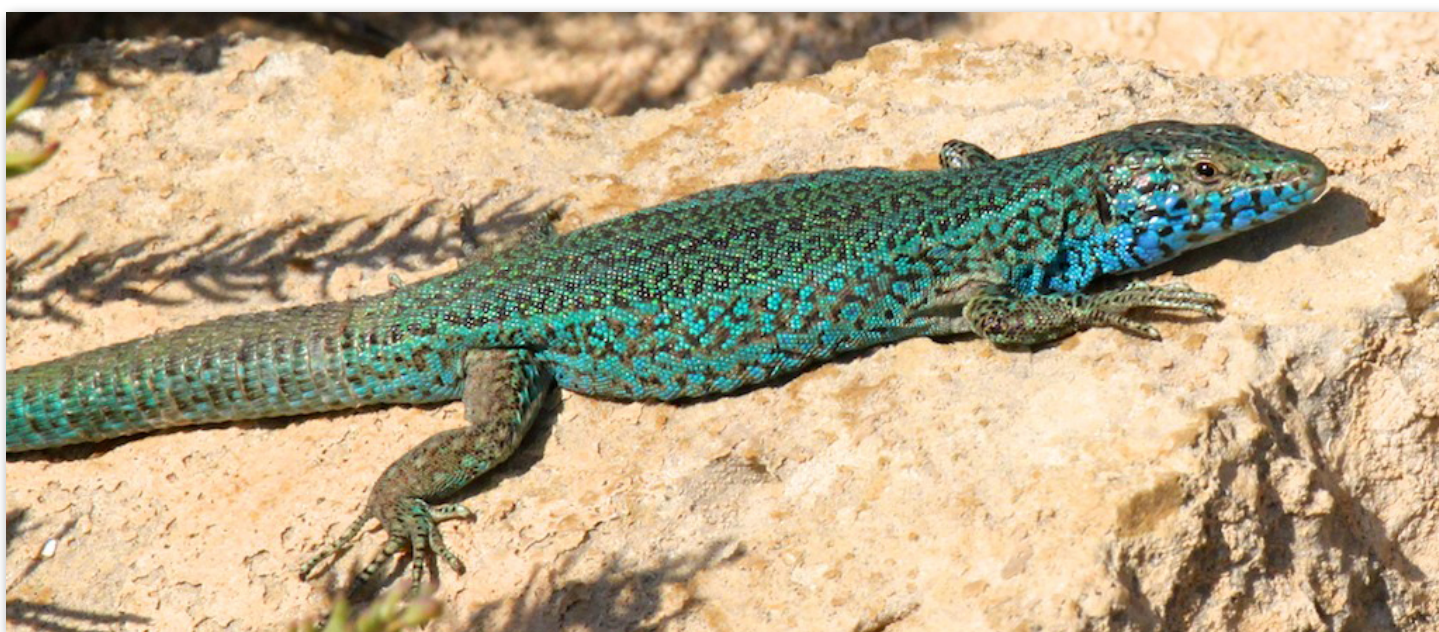


Image 101. Male.



Escui de S'Espartar



Image 102. Female.

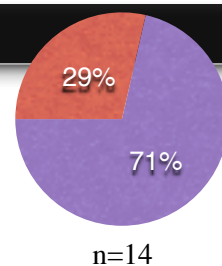


Image 103. Female.



Thursday, the 29th of May - Ibiza: **Puig d'Es Consol**

Thursday the 29th of May was a day dedicated to Ibiza populations only. The whole day we enjoyed the pleasure of clear skies. Our first stop was Puig d'Es Consol. Close to Ibiza town we drove up the Cami del Riu Danubi to an area, next to an active stone quarry, with a pine forest habitat. Here we caught 9,3,2 specimens, which were added to our database. Our trophic results were numerous snails of *Rumina* and *Eobania*, centipedes and pill bugs.



**Image 104.** Another pile of lizards.



**Image 105.** Taking some snapshots.



**Image 106.** Habitat Puig d'Es Consol.



## Thursday, the 29th of May - Ibiza: Sol d'En Serra

Second stop was at Sol d'En Serra, a small beach near Cala Llonga, with a very appropriate name that day. We walked a little up the hill in the direction of Escull des Cap Llibrell, but on second thought we chose not to walk all the way. From this open pine forrest habitat we added 5,1,1 lizards to our collection.

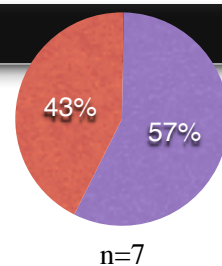


Image 107. Cap Llibrell.



Image 108. Small beach Sol d'En Serra.



Thursday, the 29th of May - Ibiza: **Puig des Falco**

For our last stop we parked our limousine at the Experimental Beach Restaurant, just before a wedding party was about to start. Probably some very important guests were expected, considering the presence of some big British security guys. Undismayed we walked up a trail in the direction of Puig des Falco, until we were stopped by a sign. Here we did catch an extra 5,2,1 specimens, enjoyed the scenery, and watched the planes leaving Ibiza, which fate was waiting for MICHAEL next morning and MIKE next evening. It was at least a perfect spot to contemplate the past week and a half.



Image 109. Late afternoon at Puig des Falco.



## Friday, the 30th of May - Conillera

After dropping MICHAEL at the airport, MIKE and MARTEN drove to Cala Comte in order to get boarded for Illa Conillera, home of *Podarcis pityusensis carlkochi* (MERTENS & MÜLLER, 1940). Close to the landing zone we collected data from 10,7,0 lizards. All lizards showed, like the lizards from S'Espartar and Escui de S'Espartar, the possible key feature of the brown hind legs.

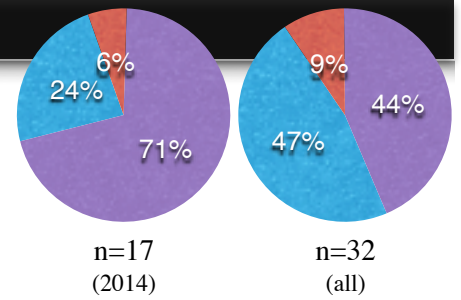


Image 110. Red bellied female.



Image 111. Mixed bellied male.



Image 112. Mixed bellied female.



Image 113. Blue bellied female.





## Tuesday, the 3rd of June - S'Espartar

MARTEN was able to join JOHN NEWTON and PAUL HUDSON on their trip to S'Espartar. Our British colleagues are doing research on the presence or absence of rats in relationship to the occurrence of regenerated tails in lizards. The weather was sunny but windy, so we landed on the eastern slope of S'Espartar, facing the Escui de S'Espartar. This slope was almost completely sheltered from the wind, what explains the choice of our skipper, but later in the morning the conditions became bloody hot. Getting back in the zodiac this time was no punishment. In the meanwhile together we collected 20,25,0 lizards, of which 5,8,0 were added to our database.

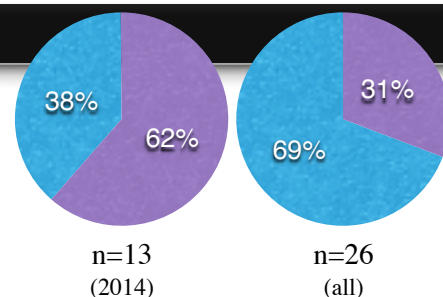


Image 114. British bucket style traps.



Image 115. JOHN NEWTON and PAUL HUDSON on S'Espartar.



Image 116. Bucket full of lizards.





Image 117. Cala d'Hort as seen from Escui de Cala d'Hort.



## Friday, the 6th of June - Escui de Cala d'Hort



Image 118. Escui de Cala d'Hort.



Image 119. More vegetated part of Escui de Cala d'Hort.



Image 120. Bare part of Escui de Cala d'Hort.

So, after several prior attempts to get on Escui de Cala d'Hort, finally walking there was satisfactory. Only there was something missing; the movement of lizards, such usual sensation when entering a small island almost everywhere else in the Balearics.

It was 11 o'clock in the morning, and the sun came out, just the perfect moment for lizards to bask, but nothing. Not discouraged at all, traps were placed and stones were lifted, but after two and a half hours of waiting and searching, still no lizards.

To our experience this island is big enough to sustain a small population of lizards. The sufficiently presence of vegetation consisting of *Crithmum maritimum*, *Erica multiflora*, *Arthrocnemum macrostachyum*, and *Limonium* sp. is also favorable. But while lifting stones the only terrestrial animals found were some pill bugs.

This leaves us to confirm the observation of MARTÍNEZ-RICA & CIRER (1982) that Escui de Cala d'Hort is without lizards. The lunch afterwards, at the beach restaurant, did almost compensate this experience.



Image 121. Pill bugs from under a lifted stone.



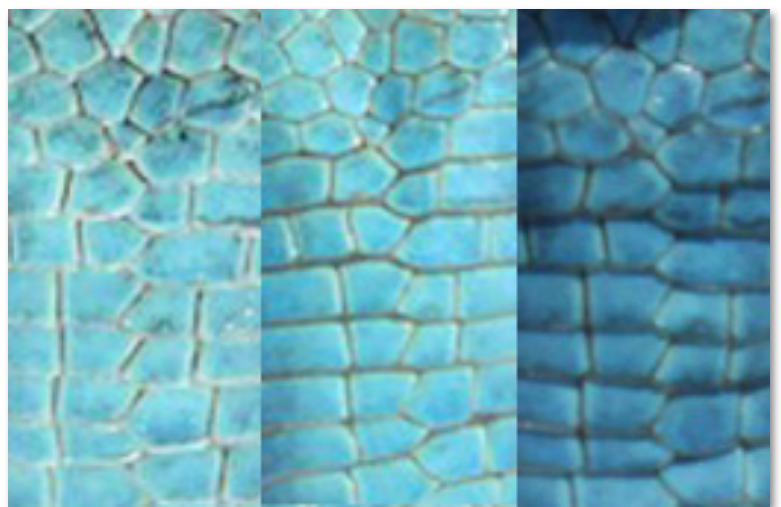


**Image 122.** VALENTIN PÉREZ-MELLADO at his presentation in Sant Jordi.

Later that evening the British and Dutch delegation attended the presentation held by VALENTIN PÉREZ-MELLADO at the community home of Sant Jordi. Meeting him finally, and his presentation, was the last highlight of this trip.

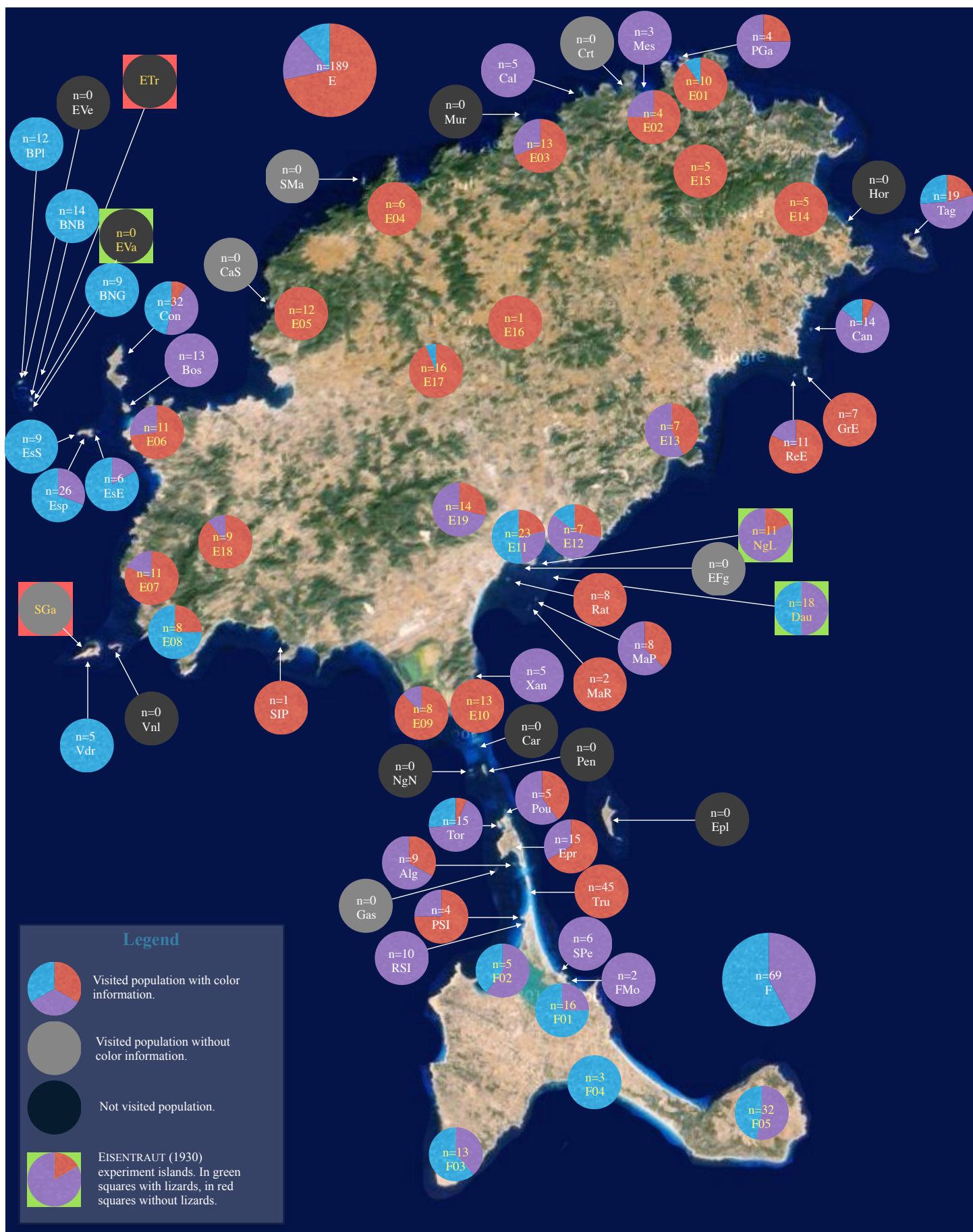
## Discussion

Digital photography made it affordable gathering color information in the field, and as such it is a great asset. However, it has its limitations of use. In the field light intensity and light color can change dramatically during the day, and among days. Even the angle of lightning can influence the result by the differences in reflectance. Camera and camera presets influence the result as well. So in order to use photography as tool for comparison, it actually should be performed under laboratory controlled conditions, which is not practical, or with the possibility of calibration at a later moment, using for instance a ColorChecker chart such as described by BERGMAN & BEEHNER (2008) with *geladas*, and by SACCHI et al. (2013) with *Podarcis muralis*.



**Image 123.** Differences in lightning, reflectance, camera and camera presets of the same detail of a female on Dau Gran.





**Image 124.** All 48 known Pityusic populations of *Podarcis pityusensis*, with data gathered so far (for details see table 2).



| Abr | Population                   | Specimens | Red | Mixed | Blue |  | Abr | Population               | Specimens  | Red | Mixed | Blue |
|-----|------------------------------|-----------|-----|-------|------|--|-----|--------------------------|------------|-----|-------|------|
| E   | Ibiza                        | 123,58,21 | 132 | 36    | 21   |  | EFg | Escui de Figueretes      |            |     |       |      |
| PGa | Punta Galera                 | 2,2,0     | 1   | 3     |      |  | NgL | Negra Llevant            | 8,4,0      | 2   | 9     |      |
| Mes | Sa Mesquida                  | 3,0,0     |     | 3     |      |  | Dau | Dau Gran                 | 8,11,0     |     | 9     | 9    |
| Crt | Canaret                      |           |     |       |      |  | ReE | Redona de Santa Eulària  | 7,5,0      | 9   | 2     |      |
| Cal | Calders                      | 4,1,0     |     | 5     |      |  | GrE | Grossa de Santa Eulària  | 6,2,0      | 7   |       |      |
| Mur | Murada                       | 1,0,0     |     |       |      |  | Can | Es Canar                 | 10,5,0     | 1   | 11    | 2    |
| SMa | Ses Margalides               | 2,3,1     |     |       |      |  | Tag | Tagomago                 | 10,7,3     | 4   | 10    | 5    |
| CaS | S'Illeta de Cala Salada      |           |     |       |      |  | Hor | S'Hort                   |            |     |       |      |
| EVe | Escull Vermell               |           |     |       |      |  | Car | Caragoler                |            |     |       |      |
| BPl | Bleda Plana                  | 9,2,2     |     |       | 12   |  | Pen | Penjats                  | 1,0,0      |     |       |      |
| BNB | Bleda Na Bosc                | 8,5,1     |     |       | 14   |  | NgN | Negra Norte              | 1,0,0      |     |       |      |
| EVa | Es Vaixell                   |           |     |       |      |  | Pou | Pou                      | 2,4,0      | 2   | 3     |      |
| BNG | Bleda Na Gorra               | 5,5,0     |     |       | 9    |  | Epr | Espalmador               | 15,5,1     | 10  | 5     |      |
| Con | Conillera                    | 20,10,3   | 3   | 14    | 15   |  | Tor | Sa Torreta               | 8,6,1      | 1   | 10    | 4    |
| Bos | Bosc de Conillera            | 4,6,3     |     | 13    |      |  | Alg | S'Alga                   | 7,2,0      | 3   | 6     |      |
| EsS | S'Espardell de S'Espartar    | 7,4,0     |     |       | 9    |  | Epl | Espardell                | 2,1,0      |     |       |      |
| Esp | S'Espartar                   | 14,16,0   |     | 8     | 18   |  | Gas | Gastaví                  | 3,0,0      |     |       |      |
| EsE | Escui de S'Espartar          | 4,2,0     |     | 1     | 5    |  | Tru | Trucadors - Es Ministere | 38,34,12   | 45  |       |      |
| Vdr | Es Vedrà                     | 6,3,1     |     |       | 5    |  | F   | Formentera               | 43,32,8    |     | 29    | 40   |
| Vnl | Vedranell                    | 1,0,0     |     |       |      |  | PSI | Pouet de Ses Illetes     | 2,2,1      | 3   | 1     |      |
| SIP | Ses Illetes de Purroig       | 1,0,0     | 1   |       |      |  | RSI | Redona de Ses Illetes    | 7,3,0      |     | 10    |      |
| Xan | Illa de la Xanga (Sal Rossa) | 3,2,0     |     | 5     |      |  | SPe | Ses Perreres             | 6,0,0      |     | 6     |      |
| MaR | Malví Rodó (South)           | 3,0,0     | 2   |       |      |  | FMo | Fonoll Mori              | 2,0,0      |     | 2     |      |
| MaP | Malví Pla (North)            | 5,4,0     | 3   | 5     |      |  | ETr | Escull Tramuntana        | no lizards |     |       |      |
| Rat | Rates                        | 5,5,0     | 8   |       |      |  | SGa | Sa Galera                | no lizards |     |       |      |

Table 2. Populations of *Podarcis pityusensis*, with number of specimens in our database and belly color distribution.

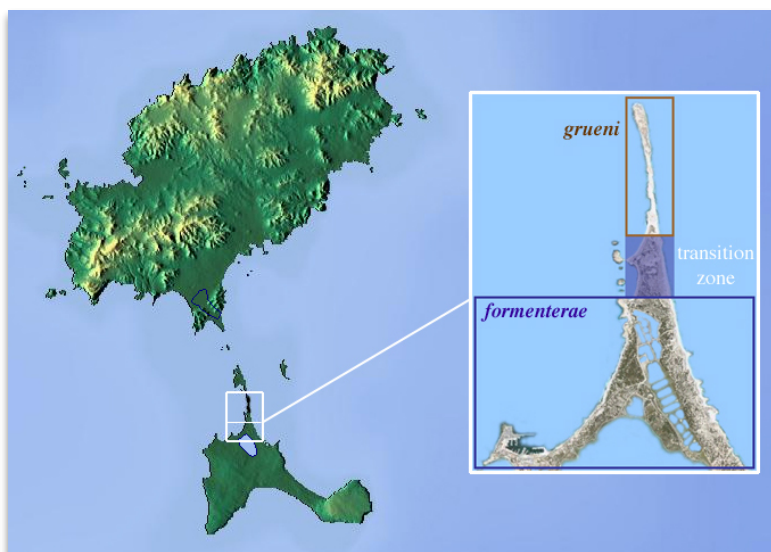


Analyzing the ventral coloration and categorizing it into one of the three categories is depending on interpretation, which even can fluctuate within the assessor. So, except for the limitations of the raw material, the image, we have also to consider the limitations of the interpretation. This degrades this method to indicative at best, which applies to all descriptions of color.

Nevertheless we have plotted our information in image 124 on the Pityusic map, in which we show all 48 known populations of *Podarcis pityusensis*. We consider the Pouet de Ses Illetes (PSI) still as population, although isolation is not always provided. Also the Punta Trucadors area of Formentera, including „Conejo de Formentera” and the area around „Es Ministere” is considered as a population (Tru), separate from remaining Formentera (see image 125).

First conclusion we have to draw is that the possible clustering as shown in image 6, at least regarding the southern Ibiza cluster, is not confirmed with the additional data we gathered during this trip. More sample locations are necessary in order to get to the point of conclusions.

Second conclusion would be that it is still uncertain if this method of belly color can contribute in a keychain discriminating between subspecies. At our first thought this is not very likely.



**Image 125.** We consider the „grueni” population as being isolated from the „formenterae” population.



**Image 126.** JOSÉ RIPOLL, our dedicated skipper in the protected areas.



## Acknowledgment

We want to express our gratitude to IVAN RAMOS TORRES for making the first arrangements necessary to this trip, including the CEP permits. We are also grateful for the assistance of all the staff of the Espais Naturals Protegits d'Eivissa i Formentera, especially their director MARIANA VIÑAS TORRES. Many thanks to MIKE from diving centre Mundo Azul in Cala de Sant Vicent, without his patience we could not have stayed the whole day on Tagomago, and ALEJANDRO BONET, who kindly gave us permission to enter Tagomago. Also many thanks to CHEMA RAMON and family, for their hospitality at Xem's house in Can Pilot. And last but not least, very special thanks to JOSÉ RIPOLL, our dedicated skipper in the protected areas the last two years, and we hope he will find a lot of satisfaction in his retirement next year.

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