

Feral Monitor Lizards (*Varanus spp.*) in Catalonia, Spain: An Increasing Phenomenon

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Abstract - Between 2001 and 2011, a total of 14 feral monitor lizards representing four species were captured in the Catalonia region of Spain, suggesting that these animals either escaped or were intentionally released by pet owners. In addition to documenting these cases, this article also discusses the potential implications of feral monitor lizards on the conservation of threatened and endangered wildlife in Catalonia.

The Catalonia region of north-eastern Spain encompasses a total land area of 32,114 km² and is dominated by forests as well as open areas and coastal habitats. The region experiences a Mediterranean climate; in 2011, the lowest annual temperatures recorded in its coastal zone, from Le Perthus at the French border to Ebro Delta Natural Park in the south, ranged from 5-10° C (Servei Meteorologic de Catalunya, 2011).

Most of Catalonia's cities and towns occur near the coastline, and Barcelona, the region's capital, is home to approximately three million residents. Large-scale animal importers, pet shops, and the exotic pet trade are concentrated in this densely populated zone. Reptiles comprise an important part of the exotic pet trade, and among them, monitor lizards (*Varanus spp.*) are one of the biggest groups imported (Pernetta, 2009).

The number of feral, free-ranging monitor lizards observed in Catalonia has conspicuously increased over the past several years, most likely due to the deliberate release or escape of captive specimens. Between 2001 and 2011, the Catalonian Reptile and Amphibian Rehabilitation Center (CRARC) received and accommodated 14 monitor lizards that were captured within the region (Table 1). However, this number probably represents a small fraction of the total number of feral monitors in Catalonia, and raises the questions of how many monitors are living in the region, and can any survive the winter or reproduce in Spain?

With 4,500 living specimens exported from Ghana, Benin and Togo to Spain between 2001 and 2011 (CITES Trade Database, 2012), *V. exanthematicus* is one of the most popular lizard species encountered in



Fig. 1. *Varanus exanthematicus* observed in the Cadi-Moixeró Natural Park (El Grasolet). Photograph by Ariadna Cabeza.



Fig. 2. Two *V. salvator* at CRARC that were captured at the localities of Reus and Sabadell, respectively. Photograph by Joaquim Soler.

Table 1. Free-ranging monitor lizards observed or captured in Catalonia.

Species	Age class	Date	Locality
<i>exanthematicus</i>	adult	24-Oct-2011	Natural Park Cadí-Moixero (El Grasolet) * (Fig. 1) 31T CG97
	juvenile	18-Aug-2011	Natural Park Garraf 31T DF06
	adult	25-Sep-2010	Natural Park Sant Llorenç del Munt i l'Obac (Matadepera) 31T DG10
	adult	3-Sep-2009	Granollers 31T DG40
	adult	3-Oct-2007	Roda de Barà 31T CF76
	adult	17-Sep-2007	Vilafranca (near Garraf Park) 31T CF97
	adult	15-May-2006	Castelldefels (near Garraf Park) 31T DF16
	adult	20-Oct-2004	Viladecans (near Garraf Park) 31T DF17
	adult	12-Jul-2004	Mataró 31T DF59
	adult	19-Jan-2002	Cambrils 31T CF34
	adult	11-Jul-2002	Vigues i Riells 31T DG31
	<i>niloticus</i>	adult	7-Aug-2001
<i>salvator</i>	subadult	6-Jul-2008	Reus (Fig. 2) 31T CF45
	juvenile	15-Jun-2011	Sabadell (Fig. 2) 31T DG20
<i>juxtindicus</i>	adult	1-Aug-2011	Llagostera (Fig. 4) 31T DG93

* This specimen could not be caught, and was identified from a photograph (see Fig. 1).

the pet trade. From the data collected at CRARC, we see that *V. exanthematicus* has been the most frequently encountered feral monitor lizard in Catalonia, with most observed animals being adults. It is a robust species that can probably survive for some time in natural areas of the coastal zone, where it can be detrimental to native

wildlife and create conservation problems for protected and endangered species.

Introduced monitors can pose serious threats to the indigenous wildlife of a region (Enge *et al.*, 2004; Krysko *et al.*, 2011). For example, in southern Florida, USA, a region with a climate similar to that of

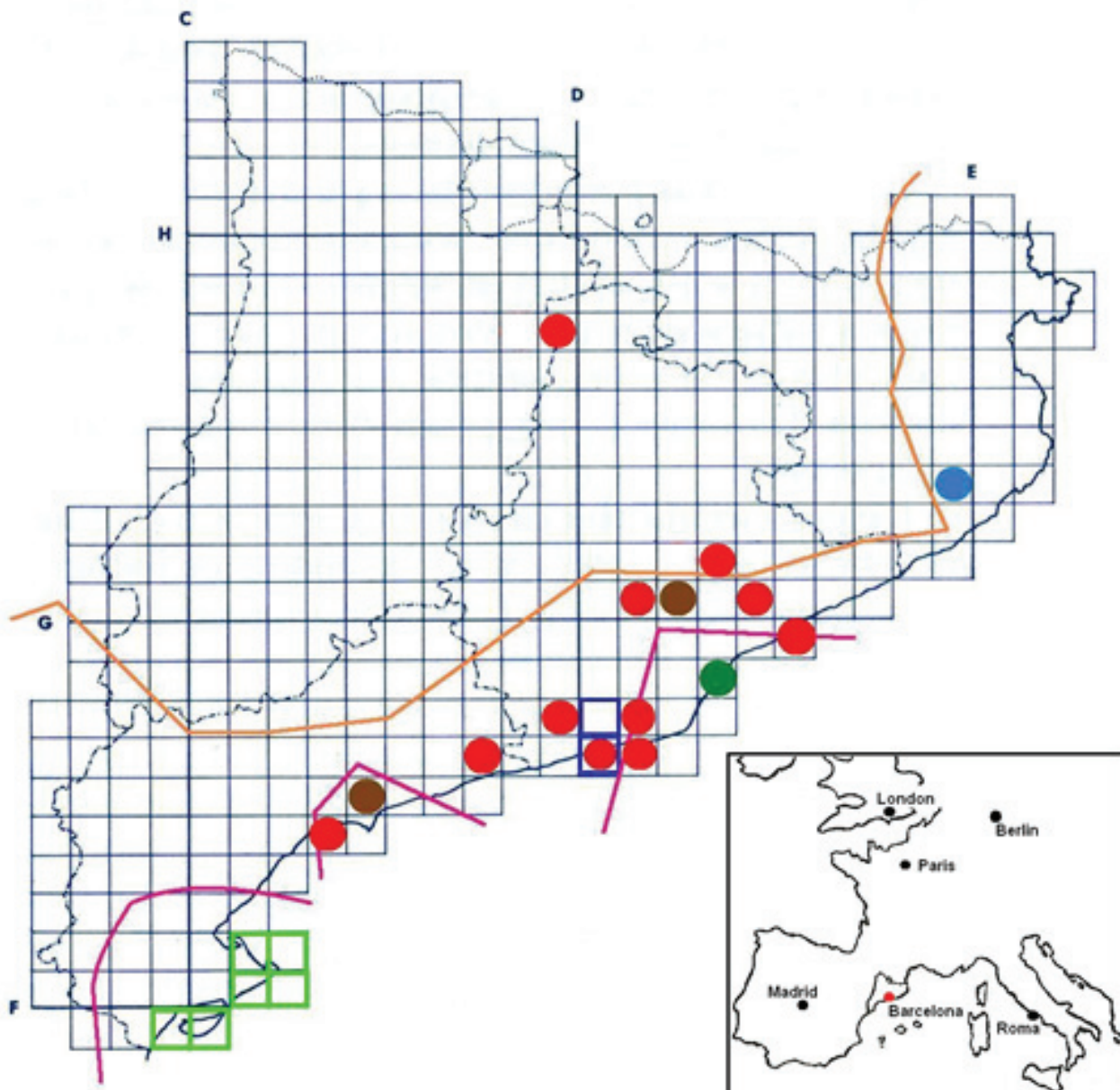


Fig. 3. Localities of free-ranging *Varanus exanthematicus* (red dots), *V. salvator* (brown dots), *V. niloticus* (green dot), and *V. juxtindicus* (blue dot) in Catalonia, Spain. Areas beneath the orange line experience an average annual temperature range of 14-16° C, and areas beneath the purple lines experience average temperatures of 16-18° C. Green squares represent Ebro Delta Natural Park; Blue squares represent Garraf Natural Park.

Catalonia, at least one species of monitor (*V. niloticus*) has become established through the escape or deliberate release of captive specimens, where it poses a threat to several native species (Enge *et al.*, 2004). While large monitor species may be unable to survive harsh winters in Catalonia, they can probably find enough food and suitable climatic conditions to survive from spring to autumn. Even if they are only capable of surviving for short periods of time, their temporary presence in natural

habitats may affect endangered wildlife in Catalonia. With rising global temperatures, there is also some risk that monitors could eventually adapt to a warmer Mediterranean climate and become established within the region.

The discovery of several *V. exanthematicus* in the vicinity of Garraf Natural Park in 2011 raises concerns that feral monitors could prey on an existing population of the Mediterranean tortoise *Testudo hermanni hermanni*,



Fig. 4. *Varanus juxtindicus* captured at Llagostera, now in the quarantine room at CRARC. Photograph by **Joaquim Soler**.

a species which is threatened with extinction on the Iberian Peninsula and has been reintroduced to the park since 1992 (Soler *et al.*, 2001). *Varanus exanthematicus* is known to prey on tortoise hatchlings (Owens *et al.*, 2005), and may threaten this population if additional monitors are present or arrive in the future. Due to its close proximity to residential areas with reptile keepers, Ebro Delta Natural Park is another setting in Catalonia where free-ranging monitors could threaten the survival of rare indigenous species. Potentially vulnerable wildlife in this park include one of the last remaining European colonies of Audouin's Gull (*Larus audouinii*) (Martínez-Vilalta, 1994) as well as an additional reintroduced, and well-established population of *T. h. hermanni* (Bertolero, 1991). While these scenarios remain speculative for now, the fact that several large monitor species have been able to survive in Catalonia under the Mediterranean climate and natural conditions of its coastal zone where they may prey on threatened indigenous species, demonstrates a risk which will need to be evaluated.

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