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Evidence of high longevity in an Island lacertid, *Teira dugesii* (Milne-Edwards, 1829). First data on wild specimens

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Abstract. Using the technique of capture, mark and recapture, here is reported a case of high longevity in the Madeiran lizard, *Teira dugesii*. It is one of the highest reported values for lacertid lizards (16 years or more) in a wild population.

Keywords. Longevity, *Teira dugesii*, Madeira island.

Teira dugesii is a lacertid lizard endemic to the Madeiran Archipelago, and was introduced to some islands of the Azores in the XIX century (Malkmus, 1985, 2004) and to the harbour area of Lisbon (Sá Sousa, 1995). It is an omnivorous and oportunistic lacertid that inhabits a wide range of habitats, from sea level to the highest altitude of Madeira Archipelago (1871 m – Pico Ruivo, Madeira Island). It can be found in almost every island/islet of the archipelago (Jesus et al., 2009).

Since the earliest 1990's we have being studying *T. dugesii* in their native environments. Most of the studies dealt with phylogeny and population genetics (e.g. Brehm et al. 2001, 2002, 2003; Jesus et al., 2005a). Other studies have also been performed in this species, for example on diet (Sadek, 1981), predation (Jesus et al., 2005b), morphological variability (Cook, 1979; Báez and Brown, 1997; Jesus et al., 2006), and colour pattern variability (Crisp et al., 1979; Báez, 1990). Curiously, no data exists on longevity in wild populations in the native area. The ecological aspects and life histories traits of wild populations are practically unknown, with a few studies performed on captive lizards (e.g., Galan and Vicente, 2003).

In 1996 we started capture-mark recapture sessions on Madeiran lizards to study growth, and some other aspects such as time of courtship, pregnancy, egg laying, hatchling and male maturation cycles, using toe-clipping. Sessions lasted two years and several captures/recaptures were performed essentially in four localities of Madeira Island, using pitfall traps. The first was Ponta de São Lourenço located in the Eastern part of the Island, at approximately 70 m of altitude, a notably arid location. The second locality was Pico

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do Arieiro, with 1850 m of altitude, in the central mountain ridge, the third was Curral das Freiras, with 950m of altitude, in a inland position in the island, and the fourth was Ribeira do Alecrim, Paul da Serra, a plateau in the western part of the Island, in the Central Mountain Ridge at about 1300 m.

In 2006, a unique event occurred in Paul da Serra. Two (individuals 105 and 108) of the 7 lizards that were caught, were recaptured. According to SVL values, in 1997, the individuals 105 and 108 were probably around or less than one year old (Table 1). Forty-six mm is the typical size of juveniles. Although variation exists, according to Cook (1979), animals of 45 mm or less are probably less than one year old. Juveniles and young adults between 46 and around 60 are one or two years old, while larger ones are older mature adults.

In 2011, another session of capture was performed. Eighteen lizards were captured, three of which were recaptures. Individual 10 was probably one year old in July 1996. Regarding individual 204, it was difficult to estimate the age although probably, in September 2006, it was at least 2 years old (Table 2).

The most unexpected value belongs to individual 500. In 1997 it was already an adult female. The SVL at that time suggests that the female was older than 2 years, and probably was born in 1995 or earlier, making her at least 16 years old in 2011. In this population males with SVL longer than 75 (and even 80) mm are frequent, and it is even possible to find females with a similar size, almost reaching a SVL of 80 mm. Thus, although variability exists, there is a high probability to find females that are even older than this one.

Table 1. Date of captures and SVL of individuals 105 and 108 from Paúl da Serra

Individual 105 (Female)		Individual 108 (Male)	
Date	SVL (mm)	Date	SVL (mm)
02 Jun 1997	59	23 Jun 1997	46
		15 Apr 1999	65
06 Sep 2006	66	06 Sep 2006	70
In 2006: 9 years *		In 2006: 9 years*	

* Estimated age

Table 2. Date of captures and SVL of individuals 105 and 108 of Paúl da Serra

Individual 10 (Female)		Individual 204 (Male)		Individual 500 (Female)	
Date	SVL	Date	SVL	Date	SVL
10 Jul 1996	54			02 May 1997	67
15 Apr 1999	66	06 Sep 2006	68		
19 Jul 2011	73	19 Jul 2011	78	19 Jul 2011	75
At least 15 years *		At least 6 years*		At least 16 years*	

* Estimated age

Table 3. Date of captures and SVL of individuals 105 and 108 of Paúl da Serra

Individual 75 (Male)	
Date	SVL (mm)
06 Mar 1997	69
07 Aug 2011	74
At least 15 years *	

* Estimated age

In 2011, one session of capture was performed in Pico do Arieiro, another high-altitude site, separated from Paul da Serra by deep valleys. Nine individuals were captured, of which one (individual 75) was a recapture (Table 3). Probably in 1997, this individual was at least two years old, and was born in 1995 or earlier.

In 2011, two attempts of capture in Ponta de São Lourenço were performed. Fifty-seven lizards were captured and none were marked.

These longevities are high when compared with other lacertid species, although most of the published data are from terrarium animals. Slavens and Slavens (1992, 1993) reported high longevities for captive reptiles including lacertids. For example they refer the following maximum ages: *Timon lepidus,* 14 years and 5 months; *Lacerta trilineata,* one individual 7 years and 9 months old and another 4 years and 4 months old; *Gallotia galloti,* 5 years; *Podarcis pityusensis,* 4 years and 7 months (still living at that time). A specimen of *T. lepidus* living in Museum Koenig has an estimated age of at least 28 years (Philipp Wagner, *pers comm*). Bannert (1998) refers higher values for captive lacertid lizards, with 12 years for *Gallotia atlantica*, *Gallotia caesaris* and *T. dugesii*, 13 years for *Gallotia stehlini*, *Lacerta bilineata* and *Podarcis hispanica*, 15 years for *Gallotia galloti eisentrauti* and *Podarcis tiliguerta* and 18 years for *P. pityusensis*. The value for *T. dugesii* is lower than our estimated age for wild specimens of this species.

According to Avery (1975) the mean expectation of life for *Zootoca vivipara* was about 5 years. Saint Girons et al. (1989) obtained different longevities in two populations of *Lacerta viridis* (5 and 8 or more). For *Podarcis muralis*, Castanet and Roche (1981) obtained 6 years, Bourliére (1946) 4 to 6 years, and Flower (1937) 4 to 10 years. In *Lacerta agilis*, in an Alpine area of Italy Guarino et al. (2010) found that longevity was 4 years for males and 3 for females. In the same species, living in Daghestan (Russia), Roitberg and Smirina (2006) found longevities of 6 years for males and 5 years for females in the population from lowland and submontane regions (until 600 m. a.s.l.), but 7 years for males and 6 years for females in the population from highlands (starting from 960 m. a.s.l), emphasizing the variability in longevity. In the western coast of Sweden Olsson and Shine (1996) also observed in *L. agilis* that maximum longevity was 11 years for males and 12 for females. Although high, this value is still lower than that observed for *T. dugesii*.

Although the data is limited, an interesting aspect is that the longevity seems to be higher in high altitude populations. However, further captures are needed at different altitudes to confirm this. Normally, these high longevities are common on islands forms, such as *Gallotia simonyi* (20 years) (Castanet and Báez, 1991) and the extinct scincid *Macroscincus coctei*

(16 years) (Andreone and Guarino, 2003). *T. dugesii* is usually much smaller than these two species, so it is probably one of the smallest lacertid lizard with such a high longevity.

Finally, this finding could be in accordance to the island theory, which states that species tend to have higher longevity than their mainland relatives (Blondel, 1986). In fact, despite the lack of published data, there is evidence that *Scelarcis perspicillata,* regarded as the mainland sister taxon to *T. dugesii* (Harris et al., 1998), has lower longevity, about 4-5 years (Ana Perera, pers comm).

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