

An extremely large spur-thighed tortoise male (*Testudo graeca*) from Măcin Mountains National Park, Romania

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Abstract. In Măcin Mountains National Park (Romania) lives an extremely large male of spur-thighed tortoise (*Testudo graeca*), whose measured curvilinear carapace length is 37.5 cm. We estimated a body weight of 4.8 kg from the regression equation weight-carapace length based on the log-transformed data of 100 males from the same population. This proves to be the largest spur-thighed tortoise male ever reported in the wild.

Keywords. *Testudo graeca*; Măcin Mountains; body size; Romania.

The spur-thighed tortoise, *Testudo graeca*, has a patchy range covering parts of three continents (Africa, Asia and Europe), from southern Spain and North

Africa to Iran, Asia Minor and Eastern Europe. Its range extends approximately 6500 km (east-west) and 1600 km (north-south) (Fritz et al. 2007). It is well adapted to semi-arid and arid habitats. The tortoise is threatened by habitat destruction and over-collecting for the pet trade and food consumption. It is considered vulnerable according to the IUCN classification, both in Europe (Cox and Temple, 2009), and at a global scale (Baillie et al., 2004). Various international conventions have included the spur-thighed tortoise on their lists. Thus, the Washington Convention considers it globally

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Table 1. Body weight and carapace length reported from different spur-thighed populations across the range.

Location	Sample size	Average body weight (g)	Maximum body weight (g)	Average curvilinear carapace length (cm)	Maximum curvilinear carapace length (cm)	Average straight carapace length (cm)	Maximum straight carapace length (cm)	Source
Romania, Măcin Mountains National Park	100	1718±50.1	2876	25.1±0.2	30.2	20.0±0.2	25.5	Present study, without the reported male
Greece	-	1276	-	24.8	-	17.8	-	Willemsen and Hailey, 2003
Spain, Donana	94	-	-	-	-	14.08±1.4	19.1	Diaz-Paniagua, Keller and Andreu, 2001
Spain, Donana	161	-	-	-	-	-	16.0	
Turkey, Central Anatolia	6	-	-	-	-	21.1	24.6	Turkozan et al. 2005
Turkey, Mardin Province	16	-	-	26.7±2.6	30.2	20.3±2.3	23.9	Turkozan et al. 2003
Western Turkey		-	-				20.8	Lambert, 1982
Morocco, Jbilet Mountains	44	636.3±25.7	972	19.4±0.3	22.2	15.1±0.2	18.4	Carretero et al. 2005
Morocco, Jbilet	131	418.4±8.6	750	16.3±0.1	20.2	12.5±0.1	15.5	Kaddour et al. 2008

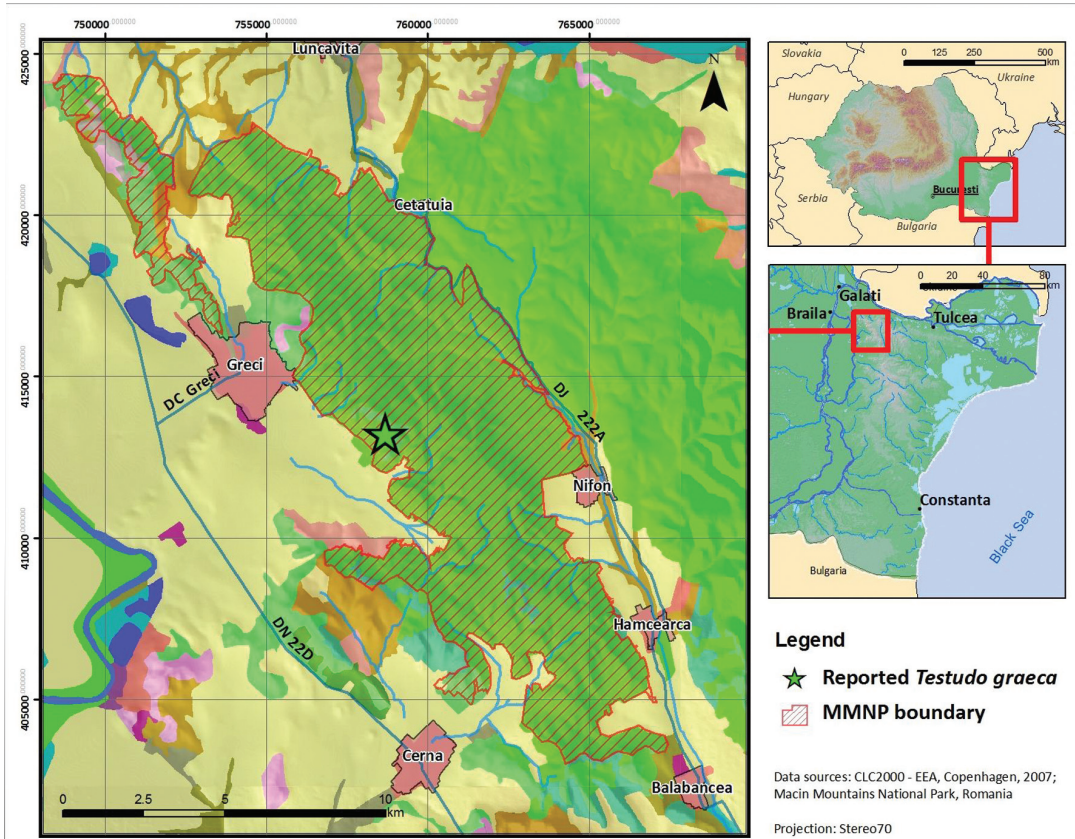


Figure 1. Position of Măcin Mountains National Park and the location of the reported male.

threatened (Annex II), vulnerable according to CITES, and included in Annex C1 (Appendix II) of the EU Wildlife Trade Regulation 3626/82.

The spur-thighed tortoise reaches the northern limit of its range in the Măcin Mountains National Park (Dobrogea province, Romania). Măcin Mountains are located in the south-east of Romania, respectively in the north-western part of Dobruja, in Tulcea County, bordered by the Danube River to the north (figure 1). The protected area totals 113.21 km² and the highest peak reaches 467 m above sea level. Spur-thighed tortoises are common and can be found in meadows, cultivated land, scrub-covered hillsides and deciduous forests. The population density is high and the human impact is relatively low in the area. In the period 2006-2009 we inventoried the park, including the abundant spur-thighed tortoise population. On May 15, 2009, an extremely old and large male, with a curvilinear carapace length (CCL) of 37.5 cm was found in Măcin Mountains National Park (N 45.1711, E 28.2902) at an altitude of 397 m. After it was photographed and marked

with white paint, the animal was released on site. The shell was smooth and it was not possible to estimate its age (figure 2).

Based on the measurements made on 100 spur-thighed males from the area, we computed the equation between CCL and body weight (BW) and between CCL and straight carapace length (SCL).

$$\text{LogBW} = 2.649 \cdot \text{logCCL} - 0.4845 \quad (R^2 = 0.93)$$

$$\text{LogSCL} = 1.015 \cdot \text{logCCL} - 0.119 \quad (R^2 = 0.86)$$

We then estimated BW to be 4885 g and SCL was 30.1 cm (figure 3). This is far larger than the reported maximum sizes in literature (Table 1), indicating that the Măcin Mountains National Park tortoise population has the highest average and maximum size, only equalled by the Mardin Province population (Turkozan et al. 2003). A similar situation, of large body sizes in cooler areas, increasing with both latitude and altitude, was reported for *Testudo hermanni* in Greece (Willemssen and Hailey, 1999). The only similarly large wild animal was reported by Lambert (1982) citing Boulenger (1902), also from Romania, as a record female tortoise



Figure 2. The large male found on May 15, 2009 in Măcin Mountains National Park.

having a straight carapace length of 30.5 cm and a body weight of 3.6 kg. Since females are larger than males in spur-thighed tortoises (Carretero et al. 2005; Willemsen and Hailey, 2003) we expect that even larger females may occur in the wild.

Acknowledgements. We thank the Măcin Mountains National Park Administration for their support during the study and especially Mr. Bogdan Băjenaru for his constant support.

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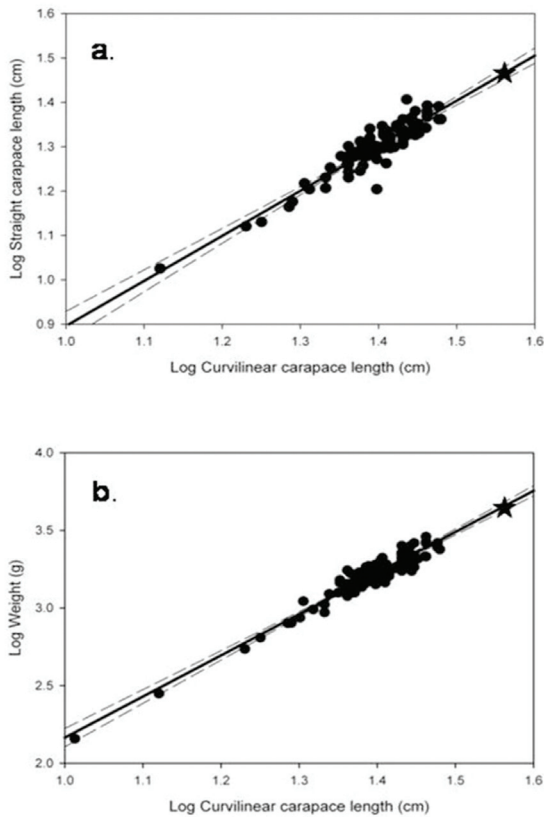


Figure 3. Correlation between CCL and (a) SCL, and (b) BW based on measurements made on 100 spur-thighed males from Măcin Mountains National Park. The star marks the position of the reported male.

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