

Testudo graeca iberica

The Eurasian Spur-Thighed Tortoise in Romania



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Taxonomy, Ecology, and Conservation



According to the latest of taxonomic revisions, not without controversy, the genus *Testudo*, described by Linnaeus in 1758, now comprises 17 subspecies. One of these is a subspecies of spur-thighed tortoise known as the Eurasian tortoise, *Testudo graeca iberica* (Pallas, 1814). The name “iberica” refers to the Caucasian Iberia, a designation used 3,000 years ago for the region that is now

eastern and southern Georgia. This region from the central Caucasus to the Caspian Sea is called the Caucasian Iberia or Eastern Iberia to distinguish it from the western Iberia or Iberian Peninsula of southwestern Europe — modern-day Spain and Portugal. The eastern and western extremes of ancient European civilization have the same name.

As with other tortoises, the taxonomy of *Testudo graeca iberica* is

characterized by great controversy and differences of opinion among scientists.

The taxon was first described by PALLAS (1814), who considered its geographic range the area of southeastern Europe and western Asia through Turkey and the Caucasus. CĂLINESCU (1931), of the Romanian Academy of Sciences, indicated that it should be called *Testudo iberica racovitzae*, in honor of Romanian biologist Emil



Typical habitat of *Testudo graeca iberica* in Macin Mountains National Park (Dobrogea, Romania)

G. Racovitza (1868–1947), with a type locality of Tutrakan (Bulgaria). German herpetologist MERTENS (1946) considered the taxon a subspecies of the spur-thighed tortoise, *Testudo graeca*, designating it *Testudo graeca iberica*.

BOUR (1987) elevated the taxon to full species status with the name *Testudo iberica*, and indicated that its range was the Caucasus, with Tbilisi (Georgia) as the location of the type specimen from which the taxon was described (he also said that the tortoises occurring in the southeastern Balkans should be called *Testudo racovitzae*). DAVID (1994) called the taxon *Testudo terrestris iberica*, a subspecies of a species that is not widely accepted in the scientific community.

The most recent taxonomic survey of tortoises published by

FRITZ and HAVAS (2007) again calls the taxon a subspecies of the spur-thighed tortoise — i.e., *Testudo graeca iberica*. In this article we will use this most recent nomenclature



This tortoise is one of the emblems of Macin Mountains National Park

for the tortoise. The decision to do this does not mean that we consider the name definitive. Of course it is subject to continuing taxonomic studies.

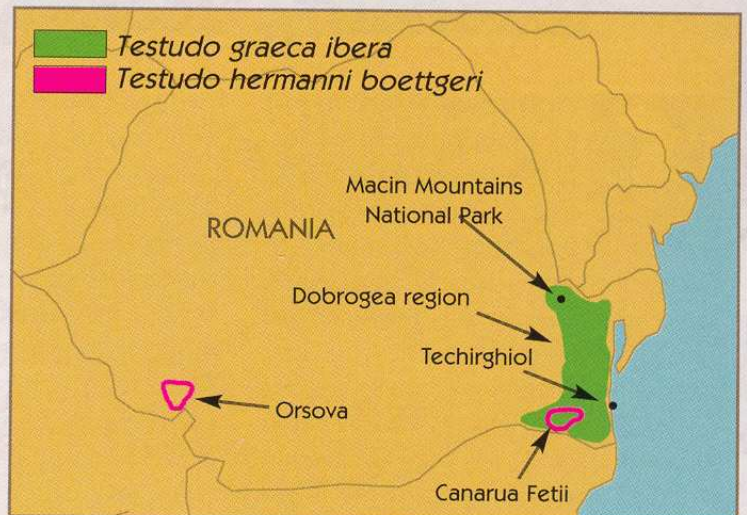
Distribution and habitat

Testudo graeca iberica is distributed through a large region stretching from the southeastern Balkan Peninsula through Asia Minor and into the Caucasus. The species is found from coastal lowlands to elevations of up to about 1,300 meters above sea level in Bulgaria, and to 1,700–2,000 meters above sea level in eastern Turkey near Lake Van.

The northern limit of the range in Romania, the Dobrogea region extends along the coast of the Black Sea, and includes the mouth of the Danube River. In fact it is the Danube River that forms the northern border of the range of the tortoise. In its Romanian distribution, *Testudo graeca iberica* is sympatric with the country's other tortoise species: the eastern Hermann's tortoise, *Testudo hermanni boettgeri* (Mojsisovics, 1889). The



Eurasian distribution of *Testudo graeca iberica* showing place names mentioned in the text



Distributions of *Testudo graeca iberica* and *Testudo hermanni boettgeri* in Romania, with place names mentioned in the text

eastern Hermann's tortoise lives in very particular and limited areas — one near Orsova at the Serbian border, considered the type locality (where the specimen used for describing the species is from); the other is south of Dobrogea in the Canarua Fetii reserve, which is also inhabited by *Testudo graeca iberica*.

Testudo graeca iberica is known to have been present in Romania since the Middle Neolithic Age, at the time of the Hamangia culture (4,200–3700 B.C.). An archeological dig at Techirghiol (Dobrogea) uncovered remains of two specimens of *Testudo graeca*. The study, of a human settlement, revealed that the early inhabitants of the region occasionally ate tortoise meat (HAIMOVICI and BALASESCU, 2006).

Testudo graeca iberica can still be found easily in open habitat, deciduous forest, and hilly agricultural regions. One part of the Dobrogea region with an abundant population of this species is Macin Mountains National Park, a protected area encompassing 11,321 hectares known internationally for its diverse herpetofauna and for having the geologically oldest mountains in the country. The topography is gentle, and includes elevations lower than 470 meters above sea level.

From a botanical point of view, this area is the northern limit of Balkan vegetation, the southern limit of Caucasus and central European vegetation, and the western limit of many Asian plant species. All of the plant communities in the area are considered rare for Europe. Local mountain floras here comprise from 1,779 to 1,911 species, representing 19 percent of the total of European plant species. To date a total of 27 plant species are considered endemic to the area. The forests are composed of low trees — especially oaks (*Quercus daleschampii* and *Quercus pubescens*), ash (*Fraxinus ornus*), and hornbeam (*Carpinus orientales*), and a few St. Lucie



Testudo graeca iberica has large horny spurs on its thighs



The posterior marginal scutes are strongly curved outward



The armored front legs can be drawn in to protect the head



Diversity of plastral patterns in *Testudo graeca ibera* juveniles

cherries (*Prunus mahaleb*) and spindle trees (*Euonymus europaea*). Dobrogea is the only part of Romania and the Balkan countries with vast steppe landscapes. Thus the habitat of *Testudo graeca ibera* does not correspond with the habitat of the Spanish *Testudo graeca*. This fact helps to illustrate the difficulty of taxonomic classification of the species.

Description

Testudo graeca ibera is the second largest species of the genus

Testudo. Its size is recorded in various reports. BESHKOV (1997) compiles data of maximum measurements of these tortoises from different parts of its range (see Table 1). The most spectacular record is from Bulgaria, where a specimen measuring 389 millimeters and weighing 5,860 grams was documented. For Romania the same author compiled rather old reports from scientists of the caliber of Boulenger (who documented a specimen of 305 millimeters in 1902) and Fuhrn and

Vancea (who documented a specimen of 270 millimeters in 1961). Much more recent reports of large specimens were published by MARAN (2007) (see Table 2) for specimens found in Macin Mountains National Park. This French naturalist found a female that measured 243 millimeters and weighed 2,716 grams.

We have had the opportunity to see two of these amazing specimens: a female measuring 237 millimeters and weighing 2,750 found in September of 2008 on an excursion to Macin Mountains National Park to collect blood samples for a genetic study, and a very large female measuring 325 millimeters and weighing 5,980 grams.

Testudo graeca ibera has quite variable coloration. Some specimens are almost entirely black, whereas others are much lighter with brown or ochre tones. In any case, the coloration of neonates and juveniles is much lighter than the coloration of adults and older specimens. Indeed, the neonates and juveniles have a very light coloration similar to that of *Testudo graeca graeca* in Spain.

One morphological characteristic that is common to all of the subspecies of *Testudo graeca* is a horny spur on the thigh on each side of the tail. The spurs of *Testudo graeca ibera* are especially large, and even somewhat curved at the tip because of their long growth.

Table 1. Maximum measurements of *Testudo g. ibera* collected by Beshkov, 1997

Carapace length (in mm)	Locality	Author
389	Bulgaria	Beshkov, 1997
364	Bulgaria	Beshkov, 1997
305	Romania	Boulenger, 1902
290	Russia	Bannikov <i>et. al.</i> , 1977
285	Bulgaria	Beshkov, 1984
280	Russia	Terent'ev, 1961
278	Russia	Terent'ev & Chernov, 1949
270	Romania	Fuhrn & Vancea, 1961
260	Georgia	Muskhelishvili, 1970
257	Syria	Siebenrock, 1913
230	Black Sea coast	Inozemtsev & Pereshkolnik, 1994

Tabla 2. *Testudo graeca ibera* recent carapace measurements

Carapace length (in mm)	Locality	Author
243	Romania	Maran, 2007
237	Romania	Soler <i>et. al.</i> , 2008 (present article)
325	Romania	Soler <i>et. al.</i> , 2008 (present article)

In recent studies at the Canarua Fetii Reserve, specimens have been found with morphological characteristics common to both *Testudo hermanni boettgeri* and *Testudo graeca iberica*. Some *Testudo hermanni boettgeri* present horny spurs on the thighs and a partially divided supracaudal scute. This could indicate the existence of hybridization between the two taxa (SOS et al., 2008).

An older *Testudo graeca iberica*, whether male or female, develops distinctly flared posterior marginal scutes that are similar to those of *Testudo marginata* (Schoepff, 1793). Sometimes very old specimens even have flared anterior marginals.

The plastron usually has a dark marking in each scute, but these vary greatly in size.

Ecology and reproduction

The life cycle of *Testudo graeca iberica* is similar to that of the other European tortoises. The populations in Romania are affected by the country's latitude and continental climate — very cold winters and very hot summers.

The tortoises hibernate in winter, when temperatures in the Dobrogea region can reach -25°C (-13°F). To survive the cold, the animals bury themselves several centimeters in the ground under shrubs and leaf litter.

When spring comes and temperatures rise, the tortoises come out of their lethargy and begin looking for mates. A second mating season takes place in the autumn. Females lay two or three clutches of eggs a year. In captivity, clutches consist of four or five eggs measuring 33–48 millimeters by 23–49 millimeters; some of the eggs are nearly spherical.

At a constant incubation temperature of $28\text{--}30^{\circ}\text{C}$ ($82\text{--}86^{\circ}\text{F}$) the eggs hatch after 69 days. At the Centro de Recuperación de Anfibios y Reptiles de Cataluña (CRARC), newly hatched *Testudo graeca iberica* measured an average of 37.7 x 34.4 millimeters and weighed an average of 15.4 grams. In the wild, hatching takes place in late August and early September.

As with other species of the genus *Testudo*, eggs, hatchlings, and juvenile *Testudo graeca iberica* are vulnerable to predation. In Bulgaria the wild boar (*Sus scrofa ferus*) is cited as the main threat to the survival of the tortoises. In Romania wild boars are also among the main predators, and free-range domestic pigs (*Sus scrofa domesticus*) also represent a significant threat to tortoises in rural areas.

Conservation

Testudo graeca iberica is sometimes a victim of farm machinery — it is not uncommon to find dead tortoises with broken shells, and surviving tortoises with less extensive injuries. These are common occurrences in tortoise populations near farming communities. Another threat to the tortoises in these areas is the still common practice throughout Dobrogea of burning large expanses of land to create pastures for sheep



The clutch usually consists of four or five eggs



Juvenile *Testudo graeca iberica* with typical carapace coloration similar to that of *Testudo graeca graeca*

or cattle. Many tortoises die in these fires or suffer debilitating carapace burns.

Testudo graeca iberica is a protected species in all of Romania (as are the other two turtle species in the country: the eastern Hermann's tortoise, *Testudo hermanni boettgeri*, and the European pond turtle, *Emys orbicularis*).

The emblem of Macin Mountains National Park is a turtle, which illustrates the importance of this animal in the area. Romanian legislation has prohibited the sale of turtles in the country since 2007. In European legislation, *Testudo graeca* is included in Annex A of Commission Regulation (EC) no. 318/2008 of 31



Open area with oak trees (*Quercus robur pedunculiflora*), habitat of *Testudo graeca ibera* in Dobrogea, that has been burned to create pasture



Female *Testudo graeca ibera* with scars from burns on the posterior third of the carapace



Adult male with a successfully healed carapace injury from farm machinery



Drawing blood for genetic analysis

March 2008, amending Council Regulation (EC) no. 338/97 on the protection of species of wild fauna and flora by regulating trade therein. The species is also included in CITES Appendix II.

In Romania there is a popular custom of keeping tortoises as pets, especially in areas near the natural distribution of the species. These animals are usually kept as family pets mainly for the entertainment of children. But for the most part, the local people show no interest whatsoever in the tortoises, and this general indifference has contributed to the preservation of healthy wild populations of *Testudo graeca ibera* over the decades.

Currently the most worrying threat faced by *Testudo graeca ibera* is the increasing use of more intensive agricultural methods including indiscriminate application of herbicides

and pesticides. Romania is experiencing a dramatic modernization since becoming a member of the European Union — the economy of rural areas is changing rapidly. On the other hand, adopting European legislation will presumably help guarantee the conservation of Romanian wildlife, which is still very well represented. ■

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