

Status Report on Keeping and breeding
Endangered Reptiles in Europe
Testudo hermanni boettgeri; concept 8-05-2003
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Short Characteristics

Testudo hermanni boettgeri is one of the most common species of tortoises. It inhabits most of the Balkan countries as Bulgaria, southern Italy, Greece, Rumania, the European part of Turkey, the former Yugoslavia and Aegean Islands.

Full-grown females can reach a length of 30 cm and a weight of more than 4 kg. In general males and tortoises of southerly populations are smaller. The carapace shields include five vertebras, four pair of costals, 23 marginals and a nuchal. Rather often the tail marginal is divided into two. The carapace is moderately domed, pale yellow in ground colour, with black areas covering the anterior and lower part of the scutes. The plastron is pale yellow with a black band of variable width along each side, which in many specimens is interrupted at the transverse seams. Colouration varies with different population and between individuals.

The principle characteristic of Testudo hermanni is a claw-like terminal at the end of the tail for both sexes. This can easily distinguish it from Testudo graeca and by the absence of the horny thigh spurs, which forms the most characteristic feature of Testudo graeca. Differences with Testudo marginata can be found in different colours. Young T.marginata has more black/white markings and misses the typical horny pin at the end of the tail. Full-grown T.marginata may get an almost complete black carapace and have very characteristic triangular black spots on the plastron shields.

Fundamental requirements on captive propagation

The easiest way to keep Testudo hermanni in captivity is to release it in an enclosed garden in an area whose climate offers a reasonable alternative to the natural habitat. Under such conditions in South-Europe tortoises can live for many years, obtaining their own food by eating the available vegetation. However the climate in the middle, northern and western parts of Europe is unsuitable with respect to temperature and humidity and specific adaptations has to be made to maintain a healthy group of tortoises in an outdoor terrarium. In the Netherlands for example T.hermannii can live for many years in good health on the condition that the outdoor terrarium is not shadowed and protected for cold winds. For propagation extra provisions has to be made. For instance shelters or greenhouses to protect the tortoises from the unfriendly climate or raising hatchlings, part of the year in indoor terrariums to give them extra warmth, food and shorten their hibernation period.

These greenhouses however may never prevent the animals from the essential basking in full sunlight. For countries with an even more hostile climate heated warehouses are needed and the idea of an outdoor terrarium is gradually changed in a fully controlled indoor terrarium. In general tortoises don't need much living room. Under the condition that the terrarium is kept clean and food and hiding places are available an area of one m² for an adult individual may be enough. However for a breeding group much more room should be available. In that case females should have the possibility to nest without being disturbed by the other animals i.e. the males. The largest threat to (young) tortoises is inadequate care of the owner, mainly incorrect temperatures (too low) and hiding places (too dry). Also food is important. Testudo hermanni is an herbivore and offering a wide variety of leaves is the best approach. Other food like soft fruit, bread, dog- or cat food should be avoided or limited at least. There is no need for extra vitamins for tortoises that are kept in outdoor terrariums. In many parts of Europe however extra supply of calcium is important especially for fast growing hatchlings or juveniles and for egg laying females.

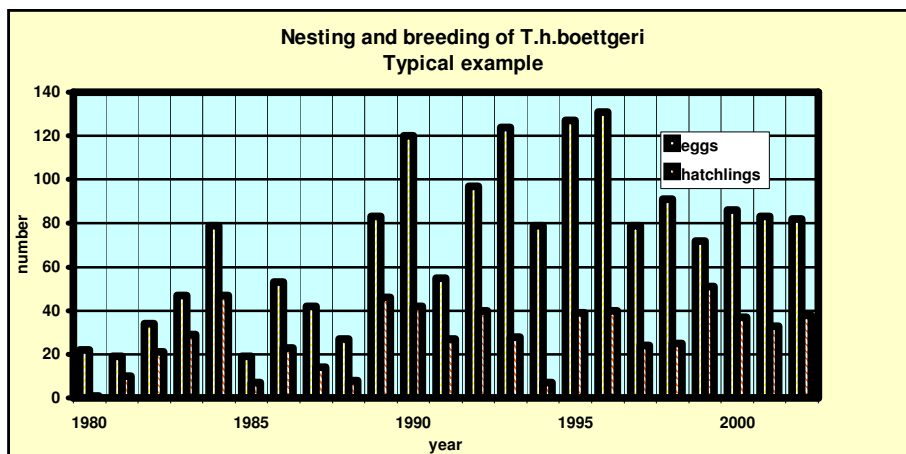
Captive keeping and breeding of Testudo hermanni boettgeri

Testudo hermanni boettgeri is one of the most frequently kept tortoises in Europe and it has been imported in the past in large quantities. However these days in many European countries breeders raise

it again in large quantities. Studbooks report these successful breeding results, however still many breeding results are not reported, partly because of uncertainty as to the right procedure for possibly needed licenses. In the following a typical example of successful breeding results in the Netherlands is described. It concerns a group of ca. 10 female *T. hermanni boettgeri* during period of more than 20 years. For more details on this self-sustaining population in captivity see Eendebak, 2002.

The number of females in a group determines the number of offspring; the number of males is less important. Up to three clutches a year can be produced, with an average of six eggs per clutch, resulting in an average production of ~10 eggs/female/year. Because, in captivity, female tortoises can reach a higher age than in nature and can be reproductive for two or three times as long as females in the wild egg production during a lifetime for captive animals may be twice as much as for females in the wild. Most eggs are fertilized, but some embryos will die during the incubation. In nature most of the embryos and hatchlings are lost due to predators like birds and foxes. These dangers may also play a role for captive held groups, but in that situation in general, eggs are protected in incubators and hatchlings are protected by keeping them indoors, during the first vulnerable year(s). Therefore to keep the size of a captive group within limits part of the juveniles has to be transferred to other breeders. In the following typical breeding results in an outdoor terrarium in the Netherlands are described. They are typical for the situation as described under fundamental requirements: the outdoor terrariums are provided with some shelters (but no heaters are present) and hatchlings are protected in their first and second year. This breeding group is described in more detail elsewhere (Eendebak, 2002).

In the figure the numbers of produced eggs and hatchlings during a period of 22 years are presented. It is important to know that most of the eggs (~75%) are fertilized and about 50% of these fertilized eggs result in a healthy hatchling. This number is an underestimate of the real possible survival because of the many measurements at relatively low and high incubator temperatures, leading higher mortality rates. Using "safe" incubation temperatures like 29 or 30 °C the embryo survival was about 90%. During this period of 22 years about 400 *T. h. boettgeri* have been transferred to other pet holders. Such results are not exceptional in the Netherlands. Some breeders produce more hatchlings each year and many members of the Dutch Tortoise Society have yearly positive breeding results with *T. h. boettgeri*. The same holds for many other European countries like Austria, Belgium, England, Germany, the Netherlands, Switzerland and many more. It is obvious that the thousands of hatchlings that are legally offered at the European "market" of *T. h. boettgeri* make sure that there is no need whatsoever to import these animals illegal anymore.



References

- Eendebak, B.Th., 2002 *Testudo hermanni* and *Testudo marginata*. A sustainable breeding program. The "International Turtle and Tortoise Symposium", Vienna, Austria, Jan. 17-20, 2002.