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First recorded second generation breeding with the Namaqualand speckled padloper, *Homopus signatus signatus*

Introduction

In the past decade, the number of initiatives to form captive colonies of tortoise species has steadily increased. Especially the efforts of the *European Studbook Foundation* have lead to studbook programs on various tortoises in Europe. More recently, intercontinental work has been structured through the *Turtle Survival Alliance*. One of the aims of the captive populations is to form 3 insurance colonies that may be used to reintroduce captive-bred specimens in the wild, might this be desired in the future from a conservation point of view.

In order to form and maintain a viable captive population, it is required that the species can complete its entire lifecycle in captivity. However, due to the relatively long generation time of tortoises and the short period of time that most tortoises have been bred successfully, this is still an unproven assumption for many species. Survival of hatchlings, growth, and maturation of subadults are all aspects that are of importance for the formation of a captive colony, after a species has first reproduced. Ultimately, reproduction into a second generation can demonstrate if a species' lifecycle can be successfully completed in captivity.

Studbook *Homopus signatus signatus*

Among the first studbook programs started was that on the Namaqualand speckled padloper, *Homopus signatus signatus*. It was initiated in 1995 to generate biological information about this poorly known species, and to see if it could be kept and bred in captivity. At that time, husbandry results were not conclusive in answering the question if *H. s. signatus* could survive in captivity. The results obtained in the studbook have been very promising, with low mortality rates and many offspring at different locations. At the moment of writing as many as 37 hatchlings have been born from 5 females. The founder specimens were imported with two pairs at a time from South Africa, between 1995 and 2001. The specimens imported in 1995 have reproduced annually without interruption.

Also the generation of information went well, with the following projects being the most important:

– Long term captive study of the (especially reproductive) biology (*Homopus Research Foundation* in collaboration with the *University of the Western Cape*, South Africa)
– Provision of blood samples for a study on microsatellite DNA and parent-off-

Ill. 1. Hatching of *Homopus signatus signatus*.

spring relationships (*University of Cape Town*, South Africa)
– Provision of egg shells and expertise for a study on calcium mobilization and egg shell morphology (*Nijmegen University*, Netherlands in collaboration with the *Homopus Research Foundation*)
– Provision of specimens for a study on metabolism in relation to temperature and metabolism in other tortoise species (*Frankfurt University*, Germany)

Second generation breeding result

First egg production in a captive-bred female in the studbook occurred at an age of 3.5 years, and first mating activity in a captive-bred male was observed 9.5 months after birth. A female that was born on 27 February 1996 produced its first single egg clutch (42.9 × 23.0 mm, 13 g) on 27 February 2003. This egg was incubated buried in Seramis mixed with water in a (weight based) ratio of 4.4:1.0, at 32 and 26 °C (each 12 hrs per day). The substrate was not remoistened during incubation and dried out as a result of the open top of the incubation container. The hatchling left the egg on 20 July 2003, and measured 33.1 × 27.0 × 18.0 mm (straight carapace length × maximum shell width × maximum shell height) at 9 g. The plastron length was 30.2 mm. Interestingly, the hatchling was positioned longitudinally in the relatively elongated egg (if compared to other *H. s. signatus* eggs), whereas hatchlings are usually orientated diagonally. This may have been a result of the narrow egg width.

Conclusion

To the best of my knowledge, this is the first report of second generation breeding in the Namaqualand speckled padloper. Combined with the overall good results in the captive husbandry and breeding of this species, it shows that *H. s. signatus* is likely a suitable tortoise to form a viable captive population.

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