Phelsuma **26** (2018); 1-9

Remarks on the first breeding success of free living Arnold´s giant tortoises *Aldabrachelys gigantea arnoldi* (Bour, 1982) at Grand Barbe, Silhouette, Seychelles

Dr. Sascha Pawlowski
Jahnstr. 26, 68623 Lampertheim, Germany
spawlows@gmx.de

&

Dr. Justin Gerlach
133 Cherry Hinton Road, Cambridge CB1 7BX, U.K.

Abstract: The islands of the Seychelles support the last remaining giant tortoises in the Indian Ocean. Most of them belong to the Aldabra giant tortoise *Aldabrachelys gigantea gigantea* (Schweigger, 1812) subspecies, but some are remnants of the old granitic islands population, namely the Seychelles giant tortoise *A. g. hololissa* (Günther, 1877) and the Arnold´s giant tortoise *A. g. arnoldi* (Bour 1928). Appropriate breeding groups were established by the late 1990s on Silhouette Island, Seychelles. In 2007 the breeding group (3, 2) of Arnold´s giant tortoise *Aldabrachelys gigantea arnoldi* (Bour, 1982) was released at Grand Barbe, Silhouette. After almost 10 years of residence, the first offspring from that breeding group were found, hatched at Grand Barbe. In total 4 juveniles of approximately one year of age were found and transferred to a secure enclosure at La Passe, Silhouette.

Introduction

The Seychelles islands are the last natural refuge of living giant tortoises in the western Indian Ocean. Most of the entire population belongs to the Aldabran form, namely *Aldabrachelys gigantea gigantea* (Schweigger, 1812), but some individuals are currently considered as different subspecies due to significant morphological differences as shown by both adults and their offspring: The Seychelles giant tortoise *Aldabrachelys gigantea hololissa* (Günther, 1877) and the Arnold´s giant tortoise *Aldabrachelys gigantea arnoldi* (Bour 1928) (www.reptile-database org, Dec. 2017; Turtle Taxonomy Working Group 2017).

After its rediscovery, breeding groups of both subspecies were established on Silhouette Island by the Nature Protection Trust of Seychelles, NPTS in 1997 (Gerlach 1996, 1999, 2003, Gerlach & Canning 1995, Gerlach & Ganning 1998, Lücker 2000, Wüthrich 2003). Until the end of the project in spring 2010 at total of 42 *A. g. hololissa* and 130 *A. g. arnoldi* offspring were hatched and reared in captivity before their intentional release onto various Seychelles granite islands (Gerlach 2011). Finally, both adult and juvenile *A. g. hololissa* were transferred to Cousine island, whereas all juvenile *A. g. arnoldi* were transferred to both North and Fregate (Gerlach 2011, Pawlowski 2017). The adult *A. g. arnoldi* breeding group (3,2), however, had

already been transferred to Grande Bare, Silhouette (in 2007) order to spend the rest of their lifespan in a more or less natural environment (Fig. 1, 2a, b; Gerlach, et al. 2007, Pawlowski 2016, Pawlowski & Krämer 2010, Wüthrich 2007). In addition, four adult *A. g. gigantea* were also transferred to Grand Barbe (Fig. 3).

Observation

Although, the breeding groups of *A. g. arnoldi* was subsequently monitored until the end of 2009 and attempts of nesting was observed, no hatchlings had been found during this time period or the following years of observation (NPTS 2009, 2010). After 2010 no regular monitoring of the giant tortoises was carried out.

In summer 2017, however, four juveniles were found at Grand Barbe and brought to a safe enclosure at La Passe in order to prevent them from poaching or attacks by potential predators (i.e. rats *Rattus rattus* L., mangrove crabs). The age of the juvenile was estimated to be about one year, corresponding to a straight carapace length of about 15 cm. The colouration of the juveniles was similar amongst the four individuals with rather blackish carapace, but brownish to yellowish legs, neck and head (Fig. 4a, b). The jaws were again rather blackish and clearly distinguishable from the yellowish head underside. The carapace was entirely smoothly grown. At the end of 2017, the four hatchlings were kept in an appropriate in house enclosure, allowing them to be exposed to indirect sunlight (and thus UV radiation) and sufficient freshwater as well as sufficient food supply (Fig. 5).

Fig. 1. Habitat of *A. g. arnoldi* at Grand Barbe

Fig. 2. Adult *A. g. arnoldi* living at Grand Barbe: a) male; b) female

Fig. 3. Adult female *A. g. gigantea* living at Grand Barbe (2016)

Fig. 4. Juvenile *A. g. arnoldi*. a) total view; b) portrait

Fig. 5. Enclosure for the four juvenile *A. g. arnoldi*

Fig. 6. Juvenile *A. g. gigantea* from Curieuse Island, 2007 (wild hatched). a) lateral view; b) portrait

Fig. 7. Juvenile *A. g. gigantea* from L´Union Estate, La Digue 2016 (captive hatched). a) lateral view; b) frontal view

Discussion and conclusion

Outside of Aldabra, reproduction of *A. g. gigantea* was observed on various granite islands of the Seychelles for many years, both in captive and free ranging groups (Gerlach 2004, 2007, Gerlach 2015, Hambler 1994, Pawlowski 2008, 2009, Pawlowski & Krämer 2005). Typically all hatchlings and juveniles from those populations showed a similar pattern of colouration. In fact, carapace, plastron, legs, neck and head are dark brown to blackish with no significant visible change in colouration from the top to the underside of legs, neck and head as shown by rather clean animals from both Curieuse and La Digue (Fig. 6a, b; 7a, b). In one case, juvenile

Fig. 8. Juvenile *A. g. gigantea* from Jardin Du Roi, Mahé, 2008 covered with dust/soil (captive hatched). a) lateral view; b) frontal view

A. g. gigantea appeared to look like juvenile *A. g. arnoldi* but it should be noted that those juveniles were living on soil and were covered with dust and soil (Fig. 8). However, the colouration of the four juveniles found at Grande Barbe, Silhouette, differs from those known and described above for *A. g. gigantea* juveniles of a corresponding size and age. In contrast, the four juveniles showed the same colouration pattern, as those known from *A. g. arnoldi* hatchlings and juveniles bred and hatched in captivity (Fig. 9; Gerlach 1999, 2009). The dark grey carapace of the four juveniles differs from the rather brownish carapace of the captive breed hatchlings, this is known to occur in *A. g. arnoldi* juveniles as the carapace turns darker (i.e. stronger pigmentation) once the tortoises are exposed to direct sunlight. This has been shown by many terrestrial and aquatic turtles as well as by growing *A. g. arnoldi* in the NPTS breeding programme (Pawlowski 2007a, b, Pawlowski & Krämer 2010, Wüthrich 2003). The brownish to yellowish colouration of legs, head and neck is a good match with the green to yellowish leaves of the vegetation. Taking into account that *A. g. arnoldi* hatchlings have a rather bright brownish colouration, their camouflage is excellent in the dense natural vegetation at Grand Barbe. This might be also the reason why hatchlings or juveniles had not been observed at this site previously. Another reason for the absence of observations of descendants from this breeding could be due to predation (mangrove crabs, rats) or poaching.

Nevertheless, taking all observations into account, it can be concluded that the four juvenile giant tortoises collected from Grand Barbe, originated from the *A. g. arnoldi* group and thus are the first *A. g. arnoldi* hatched in the wild since the 1800s. In addition, it was the first observation of juveniles almost ten years after the release of the adult breeding group to Grand Barbe.

Fig. 9. *A. g. arnoldi*: a & b) hatchlings; c) juvenile

References

Gerlach, G., J. Gerlach & R. Gerlach 2007 *Silhouette - Nature's Island.* Victoria.

Gerlach, J. 1996 Seychelles giant tortoise identification project - Chairman´s report. *Phelsuma* **5:** 4.

– 1999 On the first recorded observations on egg-laying in *Dipsochelys arnoldi*. *Phelsuma* **7:** 79-83.

– 2003 Ausgestorben geglaubte Riesenschildkröten wieder entdeckt - Herkunft und Erhaltung der Seychellen-Riesenschildkröten. *elaphe N. F.* **11:** 57-61.

– 2004 Giant tortoises of the Indian Ocean. Frankfurt am Main, ChimairaS.

– 2007 *Terrestrial and freshwater vertebrates of the Seychelles*. Leiden, Backhuys.

– 2009 *Aldabrachelys arnoldi* (Bour 1982) - Arnold´s giant tortoise. in: A. G. J. Rhodin, P. C. H. Pritchard, P. P. Van Dijk, R. A. Samure, K. A. Buhlmann and J. B. Iverson (Hrsg.): Conservation Biology of Freshwater Turtles and Tortoises: A Compilation Project of the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group. *Chelonian Research Monographs* 5: 028.1-028.5.

– 2011 Das Ende eines Schutzprojektes für Seychellen-Riesenschildkröten. *Radiata* **20:** 22-29.

Gerlach, J. & K.L. Canning 1995 Seychelles giant tortoise rediscovered? *Oryx* **29:** 74.

Gerlach, J. & L. Ganning 1998 Taxonomy of Indian ocean Giant Tortoises (*Dipsochelys*). *Chelon. Conserv. Biol.* **3:** 3-19.

Gerlach, R. 2015 *The lost giants - a tale of tortoises in the Seychelles.* Cambridge Phelsuma Press.

Hambler, C. 1994 Giant tortoise *Geochelone gigantea* translocation to Curieuse Island (Seychelles): Success or failure? *Biol. Conservation* **69:** 293-299.

Lücker, H. 2000 „Ausgestorbene" Riesenschildkröten im Zoo Dresden. *DATZ* **53:** 56-58.

NPTS 2009 Research and Monitoring - Annual Report 2009. 28.

– 2010 Research and Monitoring - Annual Report 2010. 20.

Pawlowski, S. 2007a Haltungstipps und Haltungsfehler bei der Pflege terrestrischer Sumpfschildkröten am Beispiel der Gelbrand-Scharnierschildkröte *Cuora flavomarginata* spp. (Gray, 1863). *elaphe N. F.* **15:** 43-52.

– 2007b Sinn und Zweck der Erneuerung von Panzerschilden bei Schildkröten. *elaphe N. F.* **15:** 26-32.

– 2008 Haltungsbedingungen von Aldabra-Riesenschildkröten *Dipsochelys dussumieri* Gray 1831 auf den zentralen Seychelleninseln *Radiata* **17:** 19-32.

– 2009 Die Aldabra-Riesenschildkröten *Dipsochelys dussumieri* Gray 1831, von Curieuse Island, Seychellen. *Testudo* **18:** 5-17.

– 2016 Arnolds Riesenschildkröten *Aldabrachelys gigantea arnoldi* (Bour, 1982) auf Silhouette Island, Seychellen. *Radiata* **24:** 4-14.

– 2017 Nach dem Ende eines Zuchtprojektes für Seychellen- *Aldabrachelys gigantea hololissa* (Günther, 1877) und Arnold´s Riesenschildkröten *A. gigantea arnoldi* (Bour, 1982). *Marginata* **51:** 40-47.

Pawlowski, S. & C. Krämer 2005 Aldabra-Riesenschildkröten, *Dipsochelys dussumieri* (Gray 1831) auf den zentralen Seychelleninseln Praslin, La Digue, Curieuse