

## First report of a wild hypomelanistic Hermann's tortoise (*Testudo hermanni*) in Sicily (Italy)

Marco Di Giuseppe<sup>1\*</sup>, Albert Martínez-Silvestre<sup>2</sup>, Francesco Paolo Faraone<sup>3</sup>  
and Joaquim Soler<sup>2</sup>

Sicily is home to one of the known populations of Hermann's tortoise. The Sicilian populations have been genetically assigned to the nominal subspecies (Fritz et al., 2006; Giacalone et al., 2009), its distribution is somewhat fragmented but appears to be relatively widespread in the eastern territories of the island (Turrisi, 2008; Giacalone et al., 2008). This species has been present in Sicily since at least the Middle Pleistocene, as indicated by the oldest fossils found on the island (Delfino, 2002). Tortoise coloration on the island is the same as described for the continental populations. However, some variations have been described in insular tortoises, such as melanistic or amelanistic specimens (Martínez Silvestre & Soler 2001; Soler et al. 2001). We here report the case of a hypomelanistic tortoise found on the island of Sicily. This is the first citation of a wild hypomelanistic tortoise found in the Mediterranean Basin. During a field trip in the Parco regionale dei Nebrodi (Sicily) in summer 2013 an adult female of *Testudo hermanni* (Gmelin, 1789) was found, showing a faded colour of both skin and carapace (Fig. 1). The specimen showed considerable fading of the dark pattern of the plastron and carapace, a pale yellow complexion of head and limbs, and an overall considerably lighter than normal coloration. The animal was 16.7 cm long (plastron length) and weighed 820 g. Both size and weight falls within the normal range

reported in a previous study of Hermann's tortoise in Sicily (Giacalone et al., 2008).

The tortoise was observed inside a square of 10×10 km, identified by the following central coordinates UTM, WGS84: 33 475000 S; 4205000 E. The site is located at 550 m a.s.l., along a slope facing South-East. The individual was found on the edge of a small holm oak wood, mainly characterized by dense shrub vegetation and a few small rocky outcrops.

The "Parco dei Nebrodi" is the largest natural reserve in Sicily, covering 86 000 ha with an altitude ranging from 20 m up to 1847 m a.s.l. ("Monte Soro"). The topography of the area is mainly characterized by patches of sandstone and clay, but there are also a few massive limestone outcrops. The vegetation cover consists mainly of oak deciduous woodlands and grasslands but there are also vast tracts of scrubland and beech wood, and small areas dominated by holm oak and cork wood (Schicchi, 2004).

This colour variation has never been found before in this area, neither in Sicily nor in Italy. Supposing that the incubation conditions were the same for all the individuals of this area it is assumed that the observed difference may be due to the expression of a recessive gene. An individual of *Testudo hermanni* characterized by a reduced amount of melanin expression is classified as hypomelanistic. The main difference between an amelanistic and a hypomelanistic tortoise is the expression of melanin that in the first case is absent and in the second is reduced.

If a certain habitat, characterized by low predation pressure, offers enough vegetation cover that provides protection from the sunlight and offers many hiding places, a hypomelanistic as well as an amelanistic tortoise may be able to survive, as already shown in Spain (Martínez-Silvestre and Soler, 2001) and in the present case.

---

<sup>1</sup> Centro Veterinario per Animali Esotici, Viale Regione Siciliana Sud Est 422, Palermo 90129 Italy

<sup>2</sup> Catalanian Reptile and Amphibian rehabilitation Center (CRARC), Masquefa, Barcelona 08783 Spain.

<sup>3</sup> Viale Regione Siciliana Sud Est 532, Palermo 90129 Italy

\* Corresponding author e-mail: marcodigiuseppe@yahoo.com



Figure 1. Adult hypomelanistic female *Testudo hermanni hermanni* found in the nature reserve Parco dei Nebrodi on the island of Sicily.

The same hypothesis has been suggested in other studies where the survival of albino individuals in the wild was related to the characteristics of the habitat (Reed 1991, Peles *et al.* 1995, Kehas *et al.* 2005). All the reported colour mutations described for wild tortoises in Europe occurred on islands as well as in similar instances of colour aberrations reported in other species. Partial albino individuals are more frequent in small and isolated populations (Holyoak, 1978). This is to be expected since inbreeding is more likely to occur (Bensch *et al.* 2000).

The specific climatic conditions characterizing the Mediterranean islands and/or the lack of genetic variation could facilitate the observed coloration changes in tortoises.

**Acknowledgments.** We acknowledge the critical review of manuscript done by Claudia Corti (Università di Firenze, Italy).

## References

- Bensch, S., Hansson, B., Hasselquist, B., Nielsen, B. (2000): Partial albinism in a semi-isolated population of great red-warblers. *Hereditas* **133**: 167-170.
- Delfino, M. (2002): Erpetofaune italiane del Neogene e del Quaternario. Unpublished PhD thesis. University of Modena and Reggio Emilia.
- Fritz, U., Auer, M., Bertolero, A., Cheylan, M., Fattizzo, T., Hundsdoerfer, A.K., Martín-Sampayo, M., Pretus, J.L., Široký, P., Wink, M. (2006): A rangewide phylogeography of Hermann's tortoise, *Testudo hermanni* (Reptilia: Testudines: Testudinidae): implications for taxonomy. *Zool. Scr.*, **35**: 531-543.
- Giacalone, G., Abbate, M., Fritz, U., Lo Valvo, M. (2008): Preliminary data on distribution, morphometric and genetic characterization of Hermann's tortoise in Sicily. In: *Herpetologia Sardiniae*, p. 282-286. Societas Herpetologica Italica/Edizioni Belvedere, Latina, Le Scienze" (8).
- Giacalone, G., Lo Valvo, M., Fritz, U. (2009): Phylogeographic link between Sicilian and Corso-Sardinian *Testudo h. hermanni* confirmed. *Acta Herpetologica*, **4**: 119-123.
- Holyoak, D.T. (1978): Variable albinism of the flight feathers as an adaptation of recognition of individual birds in some Polynesian populations of *Acrocephalus* warblers. *Ardea* **66**: 112-117.
- Kehas, A.J., Theoharides, K., Gilbert, J. (2005): Effect of sunlight intensity and albinism on the covering response of the Caribbean sea urchin *Triploneustes ventricosus*. *Marine Biology* **146**: 1111-1117.
- Martínez-Silvestre A., Soler, J. (2001): An amelanistic Hermann's Tortoise (*Testudo hermanni hermanni*) from the Balearic Islands (Spain). *TESTUDO* **5**: 35 - 36.
- Peles, J.D, Lucas, M.F., Barrett, G.W. (1995): Population dynamics of agouty and albino meadow voles in high-quality, grassland habitats. *Journal of Mammalogy* **76**: 1013-1019.
- Reed, H. (1991): Does an absence of gape marking affect survival of leucistic young in the zebra finch? *Bird Behaviour* **9**: 58-63.
- Schicchi, R., (2004). Materiali per una carta tematica delle emergenze floristiche e vegetazionali del Parco dei Nebrodi. *Naturalista Siciliano*, **4**, 28: 139-163.
- Soler, Massana, J., Vallespir, J., Martínez-Silvestre, A., Medina, D., Solé, R. 2001. Patrón melánico en una población de *Testudo hermanni hermanni* del sudoeste de Mallorca. *Boletín de la Asociación Herpetológica Española*, **12**: 19-21.
- Turrisi, G. F. (2008). Testuggine di Hermann *Testudo hermanni* Gmelin, 1789. In: *Atlante della Biodiversità della Sicilia: Vertebrati terrestri*, p. 281-286. Studi e ricerche 6, Arpa Sicilia, Palermo.

*Accepted by Diogo Provete;  
Managing Editor: Hendrik Müller*