

Dark coloration in Sardinian grass snakes (*Natrix natrix cetti*)

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The grass snake (*Natrix natrix*) is a widespread snake that includes several subspecies distributed in different areas of Europe and North Africa (Kindler et al, 2013). Sardinia Island hosts the most differentiated subspecies from the *N. natrix* ssp. complex, *N. n. cetti* (Capula et al, 1994; Corti et al, 2010). It is distributed across the island, even if the majority of detections have been made in the southern and eastern part of Sardinia (Corti et al, 2010; Salvi and Bombi, 2010). Such discrepancy is probably a result of the limited number of studies performed on this subspecies (Lanza, 1986; Stefani, 1983; Capula et al., 1994). However, no authors have reported abnormal colouration, even if darker colourations are known within *Natrix* species and subspecies (Gvozdenović and Schweiger, 2014; Jandzik, 2004; Mollov, 2012).

In two occasions (May 2011 and October 2015) we found 3 individuals of *N. n. cetti* on Seven Brothers Mount. We photographed each snake and then they were measured using the program ImageJ. The first snake was abundistic and its total length was 109.48 cm (Fig. 1a). The second showed a particular bluish colouration but the darker pigmentation was regular; total length 91.94 cm (Fig. 1b). The third snake was melanotic (Zuffi, 2008; Fig. 2a) and showed an uncommon shortened tail, perhaps a result of injury with only 21 subcaudal scales (Fig. 2b). The total length was 65.52 cm, with SVL 62.08 cm and tail length 3.54 cm. One way to recognise gender in this subspecies is subcaudal scale count: in *N. natrix cetti* the average number for males is 59, while the average number for females is 50 (Corti et al, 2010). In this individual the subcaudal scales were too few so we were unable to recognize the sex. However, it was likely an adult and since SVL > 60 cm a female (Capula et al, 1994; Corti et al, 2010). *N. n. cetti* showed a marked polymorphism in coloration within the same population. All these unusual colorations involved an increase of dark pigmentation: two snakes had expanded black pigmentation (Fig 1a and 2a), while in the other the ash ground colour was darker, tending to blue (Fig. 1b). In this subspecies the ground colour is usually more prevalent than black pigmentation (Stefani, 1983) so our observations are unusual for this subspecies.



Figure 1. Two individuals of *N. n. cetti* with unusual coloration: first snake has abundistic pattern (A), while the second has a general bluish bottom colour (B).

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Figure 2. Melanotic individual of *N. n. cetti* (A); photograph showing shortened tail (B).

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