

Albinism of Aesculapian snake *Zamenis longissimus* (Laurenti, 1768) *in situ*: first record for Bosnia and Herzegovina

Albinizem navadnega goža *Zamenis longissimus* (Laurenti, 1768) *in situ*: prvi podatek za Bosno in Hercegovino

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Albinism is a genetic anomaly caused by the lack of activity of the enzyme tyrosinase, which converts to melanin through a stepwise biochemical pathway that results in a lack of pigment in the skin, iris and choroid. More than 100 mutations have been discovered so far associated with albinism (Oetting & King 1999). The red colour of eyes results as the reflection from the choroid capillaries behind the retina, which is visible due to the lack of the pigment melanin in the iris in albinos (Dyrkacz 1981, Boulenger 2000). In snakes, partial amelanism (leucism) is rare, and total amelanism (albinism) is even rarer (Boulenger 2000).

In Europe, there have been several cases of albino snakes of six different species: Aesculapian snake (*Zamenis longissimus* (Laurenti, 1768)), Balkan whip snake (*Hierophis viridiflavus* (Lacépède, 1789)), smooth snake (*Coronella austriaca* Linnaeus, 1758), common European adder (*Vipera berus* (Linnaeus, 1758)), nose-horn viper (*Vipera ammodytes* (Linnaeus, 1758)) and aspic viper (*Vipera aspis* (Linnaeus, 1758)) (Ferri & Bettiga 1992, Happ 1994, Krofel 2004, Gezova et al. 2018).

Since 1879, only nine albino Aesculapian snakes have been reported: three cases from Austria (Erber 1879, Sochurek 1955, Happ 1994), two from Slovakia (Balthasar 1935, Gezova et al. 2018), and one each from Serbia (Radovanović

1941), Switzerland (Bruno & Maugeri 1990), Italy (Ferri & Bettiga 1992) and Slovenia (Krofel 2004).

This paper reports on the first finding of an albino Aesculapian snake and the only albino record among reptiles (class Reptilia) in Bosnia and Herzegovina. The adult albino Aesculapian snake was found on 24. 6. 2014 (leg. I. Bošnjak, det. A. Čurić) near the town of Teslić, Bosnia and Herzegovina (lat. 44.600674 long. 17.820065, elevation 220 m a.s.l.) (Fig. 1a). The locality is populated and with obvious anthropogenic impact on the local nature, but also there are residues of deciduous forest, brushwood and meadows that correspond to the Aesculapian snake natural habitat. The individual was around 900 mm long (Fig. 1b). From the tail region to the head region, this albino was whitish with visible pale pattern along the body, while the head was much more yellowish. The eye colour was red (Fig. 1a). The gender was not determined. Categorisation into adult individual was done according to Kurek et al. 2019. After determination and measurements, the individual was released back to nature.

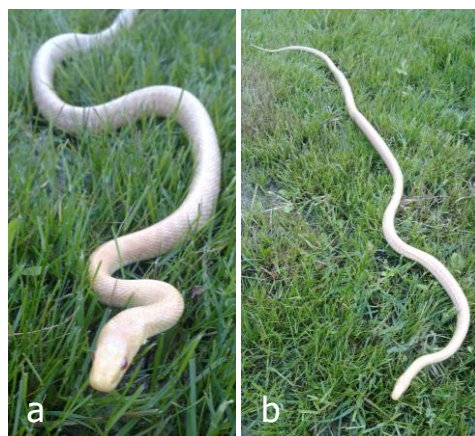


Figure 1. Albino Aesculapian snake found in Bosnia and Herzegovina, a – closer view, b – full size of the animal (photo: I. Bošnjak).

Slika 1. Albino navadni gož, ki smo ga našli v Bosni in Hercegovini, a – bližnji pogled, b – celotna dolžina živali (foto: I. Bošnjak).

Most albino snake individuals do not reach adult size due to their vulnerability and exposure to predators (Gezova et al. 2018). Albinos have low survival rates and are rapidly removed from the populations as they are conspicuous to predators (birds and mammals) and even to their prey (small rodents, voles, mice, rats, squirrels, birds) (Arnold 2002). They are also exposed to increased skin and eye sensitivity (lowered vision) to sunlight and with the absence of melanophores exposed to high levels of UV radiation, which may have fatal consequences on juveniles survival rate (Krečsák 2008, Kirkwood 2009, Fellows 2018). With peak hunting activity in the early mornings and between early mornings and late afternoons (Beshkov 1976), albino Aesculapian snakes are extremely noticeable which affects their hunting success and surviving rate (Kirkwood 2009).

So far, this is the third record of an albino Aesculapian snake found on the Balkan Peninsula and 10th record in Europe (Erber 1879, Balthasar 1935, Radovanović 1941, Sochurek 1955, Bruno & Maugeri 1990, Ferri & Bettiga 1992, Happ 1994, Krofel 2004, Gezova et al. 2018). Unlike mammals, besides melanophores, reptiles have two other pigment cells: xanthophores and iridophores. For that reason, disruption of melanin production does not affect the production of these pigments and the animals are seldom white, eye-red and with visible patterns (Bechtel 1978, Boulenger 2000, Krečsák 2008).

These findings are rare cases, not only for the albino Aesculapian snakes, but also for wild adult individuals that have survived despite their greater vulnerability.

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