

First record of dicephalism in
Vipera ammodytes (LINNAEUS, 1758),
from Slovenia

Dicephalism, axial bifurcation or *duplicitas anterior* is a severe developmental disorder found in animals that is well documented for mammals and reptiles (BROADLEY 1972; BRANCH 1982; NODEN & DELAHUNTA 1985; MATZ 1989; HOSER & HARRIS 1995; SWANSON et al. 1997; DIONG et al. 2003; MCALLISTER & WALLACH 2006; SPADOLA & INSACCO 2009; DE ALBUQUERQUE et al. 2010). In his review paper, WAL-

LACH (2007) proposed the use of the descriptive term “dicephalism”, since more than 90 % of 950 cases reported in snakes therein involved duplication of all or a part of the head. In many cases the duplication included the neck, i. e., adjacent parts of the spinal column. Two-headed snakes are rarely found in nature but frequently produced in captivity as a result of different developmental processes (WALLACH 2007). The dicephalism rate in the captive-bred snakes seems to be approximately ten times higher than in wild populations; in wild populations ranging from 1:20,000 to 1:100,000 (KLAUBER 1956; BELLUOMINI 1959). As detections of dicephalism in nature are rare, observations represent valuable information of its occurrence in natural populations.

Regarding the European snake fauna, observations of dicephalism were noted for seven species of the family Viperidae, with the majority of the cases recorded for *V. berus* (LINNAEUS, 1758), and in majority corresponding to captive bred animals (WALLACH 2007). WALLACH (2007) interpreted that high rate as a consequence of the common occurrence and widespread distribution of the species both in the wild and in captivity. As a contribution to the general knowledge of this abnormality, a case of dicephalism in *V. ammodytes* (LINNAEUS, 1758) from Slovenia is described here.

The specimen (Fig. 1) was detected in September 2012 on a pasture adjacent to the mixed forest in the vicinity of the village Pleš near Žužemberk in the central part of Slovenia (45°46'N, 14°52'E). It was found dead and the carcass was in bad condition. The first author received the information and photographs of the carcass some days after the discovery. Unfortunately, the remains were then not found anymore. Nonetheless, from the photographs of the finding and first-hand information by those who detected it, a dicephalic small individual of *V. ammodytes* can be recognized clearly. According to these local observers, the individual was first seen alive and basking on the ground near an apiary. As fear of venomous snakes is well present in many places of the Slovenian countryside, similarly as in other European countries (BRITO et al. 2001), this individual was later killed and the photographs were made. As can be seen

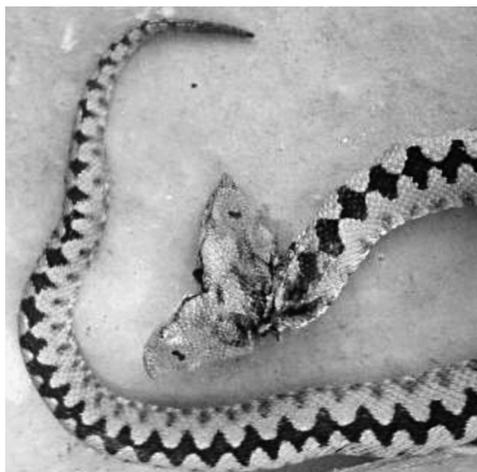


Fig. 1: Dicephalic (craniodichotomous) hatching of *Vipera ammodytes* (LINNAEUS, 1758), from the village of Pleš near Žužemberk in central Slovenia. Photo: F. BLATNIK.

from the photograph, this snake was clearly craniodichotomous. It had two incompletely separated heads lateral to one another in the horizontal plane. Both heads had two eyes and a nose-horn. About 93 % of somatodichotomous snakes are likely to fall into the cranio- or prodichotomous categories (WALLACH 2007). As in other similar cases, this snake was a hatchling found during the hatching season (LUISELLI & ZUFFI 2002; CRNOBRNJA-ISAILOVIĆ et al. 2007) and probably unable to feed or continue autonomous life in the wild, its abnormal morphology making it more vulnerable to predation or, like in this case, to human persecution.

This observation is a further case of dicephalism of snakes and as far as known the first for this species in Slovenia.

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KEY WORDS: Reptilia: Squamata: Serpentes. Viperidae; *Vipera ammodytes*, dicephalism, craniodichotomy, morphology, axial bifurcation, *duplicitas anterior*, pathology, abnormality, Slovenia

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