

A case of cannibalism behavior of the Slow worm, *Anguis fragilis* (Reptilia: Anguidae) in Turkey

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Abstract. We observed a cannibalism case between adult male and juvenile slow worm in captivity. This observation is firstly recorded from Turkish population.

Key words: *Anguis fragilis*, Slow worm, Cannibalism, Turkey.

Cannibalism is a mechanism, which increases the success of survival rate of the individuals and is observed from protozoa to mammals (Polis 1981, Polis & Myer 1985). It is also relatively common in amphibians and reptiles (Polis 1981, Polis & Myers 1985, Mitchell 1986). Cannibalism is characterized by four aspects: killing victims, gaining energy from victims, size-dependent interactions and intraspecific competition (Claessen et al. 2004). In general, cannibalism appears to be genetically based but controlled or induced by various environmental cues (Polis 1981, Polis & Myers 1985). Environmental and nutritional stress could be stimulating cannibalism (Polis 1981). Generally, cannibalistic individuals may be unable to detect conspecifics visually or chemically because of physiological or neurological defects and in such individuals visual or chemical stimuli may result in a predatory response (Mitchell 1986). In most species of reptiles cannibalism appears to occur opportunistically as a byproduct of normal predatory behavior (Polis & Myer 1985).

The Slow worm, *Anguis fragilis* L. 1758 is widely distributed in southern and central Europe, Asia Minor, in the Caucasus and in northern Iran (Ananjeva et al. 2006). The species inhabits forests, meadows, gardens and compost heaps (Başoğlu & Baran 1977, The HCT 2010). Food of Slow worm consist of wide variety of invertebrates especially earth-worms and slugs (Luiselli 1992, Luiselli et al. 1994, Pedersen et al. 2009, Mollov 2010).

In our field studies in western Black Sea Region (Turkey), which is part of a project on systematic and distribution of *Anguis fragilis* and *Pseudopus apodus*, we captured five *Anguis fragilis* (three adults and two juveniles) on April, 2010 in Sarikum National Park (Sinop) [lat: 42.019573°, long: 34.922761°, 19 m a.s.l.] and brought to laboratory. The individuals were kept in terrarium [its size, 55x35x35cm; its ground covered with moss, bark and leaves] and feed with earth-worms. A month later on May, 2010, an adult male [SVL= 168 mm] ate a juvenile [75 mm] biting from the head (Fig. 1).

Cannibalism in *Anguis fragilis* was previously reported by Delitz (1921), Petzold (1971), Davies (1967), and Fretey (1987). Petzold (1971) indicated that captive juveniles are eating each other. Davies (1967) reported a female, which ate two of her new borne offspring in captivity. Fretey (1987)

mentioned that *A. fragilis* sometimes could prey on small lizards (*L. vivipara*, *A. fragilis*) and juvenile snakes (*N.atrix*). Among anguids, *Ophisaurus ventralis* exhibits cannibalism in captivity (Carr 1940, Badger & Netherton 2003). Hamilton & Pollack (1961) found five *O. ventralis* with remains of conspecifics in their stomachs in the field.



Figure 1. An adult male *Anguis fragilis* devours a juvenile in captivity.

Juvenile individuals are generally ate by adult conspecifics in many lizard species (Polis & Myers 1985, Mitchell 1986). Our observation is an example for this phenomenon. Mitchell (1986) stated that the presence of color and pattern differences between adults and juveniles could be the result of natural selection for avoidance of cannibalism. He also reported that the frequency juvenile cannibalism could be associated with population density in natural populations. However, the reason of this case could be environmental (e.g., space, temperature, light requirements) and nutritional (e.g., starvation, food preference) stress in captivity. The captivity conditions could not completely fulfill the health, behavioral, and psychological needs of the species. According to Cooper (1990) the anguids can distinguish between chemical stimuli arising from prey and other odorous stimuli like other active foraging lizard species and its tongue is the organ that gathers the molecules to be analyzed by the vomeronasal organ. Slow worms are

active foragers (Ghira et al. 1999) and use the “sit and wait” technique, having nothing to gain by repeated sampling at the ambush site. Moreover the detection of the prey by tongue-flicking may be disrupted by immobility (Cooper 1997). Adaptation of ambush foraging may induce loss of chemical discrimination of the prey (Cooper & van Wyk, 1994). Since the lizards are kept in captivity, immobility could cause the adult to wrongfully identify the juvenile slow worm as prey. Polis (1981) reported in 86% of the 50 cases for which sexual differences in the predator were noted, females were more cannibalistic. Our observation did not support his claim. Most of data on cannibalism are incomplete and do not provide insights into the causes and consequences of this behavior (Mitchell 1986). For obtaining detailed data on cannibalism and understanding its mechanism, future comprehensive works should be implemented.

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