

Morph switching in *Lissotriton vulgaris* (Caudata, Salamandridae)

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Abstract. During a monitoring survey in Lake Sülüklü (Western Anatolia, Turkey), I captured 2 paedomorphic *Lissotriton vulgaris* ssp. females on 10 September 2010. The individuals were brought to the laboratory and kept in aquarium. I recorded both individuals switched to the metamorphic form in 22 days. This morph switching observation is the firstly recorded from the Turkish populations of *L. vulgaris*.

Key words: *Lissotriton vulgaris*, facultative paedomorphosis, metamorphosis, Turkey.

Facultative paedomorphosis occurs in several urodele species when individuals retain larval traits while becoming sexually mature (Gould 1977, Wilbur 1996, Denoël 2003, Denoël et al. 2007). The phenomenon has been observed in 57 species of newts and salamanders (Denoël et al. 2005a). *Lissotriton vulgaris* has a high tendency to be paedomorphic (Beebe & Griffiths 2000) and several records have been found in the Anatolian (Çiçek & Ayaz 2011), Caucasian (Litvinchuk 2001, Skorinov et al. 2009) and European (e.g. Covaciu-Marcov & Cicort-Lucaciu 2007, Denoël et al. 2009) parts of its distribution.

During our monitoring survey on the amphibians and reptiles in Lake Sülüklü (Manisa, Turkey, 38.565035° N, 27.532617° E, 612 m a.s.l.) in 2010, we found a dimorphic *L. vulgaris* population (Çiçek & Ayaz 2011). The surface of the lake is nearly 1.58 ha and its depth 2-4m. Dominant plants in the lake vegetation include *Typha angustifolius*, *Phragmites australis*, *Juncus* sp., *Carex* sp. and *Potamogeton* sp. In our sampling on 10 September 2010, we captured two paedomorphic females, and their snout-vent lengths were 33.9 and 37.4 mm and their total lengths were 58.1 and 65.3 mm, respectively. The individuals were brought to the laboratory, kept in aquarium (40x30x30 cm). The aquarium was filled with natural spring water and fed with Nematocera larvae. The bottom of the aquarium was covered in gravel; water level was kept constant at 25 cm. We added *Ceratophyllum demersum* to provide a shelter for individuals. The temperature was 25°C, photoperiod 12D/12N. About 22 days later, both individuals switched to the metamorphic form. The morph switching observation is the firstly recorded from the Turkish populations of *L. vulgaris*.

Facultative paedomorphosis is controlled by environmental and genetic factors (Semlitsch 1987, Denoël et al. 2005a). Since metamorphosis is irreversible, paedomorphs can switch to the metamorphic form (Denoël & Poncin 2001, Denoël 2003, Denoël et al. 2007). Reasons, such as reduction in water level (Harris 1987, Semlitsch 1987, Denoël 2003), desiccation of pools (Semlitsch 1987, Denoël 2005), high density (Harris 1987, Semlitsch 1987, Denoël & Poncin 2001, Denoël 2003, 2006), scarcity of food (Denoël 2003), and predator pressure (Denoël et al. 2005b, Denoël & Poncin 2001), stimulate the completion of metamorphosis. However, the rate of switching to metamorphic form is rather low in natural populations (Denoël et al. 2007), except when drying occurs. Morph switching in *L. vulgaris* might be due to food deficiency or captivity stress but more experimental work is

needed to determine the exact proximate factors. In my previous experiment, nine paedomorphic individuals from the same population (3 males and 6 females) had been brought to the laboratory and kept in captivity for 2 months. Nevertheless, none of these individuals switched to the metamorphic form, which may indicate that the completion of metamorphosis might vary among individuals. However, laboratory conditions differed in the two situations and may have thus caused different cues to newts. In his experiment on the Alpine newt *Mesotriton alpestris*, Denoël (2003) observed that some individuals did not switch to the metamorphic form. He suggested that this resulted from the age of individuals or the genetic differences among individuals. If the terrestrial habitat has quality resources and the aquatic habitat has unfavorable conditions (e.g. desiccation of water, crowded population, and scarcity of food), completion of metamorphosis and transition to land will be advantageous (Wilbur & Collins 1973, Whiteman 1994). The completion of metamorphosis and transition to land of some individuals is probably attributed to the fact that the aquatic habitats were not enough favorable to the gilled individuals.

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