

Amphibian mortality in a national park in the north of Portugal

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The first documented case of mass mortality in newts in Portugal was described by Froufe *et al.* (1999). This event occurred in a protected and more or less pristine area in the mountains of the Peneda-Gerês national park in northern Portugal. A large number of marbled newts, *Triturus marmoratus*, were found dead at the shores of the ca. 0.5 ha Carris lake that is located at an altitude of approximately 1500 m.

In order to determine the cause of the fatalities, we set up a program to monitor the populations of all locally breeding amphibian species. In 2001, larvae and adults of Bosca's newt (*T. boscai*) and the common midwife toad (*Alytes obstetricans*) were found diseased and death (Soares *et al.* 2002). In 2002 also adult Perez's frogs (*Rana perezi*) were found ill, although not in the high number as observed in *T. marmoratus* (n=42). Affected adults were lethargic and displayed cutaneous ulcers and tissue haemorrhages and those kept in captivity all died within days. Affected larvae showed tissue haemorrhages and eodemas. The highest mortality was observed in spring and summer.

We conducted light- and electron-microscopic examination of tissue samples taken from recently died animals. This revealed the presence of iridovirus-like particles in the underlying cells (Alves de Matos *et al.* 2002) and constitutes the first reported case of an iridovirus-like virus in the genus *Triturus*. Microbial analysis of freshly collected liver tissue and fragments of cutaneous lesions showed the presence of the bacteria *Cedecea lapagei* and *Aeromonas hydrophila* in one individual. We consider the virus as the potential cause of the observed amphibian mortality and the bacterial infection as an opportunistic attack. The analysis of one sample of *T. marmoratus* for chytridiomycosis yielded a negative result (Jaime Bosch, *pers. comm.*).

We are uncertain as to the origin of the disease. We are aware, however, of the uncontrolled introduction of the exotic invasive fish, *Lepomis gibbosus*, which was first observed in the lake in 2001. *Lepomis gibbosus* may have carried one or more of the pathogens. Moreover, this fish is known to have a wide carnivorous diet (Scott & Corssman, 1979) and a potential predator for amphibian larvae and small adult newts. We are now evaluating the possible involvement of the virus in the disease pathogenesis and aim to document the impact of the disease on the amphibian populations of Carris lake.

References:

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