

## OBSERVATIONS ON THE TERRITORIAL AND REPRODUCTIVE BEHAVIOUR OF *SALAMANDRA LANZAI* AND CONSIDERATIONS ABOUT ITS PROTECTION (AMPHIBIA: SALAMANDRIDAE)

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A new species of alpine salamander, *Salamandra lanzai*, has been recently described by Nascetti *et al.* (1988) (Fig. 1). Similar in colouration to the typical *S. atra* (uniformly black), it differentiates from this, among other things, because of genetic and morphological features (see Andreone *et al.*, 1990a). Another similarity between these two species is that both are viviparous (Andreone & Sindaco, 1989), a character that most probably is a convergent adaptation to life at high altitude.

Actually its known distribution embraces only a narrow area of the Cottian Alps (and, perhaps, the Maritime Alps), in Italian (Piedmont) and nearby French territories (Andreone & Sindaco, 1989).

Being present in alpine meadows over 1500 m a.s.l. the active life of *S. lanzai* is conditioned by meteorological conditions, and therefore by the long permanence of snow.

In fact its main period of activity lasts only for the "alpine summer", beginning at the end of May and finishing usually in late September - early October, varying according to the particular climate of the year.

On the occasion of a visit made during September 1990 in one of the localities in which the species lives, some observations were made on the territorial and reproductive activities of this salamander. So, lacking altogether basic information about its biology I think it is interesting to refer to them.

The area of observation is an alpine moor and nearby rocks at about 2020 m.a.s.l., sited in the upper Po valley, "terra typica" of the holotype (see Nascetti *et al.*, 1988) (Figure 2).

The only other amphibian species present in this habitat is the common frog *Rana temporaria*.

If the space of a few hundred metres, during a storm, at least 60 individuals were observed, sexed and immediately released. In particular looking in an area with a radius of about 10 metres it was possible to identify about 5-6 salamanders. Nearby all the salamanders were males; only three females and no youngsters at all were observed. The high number of active animals was probably due to the particular meteorological conditions (rain, high humidity), since on other occasions a considerably lower number of animals was usually observed.

It is interesting to point out how the salamanders came out from their hiding-places (cavities under great rocks) and climbed over elevated places, where they stayed quite motionless, keeping raised the fore part of the body and looking with particular attention all around (Figure 3).

For several reasons I interpret this as a territorial and sexual behaviour. In fact, on one occasion I observed one couple in amplexus: the male moved staying under the female and embracing her forelegs with its own. In this behaviour *S. lanzai* is therefore similar to *S. salamandra* and *S. atra* (Fachbach *et al.*, 1975).

On another occasion I observed two fighting males in embrace, rubbing their heads one against the other. When one male tried to escape the other one quickly followed and embraced it again.

Taking into account these observations it is likely that, considering the high number of observed males, together with mating and territorial behaviour, *S. lanzai* most probably has a breeding period occurring in late summer.

In a recent paper (Andreone *et al.*, 1990b) it was pointed out that during the early phase

of activity (July) several youngsters were observed, together with a few males and a greater number of females, while at the end of the summer the majority of those collected were males.

It is therefore likely that *S. lanzai* may have a biennial reproductive cycle, with the mating activities at summer's end. So, the pregnancy lasts for the first year following mating and the young are born at the beginning of second year's summer (most probably in June). By the way it is obvious that further studies are necessary to confirm this hypothesis.

As previously said, *S. lanzai* is typical only of south-western Piedmont and nearby French territories. For this reason it should be considered rare and endemic, even if the status of each single population is not well known. Personally I believe that at the moment *S. lanzai* is not really endangered.

Firstly it must be remembered that it is an alpine amphibian (over 1500 m a.s.l.), living therefore in areas usually not affected by extreme antropization. Furthermore it does not breed in water but it bears well formed young directly on land.

By the way, its taxonomic status being unique there is the risk of collection and capture for scientific and museological purposes. On the other hand it must be emphasised that its capture is regulated by the regional law n.32/82, which forbids any capture of amphibians (excepting green frogs) in all territories of Piedmont, where the main populations actually known of *S. lanzai* live, the entity of French populations not yet being known at all.

The main risk concerns one population, that described in this article. This is because the alpine moor is afflicted by excessive car movements, as many people visit it in holidays and week-ends. Several cars and vans arrive in summer just in this area, and even if (fortunately) salamanders do not attract tourist attention, on wet and rainy days they move actively, just on the upper part of the asphalted road, and are easily killed by car traffic.

This area is proposed to become a regional park: one of the hypothesised measures of habitat protection is to stop the traffic at a lower altitude and allow access only by foot. This simple action will certainly preserve the area from further alterations and will contribute to the conservation of one of the greatest Lanza's Salamander populations.

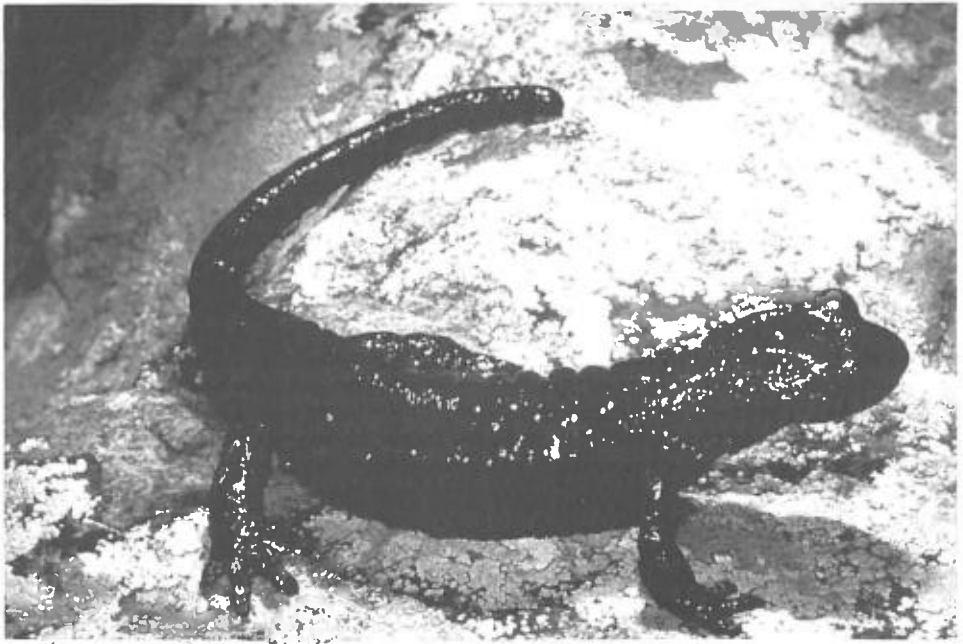


Plate 1. – Male of *Salamandra lanzai* (photograph by F. Andreone).



Plate 2. – Alpine moor at about 2020 m a.s.l. in south-western Piedmont (Cottian Alps, north-western Italy), habitat of *Salamandra lanzai* (photograph by F. Andreone).

#### REFERENCES

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