CAN A SALAMANDER CHANGE ITS SPOTS?

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Fire Salamanders, *Salamandra salamandra,* are very variable in body pattern. As juvenile salamanders grow so there are dramatic changes in spot patterns. Juvenile post metamorphic salamanders are often almost pure yellow in coloration, with a few black flecks. This soon changes as the size of the salamander increases. The yellow pattern breaks up to form discrete spots and stripes and these drift apart and change shape until the animal reaches adult size. It has been assumed that the body patterning of adult urodeles changes comparatively little and that these markings can be used as a means of identifying individuals eg. in the Crested Newt (Hagstrom, 1973). Whether this holds true for the Fire Salamander was tested by the authors quite by accident. In 1975 2.2 nominate race Fire Salamanders *Salamandra s. salamandra* originating from the former Yugoslavia were obtained via a herpetological supplier. These were apparently of adult size and in 1979 produced tadpoles (Wisniewski & Paull, 1986).

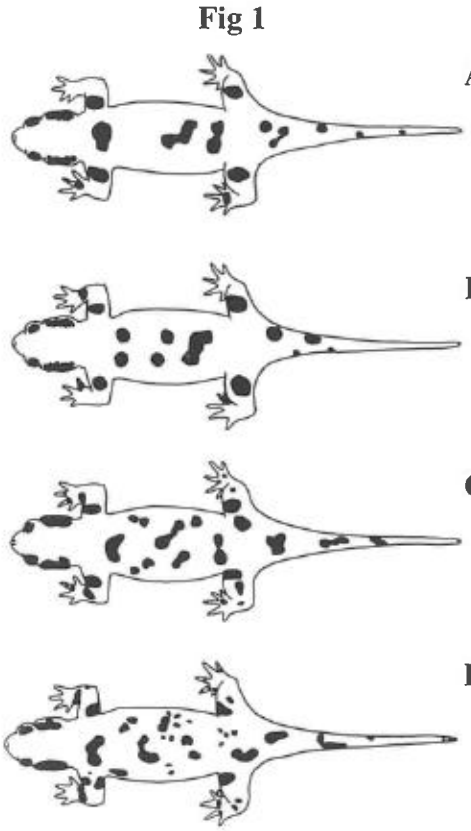

Fig 1. Body patterns recorded for two males A and B in 1982 and two young animals C, a female, and D a male in 1983.

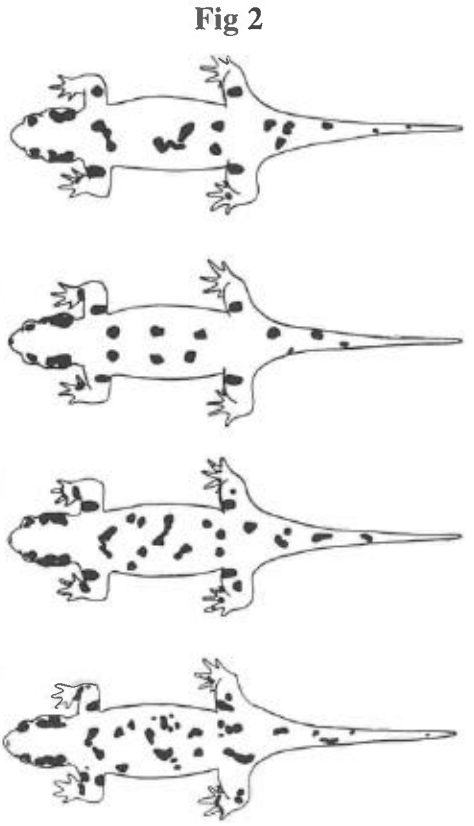

Fig. 2 Body patterns recorded for A to D in 1996.

In January 1982 the body patterns of the remaining 2.1 animals were recorded in order to distinguish them from other adult salamanders incorporated into the colony. In August 1983 the body patterns of the three remaining animals born in 1979 were recorded before they too were incorporated into the main colony (apparently at adult size).

In May 1996 the drawings were compared with the animals in the main colony. Of the original 2.1 adults the female had died but the two males were still recognisable. However, subtle changes had taken place in the extent and configuration of the yellow markings.

These changes involved the splitting and subsequent drifting or fusing of spots, relative reduction or increase in size of spots and "ghosting" or loss of spots. The latter should not be confused with the overall loss of colour sometimes seen in sick and dying animals which appear to suffer an inability to slough. No new spots appeared, at least on the dorsal surface, the only surface for which records were kept.

Splitting and drifting of spots can be clearly seen in animal A (original male) between the shoulders and mid-dorsum; in animal B (original male) on the lower dorsum and base of tail; in animal C (captive bred female) on lower dorsum and animal D (captive bred male) on mid and lower dorsum and base of tail.

Reduction of spot size can be seen in A at the base of the tail; in B on the right hind leg; in C on the parotoids and hind legs and D on the left foot and hind legs.

Increase of spot size can be seen in A on the right side of the lower dorsum.

"Ghosting" or loss of spots can be seen in A on the right side of the mid-dorsum, left front foot, right hind toes and tip of tail; in B on the hind toes and in C on the left hind toes.
Fusion of spots occurred in A on the lower dorsum.

In addition, the shoulder spot of D had taken on a very different form to the oval spot observed in 1983, possibly prior to splitting.

These results indicate that in the spotted forms of the Fire Salamander body patterns change relatively little over a period of twelve years or so, though changes do indeed occur. Individual animals can still be recognised. However in the striped forms of Fire Salamander breaking up of the pattern might present a more severe handicap to individual recognition.

REFERENCES

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