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Maximum size of the Spectacled Salamander, *Salamandrina perspicillata* (SAVI, 1821)

Salamandrina FITZINGER, 1826 is a genus endemic to Italy, discontinuously distributed from the northern Apennines (westernmost portion of Genoa province) to the tip of Calabria. The great majority of records is from the Tyrrhenian side, less records are from the Adriatic one (ZUFFI 1999). Until now *Salamandrina* was considered a monotypic genus with the sole species *S. terdigitata* (LACÉPÈDE, 1788). However, recent genetic studies indicate that the genus *Salamandrina* requires a split in two species named *S. terdigitata* (LACÉPÈDE, 1788) and *S. perspicillata* (SAVI, 1821) as suggest by MATTOCCIA et al. (2005) and NASCETTI et al. (in press). *Salamandrina terdigitata* lives in the southern portion of peninsular Italy while *S. perspicillata* occurs in the Central-Northern Italian Peninsula. The approximate borderline of these two specific entities passes through the Caserta province in the Campania region (ROMANO & MATTOCCIA unpublished). Distinguishing sexes in living animals is very difficult because this genus does not show clear dimorphism in this respect. However, males tend to be of smaller size and have different biometrical body

ratios than females (e.g., head length/ snout-vent length, tail length/snout-vent length) as reported by VANNI (1980), ZUFFI (1999) and ANTONELLI (1999). Total length (TL; i.e. from the tip of the snout to the end of the tail) of the Spectacled Salamander is usually 8-10 cm (VANNI 1980; ZUFFI 1999; ANGELINI et al. 2001). Until 2001 the maximum TL recorded in males and females were 9.6 cm (ANTONELLI 1999) and 11.6 cm, respectively (ZAGAGLIONI 1978; VANNI 1980). Later, ANGELINI et al. (2001) reported a maximum TL of 12.3 cm recorded in two females from different populations of *S. perspicillata* in the Lepini Mountains (Central Italy).

In the beginning of April 2005 we counted 254 egg-laying females in one single breeding site. The spawning site was a pooling spring feeding livestock watering places at 1050 m a.s.l. in the southern Lepini Mountains (Latium, Central Italy). One hundred and fifty *S. perspicillata* were caught and measured for TL and snout-vent length (SVL) with dial calipers (TL: mean \pm SE = 10.57 ± 0.02 cm; range 8.85-13.10). Among them were two females which surpassed the maximum length reported by previous studies (specimen A: TL = 12.8 cm, SVL = 4.6 cm, TL/SVL ratio = 2.78; specimen B: TL = 13.1 cm, SVL = 4.7 cm, TL/SVL ratio = 2.79). The size of the remaining specimens captured was equal to the previous maximum record (i.e. one specimen reached 12.3 cm) or smaller than 12.1 cm.

All animals were released at the place of capture just after the measuring. Student's t test indicated that female B was significantly larger than the others of the sample (one tailed t test; $df = 148$; $p < 0.001$). This specimen therefore can be considered an "outlier" and not representative of its population.

ANGELINI et al. (2001) reported that the averages of TL and SVL of the Lepini Mountain populations were larger than in salamanders from various other central northern Italian regions while biometrical data from southern Italy are not available. The averages of SVL and TL that we found were within the range reports for six Lepini populations, i.e. 3.54 - 4.21 cm and 9.01 - 10.61 cm, respectively (ANGELINI et al. 2001). These authors did not report the standard error or standard deviation of their mean

values and therefore a test to evaluate the distributional differences of biometrical data between the sample measured by us and those studied by these authors in the Lepini Mountains was inapplicable.

However, comparisons (Kruskal-Wallis) among means of TL attained by four populations from the Lepini Mts. (ROMANO & MATTOCCIA, unpublished data) resulted in highly significant ($p < 0.001$) differences. Ectotherms living under colder climate conditions tend to reach a larger size than their conspecifics living in warmer climates (e.g., RAY 1960; reviewed in ATKINSON 1994; PARTRIDGE & FRENCH 1996; ATKINSON & SIBLY 1997). Many authors provide data regarding the increase in body size with increasing altitude or latitude in other Urodela species (e.g., CAETANO & CASTANET 1993; HOUCK 1982). In contrast, other works revealed a more complex pattern and relationships among amphibian body size and environmental temperature, latitude and altitude, and found the larger specimens in lowland populations (e.g., SCILLITANI et al. 1992; VENICES et al. 1999). The largest specimens of *Salamandrina* were found in the Lepini Mountains (ANGELINI et al. 2001; this note). Anyway, these mountains are not a cold zone in comparison with other territories where the Spectacled Salamander lives (e.g., Northern Apennine). Breeding sites of this species are known to occur up to 1.500 m (BARBIERI & PELLEGRINI in press) and also in the Lepini Mountains they are found at elevations higher than 1050 m a.s.l. (CORSETTI 1994; ROMANO pers. obs.) Very poor biometrical data referring to high altitude populations is available; however sporadic measuring of specimens revealed always TL values below 12.1 cm (ROMANO unpublished data).

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