

Body size and life history traits of the fire salamander *Salamandra*  
*salamandra* from Poland

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**Supplementary material**

**Table S1.** Body length (STL) and body mass (BM) of adult fire salamanders *Salamandra salamandra* in the sampled populations from Poland. The Carpathian populations are presented in bold.

Site number	N (female / male)	STL				BM			
		female range	female mean (SD)	male range	male mean (SD)	female range	female mean (SD)	male range	male mean (SD)
1	38 (28/10)	13.9 – 17.5	16.17 (0.954)	14.8 – 17.2	16.12 (0.728)	13.2 – 32.7	24.19 (4.231)	18.7 – 23.5	21.17 (1.632)
2	95 (43/52)	10.1 – 17.5	13.95 (2.149)	10.3 – 18.1	15.16 (2.003)	6.5 – 35.1	18.11 (8.178)	6.0 – 31.5	19.85 (6.192)
3	85 (45/40)	10.9 – 16.8	14.52 (1.560)	12.3 – 17.5	14.85 (1.222)	7.5 – 27.5	19.14 (6.115)	10.5 – 26.5	18.15 (3.594)
4	83 (47/36)	9.9 – 15.9	12.59 (1.416)	9.7 – 15.4	12.60 (1.510)	6.4 – 24.5	13.71 (4.440)	5.5 – 23.5	12.34 (4.318)
5	183 (79/104)	10.0 – 18.0	13.90 (1.371)	10.2 – 21.0	13.59 (1.368)	5.5 – 28.5	18.31 (4.607)	7.4 – 21.0	15.23 (3.146)
6	77 (43/34)	10.4 – 16.9	14.70 (1.346)	12.9 – 18.3	15.22 (1.256)	10.5 – 35.5	20.26 (5.232)	6.7 – 30.2	21.25 (4.774)
7	90 (49/41)	-	-	-	-	5.3 – 29.5	18.06 (5.480)	6.0 – 24.5	14.97 (4.302)
8	N <sub>STL</sub> = 132 (74/58), N <sub>BM</sub> = 55 (33/22)	12.0 – 19.2	15.69 (2.056)	12.0 – 18.4	15.84 (1.511)	10.5 – 45.0	24.68 (9.773)	12.0 – 28.0	19.82 (4.064)
9	95 (51/44)	10.0 – 16.0	13.36 (1.283)	11.7 – 15.3	13.56 (0.969)	6.8 – 22.5	15.57 (3.710)	8.5 – 19.9	14.45 (2.799)
10	91 (39/52)	11.0 – 17.0	14.08 (1.350)	11.0 – 17.0	13.90 (1.624)	7.0 – 29.0	16.44 (4.528)	6.0 – 23.0	13.23 (3.721)
11	90 (45/45)	9.4 – 17.3	14.03 (1.530)	10.6 – 15.6	13.81 (1.202)	6.8 – 33.0	18.57 (5.948)	7.0 – 21.0	15.52 (3.259)
12	97 (44/53)	-	-	-	-	7.5 – 25.6	16.33 (5.212)	6.9 – 23.0	13.48 (3.572)
13	91 (64/27)	-	-	-	-	7.5 – 30.5	21.88 (4.800)	11.9 – 25.0	18.87 (3.680)
14	97 (67/30)	9.4 – 16.4	14.35 (1.348)	10.2 – 15.8	13.63 (1.331)	7.8 – 34.0	19.99 (5.004)	6.4 – 25.5	15.79 (4.620)
15	149 (60/89)	10.7 – 18.0	13.80 (1.544)	10.0 – 16.4	13.65 (1.219)	8.0 – 33.5	17.40 (5.929)	10.0 – 16.4	13.65 (1.219)
16	56 (18/38)	16.5 – 20.0	18.07 (1.087)	13.5 – 19.5	16.99 (1.246)	30.5 – 48.7	39.85 (6.69)	16.0 – 42.7	25.01 (5.036)
17	<b>59 (28/31)</b>	<b>11.6 – 18.9</b>	<b>16.69 (2.001)</b>	<b>10.6 – 19.2</b>	<b>16.01 (1.921)</b>	<b>7.3 – 51.7</b>	<b>32.18 (12.349)</b>	<b>6.8 – 42.0</b>	<b>22.03 (10.304)</b>
18	<b>39 (18/21)</b>	<b>9.8 – 18.7</b>	<b>16.21 (2.076)</b>	<b>12.7 – 17.6</b>	<b>15.87 (1.367)</b>	<b>6.8 – 48.0</b>	<b>27.45 (8.985)</b>	<b>12.0 – 36.0</b>	<b>24.79 (6.087)</b>
19	<b>51 (17/34)</b>	<b>10.1 – 19.6</b>	<b>16.55 (2.200)</b>	<b>13.8 – 19.5</b>	<b>16.65 (1.285)</b>	<b>6.4 – 39.0</b>	<b>25.91 (8.574)</b>	<b>14.0 – 32.0</b>	<b>24.259 (4.200)</b>
20	<b>6 (4/2)</b>	<b>12.4 – 18.0</b>	N/A	<b>15.4 – 17.0</b>	N/A	<b>14.1 – 41.6</b>	N/A	<b>25.7 – 30.1</b>	N/A
21	<b>41 (27/14)</b>	<b>14.7 – 20.5</b>	<b>17.29 (1.422)</b>	<b>14.2 – 19.2</b>	<b>16.04 (1.239)</b>	<b>17.0 – 44.0</b>	<b>30.11 (6.523)</b>	<b>16.0 – 35.0</b>	<b>25.91 (6.189)</b>
22	<b>48 (20/28)</b>	<b>13.6 – 19.7</b>	<b>17.27 (1.772)</b>	<b>12.5 – 19.1</b>	<b>16.70 (1.638)</b>	<b>13.3 – 40.1</b>	<b>28.60 (7.788)</b>	<b>11.8 – 36.7</b>	<b>23.71 (5.296)</b>
23	<b>46 (34/12)</b>	<b>12.9 – 20.3</b>	<b>17.62 (1.674)</b>	<b>13.8 – 18.8</b>	<b>16.82 (1.518)</b>	<b>14.0 – 44.0</b>	<b>30.84 (7.286)</b>	<b>18.0 – 37.0</b>	<b>26.5 (6.252)</b>

**Table S2.** Age structure of adult female and male fire salamanders *Salamandra salamandra* in the selected populations from Poland. The Carpathian populations are presented in bold.

Site number	N (Females / Males)	Age			
		Females		Males	
		Range	Mean (SD)	Range	Mean (SD)
1	38 (28/10)	5–10	7.29 (1.213)	6–8	6.90 (0.738)
2	38 (17/21)	5–12	7.94 (2.304)	5–13	8.62 (2.012)
3	29 (13/16)	4–9	6.69 (1.316)	5–9	7.50 (1.095)
4	39 (20/19)	3–12	7.65 (2.277)	4–11	7.21 (2.123)
5	46 (15/31)	5–12	7.67 (2.257)	4–11	8.45 (1.947)
6	45 (17/28)	4–10	7.00 (1.541)	6–16	8.96 (2.389)
7	38 (22/16)	3–10	6.59 (1.709)	4–10	7.19 (2.105)
8	51 (23/28)	2–8	4.22 (2.131)	2–9	5.04 (2.009)
9	45 (20/25)	5–11	7.45 (2.089)	5–11	8.68 (1.651)
10	46 (22/24)	2–11	6.18 (2.108)	2–11	4.83 (1.786)
11	47 (22/25)	5–10	7.55 (1.405)	5–12	7.64 (1.524)
12	48 (19/29)	5–12	6.95 (2.094)	4–12	6.45 (1.901)
13	51 (28/23)	4–12	7.93 (2.053)	5–14	8.83 (2.498)
14	45 (24/21)	5–10	7.25 (1.189)	5–9	7.24 (1.338)
15	51 (22/29)	5–10	7.27 (1.241)	4–10	6.44 (1.270)
16	52 (17/35)	6–12	8.71 (1.993)	2–10	7.00 (2.047)
17	<b>58 (28/30)</b>	<b>3–15</b>	<b>8.53 (2.349)</b>	<b>2–15</b>	<b>8.47 (2.623)</b>
18	<b>39 (18/21)</b>	<b>2–12</b>	<b>8.39 (2.524)</b>	<b>3–10</b>	<b>7.76 (2.047)</b>
19	<b>49 (16/33)</b>	<b>4–13</b>	<b>8.94 (2.542)</b>	<b>4–13</b>	<b>8.48 (2.152)</b>
20	6 (4/2)	2–12	N/A	8–10	N/A
21	41 (27/14)	6–15	9.19 (2.386)	5–15	8.36 (2.590)
22	47 (19/28)	4–12	8.89 (2.079)	4–11	8.36 (1.870)
23	46 (34/12)	4–16	10.03 (2.680)	4–13	8.75 (2.800)

**Table S3.** Estimates of parameters of growth curves (mean values of  $A$ ,  $K$  and  $t_0$  from bootstrap analyses  $\pm$  SEs are given), sample sizes (number of individuals) and  $R^2$  of models (the fit between observed values of body lengths and values predicted by the respective growth curve).

Mountain range	Sex	N	$R^2$	$A$	$K$	$t_0$
Carpathians	Females	196	0.92	$19.8 \pm 0.449$	$0.20 \pm 0.022$	$-1.3 \pm 0.291$
	Males	190	0.90	$18.2 \pm 0.349$	$0.26 \pm 0.027$	$-0.9 \pm 0.245$
Sudetes	Females	331	0.59	$20.1 \pm 1.210$	$0.13 \pm 0.023$	$-2.5 \pm 0.532$
	Males	383	0.52	$16.2 \pm 0.410$	$0.26 \pm 0.035$	$-1.2 \pm 0.369$

**Figure S1.** Bone cross-sections of phalanges of the fire salamander *Salamandra salamandra*. A – after first hibernation, B – 3 LAGs (= 3 years old), C – 7 LAGs, D – 9 LAGs, E – 9 LAGs. Abbreviations: bm – bone marrow, eb – endosteal bone, fn – nutrition canal, sf – Sharpey fibres (according to Kolenda et al., 2018).

