GROWTH IN RANA TEMPORARIA AND R. ARVALIS

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The growth in two frog species (Rana temporaria and Rana arvalis) was studied by means of: (1) The size distribution in the catch from pitfalls operated continuously for 2½ years. Due to individual variation in growth, a year-class could only be followed up to one year of age with this method. (2) Individual growth records from marked adult frogs recaptured during the same growth season. (3) Ditto, but recaptured during successive summers. All measurements are snout-urostyle. The study area is located in S Sweden (55°40′N, 13°30′E).

During the growth season, the mean growth in adult frogs was 0.03 mm per day (Rana arvalis, N = 19) and 0.08 mm per day (R. temporaria, N = 53). There was no difference between males and females. R. temporaria virtually ceased growing after 1st September. Too few captures made a similar analysis of R. arvalis impossible. In the catch from the pitfalls, the size-class of young-of-the-year was distinct. Young R. arvalis grew significantly from July to August but not from August to September (means of 17.2, 20.7 and 21.3 mm resp.). Young R. temporaria grew significantly from July through September but not from September to October (means of 14.3, 22.0, 23.6 and 24.0 mm resp.). When measured both intra- and inter-yearly, large frogs grew more slowly than smaller. When measured within one season, the linear regression of growth per day, g(μm), on the length of the middle of the growth period, L (mm), was g = -0.037 L + 0.041 (r = -0.75, N = 15, R. arvalis) and g = -0.037 L + 0.048 (r = -0.54, N = 55, R. temporaria). According to these equations, growth ceases completely at 52 and 67 mm resp. When measured on a yearly basis the linear regression of growth per year, G (mm), on the length of the frog in the first year, L (mm), is G = -0.58 L + 3.01 (r = -0.82, N = 17) and G = -0.73 L + 4.75 (r = -0.73, N = 13). According to these equations, growth ceases completely at 52 and 65 mm resp. The largest frogs measured in these populations were 56 mm (R. arvalis, 230 measured frogs) and 70 mm (R. temporaria, also 230 measured frogs).

The large spread in size of young (16–27 mm (R. arvalis) and 18–33 mm (R. temporaria) for frogs measured during the winter) shows that growth rate is individual. The data above show that the asymptotic growth limit (that I suggest exists for each individual frog if food availability is constant) also varies individually. For both growth rate and growth limit I suggest that genotypic and environmental factors influence the values for individual frogs.

If these data are used to construct growth curves for a 'mean frog', the following results are obtained: R. arvalis year 0: metamorphosis, I: 30 mm, II: 42 mm, III: 47 mm, IV: 50 mm, V: 51 mm. Fast growing and/or early maturing frogs might start breeding when not quite two years old, but most probably do not start breeding before they are three years old. R. temporaria: year 0: metamorphosis, I: 38 mm, II: 58 mm, III: 64 mm, IV: 65 mm, V: 65 mm. Fast growing and/or early maturing frogs might start breeding when not quite two years old, but most probably do not start breeding before they are three years old.

THE REPRODUCTIVE CYCLE OF UIPERA BERUS IN SW SWEDEN

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Investigations on the reproduction biology of Uipera berus from the west coast of Sweden have been in progress. The normal reproduction cycle U. berus spans over one year, if one male is able to mate every year. The spadegon genesis is non-active during the resting spermatogenetic cycles. At the end of June, the tubules are empty and spematocytes continue during the winter. In January, spermatogenesis is evident in the middle of March, and the activity starts again in late February. The mating period starts in April. The testis is largest dur full spermatogenesis in the spring and in the late summer, and the spermatozoa can be seen in the middle of the mating period.

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