

Need a Fast Frog?

From time to time embryologists, population biologists, or molecular biologists have expressed a requirement for an amphibian species with an exceptionally short developmental life cycle. Through literature searches and personal correspondence various species have been called to my attention. Several are actually available for laboratory use or as breeding stock, and are described below:

Ceratophrys ornata

1. Native to Argentina.
2. Sexually mature adults are large:
 - female = approx. 400 g
 - male = approx. 200 g
3. Food: liver strips, beef heart, crickets, meal worms, live mice (favorite). An aggressive eater, it will bite if provoked!
4. Eggs:
 - a. darkly pigmented (like Rana pipiens).
 - b. approx. 1.5 - 1.7 mm diameter.
 - c. tough jelly coats, but can be manually dejellied.
 - d. shed in large numbers.
5. Genome is reported to be octaploid (but a relatively small genome size).
6. Develops from fertilization to gastrulation in approx. 8 1/2 hrs at 30 C. Hatches in 28 hrs at 30 C.
7. Developmental rate can be slowed down at 14 C. (Reportedly will even tolerate 10 C for several hrs).
8. Tadpole is large - up to 3 1/2 in.
9. Egg develops to sexually mature adult in 3 1/2 - 6 mos.!
10. Larvae might display appendage regeneration capacity.
11. Oocytes possess large germinal vesicles, which are easily isolated!
12. Adults have teeth.

Rana adspersus (pixicephalus)

1. Native to South Africa.

2. Sexually mature adults are large:
 - female = approx. 350 g
 - male = approx. 1,000 g
3. Aggressive eater.
4. Eggs:
 - a. size = 1.1 - 1.2 mm diameter, similar to X. laevis.
 - b. darkly pigmented, similar to Rana pipiens.
 - c. soft jelly, easily manually dejellied.
5. Develops from fertilization to gastrulation in approx. 4 1/2 hrs at 37 C. Will hatch in 23 hrs at 37 C. Metamorphosis takes approx. 11 days.
6. Developmental rate can be regulated between 14 C - 37 C.
7. Neural plate may begin to form before gastrulation is complete.
8. Reaches sexual maturity in approx. 6 months.
9. Equipped for chewing! Top jaw with biters, bottom jaw with 3 teeth.

Xenopus tropicalis

1. Native to Tanzania.
2. Sexually mature adults are small:
 - female = approx. 30 g
 - male = approx. 15 g
3. Food: Xenopus frog brittle (Nasco); liver strips; beef heart; tubifex worms.
4. Eggs:
 - a. pigmentation similar to Xenopus laevis eggs.
 - b. small - approx. 1/3 to 1/4 diameter of Xenopus laevis eggs.
 - c. shed in large numbers.
5. Develops from fertilization to hatching in approx. 15 hrs at 26 C.

6. Temperature tolerance of eggs is 19 C to approx. 26 C.
7. Reaches sexual maturity in approx. 5 months.

Scaphiopus hammondi (spade foot toad)

1. Native to central California (foothills).
2. Sexually mature adults comparable size to Rana pipiens.
3. Food: crickets.
4. Eggs are approx. size of axolotl eggs (2.0 mm dia.).
5. Develops to metamorphosis in 14 days.
6. Tadpole is a vegetarian.
7. Reaches sexual maturity in approx. 5-6 months.

Each of the above are available from Bob Barnes, Central Valley Biological Supply, 1010 Sage Brush Ct., Gardnerville, Nevada, (702) 265-2843.

Dr. Ann Janice Brothers, Department of Zoology, University of California, Berkeley, California, 94720 (415) 642-9896 collaborated with Mr. Barnes to compile much of the information listed above. The fast developmental rates for Ceratophrys and Rana adspursus embryos were recently verified by G.M.M. Mr. Barnes offers limited numbers of each species for sale. Research facilities - on a limited scale - are available at Central Valley Biological Supply (Nevada) for brief visits.

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