

Brood size of the stygobiotic asellid isopod *Caecidotea pricei* from a spring run in West Virginia, USA

Daniel W. Fong

Department of Biology, American University, Washington, D.C. 20016, USA.
Email: dfong@american.edu

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On March 20, 2006, I visited Caskey Spring in the Whittings Neck area of Berkeley County, West Virginia, as part of an ongoing project to locate the stygobiotic cirolanid isopod, *Antrrolana lira*. The spring forms as water wells up inside a spring house and continues as a low gradient stony-bottomed spring run approximately 1 m wide and 4-5 cm deep. The temperature of the water on that day was 11°C. The gammarid amphipod *Gammarus minus* was the dominant benthic macroinvertebrate in the spring run, and occurred at a density of about 150-200/m² of substrate. I failed to find *A. lira*, but two stygobionts, the crangonyctid amphipod *Stygobromus allegheniensis* and the asellid isopod *Caecidotea pricei*, were present in the spring run. Rough estimation by eye indicated *S. allegheniensis* occurred at a density of about 0.25/m² and *C. pricei* at 3-4/m². They were likely flushed from their subterranean habitat by snow melt and precipitation in late winter and early spring.

Closer examination revealed that about 15% of the *C. pricei* specimens were ovigerous females carrying embryos in their ventral brood chamber. I decided to document the brood sizes from these individuals, because the basic life history parameters for most subterranean species are unknown. I collected 24 ovigerous females in separate containers, brought them to my laboratory, and placed them each in individual Petri-dishes provided with a piece of boiled maple leaf, and housed them in a 10°C chamber in constant darkness. I checked them twice per week and removed any newly released young to avoid cannibalism. Two females died before releasing young. Newly released isopods were about 1 mm in body length. I also measured the body length of each female, after she had released her entire brood, to correlate with the brood size. All isopods were returned to Caskey Spring at the end of April.

Body length of the females ranged from 10 to 17 mm with a mean of 13.7 mm and a standard error of 0.43, and brood size ranged from 9 to 100 with a mean of 41.1 and a large standard error of 3.99 (Table 1). There was no dependence of brood size on body length ($R^2 = 0.048$). Interestingly, the brood sizes showed a preponderance of even numbers, as only 5 of the 24 values were odd numbers.

A possible error in the brood sizes could have resulted from the females having released some but not all of their young in the field prior to capture. However, the entire brood of any female was released usually within a 2-3 day

span, and the earliest date of young being released was 6 days after capture (by female number 2). Furthermore, the smallest brood was 9 young released by female number 4, and she did not begin releasing her young until 10 days after capture. Therefore, I am confident that each female had released her entire brood in the laboratory. It was possible that the females could have cannibalized some of their young prior to my separating the young from the females. This second source of error would have been minimized, however, by my having separated the young from each female every 3 to 4 days. Certainly, the values reported here are representative of the natural brood size of *C. pricei*.

Table 1. The brood sizes and body lengths (mm) of female *Caecidotea pricei* isolated in the laboratory. All females were visibly ovigerous when collected on March 20, 2006. Date (month/day) is when newly released young were first observed. Females 6 and 8 died before releasing any young.

ID	Date	Body Length	Brood Size	ID	Date	Body Length	Brood Size
1	4/1	16	43	14	4/4	13	25
2	3/26	14	36	15	4/1	11	16
3	4/6	14	24	16	4/6	15	80
4	4/1	16	9	17	4/1	15	42
5	4/1	17	38	18	4/6	11	32
7	4/4	16	100	19	4/8	13	38
9	4/1	12	58	20	4/1	12	26
10	4/6	11	42	21	4/1	10	39
11	4/1	14	36	22	4/4	14	40
12	4/4	12	48	23	4/1	17	42
13	4/1	16	40	24	4/4	13	51

The brood sizes reported here seem large for a highly troglomorphic stygobiont, although very little information on brood size of other stygobiotic asellids are available for comparison. Seidenberg¹ reported 5 to 6 eggs from females between 6.5 to 9 mm in body length from a stygobiotic *Asellus* species from Illinois (which was later identified as *C. kendeighi*), and that brood size did not depend on body length. Lewis² dissected 25 female *C. stygia* from Mammoth Cave, Kentucky, ranging from 3.5 to 7.5 mm in body length, and observed between 13 to 34 eggs or developing embryos, and his data showed a significant linear regression of brood size on body length. Clearly, data on brood size from additional stygobiotic species would be needed to discern whether any pattern exists.

Literature Cited:

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