

varied from $\frac{1}{4}$ to 1 cc. of a 3% solution, and was given every 15 minutes for from 2 to 5 hours.

The level of blood sugar was raised in every experiment. Increases in fat occurred in 7 experiments and therefore were not so consistent as those obtained with adrenalin.¹ The concentration of the lactic acid of the blood increased in only 5 experiments. The determination of the total solids of the plasma was unsatisfactory because of hemolysis, an effect of ephedrine. The results of a typical experiment are presented below.

TABLE I.
Effect of Ephedrine on Blood Glucose and Lactic Acid and Plasma Fat.

	Blood sugar	Blood lactic acid	Plasma fat	Hemo-crit	Dosage
Pre-injection	110	44	705	56	
2 hours	183	59	1120	56	$\frac{1}{2}$ cc. ephedrine every $\frac{1}{4}$ hour for 4 hours.
4 "	134	60	807	64	
6 "	125	71	696	63	
8 "	125	48	697	64	

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Growth and Sexual Maturity in *Daphnia magna*.

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Several workers have stated that the number of pre-adult instars in Cladocera is constant within the species. Banta and Brown¹ report that *Moina macrocarpa* has 3 pre-adult instars. Agar² reports that *Simocephalus gibbosus* and *Daphnia carinata* have 3 and 4 respectively but adds that a small percentage of the individuals become mature in one less than the normal. Such is not the case with *Daphnia magna* which has 5 or more pre-adult instars. Calvert³ found similar conditions for the Odonata. Sexual maturity appears to be correlated with size in *D. magna*.

¹ Himwich, H. E., and Petermann, M. L., *Proc. Soc. Exp. Biol. and Med.*, 1930, **27**, 814.

* The data for this paper are the results of work done at the Zoological Laboratory, State University of Iowa.

¹ Banta, A. M., and Brown, L. A., *Proc. Nat. Acad. Sci.*, 1929, **15**, 71.

² Agar, W. E., *J. Exp. Biol.*, 1930, **7**, 349.

³ Calvert, P. P., *Proc. Am. Phil. Soc.*, 1929, **68**, 227

Individual females of the same clone have been reared on 2 different culture media. The animals used were isolated within 8 hours after their release from the mothers and placed in vials containing 30-36 cc. of the media. These were kept at room temperature (20°-25°C.). One of the media was fresh manure-soil medium.⁴ The other was old manure-soil medium to which one drop of dilute oatmeal mush was added daily to each vial. In the former one-third of the fluid in each vial was replaced semiweekly by fresh medium.

Following isolation each individual was observed daily, cast carapaces recorded, and measurements of the body length taken of each animal. No appreciable difference was found in body length when 2 or more measurements were made on the same individual during any one instar. This is in agreement with the findings of Agar.²

The results show that the individual apparently must reach a certain size before it becomes adult, *i. e.*, before the first clutch of eggs appears in the brood chamber. The number of pre-adult instars is not correlated with the size of the individual during the first instar. For the one medium the number of pre-adult instars was constant at 5—the lowest number observed. For the other, the oatmeal modification, the number varied from 5 to 8. The variation in the number of pre-adult instars was probably due to the amount of food available. In the fresh manure-soil medium very few large ciliate protozoa were found, while in the other they were numerous. These probably reduce the number of smaller organisms in the culture without themselves being available as food so that the *Daphnia* went into a state of partial inanition. Similar conditions have been observed when the cultures were infested with large numbers of the annelid *Æolosoma*.

It appears, therefore, that the number of pre-adult instars is largely dependent on the food supply available. In all likelihood a minimum number of pre-adult instars exists for each species of Cladocera. An optimum food supply must be available to reach this state and any excess of this would represent that which the animal cannot assimilate.

⁴ Banta, A. M., *Science*, N. S., 1921, **53**, 557.