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Reducing Power of Hemolymph from the Roach, *Periplaneta americana* Linn., with Special Reference to Coagulation.

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Hemolymph (blood) coagulation of the roach, *P. americana*, involves cytolysis of the hemolymph (blood) cells. This paper reports experimental results bearing on the question: do reducing substances enter the plasma from the coagulating cells? The Hagedorn-Jensen blood sugar micromethod¹ was used to determine total reducing power, expressed as mg. glucose per 100 cc. hemolymph. Hemolymph samples were obtained from severed antennae, a single sample coming from a single animal. Ten samples were from animals submerged in water at 60° for 10 minutes to fix the cells, 10 from animals subjected to glacial acetic acid vapor until cell fixation had occurred and 10 samples of "serum" were obtained from untreated animals by collecting the normal hemolymph under oil to prevent drying, letting stand 10-15 minutes to allow cell coagulation to occur and then removing the uncoagulated fluid with a fine glass capillary tube. The "serum" was transferred from the capillary tube to a 0.1 cc. micropipette, graduated to 0.001 cc., used also to measure the volumes of samples of uncoagulated hemolymph. All of the samples were introduced from this pipette into the tube for precipitation of cells and proteins, as required by the method.

All of the animals treated with heat and acid to inhibit coagulation and half of the untreated animals were imagos; the others were large nymphs. The mean total reducing powers and their standard deviations are 63.2 ± 10.2 for the heat-treated imagos (whole blood), 57.3 ± 15.7 for the acid-treated imagos (whole blood), 65.5 ± 20.5 for the untreated imagos ("serum"), 65.3 ± 9.1 for the untreated nymphs ("serum"), 65.4 ± 16.3 for the untreated animals and 62.0 ± 14.4 mg. "glucose" per 100 cc. hemolymph for the whole group of 30 animals.

These results indicate that (1) the mean total reducing power, expressed in terms of glucose, of the hemolymph plasma of this roach is of the order of 62.0 mg. "glucose" per 100 cc. This is probably greater than the true "blood sugar" value. (2) The total reducing power of the hemolymph plasma is not significantly altered

¹ Peters, J. D., and Van Slyke, D. D., "Quantitative Clinical Chemistry," Vol. II. Methods, 1932.

by (a) fixation of the hemolymph cells with heat or acetic acid treatments or (b) the occurrence of cell coagulation; this implies that no quantities of reducing substances, detectable by the method used, pass from cytolysing hemolymph cells to plasma during the 10-15 minute coagulation period following sampling. (3) The total reducing powers of imaginal and large nymphal hemolymph plasmas are essentially the same.