Total Iodine Concentration and Neoteny in the Barred Tiger Salamander

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This experiment tests one of the leading hypotheses on the causes of salamander neoteny. Under ordinary circumstances, Barred Tiger Salamanders (Ambystoma mavortium) metamorphose into terrestrial adults, but sometimes populations of this species retain their gills and become sexually mature in the larval stage. Retaining juvenile features, such as larval characteristics in the Barred Tiger Salamander, is called neoteny. A proposed hypothesis for the cause of neoteny in salamanders is the lack of sufficient concentrations of Iodine in the surrounding environment. Lack of Iodine prevents sufficient production of T3 and T4 hormones by the thyroid required for metamorphosis. In this experiment, water samples were collected from four different water bodies, half of which contained neotenic populations of the Barred Tiger Salamander and half of which contained metamorphosing populations. These water samples were tested with the Red Sea Iodine Pro Test Kit to create a color change according to the total Iodine concentration. Standard solutions of Iodine were also created using the supplies in the test kit and were tested the same way. A spectrophotometer was then used at 480 nm to quantify the color change, and a standard curve was created using a quadratic regression line with the standard Iodine solution results. This standard curve was used to determine the total Iodine concentrations in the water samples, which were compared using bar graphs. This experiment suggests that there is no correlation between total Iodine concentration in the water and the presence of neotenic populations of the Barred Tiger Salamander.

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