

Effect of temperature on larvae growth - lab report example

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Effect of Temperature on Larvae Growth

The paper "Effect of Temperature on Larvae Growth" is a good example of a lab report on science. Abstract This experiment aimed at investigating the relationship between larvae growth and temperature. The various facts about forensic entomology have been discussed as a build-up to this experiment. The experiment involved placing a constant number of larvae in beakers which were then placed in different temperature conditions. From the experiment, it was found that the beakers that were under a mean temperature of 18 deg C recorded the shortest time of 1.5 days and the adults emerged. On the other hand at the average temperature of 6 deg C the longest time of 5 days was taken for the adult to merge.

Introduction Forensic entomology known as medico-legal is the study that is linked to a human corpse in order to establish elapsed time since the time of occurrence of death (Goff, 2000). From the evidence gathered from insects, it can be established whether a body has been moved to a second site after death or if there has been any form of disturbance of the body in the due cause, either by wild animals or by the killer who returned to the scene of the crime (Catts, 1990). However, forensic entomologists are usually interested in establishing the elapsed time since the occurrence of death. A forensic entomologist will be involved in cases that have occurred at least 72 hours or more. This is due to the fact that there are other forensic methods that are more accurate than obtained from the insect. For a time period of about three days, the evidence obtained from the insects that are associated with the body is found to be very accurate and in some cases, it may be the only that can be used in the determination elapsed time since the

occurrence of death or when the body was put into conducive conditions of decomposition (Arnoldos, 2005). After a period of time, the eggs which are laid in batches on the corpse hatch into a first instar larva which feeds on the corpse and molts into second instar larva. With continued feeding of the larva, there will be the development of the third instar larva which is identified from the size and the number of spiracles (Goff, 2000; Blackith, 1990). In all this process the environmental temperature plays a very big role in determining the rate at which these processes take place. If the surrounding temperature goes lower than a specific point the growth activity may cease or even death may occur. The third instar will continue feeding for some time then it stops and starts wandering away from the corpse and settle at the ideal place to pupate. From the pupae stage, there is metamorphosis to the adult stage (Goff, 2000; Blackith, 1990). In investigations involving death, having an accurate estimate of the time of death or the time that has elapsed since the occurrence of death (PMI) is vital. The estimation of PMI is of great importance in investigating suspicious death as it will assist in the reconstruction of events and the circumstance under which the death occurred (Arnoldos, 2005; Blackith, 1990). This may help in linking the suspect to the victim and also may help to establish how credible are the statements given by the witnesses. In addition to its importance in criminal cases, it also applies to civil cases. The estimates always have implications in the judiciary in matters of insurance and inheritance whether the death is due to natural cause, by accident, or by suicide. There different methods that are put into use in order to give an estimate of PMI. Postmortem changes like settling of blood, the cooling of the

body, and the decomposition of the body are used by the pathologist when as a way to determine the time elapsed since (Goff, 2000; Blackith, 1990).

It is possible to work out the specific base temperature for a particular species from a laboratory set up. This is done by monitoring the insect's growth rate at some selected experimental temperatures. The calculations are then made bearing in mind that lower temperatures of growth will result in slow growth in the insects. By having a plot of temperature against 1/total number of days it is possible to establish the base temperatures. The total number of days is the time between when the larvae emerge from the egg and the point at which the adult emerges for a different range of temperatures. By extending the line graph to the x-axis this makes it possible to read-off the x-axis. This point is the base temperature for the particular species and this method where the base temperature is established graphically is known as linear approximation estimation method.

MethodThe base of the tank was covered with vermiculite and was moistened with precaution being taken to avoid flooding. 25ml of pig's liver was added into the 100ml beaker with fluent being applied inside of the top 1 cm of the beaker. Into the beaker 10 first instar fly larvae were placed then the beaker was placed into the tank. The temperature reading-button was then placed into the tank and the waste of a pair of ladies' tights were stretched over the top of the tank. 50% of each of the tights legs were cut off and tied into knots and then the tank was placed into a constant temperature site. These procedures were repeated for four other tanks with the tanks being placed in different temperature sites. The time taken for

each of the populations of flies to reach adulthood was recorded. ResultsThe results from the experiment indicated that the growth of larvae to adulthood varied with the temperature of the chamber. The temperatures from the chambers were averaged to get the values in the table below. From the table it can be seen that the longest time it took for the larvae to develop to adulthood was 5 days and this was when the average temperature in the chamber was lowest at an average of 6 deg C while the shortest time was 1 day and a half and the average temperature recorded was 12 deg C. At the average temperature of 15 deg C it took 3 days for the adult to emerge while at 16 it took 2 days for the adult to emerge. Temperature611151618Number of days54321. 51/Number of days0. 20. 250. 30. 50. 7 DiscussionFrom the graph, it is clear that low temperatures will make the period required for the larvae to grow to adulthood longer. It can also be observed that the base temperature is approximately 2. 5 deg C. The base temperature is very important as it is used in the calculation of post-modern interval (PMI). The base temperature is a theoretical point where the temperature will cause a lack of growth in the larvae. This point will vary from species to species. It will also vary even when dealing with the same species as a result of experimental errors. The growth rate at different temperatures can be very important when establishing the time a victim died when investigating the crime. This can also help in establishing if the body could have been moved from a different place to its present site. For example, if a body is found in a freezing condition and yet it contains some dead larvae it could be a clear indication that it could have been transferred to its present location when it had started decomposing.