

Crayfish - lab report example

[Science](#), [Biology](#)



Crayfish

Lab Report on Crustaceans- Crayfish Introduction Animals dominate various biomes of the world. Therefore, habitat determines the capability of the animal to maintain internal body temperature despite fluctuations in the environmental temperature. Such factor categorizes the animal to homoeothermic or ectothermic group. According to Zuo et al., ectotherms are species whose body temperature changes with the changing environmental temperatures (1840). Thus, the change in the body temperature will affect the biochemical reactions in the body of an ectothermic species. Ectotherms are many and dominate most part of the world. Although, the report will mainly focus on the Class Crustacea and specifically narrow to crayfish. Effect of Climate and Weather Fluctuations on Physiological Process of Ectotherms Especially Crustaceans Change in climate and weather affects the physiological and biochemical process of ectotherms because ectotherms' body temperatures are dependant to the surrounding environmental temperature. Climate change is an impact of global warming hence causing change of habitat for some organisms. Zuo indicates that ectothermic animals develop faster in warmer temperature and mature with smaller body sizes. For instance, a species mature at the rate of 20% smaller with 10°C increase in temperature (1840). Although, allocation of energy and materials during ontogeny determines the maturity of a species, increased environmental temperature also influence the body size of crustaceans at maturity. Sokolova and Lannig explain that an increase in temperature by few degrees centigrade results into change in ectotherm distribution in the world and even extinction (182). Fabry

describes that climate change due to increased carbon dioxide has led to increased ocean acidification (415). Since, exoskeleton of crustaceans mainly consists of calcium carbonate the low pH in the ocean will lead to dissolution of the exoskeleton. As a result, the dissolution of exoskeleton leads to profound effect on crustacean population. Sokolova and Lannig elucidate that increased temperature affects the solubility of dissolved oxygen in water. Therefore, increased temperature increases the level of dissolved oxygen in water increasing physiological and biochemical activities in the body of the crustaceans. Crayfish are freshwater invertebrates of population approximately 500 dominating freshwater ponds, streams, lakes, swamps and marshes all over the world. Helfrich classifies crayfish as organisms that belong to Phylum Arthropoda, Class Crustacea and Order Decapoda (2). The Crayfish body is divided into cephalothorax and abdomen. The fusion of the head and thorax formed one part known as cephalothorax, covered by a carapace. The abdomen has six segments and a fan-like tail called pleopod. Crayfish have compound eyes with numerous eyelets supported in a stalk and two antennae known as the short jointed inner antennules and the long outer antennae. The function of the inner antennules is to taste water and locate food while for outer antennae is for sense of touch. The overlapping mouthparts and tooth-like mandible crush and shred food during ingestion. Crayfish have ten legs where the first pair of legs has pincers for defence, mating, burrowing, and egg laying in females, and feeding. After the first pair of legs, there are four pairs of walking legs. The first two pairs of walking legs are tipped with small pincers, which search into cracks and holes for food, used for eating, walking and grooming.

The last two pairs of walking legs are for mating and walking. Crayfish can degenerate legs when broken. Crayfish body have exoskeleton therefore, crayfish grow during the process of moulting. Most crayfish have incomplete metamorphosis and r-selected survivorship curve. Male crayfish have gonopods while females have depressed sperm receptacle. Definition of Temperature Coefficient According to Zuo, temperature coefficient implies the increase in temperature by ten degrees Celsius rate of change in biological and chemical system in an organism (1840). Compensatory Mechanisms that Maintain Normal Rates for Biological Processes in Crayfish Helfrich posits crayfish having a shorter lifespan (4). For that reason, crayfish lay many eggs and take a shorter time to reach maturity such as less than three months. This is to ensure survival of most species. Crayfish can degenerate their legs when broken hence ensuring continuous function of the legs such as movement, defence and burrowing. According to Helfrich, another compensatory mechanism in crayfish is the fact that most crayfish are nocturnal and actively feed at night and cloudy days (3). This mechanism helps crayfish to avoid increasing temperatures during the day to maintain the normal rates of the biochemical process in the body. Costanzo mostly invertebrates such as crayfish initiate freezing in the INA found in the in the haemolymph (Web). Most crayfish hibernate during extreme weather conditions to reduce physiological activities in the body to reduce demand of energy and reduce dessication. The small body size in most crustaceans enables them to move at a higher speed with the help of the fan-like tail called pleiopods to avoid predators and to use less energy during movement.

Conclusion Although, ectotherms are organisms whose body temperature

depends to the surrounding environmental temperatures, the organisms have managed to survive even in the increasing global temperatures.

Therefore, wider temperature range may lead to loss of many habitats for most of ectothermic species increasing the number of species loss.

Crustaceans such as crayfish have been widely affected by change in water temperature and chemistry despite their compensatory mechanisms.

Crayfish are sensitive to change in water chemistry. Global warming that leads to climate change facilitate change in water chemistry. Therefore, curbing climate change will save most ectothermic species and significantly sustain the food web.

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