Evolution and natural selection lab

Science, Biology

Evolution and Natural Selection Lab Evolution Lab Your affiliation Q1. The “ tree of life” is a phylogenetic illustration of the origin of the various species of animals from an ancient single organism dating from millions of years. It shows the location of every animal in advancement relative to other organisms and relative to the original ancestral organisms (Evolution and Natural Selection, 2010).

Q2.

Geologists had no idea of how old the earth was but the emergence of the study of rocks especially sedimentation rocks started giving light to the possibility that the earth was older than the Bible claimed. Geologists postulated that the current happenings were a reflection of the past. Archaeologists found that there were fossil remains of extinct animals as they dug deeper into the strata. They could see similarities in the different fossils but could not comprehend why or how they existed. Darwin influenced the theory of evolution in his study of finches and tortoises of the Galapagos Islands. Though different, Darwin could note similarities that converged the different birds to the same ancestors. The tortoise in the different islands though seemingly similar, Darwin noted that they had distinct variation. His breakthrough was in 1859 when he published the book On the Origin of Species (Evolution and Natural Selection, 2010).

Q3.

First, Darwin views a species as organisms that can vary over time and space. He says that the equivalent of today’s organisms that existed earlier in life varied in form and behavior from those of today, as do those in distanced geographic regions today. Fossils also differ thus supporting the

claim (Evolution and Natural Selection, 2010).

Second, he says that all organisms have shared common ancestors. The relations can be traced over millions of years ago. Different organisms diverged from their common ancestry to form their own independent species. Sharing of common ancestry is manifested by the similarities that different species share today e. g. we share common ancestry with chimpanzees dating back around eight million years back. Lastly, Darwin puts forth that evolution is steady slow process. Fossil records showed this form of process plus the emergence of unprecedented novel organisms in Darwin’s time (Evolution and Natural Selection, 2010).

Q4.

Natural selection entails variation, inheritance, excessive speed of population growth and differential survival and reproduction. Related organisms vary in form and behavior and include variations in body size, facial markings, hair color and so on. Inheritance involves passing of certain traits constantly from parent to offspring. The rate of propagation per year exceeds what the resources can support bearing up competition. Competition consequentially leads to substantial mortalities. Those individuals with traits best suited for the tussle for the limited resources is able to bear more offsprings than others translating to differential survival and breeding (Evolution and Natural Selection, 2010).

Q5.

Natural selection demands fulfillment of two requirements: the trait must have heritable variation and secondly the variation must bestow a benefit in the struggle for resources (Evolution and Natural Selection, 2010).

Q6. The constant variations within a population will favor only those individuals with variations suited for competition for resources. These will reproduce more thereby increasing frequency of the trait. The traits are thus passed sand amplified down the generations (Evolution and Natural Selection, 2010).

Q7.

According to Darwin, the phenomenon could be related to the selective predation of white moths. This prompted the formation of melanin to enable them camouflage from the black background. This adaptive trait was passed down the generations. Those that could ot develop the adaptive trait were eaten up by the predator birds (Evolution and Natural Selection, 2010).

Q8.

In Kettlewell’s experiment, the light moths were best suited in the non-industrial woods since they possessed a light color identical to the tree barks. The predatory birds were unable to predate on them less easily than the dark moth in the same habitat. According to Darwin, this variation of possession of a light color against a light background favored the survival of the light moth as opposed to the dark moth. The trait was passed on to the descendants. Those individuals possessing the trait were able to survive and reproduce more than the dark moth leading to a larger population of light moth and a progressively smaller population of dark moth. The industrial woods were dark with soot offering camouflage to the dark moth while exposing the light moth to predatory birds. The population of light moth progressively diminished due to predation. The dark color trait in dark moths suited them to the habitat. They were able to reproduce the trait in their

multiple offsprings. The dark moths in this case were able to survive and reproduce in incomparable numbers to their counterparts light moth (Evolution and Natural Selection, 2010).

Q9.

Darwin postulates that through adaptive radiation the diverse types of Galapagos finches came to be from a single finch ancestor. Through existence of different niches that were not occupied, the already competing birds had room to develop adaptations to colonize the unoccupied niches. The modification of the beaks to different feeding mechanism was imperative. It hence led to the development of seedeaters' beaks for the grains and seeds niche and insect eaters' beaks for the insects' niche. Geographical isolation intensified these variations since different birds in different ecological island with its specific niche would not come into contact and possibly mate (Evolution and Natural Selection, 2010).

Q10.

According to Darwin, adaptive radiation involves development of many different species that are suited for different ecological niches from a common species. In the Galapagos finches the Darwin postulates that the different kinds of Galapagos finches have a common ancestor far in South America. The Galapagos Islands had unoccupied niches and the birds were therefore required to lower the competition in their original niche. Through adaptive radiation the finches developed beaks suited for the available unoccupied niches for instance, seed eating or nectar-sucking. Since the birds originated from the same ancestral species, they could mate and create confusion between their different niches. This was avoided by the

geographical isolation of the different niches; the birds could not converge at any given time to mate. The different populations in their different niches mated to produce individuals adapted to their specific niches (Evolution and Natural Selection, 2010).

References

Evolution and Natural Selection. (2010, October 10). Evolution and Natural Selection. Retrieved May 10, 2014, from http://www. globalchange. umich. edu/globalchange1/current/lectures/selection/selection/selection. html