

2ND ZOOLOGY STUDY GUIDE

adaptive radiation

allopatric speciation

The Beak of the Finch—Peter & Rosemary Grant

diploblastic triploblastic

directional selection

diversifying selection

Domain—Kingdom—Phylum—Class—Order—

Family—Genus/Genera—Species

Erasmus Darwin—Lamarck—Linnaeus—Hutton

—Buffon

founder effect

Galápagos Islands / Finches / Tortoises

gene flow

gene pool

genetic or population bottlenecks

genetic drift

geographic isolation

Hardy-Weinberg hypothesis

inheritance of acquired characteristics

The Malay Archipelago —Alfred Russel Wallace

multicellular ingestive heterotrophs

natural selection

nomenclature

numerical taxonomy

On the Origin of Species —Charles Darwin

On the Principle of Population —Malthus

organic evolution

paleontology & fossils

phenotypes / genotypes

Principles of Geology—Lyell

protostomes vs deuterostomes

selection pressure

stabilizing selection

sympatric speciation

systematics

taxon, taxa, taxonomic

uniformitarianism

Voyage of the H.M.S. Beagle —Charles Darwin

In the Galápagos Archipelago there are three species of large (a meter plus) lizards, two land iguanas (*Conolophus subcristatus* and *C. pallidus*) and a kelp-eating marine iguana (*Amblyrhynchus cristatus*). They are vegetarian and similar to land iguanas like *Ctenosaura* of the South American mainland, although there are no marine iguanas anywhere but in the Galápagos.

From www.rit.edu/~rhrsbi/GalapagosPages/MarineIguana.html

In his diary, Darwin noted that:

“The black Lava rocks on the beach are frequented by large (2-3 ft) most disgusting clumsy Lizards. They are as black as the porous rocks over which they crawl & seek their prey from the Sea. Somebody calls them ‘imps of darkness’. They assuredly well become the land they inhabit.”

Marine iguanas are widely distributed throughout the islands. Although the different populations vary in size and color, they are all considered to be a single species. Marine iguanas are vegetarians, feeding primarily on sea weed in the intertidal zone. The biggest individuals, typically males, however, will swim out past the breakers and feed underwater. Their dives are typically shallow, 1.5 - 5 m, but large adults dive to depths of 15 m or more. Dive times are usually only a few minutes long, but there are records of iguanas being submerged for more than half an hour. Darwin described how a sailor tied a rock to an iguana on a line and threw it into the water. When he pulled it out an hour later, the iguana was still alive.

Marine iguanas possess a variety of physical and physiological characteristics that permit their unusual feeding habits. Iguanas in general have considerable swimming abilities, which are improved upon in the marine iguana. Their tails are flattened and they swim by lateral undulation of their bodies, with their limbs held to the side (check out the underwater scene in “Godzilla”!).

Their claws are long and sharp by comparison to the land iguana, to enable them to cling to rocks along the shore, and resist being pulled away by heavy waves. Presumably these same claws enable them to cling to their underwater feeding sites. The genus name of the marine iguana, *Amblyrhynchus*, (*amblys* = short, *rhynchos* = nose) is derived from the characteristically blunt snout, which allows them to more efficiently scrape algae off of the rocks with their razor sharp, three-cusped teeth.

Describe how a species of kelp-eating marine iguanas might have evolved on an oceanic archipelago like the Galápagos.

Explain the statement that not all evolutionary change is adaptive.

How does it occur that a dangerous trait like bright coloration becomes more common in certain bird species?