

Evolution – Darwin's Finches

Pos - identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

NaG - pupils should also appreciate that variation in offspring over time can make animals more or less able to survive in particular environments

WS - pupils might analyse the advantages and disadvantages of specific adaptations

On the Galapagos Islands in the Pacific Ocean, there are a variety of different finches, which vary in the shape and size of their beaks. It is believed that a few seed-eating finches were blown from South America to the Galapagos Islands many years ago. The distance between the islands meant that the finches on different islands could not fly between them and interbreed, so the populations on the different islands reproduced between themselves and gradually evolved to suit their new habitats. The food available on the different islands varied and the finches had to evolve beaks which could take advantage of the food supplies available to them. These birds, although nearly identical in all other ways to mainland finches, evolved different beaks. Their beaks adapted to the type of food they ate. Different finch populations evolved to eat different food sources. Some finches on some islands evolved thin, sharp beaks that helped them to eat insects and the blood of larger animals; on other islands finches evolved large, sturdy beaks ideally adapted for eating seeds, berries and nuts. A scientist called Charles Darwin collected some of these finches when he visited the Galapagos Islands, and it is often stated that the finches were key to the development of his theory of evolution.

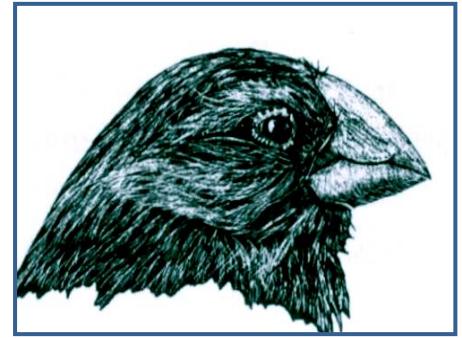
The Galapagos finches helped Darwin solidify his idea of **natural selection**. Natural selection is the process in nature, according to Darwin's theory of evolution, by which the organisms best able to evolve and adapt to their changing environments tend to survive. Animals that fail to adapt, as food and climates change, die out and can become extinct! Species that survive, like the finches, breed and have offspring that can also take advantage of the local food supplies and their populations grow and thrive. If the finches, when entering their new Galapagos habitats, failed to evolve quickly and take advantage of their new food supplies (by adapting their beaks), then it would have been very likely that the finches would have died out.

Location of the Galapagos Islands



The large ground finch

The large ground finch evolved a large broad beak which it uses to feed on hard seeds and nuts. Woody nuts are its main food source. It forages either on the ground or in trees and bushes for its food. The islands where the large ground finch lives is abundant in plants that produce hard seeds and nuts.



The small ground finch

The small ground finch evolved a small broad beak which it uses to feed on soft seeds and nuts, although it is also known to eat flowers, buds, young leaves, and the occasional insect. Unlike the large ground finch its beak would not be strong enough to crack and eat hard nuts and seeds. It forages either on the ground or in low vegetation. The islands where the large ground finch lives is abundant in plants that produce soft seeds and nuts.



The sharp-beaked finch

The sharp-beaked ground finch has evolved a beak which is small and sharp. This beak allows this finch to feed off the blood of other 'larger' birds such as masked boobies, red footed boobies and blue footed boobies. The sharp beaked finch will also jump on the back of other finches and suck their blood. This is unique amongst birds and the sharp-beaked ground finch is famed for these extraordinary feeding habits, so much so that it has also earned it the sinister pseudonym of the 'vampire finch'!



Questions

- 1) How do scientists think the original seed eating finches arrived in the Galapagos Islands?
- 2) Why did the finches have to evolve their beaks in order to survive?
- 3) Darwin used the term 'Natural Selection' to help him explain his theory of evolution. What did Darwin mean by the term Natural Selection?
- 4) Look at the three pictures of Galapagos finches below. One is of a large ground finch, another of the small ground finch and another of a sharp-beaked finch. Identify these finches, cut them out and paste them into your books and explain how you were able to identify them.



5) Other species of birds have also had to evolve over time in order to survive and carry on their species. Part of this evolutionary process has involved their beaks. Birds have to have beaks that are specially adapted to suit the food supplies found within their habitats. Birds have evolved beaks to help them eat meat, nuts, seeds, fish, berries and insects.

The birds below have all evolved beaks to help them survive in different habitats and take advantage of the different foods available in those habitats.

Research each of these birds, identify the habitats in which they are found and identify what they eat. Explain how their beaks have evolved into the perfect tool to help them with their diets.

