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Darwin's Finches

The phrase 'Darwin's Finches' is one that has entered language as a byword summing up the processes of natural selection.

Most people know that the theory showed how one species of finch, a 'common ancestor', evolved into many different species to fill a variety of vacant ecological niches on the Galapagos Islands.

There is a little more to it than that, with Darwin not realizing the significance of these finches until he compounded his theory some time later.

Darwin brought back many samples from the Islands, and thought that the finches found across the different islands making up the group were all different species.

It was not until Darwin's Finches were properly identified and studied by the famous ornithologist, John Gould, that Darwin began to realize that a more complex process was going on.

Gould realized that they the finches all belonged to a related group of buntings, comprising 12 sub-species.



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The Galapagos Islands

The Galapagos Islands are an isolated archipelago lying nearly 1000km off the coast of Ecuador. Their isolation long ago ensured that none of the species found in South America were found here.

However, wind and sea currents brought across many seeds, plants and insects which began to build up an ecosystem.

It is likely that the South American ancestors of the Darwin's Finches [1] were blown off course by strong winds.

Most of these birds would have been blown out to sea and died, but some must have managed to land on the Galapagos Islands, almost devoid of animal life. Here they began to spread out across all of the individual islands and breed.

Ecological Niches

The process did not end here, as competition began to dictate the course of development.

Populations of birds on different islands became isolated from each other and a gradual accumulation of small adaptations to the particular environment led to the population's characteristics drifting apart.

In the case of Darwin's Finches, the main adaptation was in the shape and type of beak, as the birds adapted to the local food sources on each island.

Some developed stronger bills for cracking nuts, others finer beaks for picking insects out of trees, one species even evolving to use a twig held in the beak to probe for insects in rotten wood. Each small adaptation gave a competitive advantage and so the characteristic spread through the population.

The Origin of Species

Darwin used this example, and others, to formulate his theories of natural selection.

In a nutshell, the theory postulated that these individual isolated populations would diverge to such an extent that they would be unable to produce viable offspring if they bred, the main definition for becoming a new species.

Whilst evolution is now believed to be a lot more complicated than a gradual accumulation of adaptations, Darwin's theories are still the basis of evolutionary biology and were a truly groundbreaking scientific [2] body of work.

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[1] http://en.wikipedia.org/wiki/Darwin%27s_finches, [2] <https://explorable.com/what-is-the-scientific-method>, [3] <https://explorable.com/users/martyn>, [4] <https://explorable.com/darwins-finches>