



Spanish explorers named the Galápagos Islands after the Spanish word for saddle referring to the shape of the tortoise's shell. The Galápagos giant tortoise is endemic to the Galápagos archipelago, which is located near the equator in the Pacific Ocean about 1,000 km (620 miles) off the coast of Ecuador. These long-lived behemoths are the most recognized symbol of these islands and can live past 150 years, exceed 300 kg (660 lbs) and attain a shell length of 1.2 meters (4 feet) or more. In 1835, while on his 5 year long voyage on the HMS Beagle, Charles Darwin visited

these islands and was forever changed by that experience. On each island, Darwin found unique reptiles, plants and birds that developed in isolation from each other such that they differed in distinct ways from those on adjacent islands. The natural variation in shell pattern of the Galápagos tortoises helped Darwin frame the concept of evolution and tackle the problem of how new species are formed.

Galápagos tortoises exhibit what evolutionary biologists call "island gigantism," a phenomenon common to many island dwelling vertebrate species. Gigantism evolves when there are no other similar animals to compete with for food and where there is no need to hide from predators.

Unhindered by predators for millennia, the ideally adapted giant tortoises once numbered in the hundreds of thousands; now some forms are extinct and the rest are all imperiled. Seventeenth-century buccaneers and nineteenth-century whaling ships decimated tortoise populations. Owing to their resilience aboard ships where they could live without food or water for long periods of time, visiting sailors would gather as many tortoises as their ships could hold, especially the more easily captured females during egg-laying season. More recently, introduced mammals such as feral pigs and goats, dogs, cats and rats threaten modern tortoise populations. A captive breeding program at the Charles Darwin Research Station has successfully brought some tortoise populations back from the brink of extinction.

As with the Galápagos giant tortoise, humans too have evolved. *Understanding Evolution* is a simple, concise account of the scope and significance of evolution and provides an introduction to the principles and process of evolution. This non-encyclopedic text is centered around the major concepts of evolutionary biology and provides relevant applications to the human species. This new edition is expanded and updated to include a wealth of new ideas that have been fostered by new fossil revelations and the revolution in molecular biology and DNA technology that has impacted virtually all fields of inquiry.

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