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Characteristics of Island Fauna

Islands surrounded by vast stretches of sea support unique fauna depending upon the location of the island and its history of connection and separation from the mainland. Based upon the geography and history of the islands, they can be grouped into two categories, namely, Continental islands and oceanic islands.

Continental Islands. They are located in the continental self and separated from the mainland by sea that is less than 200 m deep. They connect to the mainland during the ice age when sea level goes down by that measure and provide broad corridor to the animals to migrate. Hence their fauna shows similarities with the mainland fauna and is derived from it. Recent continental islands. Examples: Britain, Japan, Tasmania, Sumatra, Java, Borneo, Taiwan and Sri Lanka. The separating sea between the islands and the mainland is less than 200 m deep and they have been repeatedly connected and disconnected to the mainland. Ancient continental islands. Examples: Madagascar and New Zealand. They were connected to the mainland in the ancient past, sometime in the Mesozoic period but have never had any connection with the mainland ever since. Sea separating them from the mainland is very deep and hence even lowering of the sea level during ice age does not connect them to the mainland.

Oceanic Islands. Examples: St. Helena, Galapagos, Easter Islands, Fiji, Azores, Bermuda, Mauritius, Seychelles, Tristan da Cunha and Andaman-Nicobar Islands. Characteristics. They are generally the islands of volcanic origin far away in the sea which never had land connection with the continents. Strong winds prevail on these islands forcing insects to become wingless. Flora and fauna is different from the nearest mainland, although some of it may have been derived from there. Freshwater fishes, amphibians and mammals are rare or absent. Most likely mammals on these islands are bats, rats and insectivores. Birds also have a tendency to become flightless as in the case of Dodo in Mauritius. Lizards and turtles have a tendency to become giants as on the Galapagos Islands.

I. Island ecosystems: characteristics.

- The isolation of the ecosystem causes the fragility of itself and the high rate of endemic species.
- The difference between continental and oceanic islands: The continental islands are bodies of land that lie on the continental shelf, and most of them are result of rift of the continent or entrance of seawater in it. Oceanic islands sit on the oceanic shelf and they are result of volcanic activity or bending of the plates during the tectonic movements. One of the key to understand the special biodiversity on islands is the origin of them. Having already or not fauna and flora at the formation of island is a deciding factor of the future biodiversity. For example, think about bird species in UK (continental islands) versus Hawaii (oceanic islands).

The 5 most important features of islands ecosystems are:

1. Smaller number of species than continental surfaces with the same area.

2. Endemisms.

They have a high rate of endemism. There are 2 kinds of endemisms:

- Relicts, that means they survive on islands meanwhile on continental areas disappeared. For instance, Drago of Gran Canaria (*Dracaena tamaranae)* is an endemic relict to Canary Islands related to Drago (*Dracaena draco*).

Drago of Gran Canaria (*Dracaena tamaranae),* by scott.zona in Flickr (some rights reserved).

- Endemisms of new emergence by speciation on the islands. For example, Tajinaste Picante (*Echium auberianum*) is an endemic species to the top of Teide which emerged when the Canaries have been formed.

Tajinaste Picante (*Echium auberianum*), by Jörg Hempel, on Flickr (some rights reserved).

3. Different biotic communities.

For instance, the most frequent case is the lack of predators. That's very important to understand the vulnerability of islands and other characteristics of these ecosystems.

4. Gigantism and dwarfism.

There are a lot of example of giant and dwarf species from islands, as the Galápagos giant tortoise and Japanese wolf we mentioned before. Other example of giant species is Giant weta (*Deinacrida* spp.), an endemic "cricket" from New Zealand whitout wings and which can reach 20 cm long. In contrast, the Island fox (*Uorcyon littoralis*), an endemic species of Channel Islands to California which is the smallest fox to North America (70 cm long including the tail).

How can we explain the increase and decrease of body size in island animals? In 1964, Foster J. B. proposed the called "Island rule", by which gigantism could be a consequence of lack of predators combined with a strong intraspecific competition, so bigger sizes would be selected. Dwarfism, in turn; coul be explained by lack of enemies in an environment with limited resourses, which could lead to a strong intraspecific competition, situation where smaller sizes would be favorable.

5. Birds and insects without flying capacity.
Very common birds and insects who can't fly live on islands: they might lose their flying capacity when they arrived to islands or emerged on islands from birds and insects who could fly. This is the example of the Giant weta before, the Galápagos penguin (*Sphenicscus mendiculus*) or the Kiwi (*Apteryx* spp.)

Examples

Fauna of Madagascar

This is an ancient continental island, 260 miles east of Africa and supports dense tropical vegetation. The fauna lacks the variety of Africa.
Mammals. Only 5 mammalian orders are present, namely, Insectivora (one family), Chiroptera (bats), Primates (3 families of Prisemians, lemurs and aye-aye), Rodentia and Carnivora that is represented by civets.
Birds. There is large number of endemic birds and 4 families are exclusive which include helmet birds, cuckoo roller and roteoles. Ostriches, secretary birds, hornbills, woodpeckers of the mainland Africa are absent here.
Reptiles. There are Chameleons, spiny lizards and rough-tailed snake (Uropeltidae). Agamid and Lacertid lizards, turtles and poisonous snakes are absent.
Amphibia. There are only tree frogs (Polypedatidae) which are shared with Africa but 4 genera are endemic.
Fishes. There are no freshwater fishes here.

Fauna of New Zealand

This is an ancient continental island, 1000 miles south-east of Australia.
There is absence of many mainland animals and relics of ancient vertebrates are present.
Mammals. There are no native mammals except 2 families of murid bats which have reached here through flight.
Aves. The flightless birds include kiwi, rails and owl parrot *(Kakapo).* There is a flesh-eating kea bird that feeds on the kidneys of sheep by making a hole on the back. Giant moas have become extinct recently in 13th century. Flightless goose and wrens are also extinct. Wattle birds are endemic.
Reptilia. The living fossil *Sphenodon,* commonly called Tuatara exists here. There are no snakes but geckos and skinks are present.
Amphibia. Amphibians are represented by the frog, *Liopelma.*
Fishes. Strictly freshwater fishes are absent.

Fauna of the British Islands

This is a group of recent continental islands which got separated from the mainland Europe about 7000 years ago.
Mammals. There are hedgehogs, shrews, moles, red fox, wild cat, two species of deer that includes red deer
(Cervus elephas scoticus), hares, one rabbit, rodents and bats. However, there are no hamsters, lemmings, bears, ibex, wolves, beavers and reindeers of the mainland.
Aves. Only red grouse *(Lagopus)* is endemic. Other birds are migratory in nature.
Reptiles. There are 3 species of snakes that include grass snake, adder and smooth snake and two species of lizards (brown and green sand lizard and limbless lizard *(Anguis).* There are no crocodiles and turtles.
Amphibia. Only 6 species of amphibians are present, namely, 3 species of salamanders, 2 species of toads and one species of frog.
Fishes. Perches, pikes, carps and loaches are present.

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