Species Arrival to Galapagos

http://www.galapagos.org/about_galapagos/species-arrival-and-evolution/, Set 24

A Small Ground Finch shows off his meal. The 13 species of Galapagos Finches have played a major role in evolutionary science. *(Photo by Joe Italiano)*

Why the Galapagos Islands are Unique

Evolutionary Biologists are fascinated by island ecosystems and the clarity with which the species that inhabit them illustrate evolutionary processes. For this reason, as well as a world-changing historic visit from a man named Charles Darwin, the Galapagos Islands are quite arguably the most studied archipelago in the world.

The Galapagos Islands also have a unique set of environmental conditions that set them apart from all other island groups in the world. Their sunny equatorial position on the globe combined with their location amid the cool Humboldt and Cromwell ocean currents allows these special islands to display a strange mix of both tropical and temperate environments, which is reflected in the complex and unusual plants and animals that inhabit them.

Species Arrival

Five to ten million years ago, the tops of underwater Galapagos volcanoes appeared above water for the first time about 600 km from mainland Ecuador in the middle of the Pacific Ocean. Those volcanic peaks were completely devoid of plant and animal life. All plants and animals that are now native to the islands must have arrived to the islands originally through some form of long-distance dispersal.

When considering the diversity of species that do inhabit the Galapagos Islands, it is important to note how "unbalanced," in comparison to continental species diversity, the variety of Galapagos species are. For instance, there are many native reptile species, but no amphibians; there is an abundance of land and sea bird species, but very few mammals. When considering plants, those with large flowers and big seeds are absent while grasses and ferns abound.

There are two main ways for species to make their way to remote islands (aside from any methods involving humans). The first method is **by air** in the form of flying or being blown by wind, and the second method is **by sea** while swimming or floating, sometimes with the aid of rafts of tangled vegetation.

BY SEA

It is likely that the ancestors of present-day Galapagos animals that are good swimmers (sea lions, sea turtles, penguins) actually swam their way to the islands with the help of some swift ocean currents. On the other hand, it is believed that many of the reptiles and small mammals (rice rats) were carried to the islands from the South or Central American mainland on rafts of vegetation. The vast majority of such rafts would have sunk well before they ever reached Galapagos, but it would have only taken a handful of successful rafts to wash ashore to explain the present reptile diversity in Galapagos. This "raft" theory of arrival also explains why there are no native amphibians, few mammals, and many reptiles in the Galapagos Islands – reptiles are the best adapted to deal with the harsh salty and sunny conditions of weeks at sea.

Coastal plants, such as the mangroves and saltbushes of Galapagos, have seeds that are salt tolerant, and those seeds are, therefore, likely to have arrived by sea as well.

BY AIR

Wind is thought to have played a major role in transporting spores of the lower-form plants, such as ferns, mosses, and lichens, to the Galapagos Islands. Vascular plants with heavier seeds are quite scarce in Galapagos because those seeds would have had a more difficult time traveling by wind — with the exception of those plants with plumed seeds designed exactly for wind transport. This explains why members of the dandelion family (*Compositae*) are found throughout Galapagos.

Many small insects, and even tiny snails, could have easily been blown by the breeze. The weaker-flying land birds and bats (2 species) likely arrived with the help of the wind. However, land bird species in Galapagos represent only a tiny fraction of those living on the mainland, and this is because it would have been a very difficult journey for the few who did make it.

Sea birds, generally excellent fliers over long distances, simply flew their way to the islands. Birds likely brought with them hitch-hiking plant seeds or propagules that were attached to their feathers or feet, or even in their guts.

Making Roots

The mere arrival of an organism to the Galapagos Islands is just one piece of the early survival puzzle. Organisms also had to be able to establish themselves once there, and, most importantly, to go on to reproduce. Scientists can only guess that many plant seeds accidentally made their way to Galapagos, were deposited in an unfavorable area, and perished soon after arrival. Not surprisingly, those plant species that were most successful at colonizing the Galapagos Islands were those of the "weedy" variety with wide tolerances for varying environmental conditions.

One more problem facing new plant colonizers to the Galapagos Islands was pollination – many plants rely on insects or animals for pollination, and the chance of both a plant and its pollinator arriving to the islands together was unlikely. This can explain why there are so few showy flowering plants, which mostly require animal pollinators, but there are many wind-pollinated plants in the islands.

Quite simply, because animals are mobile, they have always had an advantage over plants in that they could move to more favorable areas on the islands, if such areas existed for them.

Arrival of Species to the Galapagos Islands TODAY

In the last few centuries, humans have taken the place of birds as the primary source of new introductions of plants and animals to the Galapagos Islands. Unfortunately, many of the human introductions have been detrimental to previously established native or endemic wildlife – for example, harmful species such as fire ants, goats, and blackberry have all caused great harm to one or more of Galapagos' iconic long-established pioneering species.

Read more about the challenges associated with Invasive Species in GC's Conservation section of the website.

(Note: Much of the information above was gathered from Galapagos: A Natural History *by Michael H. Jackson.)*

Clase 15: Species Arrival to Galapagos

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A: APROXIMACIÓN AL TEXTO

1. **Observa**

- las partes del texto: traduce títulos y subtítulos
- ilustraciones
- convenciones gráficas
- organización del texto

B. I. ANALIZA LAS EXPLICACIONES:

Los textos narrativos y los Tiempos Pasados

Los textos narrativos presentan sucesos que tuvieron lugar en el pasado, incluye el relato de acontecimientos que se desarrollan en un lugar a lo largo de un determinado espacio temporal. Se observa en estos textos el predominio de los Tiempos Pasados (Simple, Continuo y Perfecto). Otro elemento lingüístico característico es el uso de Conectores, cuya función es mostrar relaciones lógico-temporales entre los sucesos que se narran.

El Tiempo Pasado Simple se usa para expresar sucesos que comenzaron y terminaron en el pasado.

Observa la conjugación del verbo *to be* en Pasado Simple

Afirmativo	Negativo	Interrogativo
I was	I was not	Was I?
You were	You were not	Were you?
He was	He was not	Was he?
She was	She was not	Was she?
It was	It was not	Was it?
We were	We were not	Were we?
They were	They were not	Were they?

Los verbos lexicales (principales) en inglés pueden ser **regulares** o **irregulares**

Los verbos regulares en voz activa agregan ***-d, -ed*** o ***-ied*** a la base del verbo para formar su pasado y participio pasado:

Infinitivo	**Pasado**	**Participio Pasado**
create	created	created
work	worked	worked

study	studied	studied

Los verbos irregulares toman distintas formas:

Infinitivo	**Pasado**	**Participio Pasado**
cut	cut	cut
build	built	built
grow	grew	grown
see	saw	seen

Para formular preguntas se usa el Auxiliar *did*. Este auxiliar, al igual que *do* en el Tiempo Presente, NO tiene traducción.

Observa:

***Did** you **work** yesterday?* *Yes, I **did**. I work**ed** all day yesterday.*

¿Trabajaste ayer? Sí. Trabajé todo el día ayer.

En el texto aparecen algunas construcciones verbales de Condicional Perfectos con *WOULD* y *COULD, para indicar acciones que se presume pueden haber sucedido:*

(l.35) …*would have sunk…..*: (tales balsas)…se habrían hundido…

(l.35/36) ….would have…taken…: habría tomado…

(l.48) …could have been blown…: podría haber sido arrastrada (por el viento)

BII. ACTIVIDADES PARA REALIZAR EN PARES O GRUPOS:

II.1. Traduce las siguientes oraciones. Subraya los verbos en pasado:

1. When the Charles Darwin Foundation was created in 1959, the human population in Galapagos was minimal
   ……...

……
.

2. Tourism was essentially non-existent; fishing was at subsistence levels only; the agricultural community was small; and the Research Station *was being built* by young scientists and local residents.

……

……

II.2. Identifica las oraciones en tiempo pasado en las líneas que se indican y tradúcelas:

(l.17):……..

(l.19)……

(l.32):……..

(l.34):……

BII. ACTIVIDADES DE COMPRENSIÓN LECTORA:

Responde las preguntas de acuerdo a la información del texto:

1. ¿Por qué se dice que las Islas Galápagos son “únicas”? (l.6-15)
2. ¿Cómo fundamenta el autor que las especies que habitan Galápagos están “desequilibradas” con respecto a las que habitan el continente? (l.21-25)
3. ¿Cómo se cree que llegaron las especies a las islas?
4. Complete las oraciones:

a. Es probable que especies que son buenas nadadoras hayan llegado a las islas…..
b. Se cree que los reptiles y pequeños mamíferos……..……
c. La teoría de la “balsa” explica……

5. Resuma y explique con sus palabras cómo se pueden haber desplazado las especies por aire

Lectura extra: lea y comente los dos últimos subtítulos (l.55-75)