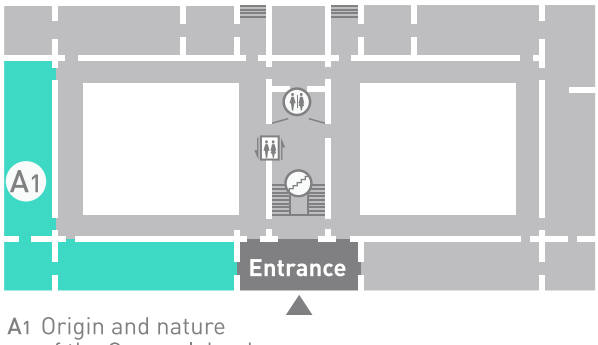
ENG

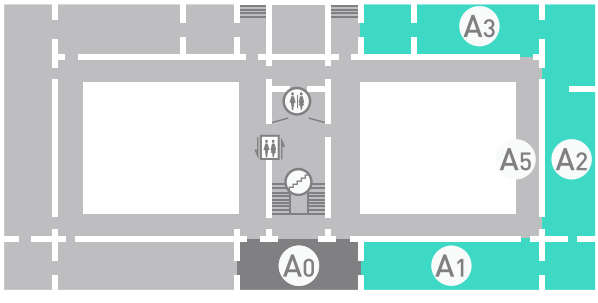
# NATURAL HISTORY

## GROUND LEVEL




A1 Origin and nature of the Canary Islands

## 1st FLOOR




A0 Evolution and speciation

A1 Botany

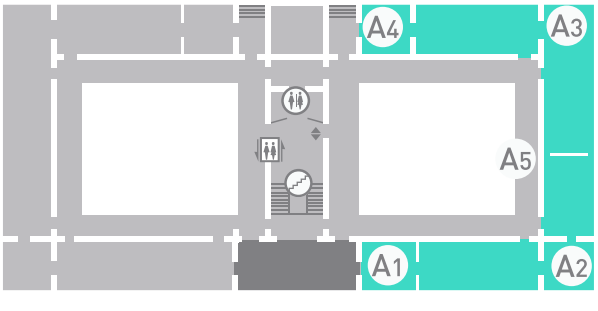
A2 Terrestrial Invertebrates

A3 Terrestrial Vertebrates

A4 Classroom Teaching

A5 A unique bugs

## 2nd FLOOR




A1 Let us preserve our heritage

A2 Minerals, rocks and fossils

A3 Marine Biology

A4 Classroom Teaching

A5 Meteorites

MUNA
MUSEOS DE TENERIFE NATURALEZA Y ARQUEOLOGÍA
ciencias naturales

CABILDO DE TENERIFE

www.museosdetenerife.org

MUNA

MUSEOS DE TENERIFE NATURALEZA Y ARQUEOLOGÍA

ENG

## MUSEUM OF NATURE AND ARCHAEOLOGY

The current Museum of Nature and Archaeology began with the creation, by the Tenerife Island Council, of the Museum of Natural History in 1951 and the Archaeological Museum in 1958, following the acquisition of important naturalistic and archaeological collections. Currently, the pertinent collections of both `founding museums´ are exhibited at these premises.

The building that houses the Museum of Nature and Archaeology, one of the most important cultural centres in Tenerife, was originally the Hospital of Our Lady of the Forsaken. Its construction began in 1745 and it underwent major architectural redevelopments until the last work on its expansion in 1920. The part including the main façade, which was remodelled in the late 19th century, is one of the most prominent examples of Canarian Neoclassical architecture and perhaps the masterpiece of the architect Oraá y Arcocha.

By 1979, the work had begun on its restoration and adaptation as the Museum and Centre of Cultural Activities, and in 1982 rooms were set up, which allowed the Museum to exhibit its natural history collections for the first time.

Inside the building, four courtyards of equal size provide brightness to the galleries. Around two of the courtyards, that overlook the main façade from both sides of the hall, approximately 32,300 ft2 have been allocated to the permanent exhibition: the Archaeological Museum collection surrounding the leafy courtyard of Manuel de Oraá and the Museum of Natural History collection along the walkway that encloses the courtyard of Las Palmeras.



## 1st FLOOR: NATURAL HISTORY

In 1951, the **Insular Museum of Natural History** was created, that was supplied, in its beginnings, with collections from very different sources—although its most important foundation was part of the collections from the former Benítez Museum—which expanded over the next years thanks to the contributions from local scientists. However, the Museum did not open until the inauguration of the Entomology Section, in early 1962. Its central venue was located in an old building, in an area that would later become the urban park Parque de la Granja de Santa Cruz de Tenerife, until it was moved to its current premises in 1974.

### BOTANY

#### 1.1.txt Plants and naturalists

This reconstruction of an ancient scientist's study shows us a brief overview of the history of botany in the Canaries. Nearly one hundred illustrations of endemic plants of our archipelago are displayed here. They have mostly been drawn by authors from the 19th century, considered the 'Golden Age' of Canarian botany.

The central interactive module provides comprehensive information on Tenerife's most common plants, both native as well as plants that have been introduced and reverted to the wild.

#### 1.2.txt Forests of Tenerife

This room is dedicated to the three main forest formations of the island, i.e., thermophilic forest, laurisilva or laurel forest, and pine forest.

The twelve most representative trees of the Canary flora are discussed individually on different panels.

The model of Tenerife depicts, through more than 1,000 fibre optic light points, the limits of potential and current areas of these forests. By pressing the button, first the original extension of each of them, and then their current area is displayed.

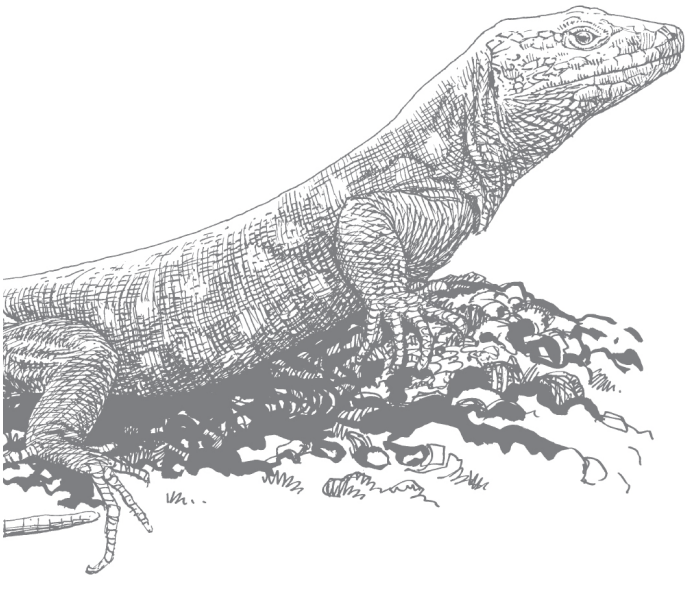
### Terrestrial invertebrates

#### 2.1.txt Introduction

Invertebrates are a heterogeneous group that includes the majority of terrestrial animals of the Canary Archipelago, among which the group of insects stands out, that make up 76% of the total population.

The three rooms that make up this section allow us to approach their world:

Upon entering the room Entomologist's study, you can meet the first European naturalists who visited the islands because they were drawn by their rich fauna, as well as the first entomologists in the archipelago. Moreover, if you go to the room Theatre of the Invertebrates, you can pretend to be an entomologist in a fun classification game. Finally, if you visit the room Life and Work of Terrestrial Invertebrates, you will learn about their biology, their relationship with the natural environment and their impact on our lives.



## 2.2.txt Butterflies of the world

Moving forward through the large room of Terrestrial invertebrates, we find a cabinet displaying insects, the dominant group in the fauna of any part of the world. Drawers installed in a kind of double dresser are authentic entomological boxes designed to conveniently view specimens.

The front side drawers contain insects of the Canaries; drawers on the back side include a sample of world's butterflies. Open them! Enjoy watching how **nature and art converge in an explosion of colours and whimsical shapes!**

## 2.3.txt Some unique creatures

This time, we turn the spotlight on some invertebrates that tell us about their life. Take a look at the most feared one, the black scorpion.

Did you know that scorpions do not naturally occur on the Canary Islands? Yet this scorpion species lives in the coastal area of the city of Santa Cruz de Tenerife.

What has really happened was the result of human activity. It is presumed that this species, indigenous to Central America, was accidentally introduced into the pier of Santa Cruz de Tenerife in the late 19th century or the early 20th century, due to heavy shipping traffic, especially with Cuba.

# Vertebrates

## 3.1.txt Mammals and reptiles

Native Canarian mammal species include various bats and a shrew typical of the eastern islands, which arrived naturally. Another important group of these vertebrates is formed by species introduced by humans in more or less recent times, such as cats and rats, which for various reasons could have caused the extinction of several endemic species, including giant rats and small birds.

The evolution of Canarian lizards—one of the most striking examples worldwide—is closely related to the volcanic past of the archipelago. All lizards are endemic species of very different size and colour, a legacy of primitive continental lineage that reached the eastern islands millions of years ago by its own means. Mullets and geckos, also exclusive to the Canary Islands, have experienced remarkable processes of colonisation islandwide, following very different patterns.

**These mummified lizard remains** prove the existence of huge sauria in the past, closely related to other large size species that survives in several western islands. Except for the still common and well distributed giant lizard of Gran Canaria, the other giant species are facing serious preservation problems, that have made it necessary to implement expensive plans aimed at ensuring their future.

## 3.2.txt Canary Islands and migratory birds

The strategic position of the Canaries on migration routes of European birds has led to a steady increase in the record of such species, which now exceeds 350. Some are regular visitors staying for weeks or even months, while others, such as the greylag goose and the purple heron,

are true rarities that have been observed on very few occasions in recent decades.

The migratory nature is also evident in other species that nest in the Canaries and leave the islands at the end of the reproductive season, on course for their wintering grounds. The destination for some of them, such as pelagic seabirds, is on the other side of the Atlantic Ocean. Others travel to the heart of the African continent to return to the islands before nesting period. Some of the recent colonists that have already settled as nesting birds, in the past had only been visiting the islands during their migrations.

**Eleonora's falcon** is a colonial bird of prey, restricted to the eastern islets north of Lanzarote, that has synchronised its arrival and nesting with the summer passage of small migratory birds it feeds on. It winters in Madagascar and each year it repeats an odyssey of 4,350 miles across the African continent to reach the breeding grounds.

### 3.3.txt Evolution and extinction of birds in the Canaries

The arrival of birds to the islands has been a process phased over time, which originated mainly in Central European forests. Some birds arrived several million years ago, giving rise to unique species in the world, real evolutionary gems. The Canary Islands stonechat, the Bolle's pigeon or the blue chaffinch are only some of them. However, the islands are also inhabited by other birds, whose ancestors reached the archipelago more recently. Their isolation has lasted less time; therefore, they have only differentiated in small details such as size, song, or colour.

Despite its proximity, the African continent has had a lesser influence on the colonisation of the archipelago, in most cases involving species whose habitat is linked to semi-desert plains, better represented in the eastern islands.

The settlement of the islands is also a dynamic process. While some species manage to colonise them and evolve, others end up extinct. Recent paleontological studies have proved that in the past, the islands were inhabited by an endemic fauna very different from the current one, as has occurred in many other archipelagos.

**The blue chaffinch** inhabits the pine forests of Tenerife and Gran Canaria, to where it is endemic. Besides being a species totally different to any other known finch, its populations on these islands differ from each other by distinctive features in coloration and song. Less than 200 specimens survive in Gran Canaria.



# 2nd FLOOR: NATURAL HISTORY

The tour around the gallery of Natural History on the 2nd Floor includes a rich representation of collections of Palaeontology, Mineralogy and Marine Biology.

## Palaeontology

### 4.1.txt The Canary Islands' paleontological record

The fossil record of the Canary Islands dates back to 140 million years ago. During the formation of the islands, the sediments deposited at the bottom of the Atlantic Ocean were displaced by the magmatic activity generated, and they crop up today in a few places in western Fuerteventura, in sites containing some fossils, such as small ammonites, very close relatives of current cephalopods.

However, most of the fossil record concentrates on the last 15 million years, on sites located on elevated beaches, volcanic tubes and fossilised dunes, containing shells of marine and terrestrial molluscs, bones of vertebrates and traces of biological activity.

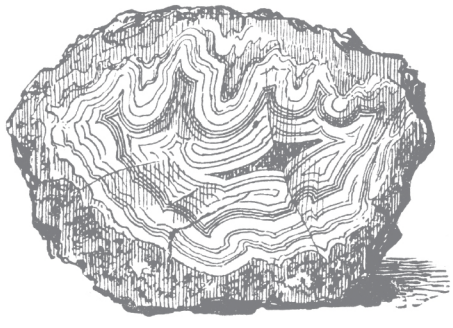
These fossils tell us about a different biodiversity, depending on the period of time we can contemplate, and suggest that the archipelago was also affected by the major global climate changes.

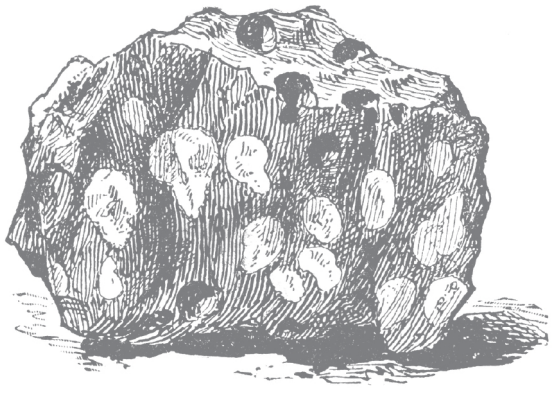
One of the most important fossils from a period 130,000 years ago, known as Upper Pleistocene, is this marine snail which lives in the tropical waters of Cape Verde and the Gulf of Senegal. Its presence in the Canary Islands, as well as that of other species that follow it, indicates warmer climatic conditions in that era.

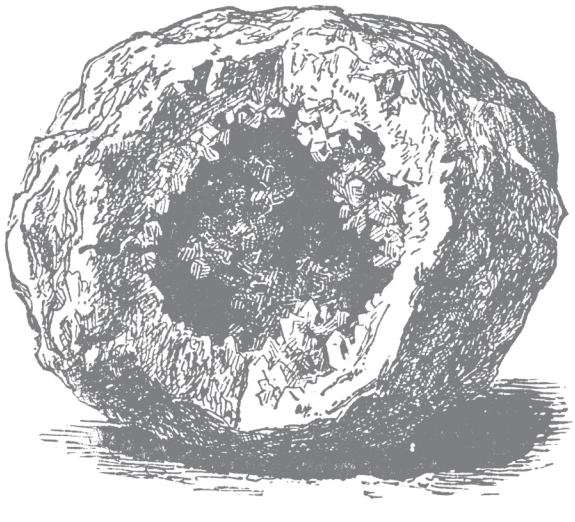
### 4.2.txt Fossils of the Canaries

Volcanic soils are not suitable for preserving fossils, however, there are several paleontological sites in the Canaries storing evidence of the life that inhabited the islands in the past: imprints of leaves from the forests that used to cover Gran Canaria; eggs of large tortoises and flightless birds that lived in Lanzarote and Fuerteventura six million years ago; bones of lizards and giant rats, now extinct, that were trapped in volcanic tubes; and millions of shells of terrestrial molluscs that tell us about the periodic changes in the climate of the Canary Islands, changes which also occurred in the sea, and which have been recorded on the elevated beaches existing on the coasts of all the islands.

Six million years ago, flightless birds similar to ostriches arrived in Lanzarote; or maybe just their eggs since no bones have been found. They probably arrived on rafts of floating vegetation, carried by major floods that originated in north-western Africa.







## Geology

### 5.1.txt Minerals and rocks from the Canaries

In this room, unique landscapes are depicted which have been modelled on each island by their volcanic and erosional processes. Some of them are whimsically sculpted, as can be seen in the photographs. These places should be protected by law since they comprise of natural heritage that is of great interest.

The predominant rocks in the archipelago are volcanic and come in a variety of interesting shapes and textures: pāhoehoe lava, karst areas, and volcanic bombs of different shapes and sizes. The olivine, a green mineral related to volcanic rocks, stands out among the otherwise very scarce minerals on the islands.

This room also contains examples of different types of minerals found in nature, as well as som e striking exhibits, such as hexagonal quartz crystals, geodes or the desert rose.

A volcanic bomb recovered after the eruption of the Teneguía volcano, in 1971 in La Palma, stands out among the rocks of the Canary Islands.

Bombs are fragments of volcanic material, big or small, which are ejected at high speed from the centre of the eruption, and can fall at a large distance from it.

### 5.2.txt Meteorites and impact craters

The Museum of Natural History houses a large collection of meteorites. Most of them come from the Sahara Desert and their composition is very similar to that of terrestrial rocks; they are the so-called stony meteorites or chondrites. The museum also contains examples of other types of meteorites, such as siderites, composed of heavy metals, and siderolites, a combination of the latter two types.

The study of meteorites yields information on the origin of the solar system. Sometimes, meteorites of large size and mass cross the Earth's atmosphere and can produce enormous impact craters.

The consequences of these impacts may be disastrous. For instance, one of the hypotheses on the extinction of dinosaurs is the crash of a large meteorite. The explosion it could have caused would be equivalent to a billion atomic bombs, triggering massive climate change on Earth.

This module highlights one of the star pieces of the permanent exhibition, a great siderite or 622 pound iron meteorite from North Africa. Its transfer to the Museum was a real odyssey. It consists basically of iron and nickel, and it could have originated from the cores of disintegrated planets. Its exact age is unknown, however, it is often estimated at 4,6 billion years, which is when our solar system was formed.

# Marine Biology

## 6.1.txt The ocean: the great unknown

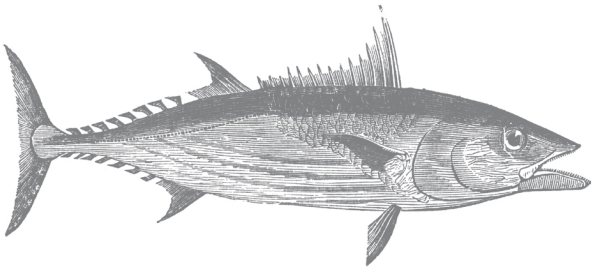
You are now at the beginning of one of the two rooms in the Museum that are dedicated to the subject of marine biology, with particular reference to the bottom of the seas and the coasts of the Canary Islands. The material displayed on the monitors you are viewing summarises the concept that we wish to present to you, of the global ocean as an ecosystem supporting numerous activities, not only as a habitat concentrating diverse life forms. Observe the different groups of animals and plants that inhabit it, the biodiversity housed by both the free waters and the seabed or marine substratum. Notice the difference between coastal areas or the shore, and the open ocean or *high seas*. Learn about various—independent yet interrelated—communities (plankton, nekton and benthos). Discover marine environment as the main source of food, the so-called *humanity's pantry*, sustainably exploited by fishing; become acquainted with current research and, of course, enjoy the coast as a place of leisure, contemplation and delight. Do not forget, however, that the ocean is still the great unknown and, although it may seem otherwise, we know very little of the many mysteries it contains. Only a tiny fraction of marine life has been recorded, compared to terrestrial environment studies.

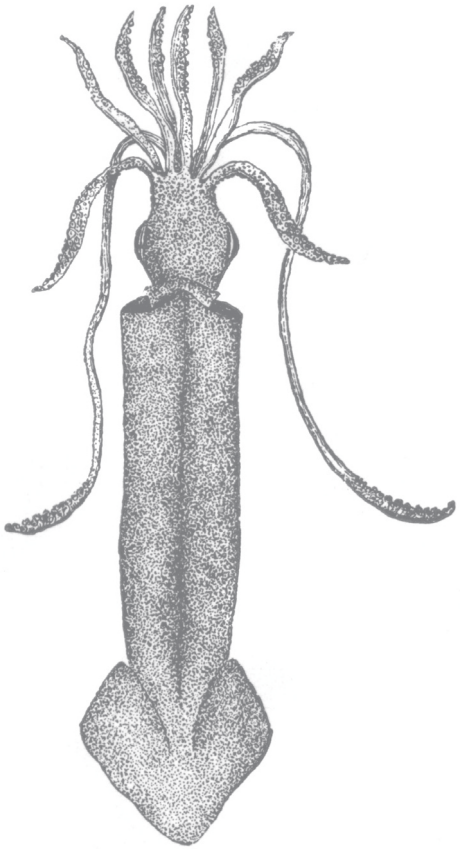
## 6.2.txt Some invertebrates of our shores

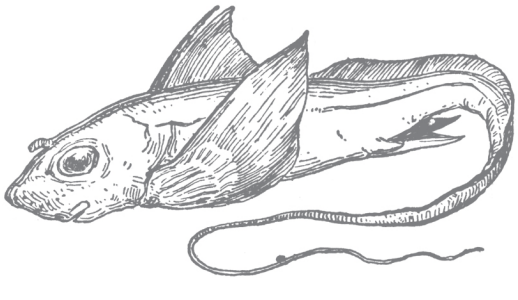
On the left side of the room, you can see a representation of the most known invertebrates of the seas and shores of the Canary Islands, classified from the evolutionary point of view: from simple ones, such as sponges, which do not have developed tissues or organs, to other complex zoological groups including cnidarians, molluscs, echinoderms, and crustaceans, to name only a few.

Take a look at the upper part of the display and discover one of the stars of this room. The impressive invertebrate you are viewing corresponds to what is known as the giant squid. This exhibit replicates to scale a squid found floating dead in the waters south of Tenerife, in November 1995, which was transferred to the Museum.

Giant squids are large cephalopods. They live in the depths, where they seem to find optimal feeding conditions and they fight fierce battles against predators, such as the sperm whale. If you focus on some details of their morphology, you will see that one of their eyes is more developed, which does not come, however, with a vision as perfect as you might think. Note the unusual pigmentation and the formations in the suction cups on the tentacles. These giants of the depths remain one of the great enigmas of marine biology, since very little is known of them, except from the dead specimens found on beaches or fragments floating in the sea.







## 6.3.txt The best swimmers

The waters of the Canary Islands are home to a wide variety of fish, whether solitary or grouped in shoals, which swim freely above the seabed. These fish have morphological traits that facilitate swimming. Take a look at the amberjack, the yellowmouth barracuda, the dolphinfish or the tuna. Look up and view the coloration detail of the blue shark, and the blue marlin located in the lower part, that has a bill or sword at the end of its snout with which it makes the water swirl in order to stun the shoals of fish that are its prey.

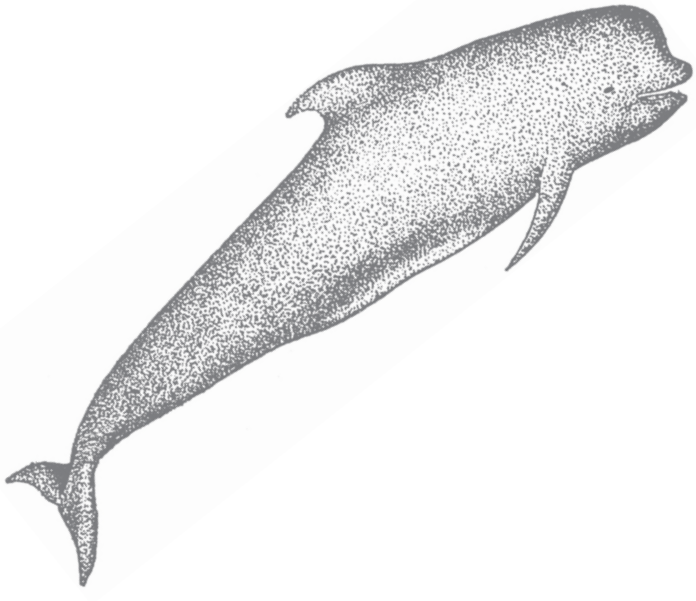
Now, focus on the exhibit in the back corner. It is an impressive ray, also known as the devil ray. It was found dead in a small bay near the so-called Black Castle, next to the city's Auditorium.

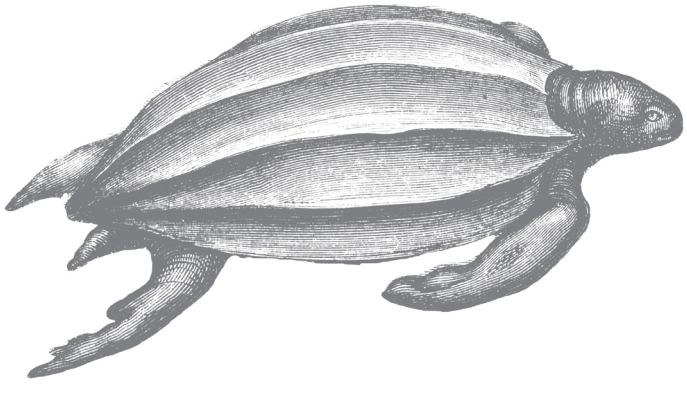
Rays are fishes related to sharks, fully adapted to pelagic life. This species inhabits the shallow waters up to a depth of 328 ft and undertakes great oceanic migrations in search of food. Despite its appearance and size, it is completely harmless. When it finds large concentrations of zooplankton it spreads the lateral appendages on the head and sweeps food into its mouth, where it is filtered. The specimen exhibited here has a relatively small size, since the species can reach a length of 30 ft.

## 6.4.txt Marine oddities

Due to their morphological, evolutionary, behavioural and lifestyle traits, certain marine animals are unknown by the public, arousing curiosity of those who discovered them in this section, which we have called '*marine oddities*'. Take a look at the 'albino' specimen of the black ghost knifefish at the bottom, or the red opah (in the centre of the display) leading a quiet life in the middle of the ocean. Above, a flying fish, a deep sea shark and, of course, a remora with the typical adaptations acting as suction cups, which allow it to attach to the sharks, its usual hosts, and move effortlessly.

However, in the lower part of the display case there is an animal that deserves special attention. The animal you are viewing is a chimaera, a resident of the great depths. Several species of this group of fish are found in the Canary Islands. This specimen was found at the bottom of the inter-island channels and was donated to the Museum of Natural History in 1993, when it was stuffed and exhibited in this display dedicated to marine oddities. Do not forget that chimaeras are considered living fossils, i.e., fishes restricted to certain habitats, at great depths and close to the seabed, which have not evolved as other families in this group of vertebrates. Their archaic nature is clearly visible in some of their physical traits: take a look at the thick and pediculate fins, eyes, grooves, lateral line canals, etc., which are typical features of ancient fishes. We are pretty sure you are looking at it with amazement.





## 6.5.txt A journey to the bottom of the sea

The monitors placed in columns, at the beginning of the second Marine Biology room, are dedicated entirely to vertebrates, and they allow you to view a bathymetric cross-section, meaning that you can simultaneously see life at different depths, from the pools and beaches on the surface to the deep sea. The abyssal seafloor below the depth of 6562 feet can only be explored by means of special unmanned devices called submersibles or bathyscaphes, given the difficulty it entails. These dark and enigmatic depths remain the great unknown in ocean studies. As you can see, one side of the column is dedicated to the flora and fauna linked to different types of substrates, whether rocky or sandy-muddy, living organisms that attach to the bottom of the sea or prowl around close to the substratum, the seabed. Remember that (in theory) light only penetrates to a depth of 656 feet, beyond which there is no plant life and utter darkness reigns.

The other side of the column is intended to show (along a depth gradient) the organisms swimming freely or floating suspended in water masses above the seabed, which biologists call pelagic organisms. These include not only the plankton microorganisms which only float, but also schools and shoals of fish that are excellent swimmers, as well as turtles, some cephalopods and cetaceans, which make up the so-called nekton.

## 6.6.txt Turtles and cetaceans

You are on the right side of the Marine Biology room that is dedicated exclusively to the world of cetaceans and turtles existing in the Canary Islands. Due to the difficulty that their preparation entails, only replicas are shown. Take a look at the pygmy sperm whale and its baby, which were left stranded dead on one of Tenerife's beaches. The baby whale still has hairy bristles around its mouth, which small cetaceans have at birth and which act as sensory organs to facilitate the contact between the baby and the mother during breeding period. These sensors are lost during their adult life.

Focus on one of the sea turtles shown. The exhibit is a replica of the most numerous species that can be seen in the waters of the Canary Islands, the so-called leatherback turtle. It has dark coloration with numerous white spots dotting the shell, limbs and head. The carapace is soft, shell-less and marked by seven longitudinal ridges. Although turtles are omnivorous, i.e., they have a wide and varied diet, this turtle feeds exclusively on jellyfish and gelatinous plankton. About five species of turtles frequent our waters, the most common of them being the loggerhead turtle, which can be seen next to the exhibit described, although it is smaller in size and has different coloration.



## 6.7.txt A different way of classifying fish

The great variety of fish can be classified from different points of view. By the morphology of the mouth: the marlin, the trumpetfish, the Guinean puffer, the rabbitfish or the parrotfish; by behaviour or adaptations such as those of the eel or the Guinean puffer; by curious shapes like the compressed ocean sunfish, the wriggling conger, the flattened wide-eyed flounder, the aberrant seahorse or the elongated trumpetfish; as well as by the range of 'colours' (some acting as sexual signals to attract mates) such as those of the Canary damsel, the parrotfish, the leopard eel, the ornate wrasse, the Mediterranean moray or the Island grouper...

Focus on this last exhibit of striking coloration. You are facing what is known as the Island grouper, a common fish in our seas, which usually swims in mid-waters on submarine cliffs and shelves, or around large rocks between the surface and a depth of up to approximately 650 ft. Despite having rather solitary habits, it sometimes forms large shoals called *abadías*. Although it usually has brown, brownish-grey or grey coloration with contrasting spots, on occasions, like in the case of this interesting exhibit donated to the Museum by an amateur fisherman, specimens with intense yellow coloration appear. These are called *abades capitanes* because, according to a popular belief, they are the leaders of the shoal. This, however, is not entirely true. In fact, in addition to a change in tone (from brown to yellow) that can occur gradually, cases have been recorded of some specimens that returned from yellow to brown coloration by regression.