NATIONAL OPEN UNIVERSITY OF NIGERIA

BIO 308

Biogeography

Module 2

BIO 308 (Biogeography)
Module2

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Module 2

Unit 1Paleotropical Kingdom

1.0 Introduction

This unit looks at the general features of the Paleotropical kingdom which comprises the tropical areas of Africa, Asia and Oceania. It also describes the sub-kingdoms of the paleotropical kingdom.

2.0 Objectives

At the end of this unit, you should be able to:

- describe the paleotropical kingdom
- explain the sub-kingdoms in the Paleotropical kingdom.

3.0 Main Content

3.1 General Description of the Paleotropical Kingdom

The Paleotropical Kingdom (Paleotropis) is a floristic kingdom comprising tropical areas of Africa, Asia and Oceania (without Australia). Its flora is characterised by about 40 endemic plant families, e.g. Nepenthaceae, Musaceae, Pandanaceae, Flagellariaceae. Part of its flora, inherited from the ancient supercontinent of Gondwana or exchanged later (e.g. Piperaceae with pantropical distribution and but few warm temperate representatives), is shared with the Neotropical Kingdom, comprising tropical areas of Central and South America. Moreover, the Paleotropical flora influenced the tropical flora of the Australian Kingdom.

3.2 The Sub-kingdoms of Paleotropical Kingdom

The Paleotropical Kingdom is subdivided into five floristic subkingdoms about 13 floristic regions. The floristic subkingdoms of the paleotropical kingdom are as follows: African Subkingdom, Madagascan Subkingdom, Indo-Malesian Subkingdom, Polynesian Subkingdom and Neocaledonian Subkingdom

African Sub-kingdom: This contains 10 endemic families and many endemic genera. The 10 endemic families include Dioncophyllaceae, Pentadiplandraceae, Scytopetalaceae, Medusandraceae, Dirachmaceae, and Kirkiaceae. The subkingdom is made up of the Guineo-Congolian Province, the Usambara-Zululand Region and the Sudano-Zambezian Region (including tropical Asia west of the Gulf of Khambhat) Karoo-Namib Region.

Madagascan Sub-kingdom: This contains 9 endemic families, more than 450 endemic genera, and about 80% endemic species. It ceased to be influenced by the African flora in the Cretaceous, but underwent heavy influence of the Indian Region's flora. Mainly up of the Madagascan Region.

Indo-Malesian Sub-kingdom: This contains 11 endemic families (including Degeneriaceae, Barclayaceae, Mastixiaceae) and many endemic genera. It is made the Indian Region, the Indochinese Region, the Malesian Region and the Fijian Region.

Polynesian Sub-kingdom: This subkingdom contains no endemic families and many endemic genera. The flora is mostly derivative from that of the Indo-Malesian Subkingdom. It contains the Polynesian Region and the Hawaiian Region.

Neocaledonian Sub-kingdom: This contains several endemic families (including Amborellaceae, Strasburgeriaceae) and more than 130 endemic genera (including. Exospermum and Zygogynum). The flora is partially shared with the Indo-Malesian Subkingdom and the Australian Kingdom. It contains the Neocaledonian Region.

4.0 Conclusion

The Paleotropic floristic kingdom is found in the tropic areas of Africa, Asia and Oceania. It is made of five sub-kingdoms with forty endemic plant families.

5.0 Summary

In this unit, you have learnt the parts of the world that the paleotropical kingdom can be found. You have also learnt the sub-kingdoms of the Paleotropical kingdom and the types of organisms that are endemic in the kingdom.

6.0 Self-Assessment Exercise

1. State the floristic regions in each subkingdom of paleotropical kingdom.
2. What are the peculiar features found in the paleotropical kingdom?

7.0 Reference/Further Reading

Dallman, P. F. (1998). *Plant Life in the World's Mediterranean Climates*. California Native Plant Society, California: University of California Press, Berkeley.

Unit 2 Neotropical Kingdom

1.0 Introduction

The Neotropical Kingdom is sometimes described as the tropical area of South America. It has more tropical rainforests than any other kingdom hence with high biodiversity. It is divided into four floristic regions and has many endemic plants and animals.

2.0 Objectives

At the end of this unit, you should be able to:

- identify the general nature of the Neotropical Kingdom
- describe the ecological regions in the Neotropical Kingdom
- list the plants and the animals endemic in the Neotropical Kingdom.

3.0 Main Content

3.1 General Description of the Neotropical Kingdom

In biogeography, the Neotropic or Neotropical zone is one of the eight terrestrial ecozones. This ecozone includes South and Central America, the Mexican lowlands, the Caribbean islands, and southern Florida, because these regions share a large number of plant and animal groups. It is sometimes used as a synonym for the tropical area of South America, although the ecozone also includes temperate southern South America. The Neotropical Floristic Kingdom excludes southernmost South America, which instead is placed in the Antarctic Kingdom.

The Neotropic includes more tropical rainforest (tropical and subtropical moist broadleaf forests) than any other ecozone, extending from southern Mexico through Central America and northern South America to southern Brazil, including the vast Amazon Rainforest. These rainforest ecoregions are one of the most important reserves of biodiversity on Earth.

These rainforests are also home to a diverse array of indigenous peoples, who to varying degrees persist in their autonomous and traditional cultures and subsistence within this environment. The number of these peoples who are as yet relatively untouched by external influences continues to decline significantly, however, along with the near-exponential expansion of urbanisation, roads, pastoralism and forest industries which encroach on their customary lands and environment.

Nevertheless, amidst these declining circumstances this vast "reservoir" of human diversity continues to survive, albeit much depleted. In South America alone, some 350–400 indigenous languages and dialects are still living (down from an estimated 1,500 at the time of first European contact), in about 37 distinct language families and a further number of unclassified and isolate languages. Many of these languages and their cultures are also endangered.

Accordingly, conservation in the Neotropic zone is a hot political concern, and raises many arguments about development versus indigenous versus ecological rights and access to or ownership of natural resources.

3.2Major Ecological Regions of Neotropic Kingdom

The WWF subdivides the ecozone into bioregions, defined as "geographic clusters of ecoregions that may span several habitat types, but have strong biogeographic affinities, particularly at taxonomic levels higher than the species level (genus, family)."

Amazonia Region

The Amazonia bioregion is mostly covered by tropical moist broadleaf forest, including the vast Amazon rainforest, which stretches from the Andes Mountains to the Atlantic Ocean, and the lowland forests of the Guianas. The bioregion also includes tropical savannah and tropical dry forest ecoregions.

Eastern South America Region

.Eastern South America includes the Caatinga xeric shrublands of northeastern Brazil, the broad Cerrado grasslands and savannas of the Brazilian Plateau, and the Pantanal and Chaco grasslands. The diverse Atlantic forests of eastern Brazil are separated from the forests of Amazonia by the Caatinga and Cerrado, and are home to a distinct flora and fauna.

Orinoco Region

The Orinoco is a region of humid forested broadleaf forest and wetland primarily comprising the drainage basin for the Orinoco River and other adjacent lowland forested areas. This region includes most of Venezuela and parts of Columbia.

Southern South America Region

The temperate forest ecoregions of southwestern South America, including the temperate rain forests of the Valdivian temperate rain forests and Magellanic subpolar forests ecoregions, and the Juan Fernandez Islands and Desventuradas Islands, are a refuge for the ancient Antarctic flora, which includes trees like the southern beech (Nothofagus), podocarps, the alerce (*Fitzroyacupressoides*), and Araucaria pines like the monkey-puzzle tree (*Araucaria araucana*). These magnificent rainforests are endangered by extensive logging and their replacement by fast-growing non-native pines and eucalyptus.

3.3 Endemic Animals and Plants in Neotropical Kingdom

Animals: Thirty-one bird families are endemic to the Neotropical ecozone, over twice the number of any other ecozone. They include rheas, tinamous, curassows, and toucans. Bird families originally unique to the Neotropics include hummingbirds (family Trochilidae) and wrens (family Troglodytidae).

Mammal groups originally unique to the Neotropics include:

Order Xenarthra: anteaters, sloths, and armadillos, New World monkeys,Caviomorpha rodents, including capybaras and guinea pigs, and chinchillas

American opossums (order Didelphimorphia) and shrew opossums (order Paucituberculata).

Forty-three fish families and subfamilies are endemic to the Neotropical ecozone, more than any other ecozone (Reis et al., 2003). These fish taxa include more than 5,700 species, and represent at least 66 distinct lineages in continental freshwaters (Albert and Reis, 2011).

Some fish groups originally unique to the Neotropics include:

- Order Gymnotiformes Neotropical electric fish
- Family Characidae tetras and allies
- Family Loricariidae armoured catfishes
- Subfamily Cichlinae Neotropical cichlids
- Subfamily Poeciliinae guppies and relatives.

Examples of groups that are entirely or mainly restricted to the Neotropical region include New World Monkeys, Sloths, Tinamous, Hummingbirds, Toucans, Ovenbirds, Antbirds, Tanagers, Caimans, New World Coral Snakes, Poison Dart Frogs, Gonyleptidae.

Plants: Plant families that originated in the Neotropic include Bromeliaceae, Cannaceae, and Heliconiaceae. Plant species originally unique to the Neotropic include: Potato (*Solanum tuberosum*), Tomato (*Solanum lycopersicum*), Cacao tree (*Theobroma cacao*), source of cocoa and chocolate, Maize (*Zea mays*), Lima bean (*Phaseoluslunatus*), Cotton (*Gossypiumbarbadense*), Cassava (*Manihotesculenta*), Sweet potato (*Ipomoea batatas*), Amaranth (*Amaranthuscaudatus*), Quinoa (*Chenopodium quinoa*).

4.0 Conclusion

This floristic kingdom used to be home to some well-known crop and cash crops that are found in many parts of the world today. It contains some endemic plant and animal species located in four different floristic regions. It spreads to different continents of the world.

5.0 Summary

In this unit, you have learnt the nature of the Neotropical kingdom and the subdivisions of the kingdom. You have also learnt the different plant and animal species that are endemic in the Neotropical region.

6.0 Self-Assessment Exercise

Compare the features that are found in each Neotropical floristic regions with those in the other regions within the kingdom.

7.0 Reference/Further Reading

Dallman, P. F. (1998). *Plant Life in the World's Mediterranean Climates*. California Native Plant Society, California: University of California Press, Berkeley.

Unit 3 South African Kingdom

1.0 Introduction

The South African floristic kingdom is mainly known as the Cape floristic region. It is located in South Africa and it has some plants and animals peculiar to it.

2.0 Objectives

At the end of this unit, you should be able to:

- describe the South African Kingdom and its location
- describe the endemic plants and animals in the floristic kingdom.

3.0 Main Content

3.1 General Description of the South African Kingdom

The Cape Floristic Region is a floristic region located near the southern tip of South Africa. It is the only floristic region of the Cape (South African) Floristic Kingdom, and includes only one floristic province, known as the Cape Floristic Province.

The Cape Floristic Region, the smallest of the six recognised floral kingdoms of the world, is an area of extraordinarily high diversity and endemism, and is home to more than 9 000 vascular plant species, of which 69 % are endemic. Much of this diversity is associated with the fynbos biome, a Mediterranean-type, fire-prone shrubland.

The economic worth of fynbos biodiversity, based on harvests of fynbos products (e.g. wildflowers) and eco-tourism is estimated to be in the region of R77 million a year. Thus, it is clear that the Cape Floristic Region has both economic and intrinsic biological value as a biodiversity hotspot.

3.2 Location and Description

The Region covers the Mediterranean climate region of South Africa in the Western Cape in the south western corner of the country, and extends eastward into the Eastern Cape, a transitional zone between the winter-rainfall region to the west and the summer-rainfall region to the east in KwaZulu-Natal.

3.3 Flora: Fynbos in the Western Cape

Most of the region is covered with fynbos, a sclerophyllousshrubland occurring on acid sands or nutrient poor soils derived from Table Mountain Sandstones (Cape Supergroup). Fynbos is home to an amazing diversity of plant species including many members of the Protea family (Proteaceae), Heath family (Ericaceae), and Reed family of restios (Restionaceae).

Other vegetation types are strandveld, a soft coastal scrubland found mostly on the west-facing coast of the Western Cape Province, on tertiary sands. Renosterveld is a grassy shrubland dominated by members of the Daisy family (Asteraceae - particularly renosterbos(Elytropappusrhinocerotis)), graminoids and geophytes, occurring on the base-rich shaley soils of the coastal forelands. Small pockets of Afromontane forest (Southern Afrotemperate Forest) can be found in humid and sheltered areas.

Ecology

The World Wildlife Fund divides the Cape floristic region into three ecoregions, the Lowland fynbos and renosterveld, Montane fynbos and renosterveld and the Albany thickets. The fynbos ecoregions are designated one of the Global 200 priority ecoregions for conservation. Conservation International declared the Cape floristic region to be a biodiversity hotspot.

4.0 Conclusion

The South African Kingdom is also known as the Cape region because that is the only floristic region in the kingdom. It, however, has three ecoregions. It is smallest floristic kingdom and has different plant families endemic in it.

5.0 Summary

In this unit, you have learnt about the nature of the South African kingdom also known as the cape floristic region. You have also learnt about the flora of the kingdom.

6.0 Self-Assessment Exercise

List the types of vegetation/flora that can be found in the Cape Region.

7.0 Reference/Further Reading

Dallman, P.F. (1998). *Plant Life in the World's Mediterranean Climates*. California Native Plant Society, Berkeley, California: University of California Press.

Unit 4Australian Kingdom and Antarctic Kingdom

1.0 Introduction

In this unit, you will learn about the Antarctic floristic kingdom. The Antarctic kingdom is found south of latitude 40^0S. It has about 50 genera of plants original to it with three regions.

2.0 Objectives

At the end of this unit, you should be able to:

- give a general description of the Antarctic Kingdom
- explain the different sub-kingdoms and regions of the Antarctic kingdom.

3.0 Main Content

3.1General Description of Antarctic Kingdom

The Antarctic Floristic Kingdom (also Holantarctic Kingdom) is a floristic region first identified by botanist Ronald Good (and later by Armen Takhtajan), which includes most areas of the world south of 40°S latitude. The Antarctic plant kingdom includes the continent of Antarctica, Patagonia (southern Chile, southern Argentina, Tierra del Fuego), most of New Zealand, the New Zealand Sub-Antarctic Islands, and all islands of the Southern Ocean south of 40°S latitude, including Gough Island, the Kerguelen Islands, and the Falkland Islands. Tasmania is omitted since its plant species are more closely related to those found in the Australian Floristic Kingdom.

Many plant species of Antarctica, temperate South America and New Zealand were very closely related, despite their disjunction by the vast Southern Ocean. The flora of this kingdom dates back to the time of Gondwana, the southern supercontinent which once included most of the landmasses of the present-day Southern Hemisphere, though it has been influenced by the flora of the Holarctic Kingdom since the Tertiary.

About 50 genera of vascular plants are common in the Antarctic plant kingdom, including Nothofagus and Dicksonia. Takhtajan also made note of hundreds of other vascular plant genera scattered about and isolated on islands of the Southern Ocean, including Calandriniafeltonii of the Falkland Islands, Pringleaantiscorbutica of the Kerguelen Islands, and the megaherb genera of the New Zealand Sub-Antarctic Islands.

There are about 11 families of plants that are endemic to this kingdom: Lactoridaceae, Gomortegaceae, Hectorellaceae, Halophytaceae, Francoaceae, Aextoxicaceae, Tribelaceae, Griseliniaceae, Misodendraceae, Alseuosmiaceae and Donatiaceae.

3.2 Sub-divisions

The Antarctic floristic kingdom is subdivided into four floristic regions, and subdivided even further into sixteen floristic provinces. Most of the provinces lie within, or very near the Antarctic convergence zone.

3.2.1Fernandezian Region

This isoften included within the Neotropical Kingdom. It contains an Endemic family: Lactoridaceae. There are 20 endemic genera including Thyrsopteris, Nothomyrcia, Selkirkia, Cuminia, Juania, Robinsonia, Rhetinodendron, Symphyochaeta, Centaurodendron, Yunquea, Hesperogreigia, Podophorus, Pantathera and Megalachne. Species endemism of vascular plants is very high (about 70%). It is made up of the Fernandezian Province.

3.2.2 Argentina-Chile-Patagonian Region

This contains the following endemic families: Gomortegaceae, Halophytaceae, Malesherbiaceae, Tribelaceae, Francoaceae, Aextoxicaceae, and Misodendraceae.

There are many endemic genera (including Leptocionium, Saxegothaea, Austrocedrus, Pilgerodendron, Fitzroya, Peumus, Boquila, Lardizabala, Philippiella, Austrocactus, Holmbergia, Berberidopsis, Niederleinia, Lebetanthus, Ovidia, Quillaja, Kageneckia, Saxifragella, Zuccagnia, Tepualia, Magallana, Gymnophyton, Laretia, Mulinum, Talguenea, Schizanthus, Melosperma, Monttea, Hygea, Mitraria, Sarmienta, Chiliotrichum, Melalema, Nassauvia, Tetroncium, Gilliesia, Leontochir, Leucocryne, Schickendantziella, Solaria, Lapageria, Conanthera, Tecophilaea, Tapeinia, Fascicularia, Ortachne, and Jubaea) and species.

It is made up of the Northern Chilean Province, the Central Chilean Province, the Argentine Pampas Province, the Patagonian Province and the Tierra del Fuego Province.

3.2.3 Neozeylandic Region

This contains an endemic family: Ixerbaceae which is an endemic monogeneric family of one species, *Ixerbabrexioides*. The Ixerbaceae is the only endemic New Zealand vascular plant family. There are 50 endemic genera in the region (including Loxsoma, Pseudowintera, Hectorella, Entelea, Hoheria, Corokia, Alseuosmia, Carmichaelia, Lophomyrtus, Neomyrtus, Plectomirtha, Stilbocarpa, Kirkophytum, Coxella, Lignocarpa, Scandia, Dactylanthus.

Others includeMyosotidium, Parahebe, Negria, Rhabdothamnus, Teucridium, Oreostylidium, Pachystegia, Haastia, Leucogenes, Phormium, Rhopalostylis, Lepidorrhachis, Hedyscepe, Howea, Sporadanthus, Aporostylis, Desmoschoenus), very high species endemism, especially among Pinophyta.

The provinces in the region include the Lord Howe Province, the Norfolkian Province, the Kermadecian Province, the Northern Neozeylandic Province, the Central Neozeylandic Province, the Southern Neozeylandic Province, the Chatham Province and the New Zealand Subantarctic Islands Province.

4.0 Conclusion

The artarctic kingdom contains about 30 genera of plant. It is located in the Antarctic region and other parts of the world like New Zealand and the Patagonia. It is made of four flouristic regions and about sixteen flouristic provinces.

5.0 Summary

In this unit, you have learnt the:

- nature of the Antarctic Kingdom
- subdivisions of the Antarctic kingdom
- types of plants that are endemic in the region.

6.0 Self-Assessment Exercise

1. State the locations of the Antarctic kingdom.
2. Give four regions of the Antarctic regions and five genera of plants endemic in each region.

7.0 Reference/Further Reading

Dallman, P. F. (1998). *Plant Life in the World's Mediterranean Climates*. California Native Plant Society, California: University of California Press, Berkeley.

Unit 5 Zoogeography

1.0 Introduction

This unit looks at zoogeography which is the branch of science that deals with animal distribution. It gives a general overview of zoogeography and explains the zoogeographical regions.

2.0 Objectives

At the end of this unit, you should be able to:

- classify the zoogeographical regions of the world
- identify the basics of zoogeography.

3.0 Main Content

3.1General Concept of Zoogeography

Zoogeography deals with the study of distribution of land animals and those living in freshwater. Marine animals cannot be confined to any one region as the seas are interconnected and the only possible barrier for them can be climate. Hence most of the animal distribution studies are based on the land vertebrate fauna that also includes freshwater fishes and amphibians, which due to osmotic problems cannot cross salt water to reach from one land mass to another, although land makes only about 29% of the earth's surface and land vertebrates only 2% of the entire animal kingdom.

Theoretically, zoogeography is the study of all animals that includes invertebrates of which insects constitute the largest group. Earlier studies involved almost exclusively the bird fauna, which being gifted fliers can cross all kinds of barriers and some of them do reach from one end of the globe to another.

Fascination for zoogeographical studies arose from the Darwinian philosophy that animals lived where evolution made them most adapted to live in. But a cursory look reveals that elephants, zebras, giraffes, lions and a large number of African animals can live equally comfortably in South America and so can do the tropical American monkeys, jaguars, Llamas, sloths, armadillos, anacondas and a large number of birds in Africa but they are limited to their regions. Alligators can live almost in any tropical habitat but are confined to the New World and China, whereas crocodiles occur in the tropics of all continents.

Given the opportunity, marsupials will do well in any other continent but are restricted to Australia and one of them, opossum, does exist in the New World. No placental mammal existed in Australia and New Zealand until recently when we carried our pets and sheep along and some of them escaped and became wild to disturb the ecological balance that existed for millions of years. Lungfishes and ostriches inhabit widely separated continents of South America, Africa and Australia. Camels are found in the deserts of Middle East to Mongolia and India but one species reaches as far away as South America.

Similarly, four species of tapirs live in South America but one species has gone too far eastern Sumatra and nowhere in between where climate is quite suitable for it to live. Limbless amphibians also show similar distribution. Such peculiarities in the distribution of animals triggered more detailed studies to find out why animals could not be distributed in all places where climate and other environmental conditions are conducive.

Zoogeographic provinces are regions of distinctive fauna. They are based on the taxonomic or phylogenetic relationships of animals and not the adaptations of animals to specific environments. One way of looking at this is to think of the fauna of each province as constituting the gene pool available to the forces of natural selection to adapt animal life to the variety of habitats present in the particular region. The gene pool (i.e. the taxa represented) is different in each province.

Following the concept of a ***region*** as used in geography, each province maintains a level of homogeniety within its borders and clearly differs from adjacent areas. The boundaries between zoogeographic provinces are drawn according to the ***distribution of vertebrate taxa*** (in particular, *families*). Slater, who is commonly acknowledged as the developer of this system of drawing regions according to fauna, based his regions on the taxonomic relationships of birds; but the same regional limits work well enough for fishes, amphibians, reptiles, and mammals.

The data used to delineate regions were compiled long before continental drift was even considered. Furthermore, they represent only taxa extant in the 19th century. Paleontological advances, particularly in the 20th century, have added new information on the distribution of vertebrate families that negate some of the assumptions of Slater, Wallace and others. Nonetheless, the basic notion and the names of the zoogeographic provinces are still in use today.

The exact locations of boundaries of any region are often problematic, and this is certainly true for zoogeographic provinces. The boundary between the Oriental and Australian provinces, for example, has been redrawn several times; the most famous version is known as Wallace's Line, which falls between Borneo and Sulawesi and between the tiny islands of Bali and Lombok. The latter pair of islands is separated by a mere 20 miles, but for the most part they are inhabited by different families of mammals and even birds with all the powers of flight.

3.2 Zoogeographic Regions

Below are some comparative data for the six zoogeographic regions. The total number of families and the number of endemic families pertain to all mammals, except bats. The number of families shared refers to those families found only in the respective two zoogeographic regions and excludes more widespread families like the Canidae, which has reached all continents except Antarctica (although entry into Australia is generally considered a result of its introduction by people and not natural dispersal processes).

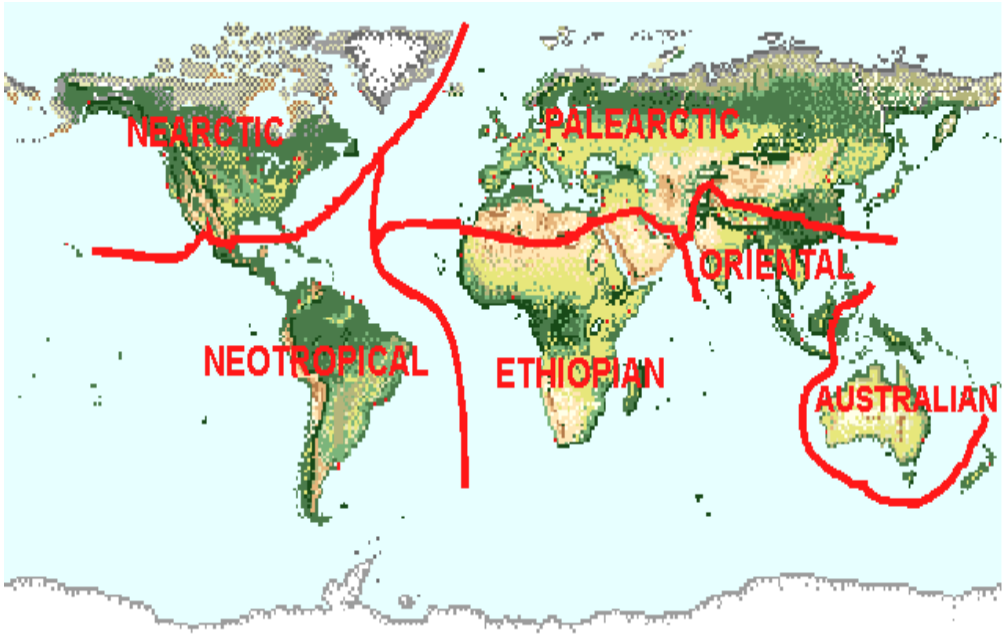

Fig.2.1a: Zoogeographic Regions

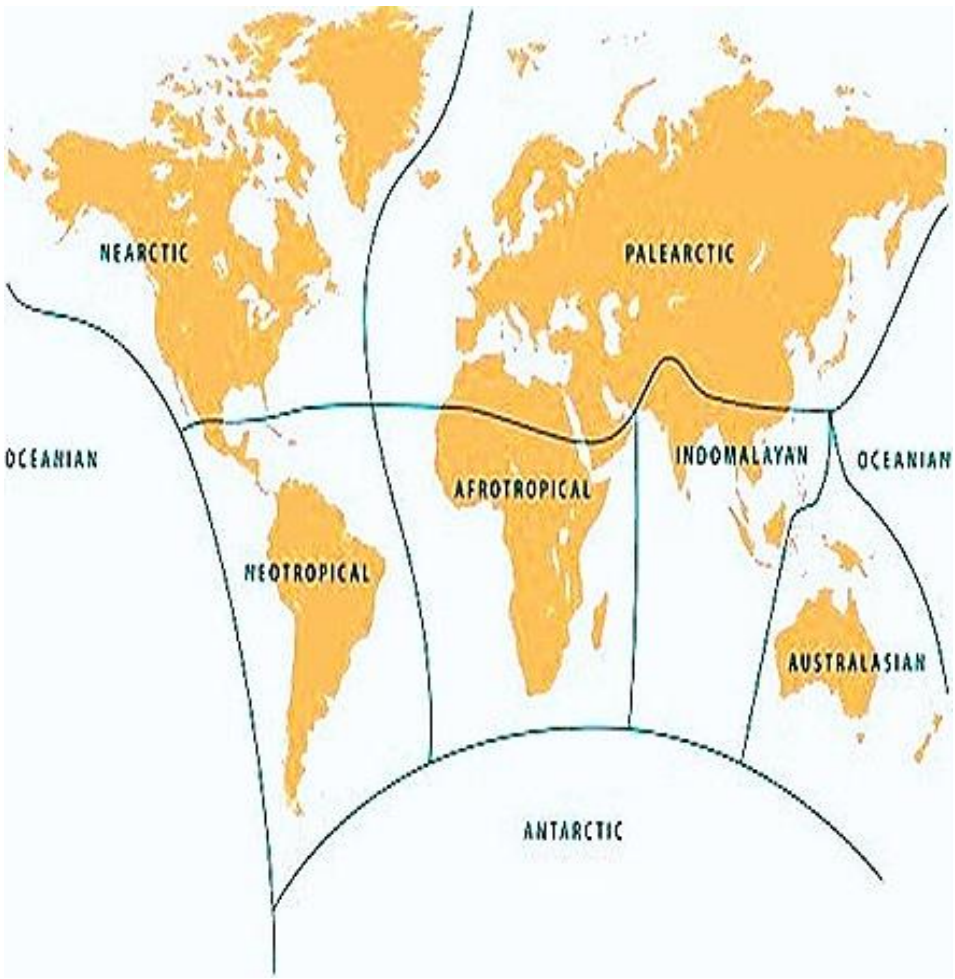

Fig.2.1b: Zoogeographic Regions

Source: http://biozoom.blogspot.com/2011/01/zoogeography-introduction.html

Palearctic Zoogeographic Province: 28 families of animals are found in this province; 2 are endemic (the mole rats, and another rodent group, the seleviniids). 22 families of animals in this province are shared with the Ethiopian while 19 families are shared with the Oriental. Many in common with the Nearctic (to the degree that the same genera and in some cases the very same species are found in both regions).

Nearctic Zoogeographic Province: This contains 24 families of animals; 4 are endemic (pronghorn, mountain beaver, pocket gophers, pocket mice). Most are widely distributed, especially in the Palearctic. 4 families in this province are shared with the Neotropical, but each is represented in Nearctic by only one species (armadillo, opossum, porcupine and peccary).

Neotropical Zoogeographic Province: This contains 32 families; 16 are endemic (10 are caviomorph rodents; 3 are in the nearly endemic order Edentata-sloths, anteaters, and armadillos; 1 is a marsupial; and 2 are monkeys). 4 families shared with the Nearctic (each represented in the Nearctic by only one species) 1 shared with the Palearctic (Camelidae), and 1 shared with the Oriental (Tapiridae).

Ethiopian (Afrotropical) Zoogeographic Province: 38 families; 12 endemic (including giraffes, hippopotamus; aardvark, elephant shrews, otter shrews, hyraxes, golden moles, and several rodents). 22 families shared with the Palearctic 8 shared with the Oriental (in many cases the same genera are found in both regions).

Oriental Zoogeographic Province: 30 families; 4 endemic families (2 primates-flying lemurs; tree shrews; hairy hedgehogs; spiny dormice). There is one endemic order (spiny dormice) in the province. 19 familie in this provinces are shared with the Palearctic, 8 shared with the Ethiopian (e.g., elephants, rhinoceroses, great apes) and 1 shared with the Neotropical (Tapiridae).

Australian Zoogeographic Province: 9 families; 8 are endemic (6 are marsupials, 2 are monotremes-a subclass of mammals). The one non-endemic family is shared with the Palearctic (the only placental mammal, a mouse).

4.0 Conclusion

The study of zoogeography helps to understand the regions of animal distribution. It also helps to give knowledge on the different types of animals endemic in various zoogeographical regions.

5.0 Summary

In this unit, you have learnt that:

- animals are found in different regions called zoogeographical regions
- the zoogeographical regions of the world.

6.0 Self-Assessment Exercise

Differentiate between the phytogeographic and zoogeographic kingdoms.

7.0 References/Further Reading

Dallman, P. F. (1998). *Plant Life in the World's Mediterranean Climates*. California Native Plant Society, California: University of California Press, Berkeley.

http://biozoom.blogspot.com/2011/01/zoogeography-introduction.html