

Review Article

Classification of the Animals Based on Environment: A Proposal to Minimization of the Mistakes in the Theophrastus' Classification

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Abstract

The objective of this article was to analyze the classification of the Animals based on Environment. The main materials used were two books and an educative YouTube video about terrestrial and aerial and aquatic Animals. The methods used were bibliographical and documentary research; each method used was accompanied by profound personal reflections about Theophrastus' classification. This article is important for Biology teachers who teach the classification of the Animals based on Environment, because presents a proposal of classification of the Animals that minimizes the mistakes that exist in the Theophrastus' classification. Theophrastus was a philosopher of Ancient Greek who used the word Terrestrials to designate only those Animals that live in the Soil and move on the Soil, and who classified Animals according to the Environment in Aerial, Aquatic and Terrestrial Animals. In the Theophrastus' classification, the Aerial Animals that normally live immersed in the atmospheric Air, for example Man and Monkey, are considered Terrestrial Animals. The main mistakes that exist in the Theophrastus' classification are the consideration of various Aerial Animals as being Terrestrial and the lack of a proper name to designate the group of Animals that normally live immersed in the Soil. The Earth is not the Soil and the word Terrestrials is not appropriate to designate only those Animals that live in the Soil and move on the Soil because is applied to any Animal that exists in the Planet Earth, the appropriate word to designate only those Animals that live in the Soil is the word Solumials or Solumics because is formed by adding the English suffix *ials* or *ics* to the Latin root *Solum* which means Soil in English. To minimize the mistakes that exist in the Theophrastus' classification is proposed the comprehension of that, the Terrestrial Animals are all the Animals that exist in the Planet Earth and the Animals are classified according to the Environment in Aerial and Aquatic and Solumial or Solumic Animals. The Environments of the Planet Earth in which the Animals can live are the Atmosphere formed by atmospheric Air, the Hydrosphere formed by Water and the Lithosphere composed by Soil. Based on Environment, the Aerial Animals are those that live immersed in the atmospheric Air, example Man; the Aquatic Animals are those that live immersed in the Water, example Fish; the Solumial or Solumic Animals are those that live immersed in the Soil, example Mole.

Keywords

Animals, Environment, Classification of the Animals Done by Theophrastus, Aerials, Aquatics, Terrestrials, Earth, Soil

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1. Introduction

The classification of the Animals is part of the Systematics. The Systematics is the branch of Biology preoccupied with the formation of groups of living beings according to their similarities and with the designation of these groups according to the international rules. In this context, the classification of the Animals facilitates the study and the location and the identification of groups of Animals in the Earth.

Theophrastus (372-287 Before Christ), disciple of Aristotle (384-322 B. C.), classified the Animals according to the Environment in Aerial, Aquatic and Terrestrial Animals [14]; the author of this article analyzed this classification, the analysis questions were the following: What is the name of the mean environment in which the Man and the Mole normally lives immersed? What is the name of the group of Animals that normally live immersed in the Soil? The classification of the Animals done by Theophrastus permits us to answer these questions with mistakes, the main mistakes that exist in the Theophrastus' classification are the consideration of various Aerial Animals as being Terrestrial Animals and the lack of a proper name to designate the group of Animals that normally live immersed in the Soil. The Earth is not the Soil [3], therefore, the word Terrestrials is not appropriate to designate only the Animals that live in the Soil and move on the Soil because is applied to any Animal that exists in the Planet Earth; according to Rêgo [12], the appropriate word to designate only the Animals that live in the Soil is the word Solumials or Solumics, because is formed by adding the English suffix *ials* or *ics* to the Latin root *Solum* which means Soil in English. These mistakes are perpetuated by Biology teachers when teaching the classification of the Animals based on Environment, thus, the reasons of the elaboration of this article are the mistakes that exist in the system of classification of the Animals done by Theophrastus and its perpetuation by Biology teachers.

The objective of this article was to analyze the classification of the Animals based on Environment to propose a classification that minimizes the mistakes that exist in the Theophrastus' classification and establish the better understanding about the classification of the Animals based on Environment. The methodology used to achieve the objective of this article was the bibliographic and documentary research and the personal reflections about the system of classification of the Animals done by Theophrastus; The bibliographic research was based mainly in the book of Freitas and Lima [3] and in the book of Roque and Castro [14], while, the documentary research was based in an educative YouTube video about terrestrial and aerial and aquatic Animals [1].

This study contributes with new comprehension about the classification of the Animals based on Environment; The old comprehension based in Theophrastus is, Terrestrial Animals are those that live in the Soil and move on the Soil and the Animals are classified according to the Environment in Aerial and Aquatic and Terrestrial Animals; but, the new compre-

hension is, Terrestrial Animals are all the Animals that exist in the Planet Earth and the Animals are classified according to the Environment in Aerial and Aquatic and Solumial or Solumic Animals.

2. Animals

The Animals are heterotrophic, multicellular and eukaryotic living beings that, in general, feed on by ingestion of foods, reproduce sexually, and move from one place to another [2, 3, 16].

The examples of Animals are: The Sponges of the phylum *Porifera*; the Hydra, the Jellyfish, the Anemone and the Corals of the phylum *Coelenterata* or *Cnidaria*; the Planaria and the Tapeworm of the phylum *Platyhelminthes*; the Roundworm of the phylum *Nemathelminthes* or *Nematoda*; the Earthworm and the Leech of the phylum *Annelida*; the Centipede, the Shrimp, the Bee and the Spider of the phylum *Arthropoda*; the Octopus and the Snail of the phylum *Mollusca*; the Starfish and the Sea Urchin of the phylum *Echinodermata*; the Ray, the Shark, the Croaker, the Tilapia, the Frog, the Turtle, the Chameleon, the Snake, the Crocodile, the Pigeon, the Duck, the Ostrich, the Koala, the Monkey, the Mole and the Man of the phylum *Chordata* [10, 14, 15].

3. Environment

The Earth is not the Soil. "The Earth is a dynamic and living planet" composed by abiotic parts and by various living organisms (free translation) [3], "the soil is the mean environment of numerous living beings" (free translation) [3]. The Earth is a Planet constituted by abiotic parts and by various living organisms in interaction; but, the Soil is the habitable physical mean that composes the Crust of the Lithosphere of the Earth.

The abiotic parts of the Earth that are directly related with the living organisms are the Atmosphere, the Hydrosphere and the Lithosphere; each one of these abiotic parts is an abiotic Environment formed by a type of habitable physical mean; the habitable physical mean that forms the Atmosphere is the Air, the habitable physical mean that forms the Hydrosphere is the Water, while, the habitable physical mean that composes the Lithosphere is the Soil. Thus, abiotic Environment is a broad term that includes its habitable physical mean, a habitable physical mean is a mean environment because it forms a specific abiotic Environment, a mean environment is a habitable physical mean that forms an abiotic Environment of the Earth; the types of means environments are determined according to the abiotic Environments or the abiotic parts that constitute the Planet Earth; the types of means environments of the Earth are the Air, the Water and the Soil [5].

The concept of Environment is different from the concept of Habitat. In the context of Biology, Environment is an abiotic part that composes the Planet Earth where various living beings live; for example, Atmosphere or Aerial Environment, Hydrosphere or Aquatic Environment, and Lithosphere or Solumic Environment. While, Habitat is a restricted place that belongs to a type of Environment where some living beings live, in other words, “Habitat of a living being is the place where it lives” (free translation) [9]; for example, Trees where the Birds live, Pond where the Tilapia live, Sea where the Croakers live, moist Soil where the Earthworms live and dry Soil where the Moles live. Some Aerial Animals that move by walking on the Soil or on the ground, such as Man and Cat and Lion and Ostrich, do not have specific Habitat [7].

4. Classification of the Animals Based on Environment

The classification of the Animals is part of the Systematics. The Systematics is the branch of the Biology that studies the formation of groups of living beings based on their similarities and the designation of these groups according to the international rules. The classification of the Animals facilitates the study and the location and the identification of groups of Animals in the Earth [6, 10, 14].

The classification of the Animals based on Environment was done by Theophrastus (372-287 B. C.), disciple of Aristotle (384-322 B. C.). The classification of the Animals based on Environment is an Artificial classification because is based on a single characteristic or on a single criterion, and is a Horizontal classification because does not consider the time factor or the evolution of the Animals [14]. The classification of the Animals based on Environment is not the classification of the Animals based on Locomotion, because the classification of the Animals based on Environment is based on the type of mean environment or habitable physical mean in which the Animal normally lives immersed, while, the classification of the Animals based on Locomotion is based on the type of locomotory organ of the Animal and its mode of locomotion.

Based on Locomotion, the Animals can be classified in various groups, such as Flying, Walking, Jumping, Crawling, Swimming and Sessile Animals. The Flying Animals, in general, have wings and fly, for example Pigeon and Butterfly; the Walking Animals, in general, have feet and walk, for example Man and Bear; the Jumping Animals, in general, have paws and jump, for example Kangaroo and Frog; the Crawling Animals, in general, do not have locomotory organs and crawl, for example Snake and Earthworm; the Swimming Animals, in general, have fins and swim, for example Tilapia and Whale; the Sessile Animals, in general, do not have locomotory organs and live fixed, for example Sea Sponges and Corals [3].

4.1. Theophrastus' Classification

Theophrastus was a philosopher of the Ancient Greek, was disciple and successor of Aristotle in the Peripatetic School designated Lyceum and founded by Aristotle. Theophrastus was a great observer of the animal and plant and mineral nature and, like his master Aristotle, was considering the study of the animals and plants species in their own mean environment essential. One of the central themes in the Theophrastus' zoological works is the classification of the animals according to the different types of means environments [13].

Theophrastus classified the Animals according to the Environment “in aerials, aquatics and terrestrials” (free translation) [14]. In the Theophrastus' classification, the Aerial Animals are those that live and move in the Air, for example Butterfly and Bird; the Aquatic Animals are those that live and move in the Water, for example Whale and Fish; the Terrestrial Animals are those that live in Earth and move on the Earth, for example Man and Mole [14], as shows the Table 1 and the Figure 1. The word Land is applied mainly in the political-administrative context as the surface of the continental crust, state, country, province, district, terrain or ground; example of application of the word Land is ‘Land Law’; therefore, is not used in this article as synonym of earth nor of Soil [5].

Table 1. Classification of the Animals based on Environment according to Theophrastus.

Groups	Mean Environment	Concept	Examples
Aerial Animals	Air	Aerial Animals are those that live in the Air.	Ostrich, Chicken, Duck, Pigeon, Bird, Owl, Eagle, Stork, Vulture, Fly, Bee, Butterfly and Grasshopper
Aquatic Animals	Water	Aquatic Animals are those that live in the Water.	Starfish, Oyster, Clam, Shrimp, Ray, Octopus, Squid, Jellyfish, Seahorse, Fish, Dolphin, Shark and Whale
Terrestrial Animals	Earth	Terrestrial Animals are those that live in Earth.	Man, Tiger, Lion, Leopard, Elephant, Giraffe, Zebra, Horse, Gazelle, Wolf, Hyena, Rabbit, Bear, Dog, Cat, Pig, Ox, Goat, Monkey, Gorilla, Koala, Sloth, Chameleon, Gecko, Mole, Earthworm and Ant



Figure 1. The three groups of Animals based on Environment according to Theophrastus.

4.2. Mistakes in the Theophrastus' Classification

The classification of the Animals based on Environment done by Theophrastus does not accurately answer the following questions: What is the name of the mean environment in which the Man and the Mole normally lives immersed? And, what is the name of the group of Animals that normally live immersed in the Soil?

According to Theophrastus, the mean environment in which the Man and the Mole lives is called earth, and the group of Animals that live in the Soil is called terrestrials. However, the "Earth is a planet" (free translation) [3] and, therefore, the terrestrial Animals are all those that live in the Planet called Earth, in other words, terrestrial Animal is any Animal that exists in the Planet Earth; an Animal that normally lives immersed in the Soil, like the Mole, is terrestrial; an Animal that normally lives immersed in the Water, like the Fish, is terrestrial; and an Animal that normally lives immersed in the atmospheric Air, like the Bird, is also terrestrial.

Thus, the system of classification of the Animals based on Environment proposed by Theophrastus has two fundamental mistakes, which are, the consideration of various Aerial Animals as being Terrestrial Animals and the lack of a proper name to designate the group of Animals that normally live immersed in the Soil.

4.2.1. The Consideration of Various Aerial Animals as being Terrestrial Animals

In the system of classification of the Animals based on Environment, done by Theophrastus, exist many Aerial Animals that are considered as being Terrestrial Animals; for example the Man, the Lion, the Monkey, the Koala and the Chameleon are considered Terrestrial Animals; but, despite their locomotion on the Soil, these Animals are Aerial Animals because normally live immersed in the atmospheric Air. The Birds, considered by Theophrastus as being Aerial Animals, also move walking or jumping on the Soil.

4.2.2. The Lack of a Proper Name to Designate the Group of Animals That Normally Live Immersed in the Soil

In the system of classification of the Animals based on Environment, done by Theophrastus, does not exists a proper name to designate the group of Animals that normally live immersed in the Soil. The word Aerials used in this system of classification of the Animals is appropriate to designate the group of Animals that live in the Air, and the word Aquatics used in this system of classification of the Animals also is appropriate to designate the group of Animals that live in the Water, but, the word Terrestrials used in this system of classification of the Animals is not appropriate to designate the group of Animals that live in the Soil because is applied to any Animal that exists in the Planet Earth. The word Terrestrials is applied to the Animals that live in the Air, in the Water and in the Soil; consequently, cannot be used to designate only a group of Animals that normally live immersed in the Soil and that move on the Soil. Therefore, is necessary to create a proper name to designate the group of Animals that normally live immersed in the Soil.

4.3. Proposal to Minimization of the Mistakes in the Theophrastus' Classification

The mistakes that exist in the system of classification of the Animals based on Environment proposed by Theophrastus need an urgent solution, because the classification of the Animals based on Environment is an important curricular content in the Biology teaching and, the teachers teach the classification of the Animals based on Environment done by Theophrastus and perpetuate the mistakes that exist in the Theophrastus' classification.

The solution of the mistakes that exist in the system of classification of the Animals based on Environment proposed by Theophrastus involves three actions, which are: Use the word terrestrials to designate all the Animals that exist in the Planet Earth, and not to designate only the Animals that live in

the Soil and on the surface of the Soil; consider all the Animals that normally live immersed in the atmospheric Air as being Aerial Animals; invent a proper name to designate all the Animals that normally live immersed in the Soil.

4.3.1. Use of the Word Terrestrials in the Classification of the Animals Based on Environment

In the system of classification of the Animals based on Environment done by Theophrastus, the word terrestrials is used to designate only the Animals that live in earth and move on the earth or the Animals that live in the Soil and move on the Soil. In this system of classification of the Animals, the word earth is synonym of the word Soil, but, “earth is the name of the Planet” and “soil is the surface layer of the Planet's crust” (free translation) [11]. Thus, in the classification of the Animals based on Environment, is correct to use the word terrestrials to designate all the Animals that exist in the Planet Earth, and not to designate only the Animals that live in the Soil and move on the Soil, because the Soil is one of the layers of one of the abiotic parts of the Earth called Lithosphere.

4.3.2. Animals that Normally live Immersed in the Atmospheric Air

In the system of classification of the Animals based on Environment done by Theophrastus, various Animals that normally live immersed in the atmospheric Air are considered as being Terrestrial Animals; for example the Lion, the Giraffe, the Man, the Monkey, the Koala, the Dog, the Cat, the Ox, the Pig and the Leopard are considered as being Terrestrial Animals. But, despite their locomotion on the Soil, these Animals are Terrestrial Animals in the sense of earth as the name of the Planet, these Animals are not Terrestrial Animals in the sense of earth as a synonym of Soil, all the Animals that normally live immersed in the atmospheric Air are Aerial Animals because the mean environment in which they are immersed is called Air.

4.3.3. Nomenclature of the Groups of Animals Based on Environment

The names that Theophrastus used to designate the groups of Animals according to the Environment come from Ancient Greek and are not exactly scientific names, but are adjectives; thus, the words, aeriels, aquatics and terrestrials used by Theophrastus to classify the Animals according to the Environment are adjectives; the word aeriels means relative or belonging to Air, the word aquatics means relative or belonging to Water and the word terrestrials means relative or belonging to Earth [13].

However, the nomenclature of the groups of Animals according to the Environment follows the international rules of scientific nomenclature of the living beings; because the “nomenclature proposed to be accepted and to have scientific

value will have to obey the rules of taxonomic nomenclature that constitute the International Code of Nomenclature” (free translation) elaborated by International Commissions; the first Commission of Zoology met in 1842 and included Charles Darwin among its members; among the main international rules of scientific nomenclature of the living beings two stand out, which are, the use of the Latin alphabet to designate a certain group of living beings and the addition of a certain suffix to the root or to the radical appropriate to designate a certain group of living beings [14].

Thus, despite being adjectives, the names of the groups of Animals according to the Environment are based on the Latin language and in the addition of appropriate suffix to an appropriate root. Consequently, the word Aerials in Latin means *Aereus* and is formed by the addition of the Latin root *Aer* which means Air in English with the suffix *eus* that correspond to the suffix *ials* in English, while, the word Aquatics in Latin means *Aquaticus* and is formed by the addition of the Latin word *Aquat* that result from the Latin root *Aqua* which means Water in English with the suffix *icus* that correspond to the suffix *ics* in English [4, 8].

So, the name of the Animals that normally live immersed in the Soil must be based on the Latin language and in the addition of a suffix to an appropriate root; the word Soil in Latin means *Solum* [8], thus, the word *Solum* is the appropriate root to originate the name of the Animals that normally live immersed in the Soil. When the suffix *eus* from the Latin word *Aereus* is added to the Latin root *Solum* is formed the word *Solumemus*, and when the suffix *icus* from the Latin word *Aquaticus* is added to the Latin root *Solum* is formed the word *Solumicus*; the names *Solumemus* and *Solumicus* are appropriate to designate the Animals that normally live immersed in the Soil because they originate from the Latin root *Solum*, which means Soil in English; given that the Latin suffix *eus* corresponds to the English suffix *ials* and the Latin suffix *icus* corresponds to the English suffix *ics*, the Latin names *Solumemus* and *Solumicus* can mean respectively Solumials and Solumics in English.

Therefore, the name of the group of Animals that normally live immersed in the Soil is Solumials or Solumics, because they are names that are based on the Latin language and in the addition of an appropriate suffix to an appropriate radical; the word Solumials in Latin means *Solumemus* and is formed by the addition of the Latin radical *Solum* which means Soil in English with the Latin suffix *eus* that correspond to the suffix *ials* in English, while, the word Solumics in Latin means *Solumicus* and is formed by the addition of the Latin radical *Solum* which means Soil in English with the Latin suffix *icus* that correspond to the suffix *ics* in English; the word appropriate to designate only the Animals that live in the Soil is the word Solumials or Solumics because is formed by the addition of the English suffix *ials* or *ics* to the Latin radical *Solum* which means Soil in English.

The classification of the Animals according to the Environment is based on the type of mean environment or habita-

ble physical mean in which the Animal normally lives immersed. The means environments or habitable physical means of the Earth in which an Animal can normally live immersed are the Air, the Water and the Soil. Therefore, according to the type of mean environment in which the Animal normally lives immersed, the Animals that exist in the Earth or the Terrestrial Animals are classified in Aerial, Aquatic and Solumial or Solumic Animals.

The Aerial Animals are all those Terrestrial Animals that normally live immersed in the atmospheric Air. The examples of Aerial Animals are: Man, Tiger, Lion, Leopard, Elephant, Giraffe, Zebra, Horse, Gazelle, Wolf, Hyena, Rabbit, Bear, Dog, Cat, Ostrich, Pig, Oxen, Goat, Monkey, Gorilla, Koala, Sloth, Chameleon, Lizard, Chicken, Duck, Pigeon, Bird, Owl, Eagle, Stork, Vulture, Fly, Bee, Butterfly and Grasshopper.

The Aquatic Animals are all those Terrestrial Animals that normally live immersed in the Water. The examples of Aquatic Animals are: Starfish, Oyster, Clam, Shrimp, Ray, Octopus, Squid, Jellyfish, Seahorse, Fish, Dolphin, Shark and Whale.

The Solumial or Solumic Animals are all those Terrestrial Animals that normally live immersed in the Soil. The examples of Solumial or Solumic Animals are: Mole, Earthworm and Ant.

Therefore, the Terrestrial Animals are all those Animals that exist in the Planet Earth; among the Terrestrial Animals, the Aerial Animals live immersed in the Air, the Aquatic Animals live immersed in the Water and the Solumial or Solumic Animals live immersed in the Soil, as shows the [Table 2](#) and the [Figure 2](#).

Table 2. Proposal of the system of classification of the Animals based on Environment.

Terrestrial Animals are those that exist in the Planet Earth				
Groups	Abiotic Environment	Mean Environment	Concept	Examples
Aerial Animals	Atmosphere	Air	Aerial Animals are those that normally live immersed in the atmospheric Air.	Man, Leopard, Monkey, Koala, Chameleon, Lizard, Bird and Grasshopper
Aquatic Animals	Hydrosphere	Water	Aquatic Animals are those that normally live immersed in the Water.	Starfish, Clam, Shrimp, Ray, Shark, Dolphin and Whale
Solumial or Solumic Animals	Lithosphere	Soil	Solumial or Solumic Animals are those that normally live immersed in the Soil.	Mole, Worm and Ant



Figure 2. Proposal of the three groups of Animals based on Environment.

5. Application of the New System of Classification of the Animals Based on Environment

The application of the new system of classification of the Animals based on Environment refers to the exercises of the

curricular discipline of Biology that can be solved based on the new system of classification of the Animals according to the Environment.

The [Table 3](#) below presents the examples of questions, and their answers, that can be answered accurately based on the new system of classification of the Animals according to the Environment.

Table 3. Exercises of application of the new system of classification of the Animals according to the Environment.

Questions	Answers
1. In what part of the Earth can be localized the following Animals?	
a) Mole and Earthworm.	1. a) Lithosphere.
b) Gorilla and Pigeon.	1. b) Atmosphere.
c) Whale and Croaker.	1. c) Hydrosphere.
2. In what mean environment normally live immersed the following Animals?	
a) Shark and Shrimp.	2. a) Water
b) Termite and Ant.	2. b) Soil
c) Ostrich and Leopard.	2. c) Air
3. What are the following Animals called according to the Environment in which live? Justify.	
a) Ant, Termite, Earthworm and Mole.	3. a) Are called Solumial or Solumic Animals, because normally live immersed in the Soil.
b) Grasshopper, Lizard, Chicken and Chimpanzee.	3. b) Are called Aerial Animals, because normally live immersed in the atmospheric Air.
c) Ray, Starfish, Tilapia and Dolphin.	3. c) Are called Aquatic Animals, because normally live immersed in the Water.

6. Materials and Methods

The main materials used were the book of Freitas and Lima [3], the book of Roque and Castro [14] and an educative YouTube video about terrestrial and aerial and aquatic Animals [1]. The methods used were the bibliographic and documentary research; each method used was accompanied by profound personal reflections about the system of classification of the Animals done by Theophrastus.

In the bibliographic research were mainly analyzed the following excerpts from the book of Freitas and Lima, “The Earth is a dynamic and living planet” (free translation) [3] and “the soil is the mean environment of numerous living beings” (free translation) [3]; and mainly the following excerpt from the book of Roque and Castro, “The plants, in turn, were classified by Theophrastus (372-287 B. C.), disciple of Aristotle, in trees, shrubs and herbs, and the animals, in aeri-als, aquatics and terrestrials. The classification [...] was based [...] size [...] environment” (free translation) [14]. In the documentary research were analyzed the groups of Animals according to the Environment [1].

7. Results and Discussion

In the analysis of the excerpts from the book of Freitas and Lima [3], was noted that the Earth is a Planet and the Soil is a mean environment that exists in the Earth. This result permits us to understand that the Earth is not the Soil. Thus, the word Earth cannot be considered as synonym of the word Soil and, consequently, the word Terrestrials which derives from the word Earth cannot be used to designate only a group of Animals that live in the Soil and move on the Soil as Theophrastus taught; but, the word Terrestrials is applied to the Animals that live in the Air, in the Water and in the Soil, because derives from the word Earth which designates a Planet constituted by different types of means environments and living beings in interaction.

In the analysis of the excerpt from the book of Roque and Castro [14], was noted that Theophrastus classified the Animals according to the Environment in Aerial, Aquatic and Terrestrial Animals. This result permits us to understand that Theophrastus used the word Terrestrials because he considered the word Earth as being synonym of the word Soil. However, the word Terrestrials is not appropriate to designate only the Animals that live in the Soil; according to Rêgo [12], who said that, “*according to the Environment [...] the Man is Aerial [...], the Fish is Aquatic [...], but the Mole in a Soil is Solumic or Solumial animal [...]*” (free translation), the appropriate word to designate only the Animals that live in the Soil is the word Solumials or Solumics because is formed by adding the English suffix *ials* or *ics* to the Latin root *Solum* which means Soil in English.

In the analysis of the groups of Animals according to the Environment in the educative YouTube video about terrestrial and aerial and aquatic Animals [1], was verified that the Terrestrial Animals live in earth and do not fly, example Dog, Cat and Lion; the Aerial Animals live in earth and fly, example Owl, Pigeon and Butterfly; the Aquatic Animals live in the water, example Fish, Dolphin and Whale. This result permits us to understand that the classification of the Animals according to the Environment is an important curricular content in Biology teaching and teachers teach the classification of the Animals done by Theophrastus. In this result are noted the following mistakes, the word earth is synonym of the word Soil, the earth is the mean environment of the Terrestrial and Aerial Animals, the atmospheric Air is not used as mean environment of the Aerial Animals, the criterion used to distinguish the Terrestrial Animals from the Aerial Animals is the Locomotion and not the Environment, the Dog and the Cat and the Lion which normally live immersed in the atmospheric Air are considered Terrestrial Animals. These mistakes are perpetuated by teachers who teach the classification of the Animals based on Environment. To minimize the mistakes that exist in the Theophrastus’ classification, is proposed the comprehension that the Terrestrial Animals are all the Animals that exist in the Planet Earth and the Animals are classified according to the Environment in Aerial and Aquatic and Solumial or Solumic Animals.

8. Conclusion

Theophrastus classified the Animals according to the Environment in Aerial, Aquatic and Terrestrial Animals. In the Theophrastus' classification, the Aerial Animals are those that live and move in the atmospheric Air, example Bird; the Aquatic Animals are those that live and move in the Water, example Fish; the Terrestrial Animals are those that live in Earth and move on the Earth, example Man and Mole.

The main mistakes that exist in the Theophrastus' classification are the consideration of various Aerial Animals as being Terrestrial Animals and the lack of a proper name to designate the Animals that normally live immersed in the Soil. In the Theophrastus' classification, the Aerial Animals that normally live immersed in the atmospheric Air, such as the Lion and the Monkey, are considered Terrestrial Animals and the word Terrestrials is used to designate only the group of Animals that normally live immersed in the Soil and that move on the Soil.

The classification of the Animals according to the Environment is an important curricular content in the Biology teaching and the Teachers who teach the classification of the Animals done by Theophrastus perpetuate the comprehension that the Terrestrial Animals are those that live in the Soil and move on the Soil and the Animals are classified according to the Environment in Aerial and Aquatic and Terrestrial Animals. The Earth is not the Soil and the word Terrestrials is not appropriate to designate only the group of Animals that live in the Soil because is applied to any Animal that exists in the Planet Earth, the appropriate word to designate only the group of Animals that live in the Soil is the word Solumials or Solumics because is formed by adding the English suffix ials or ics to the Latin root *Solum* which means Soil in English. To minimize the mistakes that exist in the Theophrastus' classification, is proposed the comprehension that the Terrestrial Animals are all the Animals that exist in the Planet Earth and the Animals are classified according to the Environment in Aerial and Aquatic and Solumial or Solumic Animals.

The Environments of the Earth are the Atmosphere formed by atmospheric Air, the Hydrosphere formed by Water and the Lithosphere composed by Soil. Based on Environment, the Terrestrial Animals are classified in Aerial, Aquatic and Solumial or Solumic Animals. The Aerial Animals are those that live immersed in the atmospheric Air, for example Man. The Aquatic Animals are those that live immersed in the Water, for example Fish. The Solumial or Solumic Animals are those that live immersed in the Soil, for example Mole. With this study, is suggested that further research be carried out about the classification of the Animals based on Environment to establish a better understanding of this theme.

Abbreviations

PPDA	People-to-People Development Assistance
B. C.	Before Christ

Author Contributions

Amâncio Maurício Xavier Rêgo is the sole Author. The author read and approved the final manuscript.

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Conflicts of Interest

The author declares no conflicts of interest.

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Amâncio Maurício Xavier Rêgo is Specialist of Education and Trainer at the School of Teachers of the Future in Chimoio; completed master's degree in Educational Management and Administration in 2015 in the Catholic University of Mozambique in Chimoio and graduation in

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