

Diversity of Entomofauna of the Scientific City of Brazzaville (Republic of Congo)

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Abstract

The entomofauna in the Republic of Congo is very little known. Studies carried out in natural forests are few. It is in this context that this inventory of entomofauna was carried out from April to July 2022 in the Scientific City Forest. The general objective is to contribute to the knowledge of the trapping, mowing and sight hunting; the three types of traps used are: Barber pots, colored plates and aerial traps. This study made it possible to invent 1523 specimens belonging to 106 species, 99 genera, 59 families and 12 orders. The order Diptera is the most abundant and richest in species (47% and 26%). This order is followed by Hymenoptera (23% and 23%). Formicidae (14%) and Calliphoridae (13%) are the most abundant families. The Formicidae family presents the greatest species richness (7%), *Calliphora sp* and *Polyrhachis cyaniventris* present the highest specific relative abundance of the entire collection. These preliminary results of the entomofauna of Scientific City constitute a database. However, this study must be continued and extended to other areas of Brazzaville, using other capture techniques and taking into account the seasons.

Keywords

Scientific City, Forest, Entomofauna, Specific Richness, Brazzaville

1. Introduction

Insects constitute one of the major components of biodiversity in tropical ecosystems. They are particularly important in the Amazon and the Congo Basin [1]. They represent three-quarters of the animal species described on the planet with

around six million species [2], a large number of insects still remain unknown in the 21st century [3]. Their interactions with plants represent particularly important scientific and societal issues since they affect the distribution and abundance of plant and animal species, consequently, the functioning and biological diversity of ecosystems as well as human well-being [4]. They make it possible, in fact, to assess the quality of ecosystems, to predict future changes and to diagnose ecological problems [5].

In the agronomic field, they are important because, living in association with plants, they ensure their protection through predation. Some are essentially true pollinators and spreaders of plants; others cause damage to crops and cause the decomposition of organic matter. In the health field, many species are used as antibiotics for dermatological infections; still others cause allergies [6]. They parasitize or transmit pathogenic organisms to humans, livestock and plants [7]. In genetics, insects have made it possible to demonstrate the process of cloning a gene to be expressed in viral DNA [8]. In pharmacology, many of them are increasingly studied in order to isolate natural substances of medical interest. The venoms of certain species are commonly used in indigenous pharmacopoeias [9]. In the traditional domain, insects and their productions also serve as technical materials. Beeswax is widely used. The dry nests of termites and wasps can be used to light fires, or be used in traditional remedies. In the food sector, insects are part of the eating habits of many populations around the world and contribute significantly to reducing the problems of deficiencies in proteins, lipids, vitamins and/or mineral salts [10] [11]. Insects of the Dactylopiidae family, notably scale insects (*Coccus cacti*), are used in the production of a natural dye called carmine, used in food coloring as well as in medicines and cosmetic products [12] [13].

In the Republic of Congo, entomological diversity is little known, because very few studies have been devoted to insects. Some works carried out, mostly old, are those of [14]-[20]. In addition, all this work is only based on the identification of the entomofauna of a few forests and savannahs in the Congo Basin. This study is a contribution to the knowledge of the diversity of the entomofauna of the natural forest of the Scientific City.

2. Material and Methods

2.1. Presentation of the Study Area

The city of Brazzaville is located between 4° 10' and 4° 15' South latitude and 15° 15' East longitude (Figure 1). It extends for a third on a formerly marshy plain and for two-thirds on a plateau deeply cut by ravines and dominating the Congo River at an altitude of 313 m [21]. It is limited to the north by District 9 Djiri, to the south by District 8 Madibou, to the east by the Congo River and to the west by District 7 Mfilou. It extends for a third on a formerly marshy plain and for two-thirds on a plateau deeply cut by ravines and overlooking the Congo River at an altitude of 20 m via a cornice [22].

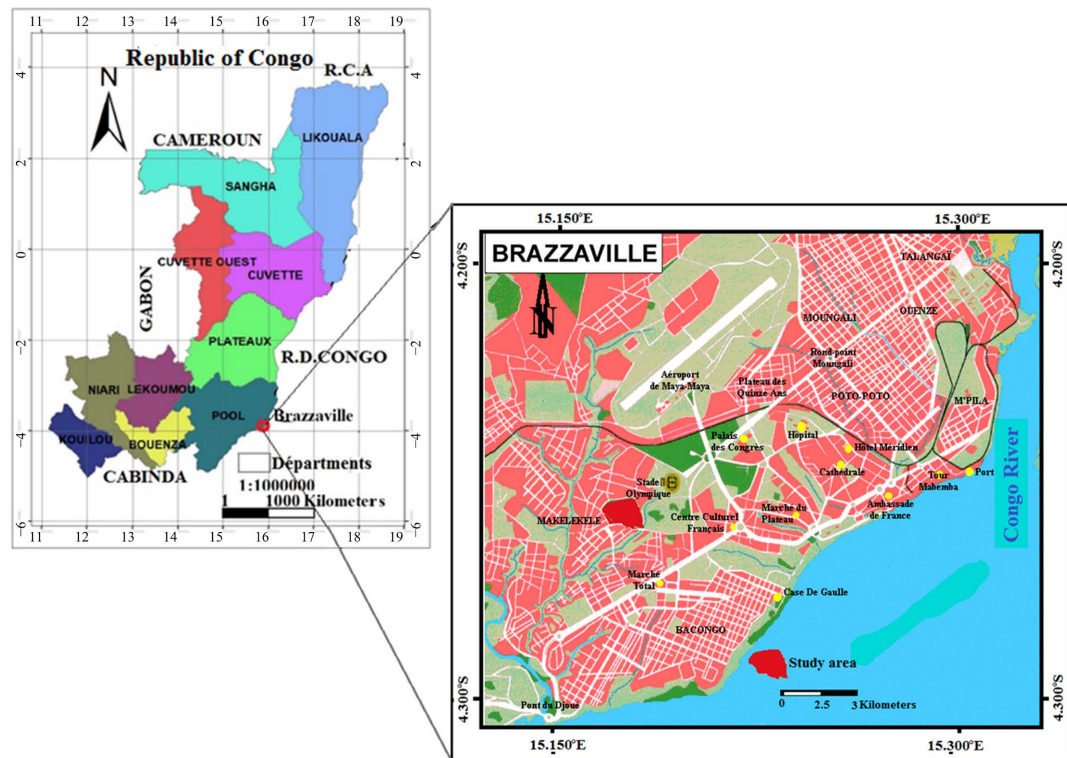


Figure 1. Location of the Scientific City forest (ex ORSTOM) (Google Earth).

2.2. Sampling and Conservation Methods

Entomological sampling often requires the implementation of several techniques. However, three (3) methods (trapping, sight hunting and mowing) with three (3) techniques (Barber pots, colored plates and hanging traps) were used to inventory the entomofauna from April to July 2022. These techniques were chosen because they are adapted to a forest environment. Samples collected in the field were fixed in acetone and preserved in alcohol at 70 °C.

2.3. Identification of Specimens

The specimens were identified and counted. The identification was based on the observation of morphological criteria, under the binocular magnifying glass using dichotomous keys and basic works. The various documents which allowed the identification of specimens are those of [23]-[28].

2.4. Data Analysis and Processing

Qualitative and quantitative data were entered into an Excel workbook, then subjected to analysis by Excel and R version 4.1.2 software. The quantitative data collected relating to the number of orders, families and species of insects made it possible to calculate the ecological indices of the identified insect population and to carry out the statistical tests. The data obtained are grouped, in a double-entry table, into means and standard deviations and their fluctuations are presented and highlighted by the histograms.

2.5. Ecological Indices

The results obtained from the sampling of entomofauna of the Scientific City are analyzed by centesimal frequency or relative abundance, Shannon-Weaver diversity indices and equitability.

2.5.1. Relative Abundance (RA%)

Relative abundance is the percentage of individuals of the species taken into consideration (n_i) compared to the total individuals (N) of all species combined [29]. It is calculated by the following formula: $AR\% = n_i/N \times 100$, with n_i : Number of individuals of the species encountered; N : Total number of individuals of all species.

2.5.2. Shannon Diversity Index (H')

To assess the species richness of insects, the Shannon diversity index which uses information theory is used. According to [30], it is necessary to combine the relative abundance of species and total richness in order to obtain a mathematical expression of the general Shannon-Weaver diversity index. The general formula for the Shannon diversity index (H') is:

$H' = -\sum q_i \log_2 q_i$, where $q_i = n_i/N$. With q_i : Relative frequency of the species (i) taken into consideration; n_i : Total number of individuals of the species (i); N : Total number of all individuals of all species.

2.5.3. Pielou Evenness Index or Equitability (E)

The calculation of the Shannon diversity index must always be accompanied by that of fairness (E). According to [31], this evenness or equidistribution index corresponds to the ratio of the observed diversity (H') to the maximum diversity (H'_{\max}): $E = H'/H'_{\max}$.

With: H' = Shannon-Weaver diversity index; H'_{\max} = maximum diversity.

$H'_{\max} = \log_2 S$, with S = total richness expressed in number of species. The equitability varies between 0 and 1. It tends towards 0 when the majority of the workforce is concentrated on one or two species. It is equal to 1, when all species are represented by the same number [32].

2.6. Statistical Tests

During this work, four (4) tests were used, including the Kruskal-Wallis, Wilcoxon and 1-factor Student tests. They work by calculating the p-value (probability). If this p value is less than or equal to the significance threshold, we conclude that the difference is significant. When it is above the significance threshold, there is no significant difference.

3. Results

3.1. Overall Specific Composition

The inventory of the entomofauna of the Cité Scientifique made it possible to identify 1523 specimens belonging to 106 species, 99 genera, 59 families and 12 orders (Table 1, Figure 2).

Table 1. List of collected species.

Orders	Families	Genus	Species	Individuals (N)	
Odonata	Libellulidae	<i>Libellula</i>	<i>Libellula sp</i>	6	
		<i>Palpopleura</i>	<i>Palpopleura lucia</i>	2	
	Aeshnidae	<i>Aeshna</i>	<i>Aeshna affinis</i>	3	
Orthoptera	Gryllidae	<i>Nemobius</i>	<i>Nemobius sylvestis</i>	3	
		<i>Brachytrupes</i>	<i>Brachytrupes sp</i>	5	
		<i>Gryllus</i>	<i>Gryllus campestris</i>	5	
	Acrididae	<i>Acheta</i>	<i>Acheta domesticus</i>	3	
		<i>Schistocerca</i>	<i>Schistocerca sp</i>	6	
			<i>Schistocerca gregaria</i>	4	
		<i>Tridactylus</i>	<i>Tridactylus sp</i>	7	
	Pneumoridae	<i>Pneumora</i>	<i>Pneumora sp</i>	3	
	Tetridae	<i>Tetrix</i>	<i>Tetrix sp</i>	13	
Neuroptera	Chrysopidae	<i>Chrysopa</i>	<i>Chrysopa sp</i>	1	
Dermaptera	Anisolabididae	<i>Euborellia</i>	<i>Euborellia annulipes</i>	65	
	Miridae	<i>Lygocoris</i>	<i>Lygocoris sp</i>	1	
	Aphrophoridae	<i>Aphrophora</i>	<i>Aphrophora sp,</i>	6	
	Lygaeidae	<i>Dieuches</i>	<i>Dieuches armatiqués</i>	3	
	Cercopidae	<i>Cercopis</i>	<i>Cercopis sp</i>	7	
	Hemiptera	Cicadellidae	<i>Oncopsis</i>	<i>Oncopsis sp</i>	8
			<i>Ledra</i>	<i>Ledra sp</i>	3
		Pyrrhocoridae	<i>Pyrrhocoris</i>	<i>Pyrrhocoris sp</i>	10
		Alydidae	<i>Alydus</i>	<i>Alydus sp</i>	3
	Membracidae	<i>Centrotus</i>	<i>Centrotus sp</i>	10	
Diptera	Neriidae	<i>Telostylinus</i>	<i>Telostylinus sp</i>	84	
	Lauxaniidae	<i>Homneura</i>	<i>Homneura sp</i>	9	
	Cecidomyiidae	<i>Cecidomyia</i>	<i>Cecidomyia sp</i>	3	
	Sphaeroceridae	<i>Sphaerocera</i>	<i>Sphaerocera sp</i>	3	
	Tachinidae			<i>Cylindromyia sp</i>	2
			<i>Tachina</i>	<i>Tachina sp</i>	15
			<i>Chloromya</i>	<i>Chloromya formosa</i>	2
	Stratiomyidae		<i>Hermetia</i>	<i>Hermetia sp.</i>	24
				<i>Lucilia sp</i>	14
		Calliphoridae	<i>Lucilia</i>	<i>Lucilia sericata</i>	2
		<i>Calliphora</i>	<i>Calliphora sp</i>	176	

Continued

		<i>Cleilosia</i>	<i>Cleilosia sp</i>	2
Syrphidae		<i>Brachyopa</i>	<i>Brachyopa pilosa</i>	1
Diopsidae		<i>Cyrtodiopsis</i>	<i>Cyrtodiopsis sp</i>	9
		<i>Phaonia</i>	<i>Phaonia rufiventris</i>	13
Muscidae		<i>Musca</i>	<i>Musca sp</i>	27
			<i>Poecilodothrus sp</i>	59
Dolichopodidae	<i>Poecilodothrus</i>		<i>Poecilodothrus nobilitatus</i>	48
			<i>Sarcophaga spp</i>	66
Sarcophagidae	<i>Sarcophaga</i>		<i>Sarcophaga melanura</i>	5
Tephritidae		<i>Tephritis</i>	<i>Tephritis sp</i>	1
Pipimculidae	<i>Dorytomorpha</i>		<i>Dorytomorpha sp</i>	3
Mycetophilidae		<i>Macrocera</i>	<i>Macrocera sp</i>	11
			<i>Drosophila spp</i>	94
Drosophilidae	<i>Drosophila</i>		<i>Drosophila melanogaster</i>	41
		<i>Rhynchium</i>	<i>Rhynchium spp.</i>	13
Vespidae		<i>Belonogaster</i>	<i>Belonogaster sp.</i>	15
		<i>Synagris</i>	<i>Synagris sp.</i>	19
		<i>Collides</i>	<i>Collides sp.</i>	3
Collitidae		<i>Hylaeoides</i>	<i>Hylaeoides sp.</i>	1
Apidae		<i>Apis</i>	<i>Apis sp.</i>	3
Ichneumonidae		<i>Netelia</i>	<i>Netelia sp.</i>	33
Scoliidae		<i>Scolia</i>	<i>Scolia sp.</i>	1
Gasteruptiidae		<i>Gasteruptions</i>	<i>Gasteruptions sp.</i>	21
		<i>Priocnemis</i>	<i>Priocnemis sp.</i>	1
		<i>Agenioideus</i>	<i>Agenioideus apicalis</i>	4
Hymenoptera	Pompilidae	<i>Anoplius</i>	<i>Anoplius sp.</i>	3
		<i>Pepsis</i>	<i>Pepsis sp.</i>	6
	Evaniidae	<i>Evania</i>	<i>Evania appendigaster</i>	2
	Bethylidae	<i>Bethylus</i>	<i>Bethylus sp.</i>	10
	Agaonidae	<i>Blastophaga</i>	<i>Blastophaga psenes</i>	2
		<i>Polyrhachis</i>	<i>Polyrhachis cyaniventris</i>	159
		<i>Dinoponera</i>	<i>Dinoponera spp.</i>	9
		<i>Attas</i>	<i>Attas sp.</i>	5
	Formicidae	<i>Serviformica</i>	<i>Serviformica sp.</i>	14
		<i>Oecophylla</i>	<i>Oecophylla smaragdina</i>	6
			<i>Formica fusca</i>	9
		<i>Formica</i>	<i>Formica spp.</i>	11

Continued

Blattoptera	Corydiidae	<i>Arenivaga</i>	<i>Arenvaga sp.</i>	11	
		<i>Pycnoscelus</i>	<i>Pycnoscelus sp.</i>	29	
	Blaberidae	<i>Lucihometia</i>	<i>Lucihometia sp.</i>	2	
		<i>Bantua</i>	<i>Bantua sp.</i>	2	
	Blattellidae	<i>Blatella</i>	<i>Blatella sp.</i>	3	
		<i>Loboptera</i>	<i>Loboptera sp.</i>	28	
	Blattidae	<i>Blatta</i>	<i>Blatta sp.</i>	3	
		<i>Periplaneta</i>	<i>Periplaneta spp.</i>	55	
	Coleoptera	Tenebrionidea	<i>Gonocephalum</i>	<i>Gonocephalum sp.</i>	6
			<i>Tenebrio</i>	<i>Tenebrio obscurus</i>	2
<i>Eपुरaea</i>			<i>Eपुरaea sp.</i>	2	
Nilidulidae		<i>Carpophilus</i>	<i>Carpophilus sp.</i>	10	
		<i>Meligethes</i>	<i>Meligethes planiusculus</i>	5	
Cetoniidae		<i>Chlorocala</i>	<i>Chlorocala africana</i>	16	
		<i>Protaetia</i>	<i>Protaetia sp.</i>	1	
Cerambycidae		<i>Phytoecia</i>	<i>Phytoecia cylindrica</i>	3	
		<i>Agapanthia</i>	<i>Agapanthia</i>	1	
		<i>Buprestidae</i>	<i>Agrilus</i>	<i>Agrilus sp.</i>	5
		<i>Coccinellidae</i>	<i>Platynaspis</i>	<i>Platynaspis capicola</i>	14
		Lycidae	<i>Lycus</i>	<i>Lycus sp.</i>	3
			<i>Badister</i>	<i>Badister sp.</i>	2
		Carabidae	<i>Acupalpus</i>	<i>Acupalpus sp.</i>	3
			<i>Pterostichus</i>	<i>Pterostichus strenuus</i>	2
Lepidoptera		Pieridae	<i>Eurma</i>	<i>Eurema brigitta</i>	4
			<i>Mylothris</i>	<i>Mylothris agathina</i>	3
			<i>Pieris</i>	<i>Pieris sp.</i>	2
			<i>Precis</i>	<i>Precis pelarga</i>	2
	<i>Bicyclus</i>		<i>Bicyclus sp.</i>	4	
	Nymphalidae	<i>Telchinia</i>	<i>Telchinia encedon</i>	5	
		<i>Acraea</i>	<i>Acraea egina</i>	5	
		<i>Papilionidae</i>	<i>Papilio</i>	<i>Papilio demodocus</i>	2
	Lyceanidae	<i>Cigaritis</i>	<i>Cigaritis sp.</i>	2	
	Erebidae	<i>Erebus</i>	<i>Erebus sp.</i>	40	
	Trichoptera	Hydropsychidae	<i>Hydropsyche</i>	<i>Hydropsyche sp.</i>	3
Isoptera	Termitidae	<i>Macrotermes</i>	<i>Macrotermes sp.</i>	2	
				1523	

Isoptera



Macrotermes sp

Dermaptères



Euborellia sp

Hemiptera



Centrotus cornutus



Oncopsis sp

Hymenoptera



Polyrhachis cyaniventris



Synagris sp

Blattoptera



Lobopectera sp



Arenivaga sp

Orthoptera



Nemobius sp



Tridactylus sp

Diptera



Telostylus sp



Cyrtodiopsis sp



Hermetia sp



Poecilodothrus sp

Coleoptera



Carpophilus sp.



Lycus sp



Chlorocala africana



Agrilus sp

Lepidoptera



Mylothris agathina



Eurema brigitta

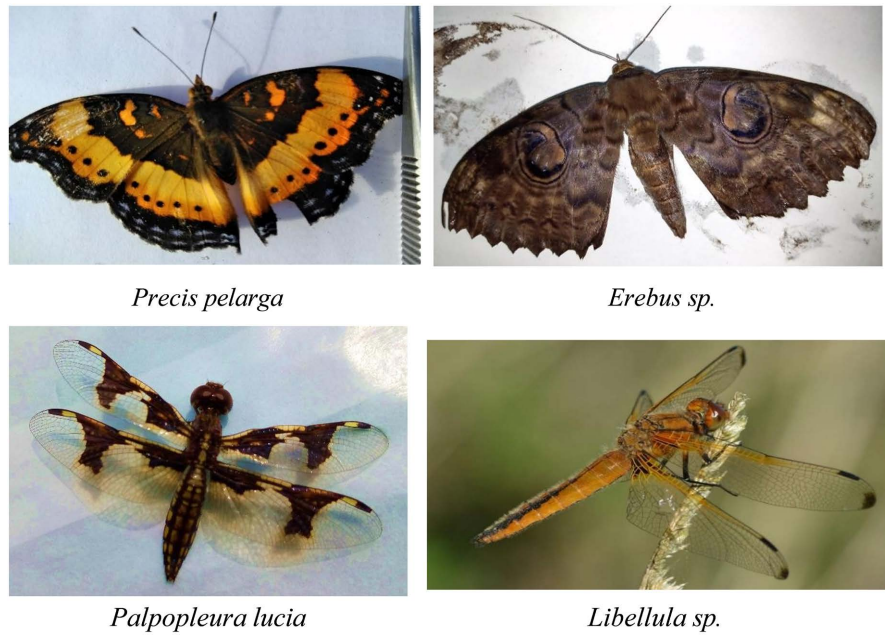


Figure 2. Collected insects.

3.2. Relative Abundance of Orders

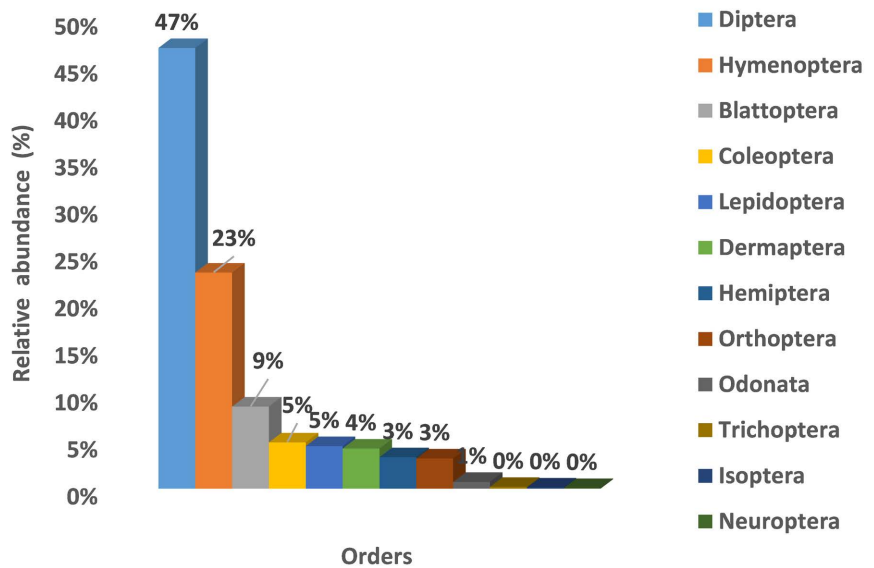


Figure 3. Proportional distribution of the relative abundance of orders.

Figure 3 generally represents the individual number of the orders listed of the Scientific City. We note that the Diptera are by far the most abundant, *i.e.* 47% of individuals, followed by the Hymenoptera (23%), Blattoptera (9%), Coleoptera and Lepidoptera (5%). The other orders (Dermaptera, Hemiptera, Orthoptera, Odonata, Trichoptera, Isoptera and Neuroptera) have very low percentages less than 5%. The Kruskal-Wallis test at the 5% threshold with $p = 0.04$, shows that there is a highly significant difference between the first two orders (Diptera and

Hymenoptera) and other orders. On the one hand, the difference is not very significant between other orders: Blattoptera, Coleoptera, Lepidoptera, Dermaptera, Hemiptera, Orthoptera, Odonata, Blattoptera, Lepidoptera, Coleoptera, Trichoptera, Isoptera and Neuroptera.

3.3. Specific Richness of Orders

The overall specific richness of the insect orders inventoried in the Scientific City is illustrated by **Figure 4**. This figure shows that the Diptera are statistically richer with a relative abundance of 26% of species, followed by the Hymenoptera (23%), Coleoptera (15%), Lepidoptera (10%). The rest of the orders (Orthoptera, Hemiptera, Blattoptera, Odonata, Neuroptera Dermaptera, Trichoptera and Isoptera) have species richness less than 10%. The Kruskal-Wallis test at the 5% threshold for a p -value = 0.04 reveals that the captured Diptera and Hymenoptera present no significant difference. On the other hand, the difference is highly significant compared to other orders: Coleoptera, Lepidoptera, Orthoptera, Hemiptera, Blattoptera, Odonata, Neuroptera, Dermaptera, Trichoptera and Isoptera.

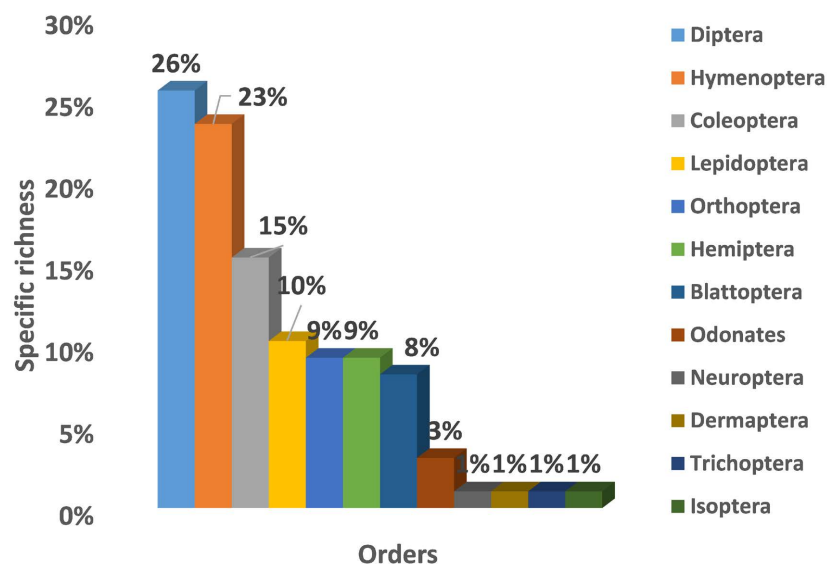


Figure 4. Proportional distribution of the specific richness of orders.

3.4. Relative Abundance of Families

The variation in the number of individuals according to the 36 families has a relative abundance varying between 10 (1%) and 213 individuals (14%). The Formicidae (213 individuals; 14%) and the Calliphoridae (196 individuals; 13%) are the most representative families; followed by the Drosophilidae (136 individuals; 9%), the Dolichopodidae (107 individuals; 7%), the Neriidae (84 individuals; 6%) and the Sarcophagidae (71 individuals; 5%). The other families have very low numerical abundances which decrease from 4% to 0.12% (**Figure 5**). The Kruskal Wallis test at 5% for $p = 0.04$ shows an insignificant difference between certain families.

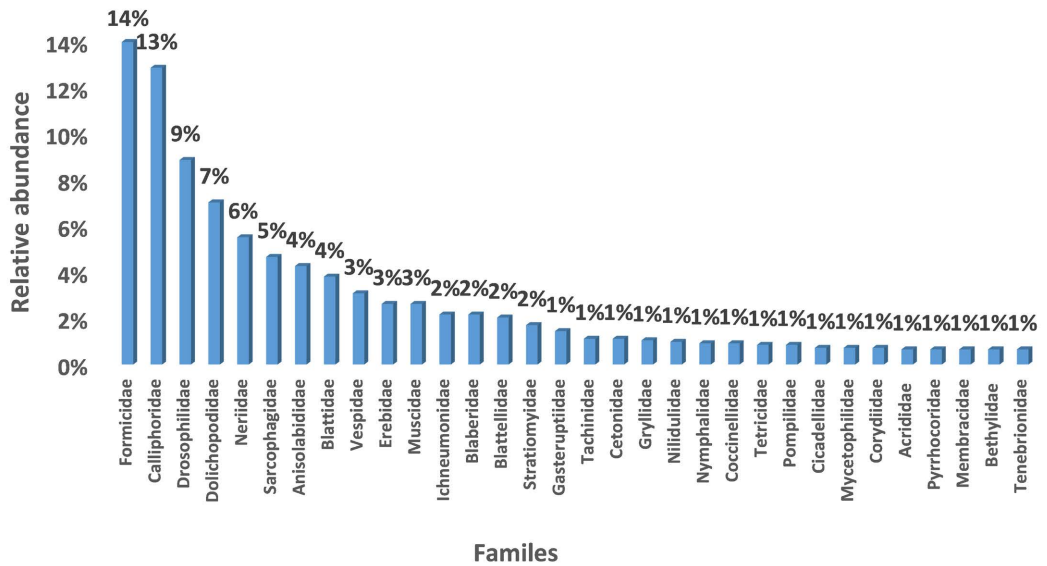


Figure 5. Proportional distribution of the relative abundance of families.

3.5. Specific Richness of Families

The overall specific richness of the 26 main families inventoried in the Scientific City Forest is illustrated by Figure 6. It shows that the Formicidae family has the greatest specific richness (7%) than all the other families which each have a percentage of less than 5%. However, the Kruskal-Wallis test at the 5% threshold does not show any difference between these different families of insects inventoried after sampling because the p-value obtained (0.56) is strictly greater than the threshold (5%).

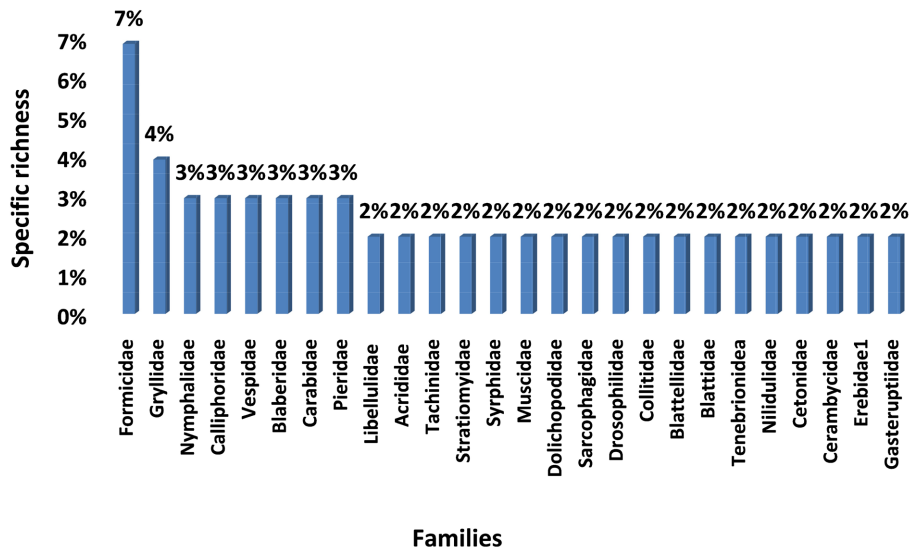


Figure 6. Proportional distribution of the specific richness of orders.

3.6. Specific Relative Abundance

The present study made it possible to identify 106 species of insects, the 35 main

species are classified according to their relative abundance (Figure 7): *Calliphora sp* (25%), *Polyrhachis cyaniventris* (24%), *Drosophila sp* (17%), *Telostylinus sp* (16%), *Sarcophaga sp* (14%), *Euborellia annulipes* (13%), *Poecilodothrus sp* (13%), *Periplaneta sp* (12%), *Poecilodothrus nobilitatus* (11%), *Drosophila melanogaster* (10%), *Erebus sp* (10%), *Netelia sp* (8%), *Pycnoscelus sp* (8%), *Loboptera sp* (7%), *Musca sp* (7%), *Hermetia sp* (7%), *Gasteruptions sp.* (6%), *Synagris sp.* (5%), *Chlorocala africana* (5%), *Tachina sp* (5%), *Belonogaster sp* (5%). The rest of the species have a specific relative abundance less than 5%.

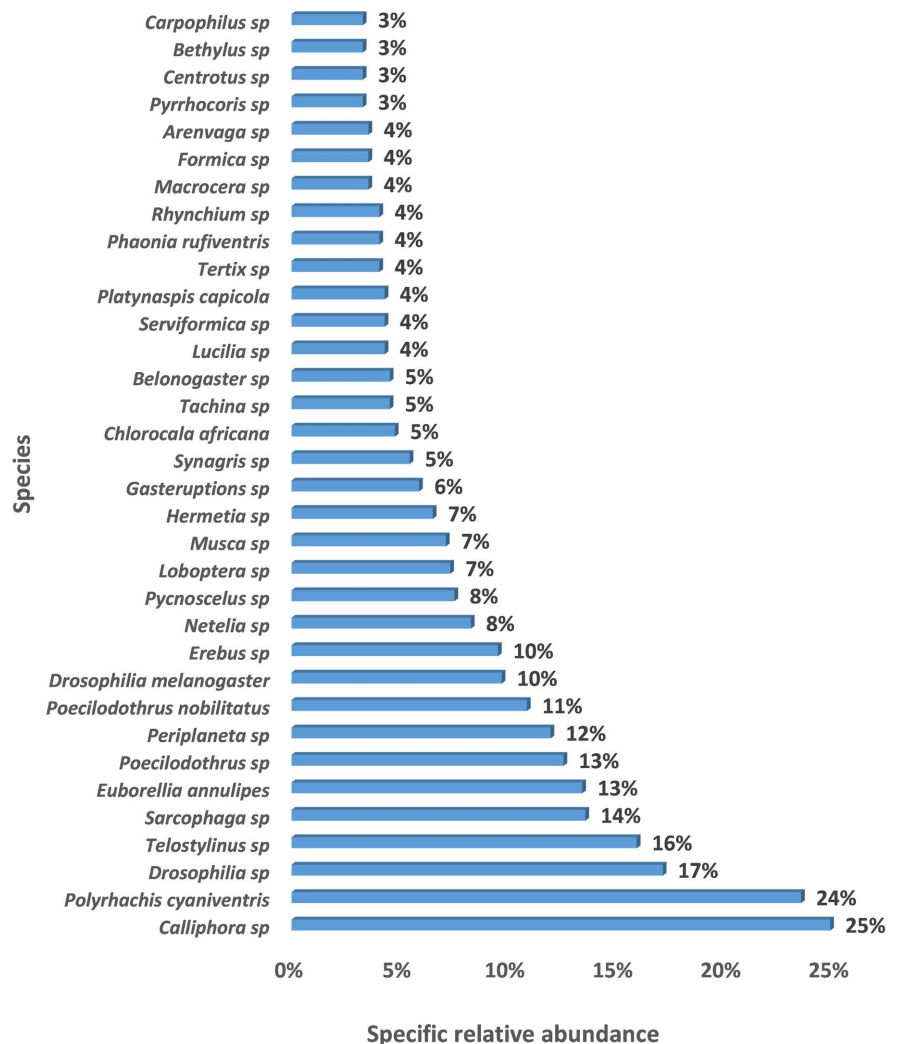


Figure 7. Proportional distribution of the specific relative abundance.

3.7. Specific Diversity

The values of the Shannon-Weaver indices (H') and the equitability of the insect population are represented in Figure 8. The insect population of the Scientific City is very diverse, the Shannon index is equal to 3.73. The equitability which is less than 0.7 is equal to 0.51, which indicates the heterogeneous specific distribution of the population which is then unbalanced.

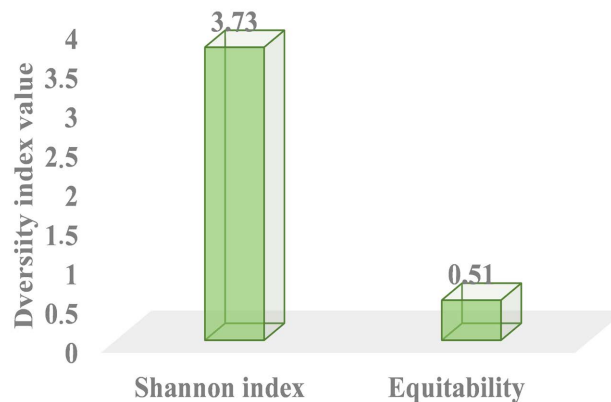


Figure 8. Distribution of the Shannon index and the equitability.

4. Discussion

During the present study, two orders dominated the collection: Diptera followed by Hymenoptera, Coleoptera, Orthoptera, Hemiptera and Blattoptera. The study of the pests of market gardening plants on the Congo River bank carried by [19], identified 4 main orders: Coleoptera, Diptera, Hemiptera and Hymenoptera. The diversity and spatial distribution of the entomofauna of Ignié studied by [20] found the following main orders: Hymenoptera, Orthoptera, Coleoptera, Blattoptera and Odonata. The analysis of these results shows that Hymenoptera is a main order in the three studies but in slightly different proportions. The identified Diptera, in high proportion in the Scientific City, are also found in high proportions in the study of [19], but present in low proportion in Ignié. These results differ from those of [3] who obtained two major orders, Coleoptera and Lepidoptera, because another very effective light trap technique was applied. Indeed, the abundance of these two major orders could also be explained by the presence of an experimental field of corn and eggplants in full flowering and or fruiting in the study environment since they are true pollinators. [33] thinks that Orthoptera are very scarce during the fruiting or flowering period. These differences can be explained by varying sampling methods and techniques, as well as floristic composition. Concerning the specific richness of the orders, the student's test (threshold 5%) with 1 factor ($p = 0.001$) showed that the Diptera are richer (25 species; 26%) than the Hymenoptera (23 species; 23%). This specific richness could be mainly due to the diversity of the calliphoridae and the Formicidae, whose dominant species are respectively *Calliphora sp* and *Polyrhachis cyaniventris*. These results corroborate those of [20]. This could be explained by the fact that these two forests belong to the same geographical area.

The Formicidae family is the most abundant, followed by the Callophoridae. We note that [20] also found that the Formicidae family dominates followed by the Acrididae in the part corresponding to the natural forest. These differ from the results of [20] obtained in the primary forest. This abundance of the two families would be justified by the use of more diversified sampling methods and techniques compared to those used in other works.

These results are similar to those of [1], who worked in a gallery forest in Gabon, and also observed the abundance of Formicidae. The 1-way Wilcoxon test ($p = 0.04$) applied to these results showed a significant difference between certain families. However, the Kruskal-Wallis test at the 5% threshold ($p = 0.56$) showed no clear difference between the specific richness of the families. Indeed, the differences observed from one entomological population to another could be explained by the fact that the aforementioned study was carried out in an area where the environmental factors are different from those of the Scientific City.

These results are similar to those of [34] who worked in the tropical zone (Guyana). This richness is marked mainly by the Coccinellidae family. [35] insinuates that Coleoptera are the richest taxon on earth and a major element of biodiversity. The 1-factor Wilcoxon test (5% threshold) showed that the Formicidae are also abundant, presenting seven (7) different species, representing the highest species richness in the field (7%).

The Shannon-Weaver diversity index is relatively high and equal to 3.73, which demonstrates significant specific richness in the Scientific City Forest [32]. Equitability is equal to 0.51, a value less than 0.7, indicating a heterogeneous specific distribution, proof of population imbalance. The study on the entomofauna of the Ignié forest carried out by [20], found a high specific diversity ($H' = 4.95$) linked to a homogeneity of the population ($E = 0.85$) in the station corresponding to the primary forest. This could result in internal ecological factors of natural forests which induce stability and a homogeneous distribution of individuals between species [36].

These results are different from those of the Scientific City due to the logging activities carried out by the neighboring populations, during the periods of civil wars that the Congo experienced during the period from 1990 to 2000. This massive deforestation caused profound environmental changes which have led to an imbalance in the population of entomofauna. Although there are no studies prior to the period of disturbances, nevertheless we can deduce that *Calliphora sp* and *Polyrhachis cyaniventris* were able to resist the changes while the majority of the more affected species are present but in small numbers.

5. Conclusion

The inventory of the entomofauna of the Scientific City (Ex ORSTOM) was carried out, following a methodology based on the combination of several quantitative collection techniques and made it possible to invent 1523 specimens divided into 102 species, grouped into 99 genera, 59 families and 12 orders. The most abundant order is that of Diptera, formed essentially by the family Calliphoridae. However, the Formicidae family (Hymenoptera) is the most representative and diverse. *Calliphora sp.* and *Polyrhachis cyaniventris* are the two species with the highest specific relative abundance. The entomofauna of the Scientific City is very diverse, the Shannon index is equal to 3.73. Equitability is equal to 0.51, indicating a heterogeneous specific distribution of the population which is therefore unbalanced.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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