

Inventory of Arthropod Fauna associated with three campus dump sites in AE-Funai, Ikwo, Ebonyi State, Nigeria

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1. Introduction

Arthropods are invertebrate animals characterized by their exoskeleton, segmented bodies, and joint appendages. Their ecological roles are integral to the functioning of ecosystems. They contribute significantly to processes such as decomposition, pollination, and biological control, and form an essential part of the food web. Despite their importance, the influence of human activities, particularly waste disposal practices, has positive and negative impacts. Human activities have led to the creation of various anthropogenic environments, one of the most common being dump sites. These sites, whether in urban, suburban, or rural areas, can harbor a diverse array of waste materials, ranging from organic refuse to plastics and metal (Onyido *et al.*, 2019, Okoye *et al.*, 2023; Anaekwe *et al.*, 2025). Such heterogeneous environments provide unique microhabitats that can significantly influence the composition and dynamics of local arthropod populations. The fauna of dump sites is not as diverse as in undisturbed ecosystems yet consists of representatives of very different groups of organisms (Babayem and Dauda, 2009).

The solid waste provides a habitat not only for microorganisms and bacteria but also for

invertebrates and vertebrates. Arthropods are diverse and numerous groups of invertebrates inhabiting dump sites (Ryke *et al.*, 2019), whose representatives are widely used in ecological and ecotoxicological studies. Waste has both direct and indirect toxic effects on arthropods. In severe anthropogenic environments, heavy metals accumulate in Insect bodies through respiration (air deposit), and food ingestion (Nwanchor *et al.*, 2024). Arthropods play an important role in the transfer of energy through food chains, especially from aquatic to terrestrial ecosystems (Onwughara *et al.*, 2010; Banjo *et al.*, 2019). It has been established that arthropods, like other animals, have mechanisms for the inclusion of trace elements in their development and survival (Onwughara *et al.*, 2010). These beetles feed on the microorganism-rich liquid in dung and use the fibrous material to raise their larvae (Byford, *et al.*, 1992). Certain beetle and fly species were highly abundant, dung beetles (Coleoptera: Scarabaeidae) specifically play crucial roles in the ecosystems services as they actively involve in organic matter decomposition (Tixier, *et al.*, 2015) and as well contribute significantly to soil fertility (Manning).

Urban dump sites are typically characterized by higher human activity and a mix of organic and inorganic waste (Rezaee *et al.*, 2014). Dumpsites often attract a high number of synanthropic species such as houseflies (*Musca domestica*), German cockroaches (*Blattella germanica*), and various ant species (Formicidae). These species are well adapted to human-altered environments and can thrive on the diverse food resources available in urban dumps (Roffman and Bradford, 2022). However, the dominance of these species may lead to reduced overall biodiversity, as competitive exclusion and environmental stressors limit the presence of more sensitive species. Suburban dump sites often present a transitional environment between urban and rural settings. Suburban dumps might support a variety of beetles (Coleoptera), spiders (Araneae), and crickets (Gryllidae), reflecting a balance between synanthropic species and those more typical of less disturbed environments (Afon and Okewole, 2007).

The composition of arthropod communities in suburban dump sites can provide insights into the intermediate effects of human disturbance and natural habitat influences (Lale, 2006). Rural dump sites might exhibit a different spectrum of species, including more specialized decomposers that thrive on organic waste, such as certain beetles and moths. These sites often receive less inorganic waste and may be less polluted compared to urban dumps, potentially supporting a higher diversity of decomposer species. Lepidoptera (Butterflies and moths) are sensitive to environmental disturbances and are typically found in higher numbers in undisturbed environments (Warren *et al.*, 2021). However, rural dumps can also attract scavengers and pests, which can impact local ecosystems and agricultural activities (Eymann *et al.*, 2016). The presence of these species can indicate the health of rural environments and the effectiveness of waste management practices. Beetles are among the most diverse and ecologically important insects found in waste-rich environments.

Many families within this order, such as Scarabaeidae (dung beetles) and Staphylinidae (rove beetles), are decomposers that play a significant role in breaking down organic matter, including

decaying plant material, carrion, and feces. These beetles contribute to nutrient recycling by processing waste materials and incorporating them into the soil, thus facilitating the flow of essential nutrients within the ecosystem (Bouchard *et al.*, 2011). This makes Coleoptera a crucial order in maintaining ecological stability at dump sites, particularly in the breakdown of organic waste and the maintenance of soil quality. Odonates are a particularly interesting group of aquatic invertebrates (Clausnitzer *et al.*, 2009). Diptera comprises flies and is one of the most prominent insect groups in dump sites due to its adaptability and rapid colonization of decaying organic matter. Families such as Calliphoridae (blow flies) and Muscidae (house flies) are often the first to arrive at decomposing waste, where they play an essential role in breaking down organic material, particularly carrion and food waste (Chapman, 2013). The larvae of flies, commonly known as maggots, are highly efficient decomposers, accelerating the decomposition process by feeding on decaying matter, thereby reducing the volume of waste and enhancing nutrient cycling. Ants, particularly species from the family Formicidae, are frequently observed scavenging in waste environments, where they gather food and organic material to transport back to their nests (Hölldobler & Wilson, 1990). Lepidoptera including moths and butterflies, are not commonly associated with dump sites to the same extent as Coleoptera or Diptera, some species may still be present in environments with significant amounts of decaying plant matter. Moth larvae, particularly those that feed on decomposing organic material, may be found in dump sites that contain large quantities of plant-based waste (Scoble, 1992).

MATERIALS AND METHOD

Study Area

This study was carried out in Ikwo Local Government Area Ebonyi State.

Ikwo is situated in the eastern part of the State with a land mass of approximately 500sq.km, and shares borders with Abakaliki, Izzi, and Ezza South Local Government Areas. Ikwo has a semi-tropical climate characterized by two major seasons, the wet season and dry season which start from the month of April-October and the month of November-March respectively, (Sikoki and Anyanwu, 2013). The study area has an annual mean temperature of 25 °C and 35 °C and seasonal temperature ranges between 22 °C - 30 °C to 23°C - 35°C for the wet season and dry season respectively, and mean seasonal rainfall is 242 mm (Sikoki and Anyanwu, 2013). The leading industry in the area is mining due to the high deposit of solid minerals such as lead, zinc, and limestone all over the area.

Study Location and Duration

The study was carried out at AE-FUNAI in Ebonyi State, South-eastern Nigeria (Fig. 1). AE-FUNAI is a world-class university with an aesthetic and desirable environment with top-notch educational facilities for imparting knowledge, in Ebonyi State Nigeria. The coordinates of the study location fall within 6°8'2"N, 8°8'29"E for site A; 6°7'51"N, 8°8'24"E for site B; and 6°7'49"N,

8°8'12"E for Control Site and covered a land mass of about 70km². The sampling points include AE-FUNAI Perm. Site-(Site A), which is 1 km away from, the AE-FUNAI term. Site-(Site B) and the Control Site (Site C) which is 3 kilometers away from Site B. The sampling covered two Months, June – July

Experimental Design

The study was an experimental work that involved the evaluation of the Inventory of arthropod fauna Associated with two Dump sites with the control in a complete randomized design (CRD). Three sites were selected for this study namely: AE-FUNAI perm-site- (Site A) which measured 1 km away from the AE-FUNAI Term. Site-Site B and Control Site-SC, which is 2 kilometers away from SA and SB.

Insects Collection Methods

The collection of insects from the Dump sites took place from June to August 2024. Insects were collected three times weekly, in the morning hours (8 am-11 am) and the evening hours (4 pm-5 pm). The insects collected were transferred to the killing bottle with 75% formalin. However, to avoid bias in the use of single insect collecting techniques, multiple sampling techniques were adopted using pitfall traps, sweep nets, and handpicking methods Akunne *et al.*, (2014).

Use of Sweep Net

A sweep net with circumference of 38cm diameter made of a light-weight aluminum handle of approximately 100cm length was used. The sweep net was swung side by side at a constant speed for better efficiency on the short vegetation while in the taller vegetation, it was swung enough to keep the upper edge of the sweep net open with the top plants (Gribb and Oseto, 2010). The net folded over with the insect at the bottom of the net and then caught/transferred into a container killing jar (killing bottle for preservation).

Pitfall traps

Soil-dwelling insects were sampled using pitfall traps. Nine (9) pitfall traps made of plastic containers with 12cm circumference diameters and 8 cm deep, were used, 3 containers for each site. Each trap was placed on the soil until each rim was flushed with ground level. Each set of traps was set at 7:00 am and inspected at 7 am (Ewuim *et al.*, 2000). The traps were filled to one-third with 75 % ethanol to about two-thirds of the volume of each container (Ewuim *et al.*, 2007). The traps were placed about 1m apart from each other.

Handpicking method

Insects found on plants at the sites were hand-picked simultaneously while inspecting other traps at the same time and preserved in a killing bottle containing 75% ethanol. The ground areas close to the plants were also searched for insect assembly and when collected were transferred to the killing bottle as described by Akunne, *et al.*, (2014).

Light traps

Light Traps of length 100cm, height 80 cm, and 50cm width locally constructed with wooden materials, designed with an opening door were made. A 48w rechargeable bulb was suspended at the center of the wooden frame of the trap. Hollow entrances were created on both sides of the traps mainly to direct insects into the collecting troughs. These troughs contained 2/3 measured quantity of water and detergent, creating an effective insect capture solution (Shimoda and Honda, 2013).

Insects Sorting and Identification

Insects collected by sweep net were sorted, and the flying insects, especially moths, and butterflies with delicate wings, were pinned inside the insect box. Insects collected by Handpicking, light trap beating, and pitfall trap method were sorted at the Biology Lab. AE-FUNAI. The liquid contents of each container were reduced using a 5ml syringe, and the contents were emptied into the Petri dish. They were viewed using a light microscope for accurate counting of the collected Insects into their various taxonomic groups.

Sorting of the insects was done using Carmel's hairbrush under a light microscope. The insects were sorted into their taxonomic groups and were carefully recorded on a data sheet. Insects collected from the sites were put into a cellophane envelope containing 75% ethanol and sent to the Insect Museum Department of Crop Protection, Institute of Agricultural Research, Ahmadu Bello University, Zaria, Nigeria with information such as the name of the collector, place of collection and date of collection for identification and later authenticated. The insects were kept at the Biology Lab., Alex Ekwueme University Ndufu-Alike Ikwo for reference purposes.

Statistical Analysis

Data on insect collection were subjected to the Kruskal Wallis Test for abundance between species and orders. However, one-way Analysis of Variance (ANOVA) was used to compare the insect's abundance/diversity at the three studied sites. All the analysis was carried out using statistical packages for social sciences (SPSS) computer package (version 25).

RESULTS

Table 1: Distribution of Arthropod Fauna in 2 Dump Sites at AE-FUNAI by Orders

Orders	Insects collected per site			
	Site A	Site B	Site C	Total
Blattodea	2(0.26)	0(0.00)	2(0.17)	4(0.16)
Coleoptera	8(1.03)	7(1.46)	7(0.58)	22(0.89)
Dictyoptera	3(0.39)	0(0.00)	2(0.17)	5(0.20)
Ephemeroptera	0(0.00)	1(0.21)	0(0.00)	1(0.04)
Diptera	59(7.58)	68(14.14)	79(6.50)	206(8.33)
Dermaptera	0(0.00)	0(0.00)	3(0.25)	3(0.12)
Hemiptera	4(0.51)	3(0.62)	11(0.91)	18(0.73)
Hymenoptera	640(82.26)	356(74.01)	1035(85.19)	2031(82.09)

Heteroptera	0(0.00)	0(0.00)	1(0.08)	1(0.04)
Isoptera	49(6.21)	40((8.32)	55(4.53)	144(5.82)
Homoptera	1(0.13)	1(0.21)	2(0.17)	4(0.16)
Lepidoptera	4(0.51)	1(0.21)	3(0.25)	8(0.32)
Neuroptera	0(0.00)	0(0.00)	1(0.08)	1(0.04)
Odonata	2(0.26)	1(0.21)	4(0.33)	7(0.28)
Orthoptera	6(0.77)	2(0.42)	10(0.82)	18(0.73)
Trichoptera	0(0.00)	1(0.21)	0(0.00)	1(0.04)
Total	778(31.45)	481(19.44)	1215(49.11)	2474(100)

RA = Relative Abundance

Table 2 Results on Shannon Weiner diversity index (H), Simpson dominance index (C), Margalef richness index (D), and Shannon Weiner Evenness (E) of insects in the study sites

Sites	Shannon Weiner diversity index (H)	Simpson dominance index (C)	Margalef richness index (D)	Shannon Weiner Evenness (E)
Site A	0.916	0.391	7.511	0.138
Site B	1.157	0.483	8.096	0.187
Site C	1.046	0.398	7.040	0.147

Table Distribution of Arthropod Fauna in 2 Dump Sites at AE-FUNAI by Species

Insects collected per site							
Order	Family	G/sp	SA (%)	SB	SB (%)	SC (%)	Total
Blattodea	Cryptoceridae	<i>Cryptocercus kybeanensis</i>	2(0.26)	0	0(0)	2(0.16)	4(0.16)
Coleoptera	Chrysomelidae	<i>Buphonella</i> sp.	1(0.13)	0	0(0)	0(0)	1(0.04)
	Gnaphosidae	<i>Herpyllus ecclesiasticus</i>	0(0)	2	2(0.42)	0(0)	2(0.08)
	Eclateridae	<i>Heteroderes coctus</i>	0(0)	1	1(0.21)	0(0)	1(0.04)
	Lampyridae	<i>Lampyris noctiluca</i>	1(0.13)	1	1(0.21)	2(0.16)	4(0.16)
	Scarabaeidae	<i>Onthophagus</i> sp.	1(0.13)	0	0(0)	0(0)	1(0.04)

		<i>Deltochilum</i>	3(0.39)	2	2(0.42)	3(0.25)	8(0.32)
		<i>gibbosum</i>					
	Slaphylinidae	<i>Paederus</i>	1(0.13)	0	0(0)	0(0)	1(0.04)
		<i>sabaeus</i>					
	Tenebrionidae	<i>Gonocnemis</i>	0(0)	1	1(0.21)	0(0)	1(0.04)
		<i>fairmairei</i>					
Dictyoptera	Blattoidae	<i>Blattella</i> sp.	2(0.26)	0	0(0)	0(0)	2(0.08)
	Mantidae	<i>Entella</i> sp.	0(0)	0	0(0)	1(0.08)	1(0.04)
	Perisphaeriidae	<i>Gyna</i> sp.	1(0.13)	0	0(0)	1(0.08)	2(0.08)
Ephemeroptera	Oligoneuridae	<i>Elassoneuria</i> sp.	0(0)	1	1(0.21)	0(0)	1(0.04)
Diptera	Agromyzidae	<i>Melanagromyza</i>	1(0.13)	3	3(0.62)	1(0.08)	5(0.2)
		<i>nigrimaculth</i>					
	Culicidae	<i>Culex thriambus</i>	0(0)	1	1(0.21)	0(0)	1(0.04)
		<i>Culex fatigans</i>	2(0.26)	3	3(0.62)	6(0.49)	11(0.44)
		<i>Culex tigripes</i>	1(0.13)	2	2(0.42)	4(0.33)	7(0.28)
	Ceratopogonoidae	<i>Culicoides</i>	55(7.07)	59	59(12.27)	68(5.6)	182(7.36)
		<i>sonorensis</i>					
Dermaptera	Forficulidae	<i>Diaperasticus</i>	0(0)	0	0(0)	1(0.08)	1(0.04)
		<i>erythrocephalus</i>					
		<i>Forticula</i>	0(0)	0	0(0)	2(0.16)	2(0.08)
		<i>senegalensis</i>					
Hemiptera	Aphrophoridae	<i>Poophilus</i>	2(0.26)	1	1(0.21)	3(0.25)	6(0.24)
		<i>costalis</i>					
	Cicadellidae	<i>Cofana</i>	1(0.13)	1	1(0.21)	1(0.08)	3(0.12)
		<i>unimaculata</i>					
	Derbidae	<i>Zoraida</i> sp.	0(0)	0	0(0)	1(0.08)	1(0.04)
	Flatidae	<i>Cryptoflata</i> sp.	1(0.13)	1	1(0.21)	2(0.16)	4(0.16)
	Pentatomidae	<i>Acrosternum</i>	0(0)	0	0(0)	1(0.08)	1(0.04)
		<i>acuta</i>					
	Miridae	<i>Hyalopeplus</i> sp.	0(0)	0	0(0)	1(0.08)	1(0.04)
	Reduviidae	<i>Pasira basiptera</i>	0(0)	0	0(0)	1(0.08)	1(0.04)
		<i>Schidium</i> sp.	0(0)	0	0(0)	1(0.08)	1(0.04)
Hymenoptera	Bethylidae	<i>Epyris</i> sp.	0(0)	1	1(0.21)	1(0.08)	2(0.08)
	Formicidae	<i>Bothroponera</i> sp.	1(0.13)	3	3(0.62)	6(0.49)	10(0.4)
		<i>Dorylus</i> sp.	620(79.69)	340	340(70.69)	932(76.71)	1892(76.48)

		<i>Camponotus</i>	19(2.44)	12	12(2.49)	94(7.74)	125(5.05)
		<i>perrisi</i>					
	Icheumonidae	<i>Echthromorpha</i>	0(0)	0	0(0)	1(0.08)	1(0.04)
		<i>variegata</i>					
Heteroptera		<i>Ematheudes</i> sp.	0(0)	0	0(0)	1(0.08)	1(0.04)
Isoptera	Rhinotermitidae	<i>Reticulitermes</i>	49(6.3)	40	40(8.32)	55(4.53)	144(5.82)
		<i>sp.</i>					
Homoptera	Cercopidae	<i>Poophilus</i>	1(0.13)	1	1(0.21)	2(0.16)	4(0.16)
		<i>costalis</i>					
Lepidoptera	Cossidae	<i>Azygophleps</i> sp.	1(0.13)	1	1(0.21)	1(0.08)	3(0.12)
	Erebidae	<i>Euchromia</i>	0(0)	0	0(0)	1(0.08)	1(0.04)
		<i>folletii</i>					
	Nymphalidae	<i>Acraea acrita</i>	2(0.26)	0	0(0)	1(0.08)	3(0.12)
	Pyrilidae	<i>Ematheudes</i> sp.	0(0)	0	0(0)	1(0.08)	1(0.04)
		<i>Ephestia</i> sp.	2(0.26)	0	0(0)	1(0.08)	3(0.12)
Neuroptera	Myrmelionidae	<i>Gymnoleon exilis</i>	0(0)	0	0(0)	1(0.08)	1(0.04)
Odonata	Libellulidae	<i>Nesciothemis</i>	1(0.13)	0	0(0)	1(0.08)	2(0.08)
		<i>farinosa</i>					
		<i>Palpopleura</i>	1(0.13)	1	1(0.21)	2(0.16)	4(0.16)
		<i>portia</i>					
	Coenagrionidae	<i>Agriocnemis</i> sp.	0(0)	0	0(0)	1(0.08)	1(0.04)
Orthoptera	Acrididae	<i>Oxya hyla</i>	1(0.13)	0	0(0)	2(0.16)	3(0.12)
	Gryllotalpidae	<i>Neocurtilla</i>	1(0.13)	1	1(0.21)	3(0.25)	5(0.2)
		<i>hexadactyla</i>					
	Pyrgomorphidae	<i>Zonocerus</i>	1(0.13)	1	1(0.21)	3(0.25)	5(0.2)
		<i>elegans</i>					
	Tettigoniidae	<i>Tettigonia</i>	2(0.26)	0	0(0)	1(0.08)	3(0.12)
		<i>viridissima</i>					
		<i>Homorocoryphus</i>	1(0.13)	0	0(0)	2(0.16)	3(0.12)
		<i>nitidulus</i>					
Trichoptera	Heptoceridae	<i>Oecetis</i> sp.	0(0)	1	1(0.21)	0(0)	1(0.04)
Total			778(31.44)	481	481(19.44)	1215(49.11)	2474(100)

Discussion

The results of this study revealed that Hymenoptera order demonstrated dominant species richness in all, particularly Formicidae recording the highest relative abundance at 85.19% in Site C, compared to dumpsites with 82.26% for Site A and 74.01% for Site B. This is consistent with the

findings of Rezaee *et al.*, 2014 who reported that Urban dump sites are typically characterized by higher human activity and a mix of organic and inorganic waste. This agrees with the work of Hölldobler & Wilson, (1990) who reported that ants are known for their scavenging behavior and can thrive in nutrient-rich environments. This findings is also in line with results obtained from work of Nwanchor *et al.*, (2024) in a work which measured heavy metal concentrations in insects, reported that SC (Control Site) recorded lower concentrations of heavy metals (mine wastes disposal/discharges from anthropogenic environments resulted from human activities) which is the major contributory factor of low relative abundance of hymenoptera at the dumpsites. Dumpsites (Site B) exhibited a substantially higher Diptera (agrimyzidae) abundance with 0.62% compared to 0.49 % recorded in Site C also Diptera in the family ceratopogonoidae with 12.27% in the same Site B compared to Site C with 5.6%. Also, Blattodea (Cryptocercidae) recorded 0.26% in dumpsite A compared to the Control Site. These results align with the work of Roffman and Bradford, (2022) Who reported that dumpsites often attract a high number of synanthropic species such as houseflies (*Musca domestica*), German cockroaches (*Blattella germanica*), and various ant species (Formicidae). The findings are also in line with the work of Tixier, *et al.*, (2015) and Uhao *et al.*, (2024) who reported that certain beetle and fly species were highly abundant, dung beetles (Coleoptera: Scarabaeidae) specifically play crucial roles in the ecosystems services as they actively involve in organic matter decomposition and as well contribute significantly to soil fertility. Lepidoptera recorded 0.51% in dumpsite Site A, and 0.25% in the Control Site. This result contradicts the findings of Scoble, (1992) who documented that Lepidoptera (moths and butterflies) are not commonly associated with dumpsites to the same extent as Coleoptera or Diptera, some species may still be present in environments with significant amounts of decaying plant matter. The result also contradicts the work of (Warren *et al.*, 2021) who reported that Lepidoptera (Butterflies and moths) are sensitive to environmental disturbances and are typically found in higher numbers in undisturbed environments. This slight contradiction could be a result of intermittent weather changes. The higher relative abundance of Coleoptera recorded in dumpsite Site A is also in line with the work of Afon and Okewole, (2007) who reported that suburban dumps might support a variety of beetles (Coleoptera), spiders (Araneae), and crickets (Gryllidae), reflecting a balance between synanthropic species and those more typical of less disturbed environments. Odonata (Libellulidae) recorded higher relative abundance in the control Site 0.33% compared to Site A 0.26% and 0.22%. This result aligns with the findings of (Clausnitzer *et al.*, 2009) who documented that Odonates are a particularly interesting group of aquatic invertebrates. Thus, their presence in the control site could be attributed to the presence of freshwater ecosystems where they exhibit their predatory functions, acting as top predators preying on smaller aquatic insects.

The Shannon-Weiner diversity index, a measure of species diversity highlighted a divergent depiction. Site B exhibited a higher diversity index of 1.157, and Control Site C 1.046 whereas Site A had the lowest value of 0.916. The disparity is an indication that dump Site B hosts more varieties

of insect species compared to Site A and the Control Site. This result is comparable with the work of these results align with the work of Roffman and Bradford, (2022) Who reported that dumpsites often attract a high number of synanthropic species such as houseflies (*Musca domestica*), German cockroaches (*Blattella germanica*), and various ant species (Formicidae). The assessment of insects' dominance, diversity, and richness in dumpsites presents a clear view of the dynamics of insects at the dumpsites. The results as presented in Table 2, keenly presented fundamental details of the insect's insect community structure providing insight into species diversity across the sites. The Simpson dominance index, a metric indicating the abundance of dominant species revealed that site B also exhibited a higher Simpson dominance index of 0.483 slightly higher than that of Control Site 0.398 whereas Site A had 0.391. This slight variation in dominance simply implies there is a balance between dominant insect species in all the sites. The similarity in dominance indices could arise from prevailing environmental conditions across the sites. This aligns with Okewole, (2007). The Margalef richness index, which is species richness, exhibited a contrasting pattern. Site B recorded a higher Margalef richness index of 8.096, slightly higher than Site A 7.511 and Site C 7.040. This means that Site B is supportive of a greater of different insect species. Such variations in species richness are influenced by environmental factors. This aligns with the work of Okewole, (2007).

Moreover, the Shannon-Weiner evenness index, as a species evenness indicator, showed certain disparities. Site B recorded a higher evenness index of 9.187, in contrast to Site A and Site C with (0.138 and 0.147) respectively, these two sites recorded lower values. These findings imply that the insect community in Site B is more evenly distributed among various species while Site A and Site C vividly display an imbalance distribution. This depicts a complex ecological variation among the sites.

Conclusion

The study of arthropod fauna in two dump sites (Site A and Site B) and a control site (Site C) at AE-FUNAI reveals the impact of waste accumulation on insect community structure, patterns of insect diversity, and dominance. The dominance of scavengers like Formicidae in the waste dump sites is consistent with ecological studies showing that disturbed environments favor generalist species capable of exploiting abundant resources. In contrast, sensitive groups such as Lepidoptera, Odonata, and Orthoptera are more frequent in the undisturbed control site, indicating better habitat quality. The relative abundance at the control site (Site C) is the highest (49.11%), likely due to less human disturbance and a more stable environment. This contrasts sharply with Sites A and B, which have a combined total relative abundance of 50.56%. The differences in insect composition between the sites highlight the ecological imbalance caused by human activities like waste dumping, leading to shifts in species dominance and ecosystem functioning. The data suggest that dump sites can lead to environmental stress, reducing diversity and skewing species composition in favor of dominant groups like Hymenoptera. However, they can also support a variety of species, particularly those adapted to disturbed environments.

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