



# Insect Local Names and Folklore in the Luvale Language: Implications for Biology School Curriculum

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**Abstract:** *The names of insects and associated folklore are at risk of being lost without proper documentation. This study aimed to document the names of insects in the Luvale language of Zambia's North-Western Province. A case study design was employed across three districts where Luvale is spoken. Data were collected by presenting 42 colored pictures of commonly found insects to participants for naming in Luvale. Participants identified all insects and added five more, bringing the total to 47. Comparison among six sites showed 86% similarity and 14% variation in insect naming. Folklore associated with 24 insects was documented. An interactive teaching tool using hyperlinked Microsoft PowerPoint was developed to support the identification and naming of insects in Luvale, complemented by pictures and videos. This tool is expected to scaffold learners in acquiring scientific insect names and improve attitudes toward learning insects in the biology curriculum.*

**Keywords:** *Luvale, Insect local names, Folklore, School curriculum, Teaching aid, Hyperlink*

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## 1. Introduction

The preservation of indigenous languages and knowledge systems is a critical component of cultural heritage and sustainable education, increasingly framed as essential for biocultural resilience and ethical scientific practice (Trisos et al., 2021; Brondízio et al., 2021). In Zambia, this imperative is reflected in the National Literacy Framework (2013), which mandates the use of seven major local languages as the medium of instruction from Grades 1 to 4. This policy aims to create a strong foundational literacy by connecting education to the learner's immediate linguistic and cultural environment. However, a significant challenge in implementing this policy is the lack of systematically documented, context-specific learning materials in these languages, particularly for scientific subjects such as biology.

One area where this gap is pronounced is in the knowledge of local insect fauna. Insect names and the rich folklore associated with them represent a vital repository of indigenous ecological knowledge and cultural values—a repository whose documentation is now recognized as an urgent priority for both conservation and education (Fernández-Llamazares & Cabeza, 2018). Without deliberate documentation, this knowledge is at high risk of erosion, accelerated by ongoing biodiversity loss, urbanization, and generational disconnect (Romero-Muñoz et al., 2020). While names of edible insects have been incidentally recorded in some Zambian languages, such as Bemba and Nyanja (Kachali, 2013; Mwizenge, 1989), there has been no dedicated, comprehensive study to document the full spectrum of insect names and their associated folklore in the Luvale language. Furthermore, an analysis of the national biology curriculum reveals a lack of localized insect references, which can hinder learner engagement

and conceptual understanding—a pedagogical gap that contemporary, culturally sustaining approaches to science education explicitly seek to address (Shay, 2021).

To address this dual challenge of knowledge preservation and curriculum relevance, this study was conducted with the primary purpose of documenting the local names and folklore of insects in the Luvale language of Zambia's North-Western Province. A key output of this research is the development of an interactive, hyperlinked multimedia teaching tool designed to scaffold the learning of scientific entomology. This paper presents the findings of this documentation process and discusses its implications for the biology school curriculum. Following this introduction, a review of pertinent literature establishes the theoretical and contextual foundation for the study. The methodology, results, and a discussion of implications are then presented, culminating in conclusions and recommendations.

## 1.1 Problem Statement

There is no official documentation on the names of insects in Luvale, and there have been no studies specifically aimed at documenting all known names of insects in the Zambian Luvale language. Preservation of this national heritage is increasingly being threatened by the loss of biodiversity and increased urbanization. There is, therefore, a need to document indigenous knowledge on the names of insects in Zambian local languages (Samboko et al., 2014) as well as folklore associated with some insects. Since English is not native to Zambia, there is

a need to document names of insects in Zambian local languages. This way, locally recognisable insects in the entomological literature may increase the relevance and contextualisation of Zambian entomological literature. The documentation of names of insects in Zambian local languages is an important contribution to the development of learning material for grades one to four as recommended by the National Literacy Framework Policy (National Literacy Policy Framework, 2013) which requires the use of seven Zambian local languages as a medium of instruction alongside English for primary school education. It is believed, according to Samboko et al. (2014), that learning in local languages from grades one to four will give learners a strong foundation on which to build literacy and language skills in later grades. Names of insects in Zambian local languages are part and parcel of local language material and should be documented

## 1.2 Purpose of Study

The purpose of this study was to document the names of insects in the Luvale language of the North-Western Province. The documentation of names of insects in Zambian local languages for use in school curricula and in the development of entomological literature will help develop learning material to be used in implementing the government policy on the use of local languages. In order

to meet the 21st century skills goals, this research promoted the use of ICT by developing a teaching tool in the form of a hyperlinked PowerPoint with names of insects in the Luvale language to be used by students learning insect taxonomy.

## 1.3 Research Objectives

This study was guided by the following research objectives, formulated to systematically document, analyze, and mobilize Luvale indigenous knowledge of insects

1. To document Luvale insect names and associated folklore.
2. To develop an interactive teaching tool using the documented names.
3. To compare folklore knowledge across different age groups

## 1.4 Research Questions

This research answered the following questions:

1. What are the local Luvale names and the folklore of common insects in the North-Western Province of Zambia?
2. To what extent does ethno-entomological knowledge (insect naming and folklore) vary across geographical districts and generational cohorts within the Luvale-speaking community?
3. How can documented Luvale ethno-entomology be pedagogically integrated into the biology curriculum to scaffold scientific learning and support biocultural preservation?

This study used a case study design, where only six sites in the North Western Province were selected as areas from which to document the names of insects in the Luvale language.

## 2. Literature Review

### 2.1 Indigenous Knowledge and the Biocultural Diversity Crisis

The interdependence of biological and cultural diversity—termed biocultural diversity—is a globally recognized framework (Maffi, 2001), now central to global sustainability and conservation agendas (Brondizio et al., 2021). Alarming, both are under severe threat. The IPBES (2019) Global Assessment confirms that species extinction rates are accelerating at an unprecedented pace, paralleled by the rapid loss of languages and the traditional knowledge they encode. Current analyses estimate that a language is lost approximately every three months, with up to half of the

world's languages facing extinction this century (Romaine, 2020; UNESCO, 2021). This parallel loss is not coincidental; linguistic knowledge and biodiversity are often tightly coupled, a correlation strongly evidenced by spatial overlap between high biodiversity regions and high linguistic diversity, and by the critical role of Indigenous lands in global conservation (Garnett et al., 2018; Gorenflo et al., 2012). Collaborative efforts to document this ecological knowledge are therefore a time-sensitive imperative not only for preservation but as a cornerstone of ethical, decolonial scientific practice (Trisos et al., 2021).

## **2.2 Insect Knowledge, Documentation, and Pedagogy in the Zambian Context**

In Zambia, indigenous knowledge of insects has often been recorded tangentially, primarily focusing on edible species. For instance, Kachali (2013) and Mwisenge (1989) listed local names for caterpillars, termites, and grasshoppers in Bemba and Nyanja, highlighting their nutritional and cultural role. This points to a wealth of knowledge that extends beyond utility to encompass cultural meaning. From a pedagogical perspective, this prior knowledge is a crucial asset. Ausubel's (1963, 1968) theory of meaningful learning posits that new concepts are best integrated when they can be anchored to existing cognitive frameworks. Contemporary research reinforces this, showing that leveraging indigenous knowledge as 'advance organizers' effectively scaffolds science learning and fosters epistemic inclusion (Shay, 2021; Bang et al., 2022). Using familiar local insect names can therefore scaffold the acquisition of unfamiliar scientific terminology and concepts, making biology more relevant and accessible.

This approach aligns with the directives of the current Zambia Education Curriculum Framework, which emphasizes the transmission of cultural heritage and the development of competencies rooted in the learner's environment (Ministry of Education, 2012; Simasiku & Mwanza, 2021). The policy shift towards using Bemba, Nyanja, Tonga, Lunda, Luvale, Kaonde, and Lozi as languages of instruction in early primary school (Marten & Kula, 2007; National Literacy Framework, 2013) creates a direct demand for the kind of localized content this study generates. It also acknowledges the complex multilingualism that is central to Zambian identity as reflected in contemporary

sociolinguistic analyses (Banda & Mwanza, 2020).

## **2.3 Gaps in Documentation and the Current Study's Position**

A series of studies has begun to address this need by systematically documenting insect names in specific Zambian languages: Tonga (Samboko et al., 2014), Bemba (Mwaba, 2015), and Kaonde (Kalonga, 2015). These studies form a crucial foundation but highlight a conspicuous gap: the Luvale language, one of the seven officially recognized for education, remained undocumented. This study directly addresses that gap, positioning itself as the fourth in this necessary series.

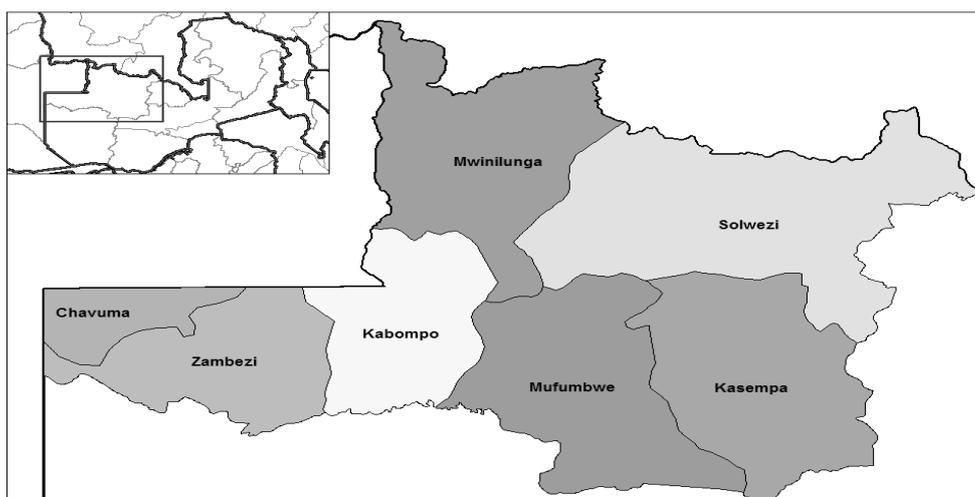
Internationally, the methodology of pairing scientific and indigenous names is established practice, recognized as essential for accurate knowledge preservation and cross-cultural respect and guided by modern ethical frameworks for indigenous data governance (Carroll et al., 2020), as seen in Australian Aboriginal studies (McConvell & Thieberger, 2001). Similarly, work in South Africa by Mkize (2013) demonstrates the value of collecting insect names alongside their cultural significances—an approach aligned with recent calls to integrate indigenous storytelling and knowledge into conservation practice (Fernández-Llamazares & Cabeza, 2018). The present study adopts and adapts these approaches for the Zambian Luvale context, aiming to contribute both to the preservation of biocultural heritage and to the creation of practical tools for imaginative and place-based science education.

## **3. Methodology**

### **3.1 Research Design**

This study employed a qualitative, community-based, descriptive research design. The approach was cross-sectional, capturing indigenous entomological knowledge at a single point in time. The design was selected to facilitate in-depth documentation of Luvale insect names, cultural significances, and attitudes through direct engagement with community members in their local settings. This design is well-suited for exploratory studies aimed at preserving and understanding complex, place-based knowledge systems.

### **3.2 Research Sites**



**Figure 1. North-western province of Zambia (Image from: <https://maps-zambia.com/map-of-western-province-zambia>)**

The study was conducted in three districts of Northwestern Province where Luvale is widely spoken: Kabompo, Zambezi, and Chavuma. Data were collected

at six school sites across these districts, as detailed in Table 1.

**Table 1: Data collection sites**

<b>District</b>	<b>Sites</b>
Kabompo	Kabompo secondary School
Kabompo	Chiweza Secondary School
Zambezi	Mapache secondary & primary School
Chavuma	Moses Luneta Secondary School
Chavuma	Chavuma Secondary School
Chavuma	<u>Chavuma boarding School</u>

### 3.3 Population, Sampling, and Respondents

**Study Population:** The target population comprised Luvale-speaking individuals residing in the rural communities surrounding the six selected schools in Northwestern Province, Zambia. This included school pupils, their parents, and other knowledgeable community elders.

**Sampling and Recruitment:** A purposive sampling strategy was employed to identify information-rich participants who could provide detailed knowledge of local insect nomenclature and cultural practices. Snowball sampling was also utilized, where

initial participants recommended other knowledgeable individuals. Recruitment was facilitated through local school heads, who distributed invitation notes via pupils to their households and nearby villages (see Section 3.5). Participants were selected based on their fluency in Luvale, length of residence in the community (preferably lifelong), and recognition as a knowledgeable person regarding local ecology.

**Sample Characteristics:** The final sample consisted of participants across the six sites, with site-specific participation ranging from 25 to 40 individuals. Participants were categorized into three age cohorts for analysis: youth (16-24 years), middle-aged adults (25-54 years), and elders (55 years and above). As shown in table 2 below:

**Table 2: Showing respondents' age groups per research site**

	Pupils: below 30	Middle-aged 31-45	Elderly 46-above
KABOMPO SEC	29	38	40
CHIWEZA SEC	31	37	40
MAPACHE SEC	30	40	42
CHAVUMA DAY	38	41	41
MOSES LUNETTA	35	39	42
CHAVUMA BOARDING	37	40	42
Totals	200	235	247

### 3.4 Data Collection Procedure

Upon arrival at a site, the research team, which included the principal researcher and local interpreters, coordinated with the school head.

1. **Group Sessions (Primary Method):** The primary mode of data collection was **focus group discussions (FGDs)**. At each site, one FGD was conducted with the assembled participants. Sessions were guided by visual aids (see 3.4) and a semi-structured protocol designed to elicit insect names, stories, uses, and attitudes. Interpreters facilitated communication between the researcher (who may have used English/Bemba) and participants (who used Luvale). Each session lasted approximately 60-90 minutes and was audio-recorded with prior consent.
2. **Questionnaire Administration:** Following the FGD, the structured **attitudinal questionnaire** (see 3.4) was verbally administered to willing participants by the interpreters to capture individual responses on Likert-scale items.
3. **Supplementary Data:** Additional informal conversations and observations were noted in a field journal. Physical insect specimens collected or observed locally were used to aid identification alongside the printed images.

### 3.5. Data Analysis

Data analysis followed a **thematic analysis approach** for qualitative data, supplemented by **descriptive statistics** for quantitative questionnaire responses.

1. **Qualitative Data:** Audio recordings from FGDs were transcribed verbatim and, where necessary, translated from Luvale to English. Transcripts, along with field notes, were repeatedly reviewed to identify recurring codes related to insect names, cultural meanings, uses, and perceptions. These codes were then grouped into overarching themes (e.g., "Insects as Food," "Insects in Folklore," "Medicinal Uses," "Pest Perceptions").
2. **Quantitative Data:** Responses from the Likert-scale questionnaires were cleaned, coded, and analyzed using Microsoft excel to generate descriptive statistics—primarily frequencies and percentages—to summarize the community's attitudes towards insects.
3. **Taxonomic Verification:** Local insect names collected were cross-referenced with available scientific literature and online databases to establish probable scientific identifications where possible.

### 3.6 Ethical Considerations

This study adhered to rigorous ethical standards for research involving human participants. Prior to data collection, informed consent was obtained from all adult participants, and for minors, assent was secured alongside parental consent. Participation was entirely voluntary, with the right to withdraw assured at any stage. The research design prioritized participant well-being, avoiding any activities involving physical or psychological risk. Strict confidentiality was maintained throughout; all data were anonymized and no personally identifiable information is disclosed in any outputs. Necessary permissions were obtained from relevant educational authorities and school management before commencing the study.

### 3.7 Data collection and Analysis

Before the research was conducted, the researchers had sought permission from the District Education Board Secretary (DEBS). The permission was granted and the researcher was given introductory letters to present to the school head-teachers.

The identification and naming of insects was done through presenting pictures of insects to the respondents in all the six sites. The first site was at Chiweza Secondary School in Kabompo district of North-Western province. The pictures presented had no English names to avoid confusing the respondents. The respondents were asked to identify the insects in the pictures and give the names in the Luvale language. The researchers also categorized the respondents according to three age groups; the elderly people preferred being interviewed separately from the pupils.

The data was collected by interviewing pupils in schools as well as villages near schools. In schools, head teachers assigned pupils who took Luvale as a subject to be the respondents. Printed pictures were distributed to the participants to name the insects in Luvale. Probing was done so as to collect more information on folklore. Each sample population had three categories of age groups, the school going, middle-aged and the elderly. This made it easy for the researcher to compare the knowledge levels of respondents, especially on folklore.

After collecting the identification of insects, respondents were asked to give folklore associated with insects. Only 24 insects out of 42 had folklore. Banda (Banda & Bellonjengele, 2010) considers folklore as a valuable supplementary element in education. He proposes to integrate folklore and informal learning as practiced by the community in the formal curriculum to enhance the quality of the education provided for all and to maintain cultural identity.

## 4. Results and Discussion

Based on the pictures presented to the participants, respondents successfully identified all 42 insects. Furthermore, they added 5 additional insects, bringing the total to 47. These insects represent 13 distinct taxonomic orders. Insects are classified into 29 orders globally. Of these, 13 orders have representatives with names in the Luvale language, accounting for 45% of the total orders.

The results indicate that Coleoptera (beetles) are the most represented order in the local language. This means more beetles were both identified from the pictures and named from memory than insects from any other order.

Table 3 lists the insect names and the corresponding responses from participants at each study site.

Table 3. Insect's local names according to locations/sites

No.	ENGLISH NAME	ORDER	FAMILY NAME	DISTRICTS/ RESEARCH SITES (SCHOOLS)					
				KABOMPO	CHIWEZA	ZAMBEZI	CHAVUMA	CHAVUMA	CHAVUMA
				Kabompo secondary boarding school	Chiweza Secondary school	Mapache Combined School	Moses Luneta Secondary School	Chavuma Secondary School	Chavuma Boarding School
1	Edible Hymenoptera	Hymenoptera		Kauvi	Kauvi	Kauvi	Kauvi	Kauvi	Kauvi
2	Long Horned Grasshopper	Orthoptera	Tettingoniidae	Mbimba- musamusa	Mbimba- musamusa	Mbimba- musamusa	Mbimba- musamusa	Mbimba- musamusa	Mbimba- musamusa
3	Short Horned Grasshopper	Orthoptera	Acridae	Mbimbalema	Mbimbalema	Mbimbalema	Mbimbalema	Mbimbalema	Mbimbalema
4	Mantid	Orthoptera	Mantidae	Katetakatemo	Katetakatemo	Katetakatemo	Katetakatemo	Katetakatemo	Katetakatemo
5	Armoured Cricket	Orthoptera	Gryllidae	Kazembwila	Kazembwila	Kazembwila	Kazembwila	Kazembwila	Kazembwila
6	Butterfly	Lepidoptera	Nymphalidae	Kauya-uya	Kauya-uya	Kauya-uya	Kauya-uya	Kauya-uya	Kauya-uya
7	Moth	Lepidoptera	Saturnidae	Kauya-uya- waketunda	Kauya-uya- waketunda	Kauya-uya- waketunda	Kauya-uya- waketunda	Kauya-uya- waketunda	Kauya-uya- waketunda
8	Dung Beetle	Coleoptera	Scarabaeidae	Chikotokoto	Chikotokoto	Chikotokoto	Chikotokoto	Chikotokoto	Chikotokoto
9	Ground	Coleoptera	Carabidae	Phupa	Phupa	Phupa	Phupa	Phupa	Phupa
10	Darkling Beetle	Coleoptera	Tenebrionidae	Kambombo	Kambombo	Kambombo	Kambombo	Kambombo	Kambombo
11	Whirligig Beetle	Coleoptera	Gyrinidae	Vakelewa	Vakelewa	Vakelewa	Vakelewa	Vakelewa	Vakelewa
12	House Cricket	Orthoptera	Gyrinidae	Kazeze	Kazeze	Kazeze	Kazeze	Kazeze	Kazeze
13	Hydrophilidae	Coleoptera	Hydrophilidae	Kambongola	Kambongola	Kambongola	Kambongola	Kambongola	Kambongola
14	Blister Beetle	Coleoptra	Maloidae	Jjiphuka	Jjiphuka	Jjiphuka	Jjiphuka	Jjiphuka	Jjiphuka
15	Fire-Fly	Coleoptera	Lampyridae	Katemulila	Katemulila	Katemulila	Katemulila	Katemulila	Katemulila
16	Housefly	Diptera	Muscidae	Jiji	Jiji	Jiji	Jiji	Jiji	Jiji
17	Mosquito	Diptera	Culicidae	Kangene-ngene	Kangene-ngene	Kangene-ngene	Kangene-ngene	Kangene-ngene	Kangene-ngene
18	Biting Fly	Diptera	Tabanidae	Chikesu	Pofu	Chikesu	Chikesu	Chikesu	Chikesu
19	Wasps	Hymenopetra	Sphecidae	Vamboji	Vamboji	Vamboji	Vamboji	Vamboji	Vamboji
20	Bees	Hymenoptera	Apidae	Vaphuka	Vaphuka	Vaphuka	Vaphuka	Vaphuka	Vaphuka
21	Cicada	Homoptera	Cicadidae	Mbangalala	Mbangalala	Mbangalala	Mbangalala	Mbangalala	Mbangalala
22	Stink Bug	Hemiptera	Pentatomidae	Chivuvu	Chivuvu	Chivuvu	Chivuvu	Chivuvu	Chivuvu
23	Lice	Mallophaga	Menoponidae	Jina	Jina	Jina	Jina	Jina	Jina

24	Soldier Termite	Isoptera		Likenyi	Likenyi	Likenyi	Likenyi	Likenyi	Likenyi
25	White Ants	Isoptera		Makenyi	Makenyi	Makenyi	Makenyi	Makenyi	Makenyi
26	Maggots	Diptera		Mavunu	Mavunu	Mavunu	Mavunu	Mavunu	Mavunu
27	Hairy Caterpillar	Lepidoptera		Livambi	Livambi	Livambi	Livambi	Livambi	Livambi
28	Grub	Coleoptera	Scarabaeidae	Lisenda	Lisenda	Lisenda	Lisenda	Lisenda	Lisenda
29	Maize Weevil	Coleoptera	Curculionidae	Vatakweji	Vatakweji	Vatakweji	Vatakweji	Vatakweji	Vatakweji
30	Hairless Caterpillar	Lepidoptera		Mongu	Likuvala	Likuvala	Likuvala	Likuvala	Likuvala
31	Flea	Siphonaptera	Pulicidae	Mbwangala	Mbwangala	Mbwangala	Mbwangala	Mbwangala	Mbwangala
32	Stick Insect	Orthoptera	Phasmantidae	Kashishi	Kashishi	Kashishi	Kashishi	Kashishi	Kashishi
33	Mud Dauber	Hymenoptera	Specidae	Zelwamalwa	Zelwamalwa	Zelwamalwa	Zelwamalwa	Zelwamalwa	Zelwamalwa
34	Cockroaches	Dictyoptera	Blattidae	Nyaumbwa	Nyaumbwa	Nyaumbwa	Nyaumbwa	Nyaumbwa	Nyaumbwa
35	Dragon Fly	Odonata		Vapheji	Vapheji	Vapheji	Vapheji	Vapheji	Vapheji
36	Red Ant	Hymenoptera		Likinda	kinda	Likinda	kinda	Likinda	kinda
37	African Stink Ants	Hymenoptera	Formicidae	Zelwa-malwa	Zelwa-malwa	Zelwa-malwa	Zelwa-malwa	Zelwa-malwa	Zelwa-malwa
38	Ladybird Beetle	Coleoptera	Coccinellidae	Sonde	Sonde	Sonde	Sonde	Sonde	Sonde
39	Earwig	Dermaptera		Vazewu	Vazewu	Vazewu	Vazewu	Vazewu	Vazewu
40	Aphids	Homoptera	Aphidae	Chikalakasha	Chikalakasha	Chikalakasha	Chikalakasha	Chikalakasha	Chikalakasha
41	Sugar Ants	Hymenoptera	Formicidae	Chikalakasha	Chikalakasha	Chikalakasha	Chikalakasha	Chikalakasha	Chikalakasha
42	Edible Termites	Isoptera		Chandangongi	Chandangongi	Chandangongi	Chandangongi	Chandangongi	Chandangongi
				Kazeze wa Tunda					
				Tulumingu	Tulumingu	Tulumingu	Tulumingu	Tulumingu	Tulumingu
				Tu tutu					
				Ka Keukeu					
				Tuswa	Tuswa	Tuswa	Tuswa	Tuswa	Tuswa

**Table 4: Showing numbers of insects per order.**

No	Order	Documented insects per order
1	Hymenoptera	7
2	Orthoptera	4
3	Lepidoptera	5
4	Coleoptera	10
5	Diptera	4
6	Homoptera	2
7	Hemiptera	1
8	Anoplura	1
9	Isopteran	3
10	Siphonoptera	1
11	Dictyoptera	2
12	Odonata	1
13	Dermaptera	1
<b>Total</b>		<b>42</b>

The additional names provided by respondents are listed below. These additions bring the total number of identified insects to 47. Insects named by participants that were not in the pictures include:

1. Army worms: mavambi
2. Tsetse fly: tushempe/chipofu
3. Small flying termites: tujinga matwitwi
4. Stalk borer: tulwendo
5. Anti-lion: kafutafuta

#### **Distance, Identification Count, and Name Similarity by Site**

Table 5 presents the relationship between the geographic distance separating study sites and the number of insects successfully identified. It further details the number of insect names that were similar (shared) between sites and the number that were different (unique to specific locations)

**Table 5: Analysis of Insect Name Similarity and Variation by Geographic Distance**

Sites	Similar names	Different names	Distances apart
Kabompo sec/ chiweza sec	32	10	10km
Chiweza sec/ mapache sec	38	4	144.8km
Kabompo sec/mapache sec	34	8	152km
Kabompo sec/ moses luneta sec	29	13	230.2km
Chiweza sec / moses luneta	33	9	223km
Mapache/ moses luneta sec	36	6	98.7km
Moses luneta sec/ chavuma day	40	2	10km
Moses luneta sec/ chavuma boarding	38	4	30km
Chavuma day/ chavuma boarding	41	1	40km

Kabompo sec/ chavuma day	37	5	231.8
Kabompo sec/ chavuma boarding	35	7	208km
Chavuma day/ chiweza sec	34	8	234km
Chavuma boarding/ chiweza sec	32	10	222km
Mapache sec/ chavuma day	39	3	120km
Mapache sec/ chavuma boarding	42	0	115km

From Table 4 above, it was deduced that distance didn't affect the naming of insects significantly; the difference is 14%, which is less than 20% of the total insects named from all the sites.

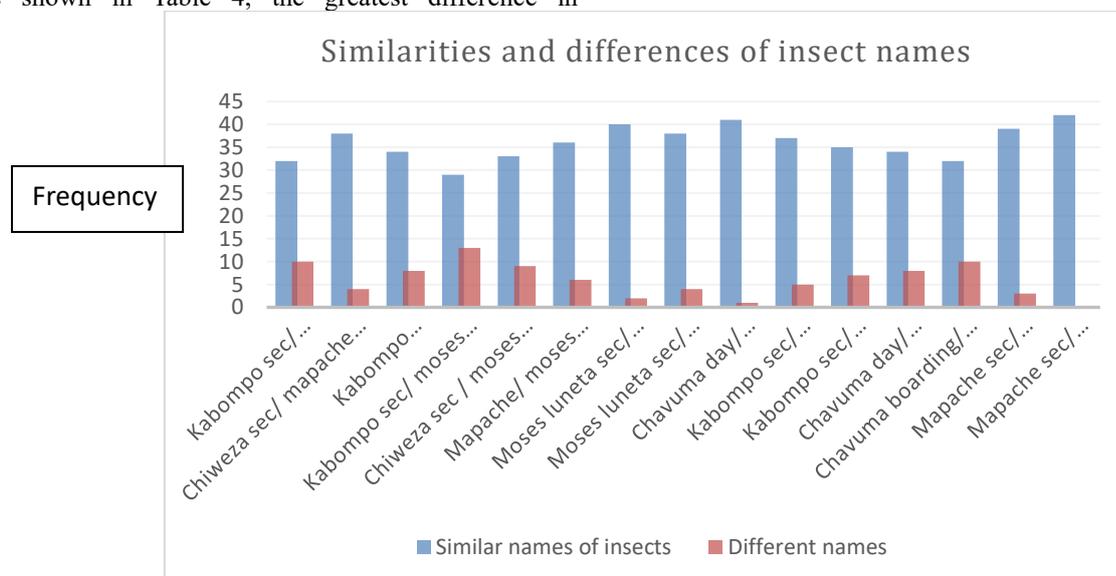
Total percentage=  $540/630= 86\%$  similarity

Meaning that the difference =  $90/630= 14\%$

As shown in Table 4, the greatest difference in

identification occurred between Kabompo Secondary School in Kabompo and Moses Luneta Secondary School in Chavuma. They shared 29 common insects, meaning there was a difference of 13 out of the total 42.

A bar chart was generated from the data in Table 4 to visualize and clarify the relationships between the study sites.



**Figure 2: Similarities and differences of insect names in relation to distance**

From Figure 2, it can be seen that Mapache Secondary and Chavuma Boarding had 100% similar names. This means the insect names identified at Mapache Secondary School were exactly the same as those identified at Chavuma Secondary School, without any differences. The distance between the two schools is 115 kilometers. For these two sites, it can be observed that distance did not affect the naming of insects.

Furthermore, the differences were minimal in the 12 comparisons, and only one pair had a difference of 13 insects out of 42. This means that 29 names were similar between Moses Luneta Secondary School and Kabompo Secondary School. Individual tables and bar charts below show further details of the similarities and differences in insect naming across all the sites in relation to distance.

In this study, distance did not appear to be an important factor in determining similarities and differences in local names, indicating that the Luvale spoken in these areas has very little variation. This contrasts with a study of local insect names in the Tonga language in Southern Province by Samboko et al. (2014), where distance influenced similarities and differences among Tonga dialects. In the current study, distance had no significant impact on insect identification and naming.

Respondents also described the impact of insects on their everyday lives. When asked to name insects that are eaten in their area, they provided names falling into 7 categories, as shown in Table 6. The category of biodegradation was included because respondents described maggots as being found only on rotten things.

The total number of insects across all these categories was 28. The pest category included both livestock pests and crop pests. Crop pests, such as army worms and stalk

borers, were noted by many respondents to cause significant damage, often devastating maize fields. A summary of these categories is provided in Table 6.

**Table 6: Categories of insects according to respondents**

Category	Names of insects	Numbers	
1	Food	Cicada, long horned grasshopper, hairless caterpillar, edible termites, short horned grasshopper, edible hymenoptera	6
2	Injurious	Wasps, bees, biting fly, hairy caterpillar	4
3	Biodegradation	maggots	1
4	Traditional medicine	Mantids, whirligig beetle, dung beetle, anti-lion	4
5	Disease causing	Mosquitoes, tsetse flies, houseflies	3
6	Pests	Army worms, stalk borer, White ants, maize weevil, fleas, aphids, ladybird beetle	7
7	Unsanitary	Lice, bed bugs, cockroaches	3
<b>TOTAL</b>		<b>28</b>	

The outstanding observation that was noted is the distinction between singular and plural forms for insect names in the Luvale language. For example, a single soldier termite is called *likenyi*, while many are called *makenyi*. Similarly, a single hairy caterpillar is *livambi*, and the plural is *mavambi*.

It was also noted that during the data collection process, elderly people knew more insect names and folklore in the local language than younger people. Additionally, it was observed that respondents were often familiar with insects even when they could not provide a local name for them.

## 4.2 Folklore associated with certain names of insects

Folklore, as a critical expression of Indigenous Knowledge Systems, provides epistemological and pedagogical alternatives that can be integrated with formal education to enhance its quality, relevance, and inclusivity. This aligns with global discourses advocating for the decolonisation of curricula and Education for Sustainable Development (ESD). As UNESCO (2021) emphasizes, integrating local and indigenous knowledge is vital for fostering education that respects cultural diversity and addresses local sustainability challenges.

The instructive value of folklore, as noted by Majasan (1969) in explaining societal rules and directing the youth, finds resonance in contemporary scholarship.

Moyo (2020) argues that African folktales are pedagogical tools that embed ethics, ecological literacy, and social cohesion, often lost in standardized curricula. Similarly, the Zambia Education Curriculum Framework (ZECF, 2013) mandates that the curriculum must "respect and retain elements of the past" while developing future competences—a principle that directly supports the integration of folklore as a living knowledge system.

The research finding that the elderly possess greater knowledge of folklore underscores a critical challenge: the intergenerational knowledge transmission gap. This is a global concern linked to biocultural erosion (Pretty et al., 2009). Documenting this knowledge, as with the following list of 24 insects and their associated folklore, becomes an act of cultural conservation and a creation of resources for interdisciplinary education, linking biology, language, history, and ethics.

The following is a list of 24 insects with their associated folklore:

1. **Red ants (vasonde):** '*nge vasonde navavula kaha nakuuza mavasi amavulu*'. This has two meanings: the presence of these signifies water nearby. It also represents floods; their presence may indicate that the area may have floods.
2. **Cicada (Mbangalala):** '*changa*' means drought or dry season. The presence of these insects signifies the dry season. If their period lasts, it means that year will experience a little bit of drought.

3. **Mud dauber (nyaumbwa):** It shows how a good parent must be providing shelter for the young ones as they grow up. It is actually a good example of a caring parent.
4. **House fly (jiji):** House flies follow rotten things. The teaching behind is that in good times, one should be careful of too many “friends”.
5. **Bees (vaphuka):** These have two folklores. ‘*Miyachi*’ this means a clan. There is a group of Luvale speaking people whose clan is represented by bees. Just like the way others are represented by other insects, plants or animals. The other one is working hard to provide for children. A parent must work hard like bees to be able to feed the family.
6. **Mantid (kateta-katemo):** ‘*ava veji kulumbununa unjimi*’. This represents strength, a fighter and a good hunter. They say if you have skills of a mantid then you have very good skills in what you do. The Mantid is also linked to a Witch-finder who should be consulted because of how it holds its front legs.
7. **Ladybird beetle (phelekese/chikalakasha):** This is said to be a problem to their vegetables in the fields and gardens, because it eats the flowers of pumpkins. Their presence in the field shows that in that year you will have a low yield of pumpkins.
8. **Dragon fly (likindakinda):** This is linked to an indecisive human being because of how it moves from one point to the other, and a human being who is linked to this insect is said to be a fool. It also shows that the rains are about to fall.
9. **Grub (lisenda):** The presence of Grub in the soil signifies the fertility of the land, especially if you are looking for a land to cultivate your crops. Interesting, scientific study can be conducted to verify. It seems plausible.
10. **Antlion (kafutafuta):** Girls believe that if put on the nipple, their breasts will be enlarged. It appears this belief is derived from the shape of the sand pit cones of the antlion larvae.
11. **House cricket (kazembwila):** It produces a unique sound which signifies high temperatures of a particular place. This can be experimented scientifically.
12. **Soldier termites (makenyi):** ‘*vemanyinga tuswa*’. It entices the edible flying termites; after the rains at night, it leads them to fly out of the anthill.
13. **Lice (jina):** This signifies unsanitary conditions, which is actually true; it also represents team work, with a proverb that says one hand can’t kill lice.
14. **Whirling beetle (kajinga meya):** It is used to treat babies who have problems of delayed ability to walk.
15. **Dung beetle (chikotokoto):** Its balls are used as medicine by witch-doctors. When a dung beetle lands on you, then on that day you will have bad luck.
16. **Ground beetle (phupa):** This beetle in Luvale signifies good luck. When you meet this insect you are definitely lucky.
17. **Wasps (vamboji):** Self-defence, or defence for young ones. It is also said that when the visitor comes, they shouldn’t disturb a wasp nest or else they will get stung, meaning that as a visitor you have to respect yourself before you get in trouble. When you are in Rome do what the Romans do.
18. **Flea (mbwangelala):** Someone very hard to control. When someone is referred to be as hard as a flea, they simply mean you are very much rigid to advise from anyone.
19. **Stick insect (zelwa-malwa):** When you meet this insect anywhere it means bad luck and a taboo. It may mean that someone has passed away from your family.
20. **African stink ant (vazewu):** ‘*ngenau wana vanambate vaiya a kukanwa kaha okwonauya nauwana vyakulya vavivulu*’. This simply means that when you find these insects with food on their mouths and you are going somewhere, you are definitely lucky and you will find what you went there for. The other one is ‘*oloze nge novyo vanambate vyauchi kaha nawa, noko muya vyakulya vauchi*’. This simply means that when you find these insects without food on their mouths and you are going somewhere, you are definitely not lucky and you will not find what you went there for, or simply bad luck.
21. **Butterflies and moths (kauyauya):** Their presence signifies water nearby, or rains coming soon.
22. **Short horned grasshopper (mbimba lema):** Working in numbers, problem shared is the problem solved. Work like termites for the benefit of the society and the people around you, never work in isolation.
23. **Sugar ants (vakeukeu):** It secures its food before the rains, hence considered to be the cleverest insect. This means that if you don’t want to suffer tomorrow secure what you will eat during hard times.
24. **White ants (makenyi):** ‘*nge nakuvula makenyi na tuswa nava vula*’. These white ants entice flying termites. When they are found in the field, they are said to be a symbol of hunger in

that year.

### 4.3 Implications for the Biology School Curriculum

The documentation of 47 insect names and associated folklore in Luvale provides a concrete resource with direct implications for making the biology curriculum more contextualized, inclusive, and effective. These implications can be categorized into four key areas:

**Development of Culturally Relevant Learning Materials:** The primary output of this study is a hyperlinked PowerPoint teaching aid. This directly addresses the gap identified in the Grade 11 biology textbook and fulfills the mandate of the National Literacy Framework (2013). The implication is that the Curriculum Development Centre (CDC) now has a verified, localized resource to:

- Create bilingual (Luvale-English) insect guides for Grades 1-4, supporting the policy of using local languages as the medium of instruction.
- Develop supplementary picture charts or digital modules for integrated science (Grades 5-7) and biology (Grades 10-12) that use local insect examples to teach universal concepts like classification, ecology, and adaptation.

**Pedagogical Strategy: Scaffolding Scientific Literacy:** Following Ausubel's (1963) theory, the documented Luvale names serve as essential "advance organizers." The implication for teaching is that instructors can now explicitly use students' prior knowledge (e.g., *Kauvi* for edible Hymenoptera) as a cognitive bridge to introduce scientific names (Hymenoptera) and taxonomic concepts. This strategy reduces the perceived abstraction of biology, making it more plausible and accessible (Ausubel, 1968), thereby potentially improving learner attitudes and engagement.

**Integrating Indigenous Knowledge Systems:** The 24 documented folklore pieces are not just cultural artifacts; they are entry points for interdisciplinary learning. The implications for curriculum design include:

- **Science Connections:** Folklore about cicadas (*Mbangalala*) signaling drought or grubs (*Lisenda*) indicating fertile soil can be the basis for student-led investigations into insect phenology and soil biology, moving from traditional observation to scientific inquiry.
- **Ethics and Attitude:** Stories about the hardworking bee (*Vaphuka*) or the communal grasshopper (*Mbimba lema*) can frame discussions on work ethic, sustainability, and human interdependence with ecosystems, aligning with the curriculum's aim to develop positive attitudes towards nature (Bridging Early Childhood and Nature Education, 1991).

**Addressing the Generational Knowledge Gap and Promoting Conservation:** The finding that the elderly

possessed more detailed knowledge than the youth highlights an urgent curricular implication: education must become a vehicle for biocultural conservation. The curriculum can facilitate "knowledge transfer" projects where learners interview elders about insects, documenting not just names but also historical changes in insect populations. This active participation makes learners custodians of their own linguistic and biological heritage, fostering a sense of responsibility and aligning with global goals of preserving biocultural diversity (Maffi, 2001; Loh & Harman, 2014).

In conclusion, the implications extend beyond mere vocabulary addition. This study provides the foundational content for a pedagogical shift—from a decontextualized biology curriculum to one that is rooted in the learners' environment, language, and culture, thereby enhancing relevance, comprehension, and conservation ethics.

## 5. Conclusion and Recommendations

### 5.1 Conclusion

This study successfully documented the local names and associated folklore of insects in the Luvale language across three districts of Zambia's North-Western Province. The research demonstrates that Luvale speakers possess extensive and consistent entomological knowledge, with participants identifying all 42 presented insects and contributing an additional five, resulting in a total of 47 documented species across 13 orders. Notably, the naming of insects showed remarkable uniformity (86% similarity) across the six research sites, indicating that distance does not significantly influence lexical variation within the Luvale language in this context.

A key finding was the generational disparity in knowledge: elderly participants consistently demonstrated deeper familiarity with both insect names and their associated folklore compared to younger and school-going groups. This underscores the urgency of documenting such indigenous knowledge as a vital component of biocultural heritage. The rich folklore documented for 24 insects reveals a complex cultural framework that interprets insects as indicators of weather, symbols of social values (e.g., hard work, community, luck), and sources of practical teachings.

The primary output of this research—a hyperlinked, multimedia teaching tool—provides a direct resource to bridge the identified gaps in the current biology curriculum. By integrating locally recognizable insects and their Luvale names, this tool is designed to scaffold the learning of scientific taxonomy, moving learners from the familiar to the unfamiliar as advocated by Ausubel (1963, 1968). Consequently, this work contributes significantly to the goals of Zambia's National Literacy Framework and Curriculum

Framework by providing authentic, culturally relevant materials that can enhance contextualization, relevance, and learner motivation in science education. Ultimately, this documentation serves not only to preserve valuable indigenous knowledge but also to transform it into a functional asset for enriching the biology school curriculum and fostering a more engaged, localized scientific literacy.

## 5.2 Recommendations

Based on the findings of this study, the following targeted recommendations are proposed to translate this research into practical action for curriculum enhancement and cultural preservation:

### 1. For the Curriculum Development Centre (CDC) and Ministry of General Education

Incorporate the documented Luvale insect names and folklore into the official teaching and learning materials for Integrated Science (Grades 1-7) and Biology (Grades 10-12). Specifically, the hyperlinked PowerPoint tool developed in this study should be formally reviewed, adapted, and disseminated as a standard digital resource for schools in Luvale-speaking regions.

Mandate and support the development of similar localized resources for the other six major Zambian languages to ensure equitable, culturally relevant science education nationwide.

### 2. For Teacher Training Institutions (e.g., Colleges of Education, The University of Zambia)

Integrate modules on Indigenous Knowledge Systems (IKS) and local ethno-entomology into pre-service and in-service teacher training programs. This will equip future and current teachers with the pedagogical skills to use local examples, like the ones documented here, as bridges to teaching national curriculum concepts.

### 3. For School Administrators and Science Teachers in North-Western Province

Actively utilize the developed teaching tool and encourage participatory projects where learners document insect names and folklore from their own communities and elders. This practice can help bridge the generational knowledge gap identified in the study.

Design local field activities and assessments that recognize and value students' prior cultural knowledge, using it as a foundation for scientific inquiry.

### 4. For Future Research

Conduct longitudinal intervention studies to empirically evaluate the impact of using the Luvale insect names tool on specific learning outcomes, such as taxonomic recall, scientific attitude, and engagement in biology

classrooms.

Expand documentation efforts to include other taxonomic groups (e.g., plants, birds, mammals) in Luvale and to record the ecological knowledge associated with them, creating a more comprehensive digital repository of Luvale biocultural heritage

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