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Original Article

Exploring Phenotypic Characteristics of Edible Caterpillars and Indigenous Knowledge of Host Plants in the Coastal Forest Ecosystems for Improved Food Security

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ABSTRACT

Edible caterpillars have nutritional and economic value, thus providing food security at the household level during their harvesting seasons. Despite the significant value of these insects, they are harvested seasonally, and there is little or no documented research about the edible caterpillar species and their phenotypic characteristics, their host plants, and the effects of ecosystem utilization on the insects. This study explored the phenotypic characteristics of edible caterpillars and the indigenous knowledge of their host plants in selected coastal forest ecosystems, aiming to contribute to the improvement of food security. The study adopted a cross-sectional observational study design, involving data collection on caterpillar phenotypic characteristics and interviewing local communities on host plant preferences. One-way ANOVA was used to test for significant differences in phenotypic characteristics (body weight, body length, and body girth) among the four caterpillar species. The Chi-Square test was used to examine the association between caterpillar species and their preferred host plants. The findings show that the region is dominated by four edible species of caterpillars: Bunea alcinoe, Gonimbrasia zambezina, Gynanisa maja, and Menipe spp. These caterpillar species have distinct and discernible differences in their phenotypic characteristics, specifically in terms of body weight, body length, body girth, body color, as well as body texture with a significance level of 0.000. These variations in physical traits suggest that each species has evolved unique adaptations to their respective environments and may have different ecological roles within their habitats. These species also have varying preferences for different host plants, making each species unique. The preferred host plant species supporting the caterpillars were: Balanites wilsoniana for B. alcinoe, Mangifera indica for G. zambezina, Acacia gourmaensis for G. maja, and Ochna mossambicensis for Menipe spp. The study revealed significant associations between caterpillar species and their preferred host plants, indicating that the local community possesses specific indigenous knowledge regarding the preferred host plants for edible caterpillars in the study area.

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INTRODUCTION

Malnutrition is a global challenge with significant social and economic costs, and it stands as a major risk factor for the global burden of diseases (Hazarika *et al.,* 2020). The study reports that many countries are grappling with complications arising from energy and micronutrient deficiencies. According to the Food and Agriculture Organization (FAO), the prevalence of malnutrition in the world is 10.8% and 11.0% in 2015 and 2016, respectively, affecting 794 million and 815 million people (Prosekov & Ivanova, 2018). This condition is exacerbated by climate change and the rapid global population growth, projected to reach 9.1 billion by 2050(Manning, 2015). According to the Kenya National Bureau of Statistics (KNBS, 2019) census report, Kenya's population was 47.6 million in 2019 and is projected to reach 95 million by 2050. According to Hall *et al.* (2017), Over half of the population lacks sufficient food, attributed not only to the level of economic development but also to the rapid population increase, which outpaces the rate of food production. To sustain this huge population, food production must increase by 60 percent. Annual cereal production will need to rise to around 3 billion tonnes from the current 2.1 billion, and annual meat production will need to increase by over 200 million tonnes to reach 470 million tonnes. Meeting this meat demand through livestock production will increase Greenhouse Gas emissions (GHGs) by 37%, resulting in increased environmental pollution and climate change (Manning, 2015).

In light of this, the country should explore alternative sources of food that can be produced on a viable and sustainable commercial scale. In recent years, edible insects have been proposed as one potential source of food (van Huis *et al.,* 2015). This is because insects can be farmed at relatively low economic and environmental costs per kilogram mass gain compared to conventional livestock (van Huis and Oonincx, 2017). More importantly, insects provide a rich source of energy, protein, minerals, and vitamins (Rumpold and Schlüter, 2013). The use of insects as food is not a new idea, although they have not been cultured on a commercial scale for use as human food until recently (Dunkel and Payne, 2016). Traditionally, the majority of edible insects were gathered from the wild, particularly in remote rural areas and in tropical countries with high biodiversity, where insects have been an important wild source of protein and micronutrients (Dunkel and Payne, 2016). Some of the insects that have been consumed for a long period include crickets, locusts, grasshoppers, bamboo worms, ants, and edible caterpillars. The majority of insect species occur seasonally as they depend on the abundance of their host plants, while others may be found throughout the year, such as most aquatic insects (van Huis, 2020). Studies show that about 2 billion people in the world consume up to 2000 species of insects (Ayieko *et al.,* 2016). In Africa, several species of insects have been used as traditional foods among

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various communities (Salama, 2020). The dominant insect-eating countries in Africa are the Democratic Republic of the Congo, Congo, the Central African Republic, Cameroon, Uganda, Zambia, Zimbabwe, Nigeria, and South Africa. Recently, Kenya has been documented to comparatively consume edible insects (Kelemu *et al.*, 2015 and Ayieko *et al.*, 2016).

In Kenya, insects have been traditionally consumed as food, especially in the coastal and western regions. The most commonly collected edible insect in western Kenya is the winged termite (Ayieko *et al.*, 2016) whereas edible caterpillars form an essential part of the diets of many communities in the coastal regions of Kenya. Edible caterpillars are a forest resource that needs to be taken into account in sustaining the livelihoods of the rural communities. Research conducted by (Kusia *et al.*, 2021) on edible caterpillars in the coastal region of Kenya, highlighted the significance of these insects as a potential food source. Despite their high nutritional value, the diversity of edible saturniid caterpillars in the Caoastal Kenya has not been extensively studied. This study focused on exploring the phenotypic characteristics of edible caterpillar species and the indigenous knowledge of host plants within the Coastal region of Kenya.

MATERIALS AND METHOD

Study Area

The study was conducted in three forest ecosystems: Arabuko Sokoke, Kaya Kauma, and Kaya Fungo in Kilifi County. These three forests are among the nine Mijikenda Kaya forests, which include Kaya Fungo, Kaya Kauma, Kaya Duruma, Kaya Jibana, Kaya Ribe, Kaya Chonyi, Kaya Rabai, Kaya Kinondoni and Kaya Kambe (Adongo, 2014). These forests are situated along the Coastal Belt of Kenya and house the remains of fortified villages known as 'kayas,' belonging to the Mijikenda people (Njagi, 2019). The selection of Kaya Kauma and Kaya Fungo was based on their close proximity to Arabuko Sokoke compared to the other kayas. Additionally, the choice was influenced by the observation that the Giriama and Kauma communities around these two kayas have a higher consumption of edible caterpillars compared to other tribes in the region. The accessibility of these sites was also a crucial criterion for selecting the study locations. *Table 1* below shows the characteristics of the study areas.

Table 1: Features of the study areas

Forest Ecosystems	Area (Ha)	Location	Rainfall (mm)	Temperature in ^{O}C	Altitude in meters	Population
Arabuko Sokoke	42,000	3º 19' S and 39º 52' E	600-100	21-30	0-210 m asl	80,000
Kaya Kauma	100	3º 37' 14” S and 39º 44' 10” E	500-700	29-35	120 m asl	10,000
Kaya Fungo	200	3º 47’ 55” S and 39º 30' 52” E	700-900	30- 34	198 m asl	25,000

Source: Kioko *et al.,* 2019

Arabuko Sokoke Forest

Arabuko Sokoke Forest is the only remaining large significantly sized forest in Kilifi County, which is the largest remaining patch of indigenous coastal forest in East Africa covering approximately 42,000 Ha (Chiawo *et al.*, 2018). It is located south of Malindi bordering the main Kilifi-Malindi Road between Tezo and Gede towns. The forest is managed by the Kenya Forest Service (KFS). It hosts 20% of Kenya's bird species, 30% of butterfly species, and at least 24 rare and endemic bird, mammal, and butterfly species. It predominantly consists of three distinct forest habitat types: *Cynometra* Forest (23,500 ha) which is dominated by *Cynometra webberi* and *Manilkara sulcata*. *Brachystegia* Woodland (7,700 ha) is dominated by *Brachystegia spiciformis* on white sandy soil. The third one is the mixed Forest (7,000 ha) which occurs on the eastern side and has a diverse tree flora including *Afzelia quanzensis*, *Hymenaea verrucosa*,

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Combretum schumannii, and *Manilkara sansibarensis* and the cycad *Encephalartos hildebrandtii*. A series of seasonal wetlands run north-south along the length of the forest where the more clay-rich red soils underlie the permeable white sandy soil of the *Brachystegia* (Chiawo *et al*., 2018). There are two wet seasons: April-June (long rains) and November-December (short rains). The remaining months are usually hot and dry (Rotich, 2019). Arabuko Sokoke has a hot and humid coastal climate, cooled by strong breezes, and has a high humidity of about 89-95%. Adjacent to the forest ecosystem are communities majorly consisting of small-scale farmers. This is an indication of high forest dependency.

Kaya Kauma

Kaya Kauma is defined as a community along the coast that uses its culture to conserve and protect the Kaya Forest, a sacred site of the Mijikenda people that is recognized by UNESCO as a world heritage site for its adherence to cultural traditions (Painter, 2019). It has 79 butterfly species which makes it the second-highest Kaya Forest so far in butterfly diversity compared to 112 species recorded for Kaya Kinondoni (Kioko *et al.,* 2019). The Sacred Kaya Kauma heritage site is a cultural forest and semi-deciduous remnant of the *Phytochoria*. The evidence is the Jaribuni landscape characterized by scattered patches of the *Brachystegia spiciformis* (Mrihi) growing on white sandy soil (Sosoni) occasionally intercepted by very few *Afzelia quanzensis* (Mbamba Kofi) (Jefwa, 1982). The forest exhibits a rich soil content of iron-ore deposits with the top layer of the soil changing its colour to black due to the iron gravel. Iron ore mining is a major threat to this forest with deep pits spread all around and disposing of the bare ground to gully erosion (Rajat *et al.,* 2018).

Kaya Fungo

Kaya Fungo, the Headquarters of the Giriama, is a sacred forest. It is much respected by the larger Giriama community which believes that what goes in there is strictly secret and only the few qualified old men chosen are in the know. It contains the traces of historic fortified settlements of the Mijikenda ancestors which serve as a focus of cultural and ritual activities continuing on the sites today (Hazarika *et al.*, 2020). The common vegetation *Acacia nilotica, Lamprothamus zanguebarica, Thespecia danis, Flueggia virosa, Terminaria spinosa, Diospyros cornii, Senna simea*, and tree/shrub species are dominant in the ecosystem (Osio, 2015). This region is cited to have a favorable climate and wild ecosystem for the thriving of insects, but it is also surrounded by communities in which the consumption of edible insects is popular (Chiawo *et al.,* 2018)). The study was interested in researching the phenotypic characteristics of edible caterpillar species and identifying their host plants, it was important to choose a region in which culture, ecosystem, and insect species blend. *Figure 1*. Below are the study sites.

Study Design

The study employed a cross-sectional observational design, involving data collection on caterpillar phenotypic characteristics, host plant preferences, caterpillar availability, and ecosystem utilization practices (Setia, 2016). Observations and data collection were conducted in various locations within the study area to ensure a representative sample of the caterpillar populations (Thomas *et al.,* 2020).

Data Collection

Field Observations: Direct field observations were made to gather relevant data about insects and their host plants. Photographs were taken to corroborate and support the information provided by interviewees.

Taxonomic Classification of Insect Specimens and Host Plants: To identify and categorize the different species of edible insects across the study area, a combination of original data and taxonomic features was employed. These taxonomic features were primarily sourced from historical records, existing literature, and the help of The National Museums of Kenya through the Kipepeo Project.

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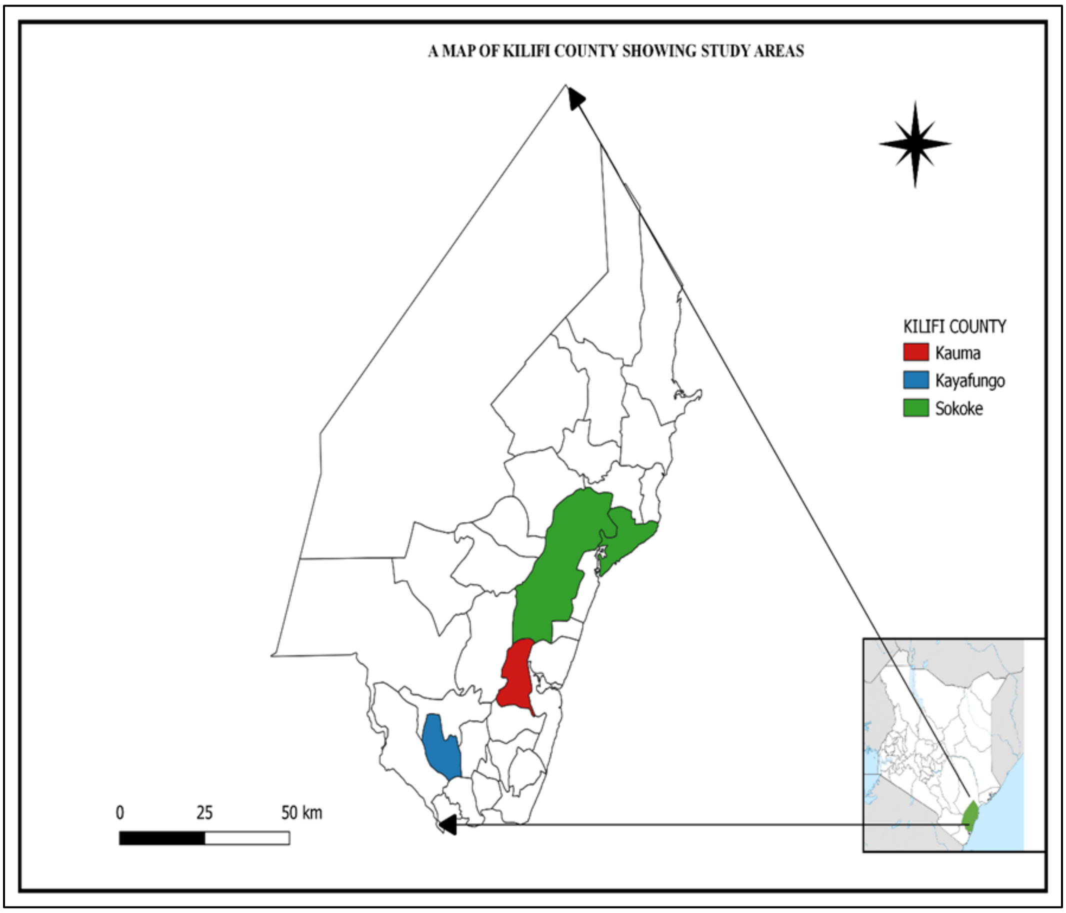
Figure 1: Map showing the study sites.



Source: John Katana

Phenotypic Characteristics

The phenotypic characteristics of the four caterpillar species (body weight, body length, and body girth) were measured using standard scientific protocols (Brasaemle, 2007). Caterpillars were collected in a non-destructive manner to avoid harm to the species and their habitats.

Samples of the edible caterpillars were collected during the 6th instar stage of development. The 6th instar stage is the last stage after which the caterpillars form cocoons, therefore it was crucial to consider this stage since the caterpillars would be fully grown. For each edible caterpillar species, 20 edible caterpillars were randomly sampled between the blocks for the study. Body measurements (morphometrics), including body weight, body length, and body circumference/girth, were taken on the individually sampled caterpillars. They were weighed individually on a digital electronic weighing scale with a capacity of 5 kilograms, and the individual weight recorded. The length of each sample was measured by placing a 20 cm sisal string from the head to the anal plate, then stretching the string on a 30 cm ruler and recording the measurements. Body circumference/girth was obtained by placing a 20 cm sisal rope around the abdomen of each sample, using a 30 cm ruler to record the measurements. The average weight, length, and girth per species were recorded. Data on colour, body texture, and morphometrics were collected through observation.

Assessing Indigenous Knowledge: Host Plant Preferences

To assess the Indigenous knowledge of the local community regarding caterpillar host plant preferences, semi-structured questionnaires were conducted with key informants such as traditional

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caterpillar harvesters and local community members (Harwell *et al.*, 2024). The interviews were conducted in *giriama*, the local language to facilitate better communication and understanding. Participants were asked about their observations and experiences with caterpillar host plant associations. The preferred host plants mentioned by the participants were recorded for each caterpillar species, along with any specific reasons or cultural beliefs associated with the choices.

Procedure for edible caterpillar collection

Samples of four species of edible caterpillars were collected from the forest ecosystems. The choice was made based on their availability within the selected ecosystems. The four edible caterpillar species were collected carefully from their host plants by hand. The collected samples were then put in different plastic containers of which each container was labelled using their local names.

Statistical Analysis

Descriptive statistics were calculated for the phenotypic characteristics of each caterpillar species. The mean, standard deviation, minimum, and maximum values of body weight, body length, and body girth were computed for the entire sample (Kusia *et al.*, 2021). A one-way ANOVA was used to test for significant differences in phenotypic characteristics (body weight, body length, and body girth) among the four caterpillar species (Kenton, 2021). The chi-Square test of independence was used to examine the association between caterpillar species and their preferred host plants (Hlongwane *et al.*, 2021).

RESULTS AND DISCUSSION

The table below shows, the results from interview of key informants on the knowledge of the edible caterpillars and host plants.

Table 2. Results from interview of key informants on the knowledge of the edible caterpillars and host plants.

Ecosystem	Knowledge of edible caterpillars and host plants	No. of Resondents	
		Yes	No
Arabuko Sokoke	Knowing Edible caterpillars	43	7
	Knowing their host plants	43	7
Kaya Kauma	Knowing Edible caterpillars	21	4
	Knowing their host plants	21	4
Kaya Fungo	Knowing Edible caterpillars	25	0
	Knowing their host plants	25	0

From the results above, it's evident that communities within the three forest ecosystems where the study was conducted have knowledge about edible caterpillars and their host plants.

Common Edible Caterpillar Species and their Phenotypic Characteristics

The study involved the collection of four edible caterpillar species: *Gonimbrasia zambezina, Bunea alcinoe, Gynanisa maja spp.,* and *Menipe spp.*, all belonging to the same family. These caterpillar specimens were gathered from the Arabuko Sokoke, Kaya Kauma, and Kaya Fungo Forest ecosystems for a phenotypic analysis. The selection of these particular caterpillar species was influenced by their availability during the research period. Each caterpillar species was identified and catalogued with their common, local, and scientific names, as detailed in table 2. It was observed that the mentioned species inhabited all three ecosystems, except for *G. zambezina*, which was not found in Kaya Kauma. Notably, these species are consumed in their larval stage, as highlighted by Ishara *et al.* (2022).

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Table 3: Common and local names of edible caterpillars

Common name	Local name	Scientific name	Family name	Order	Study area present			Stage of consumption
					Arabuko Sokoke	Kaya Kauma	Kaya Fungo	
Caterpillar	Maungu ga Mwembeni	*G. zambezina*	Saturniidae	Lepidoptera	Present	Absent	Present	Larvae
Caterpillar	Maungu ga Mkongani	*B. alcinoe*	Saturniidae	Lepidoptera	Present	Present	Present	Larvae
Caterpillar	Madoredore	*G. maja*	Saturniidae	Lepidoptera	Present	Present	Present	Larvae
Caterpillar	Maungu ga Mudhahabunu	*Menipe spp*	Saturniidae	Lepidoptera	Present	Present	Present	Larvae

Table 4: Colour and body texture

Scientific name	Colour	Texture
G. zambezina	Orange with Black and white spots The body contains white fur	Covered with black/grey spikes
B. alcinoe	Black with Maroon spots on the sides	White spikes on the abdomen and black spikes on the thorax.
G. maja	Green with white spots on the lower sides	The abdomen is covered with white spikes and green spikes on the thorax
*Menipe spp. (*species name undetermined)	Maroon with black strips running along and across the body	Covered with Black spikes

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The identification of both common and scientific names for the edible caterpillar species was achieved with the assistance of local Indigenous communities and the Kipepeo Project based in Gede. This collaborative effort facilitated the accurate naming and categorization of these species. In addition to the naming process, detailed records of their phenotypic characteristics, specifically colour and body texture, were made. These phenotypic details are systematically presented in *Table 3* below, offering a clear and organized overview of the physical attributes of the edible caterpillars.

From the above results, it is clear that the four edible caterpillar species are distinct from one another in terms of colour and texture. Below are photos from *Plate 1-4* of each of the four edible caterpillar species collected for the study.

Plate 1: *G. zambezina*

Plate 2: *B. alcinoe*

Plate 3: *G. maja*

Plate 4: *Menipe spp.*

The ANOVA results revealed significant differences in the phenotypic characteristics of caterpillar species. For body weight, a significant effect of caterpillar species was found F (3, 76) = 588.94, $p < .001$. There was a significant between-groups difference (M = 10.15, SD = .66) for *G.*

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zambezina, B. alcinoe (M = 19.67, SD = 1.04), *G. maja* (M = 10.07, SD = 1.38), and *Menipe* spp (M = 8.54, SD = .33). Similarly, for body length, there was a significant effect of caterpillar species *F* (3, 76) = 128.70, $p < .001$. The between-groups difference was significant for *G. zambezina* (M = 8.47, SD = .31), *B. alcinoe* (M = 11.64, SD = 1.00), *G. maja* (M = 8.92, SD = .30), and *Menipe* spp (M = 8.74, SD = .41). In terms of body girth, a significant effect of caterpillar species was observed *F* (3, 76) = 79.09, $p < .001$. The between-groups difference was significant for *G. zambezina* (M = 4.56, SD = .11), *B. alcinoe* (M = 5.05, SD = .36), *G. maja* (M = 4.32, SD = .29), and *Menipe* spp (M = 3.91, SD = .07).

Table 5: ANOVA Results for Phenotypic Characteristics of Caterpillar Species

		Sum of Squares	df	Mean Square	F	Sig.
Body Weight	Between Groups	1557.320	3	519.107	588.939	.000
	Within Groups	66.989	76	.881		
	Total	1624.309	79			
Body Length	Between Groups	130.685	3	43.562	128.698	.000
	Within Groups	25.725	76	.338		
	Total	156.410	79			
Body Girth	Between Groups	13.494	3	4.498	79.088	.000
	Within Groups	4.322	76	.057		
	Total	17.817	79			

In each case, the p-value is less than 0.001, indicating that the differences among caterpillar species are statistically significant. The means (M) and standard deviations (SD) for each species provide additional details about the magnitude and variability of the observed differences in body weight, body length, and body girth.

Respondent's Indigenous Knowledge of the Preferred Host Plants

To assess the indigenous knowledge of the preferred host plants by edible caterpillars in three forest ecosystems, a chi-square test of independence was conducted.

The results of the Preferred Host Plant and Caterpillar Species cross-tabulation indicate the distribution of host plant preferences among different caterpillar species. The cross-tabulation table shows the counts and percentages of caterpillar species associated with each preferred host plant as shown in *Table 5* above.

The Chi-Square tests were conducted to examine the significance of the association between caterpillar species and preferred host plants. The Pearson Chi-Square test revealed a significant association, $\chi^2(30) = 300.00$, $p < .001$. Notably, 88.6% of the cells had expected counts less than 5, and the minimum expected count was .44. These findings suggest that there is a strong relationship between caterpillar species and their preferred host plants. *Plates 5-9* below show the preferred host plants.

Table 6: Preferred host plant * caterpillar species cross-tabulation

Host Plant		Caterpillar Species				Total
		B. alcione	***G. maja***	***G. zambezina***	***Menipe spp***	
A. nilotica	Count	0	6	0	0	6
	%	0.0%	100.0%	0.0%	0.0%	100.0%
A.gourmaensis	Count	0	12	0	0	12
	%	0.0%	100.0%	0.0%	0.0%	100.0%

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Host Plant		**Caterpillar Species**				**Total**
		B. alcione	***G. maja***	***G. zambezina***	***Menipe spp***	
B. wilsoniana	Count	17	0	0	0	17
	%	100.0%	0.0%	0.0%	0.0%	100.0%
C. zimmernii	Count	5	0	0	0	5
	%	100.0%	0.0%	0.0%	0.0%	100.0%
D. cineria	Count	0	4	0	0	4
	%	0.0%	100.0%	0.0%	0.0%	100.0%
D. consolatae	Count	0	0	2	0	2
	%	0.0%	0.0%	100.0%	0.0%	100.0%
E. natalensis	Count	0	0	5	0	5
	%	0.0%	0.0%	100.0%	0.0%	100.0%
H. inopleum	Count	0	0	3	0	3
	%	0.0%	0.0%	100.0%	0.0%	100.0%
M. indica	Count	0	0	20	0	20
	%	0.0%	0.0%	100.0%	0.0%	100.0%
O. mossambicensis	Count	0	0	0	22	22
	%	0.0%	0.0%	0.0%	100.0%	100.0%
Z. mays	Count	0	0	0	4	4
	%	0.0%	0.0%	0.0%	100.0%	100.0%
Total	Count	22	22	30	26	100
	%	22.0%	22.0%	30.0%	26.0%	100.0%

Plate 5: *M. indica.*

Plate 6: *B. wilsoniana.*

Plate 7: *D. consolatae.*

Plate 8: *A. gourmaensis*

Plate 9: *O. mossambicensis.*

The edible caterpillar species identified were observed to have very distinct host plant specificity across the three study sites surveyed. This study found out that *B. alcinoe* was feeding on *B. wilsoniana*. The results concur with a study conducted by Kusia *et al.* (2021) in Kenya, which indicated *B. wilsoniana* as the host plant for *B. alcinoe.* However, In the Democratic Republic of Congo, *B. alcinoe* has a wide range of host plants: *Sarcocephalus latifolius*, the preferred host, but it

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also feeds on *Acacia auriculiformis*, mango, oil palm, *Dacryodes edulis*, avocado, *Crossopteryx febrifuga* and *Anthocleista schweinfurthii* (Latham, 2015). This study also found that *G. zambezina* prefers *M. indica* as the host plant. The results collaborate with Latham (2015) which indicated *M. indica* as the most preferred host plant by *G. zambezina*. A study done by Kusia *et al*. (2021), also indicated *M. indica* as the preferred host though the study also found out that the Cashew nut tree is a host. *Anacardium occidentale* (Cashew nut) and *M. indica* (mango) trees are important commercial trees whose nuts and fruits are widely consumed. In this regard, *G. zambezina* is sometimes considered a pest of mango trees thus spraying of mango trees poses a threat to *G. zambezina* larvae feeding on the leaves.

G. maja was found feeding on *A. gourmaensis*, though it was revealed during the survey that the caterpillar has two host plants: *G. gourmaensis* and *D. cineria.* In Zambia, studies done by Benjamin *et al*. (2022) and Siulapwa *et al.* (2012) revealed *Julbernadia paniculata* as the most preferred host plant for *G. maja* though the earlier study outlined other alternate host plants for the caterpillar: *Brachystegia longifolia*, *Erythrophleum africanum,* and *Albizia antunesiana*. This shows the difference in forage preference of the edible caterpillar in different ecosystems. On the other hand, *Menipe spp* was found inhabiting and feeding on *O. mossambicensis,* which is an evergreen shrub. This study, therefore, reveals that the indigenous people around these ecosystems are able to locate edible caterpillar species in their habitat and have a good knowledge of their host plants. In addition, the Indigenous people were able to state the common names of each of the preferred host plants for every caterpillar species.

These findings suggest that there is a strong relationship between caterpillar species and their preferred host plants in the Kaya and Arabuko-Sokoke forests ecosystem. The indigenous knowledge of the local community regarding the association of caterpillar species with specific host plants is supported by the significant Chi-Square results. The findings highlight the importance of understanding the ecological interactions between caterpillars and their host plants in conservation efforts and sustainable management of the forest ecosystem

CONCLUSION

This study investigated the phenotypic characteristics and assessment of indigenous knowledge of host plant preferences of edible caterpillar species in the Kaya and Arabuko-Sokoke forests ecosystem. The three ecosystems of the Coastal Kenya are major sources of edible caterpillars. The main caterpillar species found in the ecosystem were: *B. alcinoe*, *G. zambezina*, *G. maja*, and *Menipe spp.* The phenotypic characteristics of caterpillar species, highlight their diversity and potential adaptations to specific ecological niches. The phenotypic characteristics of the four edible caterpillar species were distinct and easy to document and among the four species identified, *B. alcinoe* was the biggest while *Menipe spp*, was the smallest.

Moreover, the research demonstrated the significance of the association between caterpillar species and their preferred host plants based on indigenous knowledge. The preferred host plant species supporting the caterpillars were: *B. wilsoniana*, for *B. alcinoe, M. indica* for *G. zambezina, A. gourmaensis* for *G. maja*, and *O. mossambicensis* for *Menipe spp*. The findings underscore the importance of conserving biodiversity and maintaining suitable habitats for these valuable insects species for enhanced food and nutrition security. The study reveals significant associations between caterpillar species and their preferred host plants, indicating that the local community possesses specific indigenous knowledge regarding the preferred host plants for edible caterpillars in the study area.

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Conflict of Interests

The authors have not declared any conflict of interests

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