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*Full Length Research Paper*

# Diversity and Local Community Knowledge on Butterflies: A Case Study of Kiang'ondu Montane zone of Mt Kenya Forest

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***Abstract***
*Butterflies are among the most popular insects that are extensively studied to determine both the status of their populations and as an indicator of ecosystem health. In this study, an assessment of diversity, abundance and distribution of butterfly species in Kiang'ondu Forest and surrounding farmlands was conducted between May and June, 2017. A total of 12 transects (Pollard walks) were used to collect data in the montane forest, forest edges, stream sides and adjacent farms. In addition, a social-ecological survey to determine local community's knowledge on butterfly conservation value in the area was carried out using self-administered questionnaires. A total of 49 butterfly species were recorded with the most abundant species being Pierisrapae. Species diversity was highest in the forest (H' 3.29) and at the forest edges (H' 2.46). Apparently, all the respondents were aware of the presence of butterflies in the forest. Majority of the respondents (85%) felt that the presence of butterflies in their farms benefitted the community by pollinating their crops in addition to adding beauty to the environment (67%). The study provides important insights into the diversity of butterflies in a tropical montane forest as well as the social-ecological values attached to the taxa by the local community. The data is important in promoting appreciation of the forest biodiversity and encouraging local community support in forest conservation.*

***Keywords:*** *Butterflies; diversity; threats, attitudes, local community*

## Introduction

Insects are by far the most species-rich group of animals, representing over 20% of terrestrial biodiversity. Compared to other groups of insects, butterflies (order Lepidoptera) are the most popular, well documented, and easy to recognize insect groups (Tam &Bonebrake, 2016). These insects have an average life span of one month and face many challenges on their battle for survival. During their short life span, butterflies play critical ecosystem roles as pollinators of both wild and cultivated plant species (Klein *et al.,* 2007; Bonebrake*et al.,* 2010; Macgregor *et al*., 2015). These insects also provide food for other organisms, for example; birds, reptiles and amphibians and also act as biological pest control agents (Ghazanfar*et al*., 2016). Loss of butterflies in an ecosystem would, therefore, lead to gradual extinctionof biotathat they support.

As species are lost at an increasingly high rate (Raven and Yeates, 2007; Pimm*et al*., 2014) it has become important to establish baseline data on species' abundances and distributions to which future surveys and conservation efforts can be related. To document biodiversity and its distribution through time and space is an invaluable resource for research, education and policy making (Winker 2004; Maldonado*et al*., 2015). It is well recognized that biodiversity by its nature is not a constant, but a dynamic element of ecosystems, changing its composition, structures and functional properties in response to a wide variety of external and internal forces (Jürgens, 2006). This fact makes it imperative to continuously monitor biodiversity.

Although over the last two decades, research on biodiversity has expanded dramatically, fuelled by increasing threats to the natural world, scientific research on animal biodiversity is systematically biased towards vertebrates and temperate regions (Titley*et al*., 2017). In Africa for instance, little attention has been given to small sized animal taxa in most protected areas and until very recently, surveys have mainly focused on large mammals. Nonetheless, it is increasingly recognized that smaller species are important for ecological and conservation monitoring because some are particularly sensitive to environmental pollution and changes in habitat structure, (Houlahan*et al*., 2000; Stuart *et al*., 2004).

Kenya has over 900 butterflyspecies distributed in various habitats (Larsen 1996; Kühne, *et al*., 2004; Lehman and Kioko, 2005; Namu*et al*., 2008). However,conservation status of butterflies and invertebrates in general is not available or not well explored (Republic of Kenya, 2015). Indeed,although Mt Kenya Forest is recognized globally for its exceptional biodiversity value (Kariuki, 2006), little information is available on the diversity of butterflies in the forest. In addition, the ecological roles and social cultural values attached to butterflies are scarcely known. The knowledge bases of the local communities or ecoliteracy, can provide lessons and insights in addressing the relationships between humans and nature (Berkes, 2008). Gorenflo*et al*., (2012) has argued that the current and ongoing loss of biological diversity in the world is closely linked to the erosion of cultural diversity. Besides, a number of studies have indicated the value of local ecological knowledge (LEK) and the need to bridge scientific knowledge and LEK as an important aspect for the successful governance and management of social–ecological systems (e.g.Tengo*et al*., 2014; Sutherland*et al*., 2014;Díaz*et al.,* 2015). However, most of the emphasis in understanding local people's knowledge and perceptions has focused on the conflicts between people and protected areas, such as loss of traditional extraction access or damage by wildlife to crops and livestock (Gadd, 2005;Allendorf*et al*., 2007; Maitima*et al.,* 2009). It is upon this background that we sought to determine the diversity and distribution of butterflies in Kiang'ondu Forest block of Mt Kenya Forest and establish the ecological knowledge and attitudes of the local community towards butterflies in the region.

**Materials and Methods**

*Study Site*

The study was conducted atKiang'ondu Forest Block located on the eastern side of Mount Kenya. Mount Kenya is the second largest Mountain in Africa after Mount Kilimanjaro of Tanzania. It is located at 00°10S and 37°20E, and lies between altitudes 1600-5199 m above sea level. It is located on the eastern side of the Great Rift Valley and the northern slopes reach the equator. The study covered Kiang'ondu forest located on the lower slopes of the South-eastern part of Mount Kenya Forest Reserve ure 1).

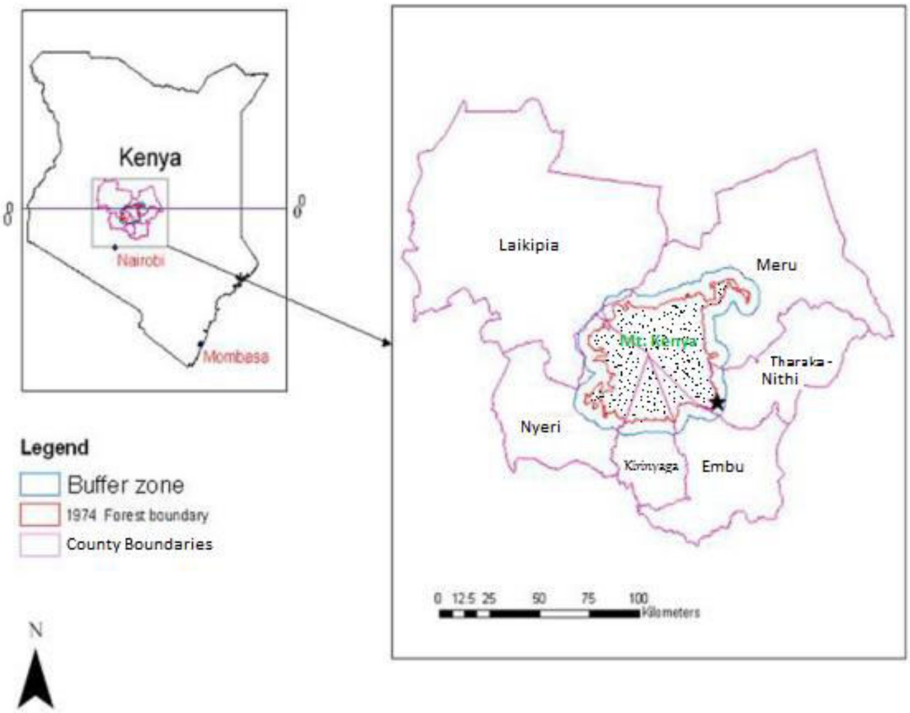


**Fig 1:** A map of the study area and the study site indicated by a star. (Map adapted and modified from Ndegwa, 2005).

*Climatologically,* Mount Kenya is influenced by differences in altitude. Rainfall in the area is bimodal and averages about 1200mm to 1800mm with maximum rains falling during months of March to June and October to December. The driest months are January, February and September. The diurnal temperature range in January and February may be as high as 20 degrees Celsius (Ojany and Ogendo 1973). The topography of the study area is characterized by foot ridges and hills but in other areas of Mount Kenya Forest there are plains and valleys with the majority of the valleys having rivers and streams and in some areas, marsh. The Mount Kenya ecosystems especially where the Kiang'ondu forest block is located consist of pyroclastic rocks and volcanic ash originating from various secondary eruptions.

The forest is home to a wide diversity of flora and fauna. Some 882 plant species, subspecies and varieties belonging to 479 genera of 146 families have been identified in Mount Kenya forest; with 81 plant species being endemic (Vanleeuwe*et al*., 2003). Fauna including African elephant (*Loxodontaafricana*), leopard (*Pantherapardus),* Buffalo (*Synceruscaffer)*, Bongo (*Tragelaphuseuryceros*) and the black fronted duiker (*Cephalophusnigrifronsvhooki*). Several primates are also found in the forest, the most common being the black and white colobus (*Colobusguerezakikuyuensis*) and Sykes monkey (*Cercopithecusmitiskolbi*), and the olive baboon (*Papioanubis*) which is common on the forest margins.

*Field Data collection*

This study was conducted during the months of May and June 2017. During this period a total of 12 transects or 'Pollard walks' (Pollard, 1977) were used to study butterflies. Transects traversed undisturbed part of the montane forest, forest edges, stream sides (riverine) and adjacent farmlands. During each site visit, walks at a slow constant pace (Soga and Koike 2012) along a 500m transect line were conducted recording all species of butterflies2.5m to each side and 5m in front and above(Pollard 1977; Kitahara and Sei 2001). No attemptswere made to count butterflies flying above the recorder (6 m and above), so that species that habitually fly in the canopy would be recorded only when they were at ground level (Pollard & Yates 1993). All butterflies that were not positively identified in the field were captured using a sweep net, photographed and stored in a butterfly envelope carrier for later identification. Specimens were identified using the Butterflies of Kenya guide book by Larsen (1996) and also from the help of entomologists from Chuka University Entomology Lab. Due to Lepidoptera's flight activity which is closely related to thermal effects, such as, calm conditions with high temperatures and solar radiation (Dennis *et al.*, 2006) and the reducedbutterfly's activity in cooler, cloudier, windier weather (Dennis *et al.*, 2004), fieldwork took place between 08:00 and 14:00 local time, at a temperature above 17 $^{0}$C, without rain and strong winds.

*Questionnaire administration*
In order to determine local community's knowledge on butterflies, a set of household questionnaires were used. The spatial arrangement of households in the study area is dictated by access roads to the extent that they form villageswith clear linear patterns.Community livelihoods are based on tea, coffee and livestock production. To ensure effective coverage of villages, we used systematic random sampling technique whereby after obtaining informed consent from the village elders, we marked the first household and then used every fourth household as a sample. Each household was considered a sampling unit, and each questionnaire was restricted to 1 respondent per household (preferably the oldest one). A total of 30 semi-structured questionnaires were administered representing about 25% of the target households.

**Data analysis**
*Species diversity (H'):* Shannon- Wiener Index Diversity, (H') was used to calculate diversity of species in various habitats (Magurran, 1988).

$$H' = -\sum p_i \ln p_i$$

Where; *H' is the Index of species diversity, pi is the proportion of the total sample belonging to the, i-th species and ln is the natural logarithm.*

*Species richness* (*S*) was taken as the sum of species recorded in each habitat type.
*Species evenness* ($E_H$)is the proportion of individuals among the species which indicates their relative abundance on a site(Magurran, 1988).

$$E_H = \frac{H'}{lnS}$$

Here, H' is the species diversity, *ln* is natural logarithm and S is the number of species present in each habitat type.

*Abundance of species:* Total butterfly abundance was calculated as the sum population of all component species at each habitat type. A relative abundance of butterfly species in various habitats was calculated as the ratio of the number of species found in each habitat and the total number of species recorded in all study habitats.

*Distribution of species:* The distribution of species recorded as presence or absence of species in a particular habitat.

*The local community's knowledge and attitude towards butterflies*
To analyze the data on local knowledge and attitude, the responses were entered verbatim into Microsoft Excel spreadsheets. Repeated-similar answers were categorized and tallied. To identify correlations in the responses, Pearson chi-squared ($\chi^2$) was applied in the analysis using SPSS 16.0 software.

**Results**
A total of 498 individual butterflies were identified. These comprised of 9 species belonging to five (5) families (Table 1). A species accumulation curve showed that the number of species recorded each day of sampling was still rising at the end of the study period (Figure 2). There were far more species of Papilionidae (12 species) and fewer Hesperidaespecies (7 species) recorded.

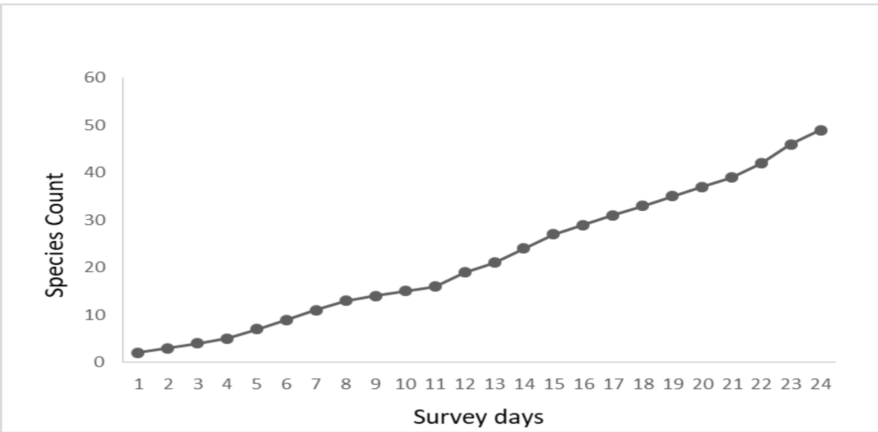


**Fig 1:** Species accumulative curve ofbutterfly species combined for the forest, edges, riverine and farmlands in Kiang'ondu

**Table 1:** A summary of butterfly families observed within Kiangondu Forest, Mt Kenya

| Family | Number of species | Percentage |
|---|---|---|
| **Papilionidae** | 12 | 24.49 |
| **Pieridae** | 10 | 20.41 |
| **Lycaenidae** | 10 | 20.41 |
| **Nymphalidae** | 10 | 20.41 |
| **Hesperidae** | 7 | 14.29 |
| **Total** | 49 | 100.00 |

*Diversity index of butterflies*

Butterfly species diversity differed among habitats as shown in Table 2. The highest species diversity of butterflies was recorded in the forest (H'=3.29), followed by forest edges (H'=2.46) and the lowest diversity was recorded in farmlands (2.30). However, these variations in the species diversity of butterflies between the four habitats was not statistically significant ($F_{3, 4}$ =2.8932; *p*=0.9622).

**Table 2:** Diversity index of butterfly species in Kiang'ondu Forest

| | Habitat Types | | | |
|---|---|---|---|---|
| | Forest | Edges | Farmlands | Riverine |
| **Species richness** | 27 | 12 | 12 | 14 |
| **Evenness** | 1.00 | 0.91 | 0.93 | 0.91 |
| **Shannon-Wiener diversity (H')** | 3.29 | 2.46 | 2.30 | 2.40 |

*Relative abundance of butterfly species*

Based on families, the abundance of butterflies did not vary significantly ($\chi^2_{(3,\ N=30)}$= 1.600,*p*=0.449). As shown in figure 2,members of the familyPapilionidaewere the most abundant (25%) followed by Pieridae(21%).

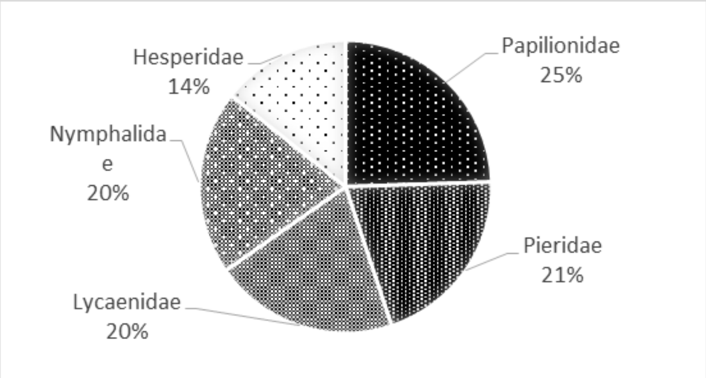


**Fig 2**: Comparison of relative abundance of five butterfly families in Kiang'ondu Forest and adjacent farmlands.

Butterfly abundance in different habitats was compared forthe expected number of individuals relative to the undisturbed forest. We observed significantly fewer than expected abundance of butterflies at forest edges, in farmlands and riverine (stream side) habitats ($\chi^2_{(3,N=30)}$ =6.482, *p*<0.001). As shown in Figure 3 below, most of the butterflies wereobserved within the forest (55.1%; n=27).

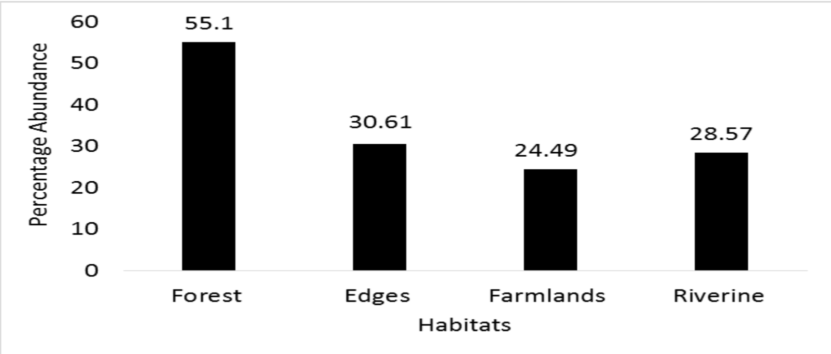


**Fig 3:** Proportions of butterflies observed in four habitat types within Kiang'ondu Forest

*Distribution of butterflies:* Most species were recorded in the forest (27 species; accounting for 39.71%), while the farmlands had the lowest number of species (12 species representing 17.65% of the species recorded). Pierisrapae and Borbosirena in the families of Pieridae and Hesperiidae respectively were widely distributed in the habitats (Table 3).

**Table 3**. Distribution of butterfly species based onhabitat type

| | Habitats | | | | |
|---|---|---|---|---|---|
| **Family and species** | **Forest** | **Edge** | **Farmland** | **Riverine** | **%Occurrence** |
| **Family Papilionidae** | | | | | |
| ***Graphiumalmansor*** | + | _ | _ | _ | 25 |
| ***Graphiumangolanus*** | _ | _ | + | _ | 25 |
| ***Graphium Leonidas*** | + | _ | _ | + | 50 |
| ***Papiliodemodocus*** | _ | + | _ | _ | 25 |
| ***Papiliolormieri*** | _ | + | _ | _ | 25 |
| ***Papilioimterjectana*** | + | _ | _ | _ | 25 |
| ***Papiliojacksoni*** | + | _ | _ | _ | 25 |
| ***Papilionireus*** | + | _ | _ | _ | 25 |
| ***Papiliorex*** | + | _ | _ | _ | 25 |
| ***Papiliophorcas*** | + | _ | _ | _ | 25 |
| ***Graphium Leonidas*** | _ | + | _ | _ | 25 |
| ***Papiliomackinnoni*** | + | _ | _ | _ | 25 |
| **Family *Pieridae*** | | | | | |
| ***Coliaselecto*** | + | _ | _ | + | 50 |
| ***Euremabrigitta*** | _ | + | _ | _ | 25 |
| ***Belenois calypso*** | + | _ | _ | _ | 25 |
| ***Belenoissudanensis*** | + | _ | _ | _ | 25 |
| ***Eroniacleodora*** | _ | _ | + | _ | 25 |
| ***Mylothrisschumanni*** | + | _ | _ | _ | 25 |
| ***Nepheroniaargia*** | + | _ | _ | _ | 25 |
| ***Leptosiaalcesta*** | _ | _ | _ | _ | 25 |
| ***Mylothrischloris*** | _ | _ | + | _ | 25 |
| ***Pierisrapae*** | + | + | + | + | **100*** |
| **Family *Lycaenidae*** | | | | | |
| ***Aphnaeus orcas*** | _ | _ | _ | + | 25 |
| ***Deudorixlorisona*** | + | _ | _ | _ | 25 |
| ***Hypolycaenaliara*** | + | _ | _ | _ | 25 |
| ***Iolausbansana*** | + | _ | _ | _ | 25 |
| ***Iolauscatori*** | + | _ | _ | _ | 25 |
| ***Pentilapauli*** | _ | + | _ | + | 50 |
| ***Triclemaphoenicis*** | _ | + | _ | _ | 25 |
| ***Eucochrysopscrawshayi*** | _ | _ | + | + | 50 |
| ***Myrina sharpie*** | + | _ | _ | _ | 25 |
| ***Iolaussidus*** | _ | _ | + | + | 50 |
| **Family *Nymphalidae*** | | | | | |
| ***Acraeacerasa*** | + | _ | _ | _ | 25 |
| ***Amaurisniavius*** | + | _ | _ | + | 50 |
| ***Euryteladryope*** | + | _ | _ | + | 50 |
| ***Amaurisniavius*** | _ | + | _ | _ | 25 |
| ***Aterica galena*** | + | _ | _ | + | 50 |
| ***Lachhnopteraanticlia*** | _ | _ | + | _ | 25 |
| ***Tirumala Formosa*** | _ | _ | + | _ | 10 |
| ***Neptisnicomedes*** | _ | + | _ | + | 50 |
| ***Neptissaclava*** | _ | _ | + | + | 50 |
| ***Pseudargynnisbegemone*** | _ | + | _ | + | 50 |
| **Family *Hesperiidae*** | | | | | |
| ***Aclerosploetzi*** | + | _ | _ | + | 50 |
| ***Andronymuscaesar*** | + | _ | _ | _ | 25 |
| ***Borbomicans*** | _ | _ | _ | + | 25 |
| ***Borbo kaka*** | + | + | _ | _ | 50 |
| ***Borbosirena*** | + | + | _ | + | **75*** |
| ***Metisellamedea*** | + | + | _ | _ | 50 |
| ***Metisellamidas*** | -_ | -_ | _- | + | 25 |

*+ indicates presence*
*- Indicates absence*
*% occurrence indicates the proportion of habitats the species was recorded out of the four habitat types. Species recorded in more than three habitat types are shown by an asterisk (*).*

*Local community's knowledge on butterflies:* All the respondents who participated in this survey were aware of the existence of at least one species of butterfly within Kiang'ondu forest area. As shown by table 3, 15(50%) of the respondents had seen between 2 to 5 different species of butterflies while 8(26.67%) had seen more than 5 species in the area. When asked on their perception about the changes in number of kinds butterflies(diversity) seen within Kiang'ondu Forest, the respondent's perception did not differ significantly ($\chi^2_{(2, N=30)}$ =4.200, p= 0.122). However, based on majority of the respondents (46.67%; n=14), it was clear that there was a general perception that butterfly diversity had decreased over the years as shown in Table 4. Only 5(16.67%) of the respondents noted of butterflies numbers increment whereas 11(36.67%) said that the numbers had not changed.

**Table 4:** Local community knowledge about butterflies within Kiangondu Forest, in Mt Kenya

| Knowledge on butterflies | Frequency | Percentage | p-value |
|---|---|---|---|
| ***How many kinds of butterflies do you know?*** | | | |
| • **One type** | 7 | 23.33 | 0.150 |
| • **2-5 types** | 15 | 50.00 | |
| • **More than 5 types** | 8 | 26.67 | |
| **Total** | 30 | 100.00 | |
| ***What can you say about the of abundance butterflies compared with the past years?*** | | | |
| • **Increased** | 5 | 16.67 | 0.122 |
| • **Not Changed** | 11 | 36.67 | |
| • **Decreased** | 14 | 46.67 | |
| **Total** | 30 | 100.00 | |

The respondents differed significantly on their perception about the importance of butterflies in Kiang'ondu Forest ($\chi^2_{(3, N=30)}$=19.258, $p$<0.001). Apparently, most of the respondents 18(60.00%) revealed that they associated butterflies with beauty and the pollination of flowers 14(46.67%). However, 10(33.33%) of the informants associated butterflies with destruction of crops caused by caterpillars (Figure 4).

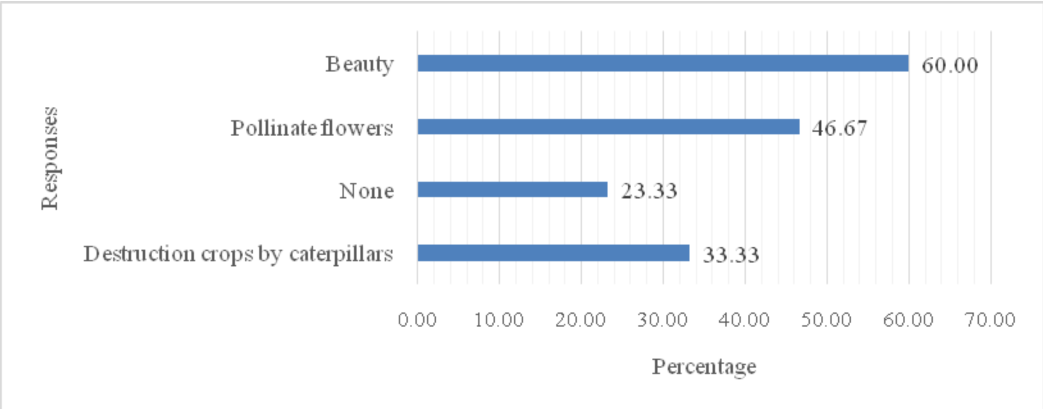


**Fig 4**: Local community perception about the value of butterflies within Kiang'ondu forest block

As shown in table 5, the majority of the respondents felt that conservation of butterflies was not important 11(36.67%). whereas 10(36.67%) felt that conservation of butterflies was important. These views on the importance of conservation of butterflies within Kiang'ondu were not significantly different ($\chi^2_{(2, N=30)}$ =0.200, $p$ = 0.905).

**Table 5:** Local community perception about conservation of butterflies in Kiangondu Forest and adjacent farmlands

| Attitude towards butterfly conservation | Frequency | Percentage | P- value |
|---|---|---|---|
| ***1. What do you think about the need to conserve butterflies?*** | | | |
| • **Very Important** | 10 | 33.33 | $p$ = 0.905 |
| • **Important** | 9 | 30.00 | |
| • **Not Important** | 11 | 36.67 | |
| **Total** | 30 | 100.00 | |
| ***How best can butterflies be conserved?*** | | | |
| • **Forest conservation** | 23 | 76.67 | $p$ = 0.311 |
| • **Planting more trees in farms** | 14 | 46.67 | |
| • **Discourage use of pesticides** | 17 | 56.67 | |
| **Total** | 30 | 100.00 | |

**Discussion**

*Diversity and Species distribution*

The findings from this study support the assertion that Kenya is a mega Lepidoptera country. About 900 species of butterflies (Larsen, 1991;Kühne, *et al*., 2004) have been recorded in the country, and of these 34 butterfly species are endemic. This has been attributed to the diverse habitats in the country including tropical montane rainforest, afro-alphine moorland, riparian forest, grassland, woodland and semi-arid wooded savannah. Most of these habitats including Mt. Kenya Forest have scarcely been explored for their Lepidopteran diversity.

In this study, the species accumulation curve did not reach an asymptote, an indication that the sample did not capture the full diversity of butterflies in Kiang'ondu forest and more species are therefore expected to be recorded in the habitats. Apparently, more sampling effort is needed to obtain a fullrepresentationof butterflydiversity in the study area. Additionally, butterfly communities are known to be dynamic, with species assemblages varying seasonally and from year to year (Hamer*et al.,* 2005; De Vries *et al*., 2012; Grøtan *et al*., 2014). It is therefore imperative that future studies would consider sampling across seasons and years so as to provide a deeper understanding of butterfly diversity in the region.

The highest butterfly diversity and absolute species richness were recorded in the forest and at forest edges. Habitat heterogeneity in the forest and edges could be effective in offering habitat requirements for both adult butterflies and their developmental stages. High floral resources abundance in these habitats could have also contributed to the high butterfly diversity. A positive relationship is known to exist between butterfly diversity and floral abundance (Kitahara*et al*.,2008; Matteson and Langellotto, 2010). Butterfly diversity was significantly higher at the forest and edge than riverine and farmland. This shows that a greater proportion of butterfly species inKiang'ondu Forest could be restricted to the forest and the forest edge with limited foraging ranges between the two habitats. Probably, the forest and forest edge provide specific habitat requirements for diverse butterfly species in the area. Butterflies are known to have highly specific requirements in terms of feeding resources in both the larval and adult stages (Erhardt & Mevi–Schutz, 2009; Munguira*et al.,* 2009). They require adequate numbers of a single or a few host-plants for oviposition, nectar-source plants, or even more cryptic resources ranging from mutualistic dependencies to pools of standing water for critical minerals (Baz and Antonio, 1992; Bergström, 2005;Vanreusel*et al*., 2007). Such microclimatic conditions are needed for the viability of populations (Roy & Thomas, 2003). Many of these butterflies in the forest could be specialised to inhabit the forest understory and feed on other food sources other than flowers. The food resources could be restricted in the forest and within the narrow range of forest edge. This concept highlights the significance of the Mt. Kenya forest in the conservation of butterflies.

*Pierisrapae* was the most abundant butterfly species recorded and most individuals were encountered in edges followed by farmland. Its dominance is probably attributed to its preferred habitat which consists of almost any type of open space. *P. rapae*has a high dispersal ability (Rochat*et al*., 2017) which could explain the relatively high abundance of the species observed in this study.

*Local community's knowledge and attitude towards butterflies*

Majority of the local people could identify different butterfly species within the study area. In addition, they could notice and explain qualitative trends in the abundance of butterflies over the past years. Such traditional ecological knowledge is increasingly being recognized as a suitable approach to promoting environmental sustainability in both academic circles and policy formulation, (Gandiwa, 2012). This is in recognition that the knowledge that local people gain through daily interaction with ecosystems and constituent animal species may hold clues for sustainable animal species conservation and management in tropical ecosystems (Nyhus, Sumianto&Tilson, 2003).

Based on the findings from this study, it was clear that the community were knowledgeable about the existence of a diversity of butterfly species within Kiang'ondu forest. Furthermore, the results gave a clue of the possibility that the abundance of butterflieshad declined over the past years. Possibly this could be as a result of changes in agro-ecosystems that provide effective refugia for some butterfly assemblages. Some species of butterflies are known to have limited mobility and live in meta populations, being strongly and negatively affected by habitat destruction and landscape fragmentation (Steffan–Dewenter &Tscharntke, 2000; Hamer *et al*., 2003). Such characteristics and the ease with which butterflies can be seen make them an ideal target to explore the potential implications of forest degradation and changes in agro-ecosystems to wildlife.

It was evident from this study that majority of local community members appreciated the aesthetic value and ecological roles butterflies play in pollination of plants including their crops. The community also recognized the potential destructive nature of butterfly larvae. Such local ecological knowledge (LEK) has been found to be one of the main bridges to manage biocultural diversity (Iniesta-Arandia, 2015) and recording local ecological knowledge (LEK) is a useful approach to understanding interactions of the complex social-ecological systems (Naah and Guuroh 2017). Variability in the knowledge and perception of butterflies in Kiang'ondu could be influenced by levels of environmental awareness in the study community and the extent of human-wildlife conflicts experienced in the area and suggests the need to expand conservation awareness and wildlife-related educational programmes to the community.

## Conclusion

The study shows that there is a high diversity of butterflies in the study area and this varied significantly with the habitat type. In particular the montane forest consisting of undisturbed habitat had the highest diversity and abundance of butterflies compared to the edges, riverine (stream sides) and farmlands. This observation underscores the significance of the forest in conservation of butterfly assemblages. The most abundant butterfly species was *Pierisrapae* (in the family Pieridae) for which most individuals were recorded in the forest edges and farmlands. In addition, we noted that *Borbosirena* in the family Hesperiidae was widely distributed in all habitats. In this context, we recommend that conservation of butterfly diversity in the study area should consider adapting strategies that are aimed at preserving the heterogeneity of the montane forest while at same time identifying the potential consequences of alterations of the forest edges, riverine areasand farmlands on the maintenance of butterfly diversity in the area. Lastly, this study established that the local community largely appreciated the conservation of butterflies in the region and also revealed that the composition of butterflyassemblage in the farms and the region as a whole could have decreased over the past years.

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