

# Ethnobiological data in Kenya

## Workshop on Mobilizing Ethnobiological Data in Africa

**9 -10 October 2023**

**Ng'iya, Siaya county**

**Organized by ITCER Kenya and the Bavarian Natural History  
Collections, Germany (SNSB)**

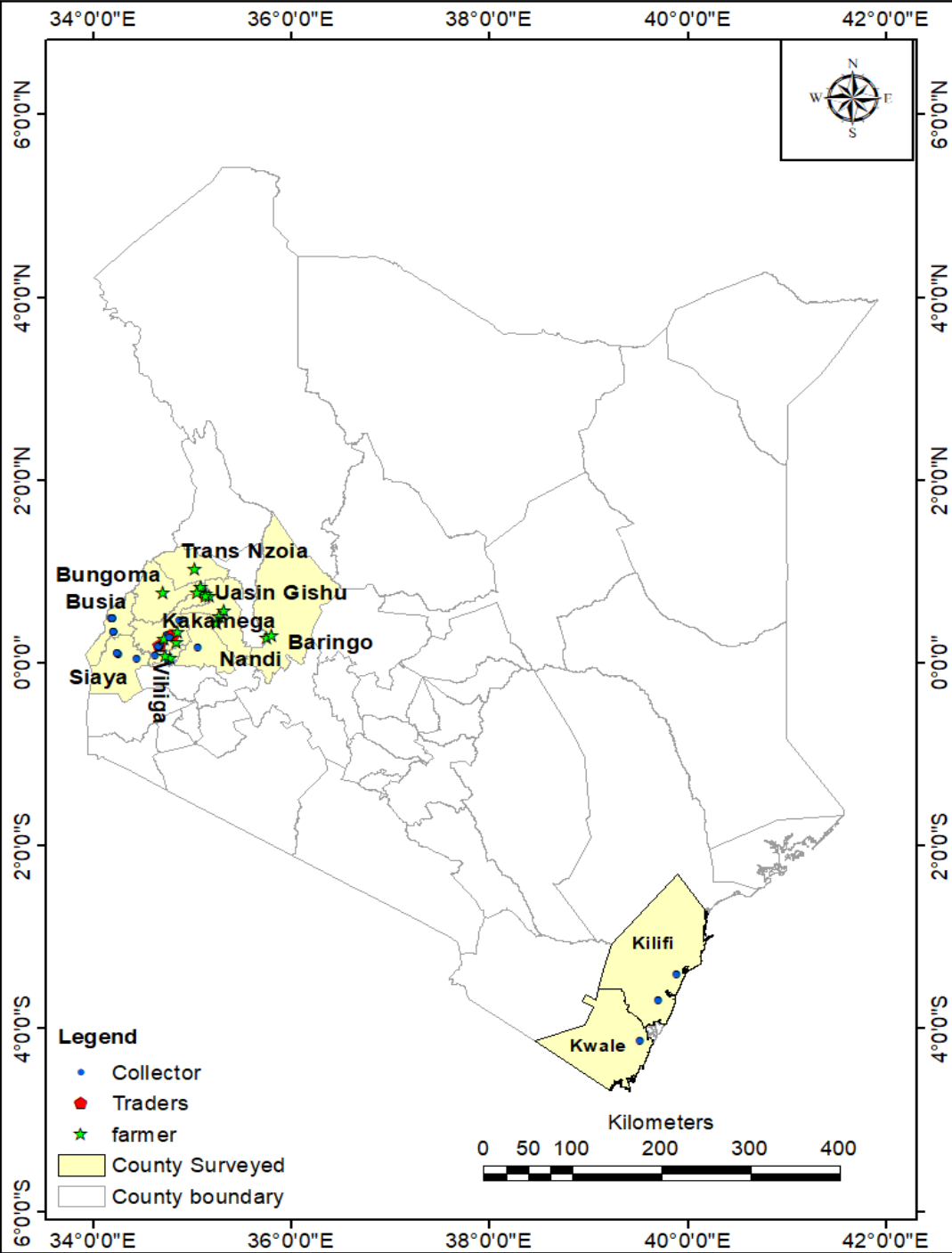
**Jefwa JM., Okoth S., Baraza D., Kirika P., Wasike Victor., Mwaura A.,  
Makonde H and Korir M**



# Wild Edible Mushrooms harvesting and trade

A survey was conducted in regions with culture of wild mushroom consumption to establish the extent on consumption/utilization and trade of indigenous wild edible mushrooms and the sites of collection.

The regions surveyed were Western, Nyanza, and Coast.



# Collectors and traders in western region

- The most indigenous edible mushrooms consumed are *Auricularia* sp, *Pleurotus* species (Oysters) and *Termitomyces* species.
- The extraction of natural resources in Kakamega forest is regulated with guidelines in place.
- Wild indigenous edible Mushroom are commonly sold in trading centres (vendor markets) of Kakamega, Musoli, Kisumu, Busia.



## Diversity of study Habitats





# Indigenous edible mushrooms In Western Region

- (1) **Shimechero** (*Termitomyces microcarpus*): sourced from gardens
- (2) **Obukofuma** and **Obulando (Bulando)** (preserved by sun drying).
- (3) **Bulando**: They believe mushrooms are medicinal.
- (4) **Obukofuma (Obukovuma, Bukufuma)** most common and preferred in the market throughout the year; sold in dry for
- (5) **Obulasiu**
- (6) **Oumechero**: most preferred mushroom
- (7) **Bumekere**: They believe mushrooms are medicinal.
- (8) **Obukotswe**: from ant-hill

## Indigenous edible mushrooms In Western Region

- **(9) Echalaa:** most preferred mushroom. They preserve by sun drying.
- **(10) Ekaring'ane:** most preferred mushrooms; found on cultivated land. They preserve by sun drying; the most community consumed
- **(11) Emarkit:** most preferred mushrooms; sourced from ant hills
- **(12) Eumes:** sourced from ant hills
- **(13) Eswee:** sourced from swampy areas; uncultivated land

# Indigenous edible mushrooms In Western Region

- **(14) Eng'orit**
- **(15) Ekidamunyu:** Ekidamunyu is found in cowsheds
- **(16) Aasirit:** Sourced from swampy areas
- **(17) Esoromotoro:** sourced from ant hills
- **(18) Echalaa:** are found in cultivated land.
- **(19) Egutii:** found in uncultivated land



# Indigenous edible mushrooms In Western Region

- **(20) Ekidamunyu**
- **(21) Egutii**
- **(22) Emarkit:** most preferred mushrooms in the market, Dried and stored
- **(23) Ekuuyo:** not sold in markets but in homes, sourced from anthills
- **(24) Obuolo**
- **(25) Obuolo mar liel:** most preferred mushrooms in the market; is the one used most

# Indigenous edible mushrooms In Western Region

- **(26) Obuolo mar Oruka:** most preferred mushroom in the market is
- **(27) Obuolo mar Oruka**
- **(28) Obuolo mar flat,**
- **(29) Olando,**
- **(30) Obuolo mar Atieno,**
- **(31) Obuol mar Luanda**
- **(32) Obuoch buodho.**

# Indigenous knowledge on mushrooms in Western region

- **Indigenous knowledge on mushroom sustains livelihoods**
- Joseph, a 67 years old, has been a mushroom collector for 28 years.
- Henry, 57 years old, has been a mushroom collector for 10 years.
- They collect mushrooms from the forest during the rainy seasons in March-April and July.
- On average, they collect 6kg of the indigenous mushrooms per day
- On average, the collection sites are 7km apart.

# Indigenous knowledge on mushrooms in Western Region

- The sites are identified using the vegetation and termite activities in the forest.
- The most preferred forest mushroom variety is *Auricularia*, locally known as “Materé”,
- It stays for long with no interferences from pests.
- Materé also has social and cultural values whereby a specific type of Materé, known as “Luswi”, is used to wade off bad omen and evil spirits from the homes and also to catch thieves magically.
- The collectors’ sundry the mushrooms before selling them to the nearby markets.



**Auricularia spp.**



# Indigenous Mushroom trade

- Mushroom trade is lucrative in the towns due to mushrooms' nutritional value.
- Three (3) female traders have been selling mushrooms in the market since 1995.
- They get the mushrooms from Kakamega forest, Ingotse, Bukura and Malava forest areas.
- Mushrooms seasons are usually in March-April and July-August.
- The mushrooms are sundried immediately after collection.
- Sundried mushrooms can be preserved for 2 - 3 years.
- During cloudy seasons, they dry the mushrooms in low fire.

# Mushroom trade

- They sell three main varieties: “**Obukofuma**”, “**Shimechero**” and “**Ovulando**”.
- During the rainy seasons, they sell around 20kg of dried mushrooms per day,
- In dry seasons, they sell 2kg of the dried mushrooms.
- There are several markets where they sell at Ksh 1000 per kilogram.

# Community reasons for collecting mushrooms

- A vegetable served with ugali or rice, for trade, and use as medicine.
- Believe *Auricularia* improves the immune system, reduces blood sugars and pressure, and manages lung infections.
- Believe *Termitomyces* regulates of blood sugars a
  - Used by the indigenous community for the treatment of diabetes and the collections gives them small sustainable income.



# A Female Trader

- Collects mushrooms from the farm and also gets supplies from other collectors.
- She collects mushroom enough for two days and sun dries as a means of preservation for the purpose of sale.
- She does retail sale with a temporary vendor and has been selling “obwoba bwo mukanda” for 3 years on a weekly basis,
- She sells 2kg tin at ksh. 1000, selling at least 4kg per week.
- She buys and sells 10 - 20 bowls of mushroom in dried form that amounts to kshs1000.

# Cultural beliefs and Identification of edible species

- Miracle plant,
- Cultural beliefs associated sites of mushroom production
- Associated with places where snakes have spat and grave yards.
- Culturally believed that it disappears and reappears
  - belief that you can pass without seeing it and the next person sees it.
- It is consumed for nutritional value.
- Believed to be of medicinal value and was associated with the treatment of chest complications and to boost the immune system of the sick.
- As medicine, mushrooms are not displayed in the public and doctors specifically referred patients to traders.

# Indigenous knowledge on Identification features

- Associate mushrooms with the habitat they grow i.e those that grow on ant hills.
- Colour and shape to e.g ekaring'ane is red in colour, eumes is brown and Emarkit is umbrella shaped and white in colour.
- Size, height and stalk sizes, thickness of the crown and head shape are also used to differentiate mushrooms.

# Challenges by collectors

- They have limited knowledge of the mushroom species.
- They are not able to differentiate between some poisonous and edible species.
  - For example, some *Auricularia* species cause mumps when utilized.
  - Morphologically, both edible and poisonous mushrooms look the same according to the collectors.
- They need more information on the species differences, nutritional and medicinal properties of the mushrooms to educate the buyers and community at large.

# Challenges by collectors in western region

- They lose mushrooms after collection due to limited knowledge on the collection and storage of the indigenous mushrooms.
- Home pests such as rats during storage.
- Deforestation hence challenging the growth of mushroom biodiversity.
  - So the traders keep looking for other possible sites for indigenous mushroom growth.

# Challenges by collectors in western region

- Change of land uses to commercial sugarcane and subsistence farming and urbanization leading to disappearance species such as *Termitomyces*.
- Destruction of termite habitats by killing the termites' queens, because termites destroy crops and structures in the farms.
- Government policies such as restriction on some forest resources.
  - *Auricularia* species are protected by the government.
  - The collectors are only allowed to collect a few kilograms for their consumption, but not for commercial uses.
  - They are allowed to collect a maximum of 2kg per day.

# Challenges by collectors in western region

- Forest pests infestation by animals and insects who also eat the indigenous mushrooms.
- The collectors are not recognized officially. Therefore they cannot access credit.
- Business declined during the Covid-19 pandemic period.
- In the past 5 years they have been selling less
- Changes in climate with mushroom production decline during dry seasons.
- People depend on indigenous mushrooms not agricultural ones,.
- Lack of platforms to market the mushrooms

**Indigenous  
Knowledge  
on  
mushrooms  
of the Coastal  
region**





# Ectomycorrhizal tree species associated with indigenous mushroom production

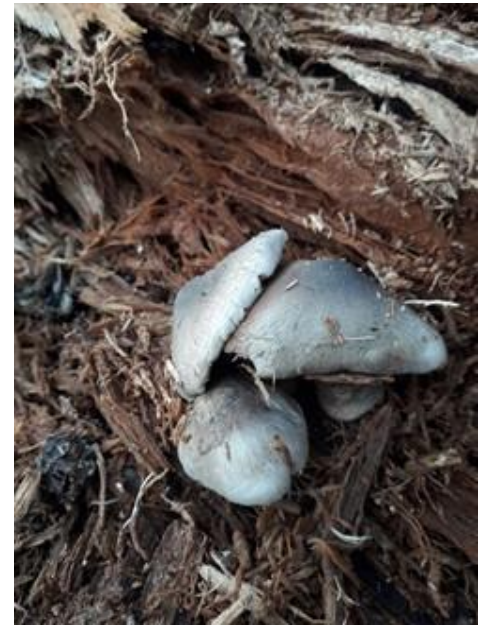


Bryophytes associated with the production of *Amanita losii*





*Russula* spp., *Canthrellus* spp., *Lactiflus* sp.



***Amanita* sp. That poisoned five children in Kilifi can be mistaken for *Volveriella*.**

**All the rest are types of *Volveriella* spp.**





Local name	Scientific name	Edibility
<b>Nchidzago</b>	Amanita (smooth and grey)	
<b>N'mahembo</b>	Amanita sp.	
<b>Hako ra nyani</b>	Russula sp.	<b>edible</b>
<b>Nimakoba</b>	<b>Russula sp.</b>	<b>edible</b>
<b>Likosi</b>	<b>Russula sp.</b>	
<b>Mlumbwi</b>	Russula sp.	
<b>Nimakoba mwerure</b>	Russula sp.	
<b>Gadugadu</b>	Cantherellus sp.	<b>edible</b>
<b>Mwatsaka</b>	Cantherellus sp.	<b>edible</b>
<b>Chidzogolo</b>	Cantherellus sp.	<b>edible</b>
<b>N'phande</b>	Termitomyces sp.	<b>edible</b>
<b>N'phande wakunudu</b>	Termitomyces sp.	<b>edible</b>
<b>N'kuvi</b>	Termitomyces sp.	<b>edible</b>
<b>N'mazia</b>	<b>Lactarius sp.</b>	

<b>Choga nyere</b>	<b>Amanita sp.</b>	
<b>Rerema thithe</b>	Amanita sp.	
<b>Lulthimi lwa ng'ombe</b>	Amanita sp.	<b>edible</b>
<b>Tovu ra ngombe</b>	Amanita sp.	
<b>Rerema Hako ra nyani</b>	A. zambiana Russula sp.	<b>edible</b> <b>edible</b>
<b>Masikiro ga hawe chonya</b>	Russula sp.	
<b>Masikiro ga mdzomba</b>	Russula sp.	<b>edible</b>
<b>Muhama</b>	Russula sp.	
<b>Uherezi</b>	Russula sp./Lactarius sp?	
<b>Masikiro ga mrahai</b>	Russula sp.	
<b>Hako ra nyani (large) Nyani</b>	Russula sp. Russula sp. (grey)	<b>edible</b>
<b>Masikiro ga mchonyi</b>	Russula sp.	
<b>Choga kapilipili Malombo</b>	Cantherellus sp. Cantherellus sp.	<b>edible</b> <b>edible</b>
<b>Kapilipili kabomu</b>	Cantherellus sp.	<b>edible</b>
<b>Choga Mazia</b>	Lactarius sp.	
<b>Mlonja muthithe Choga nyama</b>	Termitomyces sp. Termitomyces sp.	<b>edible</b> <b>edible</b>
<b>Mlonja</b>	<b>Termitomyces sp.</b>	<b>edible</b>

# Ranking based on preference

<b>North coast</b>	<b>South coast</b>
<b>Choga nyama</b>	<b>N'kuvi</b>
<b>Muyu</b>	<b>Udzodzo wa muyuni</b>
<b>Kadzodzo</b>	<b>N'chibalazi</b>
<b>Mrihi</b>	<b>N'cha</b>
<b>Tsulu/mkulu</b>	<b>Chidzogolo</b>
<b>Mahutuwe</b>	<b>Nimakoba</b>
<b>Kundu ra nyani</b>	<b>Mbokwe</b>
<b>Mkuyu</b>	<b>Suzi ra tsungula</b>
<b>Muungo</b>	<b>Mpande</b>
<b>Murya nyani</b>	<b>N'chitiro</b>

# Variety of *Cantharellus* species





# Variety of *Cantharellus* species



# Mushroom species production calendar

Month	Types of mushroom
January	<i>Sikiro (Cantherellus spp.)</i>
February	<i>Sikiro (Cantherellus spp.)</i>
March	<i>Sikiro (Cantherellus spp.)</i> , <i>Choga kapala</i>
April	<i>Sikiro (Cantherellus spp.)</i> , <i>Malombo (Lactarius sp.)</i> , <i>Hako ra nyani (Russula spp.)</i>
June	<i>Sikiro (Cantherellus spp.)</i>
July	<i>Sikiro (Cantherellus spp.)</i> , <i>Choga nyama</i> (Termite associated mushroom), <i>Hako ra nyani (Russula spp.)</i> , <i>Rerema (Amanita zambiana)</i>
August	<i>Sikiro (Cantherellus spp.)</i> , <i>Choga utuwe</i> (Termite associated mushroom)
September	<i>Sikiro (Cantherellus spp.)</i>
October	<i>Sikiro (Cantherellus spp.)</i>
November	<i>Sikiro (Cantherellus spp.)</i>
December	<i>Sikiro (Cantherellus spp.)</i>

# Indigenous mushrooms and Livelihoods

- Preparation involves washing, then either boil (with mangoes or coconut) or fried (mixed with meat) with the meals prepared consumed on the same day.
- Potential production areas are protected by the community by conserving them to their natural state.
- **The scale of trade at the coast was on the forest species *Cantherellus* which was highly favoured by the European community and hotels.**
- **According to Mr. Geoffrey, a former employee of Wild -Living for mushrooms sales,**
  - **Wild Living bought from local collectors at Ksh 200 per kg and sold at Ksh 700 to the consumers.**
  - **The collections were delivered only in the morning.**
  - **The collection of 10 – 20 kg was done on a small area of approximately quarter an acre leaving the vast over 50 ha forest acres forest and many other forests mushrooms uncollected.**



# Cultural beliefs – Coastal Region

- One wakes up quite well when mushrooms are consumed in the evening while tired.
- Mushrooms give one a peaceful sleep without weird dreams.
- Harvesting is done sustainably with the mature mushrooms harvested first leaving newly formed mushrooms for harvesting later.
- **Harvesting** is done at least three times a week in areas less than a kilometre from households.
- The collection on average accounts for between 5 to 8 bags (1 litre) per harvest.
- Edibility confirmed with millepedes, Tortoise, Monkeys, Snails, insects

# Challenges:

- The increase in the number of elephants,
- Destruction of termite mounds,
- Livestock grazing in mushroom areas,
- Destructive agriculture (through use of tractors),
- Modern farming methods and population increase.
- Charcoal burning
- Changing weather patterns
- Lack of post harvest processing knowledge and facilities,
- Awareness creation and access to markets.

# Challenges in Identification

- Loss of Indigenous knowledge
- Mistaken Identification leading to death
- Toxins and aflatoxins
- Low production due to loss of substrates and habitats

Home / Coast

## Three children die, seven others admitted after consuming poisonous mushrooms

By Mwanza Mwa... 2 days ago

Mushroom poisoning



Three children have died after consuming poisonous mushroom soup. [Mañon Kijia, Standard]

Three children in Katendewa village in Bamba, Kilifi County have died after consuming poisonous mushroom soup.

## Four dead in Mt Elgon after consuming the poisonous mushroom

Tuko News | Sept 16, 2018

- The victims consumed mushroom harvested from a decaying tree
- Among the victims was a Ugandan national alongside two women and an infant
- Several children survived the poisoning after being rushed to hospital

A sombre mood has engulfed a Mt Elgon village following as four residents lost their lives after consuming what is believed to be poisonous mushroom soup.

Chepkube village in Cheptais Sub County Mt Elgon constituency is still reeling in pain following the sudden demise of three relatives and a Ugandan national.



## Challenges







Acknowledgment: ITCER Kenya Non-governmental organization and the Bavarian Natural History Collections, Germany (SNSB)  
Gerhard Rambold  
Tonjock Kinge  
National Research Fund (NRF) Kenya

