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# STUDIES ON NATIVE PLANTS USED AS ANTHELMINTICS AMONG THE PEOPLE OF KOLOKUMA-OPOKUMA CLAN, BAYELSA STATE NIGERIA

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**Abstract**

Helmenthic infection is a major health concern among peoples with poor economic status in the tropical. This study document information on plant botanicals folks of Kolkuma-Opokuma clan used traditionally for de-worming. Three hundred informants from twenty villages within the two clans were selected and administered structured questionnaires. 19 plants (*Astonia boonei, Emilia praetermissa, Newbouldia leavis, Newbouldia leavis, Musanga cecropioides, Costus lucausianus, Nephrolepis bisrrata, Panda oleosa* etc) in 18 different families were reportedly used as anthelmintic plants. Of the nineteen (19) plants listed, three (*A. boonei, C. schweinfurthii* and *P. brevipes*) were peculiar to Opokuma clan, and *H. indicum* to Kolokuma clan. The most used parts were the leaves, stem and bark. The plants were contended to exhibit dual actions of vermicide and vermifuge, and were asserted to be non-irritating with broad spectrum anthelmintic affects. Thus, further studies to ascertain the sensitivity of helminthes to extracts of

the plants is required, as this may be raw materials for pharmaceutical to develop potential drugs for the management of helminthes.

Keyword: Plant species, Use, Anthelmintics, Kolokuma-Opokuma,

## INTRODUCTION

Anthelmintics are substance used to eradicate parasitic intestinal worms (Holden-Dye, 2005; Nweze, et al., 2013). According to Suleiman *et al.* (2013) some plants possess anthelmintic properties, and are used locally as anthelmintics by different traditional societies all over the world (Wolpert *et al.*, 2008). A variety of parasitic worms make human their host (Cox, 2002), Nur-Amirah *et al*. (2020) estimated that 24% of the world's population (mostly among the indigenous people in tropical and subtropical regions in particular, Sub-Saharan Africa, the Americas, China, and East Asia) is infected with soil-transmitted worms and the number increase day by day. An estimated 12% of the global burden of intestinal worm disease occurred in children between the aged of 5 to 14 (Awasthi et al., 2003). Worms increase the risk for intestinal blockages, anemia, and malnutrition (Mahmud et al. 2013). Although synthetic drugs are widely used to treat different kind of worm infections, indigenous people avail themselves of different sections of certain plant species to manage all forms of worn infections.

A considerable number of the plant species used to manage worm infections are bioactive plants (Athnasiadous *et al.,* 2007). These plants are used locally for de-worming because they possess substances having high anthelmintic activities (Waller *et al*., 2001). According to Oyeyemi *at al.*

(2018) anthelmintic agent paralysis worms, interfere with energy generation; impair nutrition absorption, motility and reproduction, and can either be a vermicide or a vermifuge (Bereda, 2022). The former destroys worms without necessarily expelling them, whereas the latter expels worms from the bowel (Nwakaego *et al*., 2013; Bereda, 2022).

Lots of ethnomedicinal studies on local materials for the eradication of worms have been reported in different part of the world: Garedew and Abebe (2018) accessed 29 plant species belonging to 20 families for the treatments of gastrointestinal parasitic diseases in the human in southwest Ethiopia. Coelho et al. (2018) identified 35 different species (belonging to plant families 22) of medicinal plants used for the treatment of parasites and tapeworms among the Amazonas. Afolayan and Sowemimo (2022) survey revealed 45 plants belonged to 31 different families that are used in the treatment of intestinal worms in Ibadan. Nweze *et al.* (2013) evaluated the potential of three indigenous plants with anthelmintic potentials in South east Nigeria. Although many synthetic drugs are effective against helminthic, yet around one third of the world population still lack access to essential drugs, with the figure rising to over 50% in many countries (WHO, 2002). But the growing rate of helminthics resistance to synthetic drugs and the problem of re-infection after chemotherapy (Partridge et al. 2022; Aremu *et al*., 20012), provided a stirring backdrop for the accessment of plant materials used for the eradication of parasitic intestinal worms among indigenous people. As a result, this study considers a free list of plant species used since age for the management of helmintics among the natives of two ancient clans in Bayelsa State. It is expected that this could form the basis for the discovery of new anthelmintics of plant origin has advocated by Athanasiadou *et al*., 2007; Waller *et al*., 2001.

## Material and Methods

### The study area

The study was carried out in Kolokuma-Opokuma clan, Bayelsa State. Kolokuma-Opokuma is one of the eight Local Government Areas (LGAs) that constituted Bayelsa, a State in the South-South geopolitical of Nigeria. Kolokuma/Opokuma LGA shares boundaries with the Yenagoa and Sagbama LGA. There are 20 communities within the study area namely, Ofonibiri, Odi, Ayibabiri, Sampou, Okorotomou, Gbaranbiri, Orubiri, Akaranbiri, Gbarainama, Gbaranbiri, Abusari, Ekpuwari, Kalaama, Olobiri, Okoloba, sabagrehia Igbedi, Kalama, and Oyobu. . Geographically, Kolokuma/Opokuma LGA is located within latitude 4°65′ North and 4°56′ South; longitudes 6°92′ West and 6°45′ East, and covers an area of 361Km$^2$. The demography is put at 194,772. The majority of the inhabitants are member of the Ijaw ethnic group, and Ijaw language is widely spoken in the area. The climate is tropical (Iyorakpo, 2015). Rainfall occurs generally every month of the year ranging between 2000- 4000mm per annum. The mean monthly, temperature is 25-30°C. Relative humidity is high throughout the year and decrease slightly during the dry season. Generally, Kolokuma-Opokuma is situated on lowland with the elevation between 3m and 7m above sea level and characterized by flood plains. The soil is the alluvial deposit type, rich with organic matter like other area in Niger Delta. The vegetation is

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composed of lowland rainforest (Ihinmikaiye and Unanaonwi, 2018), fresh water swamp forests and mangroves (World Bank, 1995).

Harvesting of the ecological resources is less constrained by the terrain of the region, and human activities as well as villages' locations are largely determined by natural conditions and other ecological opportunities in the area. Kolokuma Opokuma is refers as the traditional home of the Ijaw people Nigeria, The LGA hosts Bayelsa National Forest. Christianity is the main religion widely practiced in the area. Farming and fishing are the major engagements of the people. Common crafts include canoe building, fish net and fish traps making, pottery, basket, mat making and they are predominantly farmers and fishermen.

**Data collection**

The study area, Kolokuma-Opokuma was delineated into two zones base on the study area traditional system clan, a common descent group of the indigenous group. Ten villages were selected from each of Kolokuma and Opokuma clans. In each clan, ten villages each were chosen. In all twenty villages were selected from the two clans of study, and fifteen informants from the villages were selected and interviewed with structured questionnaire matrix. A total of three hundred informants were interviewed and group consensus on the plant species use for anthelmintic was determined in each of the community by well coordinated group interviews. Subsequently voucher specimens of the plants were collected, and authenticated at the Department of Biology, Federal University Otuoke Nigeria. Clustered bar was used to determine the proportions of the plants sections used as anthelmintic.

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**Results**

A total of 19 plant species were assessed and reportedly used as anthelmintics among the natives of Kolokuma-Opokuma clan. Table 1 provides the species' names, the vernacular as well as the Ijaw names. The species accessed belonged to 18 different families however, *E. praetermissa* and *V. amygdalina* were members of Asteraceae family. The growth habit of the species ranges from tree, shrub to herb.

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Table 1: Ethnobotanical Data of the Plant Species Employed as Anthelmintic in Kolokuma- Opokuma Clan

| S/n | **Family**<br>Species name, Common name<br>Local Ijaw name, | Habit; Section(s) of Interest | Mode of Use |
|---|---|---|---|
| **1** | **Apocynaceae**<br>*Astonia boonei*, Pattern wood,<br>Kigbo, | Tree; Bark, Leaves | Steep the squash leaves and the stem bark in local gin (kaikai), the decoction expel worms |
| **2** | **Asteraceae**<br>*Emilia praetermissa*, Emilia,<br>Kalamatorodede<br><br>*Vernonia amygdalina*, Better leaf,<br>Ama-kiriologbo | Herb; Leaves<br><br><br><br>Herb; Leaves | Chew the fresh leaves together with alligator pepper (*Aframomum melegueta*) to expel worms from the body.<br><br>Squash the leaves and extract the juice, add a pinch of salt. The mixture is anthelmintic. Their anthelmintic action is neither non- |

| | | | |
|---|---|---|---|
| | | | irritating nor toxic. |
| **3** | **Bignoniaceae**<br>*Newbouldia leavi*s, Tree of life, Ogirizi | Tree; Root | The root decoction eliminate helminthes; take a little scoop daily until improvement |
| **4** | **Boraginaceae**<br>*Heliotropium indicum*, Turnsole, Ama-Odoguma | Tree; Leaves, flower | The leaves and flower decoction kill and expel worms from the body |
| **5** | **Caesalpiniaceae**<br>*Senna alata*, Candlebush, Efendiri | Shrub; Leaves and Seeds | Squash the leaves and seeds, extract the juice, add little potash. The mixture should be taken before meal. The mixture functions as purgative, very effective in the treatment intestinal worms. Also used on ringworm externally. |
| **6** | **Caricaceae**<br>*Carica papaya*, Pawpaw, Beke-undu | Tree; Seeds | Squash the seeds of the ripe fruit and extract the juice. The juices are anthelmintic. Their anthelmintic action is non toxic to human. |
| **7** | **Cecropiaceae**<br>Musanga cecropioides, Umbrella tree, Akpowei. | Tree; Root | The root decoction expels intestinal worms. |
| **8** | **Costaceae**<br>*Costus lucausianus*, Ginger lily, Ogbodoin | Herb; Stem | The stem juice is anthelmintic. The anthelmintic action is nonirritating nor toxic |
| **9** | **Cucurbitaceae**<br>*Momordica cissoids*, African cucumber, Bein-mo | Herb; Leaves, Fruit, Seed | A decoction of the aerial parts is a broad spectrum anthelmintics, stuns both flukes and tapeworms |
| **10** | **Dryopteridacee**<br>*Nephrolepis bisrrata*, Fern, Umbebereke | Herb; Leaves | The hot leave infusion is valued as an anthelmintic in case of gastrointestinal worms |
| **11** | **Euphorbiaceae**<br>*Bridelia stenocarpa*, Bridelia, Igbaragbara | Tree; Stem, Bark | The stem and bark decoction is anthelmintic against intestinal worms |
| **12** | **Lamiaceae**<br>*Ocimum gratissimum*, Scentleaf, Furukana | Shrub; Leaves | Squash the leaves and extract the juice. The juices are anthelmintic. The squash leaves may also be infused in local gin (kaikai). It should be taken before meal. The anthelmintic action is non toxic. |
| **13** | **Maliaceae**<br>*Khaya ivorensis*, Red mahogany, Alagba-tin | Tree; Stem, Bark | The stem and bark decoction serves as effective antihelmintics |
| **14** | **Musaceae**<br>*Musa paradisiaca*, Banana, Oyoba | Herb; Root | Steep the squashed root in local gin (kaikai). The decoction has some employment as an anthelmintic |
| **15** | **Pandaceae** | Tree; Stem, Bark | Steep the bark in local gin (kaikai), |

| | | | |
|---|---|---|---|
| | *Panda oleosa*, Panda, Akuu | | the decoction expel worms |
| **16** | **Rubiaceae**<br>Craterispermum schweinfurthii, Alum bark, Urukumu | Tree; Stem, Bark | Warm decoction of the stem and bark mixed with coconut oil expel worms. |
| **17** | **Sapotaceae**<br>*Pachystela brevipe*, Dinissoro, Nyanya | Tree; Leaves | Steep the squashed leaves in local gin (kaikai), the decoction expel worms |
| **18** | **Verbenaceae**<br>*Stachytarpheta Sp*, Blue snake weed, Fokotuo | Herb; Leaves | The leaves infusion serves as vermicide. |

The use pattern of section of interest includes squashing and steeping in water or local gin; decoction; chewing and infusion. Plant such as *Aframomum melegueta* provides synergy, with oral being the usual route of administration. Although nineteen (19) plant species were accessed as anthelmintics in Kolokuma-Opokuma clan, 16 were assessed in Kolokuma clan, while 18 were accessed in Opokuma clan (Table 2). *Heliotropium indicum* cited by the informants in Kolokuma was not referenced as anthelmintic by the informants in Opokuma clan. Likewise were *Astonia boonei, Craterispermum schweinfurthii* and *Pachystela brevipes* not mentioned as anthelmintic in Kolokuma.

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Table 2: Plants Reportedly Used as Anthelmintics Among the People of Kolokuma and Opokuma Clans

| S/N | Kolokuma Clan | Opokuma Clan |
|---|---|---|
| 1 | Bridelia stenocarpa | Astonia boonei |
| 2 | Carica papaya | Bridelia stenocarpa |
| 3 | Citrus sp | Carica papaya |
| 4 | *Costus lucausianus* | Citrus sp |
| 5 | *Emilia praetermissa* | *Costus lucausianus* |
| 6 | Heliotropium indicum | Craterispermum schweinfurthii |
| 7 | *Khaya ivorensis* | *Emilia praetermissa* |
| 8 | Momordica cissoides | *Khaya ivorensis* |
| 9 | Musanga cecropioides | Momordica cissoides |
| 10 | *Nephrolepis bisrrata* | Musanga cecropioides |

| | | |
|---|---|---|
| 11 | Newbouldia leavis | *Nephrolepis bisrrata* |
| 12 | Ocimum gratissimum | Newbouldia leavis |
| 13 | Panda oleosa | Ocimum gratissimum |
| 14 | Senna alata | *Pachystela brevipes* |
| 15 | *Stachytarpheta Sp.* | Panda oleosa |
| 16 | *Vernonia amygdalina* | Senna alata |
| 17 | | *Stachytarpheta Sp.* |
| 18 | | *Vernonia amygdalina* |

Seven sections of the plants accessed were used as anthelmintic. However, leaves were the most utilized part against helminthes followed by the stem and bark, others sections also used for anthelmintic purpose were represented.

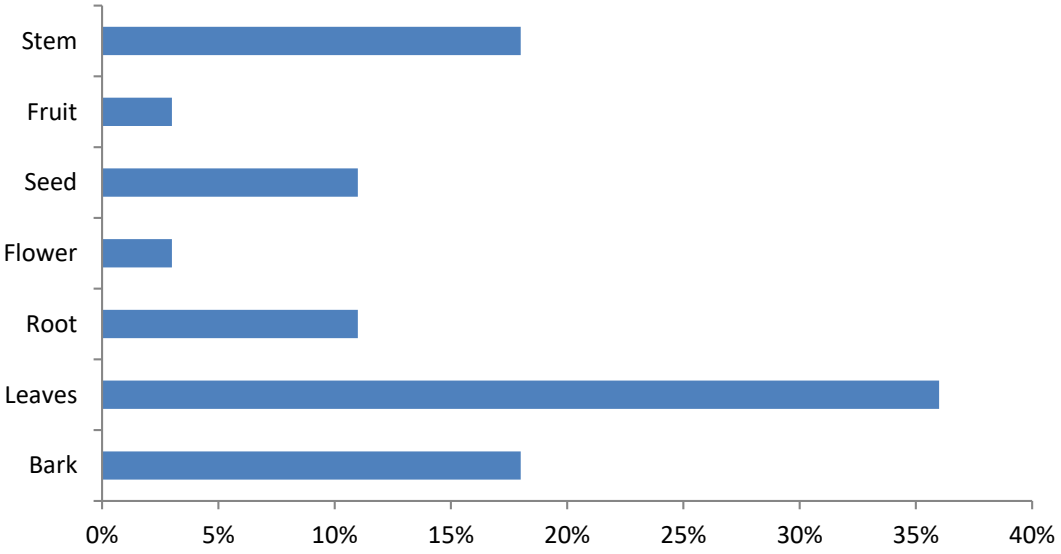


**Figure1: Sections of plants used as Anthelmintic in the Study Area**

**Discussion**

Plant, especially endemic species are value for many ethnobotanical processes, and in the fight of diseases that are of public health interest. This study showed that the Kolokuma-Opokuma clan just like other ethnic groups in Nigeria valued the role of medicinal plant in health care. Their affinity with plants suggest a complete dependent on plant for their well-being, corroborating Newman *et al*. (2007) who noted that the starting point to find helminthic natural products would be indigenous medicinal plants, specifically those known from Africa, Asia or America employed to treat infections. The number of plant species (19) assessed and documented for anthelmintic use in the area validates their lore on helminthes, and contended to exhibit dual actions of vermicide and vermifuge. The knowledge of plants for the management of helminthes, and the wide spread use could be attributed to cultural suitability, efficiency against gastrointestinal worm infections, availability and affordability (Tilehum and Mirutse, 2007; Sofora *et al*. 2013). The application of Apocybaceae, Asteraceae, Laminaceae, Euphorbiaceae, Maliaceae and others recorded give credence to the families' role in traditional medicine among native people, corroborating Ajibesin et al. (2008); Garedew and Abebe, (2018); Islam and

Lucky (2019) and, Afolayan and Sowemimo (2022) who reported members of those as possessing anthelmintic properties vital for eradicating parasitic worms, of which Yibeltal et al. (2022) and, Ademola and Idowu, (2006) attributed to the presence of bioactive phytochemicals like flavonoids, glycosides, phenolic acids, steroids, triterpinoids with antioxidant, scavenging activities and anticholinesterase.

Disparity in the number of plants accessed from the two clans suggest poor interest in medicinal plant knowledge among posterity, and lack of willingness to divulged and or effectively communicate plant knowledge on specific disease by those who are repository of medicinal plant information in the clan. Anthelmintic actions of the plants accessed were asserted to be non-irritating and having broad spectrum anthelmintic affecting both tapeworm and flukes. Although different parts of the plant accessed were used against helminthes. Leaves seem to have the most anthelmintic properties. This assertion supports the previous findings of Sajan *et al*. (2020) and Swargiary *et al*., (2021) in which leaves had the higher rates of use compared to other parts.

The traditional use of plant materials for anthelmintic implies therapeutic benefits from which pharmaceutical can developed potential drugs to manage helminthes conventionally. Therefore it is suggested that further studies to ascertain the sensitivity of helminthes to extracts of the assessed anthelmintic plants is carried out.

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