
Traditional Consumption of *Rhynchophorus Phoenicis Larvae* (F.) as Human Food in Niger Delta Area, Nigeria.

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Abstract

A survey was conducted to ascertain the uses of *Rhynchophorus phoenicis* as food in different parts of the Niger Delta Area. The study confirmed that the larvae of this insect are highly accepted as food widely eaten by the indigenes of the different ethnic groups (Ijaws, Ikwerres, Ogonis, Ibos, Ibibios, Urhobohs, Binis, Itsekiris and Efiks) in the Niger Delta area under different names. Five methods of preparation are frying, drying, cooking, roasting and raw form, but the fried product was more preferred. It is eaten on its own as a delicacy or in combination with other food items like garri, farina, tapioca, rice, yam etc. In some parts of Igbo land (Ohaji, Egbema and other areas) it is sometimes presented to visitors in place of kola nuts. There was high acceptability (92 – 100%) of the fried product of this insect in all the states of the Niger Delta in Nigeria. Harvesting the larvae from the wild and processing it for sale along the major cities and markets is a thriving small scale business.

Key Words: *Rhynchophorus phoenicis*, Larvae, Consumption, Niger Delta.

Introduction

Entomophagy, the eating of insects by humans is practiced in the different ethnic cultures in African countries and other parts of the world (MacEvilly, 2000; Rumpold and Schluter, 2012). However, the utilization of over 2,000 edible insects aligns with the different cultures in Africa, Asia and Latin America. (Bodenheimer, 1951; Defoliart, 1992 and Jongeman, 2012). For instance the Indians of western North America have introduced the consumption of insects as food in their diets (Sutton, 1988). Some cultures in Africa, such as the Yukpa people of Colombia and Venezuela prefers the consumption of insects as their traditional meals than fresh meat (Dufour, 1987). The Pedi of South Africa exports hundreds of tons of prepared Mopanie caterpillars from Botswana and South Africa to Zimbabwe and Zambia (Quin 1959; Dryer and Wehmeyer, 1982). In recent times, there is upsurge in the utilization of edible insects in the world, especially the larvae of *Rhynchophorus phoenicis* (F.) has been cherished as traditional delicacy in many rural communities and cities in African countries, including Nigeria, Ghana, Cameroon, Uganda, Congo, Tanzania, Kenya and other parts of the world where palms (oil, raphia and coconut) are cultivated in large plantations or grown in the wild (Bergier 1941; Defoliart, 1992; Jacob *et al* 2016, Allotey and Mpuchane, 2003; Choon-Fah *et al*, 2008). The Cameroonians also described their coconut larvae recipe as a favourite dish offered only to good friends (Defoliart, 1993). Oliveria *et al* (1976) in Angola reported that *Rhynchophorus phoenicis* larvae are highly nutritive as they have been the richest source of animal fat with high energy value of 234.9kJ/100g of larvae they are also valuable sources of unsaturated fatty acids, and high amounts of vitamins (thiamine and riboflavin) as well as minerals (Zinc and Iron). The different species of *Rhynchophorus* that are widely distributed and used as food include *Rhynchophorus palmarum* in western Hemispheres, *Rhynchophorus phoenicis* in Africa and *Rhynchophorus furrugineus* in Asia.

Therefore, a survey was conducted to ascertain the different methods of preparation and consumption of the larvae of the African Palm weevil (*R. phoenicis*) in eight states (Abia, Akwa-Ibom, Bayelsa, Cross-River, Delta, Edo, Imo and Rivers States) located in the southernmost part of Nigeria, called the Niger Delta which have abundance of palms (oil palm – *Elaeis guineensis* *Raphia – Raphia hookeri*; and coconut – *Cocos nucifera*) the natural host plants for the palm weevils (*R. phoenicis*) (Ene 1963; Ndegwe, 1987; Fasoranti and Ajiboye 1993, and Thomas 2003).

Materials and Methods

A total of One thousand, five hundred and sixty people (n = 1560) form the major ethnic groups of the western central and eastern Delta (Ijaws), Ikwerres, Ogonis, Ibibios, Urhobos, Itsekiris and Efiks, and some Igbos were interviewed and questionnaires were administered.

The information that were required from the respondent included the traditional name of the larvae, ingredients and equipment's used in preparation of the larvae. A subjective evaluation of the acceptability of the insect larvae was also carried out. The respondent's community Local Government Area (LGA) and state of origin were also taken, while further comments on the prospects of the insect larvae as food were also recorded. T – test analysis was used to test whether the observed differences in the acceptability were significant or not using the formula:

$$t = \frac{d - d_0}{Sd}$$

where d = population sample

d₀ = population mean

Sd = Standard error.

Results and Discussion

This study has shown that all the ethno-cultural groups in the Niger Delta have good knowledge of the larvae of *R. phoenicis* as valuable natural food, which is highly cherished as delicacy, thus they have different cultural names for this insect (Table 1)

Table 1: Traditional Names of *Rhynchophorus phoenicis* Larvae

S/N	Ethnic Groups	Traditional Names	States
1.	Bini	Ohuhu or Ikolo	Edo
2.	Ibibio	Nten	Akwa-Ibom/Cross River
3.	Igbo	Eruru	Imo-Eastern Nigeria
4.	Ijaw	Doun or Kolo	Bayelsa/Rivers
5.	Ikwerre	Eruru	Rivers
6.	Itsekiri	Ikolo	Delta
7.	Ogoni	Tam	Rivers
8.	Urhobo	Odor	Delta

The Bini people of Edo State call it “Ohuhu or Ikolo”, while the Urhobos of Delta State call it “Odor”. The Itsekiris who have historical affinity with the Binis also call it “Ikolo”. Other tribes of the Niger Delta including the Ijaws who are dominant in Bayelsa State and in habiting the riverine communities of Rivers and Delta, States also call it “Doun or Kolo”. The Igbos of Abia and Imo State as well as their relative the “Ikwerres” in Rivers State commonly call it “Eruru”. The Ibibios and Efiks of Akwa-Iboms and Cross-River State call it “Nten”, while the minority tribe of Ogoni call it “Tam”. Furthermore, the study also revealed that the different

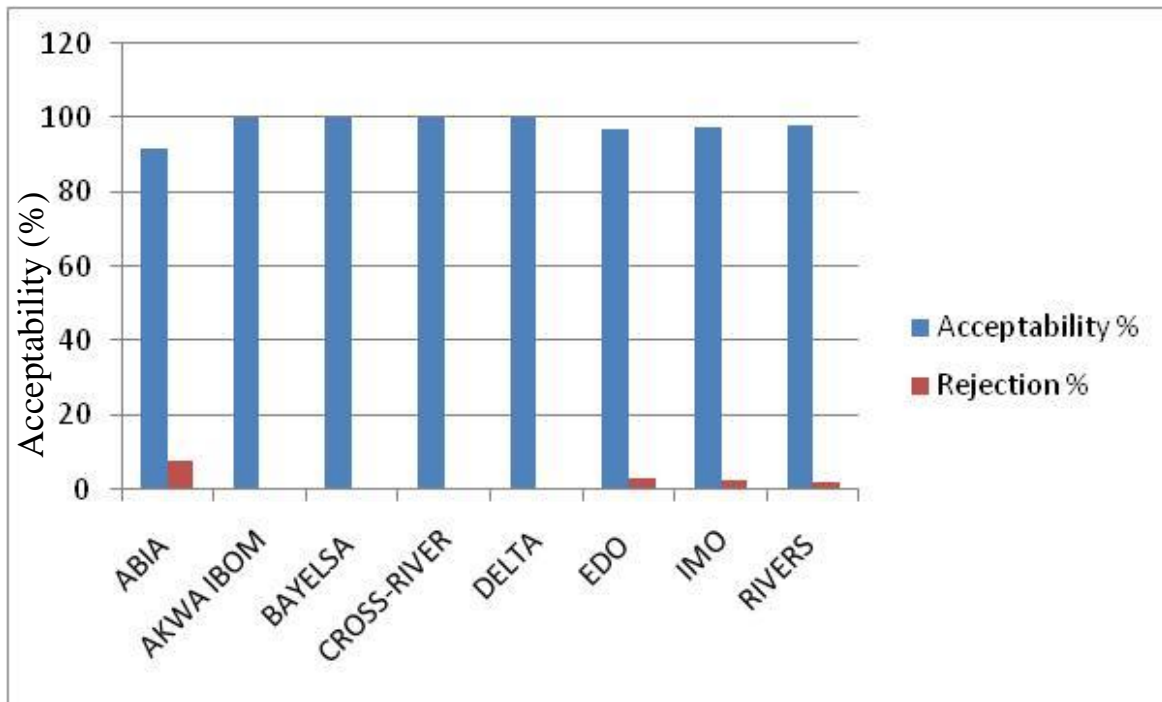
tribes in the Niger Delta had great similarity in the traditional ways of utilizing this insect, because all the major ethnic groups adopted similar methods of preparing the larvae by frying, drying or smoking, roasting, cooking and eating it in raw form after washing it with water.

Table 2: Methods of Preparation and Consumption of *Rhynchophorus phoenicis* Larvae in the Niger Delta Area.

S/N	Methods of Preparation	Respondents Number (%)	Ingredient Used	Types of Dishes	Ethnic Group
1.	Frying	920 (59%)	Peper, salt, onion, little limestone (little oil)	Sipping Garri & Farina	Ijaw, Ibibio, Igbo, Ikwerre, Urhobo
2.	Drying/Smoking	250 (16%)	Pepper and salt	Same as above Palmwine drinking etc	Urhobo, Itsekiri and Ijwa
3.	Cooking	140 (9%)	Water, pepper, salt, onion limestone, maggi/vegetables (little palm oil) washed with water	Ebba, Yam etc	Igbo, Ibibio/Efik Urhobo
4.	Raw	47 (3%)	Washed with water	Dry Garri & Farina etc	Ijaw, Ibibio/Efik Igbo
5.	Roasting	203 (13%)	Salt	As in 1, 2 & 4 above	Ijaw, Ibibio/Efik

Out of the total sampled population (n=1,560), more than 59% equivalent to nine hundred and sixty (960) respondents showed preference for consuming the fried larval meal popularly called “Bayelsa Suya” due to its peculiar sweet ‘aroma’ which is usually hawked along the east-west road connecting Calabar – Uyo – Warri to Benin and up to Lagos. The traditional harvesting of the insect from infested oil palms in the wild and selling of the ‘fried’ larvae of *R. phoenicis* is now a thriving small-scale business in the Niger Delta sub-region of Nigeria. These findings agree with earlier reports which stated that the high content of unsaturated fats and moisture was responsible for the sweet aroma, thereby improving the quality of the larval meal when combined with other ingredients like onion, salt, maggi, and pepper during frying or cooking (Okaraonye and Ikewuchi, 2008); Hereby increasing the Shelf-life of the fried larval meal which is eaten with garri, yam, bread or any staple food to obtain energy (Osabor *et al*, 2008). In some rural communities in Akwa Ibom State which have acute shortage of meat or fish as sources of protein, the larvae of the palm weevils are used in combination with vegetables to form soup and eaten with garri (eba or fufu) by the entire family (Thomas, 2003). It is of great cultural importance to note that the fried “Eruru” meal has been used in place of “kola” which is offered to respected guests as a mark of honour in Obesima Community of Ohaji/Egbema Local Government Area of Imo State, Nigeria. Still in Igbo •tradition, children were allowed only to eat the adult palm weevils, while the delicious larvae and pupae were reserved for elders. On the other hand, both elders and young people among the Ijaws and Ibibios ate all the major stages of the insect (Adult, Larvae and Pupae). However, the fried larvae and pupae were cherished more than the adult due to their rich fat content and palatability. The average cost of a mature larvae when fried ranges is between ₦10 – ₦20.00 while four to five larvae pinned

together after been fried would cost ₦100.00 – ₦200.00 depending on their sizes, and availability. Thus, marketing of prepared larvae of palm weevil is thriving small scale business in most parts of the Niger Delta.



Percentage acceptability of *R. phoenicis* larvae as human food showed no significant difference from respondents in Akwa Ibom (100), Bayelsa (100), Cross River (100) and Delta (100) States; and the degree of acceptability was the same for Edo (97), Imo (97.5), and Rivers (98) states, but these significantly differed from the response of consumers in Abia State (92) (table 3). The percentage acceptability was significantly higher than percentage rejections since $t - \text{calculated} (49.55) > (2.365:3.499)$ at 5% and 1% probability levels respectively.

Table 3: Summary of Acceptability of *R. phoenicis* Larvae in the Niger Delta Area

S/No	STATE	% ACCEPTABILITY	% REJECTION	DIFFERENCES (A – R)
1.	Abia	92c	8	84
2.	Akwa Ibom	100a	0	100
3.	Bayelsa	100a	0	100
4.	Cross-River	100a	0	100
5.	Delta	100a	0	100
6.	Edo	97b	3	94
7.	Imo	97.5b	2.5	95
8.	Rivers	98b	2	96
	Total	784.5	15.5	769
	Mean	98.06	1.94	96.13

$t - \text{cal} > t - \text{tab}$

$t - 49.66 > t = 2.365$ or 3.499 (7) at probability levels of 0.005 and 0.001 respectively. Figures followed by the same letters are not significantly different from each other at 5% (DMRT).

In conclusion, the study has confirmed that all the indigenous tribes, namely: the Igbos of Abia and Imo States including all the eastern states of Nigeria, the Ijaws of Bayelsa, Rivers and Delta States; the Efiks and Ibibios of Cross River and Akwa Ibom states; the Binis of Edo and the Urhobos plus Itsekiris of Delta and the minority ethnic nationalities of the Ogoni and Ikwerres in Rivers state have high acceptability of the larvae meal because they have good traditional knowledge of the food uses of the insect in their cultures, hence the selling of the fried larvae which are popularly known as “Bayelsa Suya” is hawked in all the major cities of the Niger Delta throughout the year, except in late October to November, when the annual flood is at the peak, submerging all the palm plantations and in the forest. It therefore, justifies the essence of initiating mass rearing and domestication programme for this insect in this region, as it is currently done in Ghana and Cameroon. This region has the advantage of a large market and natural resources, as well as the manpower (entomologists) to manage the programme successfully. A major limiting factor is the unwillingness of sponsors, which includes Federal, State and Local Governments and relevant agencies to collaborate in this economically viable programme which will certainly better the wellbeing of rural dwellers and society in general.

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Bar chart showing: acceptability of larvae of *R. phoenicis* as food in states of Niger Delta, Nigeria.

S/N	State	Acceptability %	Rejection %
1.	ABIA	92	8
2.	AKWA IBOM	100	0
3.	BAYELSA	100	0
4.	CROSS-RIVER	100	0
5.	DELTA	100	0
6.	EDO	97	3
7.	IMO	97.5	2.5
8.	RIVERS	98	2