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Potential utilization of *Tetrapleura tetraptera* Fruits as an Alternative Health Therapy by Rural Household in Ondo State, Nigeria

Author Details: Wole-Alo Felicia Itunnu

Department of Agricultural Extension and Communication Technology, the Federal University of Technology, Akure, Ondo State, Nigeria. **Corresponding e-mail: fellymee@yahoo.com/fiwolealo@futa.edu.ng**

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Abstract

*Aidan plant (**Tetrapleura tetraptera**)is an indigenous fruit tree in Tropical Africa which has various medicinal values attached to it.In view of this the study assessed the potential utilization of Tetrapleura tetraptera fruits as an alternative health therapy by rural household in Ondo State, Nigeriaby revealing that 66.2% of the respondents were male and 33.8% were female with a mean age of 49years which means that the respondents were matured enough to know if Aidan fruits have medicinal values or not. Majority of the respondents were literates which made them had access to basic information regarding Aidan fruits and their benefits. It was revealed that the respondents (83.8%) demonstrated high awareness of Aidan fruits and most of them had 20-39 year of awareness on Aidan fruits of which about 42.5% of the respondents were aware of Aidan fruits through parents and their friends (41.2%).The use of Aidan was also revealed by the farmers where 72.5% of them were using it for treatment as a result of the favourable factors it possesses which are easy accessibility, very cheap, medicinal, not easily perishable, easy to prepare and very effective. The findings also shows that the respondents had utilized Aidan fruits to treat certain health cases ranging from convulsion, hypertension, diabetes, leprosy, skin infection, schistosomiasis and asthma. The result of the hypothesis revealed that there is no significant relationship between socio-economic characteristics of the respondents and utilization of Aidan plant*

***Keywords**: potentials, utilization, Aidan plant, health therapy and rural household.*

1.0 Introduction

The use of medicinal plants as a fundamental component of the African traditional healthcare system is perhaps the oldest and the most assorted of all therapeutic systems. In many parts of rural Africa, traditional healers prescribing medicinal plants are the most easily accessible and affordable health resource available to the local community and at times the only therapy that subsists (Mahomoodally, 2013). Generally over the past years, plants have become indispensable sources of food and medicine to all human kind across the world (Sodipo *et al.*, 2000). Some individuals prefer to use medicinal herbs to cure either common or major life-threatening sickness. In West Africa, the plant of *Tetrapleura* tetraptera is used as spices, a medicine and as a dietary supplement which is rich in vitamins, also this plant is useful in healing because it contains a lot of phytochemicals, vitamins and minerals. It is high in antioxidant and anti-inflammatory properties. The fruit bark and beeves are the parts that are used in medicine (Okwu, 2003).In Nigeria, there seems to be a gradual shift from traditional foods consisting mainly of roots, cereals beans, tubers and vegetables to fatty foods, snacks and drinks which are evident by the increased number of eateries in our society (Brai *et al.,* 2007). Plants were the major source of materials used to combat different kinds of ailments in ancient times and quite a number of these plants are being explored in the treatment of various diseases (Akah *et al.*, 1995). *Tetrapleura tetraptera* (Schumand Thonn), commonly known as Aidan tree in Yoruba, ubukirihu in Igbo languages is a deciduous tree belonging to the family Fabaceae (Abii and Amarachi, 2007 , Akin-Idowu *et al.*, 2011).The fruits have been widely used in Nigeria for manufacturing of seasoning spices, pomades and soaps due to its pleasant aroma characteristics (Essien *et al*, 1990 and Okwu, 2004) while it is use in Ghana as vitamin. It is also commonly

used in soups of nursing mothers to prevent post-partum contractions (Nwanu and Alah *et al,* 1996). The soft parts of the fruit and the bark are known to contain sugars, tannins, traces of siphoning and amino acids (Abii *et al,* 2007). The plant has many traditional medicinal uses mainly in the management of convulsion, leprosy, inflammation and rheumatic pains.

1.1 Objectives of the study

The general objective of this study is to determine the Potential utilization of *Tetrapleura tetraptera* Fruits as an Alternative Health Therapy by Rural Household in Ondo State, Nigeria.

The specific objectives are to:

i. examine the socio-economic characteristics of the respondents;
ii. determine the awareness of the respondents about Aidan fruits;
iii. determine the level of utilization of Aidan fruits; and
iv. identify the factors affecting the utilization of Aidan fruit in the study area.

Hypotheses testing

H_{01}: There is no significant relationship between the socio-economic characteristics of the farmers and the level of utilization of Aidan fruits (using chi-square).
H_{02}: There is no significant relationship between the socio-economic characteristics of the farmers and the factors affecting the utilization of Aidan fruits (using chi-square).

1.2 Research Methodology

The study was carried out in Ondo State which lies on a coordinate of 7˚10ˡN 5˚05ˡE / 7.167˚N5.083˚E, and is bounded in the East by Edo State, in the North by Ekiti and Kogi States, in the West by Osun and Ogun States and in the South by the Atlantic Ocean. A multistage sampling technique was used in selecting respondent for this study. A well-structured interview schedule was employed to collect primary data. Firstly, four (4) out of the 18 Local Government Areas were purposely selected for this study because of the dominance of the plants in those areas, secondly four (4) villages from each LGAs were randomly selected (Ondo east, Ile-Oluji/Oke-Igbo, Ifedore and Owo). The third stage involved the random selection of Five (5) farmers from each of the villages thus making a total of eighty (80) farmers that were used for the study. Descriptive statistics such as Bar chart, Frequency Distribution, Tables and Percentages were used in analyzing for the interpretation of results.

1.3 Results and Discussion

1.4 Socio-economic Characteristics of Respondents

The results shows that 30%of the respondents were between the age group of 45-54 years, 23.8% were between the age group of 55-64 years, 17.5% were between the age group of 35-44 years, 13.8% were between the age group of 25-34 years, 11.2% are between the age group of 65-74 years and 3.8% were between the age group of 75-84 years. The mean age of the respondents was 49 years; this implies that many of the respondents were matured and this can assist in the utilization of any innovation passed to them. According to Wilson, 2003 age will determine the attitude and efficient utilization of resources after adoption. The study revealed that 66.2% of the respondents were male while 33.8% were females. The mean household size was 4 persons with majority (62.5%) having between 4-6 persons in their households. About 26.2% had a household size of 1-3 persons and 11.2% had a household size of 7-9 persons. The implication of this is that the respondents would have less family member's health challenges to attend to using either ornamental plants or drugs. This small household size might be that the respondents had the knowledge of family planning and the campaign for keeping

moderate family sizes still continues in each of the health centers that are within the various communities.The result in Table 1 also shows that most of the respondents were literate this is because 40.0% of the respondents had completed secondary education, about 33.8% completed primary education, 6.2% completed tertiary education and 20.0% had no formal education. This result shows that, the respondents would have access to basic information regarding Aidan fruits and their benefits as most of them were educated, this is in line with Fakayode *et.al.* 2008 who found that farmers will have a better understanding of technology introduced to them if they are literate.The finding also shows that (60.0%) had 1.0 hectare; (37.5%) had 2.0 hectares and (2.5%) of the respondent had more than 2.0 hectare. The mean farm size was 1.42ha which indicated that Aidan fruit production is dominated by smallholder farmers in the study area making the production below market demand.Table 1 also shows that most (60.0%) of the respondents in the study area had between #100,001-#200,000 as average annual income, 21.2% were between #200,001-#300,000, 16.2% were between less than #100,000 while the lowest (2.5%) had between #300,001-#400,000 as average annual income. The mean annual income was #156,775. This result implies that most of the respondents in the study area would have less income to attend to their health challenges using standard health therapy; hence they would have to use alternative health therapy for their health challenges. Income is a function of many factors and varies from household to household and depends on the type of occupation.

Table 1: Socio-economic Characteristics of Respondents

Variables	Category	Frequency	Percentage	Mean
Age	25-34	11	13.8	
	35-44	14	17.5	
	45-54	24	30.0	49.01
	55-64	19	23.8	
	65-74	9	11.2	
	75-84	3	3.8	
Household size	1-3	21	26.2	
	4-6	50	62.5	4
	7-9	9	11.2	
Farmers income	<#100,000	13	16.2	
	#100,001-#200,000	48	60.0	156,775
	#200,001-#300,000	17	21.2	
	#300,001-#400,000	2	2.5	
Sex	Male	53	66.2	
	Female	27	33.8	
Level of Education	No formal Education	16	20.0	
	Pry education	27	33.8	
	Sec education	32	40.0	
	Tertiary education	5	6.2	
Farm size	1 hectare	48	60.0	
	2 hectare	30	37.5	1.42
	3 hectare	2	2.5	

Source: field survey, 2019

1.5 Awareness about Aidan fruit as an alternative health therapy

The result in Table 2 shows that majority of respondents (83.8%) were aware of Aidan fruits, while (16.2%) were not aware of it. Most of the farmers (38.8%) had 20-39 years of awareness on Aidan fruit, 32.4% of the respondent had (40-59) years of awareness on Aidan fruit and 28.8% had (0-9) years of awareness on it. The mean of year of awareness was 24.62 which implies that a good number of the respondents were aware of Aidan fruit been used as an alternative health therapy. Furthermore, the result in Table 2 also shows that (42.5%) of the farmers were aware of Aidan through parents, 41.2% of the farmers were aware through friends

and 16.3% were aware through the means of radio. This is in tandem with Adeogun *et al*., (2010), who stated that sources of information available mostly to farmers are through family and friends.

Table 2: Awareness of the respondents about Aidan fruit

Characteristics		Frequency	Percentage
Are you aware of Aidan	No	13	16.2
	Yes	67	83.8
Years of awareness	0-19	23	28.8
	20-39	30	38.8
	40-59	27	32.4
Medium of awareness	Friends	33	41.2
	Parents	34	42.5
	Television	-	-
	Radio	13	16.3
	Newspaper	-	-

Source: field survey, 2019

1.6 Awareness of the respondents about the health benefits of Aidan fruit

The result in Table 3 shows that 78.8% of the respondents were aware of the health benefit of Aidan fruit while 21.5% of the respondents were not aware of the benefits of Aidan fruit. This implies that the respondents had the knowledge of the medicinal values that are inherent in Aidan fruits. Awareness is the first stage in the adoption of any innovation or technology, with this awareness status among the respondents; it would be possible for them to employ Aidan fruits in attending to some health issues among them

Table 3: Awareness of the Health Benefits of Aidan fruit

Awareness of health benefits		Frequency	Percentage
Health benefit awareness	Yes	62	78.5
	No	17	21.5

Source: field survey, 2019

1.7 Utilization of Aidan fruit

Results on Table 4 show that Aidan fruit were best used for culinary purposes ($\bar{x}$ = 2.73) and was ranked 1st, post-partum care ($\bar{x}$ = 2.63) was ranked 2nd, dermatological care ($\bar{x}$ = 2.59) was ranked 3rd. Furthermore, results on Table 4 also shows that Aidan fruit was also used in hypertension Treatment($\bar{x}$ = 2.35)ranked 4th, management of leprosy ($\bar{x}$ = 2.11) was ranked 5th, convulsion (Shiver) ($\bar{x}$ = 1.91) was ranked 6$^{th.}$ This implies that the respondents knew about the health benefits of Aidan fruit in treating diseases and they utilized it and this helped them in reducing the rate of visitation to the clinic in the study area.This results supports the assertion of Omokhua, *et al.,* 2002 that various ornamental plant possess medicinal values and as such can be used to treat some health related problems. However, the results show that the following were ranked low. Treatment of asthma ($\bar{x}$ = 1.23) was ranked 7th, Fibroidand cardiovascular system with a mean value of ($\bar{x}$ = 0.81) were ranked 8th, mosquitoes repellants ($\bar{x}$ = 0.41) was ranked 9th, treatment of schistosomiasis ($\bar{x}$ = 0.36) was ranked 10th andtreatment of Diabetes ($\bar{x}$ = 0.25) was ranked 11th. According to Effiong *et.al*. 2014, Aidan fruit can be used in treating schistosomiasis, cardiovascular system and fibroidwhich implies that more information and awareness about Aidan fruit utilization for those that ranked low should be disseminated to the farmers.

Table 4: Utilization of Aidan fruits

	Never		Rarely		Sometimes		Always		Mean	Rank
Utilization	F	%	F	%	F	%	F	%		
Culinary purposes	2	2.5	4	5.0	8	10.0	66	82.5	2.73	Ist
post-partum care	4	5.0	3	3.8	12	15.0	61	76.3	2.63	2nd
Dermatological care	4	5.0	3	3.8	15	18.8	58	72.5	2.59	3rd
Hypertension Treatment	9	11.3	3	3.8	19	23.8	49	61.3	2.35	4th
Management of leprosy	14	17.5	9	11.3	11	13.8	46	57.5	2.11	5th
convulsion (Shiver)	3	3.8	25	31.3	28	35.0	24	30.3	1.91	6th
Treatment of asthma	18	22.5	35	43.8	17	21.3	10	12.5	1.23	7th
Fibroid	39	48.8	20	25.0	18	22.5	3	3.8	0.81	8th
cardiovascular system	39	48.8	20	25.5	18	22.5	3	3.8	0.81	8th
Mosquitoes repellants	60	75.0	12	15.0	3	3.8	5	6.3	0.41	9th
Treatment of schistosomiasis	56	70.0	20	25.0	3	3.8	1	1.3	0.36	10th
Treatment of Diabetes	66	82.5	10	12.5	2	2.5	2	2.5	0.25	11th

Source: field survey, 2019

1.8 Factors affecting the utilization of Aidan

Results from Table 7 shows that among all the factors affecting the utilization of Aidan fruit by the farmers, low access to hospital was ranked highest with a mean value of ($\bar{x}$ = 3.38),environmental factors with a mean value of ($\bar{x}$ = 2.49) was ranked 2nd,Inadequate informationabout the importance of the fruit and Cultural & religious beliefwith mean values of ($\bar{x}$ = 2.40) each were ranked 3rd, Low Reliability of the plant ($\bar{x}$ = 2.26) was ranked 4th and low level of awareness on the preparation($\bar{x}$ = 2.23) was ranked 5th.This implies that if ornamental plants as alternative health therapy will be adequately utilized, these major factors must be attended to. On the other hand, it was revealed that some factor poor Government policy ($\bar{x}$ = 2.14) was ranked 6th, low accessibility to plant ($\bar{x}$ = 2.04) was ranked 7th, wound healing properties($\bar{x}$ = 1.89) was ranked 8th. These results show that these factors do not really affectthe utilization of Aidan fruit.

Table 7: Factors Affecting the Utilization of Aidan Fruits

	SA		A		U		SD		D		Mean	Rank
Factors	**(F)**	**(%)**	**(F)**	**(%)**	**(F)**	**(%)**	**(F)**	**(%)**	**(F)**	**(%)**		
Low access to hospital	4	5.0	47	58.8	4	5.0	25	31.2	-	-	3.38	1st
Environmental Factors	5	6.2	12	15.0	5	6.2	53	66.2	5	6.2	2.49	2nd
Inadequate information	10	12.5	53	66.2	3	3.8	10	12.5	4	5.0	2.40	3rd
Cultural&religious belief	1	1.2	12	15.0	7	8.8	58	72.5	2	2.5	2.40	3th
Low Reliability of the plant	4	5.0	46	57.5	4	5.0	19	23.8	7	8.8	2.26	4th
Low level of awareness	8	10.0	52	65.0	3	3.8	15	18.8	2	2.5	2.23	5th
Poor Government policy	-	-	2	2.5	15	18.8	55	68.8	8	10.0	2.14	6th
Low Accessibility to plant	-	-	4	5.0	12	15.0	47	58.8	17	21.2	2.04	7th
Wound healing properties	2	2.5	-	-	12	15.0	39	48.8	27	33.8	1.89	8th

Source: field survey, 2019

1.9 Hypotheses Testing

The Chi-square result on Table 9 shows that there was no significant relationship between the sex (P= 0.268≤0.05), marital status (P= 0.086≤ 0.05), educational status (P= 0.587≤ 0.05), religion (P= 0.910≤ 0.05), income (P=0.685≤ 0.05) and age (P= 0.290≤ 0.05) of the respondents and the use of Aidan as an alternative health therapy. This implies that the use of Aidan as an alternative health therapy among the respondents has nothing to do with the sex, marital status, educational status, religion and level of income of the respondents.

The implication on this study is that Aidan can be used by both male and female, and also that farmers with low income can also make use of it since it is easily accessible and cheap and that the religion of the farmers is not a barrier towards the utilization of Aidan.

Table 9: Relationship between farmers' socio-economic characteristics and utilization of Aidan

Variable	X^2	Df	P-value
Age	10.792	9	0.290
Sex	3.938	3	0.268
Marital Status	15.167	9	0.086
Farm Size	2.100	6	0.910
Income	3.938	6	0.685
Religion	2.100	6	0.910
Education Level	4.667	6	0.587
Household Size	3.937	3	0.268

Significance at ≤0.05 * represents significance
Source: field survey, 2019

2.0 Conclusion

The study conducted established that there were high percentage of awareness and also high percentage of usage of Aidan fruits for some diseases in the study area. It also provides information on the level of utilization of Aidan fruits as an alternative health therapy in Ondo state. The only sources of information about Aidan are friends or parents; this is why there is need to increase extension services in the area to create awareness on the usefulness of Aidan thereby increasing the level of usage. The study concluded that there is a need to address the low ranked utilization of Aidan fruit in order to boost the economic importance of this fruit in the study area.

REFERENCES

i. *Abii, T. A., Amarachi, E. (2007) Investigation into the Chemical Composition of the Dry fruit of Tetrapleura tetraptera. Journal of Food Technology 5(3): 229-232.*
ii. *Adeogun, S. O., Olawoye J. E and Akinbile L. A. (2010). Information sources to cocoa farmers on cocoa rehabilitation techniques (CRTs) in selected states of Nigeria. An Assessment of Food Security of Farm Household in Nigeria; A USDA approach. Journal Media and Communication Studies Vol. 2(1)pp. 009-015, January, 2010 Available online http://www.academicjournals.org/jmcs © 2010 Academic Journals*
iii. *Adewunmi C. O.and Marquis V. O. (1987). Evaluation of the effects of environmental factors on molluscicidal properties of Aridan (Tetrapleura tetraptera), Lapalapa pupa (Jatropha gossypyfolia), Endod (Phytolacca dodecandra) and Bayluscide . Phytotherapy Research Journal. Volume1, Issue2 June 1987 Pages 69-72. https://doi.org/10.1002/ptr.2650010206*
iv. *Akah P. A. and Nwabie O. K. (1993), Antibacreial activity of Tetrapleura tetraptera, Fitoterapia., (2013).*
v. *Akin-Idowu, P. E., Ibitoye, D. C., Ademogegun, O. T., Adenyi, O. T. (2011) Chemical Composition of the Dry Fruit of Tetrapleuratetrapteraand its Potential Impacts on Human Health. Journal of Herbs, Spices and Med. Plants.17: 52-61*
vi. *Brai, B.I.C., Odutola, A.A and Agomo, P.U. (2007).African Journal of Biotechnology 6(8). 1007– 1011*
vii. *Effiong G. S., UdohI. E., Essien G. E.,AjibolaD. O and ArchibongK.O., (2014). Effect of aqueous extract of tetrapleuratetraptera on excision wounds in albino rats. International Research Journal of Plant Science (ISSN: 2141-5447) Vol. 5(4) pp. 57-60, September, 2014*
viii. *Essien, 1990 and Okwu, 2004, phytochemical and vitamin content of indigenous species of South Eastern Nigeria.*

ix. *Fakayode, S .B., Rahji, M.A.Y. and Oni O.A. (2008). An Assessment of Food Security of Farm Household in Nigeria; A USDA approach. Journal Media and Communication Studies Vol. 2(1)pp. 009-015, January, 2010 Available online http://www.academicjournals.org/jmcs © 2010 Academic Journals*

x. *Mahomoodally M.F., (2013). Traditional Medicines in Africa: an Appraisal of Ten Potent African Medicines Plants. Hindawi Journal volume 2013/Articles ID 617459/14 pages https://doi.org/10.1155/2013/617459*

xi. *Nwanu and Alah, 1996, A triterpene glycoside from the fruit of Tetrapleura tetraptera. Phytochemistry. Page 24-76.*

xii. *Okwu, D. E. (2003) The Potentials of Ocimumgratissimum, Pengulariaextensa and Tetrapleuratetrapteraas Spices and Flowering agents.Niger. Agric. J. 35: 143 – 148.*

xiii. *Sodipo O. A. , Akinniyi J. A. and Ogunbameru J. V. (2000). Studies on certain characteristics of extracts of bark of Pausinystalia johimbe and Pausinystalia macroceras (K Schum) Pierre ex Beille. Global Journal of Pure and Applied Sciences Volume 6 (1).* DOI: *10.4314/gjpas.v6i1.16082*

xiv. *Willson, E. (2003). "An Examination of Agricultural and Science Educators: Attitudes towards the use of Biotechnogy " Journal of Southern Agricultural Education Research . Vol.53(1): 248-257.*