PREVALENCE OF INTESTINAL PARASITES ON SELECTED FRUITS SOLD IN SOME MAJOR MARKETS IN IBADAN METROPOLIS, NIGERIA.

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Abstract: The Prevalence of intestinal parasites on fruits sold in markets around Ibadan Metropolis was studied. Four different types of fruits were sampled from four markets ((Oje, Bodija, Oja- oba and Erunmu market. A total of 400 samples were examined for intestinal parasites using sedimentation method, out of which 150 (37.5 %) were positive for intestinal parasites which Pineapple recorded the highest contamination 51 (51%) while water melon 26(26%). recorded the least contamination microscopically. Result from this research shows high contamination levels of fruits with intestinal parasites from four different markets in Ibadan, indicating presence of a great risk of acquiring and transmitting intestinal parasitic infections by eating improperly washed fruits.

Introduction

Fruits are a major part of man's diet and in fact an important component of a healthy diet because they contain essential vitamins which are necessary for growth and body nourishment (Carey *et al* 1996). Intestinal parasitic infection is becoming an increasing concern because of the expanding number of individuals at risk of infection, particularly children, pregnant women, elderly and the immune-compromised persons (Erdogrul and Sener, 2005).

Fruits also play major role in the nutritional livelihood of human population especially in undeveloped country like Nigeria where there is poor socio-economic condition (Adeboye and Adedayo, 2008). Unfortunately, people do not wash the fruits properly before eating. Eating unclean, raw, or undercooked fruits and vegetables is one of the means by which the transmission of intestinal parasitic infections is propagated.

Market fruits are often contaminated by the eggs of human intestinal nematodes where human and animal faeces are extensively used as fertilizer and reused waste water (Alli *et al.*, 2011). Great risk for contamination of food with parasites also occurs during farm operation and their dissemination during food processing due to increase interest in organic farming.

Humans in their effort to be fed with a healthy diet regularly consume raw fruits that could serve as possible channels for the transmission of parasites [Daryani *et al*.,2008]. Intestinal parasites are common in developing nations and in Nigeria in particular [W.G,2007], this could be attributed to open defecation being practiced in some rural and pre-urban areas of the country.

Parasitic infections are associated with a high incidence of dysentery, chronic colitis, anaemia, intestinal obstruction and for children, it consumes nutrients, weaken the immune system and as well retard physical and mental development. Furthermore, it also leads to intrauterine growth retardation, prematurity and low birth weight among newborns born to infected mothers (Adeboye and Adedayo, 2008; Ezeamama *et al*., 2005).

Materials and Methods
Study Area

Ibadan, capital of Oyo State in south-western Nigeria is a major centre of commerce in the state. The city covers a land area of 240 km2 and has an estimated human population of 3,139.500 as at 2003. Ibadan lies within the secondary rainforest and savanna vegetation zone, with a mainly tropical wet and dry climate, a lengthy wet season with an estimated annual rainfall of about 1,250 mm (UNCHS and UNEP, 1997) and relatively constant temperatures throughout the year. The wet season runs from March

through October, with a lull in precipitation in August. Some of the predisposing factors to parasitic transmission are low level of sanitation which is characterized by the presence of massive refuse dump sites and dumping of the fruits on the ground at market places. Ibadan has various markets which include, Ojaoba, Bodija, Oje, and Beere markets. Fruits are brought in by the farmers and traders from rural areas into these markets.

Sample Collection
Four types of fruits including *Citrus sinensis* (sweet orange), *Citrillus lanatus* (water melon) and *Mangifera indica* (mango) Garden egg *Solanium nelegneta* were bought from four major markets (Ojaoba, Bodija, Oje , Beere) Equal numbers of samples (100 each, totally 400 samples) were collected from the market. The samples were collected into a sterile polythene bags and transported to the Biology Laboratory of the Department of Biology, Lead City University, Ibadan for parasitological analysis. The study was conducted from May to August of 2017.

Method
Sedimentation techniques was used in which 20 samples of each fruits' surface were washed in 450ml of distilled water in a sterile beaker for each preparation. The water was left to settle for 30 minutes and then the settled water was decanted without disturbing the settled suspension and the decant water discarded. The suspension was strained through a sterile sieve to removed undesirable materials like

sand. 15ml of 10% formalin was added to the filtrate. The solution formed from the addition of 10% formalin to the filtrate was stirred fervently and put into the centrifuge tube. The tube was then placed in a centrifuge and spun at 3000rpm for 5 minutes (Damen *et al.,* 2007). The resulting supernatant was decanted and discarded to leave only the sediment for laboratory analysis.

Laboratory Analysis
The sediments were tapped to mix and a drop was applied on the centre of a clean glass slide and one drop of lugol's iodine was added. The glass slide was covered gently with cover slip to avoid air bubbles and over-flooding. The slide was then placed on a microscope for viewing. X10 and X40 objectives were used for viewing and the number of ova, larvae and cysts of the parasites were isolated, counted and recorded respectively.

Identification of Parasites
The various cysts, eggs and larvae of the parasites were identified by their morphological characteristic such as the shapes and sizes of the eggs using Arora and Arora, (2010).

Statistical analysis
The result obtained were analyzed using Analysis of Variance (ANOVA) for any significant differences on the prevalence of intestinal parasites on fruits at $P < 0.05$ level of significance.

Table 1: Percentage prevalence of intestinal parasites on some fruits sold in some major markets in Ibadan

Fruits	Number Examined	Number contaminated	Percentage contaminated
Sweet orange	100	45	45(45%)
Water melon	100	26	26 (26%)
Mango	100	28	28(28%)
Pineapple	100	51	51(52%)
Total	400	150	150(37.5%)

Table 2: Table 2: Prevalence of intestinal parasites contamination among fruits sampled

	Sweet Orange	Water melon	Mango	Pineapple	Total (%)	
Number of samples examined	100	100	100	100	400	
A. lumbricoides	12(12%)	3(3%)	5(5%)	21(21%)	45(30%)	
G. lambia	9 (9%)	2(2%)	2(2%)	4(4%)	18(12%)	
C. sinensis	5 (5%)	1(1%)	3(3%)	8(8%)	17(11.1%)	
Hookworm	15(15%)	10(10%)	14(14%)	5(5%)	44(29.3%)	
E. histolytica	3(3%)	2 (2%)	6(6%)	9(9%)	20(13.3%)	
S. stercoralis	(1%)	0 (0.0%)	1(1%)	4(4%)	6(4%)	
Total	45	26	28	51	150	

Discussion

Fruits can become contaminated with microorganisms capable of causing human diseases while still on the plant infields or orchards, or during harvesting, transport, processing, distribution and marketing, or in the home and are usually transmitted by contaminated water and spread by ineffective hygienic practice.

The present study has attempted to determine the prevalence of intestinal parasites on some fruits sold at markets around Ibadan ,metropolis. A total number of 400 fruits were examined, out of which 150(37.5 %) were positive for intestinal parasites which Pineapple recorded the highest contamination 51 (51%) while water melon recorded the least contamination Fruits like water melon recorded the least contamination with parasites from my result 26 (26%). This is due to the smooth skins of the fruits which makes it easy for the eggs, larvae or cysts of the parasites to be washed off .This result is similar to the work carried out by Alli *et al.* (2011) on the prevalence of intestinal parasites on fruits available in Ibadan markets were 34 (35.4%).

In another similar study Uneke (2004) in Abakaliki, reported that of the 34 ova isolated from fruits, 30 were positive for Pineapple. This is due to the uneven surface of pineapple fruit which make the parasitic eggs, larvae or cysts attached to the surface of the fruit more easily either in the farm or when washed with contaminated water. Fruits like water melon recorded the least contamination with parasites from my result 26 (26%). This is due to the smooth skins of the fruits which makes it easy for the eggs, larvae or cysts of the parasites to be washed off.

However, six different types of parasites were isolated from 400 fruits sold around Ibadan Metropolis. They include eggs of *Ascaris lumbricoides (15*.6%), cysts of *Giardia lamblia* eggs (6.9%), eggs of *C. sinensis*

(4.6%), eggs of Hookworm (14.9%),eggs of *E. histolytica* (15.2%) and larvae *of S.stercoralis* (5.1%). However, the intestinal parasites isolated in this work differ from those isolated from other parts of Nigeria. Omowaye and Idachaba (2012) isolated larvae of *Strongyloides stercoralis* (12.60%), egg of *Enterobius vermicularis* (2.42%), eggs of *C. sinensis* (4.76%) and cysts of *Entamoeba histolytica* (0.62%) from fruits sample in Kogi.

In Western part of Nigeria, Alli *et al*. (2011) isolated three different types of intestinal parasites from 96 fruits. These parasites include ova of *Ascaris lumbricoides* 19 (55.9%), ova of hookworm 11 (32.3%) and *Strongyloides stercoralis* (11.8%). In the same vein, Hassan *et al*.,(2013) reported 38.09%, 20.38%, 18.56%, 8.33%, 6.42, 4.55%, 2.15% and 1.67% for *Ascaris lumbricoides* eggs, *Strongyloides stercoralis* larvae, hookworm eggs, Oocysts of *Cryptosporidium*,immature cyst of *Entamoeba histolytica/dispar*, *trichuris trichuira* eggs, *Taenia* species egg and oocyst of *Isospora* species respectively. Tomatoes had the highest percentage with parasites' ova, cysts or larva (73.33%) followed by *Irvingia* and carrots (66.7% each), mangoes (58.33 %), garden eggs (43.35%), cherries (33.33%), oranges (25.0%), cucumber (22.22%) and lime (12.5%) in fruits and vegetables with eggs, cysts or larvae of eight different species of parasites encountered in Ibadan, southwestern, Nigeria. This present study is similar to the work done by Yoila and Utitofon, (2016) which reported 42 % in the prevalence of fruits Sold in Federal Capital Territory, Abuja.

In southwest Ethiopia Tefera*et al.* (2014) isolated larvae of *Strongyloides stercoralis* (21.9%), ova of *Toxocara* species (14.7%), *Cryptosporidium* species (12.8%), *Hymenolepis* nana (8.3%), *Gardia lamblia* (7.5%), *Ascaris lumbricoides* (6.7%), *Entamoeba*

histolytica/dispar (5.3%), *Cyclospora* species (5.0%) and *Hymenolepis diminuta* (1.4%) from fruits and vegetables (Tefera *et al.,* 2014). The presence of intestinal parasite in fruits samples is suggestive of faecal contamination from man and or animal origin.

Conclusion

The results from this present study shows high contamination levels of fruits with intestinal parasites from four different markets in Ibadan metropolis (Oje, Bodija, Oja- oba and Erunmu Markets respectively) indicating presence of a great risk of acquiring intestinal parasite infections by eating improperly washed fruits. It is presumed that these contaminations ranged from one factor to the other such as contamination of soil by human and animal faeces, poor sanitary environment of the markets, as a lots of theses fruits poured on a barred ground before selling to the consumer and unhygienic transportation of the produce to the markets.

REFERENCES

［1］.   Adeboye, O.C. O. and Adedayo, A. (2008). Future of Nigeria under exploited Indigenous fruits vegetables in era of climate. *A review of scientific literature.* Pp. 1-4.

［2］.   Alli, J. A., Abolade, G. O., Kolade, A. F., Solako, A. O., Mgbakor, C. J., Ogundele, M. T., Oyewo, A. J. and Agboula, M. O. (2011). Prevalence of intestinal parasites on fruits available in Ibadan markets, Oyo State, Nigeria. *Acta Parasitological Globalis*, 2 (1): 6-10.

［3］.   Arora, D. R. and Arora, B. B. (2008). *Medical Parasitology*. 2nd edition, CBS Publishers and distributors Pvt Ltd., New Delhi, India. 3(8): 168-180.

［4］.   Carey, O. J., Cookson, J. B., Britton, J. and Tattersfield, A. E. (1996). The effect of lifestyle on wheeze, atopy, and bronchial hypersensitivity in Asian and white children. *Am. J. Respir. and Critical Care Med. 153:* 537-540.

［5］.   Damen, J. G., Banwat, E. B., Egah, D. Z. and Allamana, J. A. (2007). ParasiticContamination of vegetables in Jos, Nigeria. *Annals of African Medicine*, 6 (3): 115-118.

［6］.   Daryani A, Ettehad GH, Sharif M, Ghorbani L, Ziaei H(2008). Prevalence of intestinal parasites in vegetables consumed in Ardabil, Iran. Food Control;9(8):790-794.

［7］.   Erdogurul, O. R. and Sener, H. (2005). The contamination of various fruits and vegetables with *Enterobius vermicularis, Ascaris* eggs, *Entamoeba histolytica* cysts. *Food Control 16:* 557- 560.

［8］.   Ezeamama, A. E., Friedman, J. F., Olveda, R. M., Acosta, L. P., Kurtis, J. D., Mor, V. and McGarvey, S. (2005). Functional Significance of Low-Intensity Polyparasite Helminth Infections in Anaemia. *J. Infect. Dis*. 192 (12): 2160-70.

［9］.   Hassan,A.A., Ojuromi, O.T.and Onyehialam, O.(2013).Common Fresh Fruits and Vegetables Sold at some major Markets in Ibadan. *The Zoologist, 11:*40-45.

［10］.   Omowaye. S. O. and Idachaba. O. S. (2012). Fruits quality and parasites status in Kogi markets, *Nigerian Journal Academic Industrial Research*, 1 (7): 360-362.

［11］.   Tefera, T., Biruksew, A., Mekonnen, Z. and Eshetu, T. (2014). Parasitic Contamination of Fruits and Vegetables Collected from Selected Local Markets of Jimma Town, Southwest Ethiopia. *International Scholarly Research Notices*, 7pp.

［12］.   The   World   Gazette; 2007.Available:http://www.nfer.ac.uk/researcharea s/ pims data/summaries/fsr-aresearch- review-of-outdoor-learning.cfm (Retrieved 2014-09-23)

［13］.   Uneke, C. J. (2004). Potential for geohelminth parasite transmission by raw fruits and vegetables in Nigeria. Implication for a risk profile. *Journal Nutrition and Environmental Medicine,* 16 (1): 59-68.

［14］.   Yoila .D. M ,Utitofon I.T (2016).The Prevalence of Intestinal Parasites on Fruits Sold in Markets. *American Journal of Science and Technology*, Volume 3, Issue 2, pg 107-111.

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