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PROTOZOANS AND HELMINTHES DETECTION ON FARM PRODUCES IN EASTERN ZONE OF KOGI, NIGERIA

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ABSTRACT

An examination of farm produces sold in markets was carried out to determine the level of Protozoans and Helminthes detection on farm produces in Dekina and Bassa Local Government Area, Nigeria. This was done through cysts and ova recovery between May and October 2010. The farm produces were bought from the sellers and examined using concentration and centrifuging technique. Of 2426 samples of fruits and vegetables examined 75(4.3%) were positive for helminth ova and cyst with vegetables 19(2.8%) being more contaminated than the fruits (2.5%) but the difference was not statistically significant ($p>0.05$).The confirmation rate of helmith cyst and ova found are, *Trichuris trichuris* (1.73%) *Ascaris lumbricoides* (0.78%) and *Strongyloides stercoralis* (6.06%). The difference was not statistically significant ($p>0.05$).Among the vegetables surveyed, *Vernonia* species had the highest contamination rate of (21.11%) while *Amaattus cruentus* had the least (5.33%). *Corchorus olitorius* was uncontaminated. There were more contaminations of the fruits and vegetables bought from Dekina than other markets. However, the difference were not statistically significant ($p>0.05$).The data shows low infestation of protozoan compared with nematodes in the whole samples. The health risks of these finding underscore the need to embark on health promotion and health education among the populance on the mode of transmission of helminthic infections most especially the nematodes also eating habits and personal hygiene.

Key Words: helminth, contamination, cysts, ova.

INTRODUCTION

Raw fruits and vegetables grown close to the soil may be contaminated with various food borne pathogens. Various factors contribute to increase in diseases associated with raw fruits and vegetables. They include globalization of food supply. Introduction of pathogens into new geographical areas through import, use of untreated waste water and manure as fertilizers for crop production, irrigation and various agronomic practices, level of hygiene of food handlers etc. Continued use of untreated wastewater and manure as fertilizer for the production of fruits and vegetables is a major contributing factor to contamination that causes numerous food-borne disease outbreaks [1]. Contaminations can occur on the field or orchards during harvesting, transporting, processing distribution and marketing or in the home. Also during post harvest handling including at points of preparation by street vendors, food service establishments and most irrigation water. Worldwide, parasites infect millions of people. In some regions, there are a major cause of childhood diarrhoea and stunting of growth and cause significant economic losses related to human health and to agriculture. The contamination of vegetables by parasites has long been established. Amongst the classes incriminated are Protozoa, Cestodes, Trematodes and Nematodes. This current research is therefore necessary to ascertain the prevalence and types of parasites found on vegetables and fruits in the study areas. And this will enable proffering solution to the consumers [2-5].

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MATERIAL AND METHODS

Study areas

The study was conducted in Bassa and Dekina Local Government area the three major markets and commercial township-of Kogi State middle belt Nigeria between April and August 2010.The following market were used for the study: Anyigba, Bassa and Dekina.

Anyigba is located very close to River Benue, Bassa is located close to Lokoja Confluence Township where River Niger and Benue meet.Dekina is daily market are located at the Northern part of Anyigba. Rural farmers usually bring the fruits and vegetables to the markets from nearby villagers and township.

Sample collection

The fruits and vegetable were bought from the traders in these markets between 006 and 11.00 in the morning. Fruits include *Musa sapentum* (Banana), *Lycopersicum esculentum* (Tomato), *Citrus sinensis* (orange), *Pipe nigrum* (peper), and *Abelmoschus esculentus* (okro) the vegetables are *Amaranthus cruentus* (spanich) *Telferiria occidentalis* (pumpkin leave), *Talinum triangulare* (water leaf) and *Corchorus olitorus* (Jute leaf.)

Sample processing 100g of each type of fruits and vegetable were washed in 360ml of distilled water. Each suspension was strained through a piece of double layered sieve which fillered off coarse sandy particles but allowed the passage of helmaith ova and larvae. The fillfrate was centrifuge at 2500pm for one minute. The supernatants were poured off from the different tube to each tube was checked for helminth ova and larvae by the concentration technique as described by cheesbrough was used for the identification of the the ova and larvae observed. Chi-squre test was used to determine whether any relationship exist between geohelminthic oval larvae and contamination of different fruits and vegetables, type of produce and location of markets [6].

RESULTS

The overall contamination rate of fruits and vegetables was (24.6%). Out of 1755 of fruits examined 245 (14.0%) contaminated with geohelminthic cyst and oval larvae and for 671 sample of vegetables 71(10.0%) were contaminated. Proportionally, the cyst recovered were 14(2.8%) for fruits and vegetables, respectively. Also, the proportions for larvae were 125(7.1%) and 21(3.1%) for fruits and vegetables respectively (Table 1). The differences in contamination rates between the types of produce (fruits and vegetables) were not statistically significant (P>0.05). Table 2 shows that 42 of 2426 samples of fruits and vegetables examined were contaminated with significant variation (P<0.05)

Strongyloides stercoralis was the most common contaminant. The overall contamination rates for *strongyloides stercoralis, T. trichiura* and *G.lamblia* were 55.9%, 26.04% and 13.31%. *Pipe nigrum* (peper) was the most contaminated with cyst and oval larvae (27.85%) followed by *vernonia* species (bitter leaf) and *Allium cepa* with contaminated rate of (18.11%) and (15.23%) respectivel. Table 2 *Abelmoschus escutentus* (okro) had lowest contamination (4.43%). The frequency distribution of helminth cyst, ova and larvae by the location of markets is shown in Table 3. of the three markets surveyed, fruits and vegetables sold at Anyigba were the most contaminated (17.15%), while those sold at Bassa market were the least (8.48%). However, the differences were not significant (p >0.05).

Table 1. Distribution of Helminthic And Protozoan Egg, Cysts, Larvae And Oocyst on Fruits and Vegetables

Type of produce	Total No. Examined		Egg		Cysts		Larvae		Oocyst		Total	
	No	%	No	%	No	%	No	%	No	%	No	%
Fruits	1755		75	4.3	14	2.5	125	7.1	7	0.4	245	14.0
Vegetables	671		31	4.6	19	2.8	21	3.1	0	00	71	10.6
Total	2426		106	8.9	63	5.3	146	10.2	7	0.4	316	24.6

Table 2. Distribution of Helminthic and Protozoan Ova and Cyst on Farm Produces Sold at the three markets in Kogi

Fruit & Vegetable	Total No. Examined	I. t Ova	A. l Ova	Hook-worm ova	F. sp ova	E.v. ova	O.sp ova	S.I Ova	T.sp ova	S.s Larvae	G.l Cyst	E. h Cyst	I. b Cyst	B.c Cyst	C.M Cyst	C.Sp Oocyst	I. belli Oocyst	S.F Ova/egg	E.C Cyst
		No %	No %	No %	No %	No %	No %	No %	No %	No %	No %	No %	No %	No %	No %	No %	No %	No %	No %
Anyigba	761	10 1.31	3 0.39	1 0.13	0 00	3 0.39	0 00	2 0.26	0 00	65 854	20 261	5 0.66	2 0.26	0 00	2 0.26	1 0.13	1 0.13	0 00	0 00
Bassa/ Sheria	811	22 2.71	16 1.93	0 00	0 00	1 0.12	0 00	0 00	0 00	36 3.21	11 1.36	10 0.12	0 00	1 0.12	0 00	5 0.62	1 0.12	6 0.74	1 0.13
Dekina	854	10 1.17	0 00	0 00	15 1.95	7 0.8	11 1.29	5 0.59	1 0.12	56 6.25	4 0.47	1 0.12	4 0.47	0 00	2 0.23	0 00	0 00	0 00	2 0.23
Total	2426	42 1.73	19 0.78	1 0.04	15 0.6	11 0.45	11 0.45	7 0.29	1 0.04	147 6.06	6 0.25	16 0.66	6 0.25	1 0.04	4 0.16	6 0.25	2 0.08	6 0.25	3 0.08

A.l=Ascaris lumbricoides, E.v= Entrobium vermicularis, F.sp= Faciola species, O. sp= Opistorchis species, S.s=Strongiloides stercoralis, T sp= Taenia specie, E.h= Entamoeba histolytica, I.b Iodoamoeba buetschlii, B.c Balatidium coli

DISCUSSION

The detection of parasites on edible fruits and vegetables by geohelminth cyst and ova/ larvae possess a serious threat to public health. Majority of the fruits and vegetables are grown very close to soil and prone to contamination. This could cause infection and diseases especially when eaten uncooked. The presence of the cyst and ova of helmithic parasites in these study areas suggest that the environmental condition support the contamination of a wide range of fruits and vegetables. The cysts and ova

of *strongiloides stercoralis; Trichura and Ascaris lumbricoides*were the commonest in that order of importance in the study area. They embryonate and survive under very harsh conditions and survive in the presence of chemical lethal to other parasite egg. Cases of roundworm and *Ascariasis* diseases are among the commonest parasitic infection mildle-belt Nigeria with considerable morbidity in children and adults.

The result of heavy parasite burdens is seen in digestive and nutritional disturbances, blockages of the gurt, abdominial pain, vomiting restlessness, disturbed sleep and perforation of tissues. This study has shown a non-significant higher contamination rate of fruits than vegetables (P>0.05).This observation could be attributed to the fact that ripening and attractive succulent nature of fruits predisposes them to contamination with geohelminth parasite cyst and ova. Also the habit of seller throwing the fruit on bear ground retain some dirts which may not be easily removed by sliught washing Umoh *et al*.

Vernonia species was the most contaminated of the vegetables (18.11%) followed by the *Alliuum cepa* (15.23%). The high contamination rate observed inn these vegetables could be explained by their rough skins because the leaf folds could retain some dirt which may not be easily removed by slight washing by the sellers and street hawkers/ venders. *Piper nigrum* was the most contaminated of the fruits (7.59%) followed by *Solanium melangena* (3.28%). The high contamination rates could be attributed to the fact that *Piper nigrum* like type of vegetables are grown closer to the soil when compared with real fruit namely citrus sinensis which are higher above the soil. This finding corroborates the works of Ayras *et al* (1962) which reported that the low growth height of vegetables above soil level predisposes them to contamination with geohelminth parasite eggs during flooding and heavy rain splashing. Consequently, the fruits are contaminated during harvesting as they fall on the contaminated soil. The non-contaminated of *Corchorus olitoris* may be explained by the smooth skin nature of the vegetables which makes it easy for the eggs and larvae to be washed off.

Of the helminth cysts and ova found contamination different fruits and vegetables, S*trongyloides stercoralis, Trichuris trichura* and *Ascaris humbriocoides* are the most frequently encountered because the eggs/ova highly persistent in the environment. The second highest which is *Trichuris trichura* is a soil related helminth which has been incriminated in growth stunting even in moderately severe infections James *et al* (2006). Contamination rates in different markets show that Anyigha market had the highest rate of 17.15% followed by Dekina market with 13.69%.The differences in contamination of fruits and vegetables among the three markets could be attributed to the use of some agronomic practices.Most especially the use of organic manure like poultry dropping for crop production, level of hygiene of food handlers and weather of the areas, although the differences were not statistically significant. The Anyigba market is located in a cool environment even in dry season will favour parasite eggs and cyst to thrive. The temperature between 22 and 23 favours the development of *Trichuris* as well as *Strongyloides stercoralis*. These markets are not tidy but dirty and could accommodate many of these parasitic cyst and ova. The filthy environment and refuse heaps constitute means of contaminations of fruits and vegetables even at the point of sale where these products are displayed

CONCLUSION

Farmer's mode of farming system needed to be re-viewed, giving orientation which can reduced crops contamination. Emphasis on the mode of transmission is a veritable tool for the control of parasitic diseases, which constitute a major environmental health problem. Since both fruits and vegetables were found to be contaminated, consumers are advised to wash them thoroughly before eating or using for salad preparations. The promotion of better environmental conditions with emphasis on health education with regard to mode of transmission of the disease, environmental sanitation and personal hygiene and eating habits will enhance the prospect for the prospect for the control of parasitic infections in Nigeria

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