16

Effects of Cassava Effluent on Egbema Denizens: A Case of Mmahu Community in Egbema

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Abstract

A short period experiment was carried out to investigate the effects of cassava effluent on Mmahu residents. Two sets of the same five plants were geminated and watered with cassava effluent for 8 days. Significant results were obtained from the effluent without red palm oil. One part of the effluent had red palm oil mixed while the order one has non. Only Chromelaena odorata survived out of the five species. The survival was 5% in 100% effluent concentration, 20% survived in 75% effluent concentration, 25% survival in 50% effluent concentration while the control had 100% survival. Results from the effluent with red palm oil was not significant because all the species survived. Bad odour was perceived from a mean distance of 102.3 metres from the point of discharge of cassava effluent. This is an indication of air pollution. Oral interview to inhabitants showed that goats and sheep die when they drink cassava effluent without red palm oil. Evidently, the study showed that cassava effluent had negatives effect on Mmahu residents. The study however, recommends that appropriate waste disposal for both solid and liquid cassava effluent should be adhered to, for safe and healthy conditions within the environment.

Introduction

Mmahu in Egbema belongs to Imo State, Nigeria. It is the Local Government Headquarter for Ohaji/Egbema L.G.A Mmahu farmers produce garri which is a product of cassava. Staple foods in this community are garri, cassava fufu and yam. The main

occupation of the inhabitants is agriculture (farming and fishing) Garri is produced for subsidy within and commercial purposes for urban areas.

Cassava *(manihot esculenta)* belongs to the family euphorbiaceous. It contains poisonous substance called cyanide which is identified when processing cassava. It contains fibrous residue used in animal feed (Arguedes and cooke 1982). Evaporation of cyanide occurs during processing (Cooke and Maduagwu 1978).

Environmental problems for cyanide include negative effect on young stage of rice vegetables (Bengtsson and Trient 1994).

From the onset, government of Nigeria has encouraged the cultivation of cassava spices for domestic and international needs, for instance cassava starch mill located at Opuoma in Egbema. This has also resulted in corresponding increase in production and increasing the amount of cassava effluent discharged into the environment.

Problems:- Processing cassava at the mill releases of water effluent into the environment without proper treatment in the community. This has been identified as a source of pollutants which contaminates agricultural landscape. The effluent percolates into the under ground water and subsoil which may also have effect on plants, domestic animals and man.

Purpose:- The purpose of the study is to investigate the effects of cassava mill effluent on Mmahu denizens (soil, human animal and plants) in the processing area.

Significance:- This will enable the farmers to know the proper disposal of cassava effluent

Materials and Method

Study area was at Mmahu-Egbema in Imo State Nigeria

Three cassava mill effluents were identified and labeled A, B, and C, three other different area 12 metres away from he sites were also identified and labeled X, Y and Z to detect Odour.

Two methods were used in the study. First set of cassava mill effluent A, B, C, was not mixed with red palm oil but second set was mixed with red palm oil. The samples were collected into separate polythene bags duly labeled. Various concentrations of the two types of effluent were prepared viz 0, 25, 50, 75 and 100% going by the method described by Ogundola and Laisu (2007). Five plant species that thrive within the site of the effluent were identified:- *Sida acuta, Mimosa pudica, Euphorbia hirata, Tridax procumbens, and Chromelaena odorata.*

The plants seeds were collected and planted in the nursery for 12 days. The seeds were allowed to germinate and grow to two leaf stage each before they were transplanted into a bigger polythene bags. Sand-filled with top-soil only.

The five seedlings were in none big polythene bags though in replicates of five and designed thus A, C., D and E, in random block design.

First set was wetted with cassavas mill effluent without red palm oil the second set was wetted with cassava mill effluent with red palm oil mixed.

Bag A was wetter with 0% concentration
Bag B was wetted with 25% concentration
Bag C was wetted with 50% concentration
Bag E was wetted with 100% concentration

Each of the two experiments were evaluated at 6 week after transplanting in terms of percentage survival in each concentration. There was direct interview to the inhabitants on effects of cassava effluent without red palm oil when drank by goat and sheep. Results were statistically analysed for test of significance.

Results and Discussion

Fig 1(a):- Effects of different concentration of cassava effluent (no red palm oil) on five species of plant.

In fig 1a histogram, significance results were observed across the various concentration of cassava mill effluent used.

Chromelaena odorata had 5% survival in 100% concentration. 20% survival in 75% concentration, 35% survival in 50% concentration, others died. However, result obtained from control and 25% concentration were not significant because all the species survived.

Fig 1b Effects of different concentrations of cassava effluent (red palm oil mixed) on five species of plant.

In fig 1b histogram, there was no significant differences observed. Almost uniform pattern of growth was observed in all treatments, indicating that probably, the red palm oil may have reduced the toxic effect of cyanide content of the cassava effluent.

Effect of Cassava Mill Effluent on Air Quality

Table 1: Mean Distance(m) Covered by bad Odour of Cassava Effluent

Individuals	**Perception Distance(m) of Bad Odour from Cassava Effluent**	**Mean Distance (m)**
X Y Z	102.5 102.0 102.4	$\frac{X + Y + Z}{3}$ = 102.3

Table 2: Effect of Cassava Effluent on Domestic Animals

Animals	**Cassava Effluent**	
	No Red Palm Oil	**Red Palm Oil Mixed**
Cat	-	-
Sheep	+	-
Goat	+	-
Fowl	-	-
Pig	-	-

+ dead, - No effect

In table 1, the effect of cassava effluent on air quality was significant since the Odour could be perceived fro mean distance of 102.3 metres indicating air pollution.

In table 2, from respondent interview, it became clear that sheep and goat are very vulnerable to the take of cassava effluent. All respondents agreed that goads and sheep die when they drink cassava effluent that red palm oil was not mixed. There was no evidence of death in the case of other domestic animals.

That cassava effluent had negative effect on plants, has been established in this study. This agrees with the findings of Bengtesson and Trient (1994). They reported that cassava effluent has negative effect on growing stages of rice and vegetables.

Cassava though widely used as food has the disadvantages of containing toxic cyanogenic compounds (cock 1985, Rossling 1988) the toxic effect of the cynanogenic glycosides on human being and livestock is well known (Nestel 1973). These agreed with the findings of this study as animal and plant were affected.

Conclusion

This study concludes that cassava effluent had negative effect on Mmahu environment, animal and plants.

Recommendations

Enlightenment campaign by Agricultural extension workers, and detoxifying cassava effluent committee should take place in this community.

Appropriate method of disposal both solid and cassava mill effluent should be recommended for safe and healthy Mmahu inhabitants. This is important due to the fact that most farmers are illiterates who do not know the implication of the hazard posed by cassava effluents.

Reference

Arguedes, P; R.D. Cooke (1982), *Resdiaul Cyanide concentration during extraction of cassava starch food technology* 17:251-262.

Benigtsson, B. E; & T. Trient (1994). Trpioca-Starch waste water Toxicity characterized by Micortoz and Duck Weed Tests. *Ambio* 23:473-477

Cock, J.H. (1985). *Cassava a new potential for a neglected crop* (IADS) Delta Oriented literature series boulder and London. West Press 25-27.

Cooke, R.D; E.N. Maduagwu (1978). The effort of simple processing on the cyanide content of cassava chips. *Food tech*. 13:299-306.

Nestel, B.L. (1973). *Current utilization and forte potential for Cassava*. In Chromic cassava toxicity ed. Nestel B1 & Macin Tyre R. Ottawa international development research centre pp 11-26.

Oladele, A.O. (2007). Top ten environmental priorities for Africa. *Afr. J. Env*iron. Sci. *Tech*. 1 (2): 1.

Rossling. D.H. (1988), *Cassava toxicity and food Security 2nd ed.* A report of UNICEF, African household food security programme. International child health Unit University Hospital Uppsala Pp. 40-43.