Microbial Contamination and Antibiotic Susceptibility of Local Drinks in Elele Town Rivers State: Nigeria: A Study of Safety and Public Health Implications

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INTRODUCTION & AIM

Local refreshments possess a crucial role in cultural customs, embodying symbols of welcoming, festivity, and ancestral legacy within societies.

The aim of the study is to investigate the diversity of microbes and their susceptibility to antibiotics in frequently consumed local beverages in Elele town, Rivers State, Nigeria. The beverages investigated include soy milk, tiger nut drink, Nigerian gin (ogogoro, fermented palm wine), hibiscus drink (zobo), and lemon drink.

METHOD

Sample collection	Hibiscus drink (Zobo), Soy milk, Tiger nut, Nigerian gin (Ogogoro), and Lemon drink.
pH Measurement	a STARTER 2100 pH meter was used to determine the pH of the samples
Determination of Aerobic Plate Count	The Bacteria, Fungi and Coliform counts were determined using nutrient agar, Saboraud Dextrose agar and MaConkey agar respectively
Microbial Isolation	Identification of bacterial isolates was based on the standard cultural, morphological and biochemical methods (Cheesbrough, 2006)
Antibiotic Susceptibility Testing	The isolates were screened for antimicrobial susceptibility using the Kirby-Bauer agar disk diffusion method (CLSI, 2009).
Determination of Pathogenicity Using Animal Model (Mice)	➤ Pathogenicity testing of the isolates was carried out on mice (Ref: MAU/DRC/HD/E/2023/0350). ➤ This involved inoculating the isolates in mice followed by the determination of white blood cell counts and a histological study.

RESULTS

Table 1: pH values of the Sample Drinks

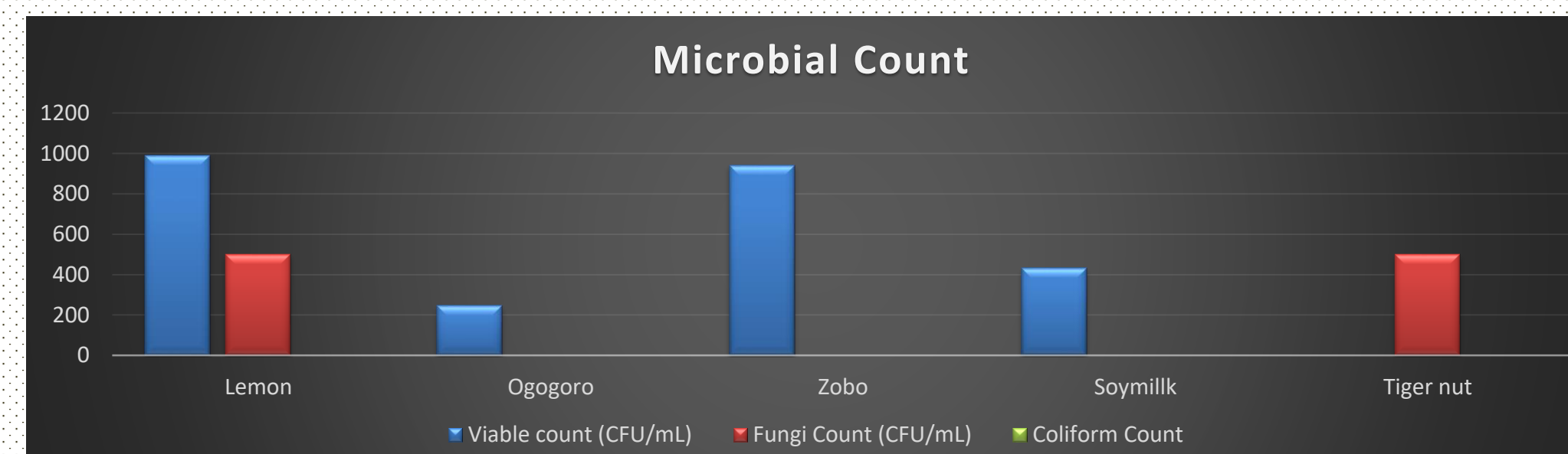| S/N	Samples	pH values
1.	Tiger nut drink	3.27
2.	Soymilk drink	3.19
3.	Hibiscus (Zobo) drink	2.31
4.	Lemon Drink	2.41
5.	Nigerian Gin (Ogogoro)	5.53

Fig 1: Microbial count of the samples

Table 2: Prevalence of the Isolates in The Sample

S/N	ISOLATES	ZOBO	OGOGORO	SOY MILK	TIGER NUT	LEMON	PREVALENCE (%)
1	Staphylococcus aureus	+	+	+	+	+	100
2	Bacillus sp	+	+	+	+	-	80
3	Shigella sp	-	+	+	-	-	40
4	Candida sp	-	-	-	+	-	20

Table 3: Multidrug-Resistant Pattern of the Isolates

S/N	ISOLATES	No of resistant antibiotics	Total Number of antibiotics used	MARI
1.	Tiger B	5	12	0.4
2.	Og Z	5	12	0.4
3.	Soy R	2	12	0.2
4.	Zobo T	5	12	0.4
5.	Soy D	7	12	0.6
6.	Soy M	8	12	0.7
7.	Og B	9	12	0.8
8.	Zobo A	5	12	0.4
9.	Tiger S	6	12	0.5
10.	Og C	8	12	0.7
11.	Lemon C	9	12	0.8

➤ The inoculation trials revealed no statistically significant ($p < 0.05$) disparities in weight and temperature among the groups.
➤ there were variations in immunological responses, indicating possible health consequences.
➤ Histopathological investigation indicated inflammation and edema in liver and stomach tissues, underlining health hazards linked with microbial infection.

CONCLUSIONS

This study underlines the significance of strengthening hygienic standards and developing effective monitoring systems in local drink production

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