Determination of heavy metals and enteric bacteria in water served for hand-washing purpose by food vendors in Ilaro

Faparusi, Foluso
Science Laboratory Technology Department,
Federal Polytechnic, Ilaro foluso.faparusi@federalpolyilaro.edu.ng

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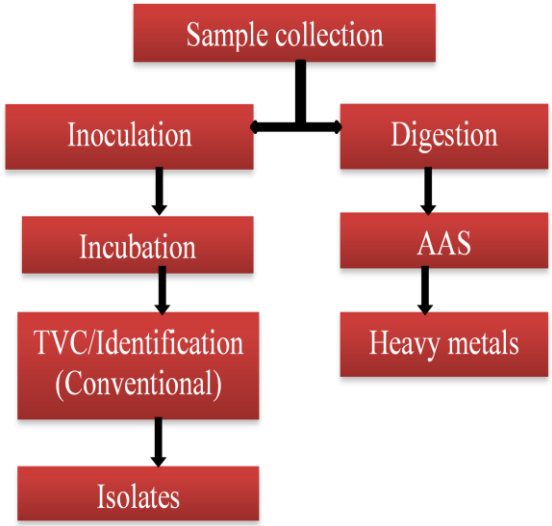
Introduction

Water is a free gift of nature and plays important roles in the life of living things (Faparusi et al., 2011). The quality of water is determined by its chemical and microbial components. Water can be contaminated with pathogens and heavy metals. Emphasis is usually on foods and drinking water safety without attention on water for washing hands.

Aim

The study aimed at determining the quality of water for washing hands in public places.

Material and Methods



Results

Table 1: Bacterial loads, heavy metals and isolates from water samples

Sample	Average Bacterial Load (cfu/ml)			Heavy Metal (mg/ml)			Isolate			
	TVC	Coliform	S/S	Pb	Cd	Cu	*Esc.*	*Ent.*	*Shig*	*Salm.*
A1	$3.1x10^5$	Nil	Nil	0.020	0.20	Nil	–	–	–	–
A2	$2.0x10^6$	$2.5x10^2$	Nil	0.020	0.15	Nil	+	–	–	–
B1	$2.3x10^6$	Nil	Nil	Nil	0.20	Nil	–	–	–	–
B2	$2.1x10^6$	$2.1 x10^2$	$2.0 x10^1$	Nil	0.21	Nil	+	–	–	+
C1	$4.0x10^6$	Nil	Nil	Nil	Nil	Nil	–	–	–	–
C2	$2.1x10^6$	$3.0 x10^3$	$3.0 x10^1$	Nil	Nil	Nil	+	+	–	+
D1	$3.0x10^5$	Nil	Nil	Nil	0.13	Nil	–	–	–	–
D2	$3.2x10^5$	$2.4 x10^2$	Nil	Nil	0.14	Nil	+	+	–	–
E1	$1.2x10^7$	$2.6 x10^2$	Nil	Nil	Nil	Nil	–	–	–	–
E2	$4.0x10^5$	Nil	Nil	Nil	Nil	Nil	–	–	–	–
F1	$4.2x10^5$	$4.0 x10^3$	$1.0 x10^2$	Nil	Nil	Nil	+	–	–	+
F2	$2.1x10^7$	Nil	Nil	0.015	Nil	Nil	–	–	–	–
G1	$2.0x10^7$	$3.0 x10^3$	$4.0 x10^1$	4.700	0.17	Nil	+	–	–	+
G2	$3.0x10^6$	Nil	Nil	4.650	0.13	Nil	–	–	–	–
H1	$3.1x10^6$	Nil	Nil	Nil	Nil	Nil	–	–	–	–
H2	$3.4x10^6$	Nil	Nil	Nil	Nil	Nil	–	–	–	–
I1	$2.1x10^7$	Nil	Nil	Nil	0.20	Nil	–	–	–	–
I2	$5.0x10^6$	Nil	Nil	0.015	0.23	Nil	–	–	–	–
J1	$4.2x10^6$	$3.0 x10^3$	Nil	Nil	Nil	Nil	+	+	–	–
J2	$2.2x10^7$	$4.0 x10^3$	$3.0 x10^1$	Nil	Nil	Nil	+	+	–	+

Key: Esc: *Escherichia coli*, Ent: *Enterobacter* Shig: *Shigella*, Salm: *Salmonella*, TVC: Total viable count, S/S: Salmonella/Shigella count, +: present and –: absent

Discussion

- Most of the water samples showed high total bacterial load, this might be due to improper treatment.
- Presence of indicator organisms and *Salmonella* could be due to contamination as a result of poor personal hygiene.
- Presence Pb and Cd in the water samples could also be due human activities and runoff.

Conclusion

The presence of *Salmonella* and heavy metals in the water samples could pose a great threat to people that patronise the food vendors.

Reference

Faparusi, F., Ayedun, H., & Bello-Akinosho, M. M. (2011). Microbial and physiochemical properties of ground water of Ilaro, South-west, Nigeria. *Int. J. Bio. Chem. Sc.*, 5(2), 500-506