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WASHING MACHINE CAN BE A HOME FOR BACTERIA

Microbiology

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ABSTRACT

Microbial(bacterial and fungal) flora can be source of numerous allergic and infective illness like skin infection, respiratory infection and others. One family used one washing machine for number of family members including children's , elder person for laundry clothes, purpose but there may be have carrier of any infection organism hence at risk acquiring this infection and it is important to major and identification of microbial bio-load. Determination of microbial contamination from textile is an important aspect of laundering part from the removal of stain and dirt from the frame work of institutional laundering is well regulated insure hygienic cleanliness. Focusing on the clinical area also considering the domestic environment which will gain importance in the future, eg. By the increase of elderly and I'll Person being cared for at home.For this determination swab were taken from washing machine indoor surface, out door surface, soft chamber surface then enriched on the culture media for the isolation and selection of microorganism and microorganisms were screened with the help of sub culturing technique. After sub culturing we were identified these microbes on the basis of biochemical tests, for this we used selective media agar plate. MacConkey's agar was used for isolation of E-coli &Mannitol salt agar was used for isolation of S.aureus In this study we identified some infection organism from washing machine bacterial isolates were identify using morphological characteristics and different biochemical tests.

KEYWORDS

Washing Machine, Surface Micro Flora, Selective Media, Pathogens

INTRODUCTION

The main task of laundering is the removal of visible stains and soil, which can be determined visually by the professional and non-professional consumer. However, the washing procedure should also lead to a hygienically clean textile surface, which includes the reduction of micro-organisms on the fabric to a level safe for use as well as addressing other adverse microbial effects, e.g. Malodorous formation. Traditionally, this issue was solved by a combination of time, temperature, mechanics and chemistry ,acting together as mean to either remove the microbial cells or kill them.

In this regard, oxidizing compounds, such as chlorine or activated oxygen bleach and temperatures of or above 60°C lay a crucial role to ensure an efficient antimicrobial action of the laundering process. In the past years especially the us of higher temperatures was aimed to be limited, thereby reducing the energy consumption but also taking away a reliable method to control microbial contamination As a consequence, it is necessary to gain a deer understanding of microbiological problems and possible counteractions to be sure to obtain a proper level of hygiene.

There are two major aspects within the laundering process from a microbiological point of view. First, the removal or inactivation of of pathogens on either washable or the washing devices itself has to be considered. This refers to cross-contamination one the one hand ,i.e. textile to textile or washing machines to textile and vice versa, as well as to an insufficient reduction of an existing bio burden. The second aspect include impairment with a lesser risk of infection, such as biofilm formation inside the washing machines and the re-contamination of already washed textiles during rinsing cycles and malodorous formation (either on the textile or in washing machine) as a consequence.

Most common human pathogens are *E. coli, Staphylococcus aureus & Pseudomonas spp.* Most *E. coli* strains are harmless, but pathogenic varieties cause serious food poisoning, septic shock, meningitis, or urinary tract infections in humans. Unlike normal flora *E. coli*, the pathogenic varieties produce toxins and other virulence factors that enable them to reside in parts of the body normally not inhabited by *E. coli*, and to damage host cells. These pathogenic traits are encoded by virulence genes carried only by the pathogens. *S. aureus* usually acts as a commensal of the human microbiota it can also become an opportunistic pathogen, being a common cause of skin infections including abscesses, respiratory infection such as sinusitis, and food poisoning. Pathogenic strains often promote infections by producing virulence factors such as potent protein toxins, and the expression of a cell-surface protein that binds and inactivates antibodies. *Pseudomonas aeruginosa* is a common encapsulated, Gram-negative, rod-shaped bacterium that can cause disease in plants and animals, including humans. A species of considerable medical importance. *P. aeruginosa* is a multidrug resistant pathogen recognized for its ubiquity, its intrinsically advanced antibiotic resistance mechanisms, and its association with serious illnesses hospital-acquired infections such as ventilator-associated pneumonia and various sepsis syndromes.

Materials and Methods:-

1. Sample collection: Four Swab samples were collected from different areas of Washing machine and labeled as I,II,III ,IV. Three swab samples were collected from one machine 1. Indoor 2.Outdoor swab sample 3. Soft chamber swab sample & labeled as (a) (b) (c). Swab samples were deepen into test tube having 1 ml saline in each

2. Enrichment of Culture:150 ml of Nutrient broth was prepared and distributed into 12 different sterile test tubes. Each of the test tube having 9 ml NB. Control was prepared by adding 10 ml of NB in 4 different test tubes. Swabs were removed & locked from saline then added to this 1 ml saline into test tube having 9 ml NB aseptically labeled as I a, I b, I c, II a, II b, II c, III a, III b, III c, IV a, IV b & IV c. Tubes were incubated at 37° C for 24 hrs & turbidity was observed after incubation

Fig:1.Domestic Washing Machine

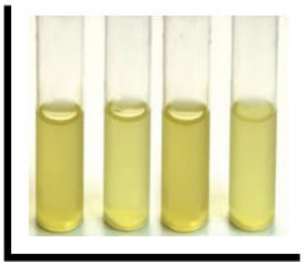


Fig:2.Enrichment of samples

3. Isolation and selection of Microorganism: Nutrient agar plates were prepared, each sample was spread on plate. Plates were incubated at 37° c for 24 hrs. Colonies were selected from each plates for Morphological, Microscopic & biochemical characterization.

4. Screening of microorganisms: Fifteen different isolated colonies were selected from Petri plates (NA) for screening the microorganism with the help of sub culturing microorganism to next NA plate. Standard culture of slants were prepared by sub culturing cultures from Petri plate with the help of nichrome loop & spreaded on slants. These slant were labeled as colony 1, colony 2, colony 3,4, 5, 6…..colony. All slants were incubated at 37° c for 24 hrs.

5. Isolation and identification of microorganism: Selection of culture media were done on the basis of colony characterization of organisms. We used selective & differential media like MacConkey's agar, Pseudomonas isolation agar and Mannitol salt agar. On MacConkey's agar medium colony 14, colony 6 were recover from these we can identify this organisms.

RESULTS & DISCUSSIONS

By using selective & differential media i.e. MacConkey's agar, Mannitol salt agar & Brilliant green Agar, we isolated and identified micro organisms.

On MacConkey's agar medium colony 6, colony 14 were recovered. Yellowish colored colonies were appeared on MacConkey's agar plate after incubation of 37° c for 24 hrs, having similarity when compared with positive control. On mannitol salt agar medium colony 5,colony 6, colony 10 were recovered from, reddish coloured medium yellowish colored colonies were observed after incubation of 37° c for 24 hrs. We were identified this organism as *S.aureus* ,when compared with positive control. On Pseudomonas isolation agar medium colonies were recovered, producing yellowish green pigmentation after incubation at 37° c for 24 hrs. compared with positive control we identified this organism as *Pseudomonas spp.* ,

On the basis of Morphological & Biochemical characteristics *E-coli , staphylococcus aureus Pseudomonas spp & Bacillus spp.* were identified from machine .

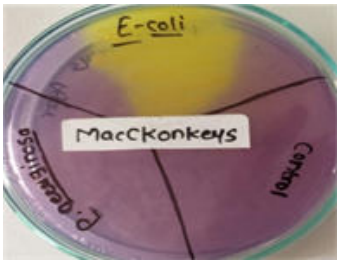


Fig:3 Isolation of *Pseudomonas spp. On* Pseudomonas Agar

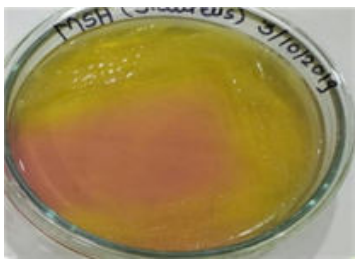
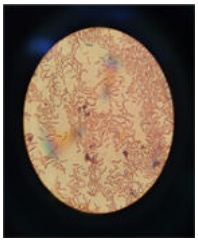
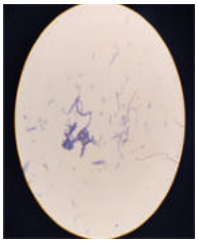


Fig:4 Isolation of *E.coli* on Mackoney agar

Fig:5 Isolation of *S.aureus* on MSA



Gram Negative isolated rods



Gram positive cocci in chain

Table: 1.Colony character's as observed as follows

Sr. Nos.	Colony Characteristics	Observations			
		Isolates-1	Isolates-2	Isolates-3	Isolates-4
1.	Grams Nature	-ve	+ve	-ve	+ve
2.	Shape	Rod	Cocci	Diplococci	Rod
3.	Motility	+ve	-ve	+ve	+ve
4.	Pigment	-ve	+ve	-ve	-ve

Fig:6. Microscopic observations :

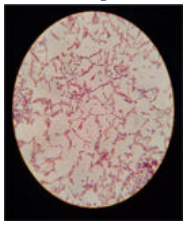


Table: 2. Biochemical Test

Sr.No.	Test	Isolates1	Isolates 2	Isolates 3	Isolates 4
1	Nitrate test	+ve	+ve	+ve	+ve
2	Oxidase test	-ve	-ve	+ve	variable
3	Cetrimide test	-ve	-ve	+ve	-ve
4	Coagulase test	+ve	-ve	+ve	+ve
5	Catalase test	-	+ve	+ve	+ve
6	Gelatinase test	-	+ve	+ve	+ve
7	Caseinase test	-ve	-	+ve	+ve
8	Amylase test	-ve	-ve	-ve	+ve
9	**IMViC test**				
A	Indole	+ve	-ve	-ve	-ve
B	Methyl red	+ve	-ve	-ve	-ve
C	Voges Proskaur	-ve	+ve	-ve	+ve
D	Citrate	-ve	+ve	+ve	-ve
10	**Sugar test**				
A	Glucose	+ve	+ve	-ve	+ve
B	Lactose	+ve	+ve	-ve	variable
C	Mannitol	variable	+ve	-ve	+ve
D	Sucrose	Variable	+ve	-ve	+ve
E	Fructose	-ve	+ve	-ve	+ve
F	Maltose	+ve	+ve	-ve	+ve

CONCLUSION

From results & observations we are concluding that the washing machine is house for the various microflora causing skin infection, allergies & pneumonia etc. Washing machine should clean frequently to avoid the disease & flow the soap of washing machine. From the above characteristics & their comparison with the standard (known) organisms we were confirmed the isolates are

Isolate No 1 – *Escherichia coli*
Isolate No 2 – *Staphylococcus aureus*
Isolate No 3 – *Pseudomonas aerogenosa*
Isolate No 4 – *Bacillus subtilis*

REFERENCES

1. Bockmohl D. (2011), Hygiene aspects in domestic laundry. Hyg Medizin (36); 280.
2. Hantges D.J.(1993),The anaerobic microflora of human body. Clin Infect Disease (16);175-180.2.Wingender J., (2011). Biofilms in drinking water and their role as reservoir for parthenogenesis, Int J Hyg Environ Health 214(6): 417-423.
3. Smith J.A., Neil K.R. and Davidson C.G., Davidson R.W. (1987),Effect of Water Temprature on Bacterial Killing in Laundry. . Infect Control 8(5); 204-209.
4. Yassin M.F. and Almouqatea S. (2010), Assessment of Air bacteria and fungi in an indoor & outdoor environment. International Journal of Environ.Sci.Tech 7(3); 535-544.
5. Cox C.S. and Walthes C.M.(1995). Bioaerosol handbook NY: Lewis Publishers.