

Isolation of bacteria from allopathic and ayurvedic syrups used for UTI and diarrhoea

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ABSTRACT

Syrups are used as the flavouring, colouring and sweetening agents in oral pharmaceutical products. I conducted my research on isolation & identification of bacteria found in Allopathic & Ayurvedic syrups. A total of 30 samples of syrups purchased from different medicine store of Paonta Sahib Market. The samples were processed for further dilutions (10⁻¹-10⁻³) in 9ml distilled water & put into Nutrient agar plates by spread plate method. After that colony was propagate in Nutrient broth followed by culture on Selective Media- EMB, MacConkey, BSA, XLD, MSA etc. All isolates have their own morphological characters. I isolated 39 isolates in which 18S.aureus, 8Salmonella, 4E.coli, 5Pseudomonas were taken. These all pathogenic bacteria cause microbial contamination in syrups samples in pharmaceutical industries.

Keywords: Syrups, medicine store, bacteria, microbial contaminants.

Introduction

Syrups are the concentrated solutions of sugar formulated as an oral medicament used as therapeutic agent in disease. Non-sterile liquid pharmaceutical dosage is the form of syrups. Drugs are the chemicals which is used in the treatment, cure, prevention or diagnosis of disease to enhance physical or mental well-being[1,5]. Drugs are the chemical compounds to be used on human or animals to diagnosis, prevention of diseases or other abnormal conditions to relieve pain or suffering or to control any physiological or pathologic conditions. Drugs are the chemical substances which may be affect the body. They are used to modify physiological system for the benefit of recipients. More dilute syrups can prove to be good media for microbial growth and require the addition of preservatives. The organisms were isolated from the syrups are-*E. coli*, *Klebsiella*, *Salmonella*, *Staphylococcus*, &*Pseudomonas*[2]. *E.coli* is gram -ve, rod shaped bacteria. It is commonly found in the lower intestine of warm blooded animals

It is isolated on EMB & MacConkey agar. When syrups sample is streaked on Selectivemedia-EMB and MacConkey agar plates, it gives Metallic green colonies on EMB & pink coloured colonies on MacConkey agar. *Salmonella* is gram -ve, rod shaped bacteria. It is found in the intestine of warm & cold blooded animals. It is isolated on XLD & BSA agar. It gives red with black centre coloured colonies on XLD agar & Black with metallic sheen on BSA agar. *Pseudomonas* is a gram -ve, rod shaped bacteria found in environment like soil, water. It is isolated on PIA agar. It gives green colour colonies on PIA agar. *Klebsiella* is a non-motile, gram -ve, rod shaped bacteria. It is found in normal flora of moth, skin & intestines. It is isolated on KIA, MacConkey agar. It gives Mucoid colonies on MacConkey agar & Creamy colour colonies on KIA agar. *Staphylococcus* is a gram +ve, cocci bacteria. It is found on Human Respiratory Tract & on the skin. It is isolated on MSA agar. There are two species of *Staphylococcus* i.e. *S. aureus* gives yellow colonies & *S. epidermidis* gives pink colonies on MSA agar [3-5]

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Materials and methods

Sample Collection: The 30 samples of Ayurvedic and Allopathic syrups were collected from the different

medicine store of Paonta Sahib used for the disease- Drug Resistance).
Diarrhoea and UTI for the isolation of MDR (Multi-

Table 1: Showing Syrups Profile

S. No.	Sample No.	Sample Name	Ayurvedic/Allopathic	Disease
1.	S-01	Hempushpa	Ayurvedic	UTI
2.	S-02	Arvindasava	Ayurvedic	Diarrhoea
3.	S-03	K-UTI	Ayurvedic	UTI
4.	S-04	Alkamax	Allopathic	UTI
5.	S-05	Megstone	Allopathic	UTI
6.	S-06	Dysenterol	Ayurvedic	Diarrhoea
7.	S-07	PowerGyl	Allopathic	Diarrhoea
8.	S-08	Zn-20	Allopathic	Diarrhoea
9.	S-09	Of lox OZ	Allopathic	Diarrhoea
10.	S-10	Cital	Allopathic	UTI
11.	S-11	HC	Ayurvedic	UTI
12.	S-12	URAL	Ayurvedic	UTI
13.	S-13	Rinifol-Z	Allopathic	Diarrhoea
14.	S-14	Walamycin	Allopathic	Diarrhoea
15.	S-15	Nephrol	Ayurvedic	UTI
16.	S-16	Alkamax-MB	Allopathic	UTI
17.	S-17	Citralka-Liquid	Allopathic	UTI
18.	S-18	Amydio	Ayurvedic	Diarrhoea
19.	S-19	Diarex	Ayurvedic	Diarrhoea
20.	S-20	Sandu-Berb	Ayurvedic	Diarrhoea
21.	S-21	Flagyl	Allopathic	Diarrhoea
22.	S-22	Oflotas-OZ Suspension	Allopathic	Diarrhoea
23.	S-23	Trustogyl	Allopathic	Diarrhoea
24.	S-24	Martigyl	Allopathic	Diarrhoea
25.	S-25	Z-Gyl-P	Allopathic	Diarrhoea
26.	S-26	Necflo-M	Allopathic	Diarrhoea
27.	S-27	Mustakarishhta	Ayurvedic	Diarrhoea
28.	S-28	Kutajarishhta	Ayurvedic	Diarrhoea
29.	S-29	Flobid-OZ	Allopathic	Diarrhoea
30.	S-30	Diagon	Allopathic	Diarrhoea

Sample Processing: 1ml sample were taken for dilutions (10^{-1} - 10^{-3}) in 9ml distilled water blanks aseptically. **Isolation of Bacterial Species:** -Isolation was done by spread plate method on Nutrient agar. Incubate the plates at 37° for 24hrs. After that pick the colony from NA plate & put into Nutrient broth tube & then incubate the tube at 37° c for 24 hrs. Streak the culture on selective media plates i.e. EMB, MacConkey, MSA, PIA, XLD, and BSA. Incubate the plates for 24hr. at 37° c. Identify the microorganisms on the basis of colony grow on the selective media [6-8].

Characterization of Species:

Physical Characterization: Gram Staining: It is a method of differentiating bacteria into two groups (Gram positive & Gram negative) based on the

presence of high level of peptidoglycan, & physical properties of cell walls.

Cell Morphology: They are identified on the basis of their colour & morphology. The gram stained cells were viewed under microscope to determine their shape and size of the cells.

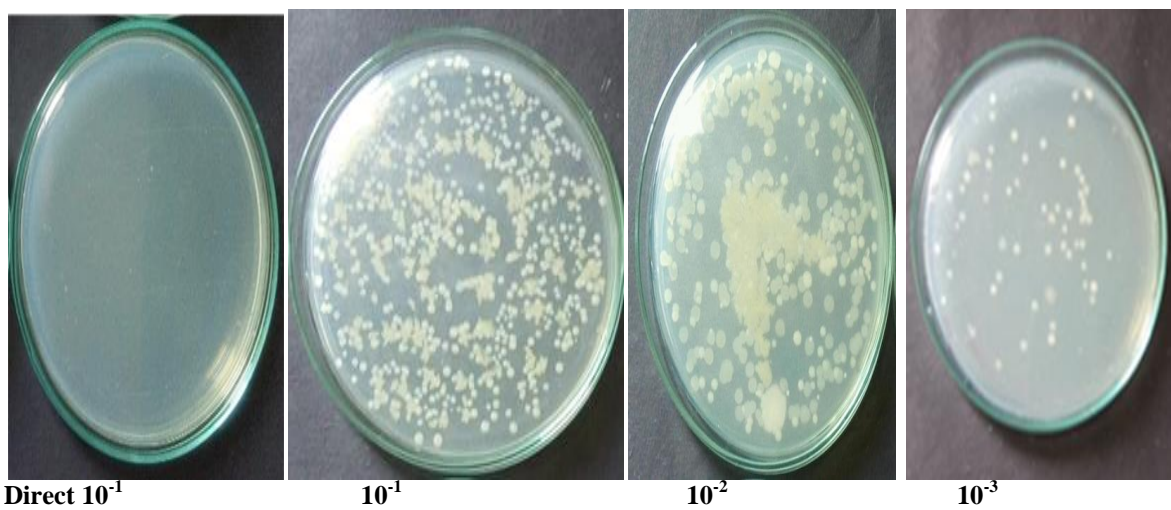
Results

Total sample processed: Total 30 samples of Ayurvedic and Allopathic Syrups were processed.

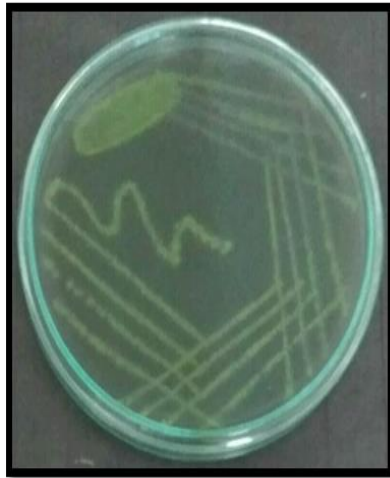
Isolation and Bacterial Count: Total 39 isolates were recovered from Syrups samples. The samples were collected from various shops of Paonta Sahib.

Table 2: Total bacterial count of Syrups sample

S.No.	Sample No.	Staphylococcus	E.coli	Pseudomonas	Salmonella
1	S-01	+	-	+	+
2	S-02	+	-	-	-
3	S-03	-	-	-	-
4	S-04	-	-	-	-
5	S-05	+	-	-	-
6	S-06	+	-	-	-
7	S-07	-	-	-	-
8	S-08	+	-	-	+
9	S-09	+	-	-	+
10	S-10	+	-	-	+
11	S-11	+	-	-	-
12	S-12	-	-	-	-
13	S-13	+	-	-	-
14	S-14	-	-	-	-
15	S-15	+	-	-	+
16	S-16	+	-	-	-
17	S-17	+	-	-	-
18	S-18	+	-	-	-
19	S-19	-	-	-	-
20	S-20	+	-	-	-
21	S-21	+	+	+	+
22	S-22	+	+	+	+
23	S-23	+	+	+	+
24	S-24	+	+	+	+
25	S-25	-	-	-	-
26	S-26	-	-	-	-
27	S-27	-	-	-	-
28	S-28	-	-	-	-
29	S-29	-	-	-	-
30	S-30	-	-	-	-

**Fig 1: Overloaded bacterial count of syrups sample**

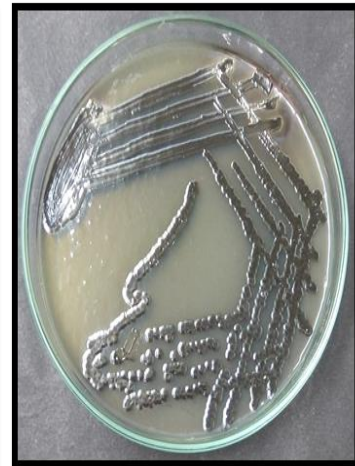
Identification of Bacteria on Selective media



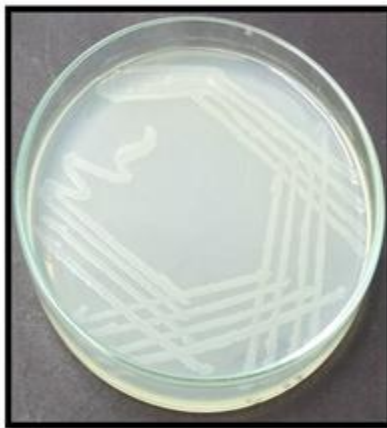
E.coli on EMB



Staph on MSA



Salmonella on BSA



Pseudomonas on King's



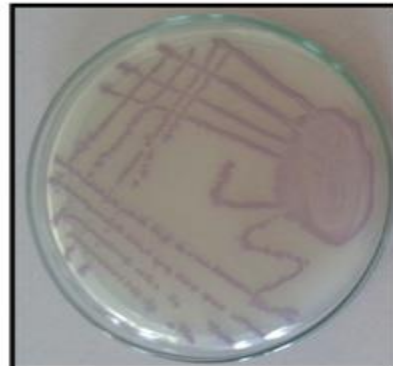
Klebsiella on MCK



Salmonella on XLD



Pseudomonas on PIA



Klebsiella on KIA

Fig 2: Identification of bacteria on selective media

Table 3: Showing colony colour on Selective media

S.no.	Media	Bacteria	Colony colour
1	EMB	E.coli	Metallic green
2	MacConkey	E.coli	Pink Colour
3	MSA	Staph	Yellow Colour
4	KIA	Klebsiella	Creamy Colour
5	MacConkey	Klebsiella	Mucoid pink Colour
6	XLD	Salmonella	Yellow with black centre
7	BSA	Salmonella	Black with Metallic sheen
8	PIA	Pseudomonas	Green Colour
9	King's medium	Pseudomonas	Colourless

Discussion

The samples were collected from the various medical stores of Paonta Sahib. Table 1 showed different syrups samples used indicating their detailed profile of syrups. In this research, it was revealed that, out of 30 syrups sample, I isolated 4 *E. Coli*, 18 *S.aureus*, 5 *Pseudomonas* & 8 *Salmonella*. The bacterial pathogens identified include *E.coli*, *S. aureus*, *Pseudomonas*, *Salmonella* reported to be the most frequent in syrups.

Conclusion

It concludes that the bacterial load of Ayurvedic syrups is more than the Allopathic syrups. This shows that the Ayurvedic syrups are not safe for the human consumption and can cause serious disease in human as compared to Allopathic syrups. The bacterial contamination was found to be greater in the Ayurvedic syrups. This study concludes that all brands of syrups examined contaminated which might be due to poor hygienic conditions

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Conflict of Interest: Nil

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