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Isolation of Micro-organisms From Soft Drinks and Fruit Juices and Their Impacts on Human Health.

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ABSTRACT

The soft drinks sector is one among the fastest-growing, most innovative, and fast changing areas of the food and drink industry. The aim of present work was isolation and identification of micro-organisms and chemicals which may lead to various health problems from soft drink and fruit juice. Samples was collected from different location of Nanded which contains 4 carbonated soft drinks of different brands. And, Apple Juice, Orange Juice and fruit beer from local market. We collected different samples of soft drinks and fruit juices with a specific dilution for testing. After testing us observed different types of micro-organisms such as-*Staphylococcus aureus*, cocci shaped bacteria, Bacillus etc. The most prevailing bacterial isolates were *glucanobacter sp*., *Lactobacillus sp*. And next prevalent bacterium was *leuconostoc sp*. Some fungi were also observed in the sample such as *Penicillium Expansum, Penicillium roquefori, Penicillium Glabrum.*

Keywords: Carbonated Soft drinks, microorganisms, fruit juices, contamination.

INTRODUCTION

Soft drink industry is growing industry and fruit juices are important role in growth and development (Endrizzi et al., 2009). It is responsibility of food industry and government to provide healthy and nutritious food to public. Fruit production is seasonally but consumption is throughout the year, due to storage of fruit it produces undesirable changes, due tremendous chemical changes Bacteria, yeast and fungi attacks on fruit. (Chen et al., 2010; Guillotin et al., 2009; Petrisor et al., 2010).

For the soft drink containers are used for packing to keep liquid food material safe, but due to packaging materials, packaging equipment, through workers contamination may occur. The second reason may be microbial contamination of fruits pertains to their post-harvest handling and through enzyme preparation for

food processing (Fernandes 2010). Pasteurization of fruit juice reduces the bacterial content Fruit juices are sterile by brief pasteurization as the pH is low. (Kisko and Roller, 2005).

Nzeako and Al- Hashimi (2006) describe the risk of infection in juice manufactured and objectionable filling into containers. The damage of microorganisms by heat follows a logarithmic relationship. Thus, there is always a chance that a spore will survive the process. Commercial sterility indicates that conditions within the product after processing are unfavourable for the outgrowth of any surviving spores. More so, obligate anaerobes constitute a crucial group of food spoilage and gastrointestinal disorder organisms. These organisms grow in the absence of free oxygen and require a low oxidation-reduction potential in the medium. It is important that researchers inquire and make recommendations to avert possible outbreak of food poisonings in retailed fruit juices. We envisaged the need to examine causative agents of deterioration in packed fruit juices. The aims of this research are to enumerate, isolate and identify microbiological quality indicators of food drinks and to predict microbiological safety of the samples used.

MATERIAL AND METHODS

Sample Collection and Processing

A total of 4 carbonated soft drinks of different brands viz.,Sip-on, Apple Juice, Orange Juice, Coca cola from different Manufacturing beverage industries in Karnataka, Mysore, Chittoor in India were collected. PH value s of the sample are noted. 120 µl of each sample was plated on LB Agar plates and incubated at 36ºC overnight and observed for bacterial growth. Similarly samples were plated on Saboraud's agar plates at room temperature for fungal growth and on Potato Dextrose agar medium for growth of Yeasts.

Isolation and Enumeration of bacteria was done by the method of Jayakshmi et. al. 2011. Morphological characterisation was observed, samples were identified by IMVIC. TSI confirmed by test starch hydrolysis catalase test, Urease test, TSI test.

Ingredients present in samples:

SR NO.	**Sample Name**	**Ingredients Present**
1	Thumps Up	Carbonated water, Sugar, Acidity Regulator(E338), Natural Colour (150d), Flavours(Natural/Artificial),caffeine
2	Sprite	Carbonated water, Citric acid, Natural flavours, Potassium citrate, potassium Benzoate, Aspartame, acesulfame potassium
3	Frooti	Mango pulp, water, Sugar, Citric acid, Ascorbic acid, Salt, Colouring and flavouring reagents
4	Rim-Zim	Carbonated Water, Sugar, Salt, Acidity Regulator(330) and Preservative(211),Natural colours(150d),Added flavours(natural and nature identical substance)
5	Apple Juice (Local Brand)	Water, Apple Juice concentrate, Ascorbic acid(Vitamin-C)
6	Orange Juice (Local Brand)	Filtered Water, premium concentrated orange juice less than 1% of calcium phosphate and calcium lactate (calcium sources,Vitamin-D3)
7	Fruit Beer (Local Brand)	Wheat extract, Frozen blackberries, Amber Dry Malt extract, Carapil Malt, Corn Sugar for priming, Hallatter Hops, Saaz Hops, Irish Moss, yeast #3056 and Starter

RESULT AND OBSERVATION

A total of s carbonated soft drinks from different brands and fruit juices were tested in our laboratory by applying various methods and processes. We collected different samples of soft drinks and fruit juices with a specific dilution for testing. After testing us observed different types of micro-organisms such as- *Staphylococcus aureus*, cocci shaped bacteria, Bacillus etc. The most prevailing bacterial isolates were *glucanobacter sp*., *Lactobacillus sp*. And next prevalent bacterium was *leuconostoc sp*. Some fungi were also observed in the sample such as *Penicillium Expansum, Penicillium roquefori, Penicillium Glabrum.*

We also found some chemicals like sodium Benzoate reduces the potassium in our body, this increases the chances of rashes of Asthma, and eczema. Soft drinks also found reactive solvents which affects the mouth

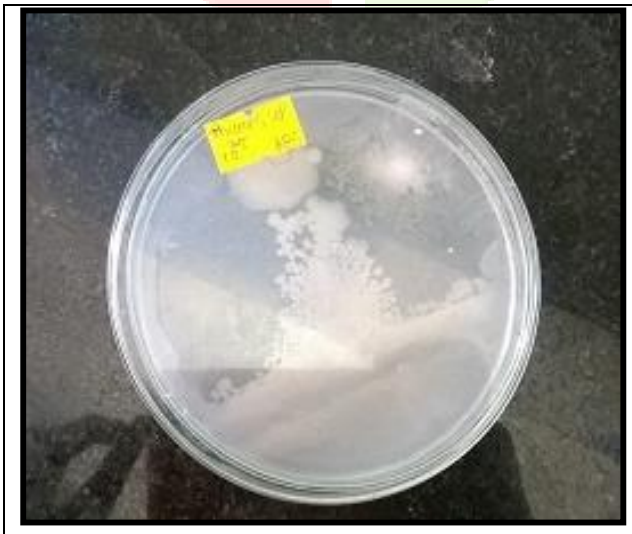
and teeth. Also found phosphoric acid disturb the digestive system and supportive organ. The soda cans contain resin which is cancer causing element.

Observation table

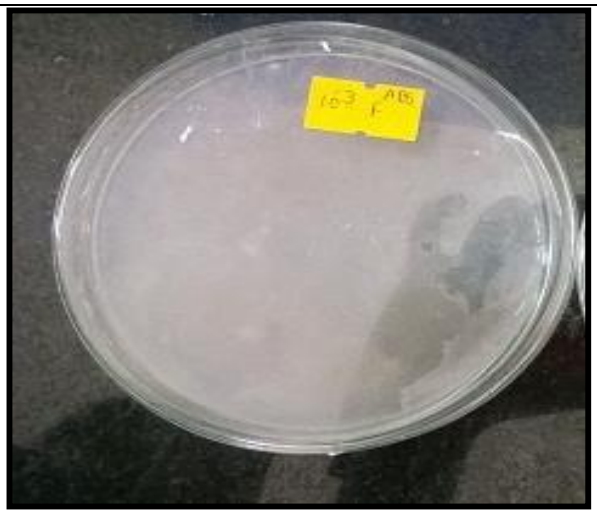
Sr No.	Kind of Samples	Dilution	Incubation period	Microbial diversity
1	Coca Cola	10^{-1}-10^{-9}	24-Hours	Observed
2	Sprite	10^{-1}-10^{-9}	24-Hours	Observed
3	Frooti	10^{-1}-10^{-9}	24-Hours	Not Observed
4	Apple Juice	10^{-1}-10^{-9}	24-Hours	Observed
5	Orange Juice	10^{-1}-10^{-9}	24-Hours	Observed
6	Rim Zim	10^{-1}-10^{-9}	24-Hours	Observed
7	Fruit Beer	10^{-1}-10^{-9}	24-Hours	Observed
8	Thumps Up	10^{-1}-10^{-9}	24-Hours	Observed

CONCLUSION

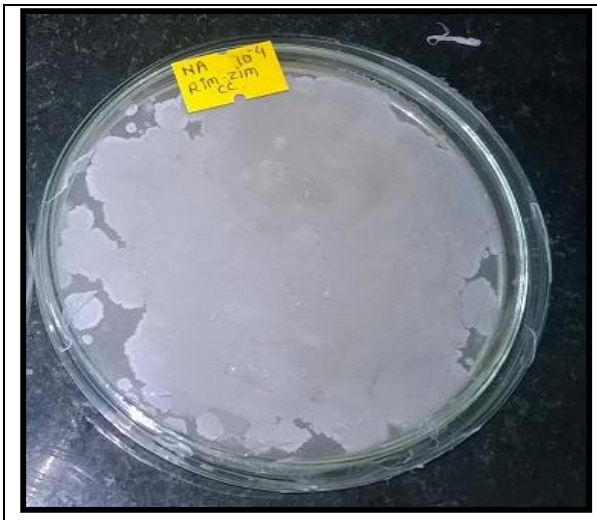
From the above study we conclude that the various types of carbonated soft drinks and fruit juices may contain different types of micro-organisms which may cause various types of health problems in humans. Hence, we have to take care of not consume these types of carbonated soft drinks and fruit juices at high intake.



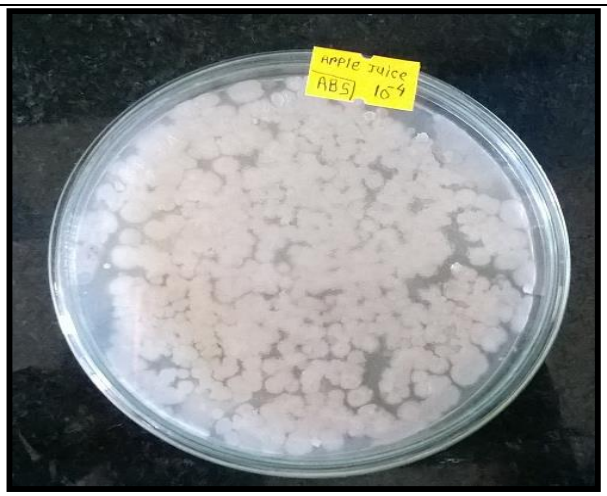
Presence of micro-organisms in Thumps up sample.



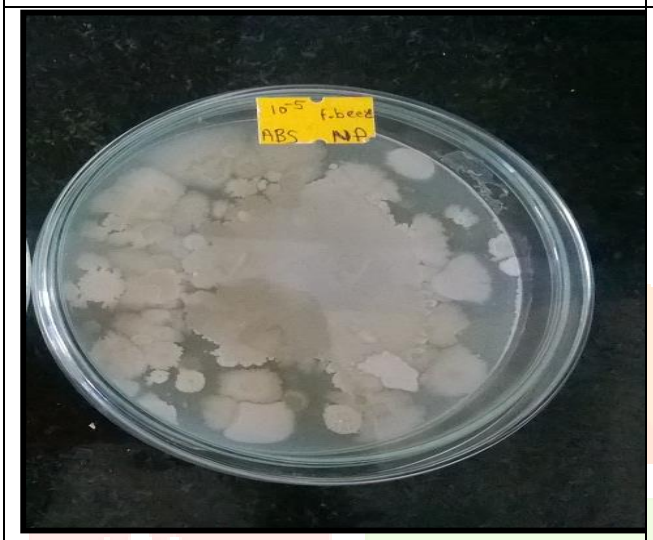
Presence of micro-organisms in Thumps up sample.



Presence of micro-organisms in Rim- zim sample.



Presence of micro-organisms in Apple juice.



Presence of micro-organisms in Fruit beer.

Presence of micro-organisms in Orange juice.

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