



Microbiological Evaluation and Antibacterial Properties of Toothpaste

K. S. MAPARI, GARODE A. M.

P.G.Department of microbiology, Shri. Shivaji Science College, Chikhli, Buldana, Maharashtra, India

ABSTRACT

The Present study was carried out to assess the microbiological properties & evaluation of antibacterial properties of toothpaste. Four branded toothpaste were purchased from the market and transferred to the laboratory for microbiological examination & antibacterial properties as to study. The assessment performed viable microbial count like Standard Plate Count, isolation of pathogens on selective media, gram staining, endospore staining, Biochemical test, enzyme test, antibiotic test by disc diffusion method etc. Standard Plate Count shows bacterial growth on some sample & coliforms growth. Pathogenic microbes *S. aureus* & *E. coli* were isolated in some samples. Antibiotic sensitivity test by disc diffusion method shows the clear zone of inhibition on EMB & MSA. That indicates the extent of the test organism is inability to survive in the presence of test antibiotic.

I. INTRODUCTION

Toothpaste is a paste thick; soft moist substance used on a brush for cleaning one's teeth. Toothpaste is used to promote oral hygiene it serves as an abrasive that aids in removing dental plaque & food from the teeth assist in suppressing halitosis & deliver active ingredients to help to prevent tooth decay & gum diseases. Salt and sodium bicarbonates are among materials that can be substituted for commercial toothpaste.

Apart from water toothpaste contains variety of components. The three important ones being abrasive. (Origin of heavy metals) flavors, sweeteners / binding agents/preservative) when considering the nature of toothpaste it prompts a suitable environment to grow & create product spoilage are health risk to human. Therefore one of the important parameters is to study the bacteriological examination of toothpaste.

II. MATERIAL & METHODS

The nutrient medium such as MSA, BSA, EMB, CA, MacConkey broth, Nutrient agar & reagents used are of Himedia India.

Sample Collection:

Four branded sealed samples of toothpaste are purchased from market and taken to microbiological laboratory for bacteriological investigation.

Methods:

A. Plate count by Standard Plate Count method was carried out to analyze four toothpaste samples.

B. All toothpaste samples inoculated on following selective media and other nutrient medium for isolation of pathogenic and coliform bacteria. The bacteria isolated was identified by gram staining, endospore staining, biochemical test and enzyme test.

C. Antibacterial test of toothpaste is done by disc diffusion method.

Observation:

Enumeration of bacteria by Standard Plate Count

Table 1. Growth on selective media

sample	MSA	BSA	EMB	CA		Macconkeybroth
	s.aureus s.typhi	E. coli	pseudomonas	coliforms		
1	Positive	Nil	Negative	Nil		Positive
2	Positive	Nil	Positive	Nil		Positive
3	Positive	Nil	Negative	Nil		Positive
4	Positive					

All the four samples shows growth of *S. aureus* on MSA which is confirmed by biochemical test sample no 2 and sample no 4 shows the growth of *E. coli* in Eosin methylene Blue agar which is confirmed by biochemical test *S. typhi* and

Table 2. Isolation of pathogens on selective media

Sample no	No Of colonies			No of bacteria / gram of sample
	1:10	1:100	1:1000	
1	2	20	75	25673.3
2	0	0	63	21000
3	120	240	300	1008400
4	0	0	40	13333.3

Result :

All the four toothpaste samples plated by spc was incubated at 37 °C for 24 hrs. with dilution 1:10, 1:100, 1:1000, 1:10000 shows growth for colonies in sample no.3 and sample no 2 and sample no 4 shows growth of colonies only in dilution 1:1000

Table 3

Serial.no	Zone of inhibition Growth (mm)			
	E.coli	S.aureus	Pseudomonas	S.Typhi
1	8 m.m.	Nil	Nil	Nil
2	4 m.m.	6 m.m.	Nil	Nil
3	5 m.m.	4 m.m.	Nil	Nil
4	7 m.m.	5 m.m.	Nil	Nil

Result :

All the four samples shows zone of inhibition for *E. coli*, sample number 2 sample number 3 & 4 shows zone of inhibition for *S. aureus*.

III. CONCLUSION

The Standard Plate Count for viable heterotrophic bacteria shows significant no of bacteria in all the 4 branded sample. In all brands *pseudomonas* and *salmonella* are not found according to ISI standards the total aerobic heterotrophic bacteria showed not exceeds more than 100 CfU & *E. coli* & *salmonella* showed about in 10 gm of toothpaste sample. Unfortunately *E. coli* was found along with *S. aureus* in all four brands. Therefore it is concluded that these brands of toothpaste provides suitable environment for growth of microorganisms and create health risk to human.

IV. REFERENCES

- [1]. K.G. Sapumohetti and et.al. chemical & microbial analysis of toothpaste available in leading supermarket in Sri Lanka.
- [2]. Adejumo O. E, George Tailor O. M. Kolapo A. L. Olubamiwa A. O. Fayokun R and
- [3]. Alawode O. A. (2009): Determination of fluoride concentration in various brands of
- [4]. Toothpaste marketed in Nigeria using ion selective electrode method *Advances in Medical and Dental Sciences*. 3(2):46-50