

## Antagonistic activity of curd against selected clinical pathogens

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### ABSTRACT:

Probiotics are microorganisms associated with the beneficial effects for humans and animals, contribute to intestinal microbial balance and play an important role in maintaining health. Antagonism a property of microorganisms which enables one microorganism to kill, injures, or inhibits the growth of a different microorganism. Curd -diary product obtained by curdling (coagulating) milk is widely used as a probiotic food now a days. The antagonistic activity of curd against some clinical pathogen is tested by agar well diffusion method on nutrient agar plates. The antagonistic effect of curd is mediated by lactic acid bacteria (LAB), through various factors like low pH, various organic acids bacteriocin production etc.

**KEY WORDS:** Probiotics, antagonism, curd, Nutrient agar

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### I. INTRODUCTION

**Probiotics** ('for life'), which is used to name microorganisms that is associated with the beneficial effects for humans and animals. These microorganisms contribute to intestinal microbial balance and play an important role in maintaining health. The probiotic microorganisms consist mostly of the strains of the genera *Lactobacillus* and *Bifidobacterium*, but strains of *Bacillus*, *Pediococcus* and some yeast have also been found as suitable. Probiotics have been extensively used in order to prevent and treat inflammatory bowel diseases. The mechanism of action of these beneficial microbes includes changes in the gut microbial environment, stimulation of the host immune responses, reduction of the oxidative stress due to their antioxidant properties and antioxidant enzyme production.

**Antagonism** a property of microorganisms which enables one microorganism to kill, injures, or inhibits the growth of a different microorganism. Bacterial antagonism is the inhibition of one bacterium by products of other. Curd -diary product obtained by curdling (coagulating) milk with rennet or an edible acidic substance such as lemon juice or vinegar- is a probiotic food that shows efficient microbial antagonism. According to Ayurveda curd is sour (amla) in taste .it absorbs water from intestine by virtue of property; it is widely used to treat diarrhea and dysentery. Curd mainly contains lactic acid bacteria (LAB) whose count increases during fermentation. These organisms belong to beneficial and non pathogenic genera & produce a number of organic compounds that are antagonistic to other microbes which makes it to be used in the treatment of diseases of duodenum and urinary bladder.

### II. MATERIALS AND METHODS

#### Sample Preparation

To prepare curd samples cow milk were collected from various areas; the samples were stored in sterile bottles. It was allowed to ferment naturally by incubating 2-3 days.

#### Collection of pathogen

In the present study the antagonistic effect of curd was tested against different bacterial pathogens. The bacterial strains used were collected from Aswini Lab and Diagnostics, Calicut. Among these two pathogens were resistant strains, methicilin resistant *Staphylococcus* and *Klebsiella* and the other pathogens were *Escherichia coli*, *Staphylococcus*, *Klebsiella*, *Pseudomonas*, and *Proteus*.

#### Inoculum Preparation

To study the antagonistic effect of curd samples the pathogens inoculum were prepared in nutrient broth by incubating for 24 hrs. Serial dilution of the inoculum was done by adding 0.5 ml of bacterial suspension to 4.5 ml of sterile distilled water upto the final dilution of  $1 \times 10^{-4}$  is obtained.

#### Antagonistic activity of curd

The antagonistic activity of curd is tested by agar well diffusion method. The serially diluted samples were spread on nutrient agar plates by using a glass spreader. Wells were made at the center of these plates by using a well borer of appropriate diameter and 0.3 ml of the curd samples was added. The plates were incubated at 37°C for 24 hours. The diameter of clear zone of inhibition around the well were measured and tabulated on Table number 1. A plate with vacant well (without curd) can be used as a control.

### III. RESULT AND DISCUSSION

Organism	Zone diameter (mm)
<i>E coli</i>	23
<i>Pseudomonas</i>	22
<i>Proteus</i>	19
<i>Klebsiella</i>	18
<i>Staphylococcus</i>	21
<i>MRSA</i>	24
<i>MRKlebsiella</i>	22

**Table 1.** antagonistic effect of curd against some common clinical pathogens

The antagonistic effect of curd with probiotic potential against some common clinical pathogens like *Pseudomonas*, *Klebsiella*, *E coli*, *Staphylococcus*, *Proteus* and also against antibiotic resistant strains like methicillin resistant staphylococcus and *Klebsiella* (resistant strain). The whole curd samples were found to have antagonistic activity against different pathogens tested. Most of them showed clear zones of inhibition on incubation. The diameters of inhibition zone were between 0-40mm. Among this, curd is more effective against *E coli* and showed clear zone of inhibition in a range of 17 – 30 mm. *E. coli* are the most susceptible organism, which showed even sensitivity to every curd samples under test. *E. coli* being the major cause of traveler's diarrhea being the major contaminants of water. The least antagonistic action or zone of inhibition was found in *Proteus* (7 mm). The antagonistic activity of curd against antibiotic resistant strains of *Klebsiella* and MRSA are 24mm and 22 mm respectively.

### IV. CONCLUSION

It is heard over years that curd has the potential to cure many intestinal diseases and support health and now a days it is considered as good probiotic food. The antagonistic effect of curd is mediated LAB, through bacteriocin production and other various factors like low pH, various organic acids etc. Also curd is a well-accepted food among every class of people (vegetarians and non-vegetarians). Thus, paving way for mass public health improvement by a simple food habit which needs further more detailed study in future.

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