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EFFECT OF CAFFEINE ON *BACILLUS CEREUS*

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ABSTRACT

The research work presented in this paper is Effect on caffeine on the growth of Staphylococcus aureus microorganism. Caffeine is a plant alkaloid which are found in more than 60 plant species just like coffia arabica (Coffee), Thea sinensis (Tea plant). It is plant product that is most commonly found in coffee beans, tea, cocoa and chocolates. Caffeine is also found in some prescription and non-prescription drug including cold, allergy and pain relievers. And it is mostly used by human. In this experiment we extract the caffeine from coffee powder using organic solvent (Ethyl acetate). The effect of caffeine was studied on Staphylococcus aureus. The caffeine proved the result show as Antibacterial agent.

KEYWORDS: BACILLUS CEREUS.

INTRODUCTION

Caffeine (1, 3, 7-trimethylxanthine) is a plant product which is extracted from plant like Coffee, Tea etc. It is used in beverages like coffee, tea, caffeinated soft drinks and cola. It is a potent stimulant that enhances alertiveness, anxiety. Caffeine concerns as a psychotropic drug which is prescribed by Doctor for reducing headache and mental stress. The long term consume of caffeine, it shows as side effect like memory loss, increased cloudiness of the brain, increase the chances of headache. [1]

MATERIAL AND METHODS

Coffee: The branded coffee powder was taken.

Micro-organisms: *Bacillus cereus* is an endemic, soil-dwelling, Gram-positive, rod-shaped, motile, beta hemolytic bacterium. Some strains are harmful to humans and cause food borne illness, while other strains can be beneficial as probiotics for animals

Experimental: The caffeine was extracted from the coffee powder by using organic solvent Ethyl acetate [2] and prepared 150ml nutrient broth as control only

with *Bacillus cereus* and another with caffeine. Both were incubated in B.O.D. incubator at 35°C.

RESULT AND DISCUSSION

Results are shown in tables 1 and comparative growth of *Bacillus cereus* is shown in figure 1.

TABLE:

OPTICAL DENSITY(O.D.)at 570nm						
sample	0 hour	4hours	11hours	15hours	26hours	30hours
1	0	0	0	0	0	0
2	0.03	0.05	0.07	0.09	0.08	0.06
3	0.61	0.65	0.58	0.58	0.57	0.57

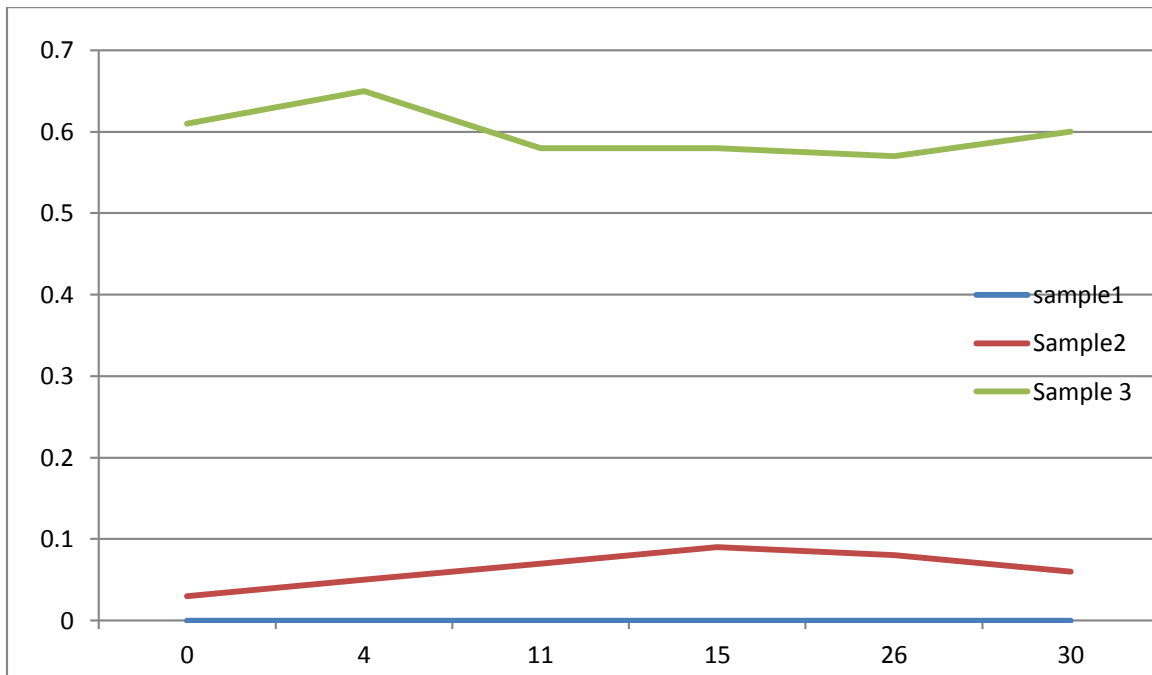


Figure: 1 show the growth curve of *Bacillus cereus*.

We had extracted **0.65grams Caffeine** from **150grams** Coffee powder. It was studied against (*Bacillus cereus*) to see its effects on its growth.

In reference to the observation table & figure 1, control sample the initial O.D. (optical density) was **0.03** at **570nm wavelength** .O.D.was taken at different interval 4, 11,15,26,30 hours. Initial O.D. of control with *Bacillus cereus* was 0.03 and sample with *Bacillus cereus* and caffeine was 0.61.Here there was no growth in both sample. After 4hours the O.D. of control with *Bacillus cereus* was 0.05 where as O.D. of sample with caffeine and *Bacillus cereus* was 0.65. These O.D. indicates that the growth of this microorganism occurs in both samples. Then O.D. of control with *Bacillus cereus* was 0.07 after 11 hours while the O.D. of sample with caffeine was 0.58.here in control, *Bacillus cereus* has normal growth but in sample with caffeine the growth was decreasing. After 15hours the O.D. of control was 0.09 where as the O.D. of sample with caffeine was 0.58.The O.D. of control showed that the growth of *Bacillus cereus* was in stationary phase but the O.D. of sample with caffeine showed no growth. After 26hours, the O.D. of control was 0.08 and the O.D. of sample with caffeine was 0.57. Here the control O.D. indicates the growth of *Bacillus cereus* was in decline phase where as the sample O.D. indicates no growth of *Bacillus cereus*. After 30hours the O.D. of control with *Bacillus cereus* was 0.06 while the O.D. of sample with caffeine was 0.57.The control O.D. showed the growth of *Bacillus*

cereus was in death phase but there was no growth observed in sample with caffeine.

CONCLUSIONS

These observations indicates that the Caffeine act as an **Antimicrobial agent**.

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