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ANTIMICROBIAL ACTIVITY OF CINNAMON ESSENTIAL OIL AGAINST BACILLUS SUBTILIS AND SALMONELLA BACTERIA

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ABSTRACT

Cinnamon is a very unique spice mostly used in food recipes. Cinnamon contains Cinnamaldehyde, Eugenol, Cinnamic acid, Cinnamyl acetate, Coumarin, etc. Cinnamon has some unique healthy properties. Cinnamon is broadly used in ayurvedic medicines. The aim of our project is to check the antimicrobial activity of cinnamon essential oil against bacillus subtilis and salmonella bacteria. Cinnamon essential oil is obtained by hydro distillation method. Antimicrobial activity of cinnamon essential oil is analyzed by Modified Kirby - Bauer method. We got good antimicrobial activity of cinnamon essential oil against bacillus subtilis and salmonella bacteria. We were study the use of this essential oil as food preservative and medicinal purpose.

KEYWORDS: *Cinnamon, Essential oil, Antimicrobial, Antibacterial, Modified Kirby - Bauer method, Bacillus Subtilis, Salmonella*

I. INTRODUCTION

Cinnamon is a very unique spice mostly used in food recipes. Cinnamon is originated from South India, Sri Lanka, China, Indonesia, Vietnam, Mexico, etc. Cinnamon contains Cinnamaldehyde, Eugenol, Cinnamic acid, Cinnamyl acetate, Coumarin, etc. Cinnamon has some unique healthy properties. Cinnamon is broadly used in ayurvedic medicines. It also used in food industry pharmaceutical industry, perfumery industry, etc. Cinnamon essential oil has very broad scope to use as medicinal purpose in treatment of high blood sugar, cholesterol, urinary tract infection, blood thinning, joint pain relief, as [3]. Bacillus subtilis bacteria cause food poisoning. Salmonella bacteria cause food poisoning, diarrheal, as [11]. We were study the antimicrobial effect of cinnamon essential oil against bacillus subtilis and salmonella bacteria.

II. ANTIMICROBIAL

Antimicrobial kills microorganisms or inhibit their growth. Antimicrobial is classified as antibacterial and antifungal. Antibacterial is used against bacteria and antifungal work against fungi. Antimicrobial can also classify according to their function. Disinfectants kill bacteria on non-living surface to prevent illness. Antiseptics are used on living tissue and reduce infection in injury. Antibiotics destroy microorganisms in the living body.

III. MATERIALS AND METHOD

(A) Raw Material:

Cinnamon essential oil is obtained by hydro distillation method. Bacillus subtilis and salmonella bacteria culture is prepared in microbiology laboratory.

(B) Modified Kirby - Bauer Method:

Procedure:

1. Grow the 0.5 McFarland Bacillus Subtilis and Salmonella bacteria culture in different Petri dish.
2. Allow the bacteria to grow for 24 hours.
3. Take a two sample of essential oil (25% and 50%)and insert into dish using antibiotic disc dispenser.
4. Put the Petri dish for 18 hours at 370 C.
5. After the 18 hours measure the Minimum Inhibitory Concentration

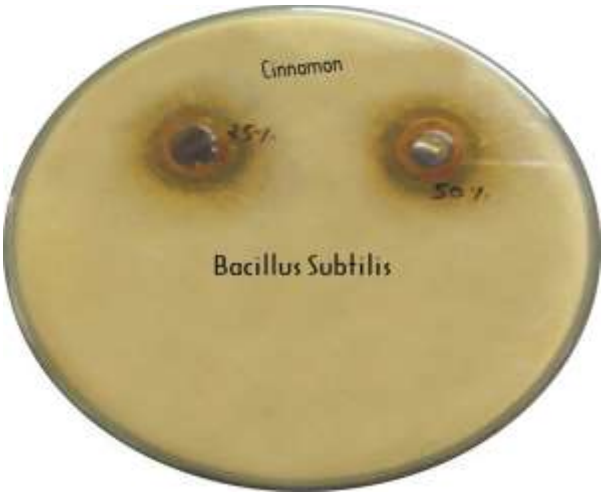

Fig.1. Antimicrobial Activity of Cinnamon Essential Oil against Bacillus Subtilis Bacteria

MIC DETERMINATION OF ANTIBACTERIAL AGENT

GRAM POSITIVE BACTERIA

Bacillus Subtilis		
COMPOUND	25.0%	50.0%
CINNAMON	17	22

Fig.2. Minimum Inhibitory Concentration of Cinnamon Essential oil against Bacillus Subtilis Bacteria

MIC DETERMINATION OF ANTIBACTERIAL AGENT

GRAM NEGATIVE BACTERIA

Salmonella		
COMPOUND	25.0%	50.0%
CINNAMON	15	18

Fig.3. Minimum Inhibitory Concentration of Cinnamon Essential oil against Salmonella Bacteria

III. RESULT AND DISCUSSION

Antimicrobial activity of cinnamon essential oil against bacillus subtilis and salmonella bacteria is analyzed by modified Kirby - Bauer method. Minimum inhibitory concentration of cinnamon essential oil is measured against bacillus subtilis and salmonella bacteria. Minimum inhibitory concentration is area in which cinnamon essential oil is worked as antimicrobial. Minimum inhibitory concentration of cinnamon essential oil against bacillus subtilis bacteria is 17 and 22 mm for 25 % and 50 % concentration respectively. Minimum inhibitory concentration of cinnamon essential oil against salmonella bacteria is 15 and 18 mm for 25 % and 50 % concentration respectively. Cinnamon essential oil has good antimicrobial activity.

IV. CONCLUSION

Cinnamon essential oil has very good antimicrobial activity against bacillus subtilis and salmonella bacteria. Bacillus group of bacteria is responsible for food poisoning. Salmonella bacteria also cause for diarrheal and food poisoning. Cinnamon essential oil can work very effectively against bacillus subtilis and salmonella bacteria. Cinnamon essential oil can be use as food preservative to preserve food longer time and it can also resist food poisoning. Cinnamon essential oil is broadly use in ayurvedic as medicine for treatment of various infections and dieses. Cinnamon essential oil can effectively resist the growth and kill bacillus subtilis, salmonella bacteria and prevent the illness spread by it. Finally, there is a broad opportunity to use cinnamon essential oil as food preservative and medicine.

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