

Antibacterial Effect of Immutonic Capsule

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Abstract

Introduction

Many herbs and natural food materials have been historically recognized as an effective panacea that can establish a balanced inflammatory response and promoting healthy immune response as well as have antibacterial and viral effects. The clinical use of some medications can cause serious side effects. We proposed that natural ingredients could serve as a better therapeutic approach.

Objective

This study aimed to evaluate the antibacterial effect of IMMUTONIC capsule *in Vitro*.

Methods

Serial dilutions of the Immutonic capsule were dissolving 500mg in 5ml of distilled water and four concentrations of the solution (100, 50, 25, and 12.5mg/ml) were done.

Nutrient agar media were prepared (100ml) for making 4 media and pre-prepared bacterial suspension (Staphylococci) was inoculated to the media. Four evenly distributed cups (wells) were made in each medium, where each cup was filled and labeled for each one, the media were incubated at 37°C for 24 hours, after 24h, the inhibition zone was measured.

Results

The Immutonic capsule produced a large inhibition zone against staphylococci with average 18.75, 14, 11.87 and 10.5mm by concentration of 100, 50, 25 and 12.5mg/ml respectively with MIC 10mg/ml.

Conclusion

The present study indicated that Immutonic capsule have antibacterial effects and can be used as antibacterial agent and support others antimicrobial agents.

Introduction

Many food ingredients like *Nigella sativa* seed have been historically recognized as an effective and promoting healthy immune response as well as have antibacterial and viral effects. Garlic, ginger and black pepper are used as food supplements in India during the time of infectious diseases. Literature shows that they have antiviral and anti-bacterial effects [1-7]. These principles are known as nutritional food supplements or nutraceuticals that give protection to our body from many diseases. Therefore, these and related food materials. have medicinal potential and they form the common ingredients for the indigenous system of medicines in India, Yemen, China and elsewhere. More than 199 countries worldwide are affected by a new coronavirus disease (COVID-19) caused by infection with SARS-CoV-2gh21. There is need to identify safe and effective drugs for treatment. However, the clinical use of some medications can cause serious side effects [8]. We proposed that natural food supplements like that could serve as a better prophylactic and antibacterial agent.

Our study aimed to evaluate the antibacterial effect of Immutonic capsule which contain mixture of six natural food materials/ingredients *in Vitro*.

Methods

The hypothesis of new formulation of IMMUTONIC capsule contain mixture of six natural food materials/ingredients with different amounts for each one which was done by Prof. Dr. Hussien O. Kadi (Patent).

The test was carried out by performing serial dilutions of the Immutonic capsule were done by dissolving the capsule (500mg) in 5ml of distilled water and four concentrations of the solution (100, 50, 25, and 12.5mg/ml) were respectively established. Nutrient agar media were prepared (100ml) for making 4 media (in Petri dishes) 25ml for each one, and pre-prepared bacterial suspension (Staphylococci) which obtained from Technology and Science hospital, Sana'a , Yemen was inoculated to the media as soon as the media

have cooled to around 50°C. After the solidification of the media, four evenly distributed cups (wells) were made in each medium, where each cup was filled and labeled for each one of the concentrations (100, 50, 25, and 12.5mg/ml) then, the media were incubated at 37°C for 24 hours, then the media were checked for the growth of bacteria and inhibition zones were measured in millimeters around each cup of the four media. The average of each inhibition zone were determined.

The Immutonic capsule produced a large inhibition zone against staphylococci with average 18.75, 14, 11.87 and 10.5mm by concentration of 100, 50, 25, and 12.5mg/ml respectively.

Table 1 shows illustrating the inhibition zones with their average for each cup in every medium.

Table 1: Effect of Immutonic capsule with deferent concentration on Staphylococci growth (averages of inhibition zones).

| Conc. of Immutonic cap. in cups(mg/ml) | Inhibition zone around each cup for every medium (mm) | | | | Average |
|--|---|----------|----------|----------|---------|
| | Medium 1 | Medium 2 | Medium 3 | Medium 4 | |
| 100 | 18 | 19 | 20 | 18 | 18.75 |
| 50 | 14 | 14 | 14 | 14 | 14 |
| 25 | 12 | 11.5 | 12 | 12 | 11.87 |
| 12.5 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 |

Table 2: Minimum inhibition concentration(MIC) of Immutonic capsule.

| | Conc. (mg/ml) | Log. of conc. | a (mm) | b (mm) | X (mm) | X2 (mm) |
|---|---------------|---------------|--------|--------|--------|---------|
| 1 | 100 | 2 | 18.7 | 10 | 4.37 | 19 |
| 2 | 50 | 1.69 | 14 | 10 | 2 | 4 |
| 3 | 25 | 1.39 | 11.8 | 10 | 0.93 | 0.86 |
| 4 | 12.5 | 1.09 | 10.5 | 10 | 0.35 | 0.062 |

a: is the diameter of the inhibition zone & b: is the diameter of the cup
 $X = (a-b)/2$

MIC was determined by plotting the relation between the log. of Immutonic capsule conc. (on the X axis) and X2 (on the Y axis), where MIC represent anti-log of the lowest log. of Immutonic concentration. In this study the MIC will be the anti-log of 1 and equal 10mg/ml as shown in Fig1 & Tab. 2.

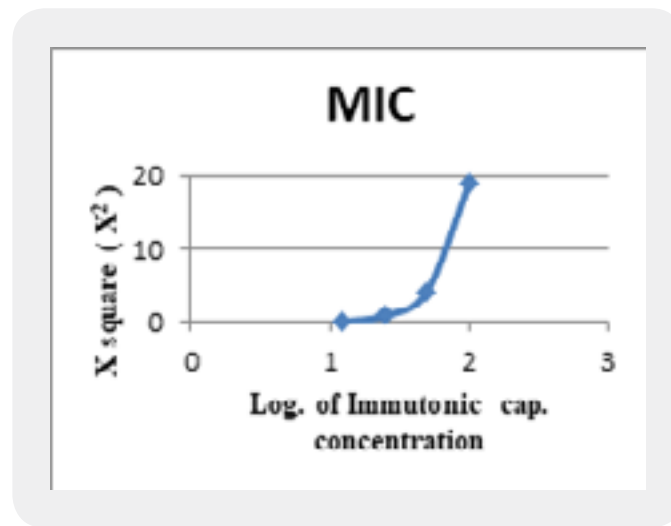


Figure 1: Minimum inhibition concentration(MIC) of Immutonic capsule

Discussion

Numerous modern studies confirm that garlic has definite antibiotic properties and is effective against a wide spectrum of bacteria, fungi and viruses [9,10]. The antimicrobial activities of garlic are linked to the presence of some bioactive compounds. Moreover, many studies have demonstrated that garlic can be more effective as a broad-spectrum antibiotic compared with conventional antibiotics [11].

H O. Kadi [12] reviewed that garlic, onions, black bean, ginger, black and green pepper, which have an antibacterial and anti-virus effect [13-16].

Scientific research has shown that Black pepper, Curcuma and Ginger increase the body's resistance to infections. These three spices contain substances with a broad spectrum of antimicrobial activity. Black pepper has antiemetic, antibacterial and antipyretic effects. Curcuma is one of the strongest antioxidants with very strong anti-inflammatory, antiviral, antibacterial and antiseptic [17].

The present study shows that Immutonic capsule have a larger inhibition zone and a strong antibacterial action with MIC 10mg/ml against Staphylococci.

In vitro studies and screening experiments provide some foundation for the traditional use of *N. sativa* seeds as an antimicrobial agent. Extracts of the seeds have been shown to exert activity against human pathogens, including methicillin-resistant *Staphylococcus aureus* and *Helicobacter pylori* [18,19]. Activity against plant fungi and antiplasmodial and antimicrobial activity have also been demonstrated [20-26].

Thymoquinone obtained from seeds of *N. sativa* revealed broader spectrum activities against multiple strains of gram-positive and gram-negative bacteria, in addition to inhibiting bacterial biofilm formation [27]. The extract of the seed displayed a larger inhibition zone on gram-positive as compared to gram-negative bacteria [28]. Thymoquinone also revealed a significant bactericidal activity against gram-positive cocci [29].

The present study suggests the antibacterial effect of Immutonic capsule via the presence of some bioactive compounds.

Conclusion

The present study indicated that Immutonic capsule have antibacterial effects and can be used as antibacterial agent and support others antimicrobial agents.

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