

Antibacterial Effect Of Immutonic Capsule

Prof. Dr. Hussein O. kadi¹ and Dr. Ali Alhawri²

¹Sana'a University, Faculty of Medicine and Health Sciences, Sana'a

²Hodiedah University , Faculty of Medicine, Hodiedah

Antibacterial Effect Of Immutonic Capsule

Prof. Dr. Hussein O. kadi¹ and Dr. Ali Alhawri²

¹Sana'a University, Faculty of Medicine and Health Sciences, Sana'a

²Hodiedah University , Faculty of Medicine, Hodiedah

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

Nutrient agar media were prepared (100 ml) 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 10.5 mm by concentration of 100, 50. 25 and 12.5 mg/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.

Key words: Immutonic, capsule, natural, food, antibacterial

Received: 11 /3/2020

Accepted: 27 /3 /2020

Address corresponding: Prof. Dr. Hussein O. kadi¹ and Dr. Ali Alhawri²¹Sana'a University, Faculty of Medicine and Health Sciences, Sana'a²Hodiedah University , Faculty of Medicine, Hodiedah Yemen - hussien62@yahoo.com

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 effects¹⁻⁷. 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 else where. 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 effects⁸. 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 Immuotonic capsule were done by dissolving the capsule (500 mg) in 5ml

of distilled water and four concentrations of the solution (100, 50, 25, and 12.5 mg/ml) were respectively established. Nutrient agar media were prepared (100 ml) for making 4 media (in Petri dishes) 25 ml 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 12.5 mg/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.

Results:

The Immutonic capsule produced a large inhibition zone against staphylococci with average 18.75, 14, 11.87 and 10.5 mm by concentration of 100, 50. 25, and 12.5 mg/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 10 mg/ml as shown in Fig1 & Tab. 2.

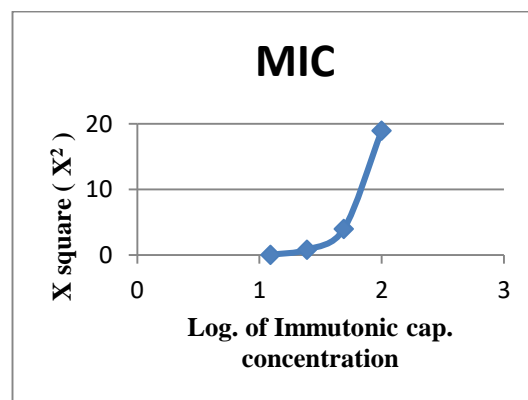


Fig. 1: Minimum inhibition concentration(MIC) of Immutonic capsule.

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 antibiotics¹¹.

H O. Kadi¹² reviewed that garlic, onions, black bean, ginger, black and green pepper, which have an antibacterial and anti-virus effect¹³⁻¹⁶.

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 antiseptic¹⁷.

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 demonstrated²⁰⁻²⁶.

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 formation²⁷. The extract of the seed displayed a larger inhibition zone on gram-positive as compared to gram-negative bacteria²⁸. 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.

References:

1. K T Augusti, Regi Jose and Paul Augustine. ANTIVIRAL, ANTI-INFLAMMATORY AND RELATED EFFECTS OF A FOOD SUPPLEMENT MADE OF GARLIC, GINGER AND BLACK PEPPER. Indian Journal of Clinical Biochemistry, 2010 / 25 (2) 217-218
2. Harris JC, Cottrell SL, Plummer S, Llyod D. Antimicrobial properties of *Allium sativum* (garlic). Appl Microbiol Biotechnol 2001; 57: 282-6.
3. Lau BHS, Yamasaki T, Gridley DS. Garlic compounds modulate macrophage and T Lymphocyte functions. Mol Biother 1991; 3:103-7.
4. Pengelly A. Essential oils and Resin. In: The Constituents of Medicinal Plants CABI Publishing Walling Ford, Oxon.UK 2004; pp85-90;105-6.
5. Ilhami G. The antioxidant and radical scavenging activity of black pepper. Ind J Food Sci Nutr 2005; 56(7): 491-9.

6. Srivastava KC. Aqueous extracts of onion, garlic and ginger inhibit platelet aggregation and alter arachidonic acid metabolism. *Biomed Biochim Acta* 1984; 43: S335-S346.
7. Bordia A, Verma SK, Srivastava KC. Effect of Ginger (*Zingiber officinal Rosc.*) and fenugreek (*Triginella foenumgraecum L.*) on blood lipids, blood sugar and platelet aggregation in patients with coronary artery disease. *Prostaglandins Leukot Essent Fatty acids* 1997; 56: 379-84.
8. A. k. Gupta, Ashish Kumar, Akhil Sharma, Shaweta Sharma. Review on COVID-19: a recommendation to examine the effect of different medicine and herbs in preventing infection and progression *Am J of Viro and Dis.* 2020; 2(1): 01-07.
9. Shuford JA, Steckelberg JM, Patel R. Effects of fresh garlic extract on *Candida albicans* biofilms. *Antimicrob Agents Chemother.* 2005;49(1):473. doi:10.1128/AAC.49.1.473.200510.
10. Low CF, Chong PP, Yong PV, Lim CS, Ahmad Z, Othman F. Inhibition of hyphae formation and SIR2 expression in *Candida albicans* treated with fresh *Allium sativum* (garlic) extract. *J Appl Microbiol.* 2008;105(6):2169–77.
11. Tsao SM, Yin MC. In-vitro antimicrobial activity of four diallyl sulphides occurring naturally in garlic and Chinese leek oils. *J Med Microbiol.* 2001;50(7):646–9
12. Hussein O Kadi. Yemen is free of COVID-19. *Int J Clin Virol.* 2020; 4:

032-033.

13. Weber ND, Andersen DO, North JA, Murray BK, Lawson LD, et al. In vitro virucidal effects of *Allium sativum* (garlic) extract and compounds. *Planta Med.* 1992; 58: 417-423.

PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/1470664>

14. Mehrbod P, Amini E, Tavassoti-Kheiri M. Antiviral Activity of Garlic Extract on Infl uenza Virus. *Iranian J Virol.* 2009; 3: 19-23.

15. Leyla B, Peir H, Ali G. Garlic: a review of potential therapeutic effects. *Avicenna J Phytomed.* 2014; 4:1–14.

PubMed: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4103721/>

16. Abiy E, Berhe A. Anti-Bacterial Effect of Garlic (*Allium sativum*) against Clinical Isolates of *Staphylococcus aureus* and *Escherichia coli* from Patients Attending Hawassa Referral Hospital, Ethiopia. *J Infec Dis Treat.* 2016; 2: 2.

17. Singh, S., Kapoor, I. P. S., Singh, G., Schuff, C., De Lampasona, M. P., & Catalan, C. A. (2013). Chemistry, antioxidant and antimicrobial potentials of white pepper (*Piper nigrum* L.) essential oil and oleoresins. *Proceedings of the National Academy of Sciences, India Section B: Biological Sciences*, 83(3), 357-366.

18. Mehta BK, Pandit V, Gupta M. New principles from seeds of *Nigella sativa*. *Nat Prod Res.* 2009;23(2):138-148.19173122

19. Salem EM, Yar T, Bamosa AO, et al. Comparative study of *Nigella sativa* and triple therapy in eradication of *Helicobacter pylori* in patients with non-ulcer dyspepsia. *Saudi J Gastroenterol.* 2010;16(3):207-214.20616418
20. Aljabre SH, Randhawa MA, Akhtar N, Alakloby OM, Alqurashi AM, Aldossary A. Antidermatophyte activity of ether extract of *Nigella sativa* and its active principle, thymoquinone. *J Ethnopharmacol.* 2005;101(1-3):116-119.15908151
21. Khan MA, Ashfaq MK, Zuberi HS, Mahmood MS, Gilani AH. The in vivo antifungal activity of the aqueous extract from *Nigella sativa* seeds. *Phytother Res.* 2003;17(2):183-186.12601685
22. Salem ML, Hossain MS. Protective effect of black seed oil from *Nigella sativa* against murine cytomegalovirus infection. *Int J Immunopharmacol.* 2000;22(9):729-740.10884593
23. Mahmoud MR, El-Abhar HS, Saleh S. The effect of *Nigella sativa* oil against the liver damage induced by *Schistosoma mansoni* infection in mice. *J Ethnopharmacol.* 2002;79(1):1-11.11744288
24. Rogozhin EA, Oshchepkova YI, Odintsova TI, et al. Novel antifungal defensins from *Nigella sativa* L. seeds. *Plant Physiol Biochem.* 2011;49(2):131-137.21144761
25. Hannan A, Saleem S, Chaudhary S, Barkaat M, Arshad MU. Anti bacterial activity of *Nigella sativa* against clinical isolates of methicillin

resistant Staphylococcus aureus. J Ayub Med Coll Abbottabad. 2008;20(3):72-74.19610522

26. Ahmed el-HM, Nour BY, Mohammed YG, Khalid HS. Antiplasmodial activity of some medicinal plants used in Sudanese folk-medicine. Environ Health Insights. 2010;4:1-6.20523878

27. E. M. Abdallah, "Black Seed (*Nigella sativa*) as antimicrobial drug: a mini-review," Novel Approches in Drug Designing and Develop, vol. 3, no. 2, pp. 1–5, 2017. View at: Google Scholar

28. N. A. Hasan, M. Z. Nawahwi, and H. A. Malek, "Antimicrobial activity of *nigella sativa* seed extract," Sains Malaysiana, vol. 42, no. 2, pp. 143–147, 2013. View at: Google Scholar

29. A.-J. Maryam, A.-A. Fatimah, A.-K. Ebtesam, A.-S. Abdulrahman, and B.-EL. Ineta, "In-vitro studies on the effect of *Nigella sativa* Linn., seed oil extract on Multidrug Resistant Gram positive and Gram negative bacteria," Journal of Medicinal Plants, vol. 4, no. 2, pp. 195–199, 2016.