

ASSESSMENT OF ANTIMICROBIAL POTENTIAL OF CHOPPED ONION

N. Santhi*, S. S. Rajendran, J. Anudeepa and W. D. Sam Solomon

Department of Pharmaceutical Analysis, RVS College of Pharmaceutical Sciences, Sulur, Coimbatore, Tamil nadu 641402, India.

***Corresponding Author: N. Santhi**

Department of Pharmaceutical Analysis, RVS College of Pharmaceutical Sciences, Sulur, Coimbatore, Tamil nadu 641402, India.

Article Received on 05/08/2019

Article Revised on 26/08/2019

Article Accepted on 16/09/2019

ABSTRACT

The intention of this study symbolize that the evaluation of antimicrobial potential of Chopped onion were kept for long duration. Two types of bacteria such as staphylococcus aureus and E.Coli were tested and their selection was based upon their common contribution in causing diseases. Here onion extract was prepared from freshly chopped onion and chopped onion kept for long duration. This was subjected to invitro study by using agar diffusion method. The results were obtained at three different times such as 0 minutes, 60 minutes, 120 minutes. The zone of inhibition were observed high at 0 minutes and very low at 120 minutes. It implies that when time increases the antimicrobial potential of chopped onion was decreased. Thus assessment was concluded that the chopped onions are capable of absorbing microbes from the environment. So that antibacterial activity gets decreased. Further evaluation using standardized techniques provide more information about antimicrobial potential of chopped onion against common bacterial pathogens.

KEYWORDS: Chopped Onion, staphylococcus aureus and E.Coli, Muller –Hinton agar media.**INTRODUCTION**

Onion is the general name of the *Allium cepa* family. Since ancient times onion have been significant dietary supply and have also been of curiosity for medical purposes.^[1] Onions are effective against common cold, heart disease, diabetes, cough, osteoporosis and sore throat.^[2] Onion bulbs hold a good number of phytochemicals, most of which are hydrocarbons and their derivatives.^[3] Some authors have reported pharmaceutical activity of extracts of *Allium cepa* including anti-tumor, anti-diabetic, antioxidant, and antimicrobial, anti allergic and molluscicidal activity.^[4,5,6] In vitro studies have shown onion to possess antibacterial, anti parasitic, and antifungal activity.^[7,8] Onions have some inhibitory effects on some food swallow pathogens usually have antimicrobial properties.^[9] Onion with a variety of purposes is generally used as a raw material in many dishes and accepts almost all of the traditions and culture. Due to its storage quality and strength of shipping, onions have been traded more widely than most vegetables. It is probably a native to South-western Asia.^[10] Onions are devoid of complexity propagated, transported, and stored.^[11] The cell wall of the onion is rich with Uronic acid, glucose and smaller amount of arabinose, xylose, fructose and galactose which are found in the lower epidermis of the onion scale.^[12] Sulphoxides (ACSOs) that gives the odour and taste of the onion when it's cleaved by allinase and two Flavonoids subgroups,

anthocyanins that gives the red or the purple colour to the onion or the yellow colour which is obtained by the quercetin that is mostly present as glycosides.^[13] Retaining above information in the brains, The present study was to assess the antimicrobial potential of chopped onion, because in fast food shops the onion is chopped and displaced openly for long time before serving. Hence these sliced raw onions are consumed we may be infected by food poisoning.

MATERIAL AND METHODS**Tested microorganism**

The test microorganism (*Staphylococcus aureus* and *E.Coli*) obtained from Microbiology Department, RVS College of Pharmaceutical Sciences was characterized by standard microbiology methods. The pure cultures were sub cultured on nutrient agar slants and kept at 4° C until ready for the study.

Extraction of onion

Allium cepa (onion was bought from local vegetables market). The onion bulb was washed with freshly prepared sterile distilled water. The outer covering of the bulb was by hand peeled off and the fleshy part of the onion was rewashed with freshly prepared sterile distilled water. Onion bulb was chopped into small pieces and blended with domestic blender.

Preparation of inoculums and antibacterial activity

About 20 hour broth culture of the test *Staphylococcus aureus* and *E.Coli* was suspended into sterile nutrient broth. It was standardized according to National Committee for Clinical Laboratory Standards.^[14]

Antibacterial activity

The antibacterial activity of the crude extract of chopped onion was evaluated in accordance with the agar-well diffusion method described by.^[15] Two hundred microliters of the standardized cell suspensions (Bacteria) were spread on a Muller –Hinton agar, Wells were then bored in to the agar using a sterile 6mm

diameter cork borer. Approximately 50microlitre of the onion juice is introduced into the wells, allowed to stand at room temperature for about 2 hrs and then incubated at 37°C. Controls were kept in parallel. The plates were observed for zones of inhibition after 24hrs.

RESULT

As shown in table 1, the prepared chopped onion extract produced inhibitory effect on the growth of all tested bacteria but it various bactericidal effects depended on its time duration of chopped onion.

Table1: Anti bacterial effect of chopped onion on agar well diffusion method.

| S. no. | Test micro organism | Onion Extract | Zone of inhibition with different time interval | | |
|--------|------------------------------|---------------|---|------------|-------------|
| | | | 0 minutes | 60 minutes | 120 minutes |
| 1 | <i>Staphylococcus aureus</i> | 50µl | 7mm | 3mm | 0mm |
| 2 | <i>E.coli</i> | 50µl | 10mm | 5mm | 0mm |



A). 0 minutes

B). 60 minutes

C). 120 minutes

Fig. 1: Zone of inhibition for *Staphylococcus aureus* at 0, 60 and 120 minutes.



A). 0 minutes

B). 60 minutes

C). 120 minutes

Fig. 2: Zone of inhibition for *E.Coli* at 0, 60 and 120 minutes.

DISCUSSION

Onion is the oldest cultivated plants and is used for multiple purposes. with the increasing interest into the utilization of natural biological active compounds and the development of specific alternative medicinal therapy we designed this study to investigate the possible antimicrobial contamination of chopped onion with different time interval. *Staphylococcus aureus* and *E.coli* bacteria were tested, and their selection was based upon

their common involvement in causing infectious bacterial diseases among people who are using chopped and kept for long duration onion. *Allium cepa* extract has been considered a natural preservative or food additive and can be used as traditional methods of controlling pathogens. The result showed that the inhibitory effect of chopped and kept long duration *Allium cepa* was showed nil zone of inhibition at 120 minutes. This indicating that the chopped and kept long duration onion having

capable of absorbing micro organism from the environment so that the zone inhibition decreases with respective time interval.

CONCLUSION

It is concluded from this study that chopped and kept long duration onion has capability of absorbing micro organism from the environment. Extract of chopped and kept long duration onion shown decreased antibacterial activity than freshly chopped onion against the organism tested. In addition to their nutritional effects, the work related to antibacterial activity against gram positive and gram negative microorganism shall be continued extensively in future. Further evaluation using standardized techniques give more information about antimicrobial potential of chopped onion against common bacterial pathogens.

REFERENCE

1. P.Rose, M.Whiteman, P.Moore and Y.Zhu, Bioactive S-alkenyl cycteine sulfoxide metabolites in the genus *Allium*.the chemistry of potential therapeutic agents, *Natural Products Rep.*, 2005; 22: 351-368.
2. K.Augusti, Therapeutic Values of onion and garlic, *Indian J Exp Bio*, 1996; 34: 634-640.
3. B. Jeffrey and B. Herbert, "Photochemical Dictionary. A hand book of bioactive compounds, 1st edition, Tavlror and Francis London Washington D.C., 2003; 234-245.
4. J. Lampe, "Health effects of vegetables and fruits: assessing mechanisms of action in human experimental studies", *Am J Clin Nutr*, 1999; 70: 475- 90.
5. A. Helen, K. Krishnakumar, P. Vijayammal and K. Augusti, "Antioxidant effect of onion oil (*Allium cepa*. Linn) on the damages induced by nicotine in rats as compared to alpha-tocopherol", *Toxicol Lett.*, 2000; 116: 61-68.
6. M. El-Meleig, M. Ahme, R. Arafa, N. Ebrahim and E. El-Kholany, "Cytotoxicity of four essential oils on some human and bacterial cells", *J. Appl. Sci. in Environ Sanit.*, 2010; 5: 143-159.
7. M. El-Meleig, M. Ahme, R. Arafa, N. Ebrahim and E. El-Kholany, Cytotoxicity of four essential oils on some human and bacterial cells, *J. Appl. Sci. in Environ Sanit.*, 2010; 5: 143-159.
8. A. Zohri, K. Gwad, and S. Saber "Antibacterial, antidermatophytic and antioxidigenic activities of onion (*Allium cepa*) oil", *Microbiol. Res*, 1995; 150: 167-172.
9. Purseglove J W, *Tropical crops [Monocotyledon]*. Longman Scientific and Technical, England, 2005; 27-38.
10. Benkeblia N. Antimicrobial activity of essential oil extracts of various onions (*Allium cepa*) and garlic (*Allium sativum*). *LWT- Food Sci Technol*, 2004; 37: 263-8.
11. Irobi O, Moo-Young M, Anderson W, Daramola S. Antimicrobial activity of the bark of *Bridelia ferruginea* (Euphorbiaceae). *Intern J Pharm*, 1994; 34: 87-90.
12. Ng A, Parker ML, Parr AJ, Saunders PK, Smith AC, Waldron KW. Physicochemical characteristics of onion (*Allium cepa* L.) tissues. *Journal of agricultural and food chemistry*, 2000 Nov 20; 48(11): 5612-7.
13. Barrett B, Marchand L, Scheder J, Appelbaum D, Chapman M, Jacobs C, Westergaard R, Clair NS. Bridging the gap between conventional and alternative medicine. *Journal of Family Practice*, 2000 Mar 1; 49(3): 234.
14. National Committee for Clinical Laboratory Standard, Performance standard for antimicrobial disc susceptibility testing, 2002; 12: M100-S12.
15. Irobi O., Moo-Young M., Anderson W. and Daramola S, Antimicrobial activity of the bark of *Bridelia ferruginea* (Euphorbiaceae)", *Intern. J. Pharmacog*, 1994; 34: 87- 90.