



Evaluation of Anti Microbial Activity of Pineapple Extract against Selected Oral Pathogen

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Abstract

Back ground

Pineapples are a tropical fruit that present with a wide array of health and beauty benefits. They are not only valued for its sweet taste, it has been used for centuries to treat digestion problems and inflammation. Studies have shown that bromelain, the enzyme found in pineapples, can reduce swelling, bruising, healing time, and pain associated with injury and surgical intervention. Bromelain is currently being used to treat and reduce inflammation from tendinitis, sprains, strains, and other minor muscle injuries as well as swelling related to ear, nose and throat surgeries or trauma. The present study is aimed to determine the antimicrobial activity neem oil against various oral pathogens

Aim

To evaluate the antibacterial activity of Pine apple extract against selected oral pathogens

Methodology

The antibacterial activity is carried out by agar well diffusion technique against the bacterial pathogens and the zone of inhibition is measured in mm diameter.

Result

In the present study, Pine apple extract was found to be effective against the oral pathogens tested when compared with control. So from this study it can be concluded that pine apple possess antibacterial activity.

Key words: Antibacterial, Pine apple extract, Agar well diffusion, zone of inhibition

INTRODUCTION

An antimicrobial is an agent that kills microorganism or inhibits their growth^[1]. Anti microbial agents plays a major role in maintaining good health. Antimicrobial resistance is threatening the management of infections such as pneumonia, tuberculosis, malaria, and AIDS. So it is important to develop Antimicrobial resistant which is achieved by various anti microbial agent . One such antimicrobial agent is bromelain. Bromelain belongs to the group of protein digesting enzymes from the fruit and stem of the pineapple plant (Ananas comosus) belonging to the Bromeliaceae family. Bromelain is a mixture of^{[2][3]} Phosphatases, Thiopeptidases, such as ananain and Comosain, Cellulases, Peroxidases, Glucosidases

, Glycoproteins , Proteinase inhibitors, such as cystatin
Due to its high medicinal value it is used by people as medicine. some of its medicinal uses are it is used especially of the nose and sinuses , for reducing swelling and inflammation^{[4][5]}. It is also used to reduce various allergic fever, to remove dead and damaged tissue after w burn and it is also used to prevent the collection of water in the lungs. Bromelain is used for muscle relaxing and to stimulate muscle contraction. It also prevent blood clotting , prevent cancer and many other uses. Therefore, the objectivity of the study was to determine the effect of enzyme bromelain which is an important constituent pineapple extract on some selected oral pathogens such as *Streptococcus mutants* and *Enterococcus faecalis*. This research may help in the development of other products with pineapple extract as its constituent.

MATERIALS AND METHODS

Test microorganisms

Bacterial strain used was *Streptococcus mutans* and *Enterococcus faecalis*. The organism were maintained in nutrient agar slope at 4°C in department of Microbiology, Saveetha Dental College.

The Pine apple was dissolved in distilled water in following concentrations 2.5mg/ml, 5mg/ml and 10mg/ml so that 100µl delivers 250µg/ml, 500µg/ml and 1000 µg/ml respectively.

Screening of antibacterial activity [Agar well diffusion technique]

Broth culture of the bacterial strain compared to Mac Farland's standard^[6,7] 0.5 was prepared. Lawn culture of the test organisms were made on the Muller Hinton agar [MHA-Hi media M1084] plates using sterile cotton swab and the plates were dried for 15 minutes. 100µl of the different concentrations of the extract were placed on the respective plates. The plates were incubated at 37°C overnight and the zone of inhibition of growth was measured in millimetres. All the tests were done in triplicate to minimize the test error.

RESULT AND DISCUSSION

The antibacterial activity of the Pine apple extract at different concentrations was screened by agar well diffusion technique and the zone of inhibition was measured in mm diameter. The results are given in the table 1. The extract was more effective

against *Streptococcus mutans* with a zone of inhibition of 26mm diameter (at con 1000 µg.), and with *Enterococcus faecalis* the extract showed a zone of 22mm diameter. Dental caries is a microbial disease that result in the destruction of mineralized tissue of the teeth. *Streptococcus mutans* is the potent initiator and leading cause of dental caries worldwide. It is considered to be the most cariogenic of all of the oral Streptococci. The results obtained from our study shows that the extracts have got a very good antibacterial activity against *Streptococcus mutans* and *Enterococcus faecalis* tested when compared with control.

Table 1: Anti bacterial activity of Pine apple extract on *Streptococcus mutans* and *Enterococcus faecalis*

Extracts	Zone of inhibition In mm diameter					
	1000µg/ml		500µg/ml		250µg/ml	
	E1	E2	E1	E2	E1	E2
Pine apple extract	26	22	20	17	14	10
Chlorhexidine	35	29	26	22	18	15

E1 – *Streptococcus mutant*,
E2- *Enterococcus faecalis*

CONCLUSION

Medicinal plants are believed to be important source of new chemical substances with potential therapeutic effects. The secondary metabolites of plants were found to be source of various phytochemicals that could be directly used as intermediates for the production of new drugs. The use of herbs in dentistry should be based on evidence of effectiveness and safety. The present study has shown the antibacterial activity of Pine apple extract on the oral microbes tested. Anti-bacterial activities could be enhanced if active components are purified and adequate dosage determined for proper administration.

REFERENCE

1. Antimicrobial Merriam-Webster Online Dictionary. Archived from the original on 24 April 2009. Retrieved 2009-05-02
2. B. K. Bhattacharyya, "Bromelain: an overview," Natural Product Radiance, vol. 7, no. 4, pp. 359-363, 2008
3. Hale, L. P., Greer, P. K., Trinh, C. T., & James, C. L. (2005). Proteinase activity and stability of natural bromelain preparations. International <http://dx.doi.org/10.1016/j.intimp.2004.12.007>
4. E. R. Secor Jr., F. C. William, M. C. Michelle et al., "Bromelain exerts anti-inflammatory effects in an ovalbumin-induced murin model of allergic disease," in Cellular Immunology, vol. 237, pp. 68-75, 2005
5. A. Cohen and J. Goldman, "Bromelain therapy in rheumatoid arthritis," Pennsylvania Medical Journal, vol. 67, pp. 27-30, 1964
6. Betty A. Forbes., Daniel F. Sahm., Alice S. Weissfeld. Bailey & Scott's Diagnostic Microbiology 11th edition Mosby page 229 - 257
7. Connie R. Mahon., George Manuselis., Saunder's Diagnostic Microbiology 2 edition Mosby page 229 - 257.