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

Thanish Ahamed S.,
Student(First Year) BDS,
Saveetha Dental College and Hospitals,
Saveetha University, 162. P. H. Road,Chennai.- 600 077

Vishnu Priya V,
Associate Professor,
Department of Biochemistry,
Saveetha Dental College and Hospitals,
Saveetha University, 162. P. H. Road,Chennai.- 600 077

Gayathri R, Geetha R. V
Assistant Professor,
Department of Biochemistry,
Saveetha Dental College and Hospitals,
Saveetha University, 162. P. H. Road,Chennai.- 600 077

Abstract

Background

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 of pineapple extract against various oral pathogens.

Aim

To evaluate the antibacterial activity of Pineapple 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, Pineapple extract was found to be effective against the oral pathogens tested when compared with control. So from this study it can be concluded that pineapple possess antibacterial activity.

Key words: Antibacterial, Pineapple 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 Ananascomosus) belonging to the Bromeliaceae family. Bromelain is a mixture of phosphatases, Thiopepdidases, 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\(^2\)\(^3\). It is also used to reduce various allergic fever, to remove dead and damaged tissue after a 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 mutans 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 Pineapple 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 \(^4\)\(^5\) 0.5 was prepared. Lawn culture of the test organisms were made on the Muller Hinton agar \([\text{MHA-Hi media M1084}]\) 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 Pineapple 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 26 mm diameter (at 1000 µg.), and with *Enterococcus faecalis* the extract showed a zone of 22 mm diameter. Dental caries is a microbial disease that results 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 show 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*

<table>
<thead>
<tr>
<th>Extracts</th>
<th>Zone of inhibition In mm diameter</th>
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<tbody>
<tr>
<td></td>
<td>1000µg/ml</td>
</tr>
<tr>
<td>Pine apple extract</td>
<td>E1</td>
</tr>
<tr>
<td></td>
<td>26</td>
</tr>
<tr>
<td>Chlorhexidine</td>
<td>E1</td>
</tr>
<tr>
<td></td>
<td>35</td>
</tr>
</tbody>
</table>

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

**CONCLUSION**

Medicinal plants are believed to be important sources of new chemical substances with potential therapeutic effects. The secondary metabolites of plants were found to be sources 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**