*Streptococcus mutans*에 대한 *Dryopteris crassirhizoma* 에탄올 추출물의 항균효과

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Antimicrobial effect of Ethanol Extract from *Dryopteris crassirhizoma* against *Streptococcus mutans*

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요 약

관중의 근경, 감초의 뿌리, 고삼의 뿌리, 진피의 과피로 부터 에탄올로 추출물을 분리하였다. 이들 4종류의 에탄올 추출물을 이용하여 *Streptococcus mutans*에 대한 항균활성을 조사하였다. 그 결과 관중의 근경, 감초의 뿌리, 고삼의 뿌리는 *Streptococcus mutans*에 대하여 항균활성을 나타냈다. 그 중 관중과 고삼의 추출물 300ug/disk 농도는 *Streptococcus mutans*에 대한 뚜렷한 항균활성을 나타냈다.l 이 결과 관중의 추출물은 *Streptococcus mutans*에 대한 황균 활성물질로 잠재성이 있음을 알 수 있었다.

ABSTRACT

Rhizoma of *Dryopteris crassirhizoma*, Root of *Glycyrrhiza uralensis*, Root of *Sophora flavescens and* Pericarp of *Citrus unshiu* were extracted with ethanol. The ethanol extracts of 4 medicinal plant were tested for the antimicrobial activity against *Streptococcus mutans*. The extracts of Rhizoma of *Dryopteris crassirhizoma*, Root of *Sophora flavescens*, Root of *Glycyrrhiza uralensis* showed antimicrobial activity against *Streptococcus mutans*. At the 300ug/disk concentration of the ethanol extract from *Dryopteris crassirhizoma* and *Sophora flavescens* showed significant antimicrobial activity against *Streptcoccus mutans*. These results suggested that the extracts from *Dryopteris crassirhizoma* could be the potential source of antimicrobial agents against *S. mutans*.

Key word

antimicrobial activity, *Dryopteris crassirhizoma, Sophora flavescens, Glycyrrhiza uralensis, Citrus unshiu*

1. INTRODUCTION

Dental caries are caused by acids produced from the fermentation of food in the mouth dissolving the calcium component and finally resulting in teeth loss. Streptococci is known to be potent in creating dental caries. Among the several species of Streptococci, *Streptococcus mutans* is the most predominant strains in human dental caries.

The colonization of *S. mutans* on the tooth surface is considered to be the first step in the induction of dental caries. *Streptococcus mutans* can adhere to the tooth surface and produce water insoluble glucans from sucrose, which enable *Streptococcus mutans* to colonize the tooth surface. The colonized *S. mutans* induced dental caries and finally teeth loss. Sometimes *S. mutans* invades cells and has been isolated from blood related to cardiovascular disease.

Several types of antimicrobial agents have been proposed to prevent dental caries. For several decades, various types of enzymes and bacteriocins have been isolated from soil bacteria to develop microbial agents that have medical and industrial usage.

In this study, antimicrobial activities of 4 medicinal plant extracts which were prepared from Rhizoma of *Dryopteris crassirhizoma*, Root of *Glycyrrhiza uralensis*, Root of *Sophora flavescens and* Pericarp of *Citrus unshiu* were evaluated against *Streptococcus mutans*.

II. Strain & MATERIALS

Strains; *Streptococcus mutans* ATCC 25175.
Materials; Rhizoma of *Dryopteris crassirhizoma*, Root of *Glycyrrhiza uralensis*, Root of *Sophora flavescens*, Pericarp of *Citrus unshiu*

III. METHODS

Medicinal Plant 25g / 500ml 70% Ethanol

↓

Boil with Heating Mental for 3 Hour

↓

Cooling & Filtration

↓

Concentrate with Evaporator

↓

Dry with Freeze Dryer

↓

Weight & Dissolve with Dimethyl sulfoxide

↓

Disk Diffusion Method

IV. RESULTS

Table 1. Antimicrobial activity by different concentration of medicinal plan extracts against *Streptococcus mutans* ATCC 25175.

Scientific Name	Medicinal Part	Concentration (㎍/disk)	*Streptococcus mutans* ATCC 25175
Dryopteris crassirhizoma	Rhizoma	300	++
Sophora flavescens	Root	300	++
Glycyrrhiza uralensis	Root	300	+
Citrus unshiu	Pericarp	300	-

The antimicrobial activity was represented as followed. : -; no inhibitory effect, +; 8.1~10.0 mm, ++; 10.1~13.0 mm, +++; 13.1~16.0 mm, ++++; over 16.0 mm

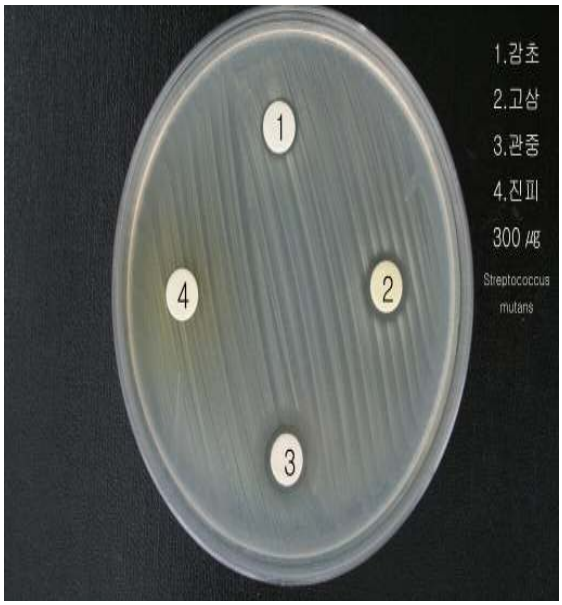

Figure 1. Assay of antmicrobial activity at 300ug of medicinal plant extracts. 1:*Glycyrrhiza uralensis*, 2:*Sophora flavescens*, 3: *Dryopteris crassirhizoma*, 4:.*Citrus unshiu*

VI. CONCLUSIONS

1. The ethanol extracts of Rhizoma of *Dryopteris crassirhizoma*, Root of *Glycyrrhiza uralensis*, Root of *Sophora flavescens and* Pericarp of *Citrus unshiu* were tested for the antimicrobial activity against *Streptococcus mutans* ATCC 25175.

2. The extracts of Rhizoma of *Dryopteris crassirhizoma*, Root of *Glycyrrhiza uralensis*, Root of *Sophora flavescens* showed antimicrobial activity against *Streptococcus mutans.*

3. At the 300ug/disk concentration of the ethanol extract from *Dryopteris crassirhizoma* and *Sophora flavescens* showed significant antimicrobial activity against *Streptcoccus mutans.*

4. These results suggested that the extracts from *Dryopteris crassirhizoma* could be the potential source of antimicrobial agents against *S. mutans.*

VII. REFERENCES

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