

1 . 1 . 1 . 1 . 2 . 1 . 1 . 1

1
2

I. 가 PGE₂

가 12-16).

Tetracycline

collagenase

1-4).

가 17-19),

가

12).

Sanguinaria extract²⁰⁾

가

. in vitro

chlorhexidine

가

21).

5),

(Magnoliae cortex)
tus) magnolol

(Zizyphi fruc-
tus) honokiol

Streptococcus mutans

가

22,23),

6-11).

Indomethacin,

Flurbiprofen, Naproxen

* 1997

(02-1997-248-0)

PGE₂
23-27),
가 , IL - 1

Stab culture method³²⁾
17g tryptone, 3g yeast
extract, 2.5g glucose, 5g NaCl, 2.5g
K₂SO₄, 0.5g sodium thioglycolate, 5Mℓ
hemin, 0.5mg menadion, 12g bacto agar

28), 9mm

가 29),
(Crassirhizomae rhizoma)
(Dryopteris crassirhizoma)

9mm, 5mm
chlorohexidine 200μℓ
37°C 3 - 7

“ 가
”
aspidin albaspidin

CO₂
vernier caliper
1mm

phloroglucinol

2.

30-31),

vitro study

in

rat 0.25%
trypsin - EDTA

well 1X10⁵

가

II.

Hank & balanced salt solu -
tion(HBSS)

1.

chlorohexidine

Actinobacillus. actinomycetemcomi -
tans., Capnocytophaga ochracea,
Streptococcus mutans, Porphyromonas
gingivalis, Prevotella intermedia,
Actinomyces viscosus, Fusobacterium
nucleatum 7

200μℓ가 95%,
37°C 24

chlorohexidine 0.2,
0.15, 0.1, 0.05%

MTT (methyl thiazol - 2 - YL - 2, 5 -
diphenyl tetrazolium bormide) 50μℓ
well 4 MTT
formazon
dimethyl sulfonide(DMSO) 50μℓ

가 . plate ELISA
 reader (THERMO max, Molecular
 devices, U.S.A.) 570nm 3. DNA
 tial medium (MEM) - minimum essen -
 well 가
 trypsinization 24 - well 1X10⁴
 - MEM 3

Table 1. Antibacterial effect to *A. actinomycetemcomitans* of chlorhexidine & *Crassirhizomae rhizoma*

sample	Cone.(%)	inhibition zone(mm)
Crassirhizomae rhizoma	0.2	22.7 ± 2.36
	0.15	18 ± 0.82
	0.1	15.7 ± 0.47
	0.05	15 ± 1.63
Chlorohexidine	0.2	24 ± 4.90
	0.15	21.8 ± 4.10
	0.1	21.7 ± 2.05
	0.05	18 ± 4.08

Table 2. Antibacterial effect to *C. ochracea* of chlorhexidine & *Crassirhizomae rhizoma*

sample	Cone.(%)	inhibition zone(mm)
Crassirhizomae rhizoma	0.2	21.3 ± 2.05
	0.15	18 ± 0.82
	0.1	17 ± 4.08
	0.05	15 ± 3.26
Chlorohexidine	0.2	31 ± 0.82
	0.15	28.7 ± 0.47
	0.1	26.3 ± 1.25
	0.05	24.7 ± 1.25

Table 3. Antibacterial effect to *S. mutans* of chlorhexidine & *Crassirhizomae rhizoma*

sample	Cone.(%)	inhibition zone(mm)
Crassirhizomae rhizoma	0.2	28 ± 0.82
	0.15	25 ± 2.45
	0.1	24 ± 1.63
	0.05	20.7 ± 0.94
Chlorohexidine	0.2	31 ± 2.45
	0.15	30 ± 1.63
	0.1	28.6 ± 2.49
	0.05	25 ± 3.26

Table 4. Antibacterial effect to *P. gingivalis* of chlorhexidine & *Crassirhizomae* rhizoma

sample	Cone.(%)	inhibition zone(mm)
<i>Crassirhizomae</i> rhizoma	0.2	33.3 ± 1.25
	0.15	31 ± 0.82
	0.1	27.3 ± 0.94
	0.05	23.7 ± 2.05
Chlorohexidine	0.2	41 ± 4.90
	0.15	36.3 ± 2.87
	0.1	33.3 ± 1.70
	0.05	29 ± 0.82

Table 5. Antibacterial effect to *P. intermedia* of chlorhexidine & *Crassirhizomae* rhizoma

sample	Cone.(%)	inhibition zone(mm)
<i>Crassirhizomae</i> rhizoma	0.2	30 ± 3.26
	0.15	27 ± 2.45
	0.1	25.3 ± 0.47
	0.05	20.7 ± 2.05
Chlorohexidine	0.2	32.3 ± 2.05
	0.15	27.7 ± 0.94
	0.1	24.7 ± 4.50
	0.05	21.7 ± 3.40

Table 6. Antibacterial effect to *A. viscosus* of chlorhexidine & *Crassirhizomae* rhizoma

sample	Cone.(%)	inhibition zone(mm)
<i>Crassirhizomae</i> rhizoma	0.2	28 ± 0.82
	0.15	23.7 ± 1.25
	0.1	21.7 ± 1.69
	0.05	19.7 ± 0.47
Chlorohexidine	0.2	27.3 ± 1.25
	0.15	24.3 ± 2.05
	0.1	21 ± 2.16
	0.05	16.3 ± 1.70

가 70% well 3Mℓ 5% trichloroacetic
 chlorohexidine, PDGF가 가 - acid(TCA) 가 4
 MEM 24 10 . 5% TCA
 , 2 well 5 μ 5% TCA 4
 Ci [3H]thymidine 가 1Mℓ 0.5N NaOH 가 37°C 30
 . 100μℓ

Table 7. Antibacterial effect to *F. nucleatum* of chlorhexidine & *Crassirhizomae* rhizoma

sample	Cone.(%)	inhibition zone(mm)
<i>Crassirhizomae</i> rhizoma	0.2	20 ± 0.82
	0.15	16.7 ± 0.94
	0.1	14.3 ± 0.47
	0.05	10.7 ± 1.70
Chlorohexidine	0.2	32 ± 3.26
	0.15	28 ± 1.63
	0.1	27 ± 2.45
	0.05	24.7 ± 2.05

liquid scintillation counter(Beckam) DNA
 radioactivity
 III.

1. chlorhexidine
 Chlorohexidine 0.2, 0.15, 0.1, 0.05%
 A.actino - mycetemcomitans, C.ochracea, P.gingi - valis, P.intermedia, F.nucleatum, S.mutans, A.viscosus 7

Table 8. Cellular activity of gingival fibroblast of *Crassirhizomae* rhizoma & Chlorhexine

sample	Cone.(%)	Cellular activity(%)
control(- MEM)		100
<i>Crassirhizomae</i> rhizoma	0.2	22.18
	0.15	37.45
	0.1	94.64
	0.05	97.04
Chlorohexidine	0.2	39.93
	0.15	42.72
	0.1	45.10
	0.05	46.39

Table 9. Cellular effect of osteoblast of *Crassirhizomae* rhizoma & Chlorhexidine

sample	Cone.(%)	Cellular activity(%)
control(- MEM)		100
<i>Crassirhizomae</i> rhizoma	0.2	33.28
	0.15	61.27
	0.1	120.93
	0.05	111.45
Chlorohexidine	0.2	42.93
	0.15	43.97
	0.1	45.34
	0.05	45.98

가
A.viscosus 6 chlorhexidine - MEM
0.2% 0.15%
가 22.18%, 37.45%
. 0.1%, 0.05%
chlorhexidine 가 94.64%, 97.04%

(Table 1 - 7)

2. Chlorhexidine

. Chlorhexidine
0.2%, 0.15%, 0.1%, 0.05%
39.93%, 42.72%, 45.10%, 46.39%

(Table 8).

Table 10. Effect of Crassirhizomae rhizoma & Chlorhexidine on the [³H] thymidine incorporation into DNA of gingival fibroblast

sample	Conc.(%)	[³ H]	thymidine
incorporation(CPM)			
control(- MEM)			623
PDGF			650
	0.2		385
	0.15		430
	0.1		620
	0.05		632
Chlorohexidine	0.2		245
	0.15		275
	0.1		300
	0.05		310

Table 11. Effect of Crassirhizomae rhizoma & Chlorhexidine on the [³H] thymidine incorporation into DNA of osteoblast

sample	Cone.(%)	[³ H] thymidine incorporation(CPM)
control(- MEM)		2025
PDGF		2305
Crassirhizomae rhizoma	0.2	668
	0.15	1435
	0.1	2178
	0.05	2145
Chlorohexidine	0.2	440
	0.15	445
	0.1	448
	0.05	510

- MEM
 0.2% 0.15%
 가 33.28%, 61.275%
 0.1%, 0.05%
 가 120.93%, 111.45%
 가

. Chlorhexidine
 0.2%, 0.15%, 0.1%, 0.05% Chlorhexidine
 42.93%, 43.97%, 45.34%, 45.98%

(Table 9).

3. Chlorhexidine
 DNA

- MEM , PDGF
 0.2% 0.15% DNA
 , 0.1% 0.05%

Chlorhexidine
 DNA (Table 10).
 0.2% 0.15%

DNA
 , 0.1% 0.05%
 , Chlorhexidine
 DNA (Table 11).

IV.

가
 가

5).

Actinobacillus.
 actiomycetemcomitans., Capnocytophaga
 ochracea, Strepto-coccus mutans,
 Porphyromonas gingivalis, Prevotella
 intermedia, Actinomyces viscosus,
 Fusobacterium nucleatum

Chlorhexidine
 . Actinomyces viscosus
 , Prevotella intermedia 0.1%
 chlorhexidine

chlorhexidine
 chlorhexidine

growth factor가
 PDGF - BB, IGF

가 36,37), BMP
 38).

Chlorhexidine

, Gabler chlorhexidine
 가 100µg/Mℓ 가
 25µg/Mℓ
 µg/Mℓ
 33), Helgeland
 34), Mobacken 40

35)
 Chlorhexidine 가

26)
 holokiol magnolol
 cytokine
 , 39)

cytokine
 listerin, , 40) Sanguinarine,
 가

Chlorhexidine
 chlorhexidien
 가

, 가
 cytokine 가

V.

chlorhexidine
 가

1. Chlorohexidine
 Chlorohexidine

2. [3H] thymidine
 incorporation 0.1, 0.05%

VI.

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Key Words : natural extract, Chassizomae rhizoma, antibacterial effect, cytotoxicity,

40. , , , : - Abstract -

1992 22:1 - 12

Antibacterial Effects and Cytotoxicity of Crassirhizomae Rhizoma

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The purpose of this study was to evaluate the antimicrobial activity of Crassirhizomae rhizoma and its possible use as an oral antiseptics for prevention of periodontitis. Its antibacterial activity against periodontopathic microorganisms including Actinobacillus actinomycetem - comitans, Capnocytophaga ochracea, Streptococcus mutans, Porphyromonas gingivalis, Prevotella intermedia, Actinomyces viscosus, Fusobacterium nucleatum was evaluated via modified stab culture method. The cytotoxicity against gingival fibroblasts and rat osteoblasts was investigated via [³H]thymidine incorporation and cellular activity was investigated via MTT assay. Chlorhexidine was used as control group. Crassirhizomae rhizoma was prepared at concentrations of 0.2, 0.15, 0.1, 0.05%.

Chlorhexidine was also prepared at the same concentration. *Crassirhizomae* rhizoma showed lower antimicrobial activity against these microorganism than chlorhexidine, but this difference was not significant. And, *Crassirhizomae* rhizoma showed more cellular activity and less cytotoxicity than chlorhexidine on human gingival fibroblast and rat osteoblast. This study suggests that *Crassirhizomae* rhizoma might be a candidate for a safe oral antiseptic for the prevention and treatment of periodontal disease.