

I.

가 , Ureles(1983)<sup>9)</sup> 가 ,  
 , , 가 가  
 Hugoson (1989)<sup>10)</sup> 가 .  
 가 가  
 45 4 - 5mm Nelson  
 가 (1990)<sup>11)</sup> Grossi (1993)<sup>12)</sup>  
 가 2 - 3  
 , Collin (1998)<sup>13)</sup>  
 가 ,  
 1). 가  
 , 가  
 2-7).Campbell (1972)<sup>8)</sup> 가 (periodontal parameter)  
 , 가  
 . Karjalainen Knuuttila(1996)<sup>15)</sup>

HCN benaldehyde  
가 . amyg -  
dalin D - form L - form D -  
mandelonitrile - -D - gentiobioside L -  
mandelonitrile - -D - gentiobioside가

(1996)<sup>16)</sup> Nishimura . ( )

(1997)<sup>17)</sup>  
glucose  
prostaglandin E<sub>2</sub>

가 .  
가 .

II.

1.

18). 500g 2 Soxhlet

(1999)<sup>19)</sup> Rotary Evaporator 2 , Freeze -  
dryer

가 .

(Armeniacaee Semen, (杏仁) (1988)<sup>20)</sup> Somerman  
果實

核仁 , , 1)

amygdalin 3%, 30 - 50% 200 unit/ml penicillin(Gibco, U.S.A.), 200 µg  
emulsion , amygdalin emulsion /ml streptomycin (Gibco, U.S.A.) 1 µg/ml  
mandelonitrile glucose amphotericin - B(Gibco, U.S.A.)가 가

Dulbecco's Modified Eagle's Medium (Gibco, U.S.A.) 4 . 1  $\mu\text{g}/\text{M}\ell$  1 , 10  
 1mm<sup>3</sup> 2  
 35mm 10 - 15 .  
 10% Fetal bovine serum (FBS, Gibco, U.S.A.) 100 unit/ml 2)  
 penicillin, 100  $\mu\text{g}/\text{ml}$  streptomycin, 0.5  $\mu\text{g}/\text{ml}$   
 amphotericin - B가 DMEM 35mm 4.5  $\times 10^4$  cells/ml  
 , 37 , 100% , 5% CO<sub>2</sub> 가 10% FBS 100 unit/ml  
 (Vision Scientific Co., Korea) penicillin, 100  $\mu\text{g}/\text{ml}$  streptomycin, 0.5  $\mu\text{g}/\text{ml}$   
 . amphotericin - B가 DMEM  
 가 , 37 , 100% , 5% CO<sub>2</sub> 3  
 0.05% Trypsin/0.02% EDTA 27 . 가  
 1:3 1  
 4 - 7 , 1 , 2 , 5  
 2) 0.05% Trypsin/ 0.02% EDTA  
 1 hemocytometer  
 4 .  
 blade 35mm 3)  
 4 - 7 35mm 4.5  $\times 10^4$  cells/ml  
 가 , 2 , 5  
 2. (Phosphate buffered saline) 2  
 0.05% Trypsin/0.02% EDTA cell pel -  
 1) let 0.5ml deionized distilled water  
 < > .  
 100 $\mu\ell$  protein assay  
 kit (BIO - RAD, U.S.A) 5ml  
 FBS 100 unit/ml penicillin, 100  $\mu\text{g}/\text{ml}$  streptomycin, 0.5  $\mu\text{g}/\text{ml}$  amphotericin - B가 UV - VIS spectrophotometer 595nm  
 DMEM .  
 400 mg/d $\ell$  .  
 가 . 4) Alkaline phosphatase  
 35mm

Table 1. Effect of Armeniaca Semen extracts on the proliferation of human gingival fibroblasts under the high glucose condition

group	time	cell number (× 10 <sup>4</sup> cells/ml)		
		1day	2day	5day
GC		4.80 ± 0.38	5.71 ± 0.51	8.50 ± 0.81
GT1		4.59 ± 0.59	5.13 ± 0.24	7.79 ± 1.11
GT2		4.45 ± 0.25	4.64 ± 0.44*	6.54 ± 0.51*

Values are the mean ± S.D. n=3

GC; control, glucose 400mg/dl, T1; A.S. 1µg/Ml+glucose 400mg/dl, T2; A.S. 10µg/Ml+glucose 400mg/dl

\* Significantly different from the control at each day (P<0.05 by one - way ANOVA)

Table 2. Effect of Armeniaca Semen extracts on the proliferation of human periodontal ligament cell under the high glucose condition

group	time	cell number (× 10 <sup>4</sup> cells/ml)		
		1day	2day	5day
GC		4.41 ± 0.49	5.42 ± 0.59	7.09 ± 0.75
GT1		4.09 ± 0.59	5.59 ± 0.68	7.20 ± 0.30
GT2		4.38 ± 0.37	6.17 ± 0.43	9.02 ± 0.96*

Values are the mean ± S.D. n=3

GC; control, glucose 400mg/dl, T1; A.S. 1µg/Ml+glucose 400mg/dl, T2; A.S. 10µg/Ml+glucose 400mg/dl

\* Significantly different from the control at each day (P<0.05 by one - way ANOVA)

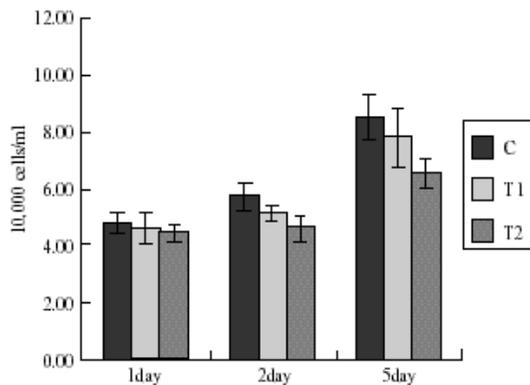


Figure 1. Effect of Armeniaca Semen extracts on the proliferation of human gingival fibroblasts under the high glucose

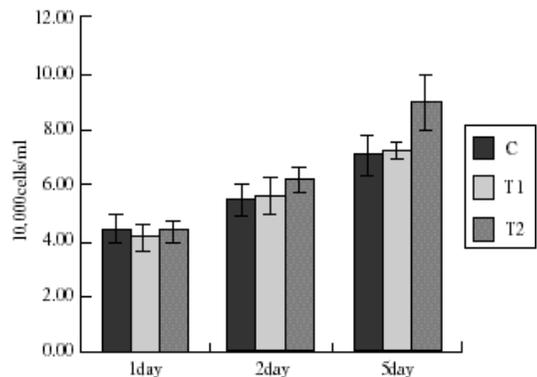


Figure 2. Effect of Armeniaca Semen extracts on the proliferation of human periodontal ligament cells under the high

4.5 × 10<sup>4</sup> cells/ml 가 , 2 , 5  
(Phosphate buffered saline) 2 0.05%

Trypsin/0.02% EDTA cell pellet  
0.5ml deionized distilled water

50 $\mu$ l Kind - King method 5) P<0.05  
 UV - VIS spectrophotometer One Way ANOVA Test  
 500nm  
 alkaline phosphatase

III.

Table 3. Effect of Armeniacaee Semen extracts on the protein amounts of human gingival fibroblasts under the high glucose condition

time \ group	Protein( $\mu$ g/M $\ell$ )		
	GC	GT1	GT2
2day	19.49 $\pm$ 0.73	19.63 $\pm$ 0.63	20.37 $\pm$ 1.51
5day	28.54 $\pm$ 1.26	26.45 $\pm$ 0.71	25.31 $\pm$ 1.11*

Values are the mean  $\pm$  S.D. n=3

GC; control, glucose 400mg/dl, T1; A.S. 1 $\mu$ g/M $\ell$ +glucose 400mg/dl, T2; A.S. 10 $\mu$ g/M $\ell$ +glucose 400mg/dl

\* Significantly different from the control at each day (P<0.05 by one - way ANOVA)

Table 4. Effect of Armeniacaee Semen extracts on the protein amounts of human periodontal ligament cells under the high glucose condition

time \ group	Protein( $\mu$ g/M $\ell$ )		
	GC	GT1	GT2
2day	18.25 $\pm$ 0.86	17.15 $\pm$ 0.94	18.83 $\pm$ 0.77
5day	29.38 $\pm$ 1.33	30.05 $\pm$ 1.38	33.20 $\pm$ 2.46*

Values are the mean  $\pm$  S.D. n=3

GC; control, glucose 400mg/dl, T1; A.S. 1 $\mu$ g/M $\ell$ +glucose 400mg/dl, T2; A.S. 10 $\mu$ g/M $\ell$ +glucose 400mg/dl

\* Significantly different from the control at each day (P<0.05 by one - way ANOVA)

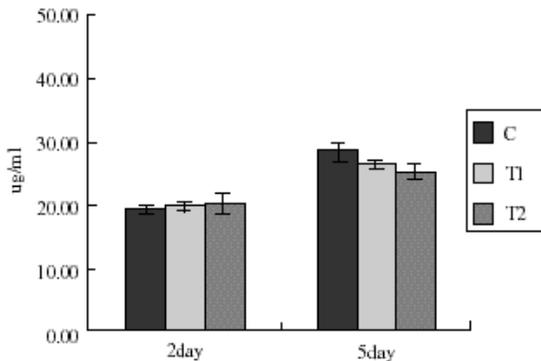


Figure 3. Effect of Armeniacaee Semen extracts on the protein levels of human gingival fibroblasts under the high glucose

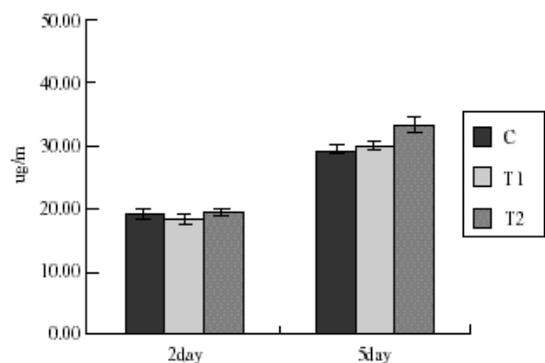


Figure 4. Effect of Armeniacaee Semen extracts on the protein levels of human peri - odontal ligament cells under the high

Table 5. Effect of Armeniacaee Semen extracts on alkaline phosphatase activity of human periodontal ligament cells under the high glucose condition

time	group	ALP		
		GC	GT1	GT2
2day		40.68 ± 1.35	43.85 ± 0.44	41.84 ± 1.46
5day		44.56 ± 0.45	51.55 ± 1.03*	48.04 ± 0.65*

Values are the mean ± S.D. n=3

GC; control, glucose 400mg/dl, T1; A.S. 1µg/Ml+glucose 400mg/dl, T2; A.S. 10µg/Ml+glucose 400mg/dl

\* Significantly different from the control at each day (P<0.05 by one - way ANOVA)

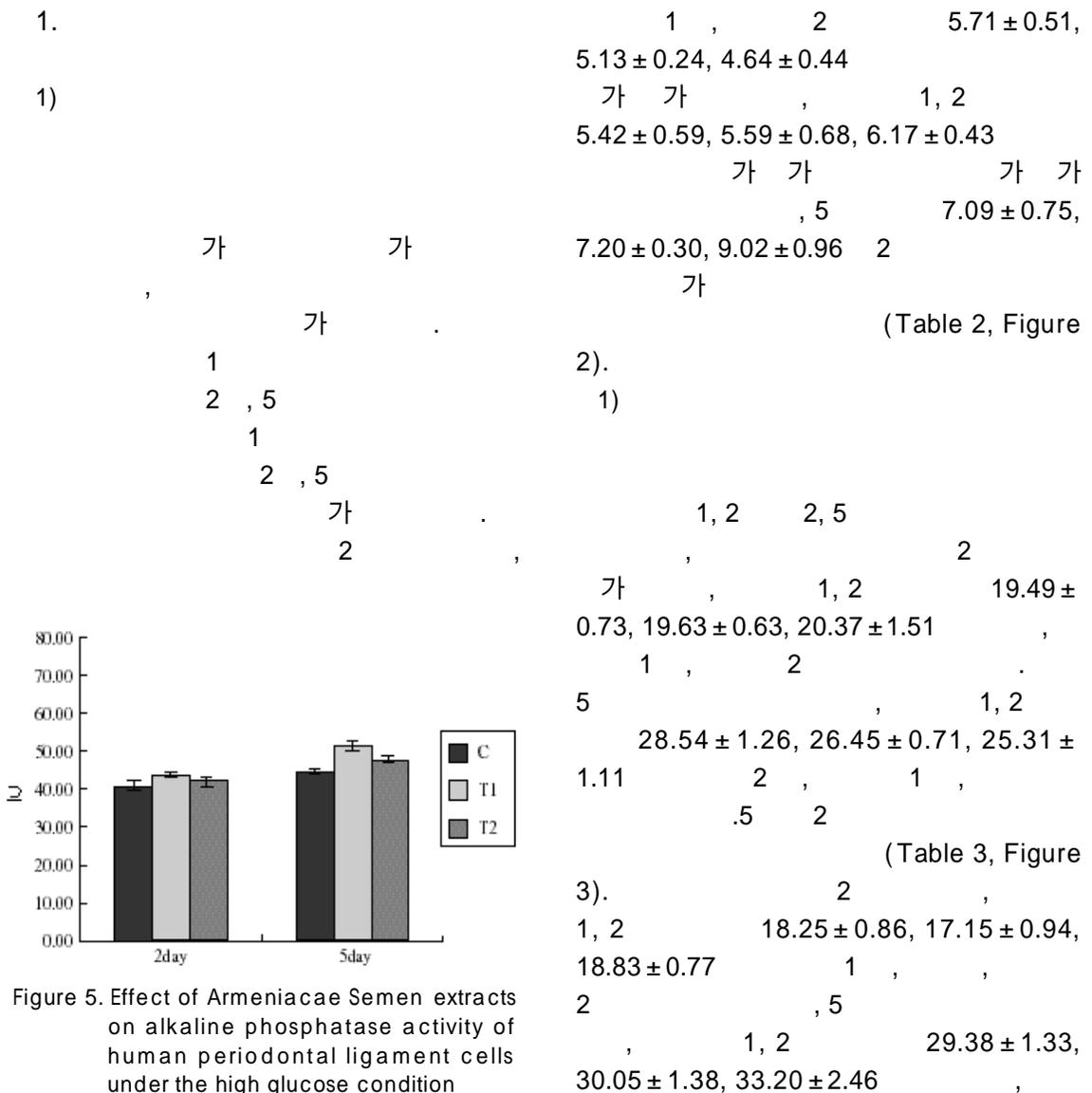


Figure 5. Effect of Armeniacaee Semen extracts on alkaline phosphatase activity of human periodontal ligament cells under the high glucose condition

1 , 2 .

(Table 4, Figure 4).

### 3. Alkaline phosphatase

1)

1, 2 2, 5  
 , 2  
 가 , 1, 2 40.68 ±  
 1.35, 43.85 ± 0.44, 41.84 ± 1.46  
 2 , 1 . 5  
 , 1, 2  
 44.56 ± 0.45, 51.55 ± 1.03, 48.04 ± 0.65  
 2 . 5 1, 2  
 가 가

(Table 5, Figure 5).

### IV.

가  
 가  
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 가  
 21,22).  
 , 2  
 1  
 20  
 - cell  
 가

1  
 가  
 2  
 40  
 - cell  
 가  
 가  
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 2  
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 23).  
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 가  
 1), 가  
 가

2 - 7).  
 Campbell(1972)<sup>8)</sup>  
 가  
 ,  
 ,  
 Ureles(1983)<sup>9)</sup>  
 가  
 ,  
 가  
 Hugoson (1989)<sup>10)</sup>  
 가  
 , 45  
 4 - 5mm  
 . Nelson  
 (1990)<sup>11)</sup> Grossi (1993)<sup>12)</sup>  
 2 - 3

(1998)<sup>13)</sup> , Collin (1997)<sup>29)</sup> PGE<sub>2</sub> IL - 1

Ficara (1975)<sup>24)</sup> 가 ,  
가 가  
가  
periodontal flora  
, , ,  
30) , cytokine, arachidonic acid

25,26). Bridges (1996)<sup>14)</sup> 가 ,  
, 가 . Arachidonic acid  
(periodontal parameter) prostaglandin ,  
가 가  
Karjalainen 31,32).  
Knuuttila(1996)<sup>15)</sup> PGE<sub>2</sub> ,  
가 33 - 36).  
PGE<sub>2</sub> 가  
, Nishimura (1996)<sup>16)</sup> 35,37 - 41).

(1992)<sup>27)</sup> , Sorsa 가 PGE<sub>2</sub> .  
collagenase 가 가 Garrison (1988)<sup>42)</sup> Sismey (1991)<sup>43)</sup>  
가 가 . Sepp I 가 lipopolysaccharide  
1997)<sup>28)</sup> 가 PGE<sub>2</sub> ,  
가 Arai (1995)<sup>44)</sup> prostaglandin  
, DNA ,  
(1997)<sup>17)</sup> . Koka  
(1997)<sup>45)</sup>  
prostaglandin E<sub>2</sub> 가 가 P. gingivalis lipopolysac -  
, Salvi charide PGE<sub>2</sub> 가



400 mg/dℓ

가

1, 10 µg/Mℓ

1, 2

,

,

.

1.

1)

가 가

5 2

(P<0.05).

가

가 가

(P<0.05).

2)

가

가 가

5 2

(P<0.05).

가 가

가

(P<0.05).

3)

가 가

5 1, 2

가 (P<0.05).

가

가

가

V.

1. :

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- Abstract -

## Effect of Armeniaca Semen Extracts on Human Gingival Fibroblasts and Periodontal Ligament Cells under the High Glucose Conditions

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Joon - Bong Park, Yeek Heer, Sung - Jin Kim

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Dentistry, Kyung Hee University

The purpose of this study was performed to evaluate the effect of Armeniaca Semen extracts on human gingival fibroblasts and periodontal ligament cells in vitro. A experiment was done to evaluate the effect of Armeniaca Semen extracts in high glucose media. 400 mg/dℓ glucose was added to the culture media of all groups. In control group, the cells ( $4.5 \times 10^4$  cells/ml) were cultured with Dulbecco's Modified Eagle's Medium contained with 10% fetal bovine serum. In experimental groups, Armeniaca Semen extracts was added to the above culture media at the final concentrations of 1  $\mu\text{g}/\text{M}\ell$  (Test group 1) and 10  $\mu\text{g}/\text{M}\ell$  (Test group 2). Then each group was tested for the rate of cell proliferation at 1, 2, 5 days, protein levels at 2, 5 days, and alkaline phosphatase activity at 2, 5 days.

The results were as follows ;

1. Under the high glucose condition

1) As concentration of Armeniaca Semen extracts increased, the rate of cell proliferation decreased significantly in test group 2 at 5 days in human gingival fibroblasts, but increased significantly in test group 2 at 5 days in human periodontal ligament cells ( $P < 0.05$ ).

2) In human gingival fibroblasts, test group 2 showed significantly decreased protein levels as compared to control group at 5 days. In periodontal ligament cells, test group 1 and 2 showed not significantly increased protein levels as compared to control group at 2, 5 days ( $P < 0.05$ ).

3) Alkaline phosphatase activity of human periodontal ligament cells increased as concentration of Armeniaca Semen extracts increased. The test group 1 and 2 showed significant increase as compared to control group at 5 days ( $P < 0.05$ ).

From the above results, Armeniaca Semen extracts appeared to enhance cellular activities including the rate of cell proliferation, protein levels and alkaline phosphatase activity of selectively human periodontal ligament cells in high glucose media. This study suggests that Armeniaca Semen extracts seem to be able to subside the inflammation of periodontal tissue and regenerate the destructed periodontal tissue.