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활성분획 추적방법을 통한 혈관확장 촉진물질의 순수분리 및 구조 동정

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Structural Elucidation of Vasodilation Compound from *Schisandra chinensis* by Activity-Guided Fractionation

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Objectives

- Isolation of vasodilation compound by activity-guided fractionation
- To investigate the vascular effects of fractionation *Schisandra chinensis* fruit.

Materials and Methods

○ Plant Material

Schisandra chinensis(SC) fruits were collected in September 2006 from Moonkyeong, Korea. A voucher specimen has been deposited in the Herbarium of Pusan National University.

○ Preparation of aortic rings

Male Sprague-Dawley rats (250-300g), were anesthetized with 50 mg/kg sodium pentobarbital (i.p.). Changes in isometric tension were recorded using a force-displacement transducer (Grass FT 0.3, Quincy, MA, USA) connected to a Power Lab system 400 (ML 118).

Results

The dried fruits of SC (2.0 kg) were ground to a fine powder and were successively extracted at room temperature with *n*-hexane, $CHCl_3$, and MeOH. The hexane extract (308 g) was chromatographed on a silica gel, obtained 38 fractions and then measured vasodilation. The fraction 28 (800 mL, 600.5 mg) were separated on a silica gel column (100 x 3.0 cm) with 5% acetone in CH_2Cl_2 to give a gomisin A (GA) (482 mg). Pure GA was identified by HPLC, LC-MS and NMR analysis (Bruker DRX 400 spectrometer).

In order to provide some scientific rationales for such effectiveness, this study investigated the vascular effects of gomisin A (GA) from SC. In the endothelium (ED)-intact rings of rat thoracic aorta, GA ($1x10^{-6}$ - $3x10^{-4}$ M) caused a concentration-dependent relaxation which were markedly attenuated by removal of ED but also by pretreatment with N^G-nitro-L-arginine methyl ester (10^{-4} M) or 1H-[1,2,4]oxadiazolo[4,3-a]quinoxaline-1-one (3×10^{-5} M).

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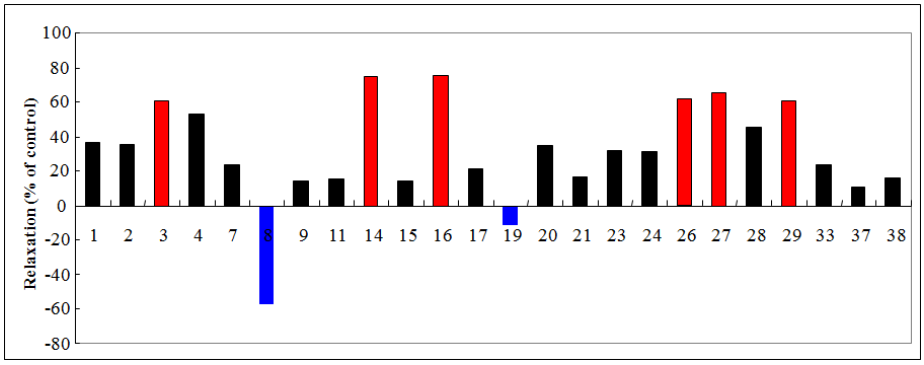


Fig. 1. Effect of hexane fraction on vasodilation.. The hexane extract was chromatographed on a silica gel, obtained 38 fractions and then measured vasodilation.

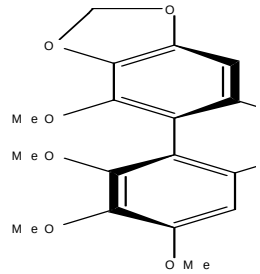
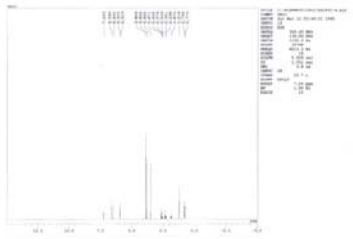
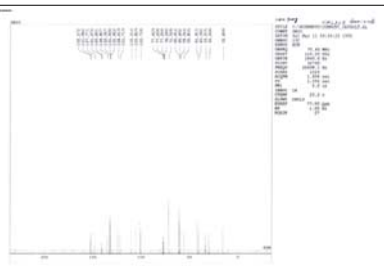


Fig. 2. Structure of gomisin A from Schisandra chinensis



^{1}H NMR of Gomisin A (500 MHz in $CDCl_3$)



^{13}C NMR of Gomisin A (125 MHz in $CDCl_3$)

Fig 3. NMR spectrum of Gomisin A from Schisandra chinensis

Table 8. ^{13}C-NMR (100 MHz, $CDCl_3$) and H-NMR (500 MHz, $CDCl_3$) chemical shifts of Gomisin A isolated from the fruits of *Schisandra chinensis* B$_{AIL}$.

Carbon No.	δ_C	δ_H
1	152.1	
2	140.8	
3	152.3	
4	110.4	6.63, s
5	132.1	
6	40.6	6α-H: 2.69 d, (13.6) 6β-H: 2.38 d, (13.6)
7	71.7	1.91 s
8	42.1	1.87 m
9	33.8	9α-H: 2.34 dd, (7.6/3.2) 9β-H: 2.56 d, (14.0)
10	132.5	
11	105.9	6.49, s
12	147.9	
13	135.0	
14	141.3	
15	121.9	
16	124.2	
17	15.8	0.82 d, (7.6)
18	30.1	1.26 s
OCH_3 C-1, 14	60.6, 59.6	3.91 (×2)
OCH_3 C-2, 13	61.0, -	3.53, -
OCH_3 C-3, 12	56.0, -	3.85, -
OCH_2O	100.8	5.97 d, (3.2)