Fitoterapia 101 (2015) 125–132

Contents lists available at ScienceDirect

Fitoterapia

journal homepage: www.elsevier.com/locate/fitote

New flavonoid glycosides from *Sedum aizoon* L.

Tanye Xu, Zhonghuan Wang, Tianli Lei, Chongning Lv, Jing Wang *, Jincai Lu *

Department of Medicinal Plant, School of Traditional Chinese Materia Medica, Shenyang Pharmaceutical University, Box 79, Shenyang, Liaoning Province, 110016, PR China

ARTICLE INFO

Article history:
Received 29 November 2014
Accepted in revised form 23 December 2014
Accepted 26 December 2014
Available online 3 January 2015

Chemical compounds studied in this article:
Gallic acid (PubChem CID: 370)
Methyl gallate (PubChem CID: 7428)
Herbacetin-8-O-β-D-glucopyranoside (PubChem CID: 44259936)
Myricetin-3-*O*-β-D-glucopyranoside (PubChem CID: 44259426)
Quercetin-3-*O*-α-L-rhamnopyranoside (PubChem CID: 40486293)
1-*O*-sinpoyl glucopyranoside (PubChem CID: 77338752)
(3S,5R,6R,7E,9S)-megastigman-7-ene-3,5,6,9-tetrol 3-*O*-β-D-glucopyranoside (PubChem CID: 23757168)
(3S,5R,6R,7E,9S)-megastigman-7-ene-3,5,6,9-tetrol 9-*O*-β-D-glucopyranoside (PubChem CID: 71694406)

Keywords:
Flavonoid glucoside
Phenolic compounds
Sedum aizoon L
Antibacterial activity
Cytotoxicity

ABSTRACT

Five new flavonoid glucosides (**3–4, 10–12**) and a new phenolic derivative (**5**), together with eight known compounds including three flavonoid glucosides (**6–8**), three phenolic compounds (**1–2**, **9**) and two megastigmane glucosides (**13**, **14**), were isolated from the ethanol extract of the aerial part of *Sedum aizoon* L. Among them, compounds **9**, **13** and **14** were isolated and identified from this genus for the first time. The structures of compounds were elucidated on the basis of 1D and 2D NMR (HSQC, HMBC and COSY) spectra and the HR-ESI-MS data. These compounds were tested for their antibacterial efficacies against both Gram-positive and Gram-negative bacteria. Compounds **1**, **2**, **3**, **7** and **10** showed certain antibacterial activity; it showed more potency against Gram-positive than against Gram-negative bacteria. Compound **2** showed the most pronounced antibacterial effectiveness against *Staphylococcus aureus* Rosenbach with MIC value of 7.8 $\mu g \cdot mL^{-1}$. The in vitro anti-proliferative activities against HepG2, MCF-7 and A549 tumor cell lines were also evaluated. The result suggested compound **7** exhibited moderate cytotoxic activities with IC_{50} values of 46.30, 75.27 and 49.76 μmol/L, respectively.

© 2015 Elsevier B.V. All rights reserved.

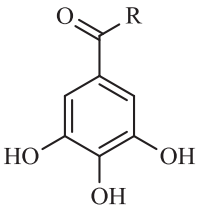
1. Introduction

The genus *Sedum*, a member of the Crassulaceae family, contains about 470 species that are widely distributed in the Northern Hemisphere [1]. *Sedum aizoon* L. is an endemic plant widespread in North Korea, Japan, Mongolia, the Sibria area and China, named as 'tusanqi' in folk medicine with light green leaves on thick stems and a yellow flower blooming in the summer. The herb has been used as a traditional medicine to treat hemorrhage, traumatism, palpitation, insomnia, neurasthenia, chronic cough, scald and insect bite [2]. It is an edible plant common to Chinese, which is useful in reducing hematic fat and blood pressure [3]. Moreover, the phytochemical study of *Sedum* indicated the presence of flavonoid, phenolic acid compounds, polysaccharose and alkaloids, which were considered to play a major role in biological activity [4,5]. In this study, we focused on the isolation of the

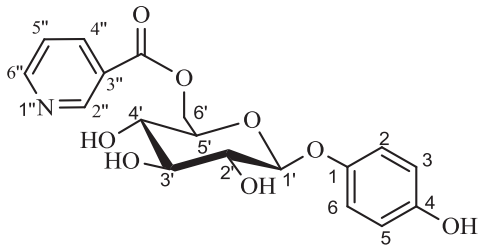
* Corresponding authors. Tel./fax: +86 24 23986500.
E-mail addresses: wangjingyk@126.com (J. Wang), jincailu@126.com (J. Lu).

http://dx.doi.org/10.1016/j.fitote.2014.12.014
0367-326X/© 2015 Elsevier B.V. All rights reserved.

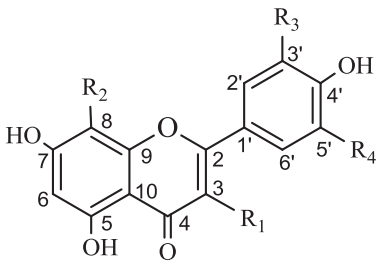
high polar constituents from the ethanol extract of the aerial part of *S. aizoon* L. and derived five new flavonoid glucosides (**3**–**4**, **10**–**12**) and a new phenolic derivative (**5**), along with eight known compounds (**1**–**2**, **6**–**9** and **13**–**14**) (see Fig. 1). Moreover, compounds **9**, **13** and **14** were isolated and identified from this genus for the first time. Their structures were elucidated by means of spectroscopic evidences (IR, HR-ESIMS, 1D and 2D NMR). These compounds were evaluated for antimicrobial against both Gram-positive and Gram-negative bacteria, with the addition of cytotoxicity test against HepG2, MCF-7 and A549 tumor cell lines in this paper.



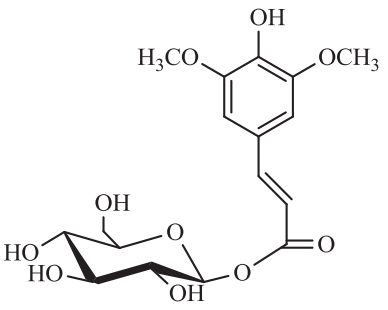
1 R=OH
2 R=OCH_3



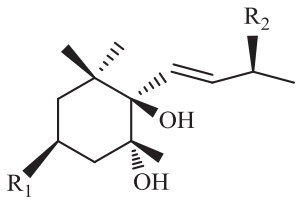
5



3 R_1=O-Rha, R_2=O-Lyx, R_3=H, R_4=H
4 R_1=O-Ara, R_2=O-Xyl, R_3=H, R_4=H
6 R_1=OH, R_2=O-Glu, R_3=H, R_4=H
7 R_1=O-Glu, R_2=H, R_3=OH, R_4=OH
8 R_1=O-Rha, R_2=H, R_3=OH, R_4=H
10 R_1=O-Glu, R_2=O-Xyl, R_3=OH, R_4=H
11 R_1=O-Glu, R_2=O-Ara, R_3=H, R_4=H
12 R_1=O-Glu, R_2=O-Xyl, R_3=OCH_3, R_4=H



9



13 R_1=O-Glu, R_2=OH
14 R_1=OH, R_2=O-Glu

Fig. 1. Chemical structures of compounds **1–14**.

Download English Version:

https://daneshyari.com/en/article/5830752

Download Persian Version:

https://daneshyari.com/article/5830752

Daneshyari.com