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CHEMICAL CONSTITUENTS FROM *Sarcopyramis bodinieri* var. *delicate*

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The genus *Sarcopyramis* belongs to the family of Melastomataceae, comprising four species and two varieties in China [1]. Many species are medicinal plants used in folk medicine to treat liver diseases. As a rare species, *Sarcopyramis bodinieri* var. *delicate* was widely used as a hepatoprotective drug in Fujian Province, China. The water extract of this dried herb can reduce aminotransferase and cure choleplania and hepatoma [2]. However, phytochemical and pharmacology studies of this plant have not been reported previously. We continue of our studies on the bioactive constituents from *Sarcopyramis bodinieri* var. *delicate* [2, 3]. The EtOH extract was subjected to solvent partitioning and chromatographic separation to yield 18 pure compounds. The structures of those compounds were elucidated by spectroscopic analysis and identified as *β*-sitosterol (**1**) [4], daucosterol (**2**) [4], kaempferol (**3**) [5], myricetin (**4**) [5, 6], dihydroquercetin (**5**) [6], astragalin (**6**) [7], kaempferol-3-*O*-(6″-acetyl)-*β*-D-glucopyranoside (**7**) [8], quercetin-3-*O*-(6″-*O*-*E*-*p*-feruloyl)-*β*-D-glucopyranoside (**8**) [9], isorhamnetin-3-*O*-*β*-D-rutinoside (**9**) [10], ellagic acid (**10**) [11], 3,3′-di-*O*-methylellagic acid (**11**) [11], ferulic acid (**12**) [12], isoferulic acid (**13**) [12], *p*-hydroxybenzoic acid (**14**) [12], protocatechuic acid (**15**) [13], *p*-coumaric acid (**16**) [13], caffeic acid (**17**) [12], and aesculetin (**18**) [6]. All of these compounds were isolated and identified for the first time in this plant.

The specimen of *Sarcopyramis bodinieri* var. *delicate* was collected from Fujian Province, P. R. China, in April 2007. A voucher specimen (RSC07) was identified by Xiu-Hong Zhou (an advanced engineer of the Forest Administration of Yongchun, Fujian Province) and deposited at the Department of Pharmacy, School of Medicine, Xiamen University. The air-dried plant material (10 kg) was ground and extracted exhaustively by maceration at room temperature with EtOH–H_2O (70:30, 20 L × 3). The concentrated total extract (1.8 kg) was further extracted with petroleum ether (PE), $CHCl_3$, EtOAc, and *n*-BuOH. The $CHCl_3$ extract (SBB 36 g) was successively purified on a silica gel (200–300 mesh) column gradient-eluted with PE–acetone (from 5:1 to 0:1) to afford seven fractions. Fractions 2, 4, and 6 were further chromatographed on a Sephadex LH-20 column eluted with $CHCl_3$–MeOH (1:1) to yield *β*-sitosterol (**1**) (1.2 g), daucosterol (**2**) (780 mg), and kaempferol (**3**) (56 mg). The EtOAc extract (SBC, 95 g) was suspended in H_2O (2 L), and the filtered layer was then aplied to a D101 macroporous adsorption resin column eluted with an equivalent H_2O–EtOH stepwise gradient to obtain five fractions. Fraction 3 (SBC-C, 13.76 g) was applied to a Sephadex LH-20 column eluted with MeOH to give six subfractions. Fraction SBC-C5 was applied to a Sephadex LH-20 column to give myricetin (**4**) (23 mg); Fr. SBC-C3 was repeatedly chromatographed on an RP-ODS column gradient-eluted with MeOH–H_2O and then repeatedly on a silica gel (200–300 mesh) column to give dihydroquercetin (**5**) (13.4 mg), astragalin (**6**) (15.2 mg), kaempferol-3-*O*-(6″-acetyl)-*β*-D-glucopyranoside (**7**) (6.5 mg), and quercetin-3-*O*-(6″-*O*-*E*-*p*-feruloyl)-*β*-D-glucopyranoside (**8**) (7.8 mg); Fr. SBC-C2 was chromatographed on a silica gel (200–300 mesh) column gradient-eluted with $CHCl_3$–MeOH to give isorhamnetin-3-*O*-*β*-D-rutinoside (**9**) (153.4 mg); Fr. SBC-C1 was chromatographed on a Sephadex LH-20 column eluted with MeOH to give 3,3-di-*O*-methylellagic acid (**11**) (9.4 mg). Fraction 2 (SBC-B, 44.4 g) was dissolved in 20% MeOH to give the ellagic sediment (**10**) (2.1 g), and the supernatant was applied to an RP-ODS column gradient-eluted with MeOH–H_2O to afford five subfractions. Fraction SBC-B2 was subjected to RP-ODS column gradient elution with MeOH–H_2O to give caffeic acid (**17**) (2.1 g); Fr. SBC-B3 was repeatedly chromatographed on a silica gel (200–300 mesh) column gradient-eluted with $CHCl_3$–MeOH to give ferulic acid (**12**) (21 mg), isoferulic acid (**13**) (12 mg), and *p*-hydroxybenzoic acid (**14**) (19 mg); Fr. SBC-B4 was chromatographed on a Sephadex LH-20 column eluted with MeOH to give protocatechuic acid (**15**) (15.5 mg), *p*-coumaric acid (**16**) (9.1 mg), and aesculetin (**18**) (7.5 mg).

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Flavonoids and phenolic acids were the major constituents in the family of Melastomataceae, especially the acylated flavonol glycoside. Isorhamnetin and its derivatives were isolated from the family of Melastomataceae for the first time, which were the typical ingredients of this plant. Isorhamnetin and quercetin and its glucosides were the major constituents from the plant. Thus, our phytochemical investigation of this plant has chemotaxonomic significance.

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REFERENCES

1. Y. L. Chen, *Flora of China*, Science Press, Beijing (1999), 309 pp.
2. C. P. Wan, X. Zheng, H. F. Chen, X. H. Zou, Z. R. Song, S. R. Zhou, and Y. Qiu, *Chin. J. Chin. Mater. Med*., **34**, 172 (2009).
3. X. M. Wang, C. P. Wan, S. R. Zhou, and Y. Qiu, *Molecules*, **13**, 1399 (2008).
4. S. C. Chen, L. L. Hong, C. Y. Chang, C. J. Chen, M. H. Hsu, Y. C. Huang, T. H. Huang, and S. C. Kuo, *Chin. Pharm. J.*, **55**, 109 (2003).
5. M. Curini, F. Epifano, L. Menghini, and R. Pagiotti, *Chem. Nat. Comp.*, **40**, 190 (2004).
6. W. X. Zhang and W. F. Bao, *Acta Pharm. Sinica*, **35**, 124 (2000).
7. T. Wu, R. Abdulla, Y. Yang, and H. A. Aisa, *Chem. Nat. Comp*., **44**, 370 (2008).
8. L. H. Li and Z. Yuan, *Chin. J. Chin. Mater. Med*., **31**, 1337 (2006).
9. B. Danieli, A. Bertario, G. Carrea, B. Redigolo, F. Secundo, S. Riva, and Sergio, *Helv. Chim. Acta*, **76**, 2981 (1993).
10. X. C. Su, L. Chen, and H. A. Aisa, *Chem. Nat. Comp.*, **44**, 365 (2008).
11. G. Ye, H. Peng, M. S. Fan, and C. G. Huang, *Chem. Nat. Comp.*, **43**, 125 (2007).
12. Y. F. Liu, X. W. Yang, and B. Wu, *J. Chin. Pharm. Sci*., **16**, 288 (2007).
13. J. Yang, X. M. Cai, S. Z. Mu, and X. S. Yang, *Chin. J. Chin. Mater. Med*., **34**, 1802 (2009).