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Original article

Chemical Constituents from Leaves of *Camellia nitidissima* and Their Potential Cytotoxicity on SGC7901 Cells

Jing Qi[1], Ruo-fu Shi[1], Jian-ming Yu[1], Yi Li[1], Sheng-tao Yuan[2], Ji-zhu Yang[3], Jiang-miao Hu[4]*, Ai-qun Jia[1]*

1. School of Environmental and Biological Engineering, Nanjing University of Science and Technology, Nanjing 210094, China

2. Jiangsu Center for Pharmacodynamics Research and Evaluation, China Pharmaceutical University, Nanjing 210009, China

3. Guangxi Gui-Ren-Tang Co., Ltd., Fangchenggang 538021, China

4. State Key Laboratory of Phytochemistry and Plant Resources in West China, Kunming Institute of Botany, Chinese Academy of Sciences, Kunming 650201, China

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ABSTRACT

Objective To isolate and identify the bioactive phytochemicals from the leaves of *Camellia nitidissima*. **Methods** The chemical constituents were isolated and purified by repeated silica gel, Sephadex LH-20, MCI gel columns, recrystallization, and semi-preparative HPLC techniques. The chemicl structures of these compounds were identified on the basis of spectral data including NMR and MS. Then quorum sensing inhibition (QSI) activities of these compounds were tested using *Chromobacterium violaceum* CV026 as the bioindicator strain. The antitumor activities of these compounds were measured using SGC7901 as cell proliferation and cytotoxicity. **Results** α-Spinasteryl-β-*D*-glucopyranoside (**1**), stigmasta-7,22-diene-3-*O*-[α-*L*-arabinopyranosyl (1→2)]-β-*D*-galactopyranoside (**2**), kaempferol 3-*O*-[2-*O*-(*trans*-*p*-coumaroyl)-3-*O*-α-*D*-glucopyranosyl]-α-*D*-glucopyranoside (**3**), aromadendrin (**4**), catechin (**5**), phlorizin 4′-*O*-β-*D*-glucopyranoside (**6**), (3*R*,6*R*,7*E*)-3-hydroxy-4,7-megastigmadien-9-one (**7**), dodecanoic acid (**8**), 3β-acetoxy-20-lupanol (**9**), and 3β,6α,13β-trihydroxyolean- 7-one (**10**) were successively isolated from the leaves of *C. nitidissima*. Unfortunately, these compounds had no QSI activity. Based on Cell Counting Kit-8 (CCK-8) assay, compound **10** showed the best anti-tumor activity of all compounds (IC_{50} = 91.7 μg/mL). **Conclusion** Apart from compounds **4** and **5**, other eight compounds are reported in this plant for the first time. All compounds show no QSI activity, compound **10** shows potential cytotoxic activity on SGC7901 cells *in vitro*.

Key words

antitumor; *Camellia nitidissima*; C-27 steroidal saponins; flavonoids; quorum sensing inhibitors; SGC7901; triterpenes

***Corresponding authors: Hu JM** Tel: +86-871-6522 3264 E-mail: hujiangmiao@mail.kib.ac.cn

Jia AQ Tel: +86-25-8431 5512 E-mail: jiaaiqun@gmail.com

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1. Introduction

The plants in *Camellia* L. (Theaceae), containing about 280 species in the world, are mostly distributed in East Asia. Among them, 238 species are in China, which are mostly located in Yunnan, Guangxi, Guangdong, and Sichuan (Zhang and Ren, 1998). Plants in *Camellia* L. contains a variety of physiologically active ingredients, such as tea polysaccharides, polyphenols, tea saponins, flavonoids (Guangxi Institute of Botany, 1991). Clinical findings showed that the plants in *Camellia* L. could inhibit the transplanted cancer, lower blood pressure, lower blood lipid, lower cholesterol, and prevent atherosclerosis (Huang et al, 2009). As one of the rare species in the world, *Camellia nitidissima* Chi was first found in Guangxi by Prof. JL Zuo in 1933, named by Prof. JW Qi in 1948 (Liang, 1992), and has been used as a Chinese materia medica (CMM) to treat sore throat, diarrhea, high blood pressure, blood in the stool, irregular menstruation, and for cancer prevention (Guangxi Institute of Botany, 1991). But there were few studies on the phytochemicals from this species before.

In this study, ten phytochemicals were isolated from the leaves of *C. nitidissima*, and were elucidated as α-spinasteryl-β-*D*-glucopyranoside (**1**), stigmasta-7,22-diene-3-*O*-[α-*L*-arabinopyranosyl (1→2)]-β-*D*-galactopyranoside (**2**), kaempferol 3-*O*-[2-*O*-(*trans*-*p*-coumaroyl)-3-*O*-α-*D*-glucopyranosyl]-α-*D*-glucopyranoside (**3**), aromadendrin (**4**), catechin (**5**), phlorizin 4′-*O*-β-*D*-glucopyranoside (**6**), (3*R*,6*R*,7*E*)-3-hydroxy-4,7-megastigmadien-9-one (**7**), dodecanoic acid (**8**), 3β-acetoxy-20-lupanol (**9**), and 3β,6α,13β-trihydroxyolean-7-one (**10**) (Figure 1).

As anti-inflammation and tumor prevention activities of this species (Yu and Wu, 2005), the quorum sensing inhibiting (QSI) and tumor cell toxic activities of these phytochemicals were tested.

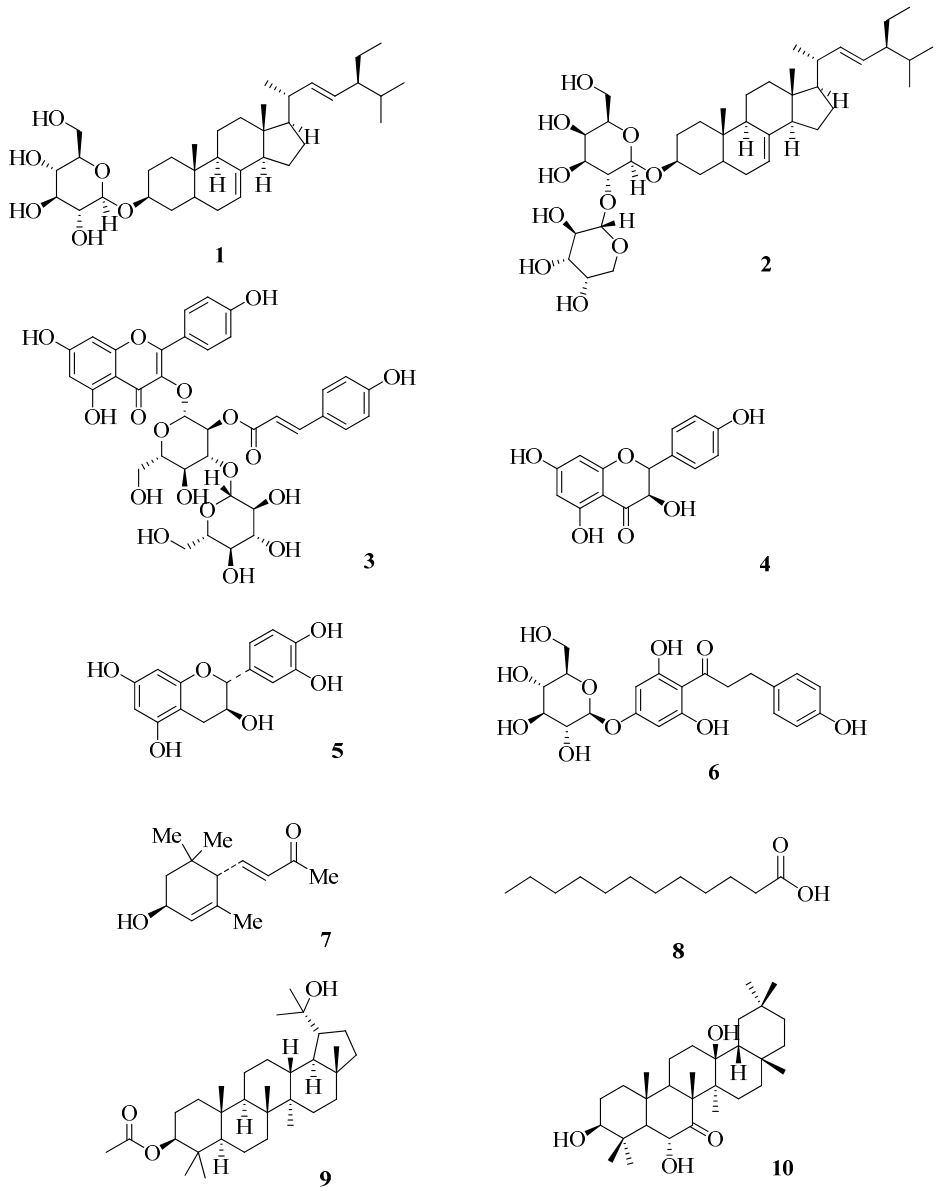

Figure 1 Chemical structures of ten phytochemicals isolated from *C. nitinissima*