

Iridoid and Flavonol Glycosides from the Leaves of *Geniostoma glabrum*

Akira Inada,* Masahiko Sayama, Yuka Matsuo, Mariko Yamaguchi, Yuka Inatomi and
Hiroko Murata

Faculty of Pharmaceutical Sciences, Setsunan University, 45-1 Nagaotoge-cho, Hirakata, Osaka 573-0101, Japan

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From the leaves of *Geniostoma glabrum*, an endemic plant of the Bonin Islands, five compounds have been isolated and identified as asperuloside, daphylloside, geniposidic acid, monotropein, and rutin. Their structures were elucidated on the basis of spectroscopic analysis.

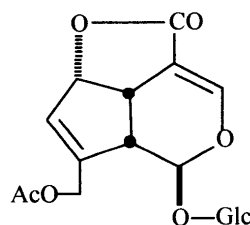
Key words *Geniostoma glabrum*, Loganiaceae, the Bonin Islands, iridoid glucoside, flavonol glycoside

Plants of the genus *Geniostoma* belonging to the family Loganiaceae, comprise about 60 species and are distributed mainly in tropical and subtropical regions throughout Asia and Micronesia.¹⁾ On the constituents of *Geniostoma* plants, 2-hydroxy-3-*O*- β -D-glucopyranosylbenzoic acid from *G. antherotrichum*²⁾ and by the chemical screening, the presence of alkaloids, saponins, and leucoanthocyanidins from *G. borbonicum*,³⁾ have previously been characterized. *G. glabrum* is an evergreen shrub 2–4 m high and indigenous to the Bonin Islands in Japan.⁴⁾ As part of our phytochemical studies on the Bonin Islands,^{5–7)} the chemical components of an MeOH extract obtained from the leaves of *G. glabrum* MATSUM. was investigated. As a result, four iridoid glucosides and a flavonol glycoside were isolated.

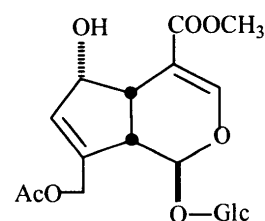
The leaves of *G. glabrum* were collected in April 2002 in Chichizima in the Bonin Islands, Tokyo, Japan and a voucher specimen (No.177) was deposited in the Department of Pharmacognosy, Faculty of Pharmaceutical Sciences, Setsunan University.

Crushed leaves (193 g) of *G. glabrum* were extracted with MeOH (3 x 1.5 l) at room temperature. The MeOH solution was evaporated off to give an MeOH extract (39.9 g). The MeOH extract was suspended with H₂O and partitioned with CHCl₃ and *n*-BuOH, successively. The *n*-BuOH extract (8.6 g) was chromatographed on silica gel with CHCl₃-MeOH-H₂O [65 : 35 : 10 (lower layer)] followed by CHCl₃-MeOH-H₂O (6 : 4 : 1), to give 9 fractions (Frs. A–I). A part (0.5 g) of

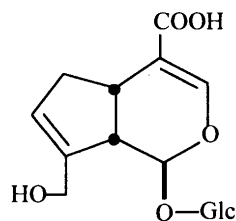
Fr. C (1.3 g) was further purified by reversed phase (ODS)-HPLC with MeOH-H₂O (1 : 1) to afford **1** (190 mg) and **2** (20 mg), respectively. Fr. D (0.4 g) was recrystallized from MeOH to give **5** (39 mg). Fr. E (0.7 g) was chromatographed on ODS with MeOH-H₂O (1 : 2) to furnish **3** (38 mg). Fr. J (1.3 g) was submitted to column chromatography on ODS followed by reversed phase (ODS)-HPLC with MeOH-H₂O (1 : 2) to give **4** (39 mg).



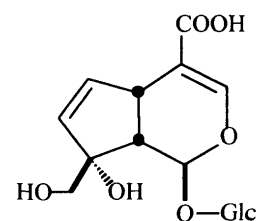
asperuloside (**1**)



daphylloside (**2**)



geniposidic acid (**3**)



monotropein (**4**)

The isolated compounds were identified as asperuloside (**1**),⁸⁾ daphylloside (**2**),⁹⁾ geniposidic acid (**3**),¹⁰⁾ monotropein (**4**),¹¹⁾ and rutin (**5**),¹⁰⁾ by spectral analyses and by comparisons of their spectroscopic data ([α]_D, HR-negative FAB-MS, ¹H-

and ^{13}C -NMR) with those in the literature. All these compounds were isolated for the first time from the plants belonging to the genus *Geniostoma*.

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