## Eucaglobulin, A New Complex of Gallotannin and Monoterpene from Eucalyptus globulus

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**Abstract:** Eucaglobulin 1, a new complex of gallotannin and monoterpene, was isolated from the leaves of *Eucalyptus globulus*. Its structure was determined by spectral methods.

Keywords: Eucalyptus globulus; Myrtaceae; gallotannin-monoterpene complex; eucaglobulin.

Eucalyptus globulus Labill. (Myrtaceae) is a kind of medicinal plant widely distributed in the Yunnan province of China. Its leaves, roots and fruits have been used as traditional remedies for the treatment of influenza, dysentery, enteritis, rheumatalgia and bleeding. Besides volatile terpenoid constituents in the essential oil of the leaves and fruits, the occurrence of a number of phloroglucinol-sesquiterpene- or -monoterpene-coupled compounds named macrocarpals<sup>1</sup> and euglobals<sup>2</sup> in the leaves and buds has been reported. In order to study the chemical and bioactive constituents of this plant native in Yunnan province, we have successfully isolated a new gallotannin-monoterpene-coupled compoud, named eucaglobulin 1.

Figure 1. The Key Correlations of 1 in HMBC

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## **Spectrum**

Eucaglobulin 1, a light brown amorphous powder, gave a dark blue colour with FeCl<sub>3</sub>, indicating that it had a galloyl group. The FAB-mass spectrum of 1 showed a peak at m/z 497 due to [M-H], which corresponded to the molecular formula  $C_{23}H_{30}O_{12}$ . The <sup>1</sup>HNMR spectrum exhibited one 2H-singlet at δ7.16 ascribe to one galloyl group, one 1H-triplet at δ6.95 due to one unsaturated proton, and glucose proton signals. The configuration at C-1' of the sugar was determined to be \beta by the coupling constant of the anomeric proton (J=7.7Hz). Additionally, some proton signals in the up-field region were also observed. The <sup>13</sup>CNMR and DEPT spectra of 1 confirmed the presence of one galloyl group and a β-glucose moiety. Simultaneously, they also revealed that ten carbon signals ascribe to a monoterpene moiety, which include one carbonyl group, two unsaturated carbon atoms, two methyls, three methylene groups, one methine and one quaternary carbon. The assignment of protons and carbons was achieved on the basis of <sup>1</sup>H-<sup>1</sup>H COSY and HMQC spectra. According to the results of HMBC spectrum, the position of the galloyl group on the glucose was determined to be at C-1', and the monoterpene moiety was at C-6' through an ester bond (Figure 1). Thus, the structure of eucaglobulin was identified as 1, which is the first example of a gallotannin possessing a monoterpene moiety.

Carbon Carbon δ (ppm) δ (ppm) Glucose Monoterpene 1 167.6 (s) 1' 95.6 (d) 2' 2 130.8 (s) 73.7 (d) 3' 3 77.6 (d) 141.0 (d) 4' 4 28.1 (t) 70.9 (d) 5' 5 45.0 (d) 75.8 (d) 6 6' 24.1 (t) 64.1 (t) 7 Galloyl 26.0 (t) 8 71.7 (s) CO 165.7 (s) 9 27.3 (q) 1" 120.8 (s) 2", 6" 10 26.8 (q) 110.2 (d) 3", 5" 146.1 (s) 4'' 139.4 (s)

Table1. <sup>13</sup>CNMR data of Eucaglobulin (400MHz, acetone-d<sub>6</sub>)

Eucaglobulin 1:  $C_{23}H_{30}O_{12}$ , light brown amorphous powder. FABMS m/z: 497[(M-1)], base peak]. HNMR (acetone-d<sub>6</sub>, 400MHz):  $\delta$ 7.16 (2H, s, H-2)], 6.95 (1H, br. s, H-3), 5.66 (1H, d, J=7.7 Hz, H-1)], 4.42 (1H, dd, J=2.4, 11.6 Hz, H-6)], 4.23 (1H, dd, J=5.6, 11.6 Hz, H-6)], 3.70 (1H, ddd, J=2.4, 5.6, 9.7 Hz, H-5)], 3.58-3.45 (3H, m, H-2), 3', 4'], 2.42 (2H, br. d, J=15.6Hz, 2×H-7), 2.31 (2H, br. d, J=18.8 Hz, 2×H-4), 1.99 (2H, m, 2×H-6), 1.49 (1H, m, H-5), 1.13 (6H, s, 2×CH<sub>3</sub>)

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