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A Novel Triterpenic Acid from *Gymnema sylvestre*

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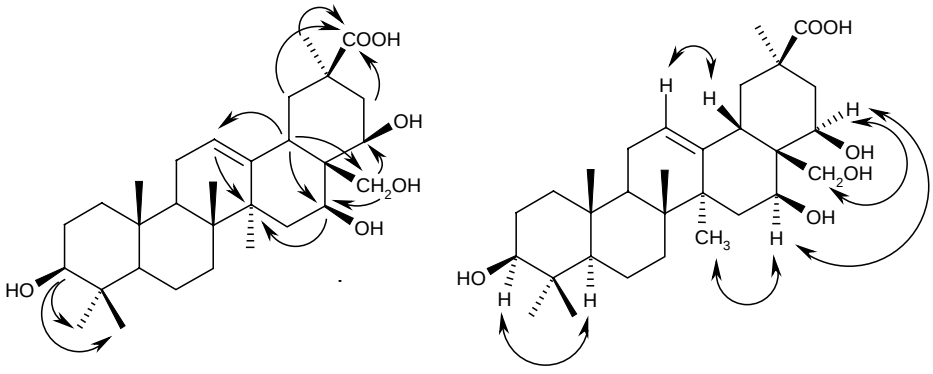
Abstract: A novel oleanane-type triterpenic acid was isolated from the leaves of *Gymnema sylvestre* (Asclepiadaceae). The structure was characterized as 3β, 16β, 22β, 28-tetrahydroxy- olean-12-en-30-oic acid on the basis of spectral evidence, including 1D- and 2D-NMR (HMQC, HMBC, ^{1}H-^{1}H COSY and NOESY).

Keywords: *Gymnema sylvestre*, Asclepiadaceae, triterpenic acid.

The plant *Gymnema sylvestre* (Retz.) Schul. (Asclepiadaceae) distributed in China and India has been used as stomachic, diuretic and anti-diabetic remedy. The total saponin fraction of the leaves had an anti-sweetening effect and was shown to be able to inhibit glucose absorption in the small intestine and to suppress elevated glucose levels in blood following the administration of sucrose in rats [1]. This paper deals with the structural elucidation of a novel oleanane-type triterpenic acid **1** which was isolated from the leaves of *G. sylvestre*.

Figure 1 The key HMBC (left) and NOESY (right) correlations of **1**



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Triterpenic acid **1** was obtained as white amorphous powder. The quasimolecular ion peaks at *m/z* 505 ($[M + H]^+$) and 527 ($[M + Na]^+$) in positive ESI-MS, and the ^{13}C NMR (DEPT) data (**Table 1**) gave the molecular formula of $C_{30}H_{48}O_6$ for **1**. The ^1H and ^{13}C NMR spectra (assigned by HMQC) of **1** exhibited the presence of a substituted Δ^{12}-oleanene skeleton possessing an olefinic bond, one carboxyl, one hydroxymethyl, three oxymethines and six methyl groups. The HMBC long-range correlations (**Figure 1**) indicated that the carboxyl group should be at C-30 (or C-29) and four hydroxyl groups were attached to the C-3, 16, 22 and 28 positions, respectively. The β-configurations of C-3, 16 and 22 were derived from the results of the NOESY experiment, in which cross-peaks between H-3 and H-5, as well as between H-16 and CH_3-27, and H-22 were clearly observed. It suggested that carboxyl group was also in β-configuration, no any correlation between H-18 and methyl groups could be observed. So the structure of **1** was confirmed to be 3β,16β,22β,28-tetrahydroxy-olean-12-en-30-oic acid.

Table 1 ^1H and ^{13}C NMR data of **1** (C_5D_5N, δ ppm, J_{Hz})

No.	δ_C	δ_H	No.	δ_C	δ_H
1	39.0 t	0.96, 1.54 (m)	16	66.4 d	4.77 (dd, 13, 5)
2	28.1 t	1.82 (2H, m)	17	43.7 s	
3	77.9 d	3.40, dd, 4, 8	18	40.2 d	2.84 (dd, 13, 8)
4	39.3 s		19	40.0 t	1.67, 2.12 (m)
5	55.7 d	0.79 (d, 11)	20	39.5 s	
6	18.7 t	1.32, 1.50 (m)	21	35.2 t	2.05 (dd, 5.5, 11), 2.66 (d, 5.5)
7	33.4 t	1.34, 1.43 (m)	22	79.2 d	5.45 (d, 5.5)
8	39.6 s		23	28.7 q	1.19 (3H, *s*)
9	47.0 d	1.54 (m)	24	17.1 q	1.02 (3H, *s*)
10	37.2 s		25	15.8 q	0.89 (3H, *s*)
11	23.8 t	1.83 (2H, m)	26	16.6 q	0.91 (3H, *s*)
12	125.2 d	5.38 (m)	27	25.2 q	1.18 (3H, *s*)
13	139.8 s		28	63.7 t	3.81, 4.46 (d, 11)
14	44.1 s		29	21.4 q	1.26 (3H, *s*)
15	35.4 t	1.63, 2.15 (m)	30	183.0 s	

Reference

1. W. Ye, Q. Zhang, X. Liu, C. Che, S. Zhao, *Phytochemistry*, **2000**, *53*, 893.

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