

## NOTE

A Flavonoid from the Roots of *Heracleum nepalense* D. Don

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A known flavonol glycoside, namely, quercetin-3-O- $\beta$ -D-glucopyranoside, was isolated from the roots of *Heracleum nepalense* D. Don. The structure was determined on the basis of UV, IR, FAB<sup>+</sup>, MS, <sup>1</sup>H & <sup>13</sup>C NMR spectral data. The isolation is significant since a flavonoid has not been previously reported from the plant.

**Key Words:** Isolation, Quercetin, *Heracleum nepalense*.

*Heracleum nepalense* D. Don<sup>1-3</sup> (Apiaceae) is a small shrub occurring in Nepal and Sikkim. The plant is used in veterinary medicine. It exhibits stimulant property and increases the rate of respiration and blood pressure in goats. The roots of the plant are used in folk medicine as digestive, carminative and antidiarrhoeal. In our earlier work we have reported the plant having antimicrobial property. The roots of the plant reported for having coumarins<sup>4, 5</sup> and steroids<sup>6</sup>. Flavonoids are more common throughout the family Apiaceae than other constituents<sup>7</sup>. Very little research has been conducted on the roots of *H. nepalense* and nothing has been found concerning the flavonoids, it was of interest to examine the flavonoid patterns of the species. In this report, we describe the isolation and structure elucidation of a flavonoidal glycoside from the roots of *H. nepalense*. It was identified by spectroscopic techniques<sup>8</sup>.

The air-dried roots (1 kg) were extracted with methanol (70%) and the extract was concentrated, treated with hot distilled H<sub>2</sub>O and filtered. The water-soluble component was fractionated by extracting it successively with petroleum ether, ethyl acetate and acetone. The ethyl acetate soluble fraction was concentrated and then on TLC over silica gel showed three spots. This fraction was submitted to column chromatography on sephadex LH-20 column using benzene : ethyl acetate as eluent with increasing polarity. Fractions 32–46 were combined, evaporated under reduced pressure, dissolved in MeOH and purified on a silica

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gel (60–120) column. From the dry residue of the flavonoid fraction compound 1 (75 mg) was obtained by recrystallization from MeOH.

### Compound 1 (Quercetin 3-O- $\beta$ -D-glucopyranoside)

It was obtained as a pale yellow amorphous powder, m.p 210–214°C; UV  $\lambda_{\max}^{\text{MeOH}}$  nm: 251, 374; +NaOMe 246, 328, 425; +NaOAc-H<sub>3</sub>BO<sub>3</sub> 229, 268, 320 sh, 383; IR (KBr, cm<sup>-1</sup>)  $\nu_{\max}$ : 3648–3611  $\nu$ (OH), 2904  $\nu$ (C-H), 1653  $\nu$ (C=O in flavone), 1615–1507  $\nu$ (aromatic rings), 1456, 1304, 1263; <sup>1</sup>H NMR (DMSO-d<sub>6</sub>),  $\delta$  (ppm): 12.48 (1H, s, OH-5), 7.56 (2H, dd, J = 2.2 Hz, H-2' and H-6'), 6.87 (1H, d, J = 8.5 Hz, H-2, H-5'), 6.41 (1H, d, J = 1.9 Hz, H-2, H-8), 6.18 (1H, d, J = 1.9 Hz, H-6), 4.92 (1H, d, J = 7.3 Hz, H-1''), 3.98–3.06 (m, the remaining protons of glucose); <sup>13</sup>C NMR (DMSO-d<sub>6</sub>),  $\delta$  (ppm): 176.05 (C-4), 164.14 (C-7), 160.95 (C-5), 156.4 (C-2), 147.9 (C-4'), 147.01 (C-3'), 135.9 (C-3), 125.8 (C-1'), 122.2 (C-6'), 115.3 (C-2), 103.2 (C-10), 98.48 (C-1''), 76.97 (C-5''), 76.92 (C-3''), 75.0 (C-2''), 69.97 (C-4''), 60.47 (C-6''); MS data m/z (rel. int.): 459 (10.2), 415 (15.8), 371 (20.0), 327 (19.2), 303 (98.8), 301 (29.7), 287 (10.2), 277 (12.0), 239 (8.2), 207 (8.0).

The structure of quercetin was established by comparison of measured UV, NMR and mass spectral data with spectroscopic data available from literature<sup>9, 10</sup>. The quercetin 3-O- $\beta$ -D-glucopyranoside showed <sup>1</sup>H and <sup>13</sup>C NMR data in full agreement with those given by Olszewska *et al.*<sup>11</sup> and Irena *et al.*<sup>12</sup>

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