

SESQUITERPENE LACTONES AND PHENOLIC COMPOUNDS FROM *Centaurea maroccana*

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Plants of the genus *Centaurea* (Asteraceae) are interesting for the variety of their chemical composition and for their biological activity [1].

The genus *Centaurea*, which contains more than 700 species [2], is represented by 45 species in Algeria [3].

Centaurea maroccana L., which was not phytochemically investigated, is an endemic species of Algeria and Morocco, flowering from April to June [3]. It was collected from the area of Biskra in the South of Algeria in April 2002 and authenticated by Prof. M. Kaabeche (Biology department, University of Setif, Algeria). A voucher specimen (CCM12/04/02) has been deposited in the Herbarium of the Biology Department of Mentouri University of Constantine.

Air-dried aerial parts (2700 g) of *C. maroccana* were macerated at room temperature with MeOH–H₂O (80:20 v/v) for 24 h three times. After filtration, the filtrates were combined and concentrated at room temperature and diluted with 1100 mL H₂O. After precipitation of chlorophyll with Pb(OAc)₄ and filtration, the remaining aqueous solution was extracted successively with CHCl₃ and EtOAc. The organic layers were dried with Na₂SO₄, giving, after removal of solvents under reduced pressure, CHCl₃ (12.5 g) and EtOAc (20 g) extracts.

The EtOAc extract was chromatographed on a silica gel (230–400 mesh) column (560 g) eluted with a gradient of *n*-hexane–EtOAc 5:95 to 100% EtOAc to yield 39 fractions (F₁ – F₃₉). Fractions F₁₄, F₁₈, and F₂₂, which were submitted to preparative TLC on silica gel GF₂₅₄ (CHCl₃: CH₃COCH₃, 12:1, 9:1 and 5:1, respectively), gave **1** (150 mg), **2** (200 mg), and **3** (70 mg), respectively. Fractions F₂₆ and F₂₈ were purified on a silica gel (230–400 mesh) column (65 g) eluted with CHCl₃: CH₃COCH₃ (3:1) and CHCl₃: CH₃COCH₃ (2:1), respectively, to give **4** (75 mg) and **5** (95 mg).

The structures of the isolated compounds were elucidated by UV, ¹H NMR, and ¹³C NMR, HSQC, HMBC, and MS analysis. All the results were in good agreement with the literature data [4–10].

Compound 1: C₁₆H₁₂O₆, yellow needles, mp 291°C. This compound was identified as 4',5,7-trihydroxy-6-methoxyflavone (hispidulin) [4, 5].

Compound 2: C₁₅H₁₀O₅, yellow needles, mp 349°C. This compound was characterized as 4',5,7-trihydroxyflavone (apigenin) [6].

Compound 3: C₁₀H₁₄O₄, yellowish powder, mp 128°C. The spectral data led to the structure of 3-(3'-methoxy-4',5'-dihydroxyphenyl)propan-1-ol [7].

Compound 4: C₂₀H₂₆O₇, colorless gum. This compound was characterized as 5 α H,6 β H,7 α H,15-hydroxy-8 α -(1',2'-dihydroxyethyl)acryloxyelema-1(2),3(4),11(13)-trien-6,12-olide [8, 9].

Compound 5: C₂₀H₂₆O₇, white needles, mp 330°C. This compound was characterized as cnicin [10].

Compounds 1–5 are isolated for the first time from *C. maroccana*.

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