TRITERPENOIDS FROM *Campanula patula*

L. S. Teslov

UDC 547.914.4

We have previously reported the isolation from the epigeal part of *Campanula patula* L. of ursolic acid and three crystalline substances (A, B, and C) of triterpenoid nature, one of which was identified as β-amyrin acetate [1]. In the present communication we give information on the proof of the structure of one more compound.

Substance B, with the composition $C_{32}H_{52}O_2$, mp 231-233°C, $[\alpha]_D^{25}$ +88.2° (c 0.54; chloroform) was obtained in the form of colorless plates from acetone. In the UV spectrum of the substance taken in concentrated H_2SO_4 a characteristic maximum at 309 nm indicated that it was a pentacyclic triterpene [2]. The IR spectrum had the absorption bands of an ester grouping (1732 and 1250 cm^{-1}) and of an exocyclic double bond (3080, 1650, and 887 cm^{-1}). The PMR spectrum (CCl_4, 0 — TMS, δ scale) showed the signals of seven CH_3 groups in the form of singlets in the 0.76-0.98 ppm region, a narrow signal of the protons of an acetyl group at 1.94 ppm (3 H), a one-proton quartet at 4.40 ppm (J = 10, J = 5 Hz) corresponding to an axial hydrogen geminal to an acetyl group, and a broadened singlet at 4.56 ppm (2 H, $>C=CH_2$). On the mass-spectrometric fragmentation of the substance under investigation, the peak of the molecular ion with m/z 468 (36), and also the peaks of ions with m/z 408 (14), 399 (10), 393 (5), 386 (3), 247 (22), 218 (13), 189 (100%), and others characteristic for pentacyclic triterpenoids [3], were observed.

When substance B was saponified with 5% caustic soda in methanol, a product with the composition $C_{30}H_{50}O$ was obtained which, after crystallization from ethanol—water, had the form of colorless needles with 197-202°C. Its IR spectrum showed a broad band in the 3300-3400-cm^{-1} region (OH group). In the PMR spectrum of the alcohol obtained, the signal of a proton geminal to a hydroxyl had shifted upfield and was observed in the form of a quartet at 3.20 ppm (J = 10, J = 6 Hz). The methylene protons of an exocyclic double bond gave signals at 4.60 and 4.62 ppm, which permits this compound to be assigned to the α-amyrin group and to suggest a position of the double bond in ring E between carbon atoms 20 and 30.

Oxidation with selenium dioxide yielded the corresponding aldehyde, in the UV spectrum of which an absorption maximum was observed at 233 nm (in ethanol). The value of λ_{max} corresponded to the calculated value for α,β-disubstituted α,β-unsaturated aldehydes [4], which is realized in the case of compounds with a double bond at C_{20}.

The results of the investigation performed showed that the melting point, IR, PMR, and mass spectra and also other characteristics of the saponification product of the substance coincided with those given in the literature [5] for the triterpene alcohol urs-20(39)-en-3β-ol isolated from *Centaurea squarrosa*. Substance B itself was the acetate of this alcohol and has not been detected in plants previously.

LITERATURE CITED

1. L. S. Teslov, Khim. Prir. Soedin., 582 (1979).
2. É. T. Oganesyan, A. A. Shinkarenko, and V. A. Bandyukova, Khim. Prir. Soedin., 212 (1968).
3. J. Karliner and C. Djerassi, J. Org. Chem., 31, 1945 (1966).
4. L. Fieser and M. Fieser, Steroids, Reinhold, New York (1959).
5. A. G. Panosyan and V. A. Mnatsakanyan, Khim. Prir. Soedin., 59 (1977).

Leningrad Institute of Pharmaceutical Chemistry. Translated from Khimiya Prirodnykh Soedinenii, No. 5, pp. 665-666, September-October, 1984. Original article submitted March 23, 1984.