cides with that of *l*-cavidine. The chemical properties, and also the spectral characteristics given, enable the base to be identified as d-tetrahydrocorysamine which has been isolated from *C. pallida* var. *tenuis* [3].

## LITERATURE CITED

1. C. K. Yu, D. B. MacLean, R. G. A. Rodrigo, and R. H. F. Manske, Can. J. Chem., 48, 3673 (1970).
2. S. Naruto and H. Kaneko, Phytochemistry, 12, 3008 (1973).
3. H. Kaneko and S. Naruto, Yakugaki Zasshi, 91, 101 (1971); Chem. Abstr., 74, 142, 108t (1971).

# ALKALOIDS OF *Ungernia vvedenskyi*

Kh. A. Kadyrov and S. A. Khamidkhodzhaev

UDC 547.944/945

We have investigated the alkaloids of *Ungernia vvedenskyi* S. Khamidh. [1] collected in the Chimkent oblast. This species has not previously been studied. The total area of the thickets amount to about 200 ha. We considered the amount and dynamics of the accumulation of the alkaloids during the vegetation periods:

| Date of collection (1976) | Dimensions, cm | Leaves |  | Bulbs |  |
|---|---|---|---|---|---|
|  |  | total alkaloids, % | lycorine in dry plant, % | total alkaloids, % | lycorine in dry plant, % |
| March 25 | 4–6 | 0,24 | 0,12 | 0,35 | 0,21 |
| April 5 | 17–22 | 0,18 | 0.065 | 0,58 | 0,28 |
| April 18 | 23–25 | 0.12 | 0,05 | 0,83 | 0,32 |
| April 29 | 30–40 | 0,09 | 0,01 | 0,08 | 0,37 |
| May 28 | 33–42 | 0,02 | — | 1,17 | 0,45 |

The figures given confirm the laws of the dynamics of the accumulation of alkaloids in plants deduced previously [2, 3]. This species may serve as a new source of the production of lycorine.

We made a detailed study of the total bases of the epigeal part of the plant collected on May 25, from which we isolated lycorine, tazettine, ungminorine, ungminoridine, hippeastrine, galanthamine, narwedine, pancratine, and hordenine [4, 5], and a base with mp 210-212°C (I). The flowers with peduncles contained 0.36% of alkaloids, from which lycorine, tazettine, and a base with mp 148-150°C (II), having the composition $C_{19}H_{25}NO_5$, were isolated.

Base (I) has the composition $C_{17}H_{19}NO_5$, $M^+$ 317; $R_f$ 0.25 (TLC on KSK silica gel in the benzene–methanol 4:1 system); optically inactive.

The UV spectrum of (I) showed a single maximum at $\lambda_{max}^{EtOH}$ 290 nm (log ε 3.40), which is characteristic for alkaloids of the lycorine type [4].

The IR spectrum showed absorption bands at 3200-3400 $cm^{-1}$ (—OH), 2840 and 1265 $cm^{-1}$ (—$OCH_3$), and 1610 $cm^{-1}$ (aromatic ring). The NMR spectrum (JNM-4-100/100 MHz in $CCl_4$, internal standard HMDS, δ scale) contained two one-proton singlets at 6.82 and 6.83 ppm corresponding to two aromatic protons, a two-proton singlet at 5.82 ppm assigned to the protons of a methylenedioxy group, a two-proton signal at 4.65 ppm assigned to geminal protons to hydroxy groups.

The spectral characteristics of (I) coincide with those of ungminorine, and a mixture with ungminorine gave no depression of the melting point. Since the base is optically inactive, it is the racemate of ungminorine.

## LITERATURE CITED

1. C. Khamidkhodzhaev, Dokl. Akad. Nauk Uzb.SSR, No. 5 (1979).

---

Institute of the Chemistry of Plant Substances, Academy of Sciences of the Uzbek SSR, Tashkent. Translated from Khimiya Prirodnykh Soedinenii, No. 3, pp. 418-419, May-June, 1979. Original article submitted February 23, 1979.

0009-3130/79/1503-0370$07.50

2. S. Yu. Yunusov, Izv. Akad. Nauk Uzb.SSR, No. 4, 11 (1948).
3. S. Yu. Yunusov, Chemistry in Uzbekistan [in Russian], Tashkent (1965), p. 26.
4. M. N. Normatov, Kh. A. Abduazimov, and S. Yu. Yunusov, Uzb. Khim. Zh., No. 2, 25 (1965).
5. Kh. A. Abduazimov and S. Yu. Yunusov, Khim. Prir. Soedin., 263 (1968).

## SIEVERSIGENIN — A TRITERPENOID SAPOGENIN FROM *Astragalus sieversianus*

A. N. Svechnikova, L. G. Mzhel'skaya,*
and N. K. Abubakirov

UDC 547.587+581.192

We have investigated the roots of the plant *Astragalus sieversianus* Pall. (family Leguminosae) collected at the foot of Mt. Chimgan (Chatkal range, Western Tien-Shan).

The air-dry comminuted roots (5 kg) were extracted with methanol. After the bulk of the solvent had been distilled off, a viscous syrupy mass was obtained, which was dissolved in two volumes of water and extracted with butanol. The butanolic extract was evaporated to dryness, the dry residue was dissolved in methanol, and the clear solution was diluted with acetone. The precipitate that deposited (217 g) was separated off. Part of the total extractive substances (10.0 g) was hydrolyzed in aqueous methanol (1:1 by volume) containing 8% of $H_2SO_4$ on the boiling water bath for 10 h. The sapogenins were separated and chromatographed on silica gel with elution by chloroform—ethanol (50:1). The product partially purified in this way was rechromatographed on silica gel and was eluted with ethyl acetate.

This gave 1.0 g of a crystalline compound with mp 229-231°C (ethyl acetate) $[\alpha]_D^{20}$ +67.1± 2° (c 1.92; methanol), $\nu_{max}^{KBr}$ 3450-3250 $cm^{-1}$ (OH), 3045 $cm^{-1}$ and 1640 $cm^{-1}$ (double bond). According to the results of mass-spectroscopic analysis (MKh-1310 instrument), the genin isolated had the elementary composition $C_{30}H_{50}O_5$ ($M^+$ 490). Ions with m/e 143 ($C_8H_{15}O_2$) (100%) with m/e 59 ($C_3H_7O$) belong, in all probability, to fragments of the side chain and show that the latter is a substituted tetrahydrofuran [1].

Oxidation of the sapogenin with the Jones reagent in acetone [2] yielded a triketo derivative $C_{30}H_{44}O_5$ ($M^+$ 484) with mp 217-220°C (methanol), $[\alpha]_D^{20}$ −58.4±2° (c 1.36; methanol). The IR spectrum of the triketo compound contained, in addition to the absorption characteristics of carbonyl functions (1710, 1728 $cm^{-1}$), a band of the absorption of the hydroxy group (3440-3470 $cm^{-1}$).

The facts given above show that the sapogenin that we had obtained belongs to the tetracyclic terpenoid series and contains three secondary and one tertiary hydroxy groups. This compound differs in its physicochemical constants from the triterpenoids reported in the literature, and we have called it sieversigenin.

### LITERATURE CITED

1. R. Tschesche, G. Biernoth, and G. Snatzke, Ann. Chem., 674, 196 (1964).
2. C. Djerassi, R. R. Engle, and A. Bowers, J. Org. Chem., 21, 1574 (1956).

---

*Deceased.

Institute of the Chemistry of Plant Substances, Academy of Sciences of the Uzbek SSR, Tashkent. Translated from Khimiya Prirodnykh Soedinenii, No. 3, pp. 419-420, May-June, 1979. Original article submitted March 1, 1979.

0009-3130/79/1503-0371$07.50