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THE ALKALOID SMIRNOVINE FROM ASTRAGALUS TIBETANUS

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As has been reported previously, alkaloids have been found in Astragalus tibetanus Beneth. (A. laxmanii Bge.). Smirnovine has been isolated as the carbonate from the epigeal parts collected in the flowering phase (8-11 August) in the Tien-Shan at a height of above 2000 m. The same substance has been found in the plants Smirnovia turkestanica Bge. [3], Eremosparton flaccidium Litw., and Eremosparton aphyllum (Pall.) Fish, [4, 5].

The plant was extracted with methanol-chloroform (3:7). The solvent was distilled off and the residue was treated with 5% hydrochloric acid. The precipitate of chlorophyll was filtered off and the acid solution was freed of contaminating acids by successive extraction with ether and chloroform. The mother solution was made alkaline with 40% caustic soda and the alkaloids were extracted with chloroform. The residue after the chloroform had been distilled off crystallized on standing; it was recrystallized from methanol-acetone (1:15). The plant contained 0.12% of smirnovine (of the weight of the dry plant). IR spectrum: ν_{\max} 1010 cm^{-1} , 1120, 1170, 1290, 1380, 1410, 1450, 1580, 1650, 1690, 2870, 2960, 3250, 3340 cm^{-1} .

Found, %: C 52.00; H 8.66; N 19.22. Calculated for $\text{C}_{12}\text{H}_{24}\text{ON}_4 \cdot \text{H}_2\text{CO}_3$, %: C 51.70; H 8.66; N 18.85.

Dibenzoylsmirnovine, mp 118-118.5°C. Found, %: N 12.68. Calculated for $\text{C}_{22}\text{H}_{32}\text{O}_3\text{N}_4$, %: N 12.50.

Smirnovine hydriodide, mp 165-166°C. Found, %: C 39.72; H 6.78; N 15.65; I 34.54. Calculated for $\text{C}_{12}\text{H}_{24}\text{ON}_4\text{HI}$, %: C 39.14; H 6.79; N 15.22; I 34.49.

Smirnovine picrate, mp 150°C, gave no depression of the melting point in admixture with a sample of smirnovine picrate supplied by A. A. Ryabinin. Found, %: C 46.20; H 5.70; N 21.09. Calculated for $\text{C}_{12}\text{H}_{23}\text{ON}_4 \cdot \text{C}_6\text{H}_3\text{O}_7\text{N}_3$, %: C 46.05; H 5.75; N 20.89.

Isopropylvinylputrescine, mp 262°C, was obtained by the saponification of smirnovine with 50% caustic potash. Found, %: C 32.27. Calculated for $\text{C}_9\text{H}_{20}\text{N}_2 \cdot 2 \text{HCl}$, %: Cl 32.72.

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