

# ISOLATION OF CYTISINE FROM THE EPIGEAL PART OF *Thermopsis lanceolata* BY THE ION-EXCHANGE METHOD

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UDC 547.944/945

The alkaloid cytisine is widely used in medicine as an effective respiratory stimulator. Industrial methods for the isolation of cytisine are known [1-3]. According to Tsarev's method [1], cytisine is isolated from the seeds of *Th. lanceolata*, which contain more cytisine than the epigeal part [4], but the industrial collection of the seeds is far more difficult. Furthermore, the isolation of the alkaloids from the seeds with water and aqueous solutions of acids is practically impossible because of their high content of proteins and vegetable fats, and it is possible to use these inexpensive solvents for extracting the alkaloids from the epigeal part.

We have studied the ion-exchange method of isolating cytisine from the epigeal part of *Th. lanceolata* collected in June 1972 in the stage of flowering and the beginning of fruit formation in the Issyk-Kul' region of the Kirghiz SSR.

The processes of the extraction, sorption, and desorption of the cytisine from weakly acid aqueous extracts have been considered. Of aqueous solutions of acids, good results have been obtained with 1% sulfuric acid.

The sorption of cytisine from weakly acid aqueous extracts on KU-2 cation-exchange resin proved to be the most satisfactory.

The comminuted epigeal part of the raw material (10 kg) was extracted with 1% sulfuric acid in a 50-liter extractor. The acid extract of the alkaloids was passed through an adsorber containing 1.5 kg of KU-2 cation-exchange resin in the H form. The rate of flow was 1000-1050 liters/h · m<sup>2</sup>.

A satisfactory desorbent proved to be a 3% solution of ammonia in 92% ethanol.

The ethanolic solution of the alkaloids obtained was concentrated until an aqueous residue was obtained. The aqueous residue, after being made alkaline with 40% caustic soda solution to pH 10-12, was extracted with ether, giving 139.5 g of alkaloids, and with chloroform, giving 160.7 g of alkaloids. The total yield of alkaloids was 300.2 g, or 3% of the weight of the raw material.

The chloroform fraction of the alkaloids, after treatment with acetone, yielded 57 g of cytisine in the form of the nitrate, and from this 41.4 g of free cytisine was obtained, amounting to 0.41% of the weight of the raw material.

Thus, the conditions for the isolation of cytisine from the epigeal part of *Th. lanceolata* by the ion-exchange method have been studied.

## LITERATURE CITED

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Institute of the Chemistry of Plant Substances, Academy of Sciences of the Uzbek SSR. Translated from Khimiya Prirodnikh Soedinenii, No. 3, pp. 440-441, May-June, 1973. Original article submitted December 18, 1972.

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