INVESTIGATION OF THE ALKALOIDS OF THE SEEDS OF *Heliotropium lasiocarpum*

S. T. Akramov

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Heliotropine (I), which is used as a biological preparation, is obtained from the epigeal part of *Heliotropium lasiocarpum* Fisch. et Mey. The seeds of *H. lasiocarpum* also contain heliotropine [1]. We have developed a convenient method of obtaining (I) from the seeds, and we recommend the seeds of *H. lasiocarpum* as a supplementary raw material.

For the investigation, 2 kg of ripe *H. lasiocarpum* seeds gathered in the Zaamin and Gala-Aral regions of the Syrdar'ya province of the Uzbek SSR were defatted with ether, the ether was distilled off, the residue was treated with 10% sulfuric acid, and the acid extract was reduced with zinc to convert the N-oxide forms of the alkaloids into the tertiary bases. Then the acid solution was made alkaline with ammonia and the bases were extracted with chloroform. This gave 14.5 g of mixed alkaloids.

The ether-defatted meal was wetted with 10% ammonia solution and was repeatedly extracted with chloroform. The extract was concentrated and was treated with 10% hydrochloric acid solution. The bases were obtained in the way described above, with the preliminary reduction of the N-oxides. The yield was 24.3 g. The total amount of alkaloids obtained was 38.8 g, or 1.94% on the air-dry weight of the seeds.

The semicrystalline mass (38.8 g) was treated with acetone, and 25.5 g separated out. After recrystallization from acetone, mp 125-126°C $[\alpha]_D$ +74.8° ($CHCl_3$). A mixture with an authentic sample of heliotropine gave no depression of the melting point. Their IR spectra were identical.

Thus we had isolated the dextrorotary isomer of heliotropin.

The acetone was driven off from the mother liquor remaining after the heliotropine had been separated off, and the residue was treated with a mixture of hexane and ether. This led to the separation of 1.4 g of lasiocarpine, mp 94-95°C (hexane), $[\alpha]_D$ −4.6° (ethanol), which was identified by a mixed melting point with an authentic sample and by their IR spectra.

The total alkaloids were obtained from another portion of *H. lasiocarpum* seeds in a similar way but without the preliminary reduction of the N-oxides. An ethereal extract yielded heliotropine, and a chloroform extract 0.58 g of a crystalline base with mp 169-171°C (decomp.), crystallized from chloroform–alcohol, which was identified as heliotropine N-oxide. Reduction with zinc in hydrochloric acid gave heliotropine.

LITERATURE CITED

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