

ALKALOIDS OF RINDERA CYCLODONTA, R. ECHINATA, AND  
HELIOTROPIUM DASYCARPUM

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R. cyclodonta Bge. was collected in the fruit-bearing period in the Kyzyl-Kum (26 April 1965). The roots contained 0.09%, the unripe seeds 3.36%, and the epigeal part 1.89% of total alkaloids.

By chloroform extraction, 400 g of the epigeal part of the plant yielded 4.2 g of total ether alkaloids, 1.88 of total chloroform alkaloids, and 1.5 g of total reduced alkaloids. The total ether alkaloids gave 2.29 g of echinatine which was identified by a mixed melting point with an authentic sample of echinatine and by their IR spectra [1, 2].

R. echinata Rgl. yielded only echinatine [1, 2]. The sample that we studied was obtained in the budding stage (17 April 1966) in the upper reaches of Kainarsai, Tashkent Oblast.

Chloroform extraction of 220 g of the epigeal part of the plant gave 11.48 g of total chloroform alkaloids and 9.67 g of total reduced alkaloids (9.61% of the weight of the dry raw material). Acetone treatment of the total chloroform alkaloids precipitated 9.05 g of trachelanthine [4], and similar treatment of the total reduced alkaloids gave 8.07 of trachelanthamine [4].

H. dasycarpum Ldb. [5]. 800 g of the defatted seeds collected in Bukharsk Oblast yielded 8.67 g of total chloroform alkaloids and 6.73 g of total reduced alkaloids, which amounts to 1.92% of the weight of the dry raw material.

On treatment with acetone, the 6.73 g of total reduced alkaloids deposited 6.45 g of heliotrine [6], and the 8.67 g of total chloroform alkaloids yielded 0.7 g of heliotrine N-oxide [7]. The mother liquors, on reduction with zinc and hydrochloric acid, gave an additional 2.3 g of heliotrine.

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ALKALOIDS OF HAPLOPHYLLUM

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Skimmianine and dictamnine have previously been obtained from the roots and epigeal part of H. ramosissimum [1]. We have determined the total alkaloids in some plants of this genus (table).

Species	Site and date of collection	Vegetation period	Epigeal part	Leaves	Roots
<i>H. ramosissimum</i>	Ustyurt, Shurukh meteorological station, KK ASSR* 13-19 July 1966	End of vegetation period	0.008	0.12	0.19
<i>H. bungei</i>					
<i>H. bungei</i>	Ravshan state farm, KK ASSR 12 June 1963, 9-12 August 1966	Flowering period, end of vegetation period	0.04	0.01	0.13
			0.1	0.03	0.09
<i>H. versicolor</i>	Ustyurt, Shurukh meteorological station, KK ASSR 15 July 1963	Flowering period	0.02	0.05	0.03

\* Kara-Kalpakskaya Autonomous Socialist Soviet Republic.

The alkaloids were isolated by extraction with chloroform. The roots of *H. ramosissimum* collected at the end of the vegetation period yielded not only dictamnine and skimmianine but also evoxine, which was identified by its IR and UV spectra and by a mixed melting point with an authentic sample from *H. perforatum* [2].

When the total alkaloids from *H. bungei* were separated on alumina, four bases were obtained: skimmianine, dictamnine, robustinine with mp 231-232° C, identified by its IR and UV spectra and a mixed melting point with an authentic sample from *H. foliosum* [3], and a base with mp 83° C which has not been studied because of the small amounts available.

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#### SYNTHESIS OF A NUCLEOTIDO (P→N) PHENYLALANINE AND ITS PEPTIDES

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In order to study the chemical and biochemical properties of amino acid (peptide) derivatives of nucleotides of the phosphoramidate type, we have synthesized a number of compounds of this class in which the nucleotide moiety is represented by ribo- and deoxyribonucleotides and the amino acid moiety by phenylalanine and its peptides with the general structure

