LITERATURE CITED

1. Kh. T. Pulatova, S. Abdizhabbarova, Z. F. Ismailov, and S. Yu. Yunusov, Khim. Prir. Soedin., 59 (1968); V. G. Khodzhaev, S. Kh. Maekh, and S. Yu. Yunusov, Khim. Prir. Soedin., 441 (1973).
2. K. P. Guha, B. Mukherjee, and R. Mukherjee, J. Nat. Prod., 42, 1 (1979).
3. Kh. G. Pulatova, Z. F. Ismailov, and S. Yu. Yunusov, Khim. Prir. Soedin., 426 (1966).
4. Z. F. Ismailov, M. V. Telezhenetskaya, and S. Yu. Yunusov, Khim. Prir. Soedin., 136 (1968).

ALKALOIDS OF *Nitraria schoberi*

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Four species of *Nitraria* have been described from the arid zones of the Soviet Union: *Nitraria schoberi* L., *N. sibirica* Pall., *N. komarovii* Iljin et Lava, and *N. roborowskii* Kom. The last mentioned is found very rarely [1]. The most common species is *N. schobari* and at the same time it is the richest in alkaloids both in the qualitative and in the quantitative respects. The aim of the present investigation was to determine the total amount of alkaloids in *N. schoberi* according to the growth site.

It is known from literature sources that this plant possesses a gigantic salt capacity and contains ions of the alkali and alkaline earth metals and chloride, sulfate, and bicarbonate ions. The bicarbonate alkalinity is 3.27 [1, 2]. The population used to use it, in particular, for soapboiling [3].

The facts given show the difficulties that must be faced in the process of extracting the alkaloids — the formation of stable emulsions in the stages of isolating the total material.

In order to select the optimum method of extraction, we performed three experiments. To simplify the experiment we took the stems of plants collected in September, 1975, in the Kyzyl-Kum, containing a relatively smaller amount of alkaloids:

Method of extraction	Total yield, %	Including tertiary alkaloids, %
Chloroform	0,043	0,035
2% solution of CH_3COOH in chloroform	0,075	0,060
Chloroform (raw material moistened with 8% ammonia solution)	0,108	0,087

The highest yield of bases was given by ordinary chloroform extraction of the plant moistened with 8% of ammonia solution, as in the cases of *N. sibirica* [4] and of *N. komarovii*. However, the use of this method is accompanied by the formation of stable emulsions in the process of extracting the bases into acid solution, which complicated the isolation of the combined bases and increases the time for which the alkaloids are present in an acidic medium. When a 2% solution of acetic acid in chloroform was used as the extractant, although about a quarter of the total material was lost, emulsions were formed to a smaller degree. Apparently, in the initial study of the material and, in particular, those organs and from those growth sites where the alkaloid content is high, it is justified to use this method. However, a detailed study of the plant must be carried out by the use of the usual method of extraction.

We give the results of qualitative determinations of the combined alkaloids of *N. schoberi* from various growth sites. In the first two experiments extraction was carried out with acidified chloroform, and in the others by the ammonia method:

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Locality	Date of collection	Organ	Total yield, %
Ayakagitma	May, 1971	Epigeal part	0.6
"	Sept., 1975	Seeds	0.073
"	"	Stems	0.108
Koktal	June, 1980	Epigeal part	0.32
"	"	Leaves	0.65
"	"	Stems	0.16
Turkestan	May, 1976	Epigeal part	0.015
Ustyurt	April, 1976	"	0.0085
"	"	Roots	0.0089

The results obtained indicate that the most promising samples are those growing in the Bukhara (Ayakagitma) [5] and Taldy-Kurgan (Koktal) provinces.

The plant from Ustyurt was collected by A. D. Matkarimov and those from the other sites by the botanists S. A. Khamidkhodzhaev and K. Taizhanov, of the Institute of Plant Substances of the Academy of Sciences of the Uzbek SSR, and others.

LITERATURE CITED

1. M. P. Petrov, Izv. Akad. Nauk Turk. SSR, Ser. Biol. Nauk, No. 2, 41 (1964).
2. I. A. Krupennikov, Bot. Zh., 29, Nos. 2-3, 62 (1944).
3. N. V. Pavlov, Plant Raw Material of Kazakhstan [in Russian], Izv. Akad. Nauk SSSR, Moscow–Leningrad (1947).
4. Z. Osmanov, A. A. Ibragimov, S. Yu. Yunusov, A. Nigmatullaev, and K. Taizhanov, Khim. Prir. Soedin., 400 (1982).
5. A. A. Ibragimov, N. Yu. Novgorodova, and Kh. N. Aripov, Khim. Prir. Soedin., 84 (1977).

ALKALOIDS OF *Veratrum oxysepalum*. III

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Three alkaloids, with R_f 0.22 (I) (system 1: chloroform saturated with formamide; Leningrad type M [slow] paper impregnated with formamide in ethanol (1:2)); 0.70 (II); and 0.73 (III) (system 2: chloroform–benzene (1:1), saturated with formamide), have been isolated from the combined alkaloids of the epigeal part of *Veratrum oxysepalum* Turcz. by chromatography on a column of cellulose [1].

Alkaloid (I) – $C_{27}H_{43}O_3N$, $[\alpha]_D^{23}$ –85° (c 0.43; chloroform). Amorphous. The UV spectrum of the substance in concentrated sulfuric acid (0.4 mg in 10 ml) recorded by Bondarenko's method [2] two hours after dissolution had λ_{max} 264, 389, 472, 523 nm. The R_f value of the substance in system 1 coincided with that of a sample of veramarine.

Alkaloid (II) – $C_{27}H_{43}ON$, mp 173-175°C (from acetone–ether) $[\alpha]_D^{24}$ –91° (c 0.35; chloroform). UV spectrum in concentrated sulfuric acid: 335, 417 nm. The R_f value of the alkaloid in system 2 coincided with that of a sample of verazine, and a mixture gave no depression of the melting point.

Alkaloid (III) – $C_{27}H_{41}O_2N$, $[\alpha]_D^{23}$ –94° (c 0.32; chloroform). Amorphous. The UV spectrum in concentrated sulfuric acid had λ_{max} 289, 416, 502 nm. The R_f value of the alkaloid in system 2 coincided with that of a sample of veramine.

The results of analyses of the compounds isolated agreed with those of known alkaloids: (I) – veramarine; (II) – verazine; and (III) – veramine [3, 4]. This is the first time that the alkaloids (I), (II), and (II) have been isolated from this plant.

LITERATURE CITED

1. N. V. Bondarenko, Khim. Prir. Soedin., 529 (1982).
2. N. V. Bondarenko, Zh. Obshch. Khim., 37, 332 (1967).

Belorussian State Institute for the Advanced Training of Physicians, Minsk. Translated from Khimiya Prirodnykh Soedinenii, No. 2, p. 263, March-April, 1984. Original article submitted December 12, 1983.

 0009-3130/84/2002-0248$08.50