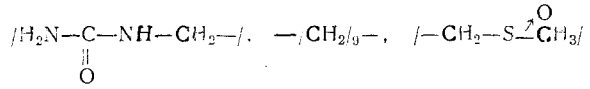
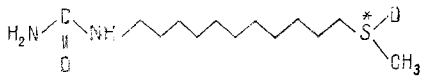
of a $-CH_2-S-O$ group (2.70 ppm; 2 H, q, J = 6 Hz); of a $-CH_2-N$ group (3.03 ppm; 2 H, t); and of -NH and NH_2 groups (6.87 ppm, 1 H; 5.49 ppm, 2 H). Diptaline gave a positive biuret reaction for urea derivatives and, consequently, it was a N-alkyl derivative of urea.

Taking into account its composition and spectral characteristics and the other information given above, the following developed formula may be proposed for (I)



The reduction of diptaline with zinc in hydrochloric acid gave an optically active substance with M^+ 260 (II). In a comparative study of (I) and (II) it was observed that the signal of the protons of the methyl group attached to sulfur had undergone a diamagnetic shift by 0.54 ppm. The difference in the molecular weight of (I) and (II) by 16 m.u. shows the reduction of the sulfoxide group.

The spectral characteristics of (I) were close to those for diptocarpaine (III) [1]. The observed difference in the molecular weights of (I) and (III) by 70 m.u. showed that diptaline was a homologue of diptocarpaine differing from the latter by five methylene groups. Thus, the structure of N-(11-sulfinylundecyl)urea may be proposed for diptaline.



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DNase AND RNase ACTIVITIES OF THE VENOMS OF CENTRAL ASIAN SNAKES

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It is known that snake venoms are rich sources of various phosphodiesterases, including those specifically hydrolyzing DNA and RNA [1-3]. In the past, the activities of the phosphoesterases of individual venoms of Central Asian snakes have been investigated, but no broad comparative studies have been made. In order to select the most suitable source for the isolation of enzymes, we have studied phosphoesterase activities of the venoms of Renard's viper *Vipera ursini renardi*, of the cobra *Naja oxiana* Eich., of the kufi *Vipera lebertina turan.*, of the saw-scaled viper *Echis carinatus* S., and the mamushi *Ancistrodon hal.* (from the Central Asian zonal Uzbek Zoological Combine).

The deoxyribonuclease activity was investigated by a method based on the colorimetric determination of the deoxyribonucleotides liberated under the action of the enzyme on a substrate and characterized by the property of dissolving in acid [4] (cited by Orlowski [5]). The hydrolytic action of these venoms of the Central Asian snakes on DNA were compared with the corresponding effect of DNase I from cattle pancreas. The results obtained (Fig. 1a, b) show that for the conditions and concentrations of venoms that we used the hydrolysis of DNA takes place as a zero-order reaction. According to the level of their activities, the DNases of the venoms that we studied form the following sequence: venoms of the kufi > cobra > saw-scaled viper > mamushi > Renard's viper. The results obtained by I. I. Nikol'skii et al. [6] in an investigation of the DNase activity in the venoms of the cobra, kufi, and saw-scaled viper showed a high DNase activity in the cobra venom and very slight activity in the kufi venom, the venom of the saw-scaled viper occupying an intermediate position. It is known that the venoms of different snakes differ substantially in their composition and properties and may differ according to the set of phosphodiesterases that they

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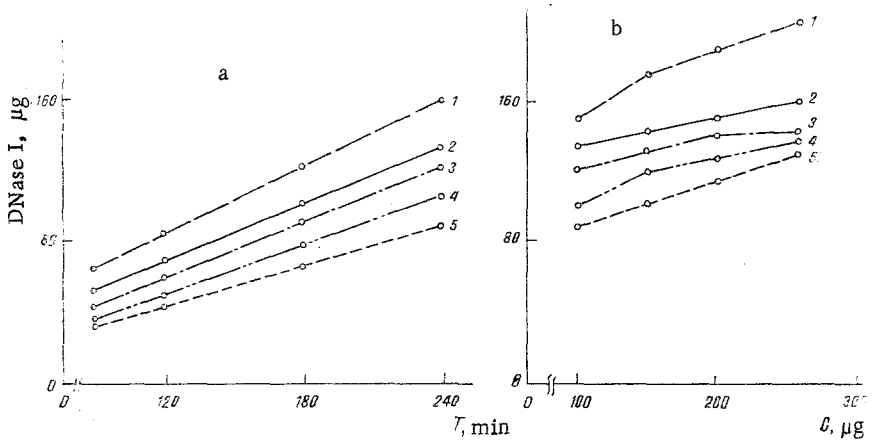

Fig. 1. Dynamics of the hydrolytic action on DNA (a) and the concentration dependences of venoms of the DNase activity (b) of the venoms of Central Asian snakes. 1) Kufi; 2) cobra; 3) saw-scaled viper; 4) mamushi; 5) Renard's viper; a) concentration of each venom 100 μg; b) time of incubation 4 h.

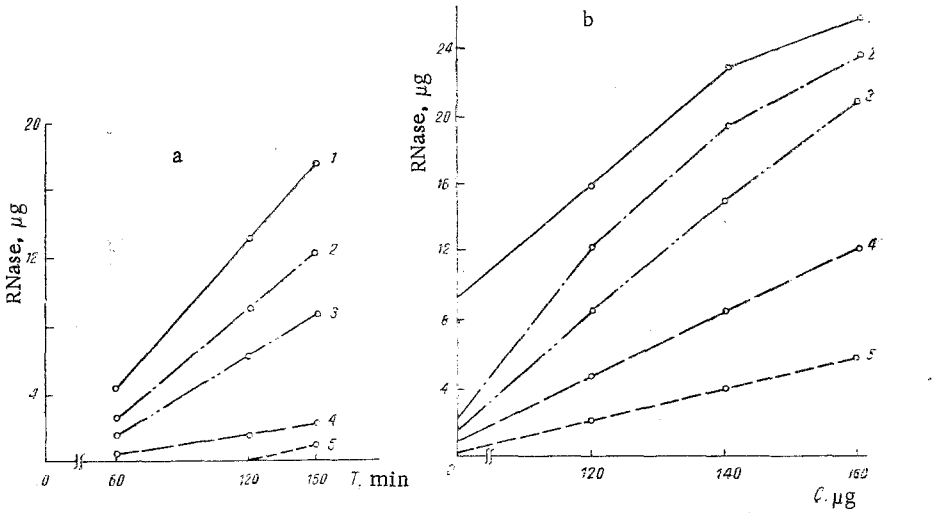

Fig. 2. Dynamics of the hydrolytic action on RNA (a) and the concentration dependences of the RNase activity (b) of the venoms of Central Asian snakes: 1) cobra; 2) saw-scaled viper; 3) mamushi; 4) kufi; 5) Renard's viper; a) concentration of venoms 120 μg; b) time of incubation 150 min.

contain and according to the level of enzymatic activity in different samples of one and the same venom, which may be connected with the ecological conditions of life of the snakes and many other factors [7, 8].

The ribonuclease activity was determined by the method of Dickman and Trupin [9], according to which the products of the hydrolysis of RNA after their separation from the unhydrolyzed RNA are determined spectrophotometrically from the absorption at 260 nm. The RNase activities of the venoms (Fig. 2a, b) depend linearly on the time of incubation of the venoms with the substrates and the concentration of venom used for incubation. In order of decreasing RNA activity, the venoms form the following sequence: venom of the cobra > saw-scaled viper > mamushi > kufi > Renard's viper. The absence of a correlation in the distribution of the DNase and RNase in the venoms can be explained by the assumption that different phosphodiesters are responsible for the hydrolysis of DNA and of RNA.

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ANALYSIS OF THE PHOSPHATASE ACTIVITIES OF THE VENOM OF RENARD'S VIPER BY ISOELECTRIC FOCUSING

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Snake venoms contain phosphomono- and phosphodiesterases with different degrees of substrate specificity. A clear idea of the composition of snake venoms is complicated by the existence of numerous forms of these enzymes. We have separated the venom of Renard's viper into fractions by isoelectric focusing and have analyzed the phosphatases in them.

When using ampholines creating a pH gradient from 3.5 to 9.5 it was possible to separate Renard's viper venom into 19 components. During the separation the following phosphatase activities were measured: those of nonspecific alkaline monophosphatase and of 5'-nucleotidase, determined by the method of Dixon and Purdom [1], cited by Orlowski [2], from the splitting off from the substrate of inorganic phsophate, the amount of which was measured by the method of Ya. Ph. Turakulov et al. [3]; that of phosphodiesterase by the method of R. I. Tatarskaya et al. [4], from the accumulation of p-nitrophenol split off from the potassium salt of di-p-nitrophenyl phosphate as substrate.

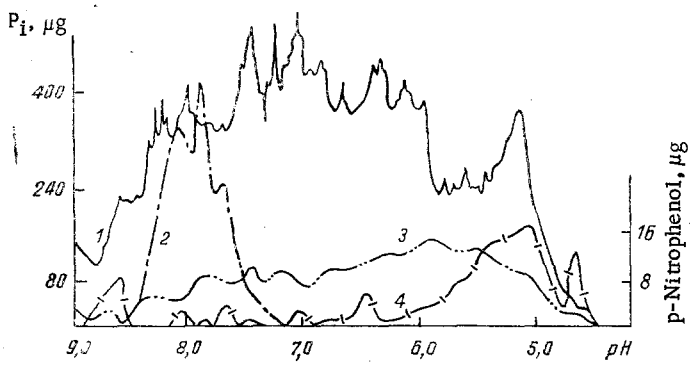

Fig. 1. Graph of the separation of Renard's viper venom (100 mg) with the aid of isoelectric focusing (time of focusing 20 h): 1) protein content (absorption at 280 nm); 2) 5'-nucleotidase activity (μg of P_i); 3) nonspecific alkaline monophosphatase activity (μg of P_i); 4) phosphodiesterase activity (μg of p-nitrophenol).

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