IR spectrum of this alkaloid showed absorption bands of active hydrogen and of a methylene group in a cyclopropane ring. Its PMR spectrum showed signals from four methyl and two N-dimethyl groups and from a methine proton geminal to a hydroxy group. The mass spectrum showed the main peaks of ions with m/z 57, 58, 71, 72, 383, 424, and M^+ 446, which are characteristic for the mass-spectrometric fragmentation of the cycloprotobuxine bases [5]. From its spectral characteristics, this alkaloid was assigned to the bases of the 9β,19-cyclo-5α-pregnane type, differing from alkaloids of the box genus isolated previously.

Thus, from Buxus sempervirens L. from a growth site not previously investigated we have isolated cyclobuxine-D, cyclovirobuxine-D, cycloprotobuxine-D, cycloprotobuxine-A, butamine E, and a new base with mp 215-217°C.

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COMPONENT COMPOSITION OF THE Thymus GENUS

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We have previously [1, 2] reported the component composition of some thyme species. We have studied the component compositions of a number of nutrient substances from individual organs of Thymus fomini Klock. et Shost., Th. trautvetteri Klok. et Shost., and Th. hadzhievii Grossh., collected, respectively, in the Stepanakert region in the Bogirkosh mountains, in the Lerik region in the environs of the village of Beir, and in the Shemakha region in the Pridarki mountains. The free amino acids were determined by the method of T. F. Andreeva and O. P. Osipova – by paper chromatography [3] – and the amount of carbohydrates by Bertrand's method [4]. The component composition was determined by O. A. Pavinov's method [3], the fatty oils by extraction with petroleum ether (bp 40-60°C) in a Soxhlet apparatus [4], the total nitrogen by the Kjeldahl method and protein by the method of Henneberg and Shtoman [5].

Free amino acids in the various organs of the species of thyme were determined by descending paper chromatography. n-Butanol–acetic acid–water (4:1:1) was used as solvent.

As can be seen from Table 1, the greatest number of amino acids was detected in the leaves of Th. trautvetteri and the smallest amount in the inflorescences of Th. fomini.

The amount of carbohydrates – monosaccharides – in the leaves of Th. trautvetteri was 4.09%, and in the stems 3.66%, while in Th. fomini there was 3.80% of disaccharides.

To identify the components of the carbohydrates in the epigeal parts of the species of thyme mentioned, n-butanol–acetic acid–water (4:1:5) was used as the solvent. The chromatograms were revealed with aniline phthalate. It was found that the carbohydrate compositions of the thyme species were identical: galactose (R_f 0.18), glucose (R_f 0.21), and arabinose (R_f 0.31).

We determined the amounts of total nitrogen and of protein and of nonprotein substances. The greatest amount of nitrogen substances was found in the leaves of Th. fomini (2.55,

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TABLE 1. Free Amino Acids of Various Species of Thymus L.

Amino acid	Plant organ								
	leaves	stems	inflores-cences	leaves	stems	inflores-cences	leaves	stems	inflores-cences
	Th. hadzhieva			Th. fomini			Th. trautvetteri		
1. Cystine	+	—	+	—	—	—	—	—	—
2. Lysine	+	+	+	—	—	—	+	—	+
3. Histidine	+	+	+	+	+	—	+	—	+
4. Arginine	+	—	+	+	+	+	+	+	+
5. Asparagine	+	+	+	—	—	—	+	—	+
6. Aspartic acid	+	+	+	+	—	+	—	+	+
7. Serine	—	—	—	+	—	—	+	+	+
8. Proline	—	—	—	—	—	—	+	+	—
9. Glycine	—	—	—	+	+	+	—	—	—
10. Threonine	+	+	+	+	+	—	+	+	+
11. Alanine	—	—	—	—	+	—	+	—	—
12. γ-Aminobutyric acid	+	+	—	—	—	—	—	—	—
13. Tyrosine	—	—	—	—	—	+	+	+	+
14. Tryptophan	+	+	+	+	+	—	+	—	+
15. Valine	—	+	—	+	+	—	+	—	—
16. Phenylalanine	+	+	+	+	+	—	—	+	+
17. Leucine	+	+	+	+	+	—	+	+	+

1.56, and 0.99%, respectively). The amounts of protein in the various organs of Th. fomini were as follows (%): in the stems, 7.68; inflorescences, 7.76, leaves, 15.93. The amounts of fatty oils in all the thyme species were from 1.54 to 3.45% on the air-dry weight of the plants.

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