Compound*	Yield %	R_f value in the following systems***					Rel. mobility on electrophoresis, g		Nucleotide: amino acid ratio
		1	2	3	4	5	pH4.5	pH8.9	
Deoxyuridylyl(5'→N) phenylalanine	50	0.58	0.45	0.80	0.40	—	0.80	0.50	1 : 0.96 : 0.89**
Deoxyadenylyl(5'→N) phenylalanine	60	0.60	0.44	0.76	0.36	—	0.80	0.45	1 : 0.98 : 0.95**
Uridylyl(5'→N) phenylalanylglycine	65	0.27	0.17	0.50	0.11	—	0.75	0.48	1:0.98 : 0.77 : 0.74**
Uridylyl(5'→N) phenylalanylvaline	65	0.63	0.43	0.84	0.40	—	0.70	0.48	1 : 0.98 : 0.83 : 0.75**
Guanylyl(5'→N) phenylalanylglycine	44	0.30	—	0.37	—	0.42	—	0.30	1:0.95 : 0.92
Guanylyl(5'→N) phenylalanylvaline	52	0.23	—	0.33	—	0.29	—	0.30	1 : 0.93 : 0.88
Guanylyl(5'→N) phenylalanylvalylalanine	55	0.27	—	0.35	—	0.40	—	0.32	1:0.97 : 0.96 : 0.93

*In all compounds the carboxy group of the terminal amino acid was methylated.

**The nucleotide: phosphorus: amino acid ratio was determined.

***Solvent systems: 1) iso-$C_3H_7OH-NH_4OH-H_2O$ (7:1:2); 2) n-$C_4H_9OH-H_2O-CH_3COOH$ (4:5:1); 3) C_2H_5OH – 1M. CH_3COONH_4 (5:2); 4) tert-C_4H_9OH – 1N. NH_4OH-H_2O (7:0.1:3); 5) iso-C_3H_7OH – 1% $(NH_4)_2SO_4$ solution (2:1).

The synthesis was carried out by the pyrophosphate method which, as has been shown [1–4] is the most effective, particularly for the synthesis of peptide derivatives. In the production of derivatives of guanosine 5'-phosphate, the solvent used was dimethylformamide. To neutralize the hydrochlorides of the di- and tripeptides, Dowex-1 (OH) was used for the first time instead of tri-n-butylamine. The use of an ion exchange resin enables an undesirable excess of amine in the reaction mixture to be avoided and the yield of product to be somewhat improved. The characteristics of the compounds obtained are given in the table.

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HYDROLYSIS OF FLAVONOID GLYCOSIDES BY FUNGUS ENZYMES

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Hydrolytic enzymes are used fairly frequently to split flavonoid glycosides in determining their structure. Nevertheless, enzymes are sometimes used without account being taken of their substrate specificity or the optimum conditions for their action. Only isolated studies have been devoted to these questions. Thus, for example, Harborne [1] studied

the features of the action of β-glucosidase, β-glucuronidase, and anthocyanase on various flavone glycosides. Westlake [2], Dunlap [3], and Okada [4], with their colleagues have published a number of papers on the characteristics of fungus enzymes that split individual glycosides.

Flavonoid glycosides are successfully hydrolyzed with purified enzyme preparations from the fungi Aspergillus flavus, Asp. niger, Asp. oryzae [5]. A preparation from Asp. oryzae obtained by aqueous extraction of a commercial enzyme preparation used in the fruit industry [6] with subsequent precipitation by isopropanol, reprecipitation by ethanol, and freeze-drying splits off α-D-glucose from flavonoid glycosides very rapidly (in 5–10 min) and β-D-glucose somewhat more slowly, and it also splits off α-L-arabinose and β-D-galactose.

The optimum conditions for the reaction of the corresponding enzymes in the preparation are as follows: α-glucosidase (α-D-glucoside glucohydrolase) pH 5.5–6.0, temperature 46–48° C; β-glucosidase (β-D-glucoside glucohydrolase) pH 4.8–5.0, temperature 50–55° C; α-arabinosidase (α-L-arabinoside arabinohydrolase) pH 5.8–6.0, temperature 48–50° C; and β-galactosidase (β-D-galactoside galactohydrolase) pH 5.0–5.5, temperature 50–52° C.

The specific inhibitors of α- and β-glucosidase – δ- and γ-lactones of gluconic acid [7] – block the enzymatic hydrolysis of α- and δ-glucosides while exerting no influence on the splitting of flavonoid α-arabinosides and β-galactosides. In contrast to the anthocyanase from Asp. niger [1], the enzyme preparation from the fungus Asp. oryzae contains no α-rhamnosidase and does not hydrolyze the flavonoid rhamnosides, rutinosides, and robinobiosides.

To carry out the enzymatic reactions, the glycosides were dissolved in the minimum amount of water (in the case of sparingly soluble flavonoids, up to 15% of ethanol was added) and were stirred with an amount of enzyme preparation equal to the weight of the glycosides. The experiments were carried out with glycosides of quercetin, isorhamnetin, kaempferol, luteolin, apigenin, and liquiritigenin supplied by colleages of the phytochemical laboratory of Kharkov Chemical and Phamaceutical Scientific-Research Institute.

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THE NITROGEN-CONTAINING SUBSTANCES OF ARTEMISIA RUTIFOLIA

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Plants of the genus Artemisia have been studied for a long time, but so far no nitrogen-containing substances have been found in them [1–4]. We have isolated such substances from Artemisia by a somewhat unusual method.

The epigeal parts of the plant A. rutifolia collected during the period 28 July-11 August in the Tien-Shan region on the banks of the R. Kokomoren were extracted with methanol–chloroform (3:7). The solvents were distilled off and the residue was treated with 10% hydrochloric acid. The separated chloroform was filtered off and the acid solution was freed from impurities by extraction with chloroform.

The residue after the chloroform had been distilled off was triturated with water, the insoluble material was filtered off, the filtrate was brought to pH 7 to universal indicator with ammonia, and the volatile fraction was distilled off in steam. The distillate was saturated with potassium carbonate and extracted with ether. The ethereal extract was