hexylcarbodiimide was treated with octadecylamine (1.2 equiv.), and column chromatography of the reaction mixture led to the isolation of O-(benzyl 2-acetamido-4,6-O-isopropylidene-2-deoxy-α-D-glucopyranosid-3-yl)-D-lactoyl-L-alanyl-D-isoglutamine γ-octadecylamide (III): 75%, $[\alpha]_{546}^{20}$ +67° (c 0.54; dimethylformamide); IR (cm^{-1}, KBr): 3370-3280 (NH_2, NH); 2920, 2850 (CH_2); 1650, 1540 (amide); 850 (Me_2C), 710, 690 (phenyl). The isopropylidene protection in the amide (III) was eliminated by heating it with 80% acetic acid, giving O-benzyl 2-acetamido-2-deoxy-α-D-glucopyranosid-3-yl)-D-lactoyl-L-alanyl-D-isoglutamine γ-octadecylamide (IV), 94%, $[\alpha]_{546}^{20}$ +59° (c 0.69; dimethylformamide); IR (cm^{-1}, KBr): 3380-3270 (OH, NH_2, NH); 2910, 2840 (CH_2); 1630, 1540 (amide); 710, 690 (phenyl); PMR (500 MHz, DMSO-d_6): 0.87 t (3H; $\underline{CH_3}CH_2$), 1.17-1.36 m (CH_2, $2CH_3CH$), 1.50 m (2H; $\underline{CH_2}CH_2N$), 1.80 s (3H; NAc); 2.06 t (2H; $\gamma\underline{CH_2}$), 4.44 d, 4.67 d (2H, J_{gem} = 12 Hz; OCH_2Ph), 4.74 d (1H, $J_{1,2}$ = 3 Hz; H-1); 7.29-7.39 m (5H; Ph), 7.02 s, 7.56 d, 7.73 t, 8.08 d, 8.12 d (6H, 4NH, NH_2). The benzyl glycoside (IV) was subjected to catalytic hydrogenolysis over 10% Pd/C at 35-37°C. The desired glycoside (I) was isolated with a yield of 90%, $[\alpha]_{546}^{20}$ +26° (c 0.50; acetic acid), IR (cm^{-1}, KBr): 3370-3250 (OH, NH_2, NH); 2900, 2830 (CH_2); 1630, 1530 (amide). The overall yield of the octadecylamide (I) amounted to 63%.

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COMPARATIVE STUDY OF AMINO ACID COMPOSITIONS OF FLAVOPROTEINS OF THE COTTON PLANT AND OF THE FUNGUS Verticillium dahliae

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A flavoprotein has previously been isolated from cotton seeds and some of its physicochemical properties have been studied [1]. An investigation of the analogous fraction of protein from the stems of 14-day cotton seedlings revealed a number of substantial differences between the flavoproteins from the seeds and the seedlings [2]. The flavoprotein from the stems consisted of two polypeptide chains and differed from the flavoprotein of the seeds in its amino acid composition.

The change in the amino acid composition of these proteins on the growth of the seeds may indicate the existence of a multiplicity of flavoproteins possessing identical electrophoretic mobilities. Moreover, in an electrophoretic study of the proteins of the fungus Verticillium dahliae Klbeb. – the causative agent of cotton wilt – it was found that a flavoprotein with a similar mobility was also present in this organism. The aim of the present work was a comparative study of the amino acid compositions of the flavoproteins isolated from the seeds of three species of cotton plant, from the leaves of 14- and 24-day seedlings, and from the mycelia of the fungus V. dahliae.

It can be seen from Table 1 that the flavoproteins isolated from the seeds of three species of cotton plant were similar in amino acid composition, although a considerable difference of the flavoprotein of the seeds of G. arboreum with respect to the leucine content may be mentioned. The flavoproteins isolated from the leaves of 14- and 24-day seedlings

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TABLE 1. Amino Acid Compositions of the Flavoproteins, mol. %

Amino acid	Flavoproteins								
	seeds of the species			leaves G. hirsutum L.		1st component		2nd component	
	G. arboreum L.	G. barbadense L.	G. hirsutum L.	14th-day	24th-day	cotton stems	fungus	cotton stems	fungus
Lysine	5,6	5,7	5,5	5,5	5,3	4,0	5,1	4,2	2,9
Histidine	1,4	1,5	1,5	2,6	2,0	1,3	1,5	0,8	1,5
Arginine	6,1	6,5	6,0	3,3	3,2	3,2	1,6	2,4	1,1
Aspartic acid	10,5	10,4	11,3	12,4	11,4	12,4	12,7	25,5	17,3
Threonine	5,7	5,6	6,2	5,0	5,4	6,2	5,9	4,7	4,4
Serine	5,6	5,4	5,9	7,3	7,8	9,9	6,9	6,0	5,8
Glutamic acid	15,1	16,5	16,2	14,1	14,9	15,2	16,6	17,9	22,8
Proline	3,7	4,2	4,3	4,5	4,9	6,3	7,4	5,1	5,9
Glycine	10,5	10,5	10,8	9,1	9,4	9,0	13,3	11,9	15,9
Alanine	11,1	11,3	11,3	10,0	10,9	11,5	10,4	7,1	6,5
1/2-Cysteine	0,7	0,5	0,7	Not determined			Not determined		
Valine	7,2	6,8	5,6	10,4	9,4	7,9	5,1	6,6	5,8
Methionine	0,4	0,5	0,7	1,0	0,7	1,9	0,9	1,2	Not deter.
Isoleucine	3,3	3,6	3,0	3,4	4,4	2,8	2,7	1,6	2,3
Leucine	7,0	5,1	4,4	7,0	6,2	5,8	6,1	2,9	4,5
Tyrosine	2,2	1,9	2,0	1,2	1,1	0,5	1,4	0,5	2,1
Phenylalanine	3,8	4,0	3,7	2,8	2,5	1,4	2,2	1,2	2,1
Alkaline	13,2	13,6	13,0	11,4	10,5	8,5	8,2	7,4	5,5
Acidic	25,7	26,9	27,5	26,5	25,3	27,6	29,3	45,4	40,1
Acidic/basic	1,95	1,98	2,11	2,32	2,41	3,13	3,57	6,13	7,29

differed from the proteins of the seeds with respect to the levels of a number of amino acids. For example, the amounts of such amino acids as histidine, serine, and valine were greater in the flavoproteins from the leaves, and the amounts of arginine, tyrosine, and phenylalanine were smaller in comparison with their amounts in the flavoprotein from the seeds.

A comparison of the amino acid compositions of the flavoproteins isolated from the leaves and stems of 14-day seedlings [2] also showed substantial differences in the amounts of a number of amino acids. On the basis of the results obtained, it may be assumed that the flavoproteins of the cotton plant are acidic proteins and that the composition of the flavoproteins changes during the growth and development of the cotton plant and a tissue specificity exists in the level of flavoproteins.

On electrophoresis in polyacrylamide gel, the flavoprotein from the water-soluble fraction of the mycelia of the fungus V. dahliae, like the flavoprotein from the stems of cotton-plant seedlings, separated into two components. Table 1 gives the amino acid compositions of these components in comparison with the analogous fractions from the cotton-plant stems.

The amino acid compositions of the two electrophoretic components of the flavoproteins of the fungus V. dahliae were different. Thus, in the first component there were larger amounts of lysine, alanine, and leucine than in the second, while the amounts of aspartic and glutamic acids were greater in the second component. Both components were characterized by high levels of acidic amino acids, the total of which amounted to 29% in the first and 43% in the second. With respect to the nature of the distribution of the aspartic and glutamic acids, the first components of the flavoproteins isolated from the fungus and from the cotton plant were identical, while in the case of the second components a marked difference was observed. The cotton-plant flavoprotein was characterized by a high level of aspartic acid – 25.5% – and the flavoprotein of the fungus by a high level of glutamic acid – 22.8% – although the sums of these amino acids were the same for both flavoproteins. Similar results have been obtained in an investigation of the amino acid composition of the proteins strongly bound to DNA from the cotton plant and from the fungus V. dahliae [3]. Aspartic acid predominates in the amino acid composition of these proteins from the cotton plant, and glutamic acid in those from the fungus.

Thus, it has been shown that the flavoproteins of 14-day cotton seedlings and the fungus each consists of two electrophoretic components differing from one another in amino acid composition. The fractions of the flavoproteins of the fungus and the cotton plant homologous with respect to electrophoretic mobility are similar in amino acid composition.

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