EFFECT OF THE SPECTRAL COMPOSITION OF LIGHT ON THE CARBOHYDRATE PRODUCTION OF THE RED PEPPER PLANTS (CAPSICUM ANNUUM L.)

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Red pepper plants had been grown till harvesting in our small phytotron set out with luminescent lamps ensuring different spectral composition by using an equal light intensity for each variant of 7000 erg/cm² sec (400–700 nm). Water soluble carbohydrates were fractioned from the dry material by making use of our own method, and starch with perchloric acid one (Pucher et al. 1948). The quantity of both fractions were measured by phenol-sulfuric acid method (Dubois et al. 1956).

The data registered (calculated in mg for a single plant) are shown in the table below:

Variant	root		stem		leaf		harvest	
	1	2	1	2	1	2	1	2
„blue"	20,52	19,84	12,73	8,29	7,23	6,03	5,97	2,30
„green"	00,55	0,64	0,90	1,13	1,64	1,51	—	—
„yellow"	3,26	2,38	4,00	3,40	4,18	4,18	—	—
„red"	12,32	8,06	0,91	7,34	4,80	4,10	6,16	2,05
„white"	21,66	11,02	7,72	7,15	4,51	4,61	4,22	2,11

Variant	whole plant	
	1	2
„blue"	46,45	36,46
„green"	3,09	3,28
„yellow"	11,44	9,96
„red"	32,19	21,55
„white"	38,11	24,89

1=soluble carbohydrates
2=starch

It may be laid down as a fact, that the spectral composition of light shifted towards the blue and red wave lengths resulted for all organs in a high carbohydrate and starch production, whereas under the one sifted towards the green and the yellow this production showed to be low. Stressing the blue wave length range, as compared to the white which is the nearest to the natural light composition increased the carbohydrate production of the plants.

Relaying upon our findings it may be considered as a fact that at the energy level amploied there is a linear relationship between stressing the wave length ranges being absorbed by the photosynthetical pigment complex to the highest degree on the one hand and the carbohydrate production on the other. In similar connection, there are available any references relating also to the interaction between light absorption by photosynthetical pigment complex and the Hill-reaction (CHEN 1952), the action spectrum of the photophosphorylation respectively (JAGENDORF et al. 1958), the intensity of the assimilation (NEUERNBERGK 1961), and the O_2 production of Chlorella (LUNDEGARDH 1964).

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