PRESENCE OF THE HIGH-CYSTINE FRACTION IN THE PISUM SEED ALBUMINS[1/]

Jakubek, M. and J. Przybylska Polish Academy of Sciences, Poznan, Poland

Seed albumins of five Pisum ecotypes, showing characteristic electrophoretic patterns (1), were separated on a Sephadex G-100 column into four chromatographic fractions, with the following approximate molecular weights: 80,000 (SI), 40,000 (S2), 18,000 (S3), and 7,000 (S4). Electrophoretic patterns of these fractions were described previously (2). Data concerning the relative contents and amino acid composition of the fractions are presented in this report.

The following Pisum lines from the Weibullsholm Collection were investigated P. sativum 'Kungsart', W 110; P. humile, W 936; P. cinereum, W 1490; P. abyssinicum, W 808; and P. fulvum, W 1256. Extraction of albumins, fractiona- tion, and amino acid de

The average percentages of fractions S1-S4 in the total albumins recovered from the column were: 16, 26, 48, and 11, respectively. Though elution profiles of the Pisum lines investigated were similar, some differences in the relative contents of particular fractions were observed (Table 1).

Table 1. Protein contents in seed albumin fractions (S1-S4) from five Pisum ecotypes, separated by gel filtration on Sephadex G-100. Values are percentages of the total protein recovered from the column.

Pisum line	S1	S2	S3	S4
P. sativum	16	28	44	12
P humile	16	31	43	11
P. cinereum	17	24	50	10
P. abyssinicum	11	20	59	11
P. fulvum	20	25	44	11
Mean	16	26	48	11

The corresponding albumin fractions of the five Pisum lines studied had a rather uniform amino acid composition, but some marked differences in the level of certain amino acids were observed between chromatographic fractions of Pisum seed albumins. Fraction S1 was rich in leucine and fraction S2 in tyrosine and phenylalanine. Fraction S3 contained a high amount of cystine (Table 2) and a relatively small amount of leucine. The average content of cystine in fraction S3 was about sixfold higher than that in the other fractions.

The data reported here indicate that a relatively high level of cystine in total albumins of P. abyssinicum, observed in the previous (4) and present investigations, is rather due to a larger proportion of the cystine-rich fraction S3 (Table 1) than to a higher content of cystine in this fraction.

1/ - This work was performed under Government Project PR-4.

Table 2. Cystine content in seed albumins of five distant Pisum lines. E-total albumin extracts; S1-S4-fractions separated by gel filtration on Sephadex G-100. Values are percentages of the total amino acids estimated.

Pisum line	E	S1	S2	S3	S4
P. sativum	2.01	0.70	0.91	3.93	0.89
P. humile	2.26	0.84	0.67	4.59	0.35
P. cinereum	3.00	0.70	1.14	4.31	0.23
P. abyssinicum	3.67	0.80	0.63	4.75	0.25
P. fulvum	2.46	0.83	0.89	3.38	0.00
Mean	2.68	0.77	0.85	4.19	0.34

(1) Przybylska, J., S. Blixt, J. Hurich, Z. Zimniak-Przybylska. 1977. Genetic Polonica 18:27-38.
(2) Jakubek, M. and J. Przybylska. 1978. PNL 10:24.
(3) Jakubek, M. and J. Przybylska. 1979. Genetica Polonica (in press).
(4) Hurich, J., H. Parzysz, and J. Przybylska. 1977. Genetica Polonica lb:241 252.

AGRONOMIC PERFORMANCE AND SEED PROTEIN YIELD OF SOME PEA GENOTYPES

Kaul, M. L. H. University of Kurukshetra, India

Earlier (PNL 10:25-26, 1978) we reported measurements of height and of several yield components in 25 varieties of peas grown at Kashmir (N.W. Himalaya region of India). Table 1 includes some additional data obtained from the same study. Among the tall types, T56 had the highest shelling percentage, number of seeds per plant, grain yield, and seed protein yield but it had the lowest seed protein content. 'Lincoln' performed second best, combining high grain yield with better seed protein content. In the dwarf group, 'Early Badger' and GC 468 were among the best in the test.