

QUANTITATIVE AND QUALITATIVE VARIATION OF PROTEIN IN PEA SEEDS

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A collection of Pisum sp. comprising approximately 1,500 lines classified according to Lehmann (1954) is gathered in the Gene Bank at Wiatrowo (see pg. 78). In 1976, following a check analysis for crude protein content in seeds, 123 lines were taken for detailed examination. These were selected from major taxa, three each. In the period 1975-1977, one each of 27 forms were selected.

From representative seed batches, 10 samples were taken of each line and analyzed for protein content (Kjelfos Nitrogen Analyzer). Statistical calculations were made on MC ODRA computer employing a so-called STOP program to determine various characteristics of variation.

In 1976 and 1977 amino acids in seeds of 50 forms were analyzed (Beckmann Analyzer).

Protein content (%) in seeds differed markedly. It was highest in P. sativum conv. speciosum, decreasing in conv. sativum, medullulosacharatum, and in primitive species. The richest source of high protein lines was in conv. medullulosacharatum (27.8-32.7%). All common and high yielding varieties of field pea belonging to conv. sativum, var. episcopii and gratiosum were characterized by a low protein content (21.1-23.2%). In the group of colored peas (conv. speciosum), there were varieties with a very low protein content as well as botanical varieties with a high protein content (e.g. violaceo-punctatum, urgeum, and zeylanicum).

Populations and varieties responded markedly to changing environmental conditions within years. The colored peas showed the lowest fluctuation of protein within years. Variation of protein content in the analyzed lines ranged from 0.25-5.30% within years. The degree of uniformity of the tested lines also varied appreciably. The best, uniformity was manifested by population No. 16 of P. abyssinicum, by the garden pea 'Old Perfection', and by the fodder pea 'Romac'. Evaluation of all variation components showed varieties 'Super Sweet' and Old Perfection and fodder peas 'Poneka' and 'Kosieczynska' should receive preference in crossing programs.

The mean amino acid content in 1967 and 1977 varied as follows: lysine - 6.64-8.05; methionine - 0.79-1.31; cystine - 0.81-1.34.

Cultivated forms had a somewhat higher level of amino acids in the seed protein than primitive forms. However, no negative correlation was observed between the composition of amino acids and the seed yield. A number of white flowering pea varieties ('Jupiter', 'Flavanda', 'Rondo', 'Kaliski' and 'Waitor'), characteristic of very high seed yields, had a very favorable composition of amino acids in protein.