VARIATION IN ELECTROPHORETIC PATTERNS OF UREA-TREATED LEGUMIN FRACTION IN PISUM[1/]

Przybylska, J., J. Hurich and Z. Zimniak-Przybylska
Polish Academy of Sciences, Poznan, Poland

As a further step of our comparative study of Pisum seed proteins (1, 2, 3), we report now on an electrophoretic analysis of urea-treated legumin fraction from various Pisum ecotypes. The analyzed material comprised 21 Pisum lines originating from the Weibullsholrn collection, the John Innes Institute, and from other sources. Isolation of legumin fraction from total globulin extracts was performed by isoelectric precipitation at pH 4.7. Polyacrylamide gel electrophoresis (PAGE) of urea-treated legumin was conducted in anodic and cathodic buffer systems to achieve resolution of acidic and basic components, respectively.

Electrophoretic banding patterns obtained in an anodic buffer system show 3 variant zones, I-III (Fig. lA-a); slow-moving bands of zone I are the major bands which are better resolved when smaller amounts of protein are subjected to electrophoresis (Fig. lA-b). Variation within each of the zones is shown for 12 Pisum lines. However, the overall variation is not entirely revealed since in individual lines electrophoretic banding patterns of particular zones form specific combinations. Within the investigated material 17 distinct patterns of anodic bands were observed.

Urea gels obtained in a cathodic buffer system revealed two, three, or four bands of basic proteins in particular lines (Fig. IB). The investigated lines showed 6 distinct patterns of cathodic bands.

In agreement with the finding of Thomson et al. (4), urea-gel electrophoresis proved to be very useful in analysis of Pisum legumin. The previously reported SDS-gel electrophoretic patterns of legumin fractions from distant Pisum lines (3) showed P. fulvum as a distinct taxon and differences between P. fulvum lines. Urea-gel electrophoretic patterns, presented here, confirmed the above data and, in addition, revealed marked variation within lines classified as P. elatius, *P_.* humile, and P. sativum. Moreover, P. abyssinicum proved to have a "species-specific" legumin pattern.

1. Hurich, J., Parzysz, 11., Przybylska, J. 1977. Genetica Polonica 18:241-252.

2. Przybylska, J., Blixt, S., Hurich, J., Zimniak-Przybylska, Z. 1977. Genetica Polonica 18:27-38.

3. Przybylska, J., Hurich, J., Zimniak-Przybylska, Z. 1978. PNL 10:66-G7.

4. Thomson, J. A., Schroeder, H. E., Dudman, W. F. 1978. Austr. J. Plant Physiol. 5:263-280.

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

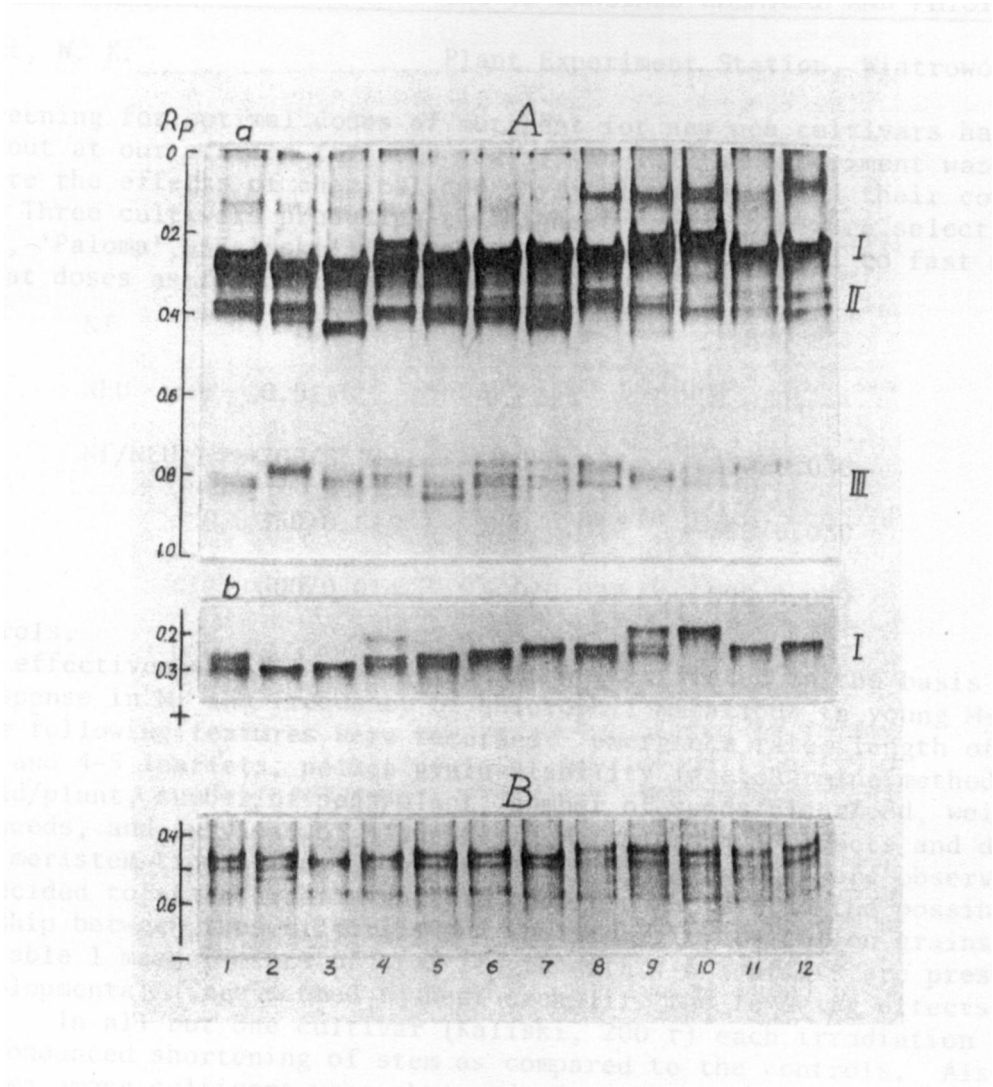

Fig. 1. Urea-PAGE in anodic (A) and cathodic (B) buffer systems of reduced legumin fraction from the following Pisum lines: (1) P. elatius, W 226; (2-3) P. humile, W 936, JI 261; (4-6) P. sativum, W 160, W 110, W 1490; (7) P. abyssinicum, W 808; (8-12) P. fulvum, w 1256, JI 224-P$_s$ and JI 224-Pf (lines distinguished on the basis of electrophoretic analysis of root peroxidases, unpublished data), VIR 3397, and sample originating from the Hebrew University of Jerusalem.

[x] a -- protein samples a. 40ug; b — protein samples a. 8ug.