ELECTROPHORETIC SEED ALBUMIN PATTERNS IN PISUM[1/]

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In an investigation performed in 1973 two electrophoretic seed albumin patterns, designated A and B, were found to occur in cultivars and breeding lines of P. sativum (3). After extending the study to include other forms or Pisum five patterns were found, designated EP I - EP V, EP I corresponding to previous pattern B (2). The distribution of these EP patterns indicated possible differences between Pisum taxa at the species-ecotype level. Analysis of seed albumins by means of gel filtration and electrophoretic analysis of the main protein peaks showed the fraction with MW of about 40,000 to be responsible for the observed differentiation of total albumin patterns (1). This report presents further data on variation in electrophoretic seed albumin patterns in peas.

To date, 251 Pisum accessions have been screened for EP patterns as previously described, using crude protein extracts with large proportions of albumins (2). P. sativum was represented by 241 accessions. Of the remaining ten accessions, two represented P. elatius, one P. humile and seven P. abyssinicum. The lines we examined were obtained from the collections at Weibullsholm (Sweden), Gatersleben (GDR) and VIR-Leningrad (USSR).

In this material the following EP patterns were detected: EP I - EP IV, patterns A, now designated as EP VI, and three "new" patterns designated EP VII - EP IX. These patterns, together with EP V reported previously for several P. fulvum forms, are presented in Fig. 1A; the characteristic bands, a-f, are indicated.

Albumins of Pisum forms representing the EP VI - EP IX patterns have now been fractionated by gel filtration on Sephadex and the peak fractions have been analyzed electrophoretically as described earlier for EP I - EP V (1). As in the case of EP I - EP V, EP VII - EP IX could be distinguished by the patterns produced by the 40,000 MW fraction. In contrast, no peak corresponding to MW of about 40,000 was observed in the gel filtration profile of albumins from the Pisum form showing EP VI. Electrophoretic patterns produced by the Sephadex albumin fractions with an MW about 40,000 are presented in Fig. 1B. It

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may be noticed that the positions of the bands in EP VII - EP IX patterns were similar to those in EP I - EP V; the additional variation is due to differences in number and combination of the previously distinguished bands.

Regarding the distribution of electrophoretic seed albumin patterns, EP I proved to be the one commonly occurring in P. sativum (183 accessions), which is consistent with the earlier data. Other EP patterns found in accessions classified as P. sativum were EP II, EP III, EP VI and EP VII. EP III, previously reported only for a single line called P. cinereum W 1490, has now been found in seven other accessions, all from the Saratov region. EP VII was observed in 59 accesaions originating from Caucasia. The P. abyssinicum accessions all showed EP IV, a pattern not found in other Pisum forms, indicating that this pattern might be specific for P. abysslnicum. EP VIII and EP IX have been found in single lines, P. humile VIR 2521 and P. elatius Gat. 255, respectively.

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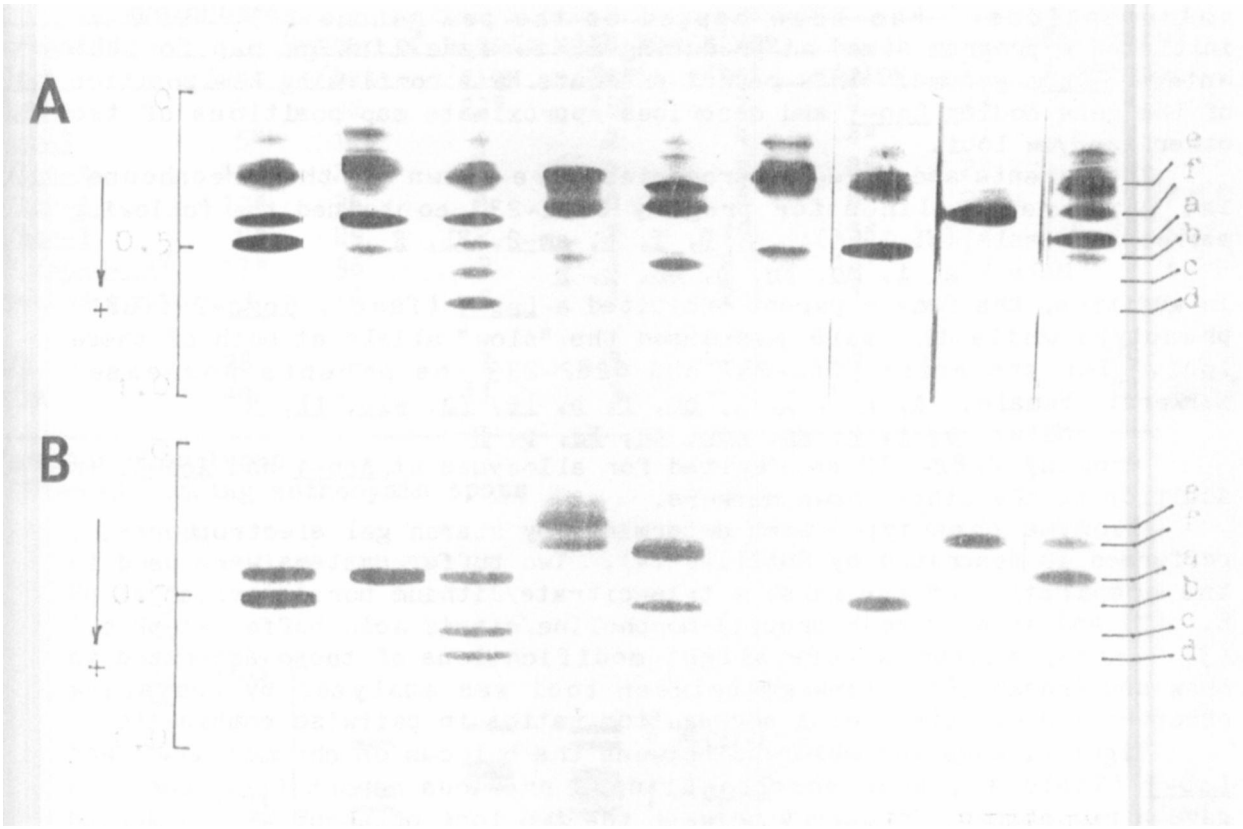

Fig. 1. Disc gel showing variation in electrophoretic seed albumin patterns in Pisum. A - Crude protein extracts; B - Sephadex fractions with an MW about 40,000. The given patterns are produced by the following accessions: I - WL 110, P. sativum: II - WL 936, P. humile: III - WL 1490, P. sativum: IV - WL 808, P. abvssinicum; V - WL 1256, P. fulvum; VI - WL 1973, P. sativum: VII - VIR 1987, P. sativum: VIII - VIR 2521, P.. humile: IX - Gat. 255, P. elatius. Characteristic bands: a-f.