

POLYPEPTIDE COMPOSITION OF PROTEIN FRACTIONS FROM PISUM SEEDS AND PODS DURING DEVELOPMENT

Gaul, E. Institute of Genetics, University of Bonn

Federal Republic of Germany

Quantitative differences (relative and absolute) in protein in the pods and seeds of 'Dippes Gelbe Viktoria' were shown to vary with developmental age (1). Qualitative changes in pod and seed protein during development were also investigated, using Na-dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE). Albumins and globulins, extracted from seeds, and the water soluble and water insoluble proteins from pods were fractionated and analyzed.

The water soluble proteins of the pods represent a heterogeneous fraction (Fig. 1a). However, the polypeptide patterns exhibited only small variation during development. In all stages investigated, a polypeptide with a molecular weight of 60 KD dominated. In the dry pods the number of bands was remarkably reduced.

A less complex protein pattern was characteristic for the water insoluble proteins (Fig. 1b). In the early developmental stages, polypeptides with molecular weights in the range of 12-14 and 35-48 KD were predominant. Only high molecular subfractions were detected in senescent pods.

The seed albumins in the early stages of development highly coincided with the water soluble fraction from pod proteins (Fig. 1a, c). In later stages the special demands on the metabolic processes of seed development were expressed by a drastic change of polypeptide composition. This was especially conspicuous in the case of the typical albumin bands (25 and 30 KD). The polypeptides were predominant during maturation, whereas they were only slightly stained in the earlier stages (Fig. 1c). The accumulation of storage proteins was likewise accompanied by alterations during successive stages of development (Fig. 1d). In the beginning, high molecular weight bands as well as polypeptides in the range of 25-40 KD were detected. The vicilin components of 32 and 50 KD could be recognized prior to the legumin subunits with molecular weights of 20 and 40 KD. Several additional bands were found, especially in the low molecular weight range. In dry seeds a polypeptide of 71 KD appeared which was recently identified as a subunit of convicilin by Croy et al (2).

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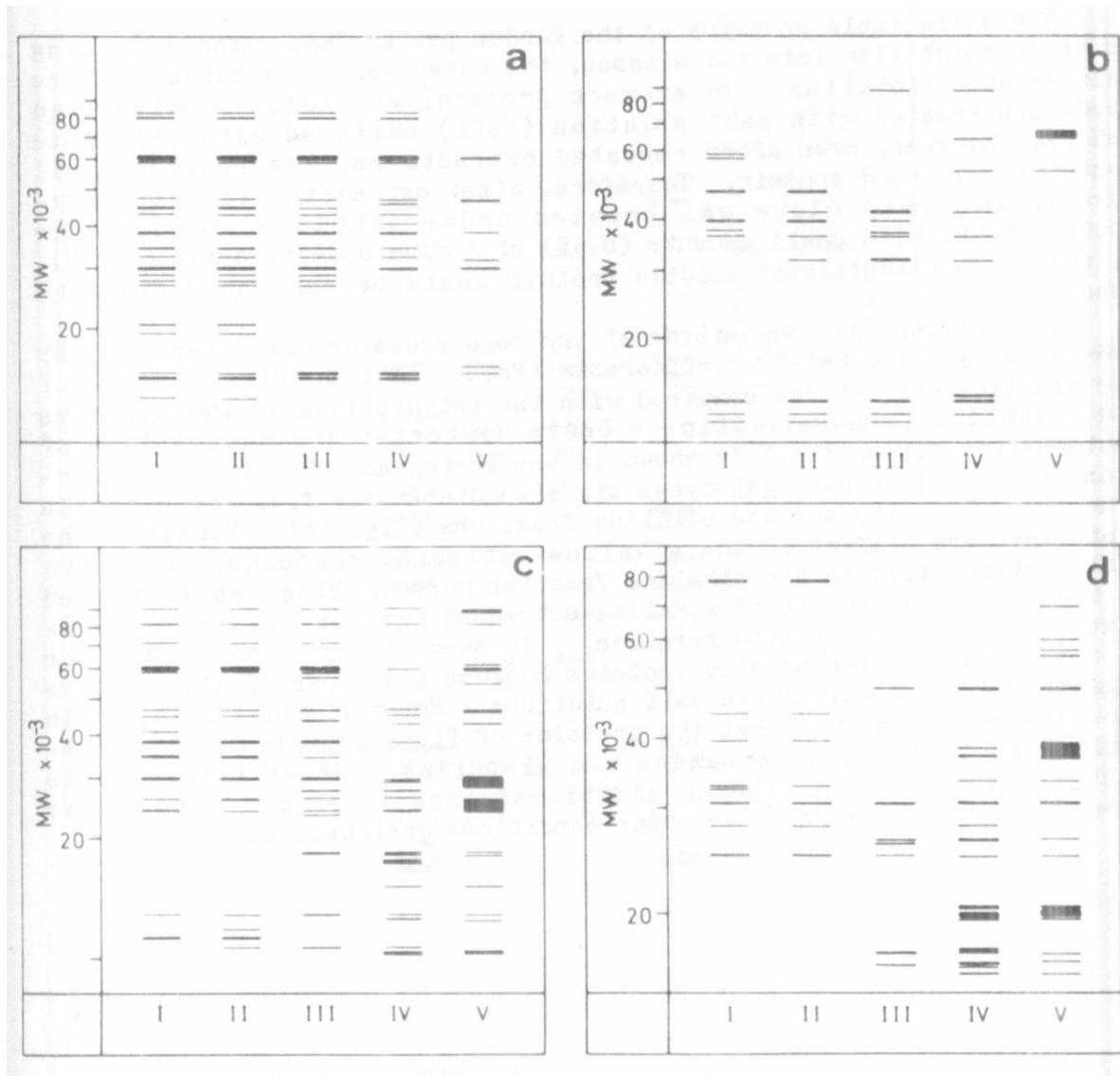


Fig. 1 SDS-PAGE of protein fractions from seeds and pods at five stages of development (I-V)

- (a) water soluble proteins of pods
- (b) water insoluble proteins of pods
- (c) albumins of seeds
- (d) globulins of seeds