## SEED PROTEIN PRODUCTION OF SOME PISUM MUTANTS AND RECOMBINANTS

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Three mutants with apical stem bifurcation (37B, 157A, 1201A) and seven recombinants (RM 20D, R 46C, R 177, RM 432, RM 836, RM 1126, RM 1128) which not only show stem bifurcation but also other morphological characters, were investigated with regard to seed yield, seed size, protein content, and protein production per plant in three consecutive years. The protein yield was compared with the control values of 'Dippes Gelbe Viktoria' (DGV) which was used as the Initial line for the radiation-genetic experiments (Fig. 1). All the recombinants tested showed dichotomous stem bifurcation due to the presence of gene bif-1 derived from mutant 1201A. Only recombinant RM 432 showed stem fasciation.

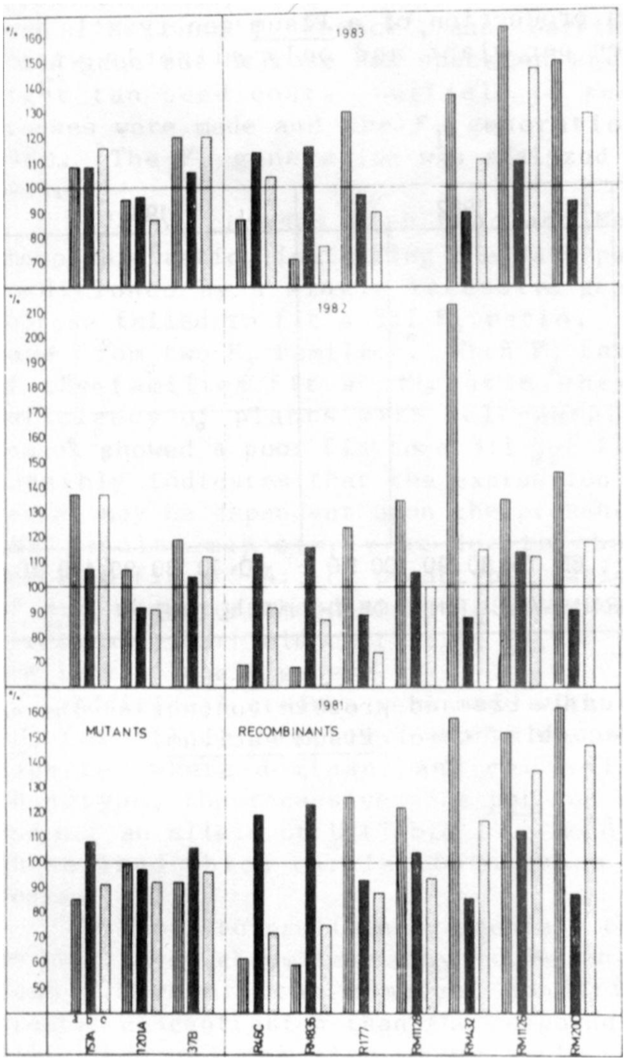


Fig. 1. Number of seeds per plant (a), protein content of the seed meal (b), and protein production per plant (c) in three mutants and seven recombinants of pea. A11 values are related to control values of the initial Variety 'Dippe Gelbe Viktoria' (DGV) - 100%

In 1981, the protein production of the three mutants was lower than that of DGV because of their lower seed yield. In 1982 and 1983, mutant 37B and 157A had a higher protein production because of a favorable combination of high number of seeds per plant and high protein content of the seed meal. This indicates that this trait is highly influenced by environmental factors. Recombinants R 46C and RM 836 showed an increased seed protein content but the protein yield was lower than DGV because of the decrease in seed yield per plant.

Recombinant RM 1126, on the other hand, had not only a higher protein content than DGV but also higher seed production. The protein production per plant was high in spite of its decreased seed size. Recombinant RM 1128 also had a higher protein content of the seed meal but the protein production was not high, possibly because of the presence of gene sg for small seeds. The increased protein production of the two recombinants RM 20D and RM 432 resulted from a very high seed production per plant, even though the protein content of the seed flour was reduced. RM 20D has normal seed size, whereas the seed size of RM 432 is reduced.

Figure 2 demonstrates that there is no clear correlation between seed size and protein content of the seed meal in the material studied. These findings contrast with the results obtained in cereals. Our investigations show furthermore that the protein production of a Pisum genotype is mainly correlated with the seed production per plant and only slightly with the protein content of the seed meal.

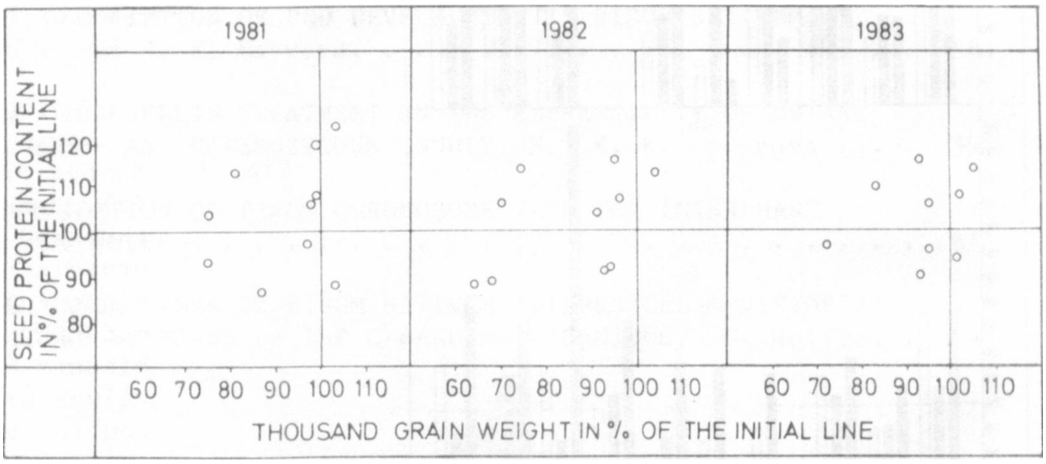


Fig. 2. The relation between seed size and protein content of the seed meal in 3 mutants and 7 recombinants of Pisum sativum.