General behaviour of an allopolyploid *Phaseolus vulgaris* L. x *P. filiformis* Benth after three generations of selfing.

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Investigations have been carried on with the advanced selfed populations issued from the initial colchicloid hybrid *Phaseolus vulgaris* (NI 34) x *P. filiformis* (NI 600) obtained by WEILENMANN de TAU and her collaborators in 1986. In a preceding research note, the same authors (1987) reported the pattern of segregation observed in C1 material (first generation of selfing): data collected on plant morphology, seed testa microstructure, fertility and meiotic behaviour revealed a very high level of genetic uniformity among the various genotypes tested. This rather surprising pattern was completely different from the variability displayed by another allopolyploid hybrid obtained previously between *P. vulgaris* and *P. acutifolius*; in the latter, quite a good amount of segregations was observed among individuals right in the first generations issued from the original CO allopolyploid (Prendota et al., 1982; BAUDOIN et al. 1985). It was therefore interesting to study the evolution of this allopolyploid material involving *P. filiformis* and to see whether further selfings would give rise to higher levels of variants. For this purpose, we decided to sample an equal quantity of seeds from several C1 plants previously grown in 1986 and the same procedure was repeated later on with some C2 plants.

Materials from this sampling, representing thus C2-C3 selfed generations, were grown in a bubble house at Gembloux during the summer 1987. Evaluations from seedling stage to seed maturity confirmed the results obtained with the C1 material, i.e. the high degree of genetic homogeneity within and between the two generations. Each one of the individuals tested expressed in a rather similar assortment a combination of the same intermediate, *vulgaris*-like and *filiformis*-like characters. Details of all the data collected will be published in a separate paper.

In consequence it appears that selfing of this particular allopolyploid does not entail a higher genetic diversity but on the contrary maintain the uniform distribution of both intermediate and parental characteristics between each genotype of the whole generation. Such a general behaviour raise immediately another question: could this allotetraploid be considered as an almost true amphidiploid? In other words, could it be stated that our colchicloid material with *P. filiformis* would have the meiotic behaviour of a diploid? This hypothesis is not only supported by the pattern of segregations observed in the various selfed generations but also by the prevalence of bivalents in the C1 meiotic configurations. Should this hypothesis be confirmed through other observations in
subsequent generations, it would even be plausible to consider our material as a distinct species artificially developed by chromosome doubling induction.

From the standpoint of the plant breeder, it remains however now essential to regress to a diploid level with the combination. Allopolyploid do not produce a sufficient set of useful agronomic attributes to meet the farmer's needs or to fit into annual cropping. A simple procedure to reverse to the diploid stage consists of back-crossing the allopolyploid with the diploid *P. vulgaris* parent. Attempts in the past have been so far unsuccessful but should not be given up. Another but more sophisticated procedure would be to investigate the possibilities of plant regeneration from anther/pollen culture with the allopolyploid genotypes. This technique represents still a very difficult area of research as far as the genus *Phaseolus* is concerned and priority should first be devoted to understand the limiting factors involved in this field.

**REFERENCES**


