**Exploring the genetics of seed dormancy and pod dehiscence in pea**

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During domestication, loss of seed dormancy and dispersal mechanisms was critical to successful farming of many crop species, including pea. Wild *Pisum* speciesshow strong pod shattering and physical seed dormancy, and seeds have a thick, rough coat (testa) that is impermeable to water. In comparison, in domesticated pea, seed coats are are smoother, thinner and more permeable, and pods do not shatter [1,2]. Little is known about the genetic basis of these differences or how they may relate to each other.

To address this, we investigated variability of these traits in a panel of diverse genotypes representing the two wild species (*P.elatius/humile* and *P.fulvum)* and the two independendently domesticated genepools (*P.sativum* and *P. abyssinicum*), and performed QTL analysis in two *humile* x *sativum* bi-parental populations. In one population, segregation of Mendel’s *A* pigmentation locus had a strong effect on both testa thickness and dormancy, whereas minor loci affected these traits independently. In this population, seed coat roughness was independent of both testa thickness and dormancy [3]. In a second population where *A* was not segregating, dormancy appeared to be under polygenic control, with seven distinct QTL detected on different chromosomes. We also detected 6 QTL for pod dehiscence, of which one co-located with a dormancy locus. Overall these results identify new loci and clarify relationships between these key domestication traits.

***References:***

[1] Zohary D and Hopf M. (1973) Domestication of pulses in the old world. Science 182, 887-894.

[2] Smýkal P. Et al. (2014) The role of the testa during development and in establishment of dormancy of the legume seed. Front Plant Sci. 5:351.

[3] Williams, O. et al. (2024) Physical seed dormancy in pea is genetically separable from seed coat thickness and roughness. Front. Plant Sci. 15:1359226