**Genetic control of flower number in pea**

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Legumes typically have compound inflorescences, in which flowers are carried on secondary inflorescences (I2) that arise from axillary meristems on the primary inflorescence. The number of flowers per I2 is variable and characteristic of each species, ranging from one to over 30. Cultivated pea (*Pisum sativum*) typically produces one or two flowers per I2, although several ”multi-pod” mutants have been reported with up to six flowers [1]. Despite the potential agricultural and evolutionary significance of this trait, few studies have explored its environmental and genetic control, with only two loci [2] and several other variants described to date.   
  
Here, we examined the effect of photoperiod and temperature on I2 flower number, and re-examined its genetic control using a selection of single-, double- and multi-flowered accessions. We found that low temperatures and short photoperiods promote the multi-flower character, with differing sensitivity among accessions suggesting different regulatory pathways. QTL analysis in three F2 populations derived from crosses between NGB5839 (double-flowered, recurrent parent), Garfield (single-flowered), and two multi-flowered lines*.* showed that the single-/double-flowered difference is under polygenic control, while the multi-flowered character is controlled by two regions on chromosomes four and six that likely correspond with the classical loci *Fn* and *Fna* loci respectively [2]. Additional variation suggests the existence of at least one other photoperiod-responsive locus that remains undefined. This research provides greater understanding of the factors controlling the number of flowers/I2 in pea, and refines the genomic position of known loci.

***References:***

*[1] Devi J. et al.(2018) Development and characterization of penta-flowering and triple-flowering genotypes in garden pea (Pisum sativum L. var. hortense). PLoS ONE 13, e0201235.*

*[2] Lamprecht H. et al. (1947) The inheritance of the number of flowers per inflorescence and the origin of Pisum, illustrated by polymeric genes.*Agri. Hort. Genet.*5, 16–25.*