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What maintains floral trait variation in wild populations?

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Close your eyes and think of your favorite flower. What is its colour? Chances are that immediately you thought on one specific colour. Indeed, most flower populations bear uniform flower colour, believed to be the outcome of pollinator-mediated directional selection. Flower colour serves as a visual signal for the pollinators, which learn to associate it with reward, and in turn, exert selection on it. Most flowering plant species exhibit monomorphic flower colour, although some exhibit colour dimorphism or polymorphism, and in rare cases even a continuous scale of colours. In Israel, the Royal Irises (Iris section *Oncocyclus*) come in all colors of the rainbow. These self-incompatible flowers rely primarily on pollination by male *Eucera* bees in a night-sheltering system. In this system, bees that sleep in irises emerge earlier in the morning to forage than ground-sleeping bees (Sapir et al., 2006). Therefore, we asked whether the strength of selection on floral traits could vary depending on the floral neighborhood density and phenology of a given focal plant? We hypothesized that if irises are rare in an area, bees may not exert strong selection on floral traits because they would rather sleep in any flower regardless of its size or color. However, if irises are common, as they would be during peak flowering or in dense clusters, then we might detect stronger selection on floral traits because bees have the opportunity to be more selective. Here we present results from our study testing this hypothesis, using the *Iris petrana* population in Yeruham. This study provides a novel insight to the evolution of flower color, a key trait in the interaction of plants with their environment, and in particular whether fine-scale temporal and spatial variation in selection on floral traits could be a mechanism maintaining continuous floral color polymorphism in the Royal Irises.

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