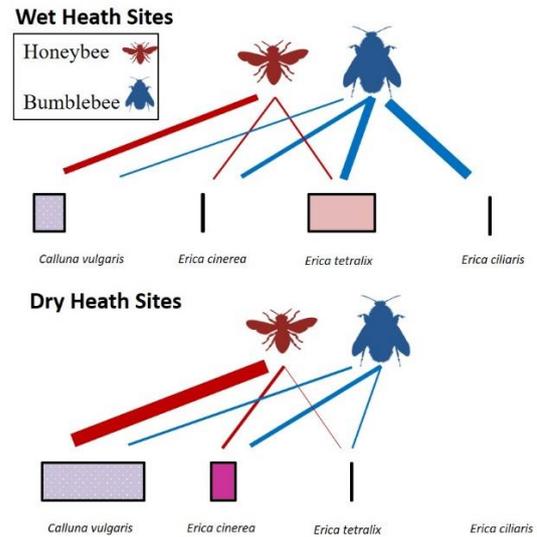


Bumble bees and honey bees on lowland heaths: competition or coexistence

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Honey bees are under significant scrutiny regarding their potential for competition with wild bees. Honey bees and short tongued bumble bees are more likely than some to be in competition with each other. This is due to them having similar tongue lengths, restricting them to flowers with a similar depth. This potential for competition will only increase as the variety of flowers and their abundance decreases. Lowland heaths are a simple but abundant source of nectar for bees and are made up of a mosaic of different habitats, characterised by the plants that grow there. Two such mosaic types are wet and dry heaths, each dominated by different heathers. Due to the simplicity and mosaic nature of lowland heath we considered it a good habitat to explore if bumble bees and honey bees are potentially competing for resources.

To do this we surveyed 60 sites (30 wet and 30 dry) around the Isle of Purbeck in the UK for bee heather visits and the availability of heather flowers throughout the season.



Picture Top: Bumble bee *Bombus lapidarius* just leaving an *Erica cinerea* flower spike amongst *Calluna vulgaris*. Bottom: The average relative abundance of floral cover at wet and dry heath sites with their relative visitation by honey bees and bumble bees (boxes show relative % cover and lines the relative number of forager observations).

We found bumble bees and honey bees to predominantly use specific heathers, honey bees preferring *Calluna vulgaris* and bumble bees *Erica tetralix* and *E. ciliaris*. In addition, these preferred heathers tended to grow in different heath mosaics (wet and dry) see image above. This preference seemed to persist regardless of the presence or absence of foragers from the other species. We only detected weak correlations between honey bee forager abundance on bumble bee forager abundance.

These findings provide evidence of the importance of maintaining complex habitat mosaics within broader habitats to promote coexistence between bumble bees and honey bees.