Flower research shows gardens can be a feast for the eyes—and the bees

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Lavenders of various colours proved highly attractive to insects.

Are our favourite garden flowers attractive to hungry visitors such as bees and butterflies to feed on?

Researchers at the Laboratory of Apiculture and Social Insects (LASI) at the University of Sussex have completed one of the first scientific studies to put the business of recommending pollinator-friendly garden flowers on a firmer scientific footing. The study's findings are published today (17 October 2013) in the journal *Functional Ecology*.

Gardens are more important than ever as a source of food for a wide variety of insects who feed on the nectar and pollen found in many flowers: pollinators such as bees and butterflies are in decline globally, with one of the main causes being the loss of flowers, especially in the countryside.

As popular support for wildlife continues to grow, gardeners are increasingly looking for ways to help bees and other insects by providing attractive flowers in their gardens for insects to feed on. To do this, they often rely on "pollinator-friendly" plant lists. But these lists are generally based on opinion and experience rather than scientific research.

The study, funded by the Body Shop Foundation, involved repeatedly counting flower-visiting insects over two summers as they foraged on 32 popular summer-flowering garden plant varieties in a specially planted experimental garden on the University's campus (each variety in 2 1x1m beds), with two smaller additional gardens set up in year two to check the generality of the results.

Open-flowered dahlias attracted pollinators including this Small Copper

butterfly.

Plant varieties studied included 19 species and hybrids, both native and exotic to Britain, with particular focus on 13 varieties of lavender (Lavandula spp.), as it is known to be attractive to bees, and also four dahlias. All the plants studied had to be popular garden plants, be widely and easily available for purchase, and had to flower mainly or exclusively in July/August.2

One key result found by researchers Professor Francis Ratnieks and his PhD student Mihail Gaburzov was that garden flowers attractive to the human eye vary enormously (approx 100-fold) in their attractiveness to insects, meaning that the best plants for bees and other insects are 100 times better than the worst. So it pays to make an informed choice of plants from the thousands available to gardeners.

Bees (87 per cent) and hoverflies (nine per cent) were the most frequent visitors, with butterflies and moths just two per cent and all other insects also two per cent. The researchers observed clear differences in the mix of bee and insect types attracted by different varieties, indicating that careful plant choice can not only help insects in general, but also help a range of insects.

Other findings were:

- Some cultivated varieties and non-native flowers – usually seen as ornamental only – can be helpful to wildlife. For example, open dahlias attracted many bees, especially bumblebees, but pom-pom or cactus dahlias attracted few insects, because their highly-bred flowers make it difficult for insects to reach the flowers' pollen and nectar.

- Highly bred varieties of lavender, including those of novel colours, such as white or pink, or hybrid lavenders, proved highly attractive to insects.
- Plants that the researchers can recommend to gardeners include lavender, marjoram, open-flowered dahlias, borage, and Bowles Mauve Everlasting Wallflower. Marjoram was probably the best all-rounder, attracting honey bees, bumble bees, other bees, hover flies, and butterflies. Borage was the best for honey bees. Lavender and open-flowered dahlias were very attractive to bumblebees. Bowles mauve was the best for butterflies. But all attracted a range of insects.
- The least attractive flowering plant to insects was the pelargonium – a popular garden plant.
- The garden perennial plant lamb's ears (Stachys) was popular with an unusual species of bee, the wool carder bee which, apart from feeding on the flowers, uses the hairs of the plant for nest-building. Male carder bees guard a patch and chase away bees of other species, and other males.

Professor Ratnieks says: "Our trial is by no means exhaustive – we looked at a small selection of the thousands of plants you can find in a typical garden centre. But our study clearly shows that planting pollinator-friendly flowers is a no-cost, win-win solution to help the bees. The plants attractive to bees are just as cheap, easy to grow, and as pretty as those that are less attractive to insects.

"Garden plants do not have to be native to help most pollinating insects. Nectar, for example, is basically sugar and water, and so it is of value to British insects whether it is from a native garden plant or one from another part of the world. Lavender is from the Mediterranean and dahlias are from Mexico.

"Helping bees in your garden is a no-brainer. Flowers that attract bees

are just as easy to grow and just as pretty, and cost no more. Plant the right flowers and the bees will come."

Mihail Garbuzov says: "We basically counted bees and other insects visiting flowers in bloom to determine the most attractive. Anyone can do this in their own garden or park, or even when shopping for plants in a garden centre."

More information: Quantifying variation among garden plants in attractiveness to bees and other flower-visiting insects, *Functional Ecology*, (October 2013). onlinelibrary.wiley.com/doi/10 … 1365-2435.12178/full

Provided by University of Sussex