FACTORS DETERMINING VISUAL DETECTION DISTANCE TO REAL FLOWERS BY BUMBLE BEES

by Gidi Ne'eman and Rina Ne'eman

Plants use visual signals to attract pollinators and direct them to their flowers. Visual capabilities of bees have been extensively studied, however, there is no empirical determination of the maximal detection distance of real flowers. Using a six armed radial maze, we tested maximal detection distance of 12 types of natural flowers by bumble bee workers. The results show that maximal detection distance to natural flowers by bumble bee workers can be best predicted by: **flower coloured area / (contour line * green contrast)**, but not from its diameter**.** Full circular flowers can be detected from longer distance than dissected flowers with identical diameter. We hypothesize that dissected flower shapes might be compensated by their higher attractiveness for bees. Empirical determination maximal detection distance to real flower is important for studying bee foraging behaviour, pollinator induced evolution of flower traits and validation of neurophysiological visual models.

Aubrieta deltoidea flower with an area of 314 mm^2 was detected by bumble bee workers from a distance of 40 cm.