Bumble bee visits a fritillary

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Bumble bees can see which fritillary has the most nectar. Pollination by the bees protects plants against moulds.

Queen bumble bees never fail to find the flower with the most nectar in a field full of snake's head fritillaries. They can also see whether there is any nectar at all, and whether anyone has got there before them. 'And there really isn't a cross on the outside of the flower', jokes researcher Albert Corporaal of Alterra, who is working on his thesis on the fritillary in the changing delta landscape.

Corporaal found out how the bumble bees do it. Only eye-catching fritillaries are honoured with a visit. And what makes them eye-catching is ultraviolet and infrared light rays, which are just outside the spectrum visible to humans. 'the degree of reflection give the bumble bee information', explains Corporaal. 'The more intensely the outside of the flower reflects infrared, the more interesting it is to the bee. The bee sees it as a bright white object against an otherwise grey background. That brightness tells her: come over here.'

Cumbersome body

But it doesn't stop there. The checked pattern on the sepals confirms the message once the bee gets closer. Corporaal: 'Half of the time, the flowers dance lightly in the breeze. The insect's eye detects fast movements, and a moving checked pattern like that is striking.'

And so the bumble bee sees where it should go. 'Landing information',

Corporaal calls it. To assist in the landing itself, the end of each sepal is equipped with a sort of hook that works as a landing place. The bumble bee grabs hold it it and wriggles its cumbersome body into the flower. There the reflected ultraviolet light provides a sort of miner's lamp to guide the bee to the nectar. The bumble bee's visit is literally vital to the fritillary, says Corporaal. It means pollination and a longer lifespan. 'Pollinated flowers live a month longer above the ground. And the pollination provides it with protection against life-threatening fungal infections which would otherwise hinder seeding.'

The bumble bee is oblivious to this complex relationship that has come about through co-evolution. Yet it is a relationship that is causing the decline of the fritillary. Because the bumble bee population of the Netherlands is in decline. Corporaal thinks this is due to the increasing amounts of road traffic. 'This has happened in the last few years. Heavy traffic takes its toll. And fewer bumble bees means less pollination and therefore fewer fritillaries that survive the fungi.'

Provided by Wageningen University