

# Ant antics

Nicola Gammans unravels the complex relationship between red ants and gorse.

If you ever take a walk on our lowland heaths when gorse is setting seed, take a close look around your feet, and you may witness a bizarre interaction between this plant and red ants.

Gorse disperses its seeds using exploding pods that throw them up to 2m away. But red ants also help, taking the seeds up to 4m further. They're attracted by seed appendages called elaiosomes, which are rich in fat, protein and sugar. Red ants carry the seed back to their nest, where they bite off the elaiosome and feed it to their brood.

That's good for the gorse, because red ants discard the actual seed unharmed, and it can germinate either within the nest or on a waste pile close by. In heathlands, wood mice eat a lot of seeds. When I prevented red ants getting to gorse seeds lying on the soil surface, the wood mice ate up to

half of them during nocturnal forays. But because the seeds fall from the plants during the day, if the ants are allowed in, they take the seeds to their nests before the wood mice can feed. Both gorse and ant benefit, so this interaction, which is called myrmecochory, is an example of mutualism.

Intriguingly, seeds which have had their elaiosome removed by the ants germinate faster than normal. The ant-nest soil also has more of the nutrients

plants need for growth than surrounding heathland. So the ants can give new gorse plants a flying

## The ants can give new gorse plants a flying start.

start, helping them spread into new areas while relieving them of having to compete with the parent plant. I put some figures to the relationship in a mathematical model, and calculated that ants could increase a gorse population's growth rate by almost 10 per cent, but more



Sugar bait helps Nicola count foraging ants.

### Want to know more?

You can view a scientific paper on this topic at: [www.springerlink.com/index/G8X7287U584W2X31.pdf](http://www.springerlink.com/index/G8X7287U584W2X31.pdf). The paper is also published in *Oecologia* vol. 146(1) pp43-49. An online search for myrmecochory will bring up more information.

importantly, they could increase the plants' ability to spread into new habitat by almost 80 per cent.

So much for the gorse, what about the ant? I set up ant nests in the laboratory and fed half of them elaiosomes as well as a normal diet. Remarkably, the nests fed with elaiosomes had twice the number of larvae, and these larvae were, on average, heavier by half. And when I analysed the elaiosomes I found they contain nutrients we know are essential to the ant's diet.

These benefits also seem to have let chemical communication evolve between the ants and seed. The elaiosomes give off chemicals that attract red ants from a distance, but not another ant, called *Tetramorium caespitum*, that eats the seed itself.

It is becoming clear to ecologists that mutualisms are widespread and could be very important in nature because they help maintain complex and diverse communities. In future, conservation efforts may need to concentrate especially on mutualistic species. Certainly, the tiny, oft-overlooked red ant can have a wide reaching influence on its environment.

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Nicola at work in the field.

