

Ants, plants and conniving caterpillars

Perhaps one of the best known examples of a beneficial interaction between ants and plants is that of the acacia bush: with its hollow thorns and extrafloral nectaries it provides a home for ants, which in turn protect the bush from damage by other herbivores.

What is not so well known, is that plants nearer home, such as bracken and common vetch *Vicia sativa*, also make use of the same defence strategy (see BBC WILDLIFE, March 1986). Vetches develop extrafloral nectaries which secrete nectar throughout the flowering season, attracting red ants *Myrmica ruginodis*, whose workers patrol the seed



Common vetch. Patrolling ants can't protect its pods.

pods and fiercely guard 'their' supply of nectar.

But the matter is not quite as simple as it seems, for in recent years mounting evidence has suggested that this form of protection can have its drawbacks. Dr Suzanne Koptur and Professor John Lawton of the University of York investigated the efficiency of this defence mechanism, and in doing so they have uncovered a group of insects which can turn the ants' protection to their own advantage (*Ecology*, vol.69, pp278-83).

The researchers' study involved observing vetches at sites with varying levels of ant activity, to see exactly how the protection systems operated. Their initial findings showed that the ants which flocked to extrafloral nectaries provided an effective deterrent to as many as

70 per cent of the potential herbivore visitors. In particular, the ants proved most effective at removing caterpillars and beetles, although weevils proved more of a problem and accounted for the bulk of insect damage in protected plants.

As their investigations continued, Koptur and Lawton found that caterpillars of the tortricid moth *Cydia dorsana* were unaffected by ants. This moth is closely related to the pea and codling moths and, like these important agricultural pests, its caterpillars live *inside* the pods and are therefore safe from disturbance by ants.

The story became even more complicated when Koptur and Lawton noticed a link between high levels of ant activity and increased pod damage by moths. This suggested that the moths

were in some way benefiting from the ants' presence.

The answer to the puzzle was found to involve protection in another form. *Cydia* caterpillars have their own particular enemies in the shape of tiny parasitic ichneumon wasps that lay their eggs in young caterpillars, which are then eaten alive by the developing wasp larvae. It turned out that the plants which attracted the most ants were well protected against a whole range of insects including ichneumon wasps, thus making them a safe hiding place for the vulnerable *Cydia* caterpillars. In this way, safe from wasps and untroubled by ants, the caterpillars short-circuit their unwitting hosts' defences by quietly making a meal of the developing vetch seeds.

ANNE-MARIA BRENNAN