

Ecology

Fresh homes for ants

Just like us, wood ants prefer to keep their homes pine fresh. In their case, it's not the smell that attracts them, but the antimicrobial properties of pine resin. According to Swiss ecologists, a nest mound containing a generous scattering of resin is less prone to the sorts of infection that could wipe out a colony of ants.

Ants aren't the only ones to harness the health-giving properties of plants. Chimps that feel under the weather dose themselves with leaves chock full of chemicals guaranteed to make them feel better. Corsican blue tits weave aromatic herbs such as lavender, lemon balm and mint into their nests to ward off pests and pathogens that might endanger their chicks. But these ants are the first insects shown to take advantage of a plant's prophylactic properties.

Philippe Christe and his colleagues at the University of Lausanne in Switzerland studied the wood ants, *Formica paralugubris*, of a supercolony made up of hundreds of large mounds linked by trails. They collect tiny knobs of hardened pine resin from the local area and mix them into their nests. The largest mounds can contain as much as 20 kilograms of resin. Although naturalists have been



Swiss ecologists have found that wood ants use pine resin to disinfect their nests

intrigued by this behaviour for several centuries, no one could explain it. One possibility was that the ants deliberately exploit the tree's chemical defences. Pine resin is rich in terpenes, which are potent antimicrobial chemicals and probably protect conifers from invasion by harmful fungi and bacteria.

Christe and his colleagues tested this idea with some simple experiments. They gathered up nest material and ants from the supercolony and created a series of artificial nests, some with resin and some without. Then they measured the growth of micro-organisms. The results were clear. Those without resin were far more prone to infection. 'Three times the density of fungi grew in the nests without any

resin – and there were more bacteria,' says Christe.

Social insects are vulnerable to infection because they live crowded together in warm nests. They do have tactics for keeping the colony healthy: some species groom each other; most dump waste outside the nest. Some secrete antibiotic chemicals. Some even carry bacteria around on their bodies that kill harmful fungi. And now it appears at least one insect uses pine resin to disinfect the nest (*Ecology Letters*, vol 6, p 19). 'Such a collective medication may play a crucial role in the extraordinary ecological success of insect societies,' say the biologists. 'It may be an unrecognised yet common feature of complex and successful societies.'