

Caterpillar noise tricks ants into service

A kind of European caterpillar can get royal treatment from ants by mimicking the sound of their queen, says an international research team.

Ants of the species *Myrmica schencki* can be fooled into carrying certain caterpillars into the colony nurseries where the fakers enjoy full care and five-star dining, explains Jeremy Thomas of the University of Oxford. An interloper caterpillar gains most of its body mass while luxuriating in ant care, and then turns into a *Maculinea rebeli* butterfly.

Chemical camouflage alone will let the caterpillars trick their way into the ant colony. Now experiments show that it's the noises the caterpillars make that get them the premium treatment, Thomas says. The rhythmic caterpillar purring has the effect of the queen ant's noises, not those of a worker, according to Thomas and his colleagues.

It's news that a queen sounds different from workers in an ant colony, Thomas says. Ants have such remarkable chemical messaging systems that their noises haven't received much scientific attention.

M. rebeli caterpillars make a mini version of the brrrrrr of a woodcock or snipe, Thomas says. Recent work has suggested that caterpillar noises may come from repeated muscle spasms. And when caterpillars become enclosed pupae, they make noises by rubbing a scraper, or plectrum, on their abdomen against a patch of fine grooves called a file. "Actually they can wriggle their abdomen quite a bit," Thomas says.

Adults of four of the 11 ant subfamilies also make noises by rubbing plectrum and file, Thomas says. "It's rather like strumming a guitar." In a quiet room of ants, he can just manage to hear "quite a scratchy sound."

Advances in miniature electronics made the new study possible. Specially built ant-scale microphones and speakers allowed researchers to record both queen and worker ants under normal conditions and then play back the noises and observe ant behavior.

To a human ear, queens and caterpillars do not sound at all similar. Yet ants perceive noises differently, picking up vibrations with sensors in the legs. "There is a debate about how well, if at all, they perceive airborne sounds," says Jeremy Thomas.



A Maculinea rebeli butterfly rests on a cross-leaved gentian. Caterpillars of this butterfly feed on this plant before they trick ant larvae into caring for them



A caterpillar has fooled ants into feeding it during the final stages before it turns into a large blue butterfly

When he and his colleagues played the caterpillar recordings to an ant colony, workers reacted as they do to queen scratchings. Most distinctive was what Thomas describes as on-guard attendance. Clustering around the speaker, worker ants stay motionless in a hunched-over posture with antennae out and jaws slightly open. Like an honor guard around a human queen, worker ants will maintain that pose for hours.

Queen-mimicry could explain the VIP treatment caterpillars receive in the ant colony. "Quite often they're treated as superior beings," Thomas says. In a crisis, worker ants rescue caterpillars before a regular ant brood. And in famine, workers will kill their own brood and feed it to the caterpillar.

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ORDINANCES AND ENFORCEMENT

Denham Springs (CA) does have a noise ordinance. It requires a decibel meter for enforcement. And, according to one councilman at a recent council meeting, the city does not have a decibel meter. He was corrected by the police chief, who said the city did have one. But it had to be calibrated before use, and could only be used by certified officers. And even if certified police were able to attend an incident with a properly calibrated meter, often the noise stopped when the noise-makers saw the police set up the equipment. And then started again after they went away. The police chief recommended an easier to enforce ordinance.

NOISE VIOLATIONS NEW A POLICE MATTER

Fines for noise violations will now be handled by police in Seymour, Connecticut. The Board of Selectmen have voted to approve a change to the town's noise ordinance. The adjustment will allow the police department to issue fines for loud noises. Under the previous rules, the town had to call in the Naugatuck Valley Health District to issue fines. The Seymour Police Department purchased a noise meter last year. Town officials said there have been numerous noise complaints over the past two years, particularly concerning loud all-terrain vehicles. The amendment also increases the minimum fine from \$25 to \$100. Selectman John Putorti said he likes the change because it will expedite how the town handles noise violations. "Now when the police department goes out to a call, they can measure [the noise] and give out a ticket," he said.

FRIENDS CALLING FROM OUTER SPACE

A mysterious extra-loud radio noise permeates the universe, preventing astronomers from observing heat from the first generation of stars, U.S. scientists at NASA said. The noise, picked up by a balloon-borne instrument, makes no sense, based on science's current understanding of the cosmos, the scientists at the National Aeronautics and Space Administration said. Astrophysicist Alan Kogut of NASA's Goddard Space Flight Center in Greenbelt, said. "Instead of the faint signal we hoped to find, here was this booming noise six times louder than anyone had predicted." Scientists ruled out primordial stars or known radio sources -- including gas in the outermost halo of our own galaxy, the Milky Way -- as the noise's source. But they don't know anything else about it, including its cause or why it's so loud. The instrument, launched in July 2006 from NASA's Columbia Scientific Balloon Facility in Palestine, Texas, flew to an altitude of 120,000 feet, where the atmosphere thins into the vacuum of space. Its mission was to search the sky for heat from the first generation of stars. Instead, it found a cosmic puzzle, NASA said. The noise complicates NASA's efforts to detect the first stars, thought to have formed about 13 billion years ago -- not long, in cosmic terms, after the Big Bang.