



PHOTO: ORCHID CHAKMA

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I've always wondered whether the presence of excessive noise irritates the plant population the way it does animals, birds, and, of course, humans. The area where I used to live always had some form of construction work going on, both indoors and outdoors. The constant churning of concrete mixer drums and deafening sounds of heavy machinery had become indispensable parts of everyday routine, and as someone who owned lots of plants, I couldn't help but ponder whether it affected them too. Turns out, I wasn't entirely wrong.

To understand how noise might affect plants, we first need to understand what sound actually is. Sound is a type of vibration that travels as waves through air, water, or solid objects. When something moves back and forth – like a speaker, a drum, or a machine – it pushes nearby air molecules, creating sound waves that spread outward. Our ears catch these waves and turn them into signals that our brains interpret as sound. Loud sounds simply mean stronger, more powerful vibrations.

Plants do not have ears or brains like animals do, so for a long time, scientists assumed that sound meant nothing to them. Plants were thought to thrive in silence, reacting only to light, water, and soil. However, modern research has started to challenge this idea. Plants may not *hear* in the human sense, but they can sense vibrations in their surroundings. These vibrations can come from wind, insects, animals, or even machines.

Even more surprisingly, plants themselves can produce sound waves. Recent studies have shown that stressed plants, such as those that are thirsty or injured, emit tiny clicking or popping sounds at very high frequencies. These sounds are ultrasonic, that is, above the human audible range, meaning humans cannot hear them without special equipment.

When these sounds are slowed down into a range we can hear, they resemble faint pops, similar to popcorn or bubble wrap. Scientists believe these sounds come from

a process inside the plant called “cavitation”, where tiny air bubbles form and collapse inside the tubes that carry water. In simple words, when a plant is under stress, its internal water system creates noise.

However, the story doesn't just end here. The presence of noise can also affect plants indirectly by changing how animals behave around them. In order to investigate this, a major study was conducted in a natural gas extraction area in New Mexico. Researchers handpicked certain areas that were made noisy using gas compressors, while nearby areas remained quiet. Artificial flower patches were placed in either of these locations.

The researchers focused on two important plant-related services provided by birds: pollination and seed dispersal. Hummingbirds, which pollinate many flowering plants, were found to visit flowers more often in noisy areas. As a result, plants that depended on hummingbirds received more pollen and were more likely to reproduce there. In this case, noise indirectly increased pollination.

Another bird, the Western Scrub-jay, plays a crucial role in spreading the seeds of the pinyon pine tree. Scrub-jays collect seeds and bury them in the ground, helping new trees grow. However, these birds strongly avoided noisy sites. In their absence, rodents, primarily mice, became the dominant seed removers. Unlike Scrub-jays, mice typically consume seeds rather than store them for future use. This shift meant that although seeds were still removed from the ground, far fewer were dispersed in a way that allowed them to grow into new trees.

Later on, surveys counting the number of seedlings in each of the areas supported the conclusion. Quiet sites contained approximately four times more young pinyon pine seedlings than noisy sites. Importantly, other environmental factors such as soil type, vegetation cover, and adult tree density were similar between locations. This strongly suggests that the reduced number of seedlings was a consequence of noise-driven changes in animal behaviour rather than differences in habitat quality.

These findings demonstrate how noise pollution can

reshape plant communities by altering the balance of species interactions. In a few cases, plants may benefit from increased pollination in noisy environments. In others, essential dispersal processes may collapse when key animal species abandon disturbed areas.

Over time, such changes can modify forest structure and biodiversity. Because trees such as the pinyon pine grow slowly and live for many decades, the effects of reduced seedling dispersion may take years to become visible. Nevertheless, the long-term consequences could be severe, as fewer mature trees would mean reduced habitat and food sources for many other organisms.

The mechanisms underlying these species-specific responses remain an area of active research. Birds that use low-frequency calls are particularly vulnerable to acoustic interference, as their vocal signals overlap with the frequencies produced by industrial noise.

In addition, noise may mask the sounds used by predators and prey to locate one another, increasing stress and reducing foraging efficiency. Conversely, some animals may be attracted to noisy areas because these locations offer refuge from predators that rely on sound for hunting.

Although the sounds produced by plants themselves have yet to show evidence of being intentional or functioning as forms of communication, there remains a strong possibility that human-generated noise could exert significant effects on plant life. By shifting the behaviour of pollinators and seed dispersers, sound pollution indirectly affects reproduction, seedling establishment, and long-term forest dynamics, highlighting the vulnerability of plants to the ecological consequences of persistent anthropogenic noise.

**References:**

1. CNN World (March 30, 2023). *Plants aren't silent. They make clicking sounds, a study finds.*
2. Proceedings of the Royal Society B: Biological Sciences (March 21, 2012). *Noise pollution alters ecological services: enhanced pollination and disrupted seed dispersal.*