

# Silent summers: The decline of cicadas

The song of the cicadas, the acoustic backdrop of summers in China since the Shang Dynasty (circa 1600 to 1045 BCE) (1), has begun to fade. For example, the wild cicada population has declined by approximately 80% in Ningling, Henan Province, in the past decade (2). Today's quiet summers highlight the need for urgent conservation action.

Approximately 220 cicada species have been identified in China (1). Males serenade females during summer evenings by vibrating specialized abdominal organs (3). The cicada nymphs feed on vascular plant tissue, especially roots belowground (4). Although they sometimes harm host plants, cicadas perform important ecosystem roles, such as cycling nutrients and enhancing soil aeration (5, 6). They also serve as a vital food source for animals such as moles and birds, and their decomposing bodies enrich the soil (7).

Rapid urbanization, overharvesting, and climate change threaten cicada populations. Concrete and compacted soil make it difficult for nymphs to surface (8). Habitat fragmentation and changes to plant communities caused by anthropogenic activities affect their ability to roost, forage, mate, and call (9). Soil pollution leaves cicadas vulnerable to fungal and bacterial diseases (10), and human noise interferes with mating calls (7). To collect the golden cicada (*Cryptotympana atrata*), a delicacy in northern China, people apply glue to tree trunks, with devastating impacts on cicadas and other wild insect populations (11). Flooding, exacerbated by climate change (12), inundates the nymphs' underground chambers and damages emerging adults (5). For example, cicada numbers substantially declined in the wake of the 2021 Henan floods (2).

Addressing the plight of China's cicadas requires several crucial steps. Unchecked urban sprawl and noise pollution must be limited. Sustainable farming practices are necessary to reduce soil contamination and habitat fragmentation. Regulations on cicada trapping and consumption should be established and strictly enforced. Global efforts, including citizen science, are needed to monitor and mitigate the impacts of climate change on these insects and their ecosystems.

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