Amplifying Insects: Reconsidering Human-Insect Relations Through Ecological Sound Art

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Abstract

Ongoing insect decline caused by anthropogenic impacts [i,ii,iii] urgently necessitates new ways of knowing and relating with humanity's insect kin.[iv] Insect diversity and resilience is critical to ecosystem function.[v,vi,vii] However, many western societies have become disconnected from the insects in our midst.[viii] I am interested in how listening can prompt humans to notice insects and shift our relations with them. By what means can listening prompt us to notice insects around us, and to move towards human-insect relationships based in respect and care? I have been researching methods for listening to insects through the development of music composition systems that interact with the sounds of insects and their habitats. This artistic research is based in *speculative ecoacoustic music composition*: sonic inquiry concerning the possibilities of interspecific ecoacoustic presents and futures. Building on the work of composer David Dunn,[ix] I am designing generative music composition systems that interact with insect sound. These composition systems are being developed during field research using modular components such as Max/MSP software patches, microphones, and playback mechanisms to adapt them according to insect activity. Through this practice of speculative bioacoustic music, I am considering the possibilities of interspecific ecoacoustics in the present, and of future sonic adaptations to ecological change. This research has been presented as public sound installations, as live performance of arrangements of the composed works with percussion and spatialized sound, in museums and galleries, on radio, and in academic settings. Here I present two ongoing components of this work: *The Insects are Present* and *Amplifying the Tropical Ants (ATTA).*

Research Questions:

Can system-based music composition that interacts with cryptic insect sound further human appreciation of insects' intrinsic value? Through what methods of composition and presentation can listening to this music shift audience consideration of their relationships with insects and the environments they share with them?

a. How can we use the interaction between and modulation of temporal, tonal, and spatial parameters of percussion-focused electronic music and environmental input to nonverbally communicate aspects of insect agency?
b. How can we design these music composition systems to prompt speculation and/or auralization concerning our understanding of intraspecific and interspecific relations among insects, ourselves, and our shared environments?

Amplifying the Tropical Ants (ATTA)
(2017-ongoing)

ATTA is composer Lisa Schonberg, entomologists Érica Marinho do Vale, Fabricio Beggiato Baccaro and, and bioacoustician Tainara Sobroza. ATTA conducts interdisciplinary research on ant bioacoustic communication in the Brazilian Amazon, and co-produces knowledge in bioacoustics, myrmecology, entomology, music composition and acoustic ecology.

Ants are doing so much of the work maintaining tropical rainforest ecosystem functions: herbivory, seed dispersal, predation, decomposition, soil aeration - and their Amazon forest habitats are in turn crucial to global water circulation and climate regulation. Can listening to ants generate empathy? Can listening to insects remind us how little we know — and that we are *not* in charge? Can it shift our perspective and encourage us to consider a biocentric viewpoint?

Works produced from ATTA have been released on two albums, Commissioned for BBC Radio, performed in Brazil and the US, and featured in several installation and video works at Harvestworks, Stand4 Gallery (NY), Z42 (Rio de Janeiro), The Museum of Contemporary art in Antwerp, and the Staten Island Museum.

Erica and Lisa, photo by Hunter Daniels

Recording ants, photo by Hunter Daniels

The Insects are Present
(2023-ongoing)

The Insects are Present is a performance-installation that engages with insects and their sound to compose music. Alluding towards Marina Abramović's 2010 work, audience members are asked to spend an extended time listening to insects, both through hearing and touch. Through this process of what I call *speculative ecoacoustic music composition*, the material of ecological information shapes and informs the resulting music.

This system of music recording, processing, and playback prompts interactions between real-time environmental sounds, with a focus on insects' cryptic sounds in soil habitats. The insect habitat soil substrate is used as a sonic filter for playback and subsequent recording of the synthesized sounds, further imprinting the ecological material of the environment on the resulting music. Through listening to and through insect microhabitats, we can speculate on the relations of extant inter- and intra- specific ecoacoustics - and consider the continued trajectories of sonic adaptations to habitat, species shifts, and associated changes in soundscape.

Manny Perez listening in Troy ^

Photos top left and above: Sina B. Hickey

Links to Selection of Artistic Results:

1. HVAC (2022, 4:44)

2. Built Hidden Soundscape: Adolfo Ducke Reserve (2020, 8:49)

3. Taschi (2024, 2:02)

4. Selections from *The Insects are Present* (2023)

5. *Dolichoderus bispinosus* (2024, 0:55)

Future Research Plans:

The next steps in this research include (a) public installation in additional locations in the US & Brazil (b) refinement of system components for use within wider range of insect architectures and (c) study of soil invertebrate soundscapes at Amazon FACE.

I am currently seeking institutional support for my post-doctoral research.
I can design and teach courses in sound art, ecological art, art-sci interdisciplinary research, environmental studies, and related topics.

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[i] Peter H. Raven and David L. Wagner, "Agricultural Intensification and Climate Change Are Rapidly Decreasing Insect Biodiversity," *Proceedings of the National Academy of Sciences* 118, no. 2 (2021): e2002548117.
[ii] Francisco Sánchez-Bayo and Kris A.G. Wyckhuys, "Worldwide Decline of the Entomofauna: A Review of Its Drivers," *Biological Conservation* 232 (2019): 8-27.
[iii] David L. Wagner, et al., "Insect Decline in the Anthropocene: Death by a Thousand Cuts," Proceedings of the National Academy of Sciences 118, no. 2 (2021): e2023989118.
[iv] Akito Y. Kawahara, et al., "Eight Simple Actions That Individuals Can Take to Save Insects from Global Declines," *Proceedings of the National Academy of Sciences* 118, no.2 (2021): 4-5.
[v] Luciana Elizalde, et al., "The Ecosystem Services Provided by Social Insects: Traits, Management Tools and Knowledge Gaps," *Biol Rev Camb Philos/Soc* 95, no. 5 (2020): 1419-20.
[vi] Edward O. Wilson, "The Little Things That Run the World (the Importance and Conservation of Invertebrates)," *Conservation Biology* 1, no. 4 (1987): 345.
[vii] Pedro Cardoso, et al., "Scientists' Warning to Humanity on Insect Extinctions," *Biological Conservation* 242 (2020): 108426.
[viii] Jeffrey Lockwood, *The Infested Mind: Why Humans Fear, Loathe, and Love Insects* (Oxford University Press, 2013): 1
[ix] David Dunn and Rene Van Peer, "Music, Language and Environment," *Leonardo Music Journal* 9 (1999).