Soil Steams

Harnessing soil biodiversity and microbes to promote human health
Harnessing soil biodiversity and microbes to promote human health

Hosted by: Serina Tarkhanian

Project Information (EN)

Tackling the Decline of Microbial Health

With sharp declines in soil biodiversity across the globe from heavy human activity, the presence of healthy soil microbes is becoming increasingly limited. In addition to industrial agriculture, part of what is contributing to poor soil health is the extensive use of antimicrobial pharmaceuticals. We are becoming increasingly aware of the central role microbes play in producing both healthy human bodies and soil environments. As one of the richest and most abundant reservoirs of environmental microbes, soils are of particular interest for supplementing the human microbiome (the collection of microbes in human bodies contributing to processes of health), which is increasingly affected by dysbiosis due to poor diet, lifestyle and exposure to antibiotics. This subsequently leads to disease. In fact, we now face an Antimicrobial Resistance Crisis: when microbes like bacteria, viruses and fungi no longer respond to medicines and increase the risk of disease spread, severe illness and death. In light of this, Tarkhanian invites us to rethink healthcare practices as mutually beneficial to both humans and the environment, by creating soil-based probiotic therapies with microbes.

The Role of Soil Microbes in Human Health

Soils indeed play a crucial role in the ecosystem, and they are a rich source of environmental microbes. The concept of using soil microbes to supplement the human microbiome has gained scientific attention in recent years. The idea is based on the premise that exposure to a diverse array of microorganisms from the soil can help restore and maintain a healthy human microbiome. Dysbiosis is an imbalance in the microbiome, which can lead to various health issues, including metabolic disorders, autoimmune diseases, and gastrointestinal problems. Soil-based probiotics aim to introduce beneficial microorganisms to counteract these imbalances. Soil microorganisms also have the capacity to suppress or outcompete soil-borne pathogens, and some of these mechanisms might extend to human pathogens. Thus, exposure to soil microorganisms has the capacity to boost the human immune system's ability to defend against harmful pathogens.

Soil Steams: Designing a Nature-Based Healthcare Experience

Tarkhanian’s work aims to challenge the current materiality of biomedicine, as it struggles to reflect human health’s interdependence with the health of the earth. This is why Soil Steams is a therapy practiced in the forest. Originally held in the Viktoria Park forest (Epekwitk, Canada), the project showcases a series of 3D printed clay vessels that release a medicinal soil mist created by culturing the microbes from thee of the forest’s soil layers. Each layer contains unique communities of microbes beneficial to health like Mycobacterium vaccae, a soil bacteria that can mirror the effects of antidepressants by raising cytokine levels and stimulating serotonin production. Using microbiology techniques, the distinct microbes of three horizons were cultivated into three medicinal liquids, which gently float in the bottom sections of three clay vessels. This liquid is then transformed by ultrasonic waves into a fine mist, so that it may flow softly into the body. Each clay vessel is designed to reveal the invisible, by visualizing the hidden particularities of the soil layers such as special textures, pH levels, and unique microbial communities.

Projectinformatie (NL)

Tackling the Decline of Microbial Health

With sharp declines in soil biodiversity across the globe from heavy human activity, the presence of healthy soil microbes is becoming increasingly limited. In addition to industrial agriculture, part of what is contributing to poor

soil health is the extensive use of antimicrobial pharmaceuticals. We are becoming increasingly aware of the central role microbes play in producing both healthy human bodies and soil environments. As one of the richest and most abundant reservoirs of environmental microbes, soils are of particular interest for supplementing the human microbiome (the collection of microbes in human bodies contributing to processes of health), which is increasingly affected by dysbiosis due to poor diet, lifestyle and exposure to antibiotics. This subsequently leads to disease. In fact, we now face an Antimicrobial Resistance Crisis: when microbes like bacteria, viruses and fungi no longer respond to medicines and increase the risk of disease spread, severe illness and death. In light of this, Tarkhanian invites us to rethink healthcare practices as mutually beneficial to both humans and the environment, by creating soil-based probiotic therapies with microbes.

The Role of Soil Microbes in Human Health

Soils indeed play a crucial role in the ecosystem, and they are a rich source of environmental microbes. The concept of using soil microbes to supplement the human microbiome has gained scientific attention in recent years. The idea is based on the premise that exposure to a diverse array of microorganisms from the soil can help restore and maintain a healthy human microbiome. Dysbiosis is an imbalance in the microbiome, which can lead to various health issues, including metabolic disorders, autoimmune diseases, and gastrointestinal problems. Soil-based probiotics aim to introduce beneficial microorganisms to counteract these imbalances. Soil microorganisms also have the capacity to suppress or outcompete soil-borne pathogens, and some of these mechanisms might extend to human pathogens. Thus, exposure to soil microorganisms has the capacity to boost the human immune system's ability to defend against harmful pathogens.

Soil Steams: Designing a Nature-Based Healthcare Experience

Tarkhanian’s work aims to challenge the current materiality of biomedicine, as it struggles to reflect human health’s interdependence with the health of the earth. This is why Soil Steams is a therapy practiced in the forest. Originally held in the Viktoria Park forest (Epekwitk, Canada), the project showcases a series of 3D printed clay vessels that release a medicinal soil mist created by culturing the microbes from thee of the forest’s soil layers. Each layer contains unique communities of microbes beneficial to health like Mycobacterium vaccae, a soil bacteria that can mirror the effects of antidepressants by raising cytokine levels and stimulating serotonin production. Using microbiology techniques, the distinct microbes of three horizons were cultivated into three medicinal liquids, which gently float in the bottom sections of three clay vessels. This liquid is then transformed by ultrasonic waves into a fine mist, so that it may flow softly into the body. Each clay vessel is designed to reveal the invisible, by visualizing the hidden particularities of the soil layers such as special textures, pH levels, and unique microbial communities.

Image List

Filename	Caption	Credit
15-soil-steams-serina-tarkhanian-copy_1697879615.jpg	Soil Steams at Art in The Open Festival, 2022	Jeff Eagar
24-soil-steams-serina-tarkhanian-copy_1697804796.jpg	Soil Steams in the Viktoria Park forest (Canada)	Serina Tarkhanian
22-soil-steams-serina-tarkhanian-copy_1697804822.jpg	Soil Steams	Serina Tarkhanian

The images above are included in the ZIP under `/images`.