

METHODS FOR CO/SENSING MICROBES

edited by Maya Hey,
Kateřina Kolářová,
Lukáš Senft, and
Tereza Stöckelová



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METHODS FOR CO/SENSING MICROBES

a methods catalogue with reflections
on a hands-on, multimodal workshop



Edited by Maya Hey, Kateřina Kolářová,
Lukáš Senft, and Tereza Stöckelová

Methods for Co/Sensing Microbes
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A TREE WITH SHORT TRUNK AND MANY BRANCHES SITS IN THE MIDDLE OF THE WORKSHOP VENUE. BRIGHT GREEN LEAVES—A SIGN OF NEW GROWTH—EXTEND UPWARDS FROM THE DARKER ONES.

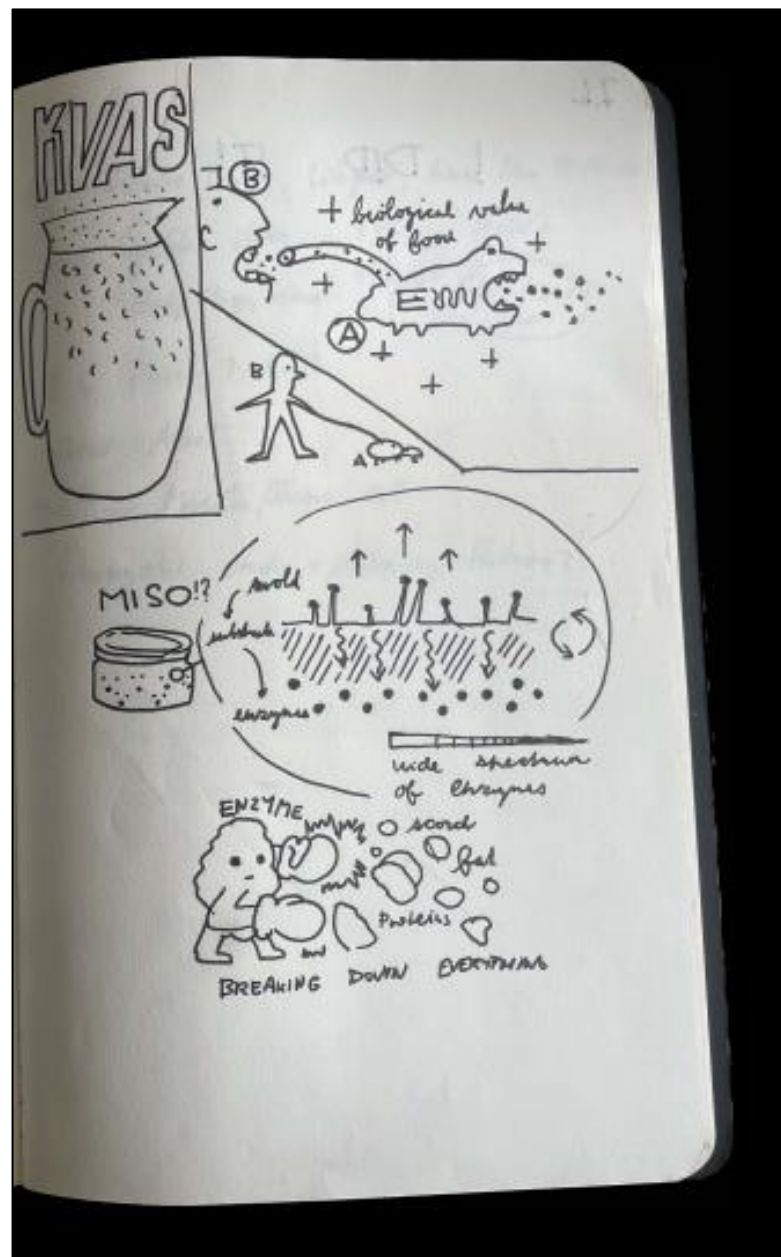
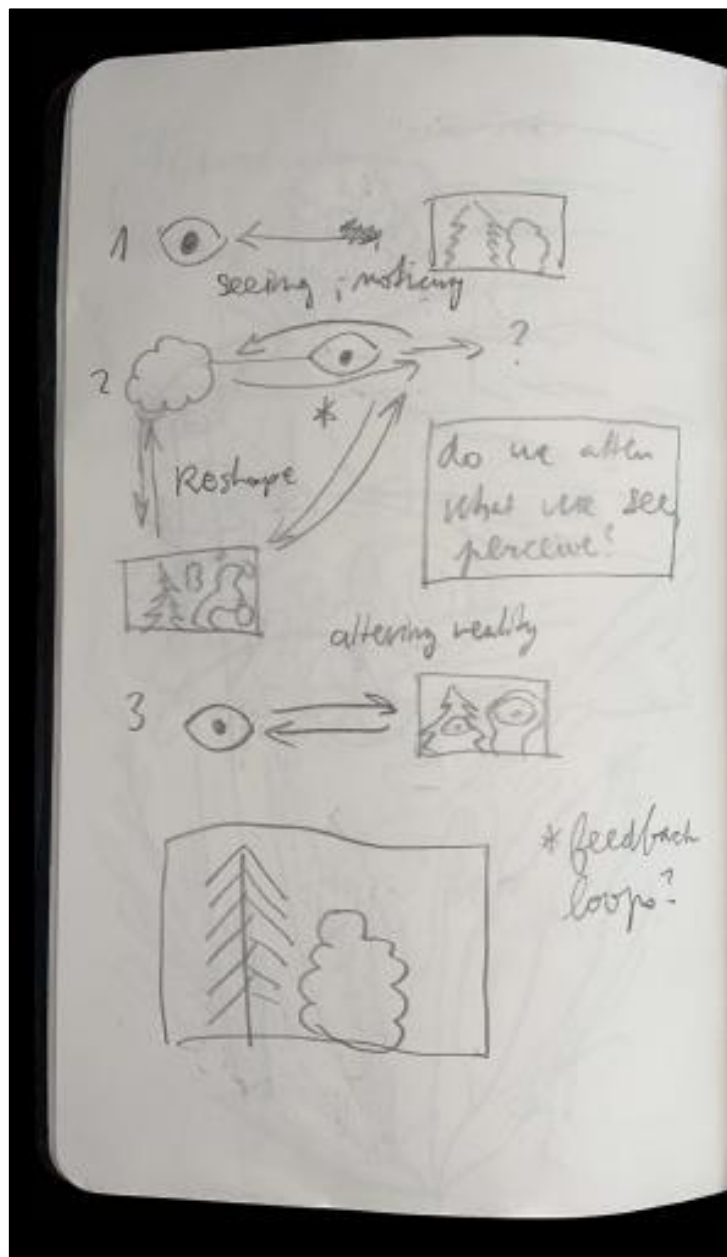
FOREWORD

This is a methods catalog, which came out of a workshop held in May 2023. The workshop brought together social scientists, humanities scholars, documentarians, multimodal artists, microbiologists, writers, composters, and fermenters based in Czechia and Helsinki. It was organized by Tereza Stöckelová, Lukáš Senft, Kateřina Kolářová and Varvara Borisova from Charles University and the Institute of Sociology of the Czech Academy of Sciences, with funding provided by the Centre for the Social Study of Microbes.

The premise of the workshop was to focus on human-microbe co-existence using social and artistic means, with emphasis on how we detect, show, and share microbes in practices such as composting, fermenting, and simply being together. But, as will become apparent, the course and outcomes of the workshop were not at all tidy—as is expected of microbes, perhaps. In the following pages, you will see how we tried to navigate microbes through our senses and how we have approached conceptual dead-ends with new interest.

Our experiments and generative failures may be of interest to scholars in STS who analyze modes of knowledge production in/through microbial worlds, in multispecies studies who struggle with methodological limits when approaching mostly-invisible organisms, and in practice-based research who think by doing. Our hope is that this catalog captures the sticky work of thinking-with microbes, and the even stickier work of doing this thinking with others from across different countries, different disciplines, and different backgrounds.

— Maya Hey and Lukáš Senft
Helsinki, October 2023





A ROUND HAY BALE SITS IN FRONT OF A COLLECTION OF STATUES. THE INSIDE OF KAFKÁRNA LOOKS LIKE A CROSS BETWEEN AN ARTIST STUDIO AND A WAREHOUSE.

WELCOME TO KAFKÁRNA

All workshop events took place inside the garden of Kafkárna, where various forms of human, nonhuman, and microbial communities could mingle and crosstalk. Part meadow, part art installation, part learning space, and part kitchen, Kafkárna served as the lush backdrop to all things unruly.

The building itself is a hundred-year-old sculpture studio in Prague's Ořechovka district, created for Bohumil Kafka and his monumental realizations. Since the fall of state socialism, the studio has been used by art students and, in recent years, Kafkárna has developed into a place where ecology and art are intertwined. Current activities at Kafkárna are primarily concerned with issues of social and ecological justice, including those of food logistics, hunger and starvation in the context of plenitude, food waste, and permaculture.

This large, living garden became our field of experimentation—for scientific, creative, and microbial queries.

INTRODUCTION

Microbes are everywhere, and we have technological, medical, and scientific ways of studying them. Advances in medicine, science, and technology have brought tools such as gene sequencing, cell culturing, and microscopy stains to detect microbes. But these methods are confined to laboratory spaces, whose spaces can be quite exclusive. (Consider how, in contrast, it is quite easy to smell compost or to listen to the vivid sounds of ferments.) The focus of this workshop was to put various approaches for sensing microbes into conversation on an equal footing.

We wanted to broaden the ways that humans can study microbes outside of laboratory contexts. The workshop asked: How can we think and sense our way through the mundane and everyday encounters with microbes? How can we do so while also stepping out of the expert-lay binary? How can we pluralize and distribute more broadly the capacity of exploring the microbial cosmos?

Part of the aim of this publication is to democratize, de-discipline, and de-specialize knowledge about microbial methods because to do so can make way for others to experiment. It attempts to build out methods for showing microbes beyond the (scientifically) familiar sampling protocols or tactics that are assumed to be more reliable or true, calling upon artistic, domestic, and lay methods for making sense of microbial worlds. With the prompt to unlearn our respective assumptions, we spent our time at the

workshop—and our reflections since—trying to actively quash knowledge hierarchies such as scientific knowledge above all. But, rather than pose as an instruction manual for what is or ought to be a proper microbial method, this catalog presents a set of provocations to pursue in the future.

The workshop where we experimented with microbial methods was framed using the twin concepts of co/sensing and re/creating. Co/sense and Re/create came from the reflection that, often, we are at loss for words or means of description when we encounter microbes: what can we sense, how, and how can we account for or recount the sensation? These questions show how terms like ‘the human’ and ‘the microbe’ come to their limits.



A HANDHELD DIGITAL MICROSCOPE HELPS A PARTICIPANT SEE WHAT MOVES INSIDE A WATER SAMPLE FROM THE POND. IN THE FOREGROUND ARE LEAVES/BARK WITH WHITE FUNGAL WISPS.



WHITE MYCELIUM GROWS UNDERNEATH A ROCK, WITH TREE SHEDDING ALL AROUND.

Thus, as much as this catalog attempts to imagine ways of differentially representing the human and the microbial, it just as importantly shows the limits of such nomenclature—even bringing these challenges to the fore. So, best not to read this as a list of best practices. We offer it more as a collection of failures and frustrations that we hope will make way for new growth.

Three parallel sessions comprised the workshop which enabled us to experiment with different ways of becoming aware of being affected. We experimented with creative ways to engage with and to re/present microbial life in textual and audiovisual formats. And while the formats could not capture the microbe per se, the hands-on sessions asked participants to grapple with the limitations of what media can offer. In this sense, the catalogue offers insights about the affordances and limitations of sensing that-which-cannot-be-easily-described and creating ways for showing that tension anyways.

Our reflections are polyvocal and are described here.

—Maya Hey, Kateřina Kolářová,
Tereza Stöckelová, Lukáš Senft

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Part One

Methods, Media, Modalities

These are preliminary outlines for methodological tools that engage with microbes. Some participants have been anonymized at their request.

Visual Methods with Jiří Havlíček

EQUIPMENT AND MATERIALS

For this workshop, each workshop participant had a mobile phone with a camera. The resulting video was composited on a computer using Adobe Premiere software.

GUIDING PROMPTS AND QUESTIONS

How can we visualize the possible co-existence of the “unseen”?

Day 1. Think about and gather video footage of what “unseen” means to you.

Day 2. What is a successful way of creating co-existence of unseen images? Re-shoot and re-frame others’ video footage of “unseen” as displayed on the computer screen.

Day 3. Use the footage from the previous days to compose a short video. Accompany it with a sound file.

CHALLENGES AND SURPRISES

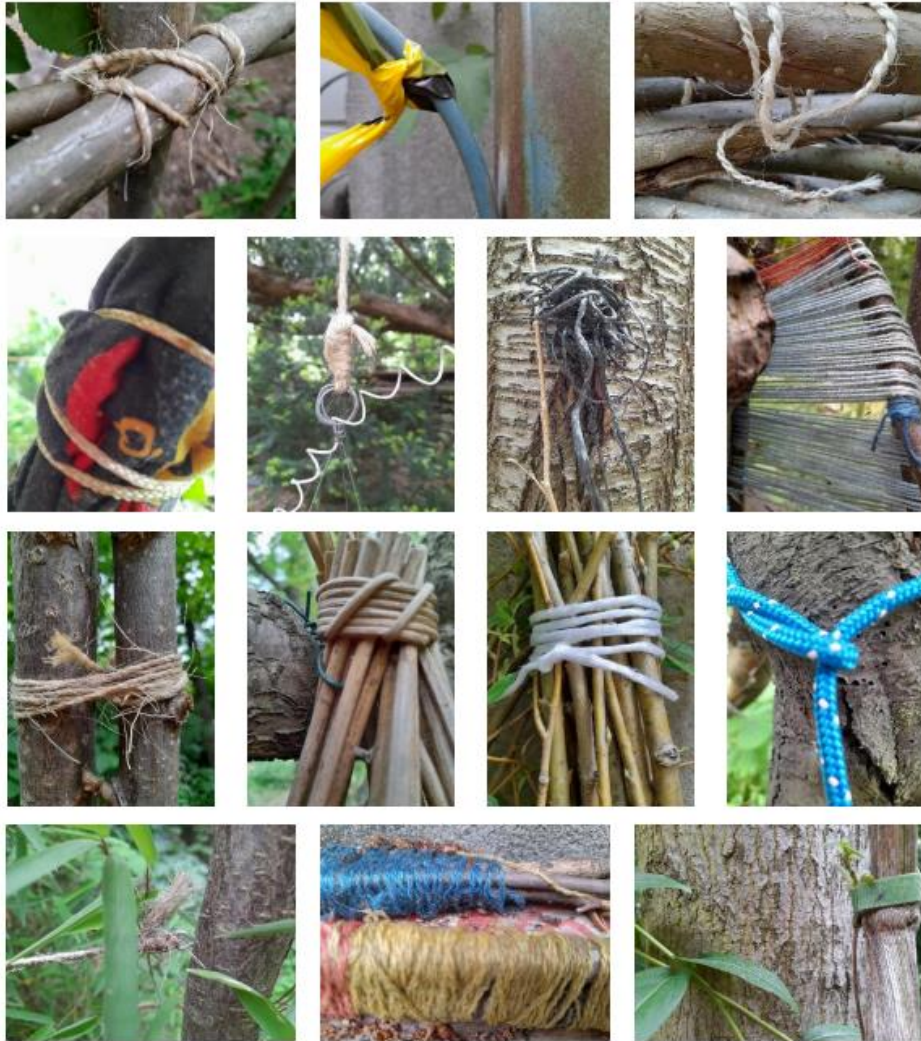
Notably, we were not actually trying to capture microbes, but we were trying to capture one of the defining characteristics of microbes—invisibility or the “unseen,” or what which resists being visualised. The real challenge was to agree together at the beginning on what “unseen” means. Mainly because we could only describe the “unseen” to others in words and this caused misunderstandings. And it was surprising to see how the images of the “unseen” (or “things unseen”) were finally brought together in what we created. —Jiří Havlíček



(L) FOUR PEOPLE CROWD AROUND A LAPTOP COMPUTER AS PART OF A WORKSHOP.

(R) SOMEONE TAKES A VIDEO OF A LAPTOP SCREEN, WHICH DISPLAYS COMPOSITE IMAGES.

IMAGE BY MICHAELA BARTOŇOVÁ



A COLLECTION OF FOURTEEN IMAGES SHOWING VARIOUS KNOTS USING MATERIALS SUCH AS ROPE, WOVEN THREADS, TWINE, AND PLASTIC STRINGS. BUNDLED TOGETHER ARE BRANCHES, TWIGS, AND FABRICS.
IMAGE BY MARUŠKA SVAŠEK

THE METHOD IN ACTION

“During our discussion, I look at Santiago’s hand movements, how he gestures in the direction of his upper body, toward microbes in his guts. His visible hands point at the invisible, as bacteria jump around in the caves of our imagination. And do things. As a group, we discuss how human organisms cannot live without microbes, but that we cannot say that people are their microbiome. Instead, we speak about entanglements and the organic symbiosis between human bodies and microorganisms. I ask Santiago to reenact his performance, making the same hand movements while I take a series of photographs as a visual articulation of our brainstorming.

I then head into the garden, unsure of what other pictures I can take to make the unseen visible. The words separation and entanglement reverberate when I spot branches tied together with ropes. Hunting for these knots, I frame and capture different ones, units that are only units because they are internally bound together.” –Maruška Svašek

More Visual Methods: layered sketches borrowed from Michaela Bartoňová



A LAYERED SKETCH SHOWING A STATUE'S FACE, A POND'S SURFACE, AND PLANTS. IMAGE BY MICHAELA BARTOŇOVÁ

“I see beauty even in hidden things. With the help of the scientists I interact with, I am able to see it even through words, formulas, and descriptions of research, where it is no longer visible with the eyes. I first started thinking about it after meeting an Australian artist (Nina Sellars, artist and Research Fellow at the Alternate Anatomies Lab) who was drawing the processes in the human tissues in the dissection room, because it was no longer possible to film them for further medical studies (more than 12 years ago).

So I looked for inspiration in Kafkárna. I walked in that garden, which is magical, neglected, full of statues and trees. Wholes, individuals and micro worlds at every step and that's how I took pictures. I made short videos of the ground, the grass, our feet, the hair of the participants in our circle, the traces of insect cocoons on the leaves, sculptures lounging in the garden inhabited by various organisms or under layers of moss, Lucie in the branches of a tree writing a text (a poem?), Santiago and his face reflecting on a pond full of living aquatic plants, decaying seeds on the concrete of decaying sculptures—as if the smoldering below was more visible as its energy transferred to the surface.

Then I layered them on Tayasui Sketches and showed them on my iPad. If we want to incorporate our thematic language, we can say that all those objects became a composted layer capturing different worlds—small and large—that I reached in that limited space with objects and people right there. I could imagine that the others could approach this method in their own way too.

I know that with each additional layer it is possible to achieve a further shift in the message and at the same time it can veil, but also create a new connection that reflects new and different associations in each mind. I consider it precisely that common possibility to transform and share.” –Michaela Bartoňová



LAYERED SKETCHES WITH PLANT LEAVES, STATUES, AND FABRICS.
IMAGES BY MICHAELA BARTOŇOVÁ

Audio Methods with Petr Vrba

EQUIPMENT AND MATERIALS

The most important piece of equipment was the recording device(s) and headphones. These were not necessarily provided by the participants, though having two machines for a group of about four or five people was enough so that everyone could record what they wanted. In fact, recording in groups of two or three people (small collective) was actually taken as a benefit as we could discuss how and what we wanted to record and then experiment very freely—and wildly. For example, the garden environment was filled with sound situations, so we could experiment with what was already there.

Other technical needs included a computer with audio software (e.g., free software like Reaper) for being able to cut, compose, recompose, and manipulate the raw recordings. One of the advantages was to have a PA system onsite with a mixer, so that we could listen to the sounds in better quality.

GUIDING PROMPTS AND QUESTIONS

To start, I used an example of field recordings which go deeply into the ears (literally) by playing *Labyrinthitis* by Danish sound artist Jacob Kirkegaard. This piece works with otoacoustic emissions, which are sounds generated from within the inner ear. By listening to it, the recording helps to produce otoacoustic emissions in the ears of the listeners. Then I played my work *Opus symbioticum* which focuses on the sounds made during fermentation processes and kimchi preparation. I used this example to get our ears focused on the micro level and pay attention to small details when in the garden or when handling food.

Then we sought out to capture sounds from other groups, mostly the text-based/oral one. On the final day, we put our files together to create a composition of sorts. While normally one would benefit from having more time to edit, in this case, we used the time limit as a creative constraint to be super efficient and quickly agreed on basic parts or approaches to our common piece.

CHALLENGES AND SURPRISES

We were not trying to capture the microbes per se since that would require technical equipment far more advanced and complicated. Besides, the garden location with the outside noise was not very good for trying to record something (like microbes) that would be impossible to hear without some sort of amplification. Based on my previous experiences with recording fermentation processes, to ask whether or not sound is an important part of fermentation is a bit of an afterthought because what is important is that we acknowledge that sound is already an inherent part of fermentation, as anyone can attest. So the challenge is in trying to choose which sounds to record and what to do with it. –Petr Vrba



PETR HOLDS A FIELD RECORDER INSIDE A BOX OF COMPOST.

THE METHOD IN ACTION

“During the three days, I didn’t think about whether we were doing art or science. Maybe it was a great example of creation becoming a knowledge-producing process. And the processes were simple—in the sound workshop: listen. Listen first with your ears, and explore places that you think might be interesting to listen to, if amplified. Listen for what the microphone picks up in the field, with the portable recorder at hand. Listen again to your recordings, in a quiet room with big speakers. This iterative listening is exciting because it offers a sense of possibility for ‘field’ research ahead.” –Faidon Papadakis

LINKS AND RESOURCES

Reaper software.

<https://www.reaper.fm/download.php>

Labyrinthitis by Jacob Kirkegaard.

<https://fonik.dk/works/labyrinthitis.html>

Opus symbioticum by Petr Vrba.

radiocustica.rozhlas.cz/petr-vrba-opus-symbioticum-8561464

Textual Methods with Petra Hůlová

EQUIPMENT AND MATERIALS

This workshop needed writing equipment: a pen plus paper, notebook, or phone to write in.



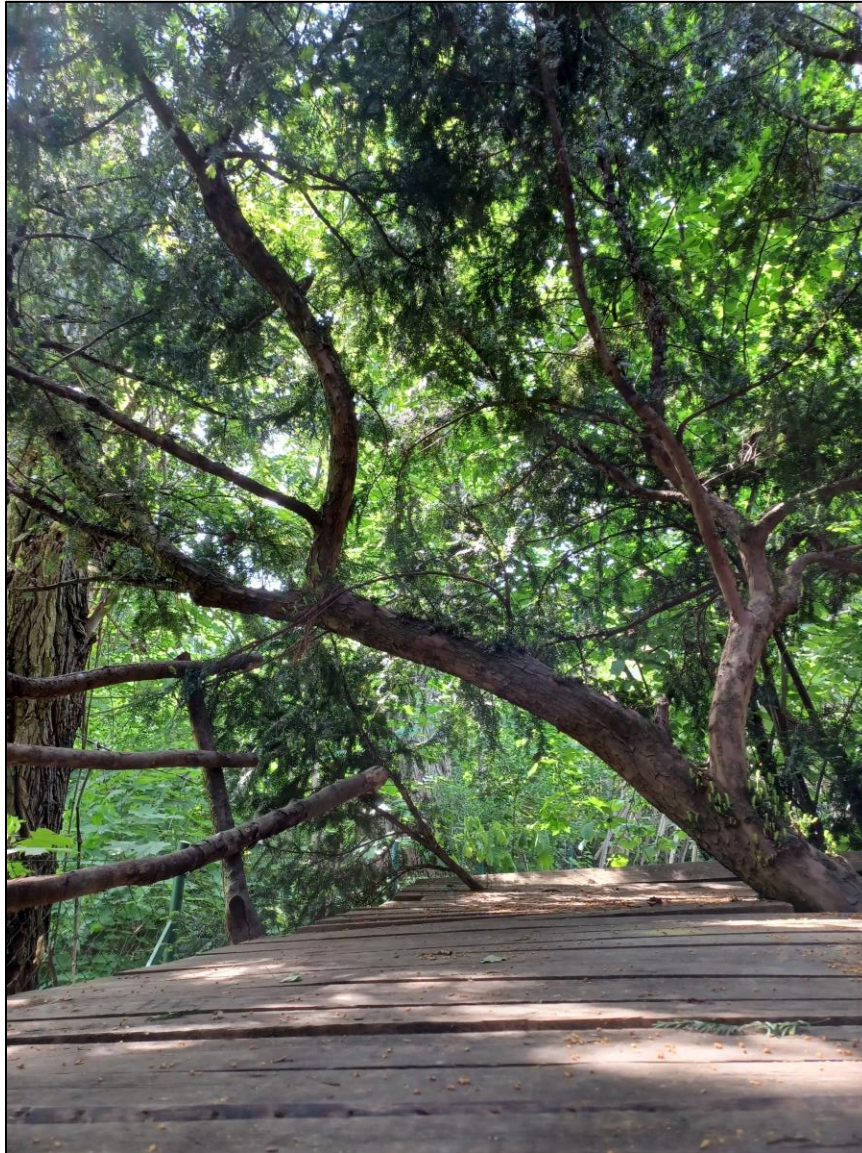
A CLEAR PLASTIC CUP CONTAINS DIRT, ROCKS, HUSKS OF TREE SEEDS, AND CENTIPEDES.
AN ANT IS WALKING ON THE INSIDE SURFACE OF THE CUP.

GUIDING PROMPTS AND QUESTIONS

First, I tried to facilitate a change of perspective, to make the members feel comfortable and trust each other in the group in order to enable them to open up to different ways of perception/sensitivity/description. This entailed a 5-minute meditation on the world(s) inside a plastic cup, containing a soil sample and, perhaps, some small critters. We practiced honing our senses and then shared what we noticed during discussion.

A second facilitation exercise involved reading poems aloud—in both English and Czech—written by Petr Borkovec on the theme of nature and time.

Later prompts also included an element of a story, and trying to describe arcs of action and tension. I picked four locations in the garden that could serve as a site-specific prompt: a hollow tree stump, a mycelial network underneath a small statue, a rock covered in tree seeds and moss, and a manmade pond. Workshop participants were directed to spend time with these sites and imagine what happened (in the past) or what could happen (in the future).



WOODEN SLATS LINE THE BOTTOM OF AN OPEN-AIR TREE HOUSE WHERE THE WRITING TOOK PLACE.

CHALLENGES AND SURPRISES

One challenge we faced was a lack of (imaginative/intellectual) tools to grasp the topic (of microbes, of co-sensing) to our satisfaction. It was a fruitful predestination to fail, which was not surprising to any of us. We were rather exploring a certain terrain and trying to test the limits of language. –Petra Hůlová

THE METHOD IN ACTION

“The texts and, even more, the atmosphere, when we read aloud the poems helped me to ‘move to another world’ and to switch to workshop mode. I could leave my everyday routine and stop for a while, and start to think in a different way.

But I missed the connection with microbes and microbiomes, which led me to wonder ‘what is the goal’ or ‘where should we get to by the end?’ I didn’t learn anything new about microbes or how to perceive them. I did learn about creative ways to engage with the sense of place.” –Lucie Najmanová

Unintended Methods with bricolage

EQUIPMENT AND MATERIALS

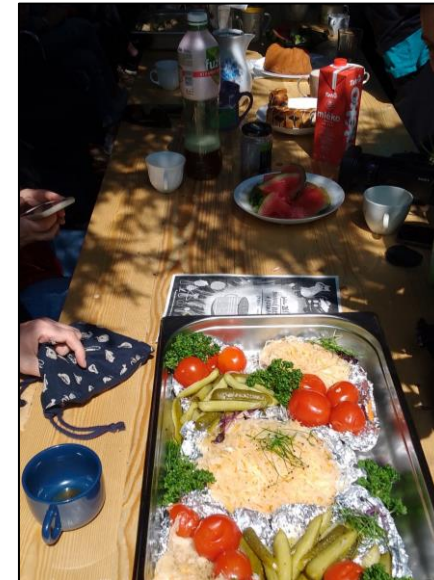
There is no need to set up anything extra. As Michel de Certeau notes, part of the art of “making do” is in letting people’s inventiveness emerge.

GUIDING PROMPTS AND QUESTIONS

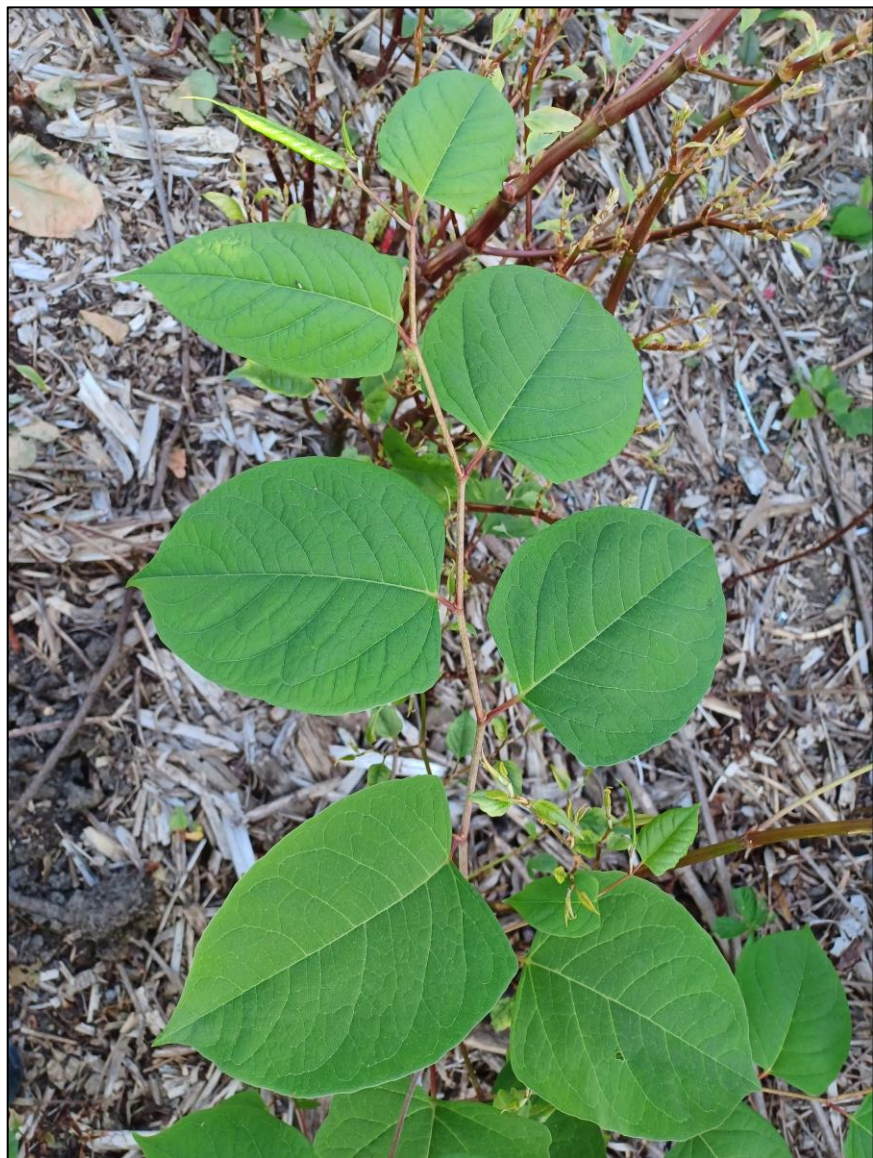
Define the boundaries of the space, invite a range of participants, and give them a theme to chew through. Offer enough instruction to structure the day (“first we will do this, then later we will do that”) but not so much that it overly governs every moment. Remember to create an ethos of experimentation, curiosity, and mingling methods (“we’re here to see what happens,” “we’re interested in the process, not the outcomes per se”). Crucial: give people enough time and space to wander off, tinker, and come up with their makeshift creations.

CHALLENGES AND SURPRISES

By definition, bricolage cannot be enforced in a top-down manner. It emerges from adaptiveness and a tactical desire to take an opportunity not otherwise sanctioned. Bricolage is the very stuff of surprises and staying open to them. —Maya Hey



A SUNLIT TABLE FEATURES A METAL PAN FILLED WITH FERMENTED AND FRESH PRODUCE, ALONG WITH CUPS AND BEVERAGES SUCH AS KOMBUCHA. IN THE MEAL THAT FOLLOWED, SOME PEOPLE ADDED MILK KEFIR TO THEIR BORSCH, OFTEN AT THE SUGGESTION OF OTHERS' WHO'D DONE THE SAME.



THE LONG STEM OF THE REYNOUTRIA PLANT HAS LARGE, SPADE-LIKE LEAVES THAT GET PROGRESSIVELY SMALLER TOWARDS THE TIP.

THE METHOD IN ACTION

50 meters from Kafkárna were warehouses, whose backyard were full of an invasive plant species. It was a kind of cane or knotwood, almost a meter tall in some places and hollow in the middle.

On the first day, we went there with pruning shears and a sickle to cut the weeds in pieces and haul them back to the garden's compost heap. Gradually, we fell into a bit of an assembly line: the "sickle group" cut the plants at the base, the "tool-less group" removed the leaves with their hands, and the "pruning shears group" processed the remaining stems by snipping them into smaller bits. Some of the stems were quite thick for the compost, so we left them there.

On the final day, one participant, a graphic designer, returned from lunch with an improvised pan-pipe, fashioned out of hollow stems that were dry by then. We took turns trying to play a tune, listening, and reflecting on how the weeds from just a few days ago transformed into something unimaginable at the start.

Said the maker, "For me another output of the workshop was a spontaneous pan-flute made from the stems of the Reynoutria plant. It was a composted byproduct."





(L) TWO HANDS HOLD AN IMPROVISED PAN-PIPE MADE FROM THE DRIED STEMS OF THE REYNOUTRIA PLANT.



(R) VOJTA AND FAIDON TRY TO PLAY THE PAN-PIPE AS A DUO. THEY ARE BOTH SMILING.

“WE BECAME ATTUNED TO ITS
CRITTERS AND MICROBES, EVEN
BECOMING THE MEANS OF TRAVEL
FOR SOME OF THEM. SOMETIMES
THIS WAS WELCOMED AND CURATED;
IN OTHER CASES IT WENT
UNNOTICED.”



TWO PARTICIPANTS CROUCH AT THE FOOT OF A MATURE COMPOST HEAP, HARVESTING WORMS FOR FUTURE VERMI-COMPOSTING ELSEWHERE.

INTERLUDE | UNINTENDED EFFECTS

The garden was an assembly, a collective, a living space full of conflictual as well as symbiotic relations—only a fraction of which we could register. Not only did the garden offer itself as a space in which we could come, play, and attempt to be-and-become-with one another, human and otherwise; it also directed us, invited us, and penetrated our bodies and our ‘home’ worlds. We became attuned to its critters and microbes, even becoming the means of travel for some of them. Sometimes this was welcomed and curated; in other cases it went unnoticed.

Here is one such instance of becoming a critterly carrier. The garden-keeper and I exchanged plant clippings and talked about exchanging bulbs in the fall. I was then offered to take some of the compost worms home and introduce them into my own vermi-composter. Others, too, decided to bring back a little compost and worms with them beyond the borders of the garden, out of the city and the country, to start new compost as a part of their research into urban collective gardening, as far away as Greece. Today, the effects of the workshop—the literal takeaways—have changed the composition of my vermi-composter. The garden where we tried to learn how to co/sense and re/create with microbes became part of another garden, my home garden, where I cannot know the effects of introducing the worms from elsewhere. Perhaps I can judge how they are getting along by how well they digest together, which I’d be able to detect by what smells they produce. It begs the question: how does one co/sense smell?

Our learning also happened through the gifts that the workshop participants brought for one another: we exchanged starters of kombucha, milk kefir grains, as well as recipes and ideas for new ferments. These encounters were mostly unplanned for, external to our prepared and planned programme, yet they remained those that touched me most. It brings me joy to think about the Garden being somehow connected to my worms at home, and to worms living in Athens. It is the material memory that traces how I was part of a particular more-than-human assembly at that time and place.

Was I de-disciplined in the end? How much of my epistemological hierarchies did I truly unlearn? Did I learn how to step aside from the human-focused perspective? Not fully, not completely, not sufficiently. But I picked up some tangible practices of how to tend to (and hopefully contribute to) more-than-human flourishing, made tangible because of the worms, kefir grains, and the bridges they built across participants based in different locales. Touching, smelling, tasting, interacting with, making, and doing with these materialised relations help us go beyond our epistemic analyses, to rupture the expectation of academic inquiry, and to then allow us to study the everyday, banal practices that constitute world-making. —Kateřina Kolářová

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Part Two

Failures and Frustrations

Participants reflect on the workshop.
Some participants have been anonymized at their request.



A LARGE ART PIECE SITS IN THE GARDEN OF KAFKÁRNA: IT HAS A METAL SKELETON SHAPED LIKE A GLOBE WITH ORANGE AND BLUE STRINGS INTERLACED WITHIN AND AROUND THE SPHERE.

Conceptual Frustrations: what exactly do we mean?

Amidst a range of disciplines, let alone a range of countries, finding a common language was an ongoing task. Some noted that the conceptual terminology—like composting or fermenting—was too convenient to use: if we use the language of co/sense and re/create, or say that we are fermenting the garden or composting our images, what are we *actually* trying to say? What do those words obscure? When do they become lazy and empty placeholders for trying to name *the thing* we want to draw attention to? How can we be more precise?

For instance, one participant noted how: “we use the language of CO/SENSE AND RE/CREATE, which has clearly started to morph our separate outlooks. How do we ‘compost’ the visuals? Will they ‘ferment’ in unexpected ways? At one point, Jiří suggests we select and ‘digest’ other participants’ images, each of us using our mobile phones to film an image produced by another participant. He calls this an ‘organic’ approach. Using the language of composting, he says that since we have all produced work that is aesthetically distinct, we must ‘decompose it’ in order to create a new concoction.” Is this the language we believe in? Does it make sense to others? What do we mean here?

Some lamented that the terminology and scope were not specific enough, noting how workshop participants conflated all things small. As one microbiologist noted, “I realized, that for many people, ‘microbe’ represents anything small, so in the garden, the others did not make a difference between small insects, earthworms, fungi and bacteria. This was a bit surprising.”



A CLEAR GLASS JAR CONTAINS SMALL INSECTS SUCH AS PILLBUGS.

**“I DON’T MIND THE
PROCESSUALITY OF
THE WORKSHOP. I LIKE
LEANING TOWARDS
QUESTION MARKS
INSTEAD OF FIRM AND
STABLE RESULTS.”**



FOUR PARTICIPANTS ARE SCATTERED IN THE KAFKÁRNA GARDENS, EACH INVESTED IN THEIR OWN INVESTIGATION. THE GARDEN IS LUSH WITH FOLIAGE ON A SUNNY DAY.

Processual Frustrations: where are we going with this?

To no surprise to anyone at an academic gathering, there were questions early on about outputs, expectations, and timelines. Notably, there was nothing predefined beyond “seeing what happens,” and trying to stay open to the possibility of what emerges from our gathering. One participant described the tension in terms of an exclamation point and a question mark: “I don’t mind the processuality of the workshop. I like leaning towards question marks instead of firm and stable results. I’m used to working with raw, unfinished material, which tells the story far better than a polished piece.”

Tensions came up in the audio and visual sessions about how to synthesize the fragments into a cohesive whole: Who gets to decide what we do with them? How will we put them together and what is the purpose? To declare? To invite curiosity? These queries epitomized the politics of selecting, editing, and curating in collaborative settings, which are, of course, never innocent.

A more potent question was for whom this work was intended: who is the audience? Is what we produce accessible to them? These questions became a meta-communicative concern that went beyond what the output would look/sound like and asked for whom this ought to matter and why.

Without preset parameters, some participants became frustrated by the vagueness: “I still missed the transmission to other members of the community. Are they supposed to understand, or feel something, or are they supposed to not care at all? If the participants in our network lose connection with an idea because it is too vague, the fine web of many microscopic hyphal endings will not be saturated and will remain stuck in space.”

“ISN'T IT THAT MICROBES
BECOME KNOWN SOCIALLY
THROUGH SHARED ACTIVITIES
OF BEING TOGETHER, EATING
TOGETHER, AND ISN'T THAT
SOMETHING THAT IS
INHERENTLY SHARED?”



A PARTICIPANT HOLDS A THERMOMETER THAT CAME OUT OF THE COMPOST HEAP (SHOWING 35 DEGREES CELSIUS), AFTER LETTING THE REYNOUTRIA LEAVES DECOMPOSE THERE FOR TWO DAYS.

Methodological Frustrations: how else can we know microbes?

Seeing is believing, and in an ocularcentric and sight-heavy world we tend to write off the invisible. (Out of sight, out of mind.) Some encounters like audio and feeling the heat off of a compost heap were explicit attempts to ‘make visible’ the invisible labor of microbes: “the audio, visual, and textual sessions encouraged us to seek methods outside of classical microscopic technologies. That said, I did not perceive the ‘invisibility’ of microbes as a completely defining characteristic but as a provocation for experimenting with making them visible. Similarly, we could engage with the elusiveness of microbial taste to better calibrate our ability to recognize what microbial labor is in fermented foods.”

Others wanted to move away from the visibility-obsession altogether. A PhD student reflected: “I’ve come to feel a bit uncomfortable with what seems like an obsession to ‘see’ microbes. During the sound recording workshop, we recorded some lines that Petra Hůlová wrote that also resonated with this point: she narrated ‘The urge to see you under the microscope’ and then likened this to a pornographic impulse to see under skirts and between the legs. Rather, isn’t it that microbes become known socially through shared activities of being together (e.g., a virus in

the air!), eating together (e.g. the taste and smell of ongoing processes of microbial fermentation), and isn’t that something that is inherently *shared*?”

Taste, touch, smell. These senses are more proximal than sight and sound. They interpellate the sensing body, calling in the subject who experiences. But, as of now, taste, touch, smell did not epistemologically figure into methods of recording and relaying. How does one record that? How do we keep and share embodied knowledge ‘outside of’ and ‘in addition to’ the bodies who know them? How can we explore and develop other sensory methods, including olfactory ‘captures’ or proprioceptive choreographies? How can we document these in ways that can convey—that is, communicate and carry—these microbial encounters long after the fact? If photography and sound recordings took several hundred years to perfect (and make accessible), and textual representations even longer, what can we do now to jumpstart other modalities for sensing and recreating?





THREE PARTICIPANTS HUDDLE AROUND THE BASE OF A TALL TREE IN THE GARDEN OF KAFKÁRNA. THEY ARE SURROUNDED BY VARIOUS METAL FRAMES, SCULPTURES, AND FOLIAGE.

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Part Three

Insights for Future Iterations

Workshop organizers reflect on the lessons learned.

WHAT WOULD YOU HAVE DONE DIFFERENTLY?

Reflection 1. Let me start by reflecting on what I would do the same way.

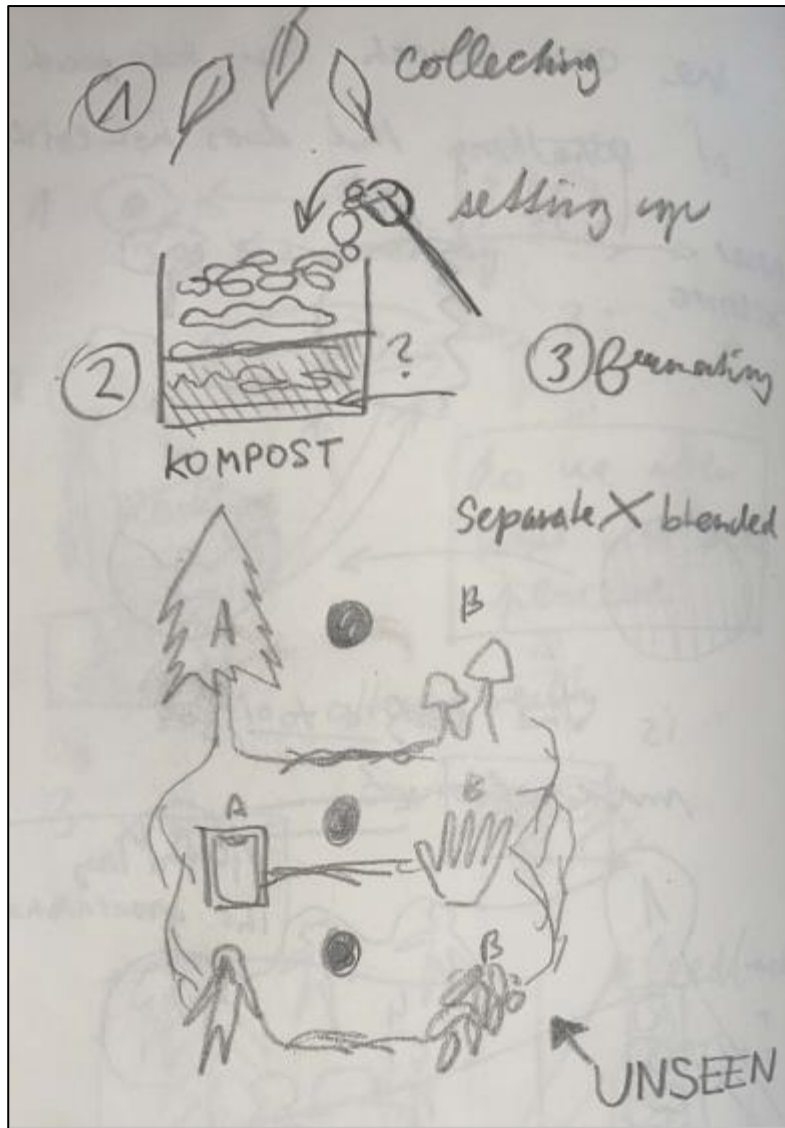
Firstly, I would organize the workshop open air. I believe it brought a special quality to the meeting—an opportunity for the emergence of uninvited entities and connections, and at least for me a special mode of focus and attention to the present. (Ah, yes, to remain offline all day). More academic events should take place open-air and out-of-chairs. Thinking and attention are differently shaped in such settings or while in movement. The epistemic implications should be more systematically explored and tested.

Secondly, I would aim for a diversity of participants in terms of disciplinary and professional background, which is rarely seen in academic events. While encounters between social scientists and artists are more often nowadays, as well as between social scientists and natural scientists, the mix of all these backgrounds, plus fermenters, gardeners, and cooks, created a special generative force. It indeed undermined any stable hierarchy of knowledge. There might be moments when the natural science perspective came to the fore and enforced itself, but it was quickly subverted by the know/how of a fermenter, the power of cooks' creations, or artistic vocabularies. But the latter did not prevail for long either and other modes of knowing and relating came to the fore.

Yet, the efforts to include diversity also bring me to what I would have done differently. As organizers, we assumed that the group would be somewhat “naturally” assembled by a shared interest in microbes, ferments and molds. However, it seems to me now that we underestimated the multiplicity of microbes—they are not a single object that everyone shares. Microbes, as they are, cannot easily “reassemble the social.” So when enrolling participants for a similar event in the future I would ask them to submit some sort of “motivation letter” that describes how they encounter microbes and how they would like to encounter them differently. I would share these letters between participants before the meeting and also dedicate an opening session of the workshop to a collective discussion about our microbial relations so far and clarify the expectation that our differences will serve as a productive starting point. —Tereza Stöckelová



A DIPTYCH OF JIŘÍ (L) AND VOJTA (R) SITTING IN FRONT OF A COMPUTER SCREEN, COMPILING AUDIO AND IMAGE FILES FROM THE DIFFERENT PARTICIPANTS.



HAND-DRAWN SKETCHES FROM THE NOTECOOK OF VOJTA, DIAGRAMMING THE 'UNSEEN' FORCES OF COMPOST.

Reflection 2. It might've been beneficial to recommend literature for participants to read before the workshop. It could be social or natural science papers, but I wouldn't hesitate to include prose or poetry about human-microbial relations (Neil Gaiman, for example, wrote a fascinating poem called "The Mushroom Hunters"). Drawing upon the texts, participants could be asked to identify the challenging moments in human-microbial interactions. As examples: What limits do you see in representations and conceptualizations of the microbes? What approaches should be chosen when encountering a *multiplicity* of microorganisms? Do we want to use these methods during the workshop, or do we want to define ourselves against them?

If such inspirations emerged sufficiently in advance, they could enter into the design of the workshop and it would've been possible to more precisely define the focus of the meeting. Furthermore, we could've determined what type of microbial world we want to explore to a higher specificity: Are we interested in microbes co-creating food, microbes living in the grass, or microbial communities existing in the water present in the garden? And how does such selection affect the choice of methods? Each of these foci calls on a different participant with different interests. Finding that balance—between having participants state their interests in advance while also having them stay open to the range of other participants' interests—would've helped us locate the practices that participants could integrate into their own artistic and/or academic routine and everyday curiosity. —Lukáš Senft

Reflection 3. Thinking back, I keep returning to the note mentioned in the methodological frustration—the one about taste, smell, touch and other embodied ways of processing microbial encounters and how these modalities have been pushed out of the centre by focusing on more established forms of knowledge production (i.e., in writing, hearing, seeing). We chose these three modalities, not because they are the end-all-be-all ways of sensing and presenting microbes. They are clearly not enough. We chose them because they go beyond what is currently practiced within disciplinary bounds. And, given that many of us are part of academia and we communicate knowledge mostly through language, the search for how to represent microbial life in writing and knowledge-production remains paramount.

During the workshop, the embodied, internal, metabolic processes of individual participants (through eating, for instance) remained too proximal to an individual's experience to be able to discuss as a group, and thus these processes were too out-of-reach to consider as a method. As we continue to grapple with methods that would not only make space for, but foreground microbial materiality, it might be helpful to accentuate the senses that have remained 'out-of-reach' in this way. So there is a tension between the disciplinary expectations around what research methods 'normally' look like, and the fact that we don't know (yet) how to know taste and smell and touch in any academically meaningful way. This is what I mean by unlearning. And this is in fact the answer to 'what would we do otherwise', since the desire to co-sense, co-

create, and become-differently-with 'what we do not know sufficiently' has been one of the ambitions of the workshop from its outset. (How to do this, of course, is the difficulty. So my reflection here is more of a note on how to keep the emphasis.) To integrate taste, touch, smell and other sensual ways of knowing into the methodological repertoire is key. Perhaps this will mean more of the everyday, less-curated encounters with microbial life—like in garden work, in cooking and preparing the fermented food ourselves. This might be a step in a worthwhile direction. —Kateřina Kolářová



A SHORT GLASS JAR HOUSES MOSS, SOIL, AND CRITTERS OF VARIOUS SIZES. IN THE BACKGROUND IS A HANDHELD DIGITAL MICROSCOPE WHERE PARTICIPANTS SEE LIFE AT A MAGNIFIED SCALE.

AFTERWORD

We were sitting in a circle, just over a dozen of us, on the third and final day of the workshop. The “what do we *do now?*” question kept lingering in the air with a particular potency, since we had just spent several days immersed in constant *doings*. (Such momentum!) We also knew that our farewells were imminent, that our tomorrows would bring us back to our respective places we call ‘home’ and ‘work.’

Given that expertise and ways of knowing were key themes to the workshop, one question we kept dancing around was: who are we to say what to do (with microbes), having done this workshop? The answer to this question was the request, “Can we lead with failures... instead of so-called best practices?”

We built this catalog because we wanted to leave traces: traces of our activities, of our thoughts then, of our thoughts now. It traces as much as it documents, showing a messy journey of sorts when people of diverse backgrounds come together to *do* the work of thinking microbially. As an artifact, we can only hope that our images and honest thoughts on the page can inspire and inform future workshops that attempt to make sense of/with microbes. —Maya Hey



TWO SMALL CHILDREN PLAY BAREFOOT WITH A RED WATER BUCKET, AFTER THE PERFORMANCE OF “I, KIMCHI” WHICH CULMINATED THE THREE-DAY WORKSHOP.

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