



PROBIOTIC RITUALS

To do at home

INTRO: *Rituals of care*

Our life in the city is tightly intertwined with the existence of non-human species. Outside of long term trends of over-sanitation, as well as the recent use and abuse of antibacterial gels, these relationships are becoming more and more fragile.

We are seeing a dramatic loss of biodiversity in our cities.

In order to mitigate the effects of climate change and to challenge contemporary building practices that perpetuate social and ecological injustices, there is a strong urgency to establish new customs of care for a more-than-human life in the city. Fermented foods, composting waste and the nourishing of soil biodiversity ask us to care for and work with microbial partners.

“Microorganisms are our ancestors and our allies.” ¹

NOTE: *Lockdown update*

As many of us had the opportunity to slow down and spend more time at home, we started seeing our domestic spaces through a closer lens. We are developing healthier and more mature relationships with our domestic environment, however this does not need to end with a nice workstation or better audio system.

Probiotic Rituals asks that you magnify the hidden world of microorganisms in your home and start a dialogue with the species too small to see. A process of learning, these rituals seek to normalise an interaction we are all too unaware of.

“Do-it-yourself fermentation is a journey of experimentation and discovery. Rediscovery really, because, like fire or simple tools, these are some of the most basic transformative processes that our ancestors used and that form the basis of human culture.”²

Guides

"I am a Lactobacillus - part of the largest genus within the group of lactic acid bacteria. We take part in the manufacture of fermented dairy, sourdough, meat and vegetable foods or used as probiotics. There are also lots of us in the human gut."

"I'm Streptomyces. You might know me because I am responsible for the smell of the soil. It is because I produce geosmin an organic compound whose name means "earth odour". I also produce antibiotic compounds and sometimes pigments. "

"I am Frankia - a bacteria that lives in symbiosis with trees. In degraded soils, one of the scarcest nutrients is nitrogen. I fix nitrogen into the soil, so am often often used to increase soil fertility"

RITUAL 01: *Lactofermentation*

Humans are in symbiotic relationships with microbes: digestion, immunity, and mental health are linked to the microbial life in our guts. Fermented foods are a way of tending to the microbial flora within. When we pour salt water over vegetables, the brine protects against putrefying microorganisms and favors the growth of good bacteria. Enter lactobacilli.

As you open the black box of fermentation, you start a dialogue with the microbial world by creating a landscape for companion species. Lactobacilli in turn will interact with your choices and actions. The evolving taste of the fermented vegetable will be the microbe's preferred choice of communicating with you.

Fermentation is also an iterative, often surprising act of creation which rejects the cult of expertise. Microorganisms are flexible and adaptable, meaning that anyone can do it and anything can happen. Why do you think Lithuanians worship Roguszys? - he is the God of Pickled Food.

“Any food can be fermented. I know of no food that is without some tradition of fermentation.”²

Tools

- Vegetables - cabbage, cucumbers, beets, turnips all work very well
- 3 tablespoons salt dissolved in 1L water - or adapt quantities as needed to have a 2-3% salt brine
- A jar
- Spices or herbs that you like - black pepper, mustard seeds, bay leaves etc.

Ritual Checklist

- Clean vegetables
- Chop them up in pieces 1cm thin or smaller - they can be as long as you like
- Mix vegetables with spices in a bowl
- Dissolve 3 tablespoons of salt in hot water
- Pack vegetables snugly into jar
- Cover with water
- Remember the mantra: *Submerge in brine and all will be fine.*
- Wait for a week before tasting at room temperature with the lid half-open.
- Taste
- If it is not sour enough for your taste, wait few more days
- Once you are happy with the result, close the lid and keep in your fridge.

Message from lactobacillus:

Hi there. Just wanted to jump in quickly and say thanks.

When you filled that jar with brine, I was amazed how all the salt took out my fiercest competition. All of a sudden, it's as if a world had been made just for me, with all the food and conditions I most appreciate.

As if that wasn't enough, I then got to do my favourite thing, and most delicious - turning sugar into acid. As I consumed and consumed, more of me got to eat, thrive and produce acid which then took care of the vegetables you provided.

It's glorious and I really can't thank you enough. As you taste the brine, I will let you know how happy I am with the process. There's one more stop on this ride, and I know we'll do it together.

See you in a week's time!

RITUAL 02: *Composting*

The second stage of your relationship with microorganisms leans on the fermentation process to deliver a regenerative act which feeds organisms around you. While food-transformation is the popular and human friendly cousin of the bacterial world, composting takes on the greatest scavenger task of our planet. Enter Streptomyces.

By breaking down the elements of dead animals and plants, Streptomyces together with many other Actinomycetes break down plant waste to restore carbon, nitrogen, hydrogen and many others into the soil - all so that plants may use them to grow. A simple ritual of caring for waste, composting ensures that our environment is not an ever accumulating mass of dead waste, all through the basic instruments and processes of fermentation.

“Dirt is devoid of life, of all-things nutritious for the flora that rely on it. Soil, on the other hand, is alive.”⁴

Tools

- Composting bin - you can make your own by drilling ventilation holes in a bucket or bin
- Organic waste - newspaper, leaves, grass, kitchen waste (fruits, vegetables), woody materials
- Soil - source of microorganisms
- Water
- Air - source of oxygen

Ritual Checklist

- Understand your waste
 - check this list - some waste is brown which means rich in carbon, some waste is green: rich in nitrogen
 - best to chop up or grind the wastes so that they can be broken down faster
- Establish your composting bin
 - make sure that you have a relatively even mix of greens and browns
 - add a thin layer of soil to introduce microorganisms to your compost bin - worms help if you can find some
 - ensure your bin has adequate ventilation and air flow
- Care for and feed the compost pile.
 - regularly turn the compost making sure that the bottom layers get exposed to air
 - if your compost smells bad, it's likely that there is too much nitrogen - add some more browns
 - if it dries out add some water - your compost bin should be moist but not wet
- Collect the finished compost for use.
 - your compost is done when it looks and smells like soil and nothing you have already put in is recognisable
 - it can take anywhere between a couple of weeks and three months depending on how small your waste was and how well you care for it

Message from Streptomyces:

Oh hi there, nice to see you again. I wanted to show you a game I am playing. We're putting nitrogen, phosphorus, potassium and many other nutrients together, and making it all look like soil!

It's a puzzle of sorts.

Myself, Cellulomonas and others have been at it since you put us in here a few weeks ago. The final image will be a living breathing mosaic of organisms. The puzzle pieces consist of everything you've fed us so far. It's my task to deal with smells and texture, and Cellulomonas keeps busy breaking down egg shells, leaves and cardboard pieces. Isn't that right C?

Right - you can deal with the aesthetics, I focus on turning waste into food for plants. Also! don't forget the worm, he's keeping busy and turbocharging all our good work. I can't wait for everything to click into place - I'm already seeing mites, fungi and protozoa working together and it's such a nice foodweb we have here.

Come back in two weeks and by the time you turn over everything in here, our puzzle will be completed and ready to check against a real patch of soil!

RITUAL 03: *Replenishing*

As you've individually developed a variety of tiny ecosystems and are seeing them thrive through an intervention based on encouraging diversity, it's time to take this knowledge out of your fridge and out of your yard, and into the bigger spaces where help is most required.

From private-public sterile architecture, to societal trends which encouraged clean patches of green to exist in our urban environment, the earth around our cities is suffering from a lack of biodiversity. Not only are we obsessively cutting out any secondary species of plants and weeds from our green spaces, the soils are also seeing changing weather patterns which are contributing to their expedited sterilisation and ultimate decay.

The ritual of soil feeding seeks to reverse this process by challenging you to an act of bacterial activism designed to nurture the ecosystems which exist in our public green spaces.

“Nature has told us a gazillion times that single species ecosystems don't work, from boardrooms all the way down to plutonium mines. We have to share. We have to respect each other's expertise.”⁵

Tools

- Compost
- Your hands - you can also use a small trowel if you'd prefer

Ritual Checklist

- Find a patch of soil that seems dry, compacted or lacking life
- Gently break up compacted soil - you can use your fingers, a small trowel or rake
- Apply a 2-3cm thick layer of compost
- Water the patch of soil
- If you would like to plant some more vegetation there, now is the time
- Tuck seeds into the soil 3cm deep
- Water when dry

Message from Frankia:

It's me, Frankia. Thank Eukaryote you came here! It's been too long that I have not been able to do my work. Compost and mulch help me. Since I've had this, I've been busy fixing nitrogen for other plants and helping them fend off the heavy metals which were killing them.

I've been seeing your progress and I think we can work together now. As you make a better home for me, I can make a better home for you and continue to support some of the nature you so need.

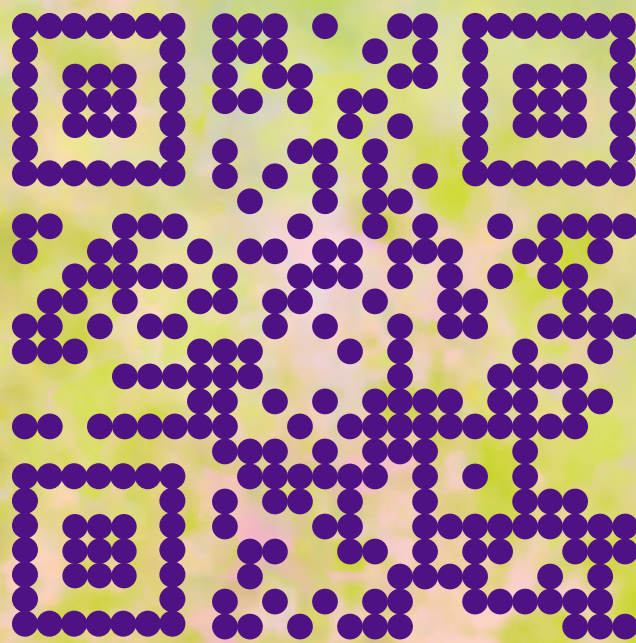
What I need you to do now is go out there in the world and focus on all the other changes you must make to protect our relationships. I hold dominion over a small patch of this land, but in a month's time, you will see the fruits of my labour. You keep talking to me, to others like me, and to others like you, about others like me.

I think this is the beginning of a very beautiful friendship.

“Social change is another form of fermentation.” ⁶

We already know that our society cannot indefinitely sustain the levels of growth which have been seen in the last hundred years. To slow down, we will need to understand how growth and decay actually happens in the natural world, and see how the cycles and language of the living environment can teach us to be a better species for our planet.

Small rituals of care like these three are not enough; they are starting points and calls to action towards new systems that are equitable for all humans and non-humans. As we push for social and economic changes, we will need to learn from the lactobacillus on how ideas and mutualistic relationships ferment, spread and then mutate in order to inspire movements for change.



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