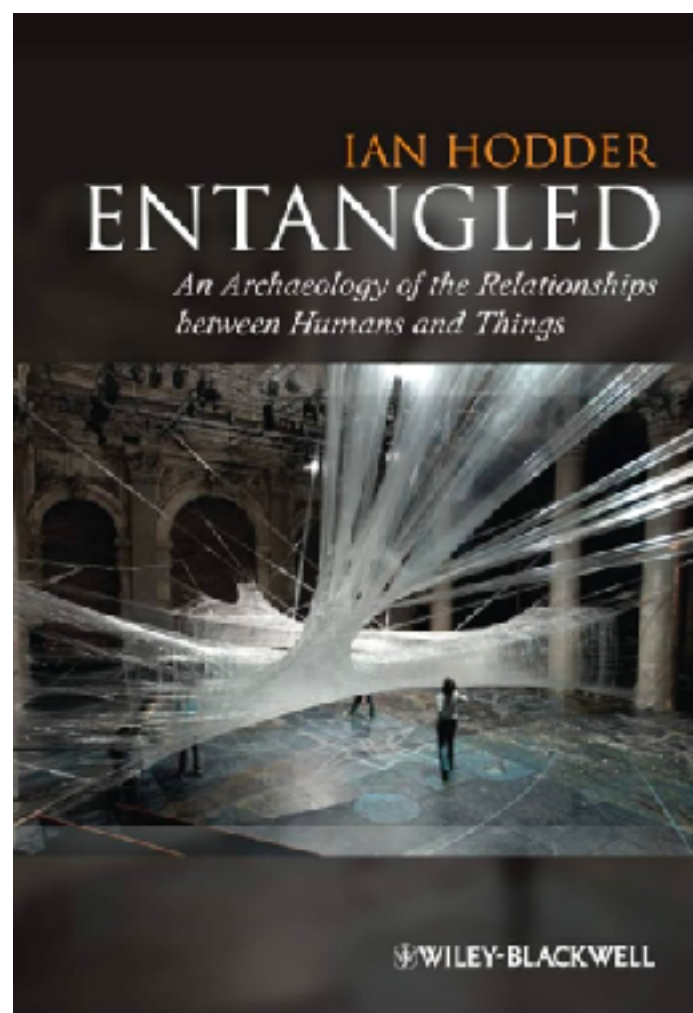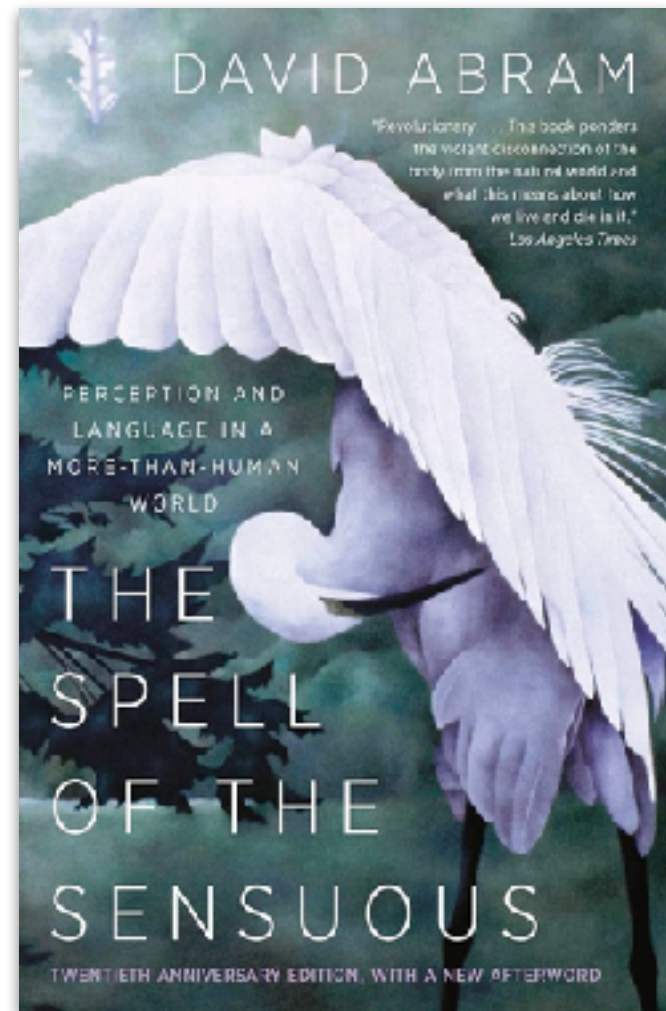# Entanglement of human and technology with the more-than-human worlds through Fermentation

Dominique Chen (Ferment Media Research / Waseda University)
2023.10.28 World Design Assembly Tokyo 2023

Toward an entanglement of human and more-than-human

- The more-than-human concept enlarges the boundary of the humanity by entangling humans with the entirety of non-human living beings

  - humans are already 'augmented' by the more-than-human worlds

- Human Centred Design needs to be updated to a More-than-human Centred Design

  - to nurture sustainable human/multi-species natureculture onto our damaged environment based on the idea of mutual care

- How does this thinking affects our design of technologies?

Human Computer Interaction

More-than-human / Multispecies Research

Animal Computer Interaction, Humanisitic HCI, Biological HCI…

Humanities on more-than-human Worlds

Khaoula et al (2016)

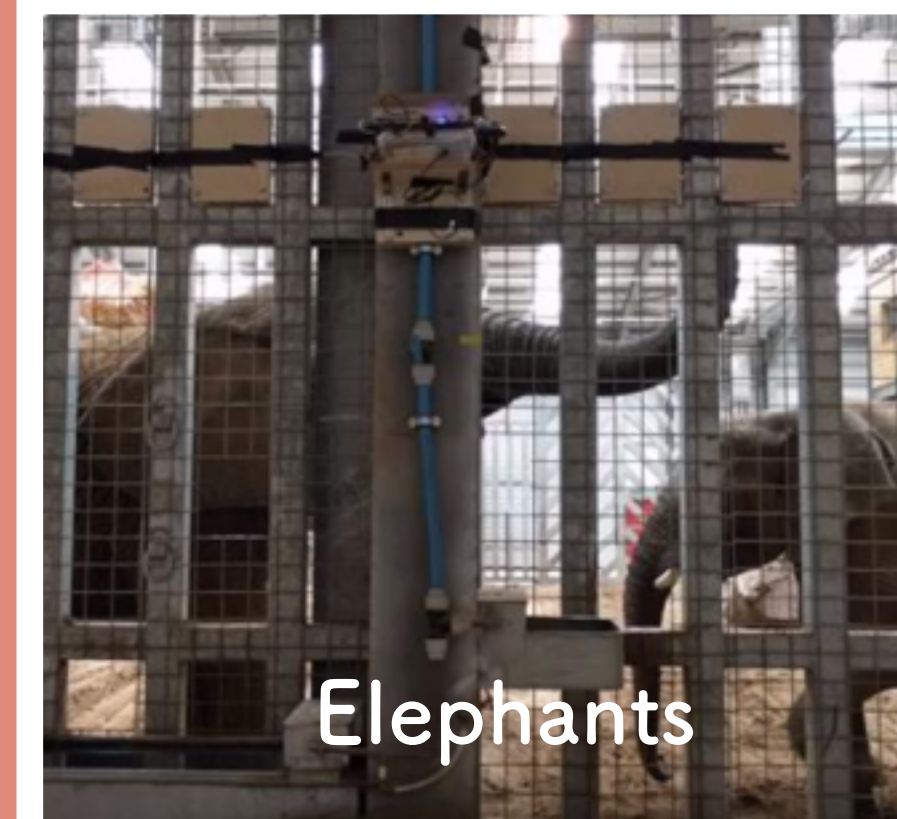Ogata et al (2012)

Osawa & Imai (2013)

Cats
Noz&An (2011)
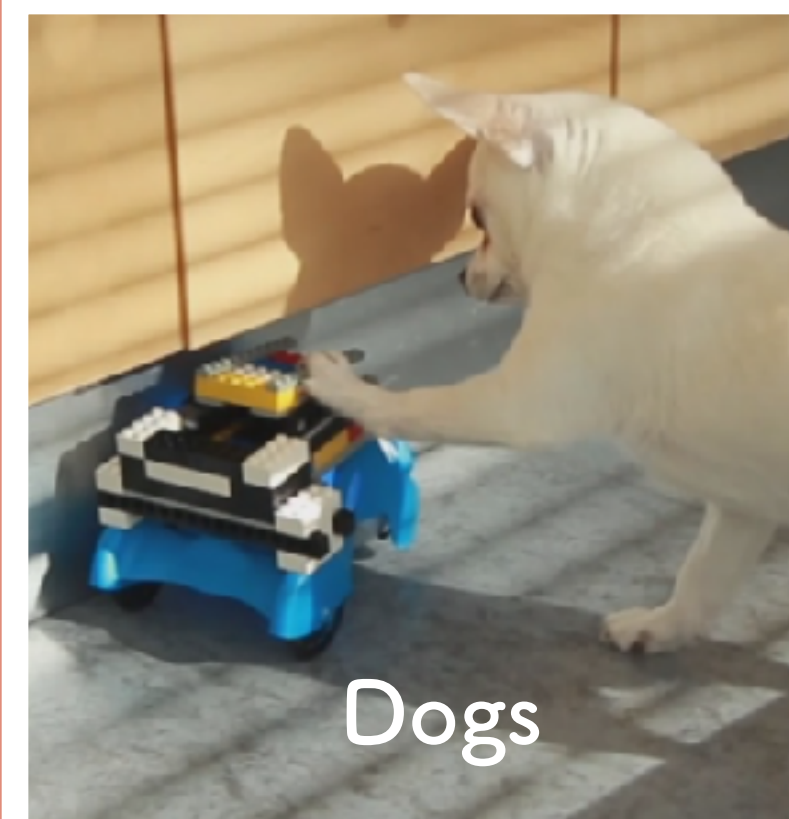
Dogs
Westerlaken&Gualeni (2016)

Elephants
French et al. (2017)

Plants
Szu-Yu Liu et al. (2019)

Fungi
Jen Liu et al. (2018)

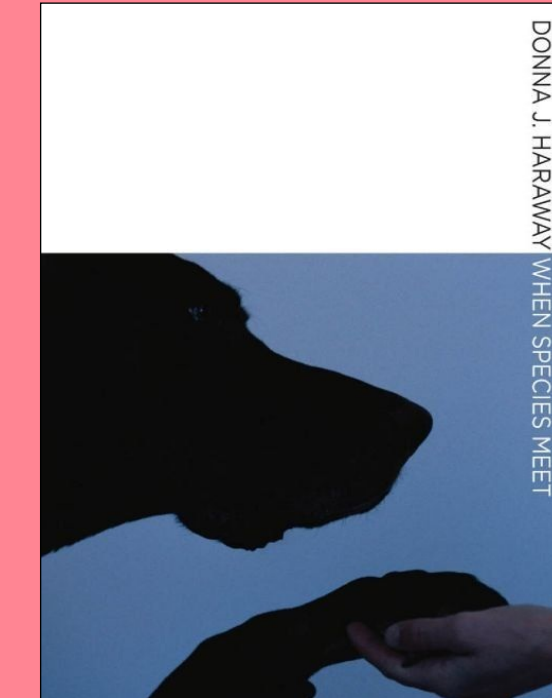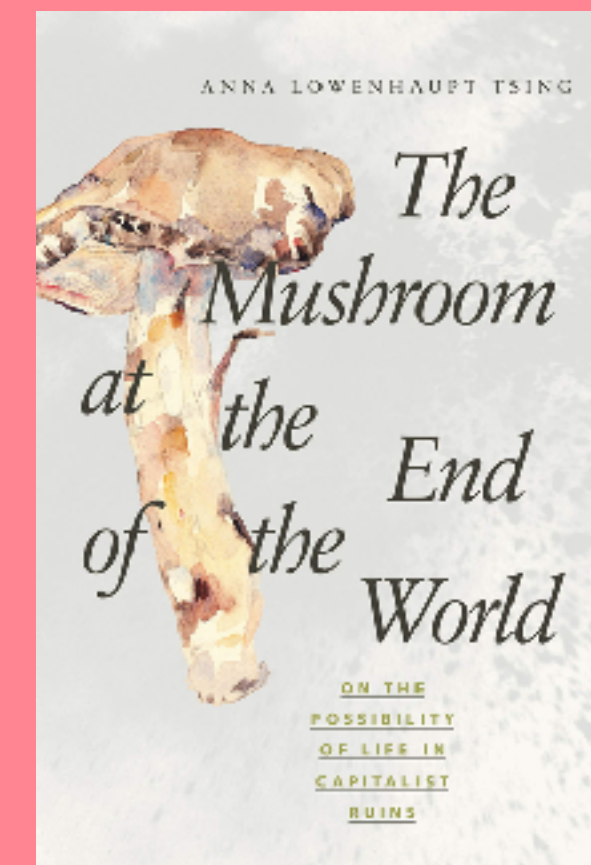Microbes
Chen et al. (2021)

Haraway (2013)

Puig de la Bellacasa (2017)

Tsing (2015)

Human Hands   **Vegetables**

Resident Bacteria

Lactic Acid Bacteria

Nuka
Rice Bran Bacateria

Complex Fermentation
with Human / Vegetable / Nuka bacteria

Nukazuke Pickles
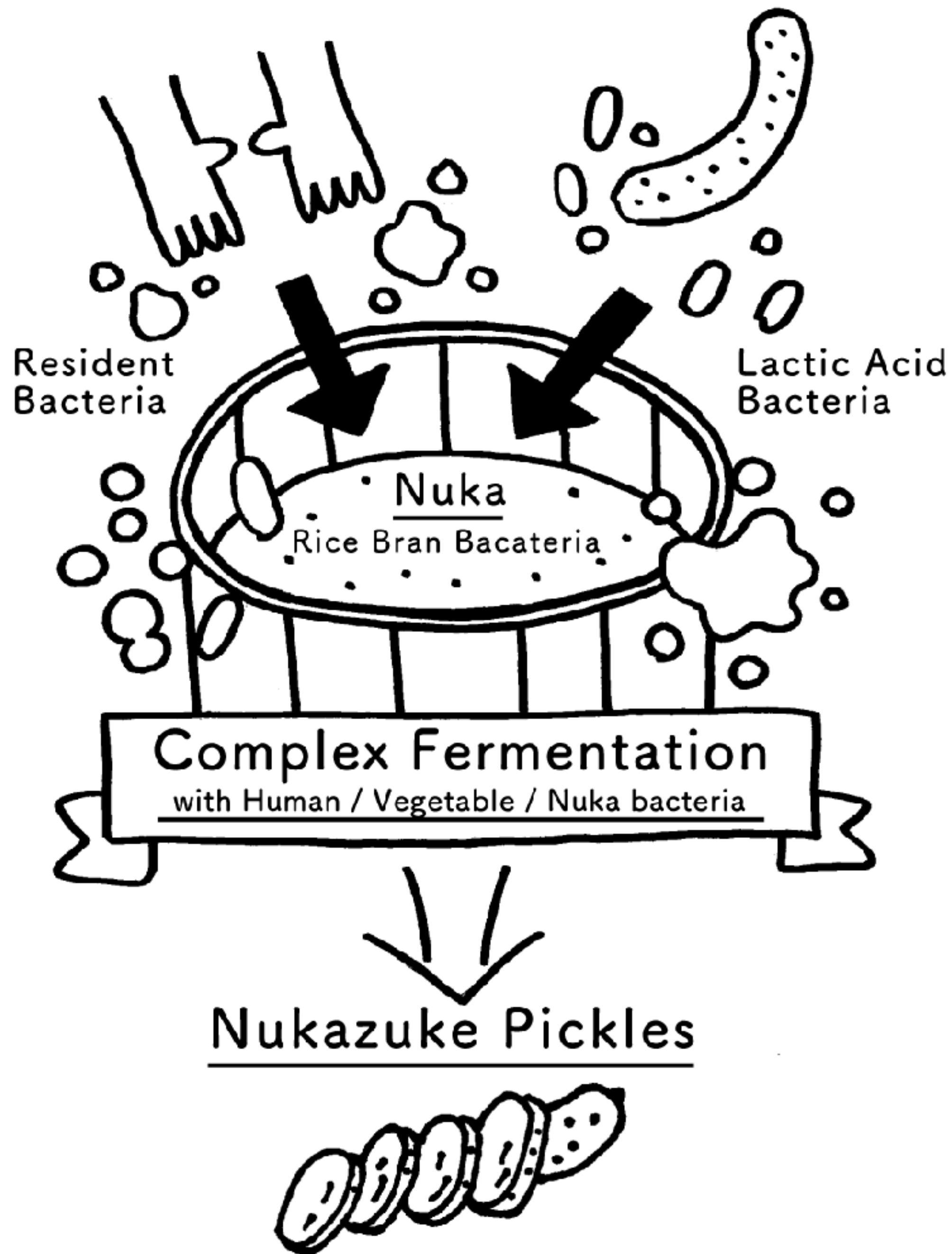
A **nukadoko** is a traditional Japanese fermentation method to pickle vegetables with **lactic acid bacteria** inside rice brans.
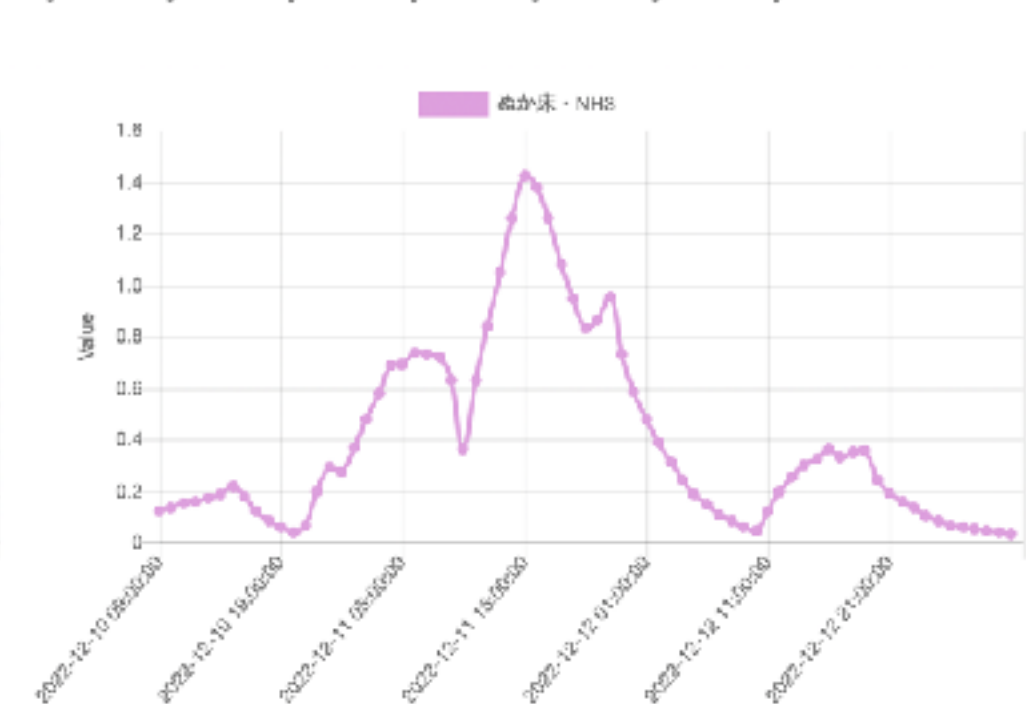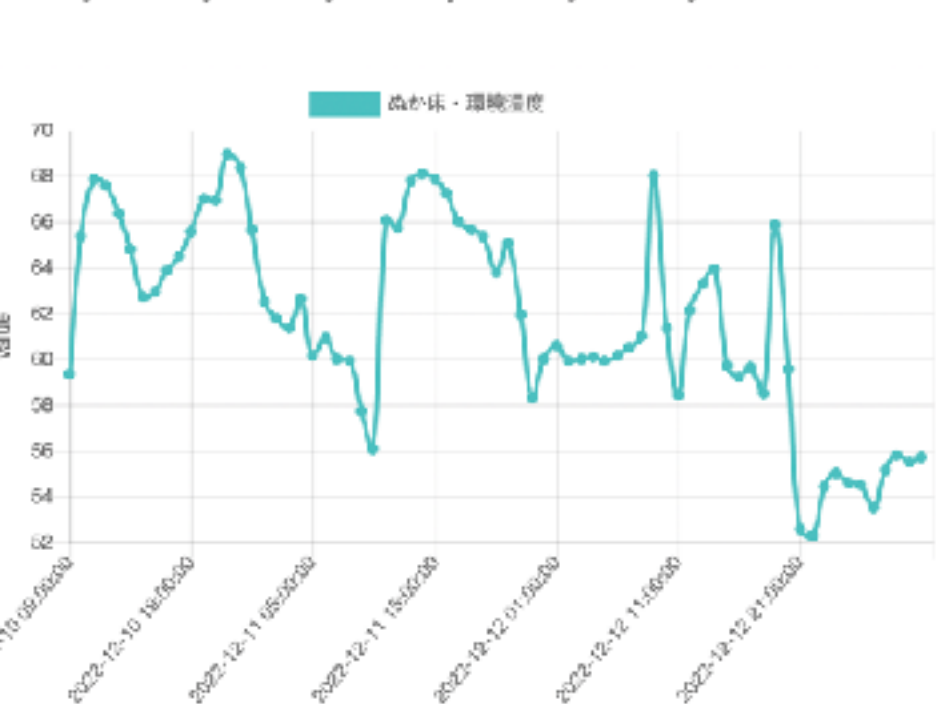
version 1 (2019.2)　version 2 (2019.5)　version 3 (2020.8)　version 4 (2022.4)

イマ、
食べゴロダヨ。
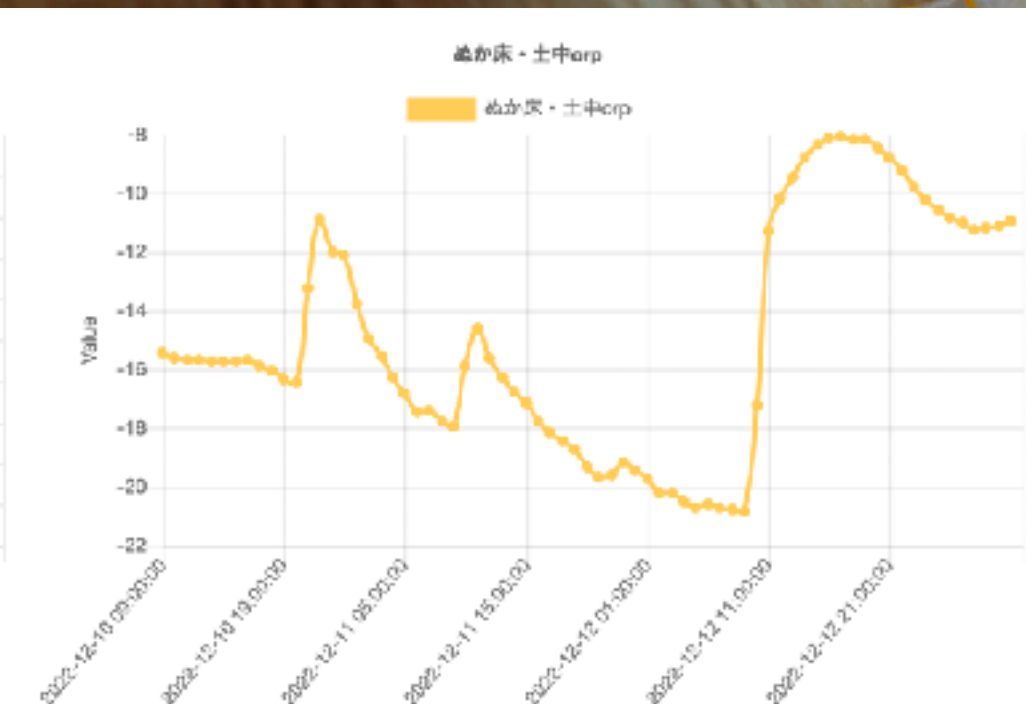
It's ripe now.

ぬか床の状態を話してくれます。

in response to your questions.

Research Square

Microbial interaction between human skin and Nukadoko, a fermented rice bran bed for pickling vegetables
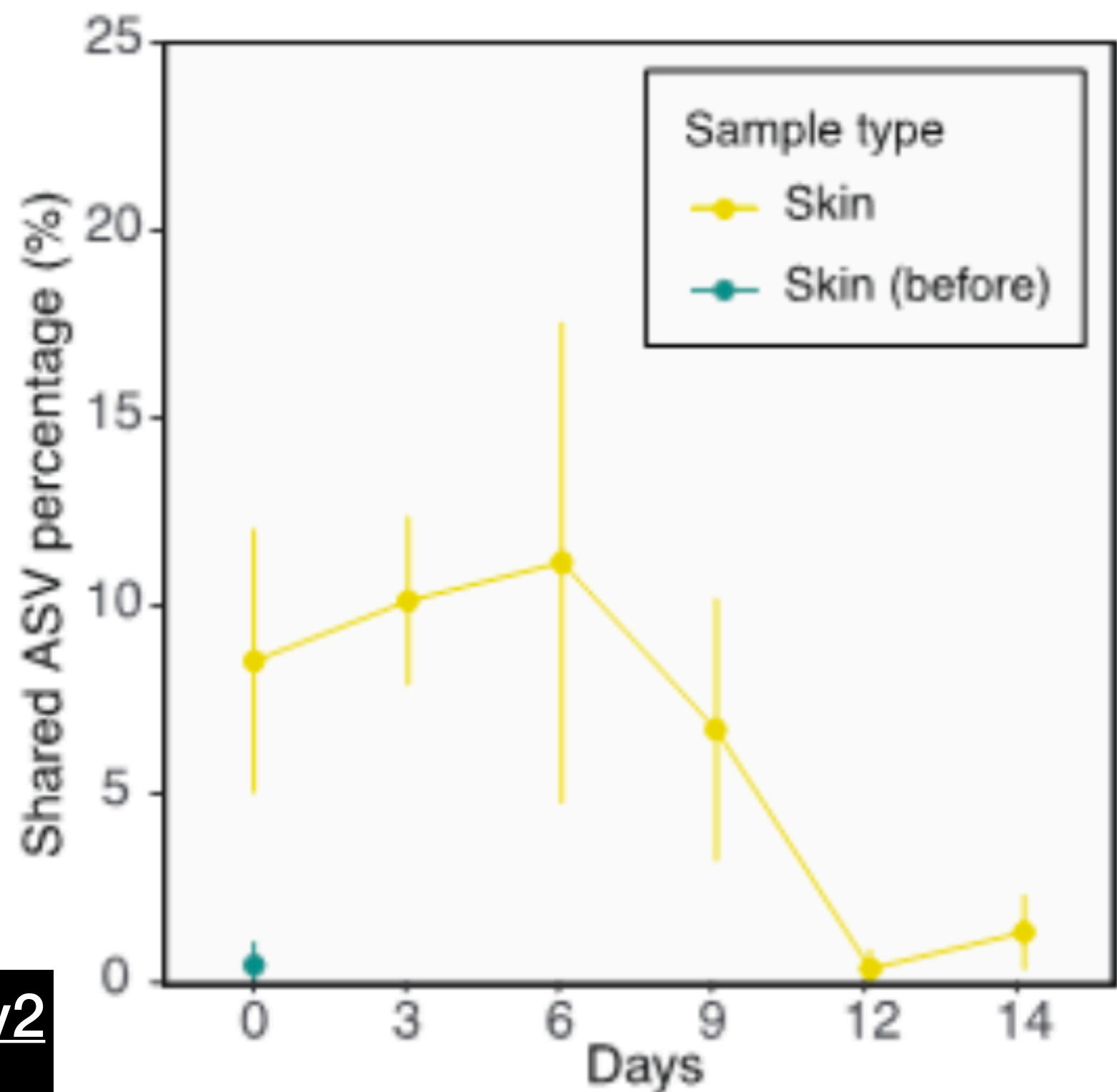
Ryo Niwa
BIOTA Inc

Young ah Seong
Hosei University

Kazuhiro Jo
Kyushu University

Kohei Ito
BIOTA Inc

Dominique Chen (✉)
Waseda University
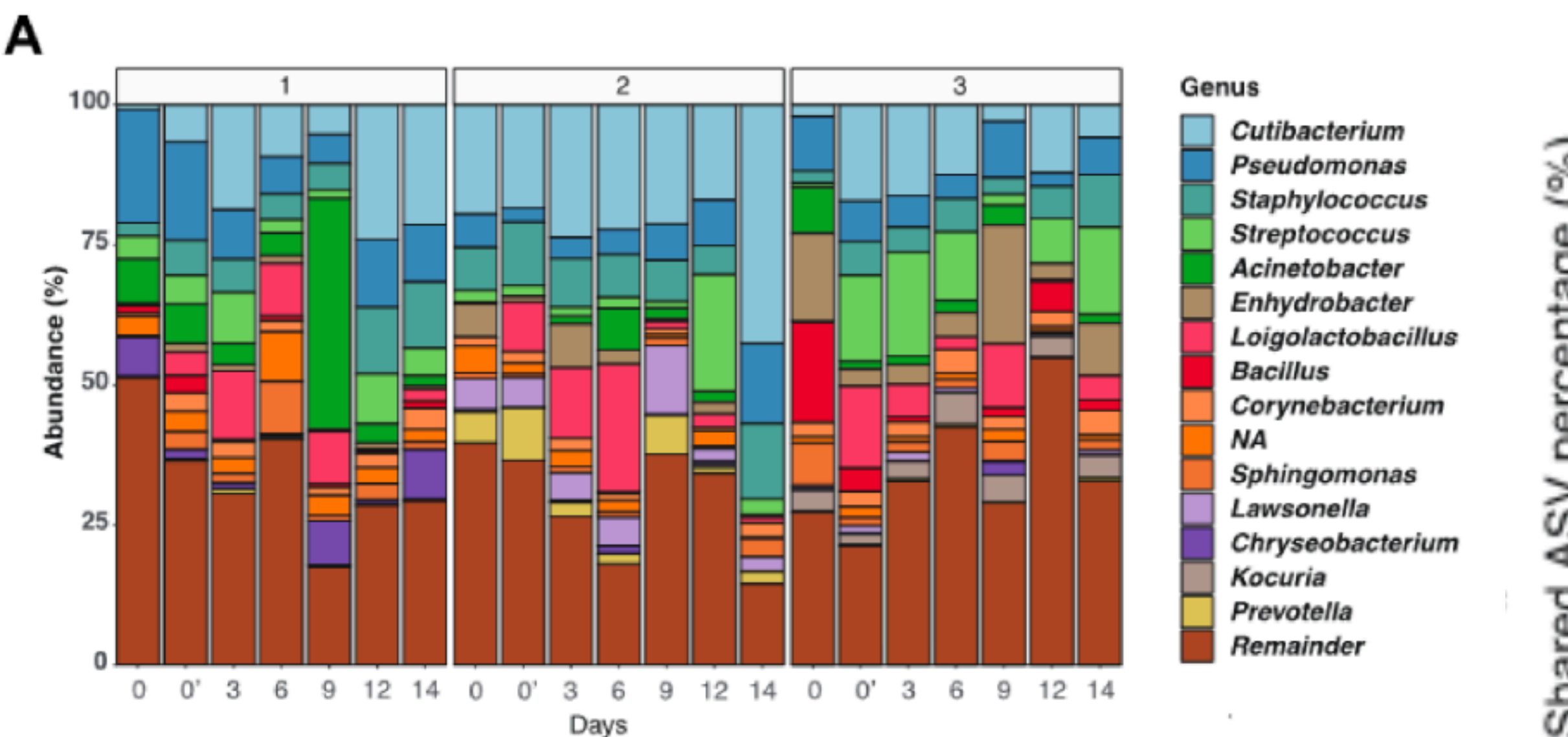
Entanglement between humans, robots and micro-organisms

FERMENTING VOICE COMMUNICATION

Content Variation by Word Learning

Grounding in Human activity

Human-Computer Entanglement

Prosodic Variation by Sensing Data

Embodiment of Microbial activity

Computer-Microbe Entanglement

Nukabot

Insert Vegetables, Stir Rice Bran

Ferment Pickles

Human-Microbe Entanglement

Human

Microbes

TRADITIONAL CARE OF RICE BRAN

Rethinking Design through the Fermenting perspective

- **Thinking about the design of things from fermentation**

  - From "making" to "nurturing" a design

- **Design things that "ferment"**

  - Things that entangle with the more-than-human worlds, by embodying the non-human living beings and grounding in the human processes

- **Design dimensions for realising mutual care of humans and more-than-humans**

  - "Fluctuating continuously," "Noticing the process," " Entrusting others."

Exploring alternative Design Perspectives

	Control	Ferment
Relations	Manipulate the object from the outside	Relating and entrusting to others
Method	Optimization towards a predetermined correct answer	Noticing the value of experience itself
World view	A world defined by instructions	A world where meaning and value emerge and change

Entanglement of human and technology with the more-than-human worlds

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