

The Nature of Sweetness

An Indigenous Fermentation Complex in Amazonian Guyana

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Introduction

During my time living in the Makushi village of Yupukari, I kept a small garden plot within the cassava farm of a local couple, Uncle David and Aunty Marilyn.¹ Under their mentorship, I experimented with planting various landraces of the staple crop bitter cassava (*Manihot esculenta*, Crantz—*kise* in Makushi), all the while learning about the growth processes of the plants and the skills required to harness their living agency. I would visit the garden every few days to check on the plants, weed between the banks, and plant new stem cuttings. Months later, once the first crop was ready for harvesting, we decided to make a batch of cassava beer (*parakari*) with the yield. *Parakari* is an eminently social drink, the very essence of commensality, and thus it seemed an appropriate form through which to reciprocate the knowledge and skills that I had acquired from the community. David and Marilyn, who had been patiently teaching me to cultivate and process cassava over the preceding months (Figure 9.1), kindly offered to guide me through the complex process of *parakari* production.

The following ethnographic account, based on long-term fieldwork with Makushi gardeners and cassava processors from two villages,² is also informed by the first-hand experience of having made *parakari* myself under the tutelage of local experts. This personal involvement in the fermentation process enables me to include an invaluable phenomenological aspect to the analysis, itself only accessible by having engaged in the tactile, sensuous experience of making *parakari*,³ and by learning and utilizing a specialized set of body techniques (Mauss, 1992 [1934]), akin to what Tim Ingold has called ‘skills as embodied practice’ (Ingold, 2000: 291).

In this chapter, I will first outline the sociotechnical process of *parakari* production, then address the social roles of alcohol in Makushi society, before finally evaluating the ritual application of alcoholic drinks in native Amazonian cosmologies. *Parakari* is made from fermented cassava bread via the addition of a fungal inoculum which activates fermentation by ambient yeasts. This is, therefore, an inherently multispecies process, involving, among others, human beings, cassava plants, a domesticated species of fungus, bullet ants, and shamanic spirits. Via an in-depth analysis of the more-than-human process of its production

¹ All names are pseudonyms.

² Yupukari and Rewa villages, Upper Takutu-Upper Essequibo, Guyana, South America.

³ Often abbreviated to ‘kari’ in common parlance.



Figure 9.1 A woman parching farine (*u'wi*).

and consumption, this study constitutes the first in-depth examination of *parakari* from an anthropological perspective.

The Anthropology of Fermentation

In the broadest terms, fermentation might be defined as the chemical breakdown of a substance by microorganisms, typically involving effervescence and the release of heat. More specifically, it may refer to the process involved in the production of alcoholic foods and drinks in which sugar molecules are converted to ethanol and carbon dioxide by yeast. Fermentation has been called the ‘oldest form of food biotechnology’ (Nout et al., 2007: 817), and is an important foundation of indigenous culinary complexes (Steinkraus, 1996; Nout et al., 2007). Fermented foods and drinks are the products of intimate, coevolutionary relationships that have been cultivated between human beings and microbes through historical time (Steinkraus, 2002: 24). Reflecting their microbial constitution, fermented foods typically have distinctive odours and tastes, making them particularly salient in indigenous sensory ecologies (Shepard, 2004).

As the pre-eminent food anthropologist Sidney Mintz has pointed out, fermentation is ‘a too little-noticed subject, when we consider that as much as one third of the food we eat is fermented’ (Mintz, 2018). Yet, despite its centrality to many indigenous cultures and cosmologies, fermentation remains at the margins of mainstream anthropological scholarship—to say the least. By contrast, the Anthropology of Food, more broadly,

constitutes a more developed area of scholarship (Barthes, 1961; Lévi-Strauss, 1968; Douglas, 1972; Counihan & van Estrik, 1997; Mintz & du Bois, 2002; Etkin, 2009). Recently, however, a nascent ‘anthropology of fermentation’ has begun to emerge (Latour, 1984; Mintz, 2008; Paxon, 2008; Jasarevic, 2015; Kawa et al., 2017; Veteto & Kawa, 2017), as part of the wider trend towards multispecies ethnography in the social sciences and humanities (Kirksey & Helmreich, 2010; Kohn, 2013; Tsing, 2015; Daly et al., 2016; Haraway, 2016; Van Dooren et al., 2016; Hartigan Jr., 2017). As I shall argue next, more-than-human thinking has a great deal to contribute to the anthropological study of fermentation complexes in indigenous Amazonia and elsewhere.

The Makushi

The Carib-speaking Makushi people live in the North Rupununi region of southwestern Guyana, a biologically diverse mosaic of savannahs, rainforests, and wetlands located on the most northerly fringes of the Amazon watershed. Numbering around 10 000 people in Guyana, with a further 20 000 across the border in Roraima, Brazil, the Makushi people have endured a long and complex history of contact with various colonial and postcolonial forces, stretching back at least to the late eighteenth century (Brett, 1853; Im Thurn, 1883; Koch-Grünberg, 1916; Farabee, 1924; Roth, 1924; Williams, 1932; Myers, 1993; Santilli, 1994). However, despite a degree of cultural and religious creolization, the indigenous cosmology centred around shamanism (*piásan*) and the proliferation of forest spirits (*imawari*) in the living environment continues to frame processes of cultural change and transformation. The research presented in this chapter is the product of long-term ethnographic fieldwork with the Makushi communities of Yupukari and Rewa, with whom I have been working since 2011.

The Makushi subsistence economy is based on the complementary interaction of hunting, fishing (Figure 9.2), swidden farming, and the gathering of wild plants. The cassava garden (*mîi*) is a primary locus for sociality, both between humans and with other kinds of beings. Farms and gardens are vibrant places of cross-species engagement in which people, plants, and animals come together in symbiotic relationships of nurture, care, and management (Daly, 2015). At the same time, these cultivated plots in the rainforest harbour the potential for cosmological predation on the part of dangerous spirit-intentionalities. As shall be seen, Makushi attentiveness towards human–non-human relationships extends into the socioecological domain of fermentation.

Parakari: ‘Fuel for Life’

For the Makushi, locally brewed alcoholic drinks are a mainstay of everyday and ritual life—not simply for their narcotic or hedonic effects, but also as socially binding substances that nourish individual and social bodies. Makushi people produce a wide array of alcoholic drinks, including three main cassava beverages: *parakari*, *kassiri*, and *wo*.⁴ *Kassiri*, made

⁴ For historical and ethnographic references to the production and consumption of fermented drinks among the indigenous groups of Guyana, see Brett (1853: 276), Barrington-Brown (1876: 114), Williams (1932: 179), Myers (1944: 37–8), Thomas (1982: 42), and Forte et al. (1992).



Figure 9.2 A man fishing (*konoipi*).

from grated bitter cassava and purple potatoes, and *wo'*, made from burnt cassava bread and sugar, are both low-alcohol drinks lightly fermented via the combined action of mastication and boiling.⁵ Makushi people also brew an assortment of wines from locally grown fruits, including jamun, mango, cashew, corn, and pineapple. Other home-brewed alcoholic drinks include 'tonic', made from commercial yeast and burnt sugar, and 'fly', made from purple potatoes and sugar. In general, fermented cassava beers are held in high esteem and regarded as symbols of Amerindian culture and tradition in opposition to commercial bottled spirits, which are purchased from Brazil and imported into communities.⁶

Of all the alcoholic drinks brewed by the Makushi, *parakari* is the most highly valued in social and economic terms, being consumed daily and constituting the ceremonial beverage par excellence. It is made from bitter cassava, which is processed and baked into bread before being fermented (a complex process, described in detail next). The staple crop cassava is so fundamental to the Makushi way of life that it could be said to define the culture more than any other plant. The woody root crop is used to make many of the staples of Makushi cuisine including cassava bread (*ikei*), farine (*u'wi*), and fermented drinks. With

⁵ *Wo'* meaning literally, 'drink'. This sweet drink is consumed by children and adults alike, often as a non-alcoholic alternative to *parakari*.

⁶ Most commonly Guyanese rum, Brazilian cane spirits, and other high-strength liquors including 'High Wine' and 'Alcool', the latter being denatured industrial ethanol with an alcohol content of over 90%. In the present chapter, I focus on the productive roles of traditional cassava beverages. However, although beyond the scope of this study, it is important to note that alcohol abuse and related domestic violence are widespread problems in indigenous communities in Guyana (cf. Forte et al., 1992: 63).

starchy substrates such as cassava, it is first necessary to convert the starch to fermentable sugars (Steinkraus, 2002: 27). Unlike most cassava beers fermented across Amazonia using prolonged heating and the introduction of salivary enzymes via mastication (Steinkraus, 1996), *parakari* is fermented via the amylolytic action of a domesticated species of saprotrophic fungus (*Rhizopus* sp., Mucoraceae, Zygomycota) (Henkel, 2004: 25). The fungus instigates the breakdown of the starches into sugars, a biological process known as amylolysis. Following the amylolytic breakdown, the sugars are fermented to ethanol by ambient yeasts.

As a fermented beverage, *parakari* is completely unique in indigenous Amazonia. Showing more in common with East Asian dual fermentations, '*parakari* is the only known example of an indigenous New World fermentation that uses an amylolytic mould, likely resulting from the domestication of a wild *Rhizopus* species in the distant past' (Henkel, 2005: 1). Its production is endemic to the Rupununi region of southern Guyana and neighbouring Brazil, with only the Makushi, Patamona, Akawaio, Wapishana, and Waiwai peoples practising it (Henkel, 2004: 25). As a consequence of its cultural and geographic localization, there has been an almost total lack of research on *parakari* from an anthropological viewpoint.⁷ A number of older ethnological texts make passing reference to the production of fermented drinks among the indigenous peoples of Guyana (Koch-Grünberg, 1916; Farabee, 1924; Roth, 1924; Yde, 1965; Forte et al., 1992: 64). However, only one scientific study of note has been conducted on *parakari* fermentation, by the mycologist Terry Henkel (2005) who worked with the Wapishana of Aishalton village in the mid-1990s. The present chapter constitutes the first dedicated anthropological study of this unique and sophisticated fermentation technology among the Makushi people.

***Parakari* Production**

For analytical purposes, and following Henkel (2004: 29), the sociotechnical process of *parakari* production can be divided into six stages: (1) preparation of cassava bread; (2) preparation of the fungal inoculum; (3) Stage I fermentation; (4) Stage II fermentation; (5) straining the *parakari*; (6) consumption. I use operational sequence diagrams (cf. Lemonnier, 1986) to assist the description of this complex, multistaged process (Figure 9.3).

Preparation of Cassava Bread

Parakari is an example of a 'dual fermentation beverage' (Henkel, 2004), in that the fermentation process can be divided into two distinct stages: Stage I, the cultivation of the amylolytic *Rhizopus* mould in the enclosed incubator, and Stage II, the production of ethanol by ambient yeasts in a sealed container. Prior to Stage I fermentation, the cassava bread must be prepared from the raw material: bitter cassava roots.

⁷ This lack of focus is indicative of a more general disregard for the production and consumption of alcoholic drinks in Amazonian ethnography. Passing references to fermented brews and their social and ceremonial contexts can be found in the literature, but serious attention is rarely paid to fermentation as an area of social and ritual significance in lowland South America (for two exceptions, see Hugh-Jones [1978] and Uzendoski [2004]).

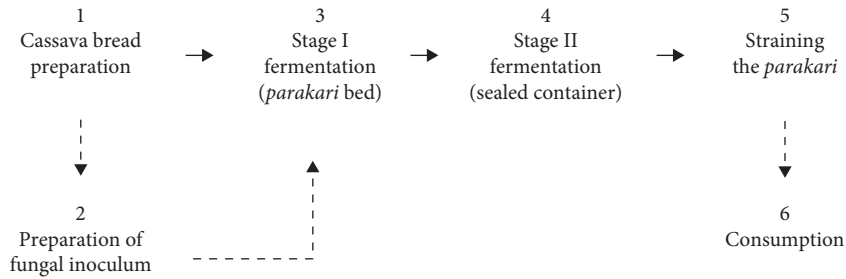


Figure 9.3 Operational sequence for *parakari* production.

To begin with, cassava roots (*kise imun*) (Figure 9.4) must be harvested from the garden. Makushi gardeners cultivate hundreds of folk-varieties of bitter cassava (Rival, 2001; Daly, 2016), displaying astonishing variation in root size and colour (from white to yellow) as well as other morphological and ecological characteristics (overall size, leaf colour, leaf shape, maturation rate, drought resistance, flood resistance, and so on). Certain varieties are deemed to be superior for making *parakari*—most notably, the purple-leafed ‘kari stick’ (*parakari piye*). This popular cultivar is said to produce large roots of the right creamish colour and starchy consistency to make perfect *parakari*. In practice, however, most land-races of cassava can be used to make cassava beer.



Figure 9.4 Bitter cassava roots (*kise imun*).

Bitter cassava roots contain high levels of toxic prussic acid (HCN), and must be detoxified prior to consumption in order to be made edible. Once carried back to the homestead, the roots must be 'scraped' to remove of the woody outer layer, before being grated into a mulch using a grater (*sumari*). The wet mulch is placed in a woven cassava squeezer (*matapi*), and squeezed repeatedly so as to remove the toxic effluent (*kata*). The resulting cylinder of dry, compressed flour is removed from the squeezer and sifted to remove any coarse fibres (called 'cassava bones'). Following this, the sifted flour is baked into large discs of cassava bread (*ikei*) on a circular metal pan above the hearth. Bread for *parakari* production is overbaked so as to burn slightly. Burning the bread is deemed necessary to achieve the distinctive taste and strength of *parakari*: it is said that the more burnt the bread, the stronger the drink will be.

First, the '*parakari bed*' (*parakari e'wonti*) must be prepared, a temporary structure made of large leaves that acts as an incubator to facilitate the growth of the mycelium via the introduction of a fungal inoculum. The bed is usually constructed on the floor inside the house, using banana, plantain, or 'wild banana' (*Heliconia* sp.) leaves (Figure 9.5). Layers of the broad leaves are laid down on the floor in a rectangular shape of roughly 6 × 3 feet.

Following this, sections of the cassava bread discs are broken up, soaked in water, and placed on top of the leaves, forming a layered mosaic of soggy bread.

Preparation of the Fungal Inoculum

At this point, the '*parakari mama*' powder is added to the bed. This fine green powder (*unikiya*) acts as an inoculum for the growth of the mycelium. The powder, made from dried



Figure 9.5 Laying the *parakari* bed.

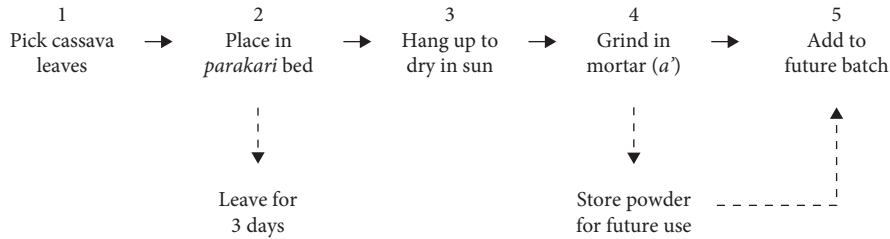


Figure 9.6 Operational sequence for preparation of the fungal inoculum.

cassava leaves,⁸ is sprinkled over the layers of moist cassava bread (Figure 9.6). Crucially, the powder is made from cassava leaves (*yare*) which had previously been placed in a prior *parakari* bed, thus becoming covered with fungal spores. The leaves are then sun-dried and ground up in a pestle and mortar (*a'*). This powder acts as a carrier for the *Rhizopus* inoculum between batches (Henkel 2005: 5).

At this point, the *Rhizopus* inoculum can be enhanced further with purified starch additives such as tapioca powder (*imu*) and thin, dried cassava slices. The addition of these carbohydrate-rich ingredients may serve as a booster for the initial growth of the amylolytic fungus in the Stage I fermentation (Henkel, 2004: 35).

Stage I Fermentation

After the addition of the powder, the *parakari* bed is 'closed' with a top layer of banana leaves, and left for a day and a night. On the afternoon of the second day, the structure is temporarily opened to insert a layer of fresh cassava leaves over the moist cassava bread. These cassava leaves will later be removed and ground into powder to be added to a future batch. The bed is closed again and left for one more night, when it will 'ripen' as the fungus spreads across the bread. The *parakari* takes three days 'to rise', as people joke, 'like Jesus.' This is the period of Stage I fermentation.

On day three, the *parakari* bed must be 'opened'. At this point, the *parakari* bed is noticeably warm to touch, evidence that fermentation has been taking place. The top layer of banana leaves is removed, and the underlying cassava leaves are put to one side (to be dried and ground into powder for a future batch). The cassava bread should be covered with a fluffy layer of white and black mould that exudes a sweet, clear liquid (Figure 9.7). This is the mycelial growth of the *Rhizopus* fungus, referred to colloquially as 'cotton' (*kato'ka*). As David advised, 'when you see the bread turn white like cotton, it is ready now; it is sweet, juicy, and ripe.' The sugary liquid exuded from the mould is the very essence of sweetness (*a'ki'ku*).

Stage II Fermentation

Following this, the mouldy bread is placed into sealed buckets for the Stage II fermentation, which is achieved in part via the action of ambient yeasts (see Henkel, 2005: 9). The

⁸ The Wapishana tend to use a different plant for this purpose: the Jamaican nettletree (*Trema micrantha*), known as *bishawud* in Wapishana (Forte et al., 1992: 64). Makushi women also report using leaves of this wild species of shrub on occasion, but generally prefer to use cassava leaves.



Figure 9.7 Opening the *parakari* bed.

buckets are then sealed and left in a cool, dark place, typically, inside the house. In the past, a large calabash (*poosi*) would have been used for this purpose; today, plastic buckets are commonly used. The desired ethanol content of the drink is determined by the duration for which it is left to ferment in the container. If left for a few days, the *parakari* will be ‘sweet’ (*a’ki’ku*), with a low alcohol content. However, if left for a week or longer, the drink becomes ‘bitter’ (*mai*), that is, alcoholic. The stronger the beer, the more bitter the taste.⁹ If the container is not sealed properly during the Stage II fermentation, the drink will become ‘spoilt’ and develop a disagreeable ‘sour’ (*so’ri*) flavour.

Straining the *Parakari*

Once ready, the fermented mash is removed from the bucket, and strained through a fine woven sieve (*manari*) with the addition of water, gradually producing a smooth, thick liquid. The finished product is ideally smooth in consistency and light brown or cream in colouration. As David put it, with his unique gift for analogy, ‘when it is finished, *parakari* should look white and fluffy, like a young owl!’

⁹ In general, low-alcohol drinks such as *wo* are described as tasting ‘sweet’ (*a’ki’ku*), whereas stronger alcoholic drinks such as *parakari* are ‘bitter’ (*mai*).



Figure 9.8 A Makushi family in their cassava farm (*mii*).

‘The Spirits Drink Cassava Beer’

Alcoholic beverages are never simply drinks; they are eminently social substances produced and consumed in communal settings, performing crucial binding roles (Douglas, 1987). Fermented beverages, along with the processes of their production and consumption, are infused with cultural meanings and values.¹⁰ For the Makushi, alcoholic beverages are regarded as fuels for participation in social activities and as catalysts for group cohesion. Fermented drinks, it might be said, constitute the very essence of *communitas*. Social relations are forged and reproduced in the convivial crucible of *parakari* fermentation. Indeed, it is in the very process of making and consuming cassava beer that one truly *becomes* Makushi—an idea that ties into the well-established theme of socially constructed kinship and person-making in indigenous Amazonia (Overing, 1989; Vilaça, 2002; Santos-Granero, 2012).

Gardening is a labour-intensive activity, and as such is rarely conducted alone (Figure 9.8). Clearing a new garden (*mii ya'ti*), for instance, requires the recruitment of help from the wider community, with extended family, neighbours, and friends all being invited to join in. This system of collaborative labour is known in Makushi as *mayu*. *Mayu* is predicated upon an ethic of ‘helping each other out’: the family provide cassava beer and cooked food such as pepper pot (*tuma*) to their fellow villagers in return for their labour. *Mayu* is

¹⁰ For two useful reviews of the anthropology of alcohol, see Heath (1987) and Dietler (2006).

an inherently social event, during which people socialize, drink, chat, and work together. Nourishing and energy-rich, *parakari* is consumed while engaging in physical work, simultaneously serving to fuel the physical body and fuel the spirit of conviviality which accompanies cooperative work. As Uncle Ignatius, an elderly man from Rewa village, once told me, ‘when we work together, we always have a bucket of *parakari*, a little fuel for the belly, man!’

For the Makushi, *mayu* is a culturally pivotal form of socialization enacted through communal labour. Social relationships between family and friends are forged in the shared experience of working and drinking together. As Thomas Griffiths has put it, ‘co-operative labour is a potent form of social bonding in which festive work groups form animated *communitas*’ (Griffiths, 2001: 248). Coworkers form lasting emotive bonds in the social experience of working with one another, which in turn contributes to social cohesion and the formation of a group ethic. Crucially, *mayu* is not constrained to the exclusively human domain; it is a ‘more-than-human’ (Tsing, 2012) process of shared selfhood, bringing together human beings, plants, fungi, animals, and forest spirits in the dynamic domain of the garden, and, in the process, harnessing the knowledge and skills of a diversity of non-human ‘selves’ (Kohn, 2013). This last point is perhaps best illustrated with a short ethnographic vignette.

During my first visit to Yupukari in 2011, I was invited to attend a *mayu* in a villager’s cassava garden. After clearing the underbrush with machetes all afternoon, with the occasional pause for a drink of *parakari* and some boiled fish and farine, we sat down under the lean-to in the centre of the clearing to rest, accompanied by children who arrived with their pet dogs (*arinmaraka*) and parrots (*arokai*). A few hours of lively talking, joking, and story-telling ensued, huddled around the bucket of beer. As the sun started to sink in the sky, just before leaving, my host, Uncle Adam, poured a final calabash of *parakari* and placed it at the edge of the garden, where the cassava crops merge into the encroaching forest. Later that evening, curious about what I’d witnessed, I asked Adam why he had left the bowl there. He replied, matter-of-factly, ‘the spirits drink cassava beer’. As I came to understand, the forest spirits (*imawari*), too, are necessary participants in *mayu*, and, like their human counterparts, must be given cassava beer to drink to facilitate the opening of a new garden.

Alcohol and Shamanism

As well as vital social substances, alcoholic drinks can also be powerful ritual catalysts. As Michael Dietler points out, ‘because of their psychotropic properties, alcoholic beverages often have a heightened valuation in ritual contexts, and they frequently even serve as a crucial indexical sign of ritual’ (Dietler, 2006: 232; see also Dietler & Hayden, 2010). Indeed, ritual action and alcohol are deeply entangled in the Makushi culture and cosmology, to the extent that the two are practically and conceptually inseparable—as, for instance, in shamanic healing séances and the more nefarious rituals enacted by much-feared ‘dark shamans’ known as *kanaimà* (Butt Colson, 2001; Whitehead 2002). Alcohol, it might be said, undergirds and makes possible the ‘highly transformational’ character of indigenous Amazonian lifeworlds (Rivière, 1994).

A preliminary linguistic analysis provides some clues as to deeper cosmological associations regarding shamanism and alcohol. In the Makushi language, the verb ‘to ferment’ is *amai'ta*, meaning, literally, to make light or buoyant (*amai*), the quality of lightness here being associated with strong alcohol and the capacity to intoxicate. The word for lightness is also linked to the term for bitterness, *mai'*, with strong alcoholic drinks being the archetypal ‘bitter’ substances. Fermentation (*mai'tanipî*) is, in short, a process of ‘making bitter’ (*mai'pa*): to ferment is to make light, which is to make bitter. These linguistic clues hint towards cosmological and spiritual meanings that come to the fore in the esoteric domain of shamanic ritual and practice.

During healing rituals, shamanic spirits are said to enter the ritual arena to consume an alcoholic elixir known as ‘piai-juice’, which is poured into a bowl and placed on the floor (Daly & Shepard, 2019). Piai-juice is made of a strong spirit (usually cane alcohol) infused with various shamanic plants. Like tobacco smoke (*kawai ere'tî*), this shamanic decoction is a ‘food of the spirits’ who descend from the celestial plane to drink it during the healing ritual. The intoxicating potion also nourishes the shaman’s vital soul or spirit (*ekaton*), allowing it to become buoyant so as to enable soul-flight, whereby his spirit travels to the celestial plane to commune with the shamanic spirits that reside there.¹¹ Like the master plant tobacco (*kawai*), strong alcoholic drinks are considered to be very ‘bitter’ (*mai'*) substances which induce ‘lightness’ (*amai*) or buoyancy of spirit—an essential quality of shamanism.

Fermentation Charms

Practically all economic and social activities are mediated by the use of a category of plant charms known as *bina*.¹² *Bina* charms are used for a diversity of purposes: for hunting, fishing, and gardening; for cooking, brewing drinks, and learning languages; for love, healing, cursing, and killing. These powerful plants are often described as being ‘people’ (*pemon*), and are spoken of and spoken to in subjective terms. These plant-people are the primary ritual tools—or better, ‘allies’—of the shaman (*pias'an*) and his malevolent mirror-image the dark shaman (*kanaimà*). As a botanical group, *bina* is highly diverse, but tends to comprise species that elicit a stinging, burning, or irritating chemosensory reaction (Daly & Shepard, 2019).¹³ The charms are typically rubbed into the skin on the hands, forearms, and face, and are said to enhance the taste and strength of the alcoholic drinks made by the charm’s beneficiary (Van Andel et al., 2015). The potent substances contained in these plants, and the extreme sensory reactions they elicit, are instrumental in their power as charms.

Bina plants play an important economic role in the subsistence economy. Without these powerful plant charms, as people say, game animals and fish would be harder to catch, and agriculture would be much less productive. Therefore, the enigmatic power of *bina* charms is such that they enhance the domestic economy and local livelihoods while also facilitating

¹¹ On shamanic spirits in Amazonia, see Viveiros de Castro (2007) and Kopenawa and Albert (2013).

¹² *Bina* being a term of Arawak origin used across Guyana (van Andel et al., 2015). The equivalent Makushi term is *muran*, which can be most directly translated as ‘charm’.

¹³ Most belong to the Araceae (arum), Amaryllis, Iris, and Cyperaceae (sedge) families.

shamanic healing and warfare. Although primarily botanical in character, the category *bina* also incorporates other classes of charms: animal (often processed body parts), mineral (stones, petroglyphs), and even charm tattoos (Daly, 2015).¹⁴

Until the 1960s, it was common for Makushi women to be tattooed across the face, forearms, and hands (Roth, 1924; see also Butt, 1961, on the Akawaio). These geometrical tattoos, called *kansku*, were not merely cosmetic; rather, they operated as cooking and brewing charms, endowing their recipients with the enhanced capacity to produce superior alcoholic drinks. Typically decorating the mouth, chin, forearms, and hands, the charm tattoos were located in those bodily regions associated with the production of fermented drinks, namely, the mouth (i.e. mastication) and the hands (e.g. grating, sifting, baking). According to elderly Makushi women, the symbolic patterns of the tattoos would depict various arthropods, creatures which either impart a painful sting (ants, wasps, scorpions) or produce sweet substances (bees, with honey [*wan*] being the archetype). The charm tattoos thus gifted their beneficiary the ability to produce sweet drinks—‘like honey’—or those with an extra kick or ‘sting’ (*yeki*). Indeed, in Makushi, the verb ‘to sting’ (*yeki*) also means ‘to get drunk’.

Today, Makushi women no longer have charm tattoos on their faces and arms.¹⁵ However, some women continue to use plant charms for fermentation and cooking. Women may also sting themselves with venomous ants (*mi’ki*) for the same end. Via the application of ant stings (again, usually around the mouth, forearms, and hands), the woman is said to acquire the capacity to brew strong, ‘stinging’ drinks. Various species of stinging ants may be used for the purpose, including the much-feared bullet ants, voracious army ants, and fire ants. During my enquiries, elderly women would sometimes recount how their mothers and grandmothers would sting them with ants when they were adolescents. Ant stinging, as I was told, enhances the recipient’s ability to produce alcoholic drinks of desirable taste and strength. Just as the ant stings its victim, the woman acquires the ability to produce potent *parakari* which ‘stings’ those who drink it.

Conclusion: ‘Our Culture is Sheer *Parakari*’

As I have shown in the foregoing, for the Makushi, locally brewed alcoholic drinks such as *parakari* are a ubiquitous feature of everyday life, not simply for their hedonic and narcotic effects, but also—and more importantly—as socially binding substances that reproduce social and cosmological structures. *Parakari*, at one and the same time, is a nourishing foodstuff, a social lubricant, and a ritual catalyst. Like the mycelium that facilitates its fermentation, this unique drink has a multidimensional saliency that threads through Makushi lifeworlds. Furthermore, as I have argued herein, *parakari* production and consumption

¹⁴ I was told of one animal drinking charm, which men would use prior to feasts and drinking ceremonies in order to increase their tolerance for consuming alcohol. The charm consisted of the larynx of a tapir (*waira awai’i*), through which the user would drink water in preparation for the dance. The charm’s beneficiary would thus gain the tapir’s ability to drink huge quantities of liquid, a useful skill during intervillage drinking ceremonies which could go on for days.

¹⁵ In part, owing to the influence of Christian missionaries. The first Anglican mission was established in the North Rupununi in 1907, at Yupukari village (Williams, 1932; Butt, 1961).

can only be understood as a generative multispecies process entangling human, vegetal, fungal, mineral, and spiritual influences.

Woven into the fabric of Makushi life, *parakari* is more than merely a drink; it is a way of life, a cultural identity, and a political motif loaded with social and symbolic meanings. Makushi people describe *parakari* with a sense of pride and defiance, as a symbol of Amerindian resistance against colonial and postcolonial oppression and the encroachment of modernity. As Uncle Abraham, a former village chief (*toshao*), told me one evening as we sampled a freshly brewed batch of the drink, '*parakari* is our traditional way; *our culture is sheer parakari*'. The passion in the *toshao*'s voice was palpable. More than 'merely' a biochemical or technical phenomenon, fermentation—along with the alcoholic drinks produced via the process—might also be regarded as a mode of political resistance and cultural continuity in the face of external change and transformation.

Important lessons can be learned by paying greater anthropological attention to indigenous fermentation technologies, a subfield we might tentatively term 'ethno-zymology'.¹⁶ In so doing, we may begin to reveal something of the complexity and sophistication of indigenous Amazonian theories of the microbiological domain, and associated notions of society, history, ecology, and cosmology. Fermentation, at one and the same time a sociotechnical and ecological system, constitutes a central arena in which these fundamental social and cosmological relationships and tensions come to the fore and are played out.

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¹⁶ Zymology being the science of fermentation as a biochemical process.

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