ELSEVIER

Contents lists available at ScienceDirect

Social Science & Medicine

journal homepage: www.elsevier.com/locate/socscimed



Purging and the body in the therapeutic use of ayahuasca

Evgenia Fotiou^{a,*}, Alex K. Gearin^b

- ^a Kent State University, Department of Anthropology, 750 Hilltop Drive, Rm. 221 Lowry, Kent, OH 44242, USA
- b Xiamen University, Department of Anthropology and Ethnology, 422 Siming South Rd, Siming District, Xiamen, Fujian Province, 361005, China



ARTICLE INFO

Keywords: Amazonia Australia Ayahuasca Body Purging Healing Emotion

ABSTRACT

Ayahuasca is a psychoactive plant mixture used in ceremonial contexts throughout Western Amazonia. Its use has expanded globally in recent decades and become popular among westerners who travel to the Peruvian Amazon in increasing numbers to experience its reportedly healing effects. Through a review of relevant literature on Amazonian shamanism, combined with the authors' ethnographic data from shamanic tourism contexts of the Peruvian Amazon and neo-shamanic networks in Australia (collected between 2003 and 2015 – with a total of 227 people interviewed or surveyed, including healers and participants), we demonstrate that purging has been integral to the therapeutic use of ayahuasca across and beyond Amazonia. Therapeutic approaches to ayahuasca point to combined modulations of the gut and the mind, and the bodily and the social, that are expressed through discourse about healing and the body. Relating ethnographic evidence to recent scientific studies that connect the gut to emotional health, we do not approach the gut as merely biological ground on which cultural meanings are imposed, but rather as simultaneously physical and cultural. Based upon our analysis, we argue that ayahuasca purging should not be dismissed as a drug side effect or irrational belief but reconsidered for its potential therapeutic effects.

1. Introduction

Ayahuasca is a psychedelic plant mixture consumed in the form of a brew, prepared from the stems of the jungle liana, Banisteriopsis caapi most often combined with the leaves of Psychotria viridis or Diplopterys cabrerana to produce visionary and purgative effects (McKenna et al., 1995). The Banisteriopsis caapi vine is indigenous to western and northwestern Amazonia—used ceremonially by several indigenous groups as well as mestizos (of mixed European and indigenous descent)—but its use has expanded globally attracting western visitors to Amazonia (Fotiou, 2016) as well as circulating in neo-shamanic circles in Europe, North America, and Australia (Labate et al., 2017). A review of first-person accounts soon reveals ambivalence toward the ayahuasca experience. Characteristically, anthropologist Michael Taussig writes, "taking yagé is awful: the shaking, the vomiting, the nausea, the shitting, the tension. Yet it is a wondrous thing, awful and unstoppable" (1987, 406). Usually unpleasant physical effects are followed or accompanied by overwhelming visions. Although physical purging is an important aspect of the ayahuasca experience itself, a variety of other purgative plants, including tobacco, are utilized to prepare the body for the ayahuasca experience, or to heal it by expelling what is causing imbalance in the body. These practices are deeply connected to Amazonian conceptions of the body and play a central role in the more recent globalized therapeutic use of ayahuasca.

The ayahuasca brew requires the presence of at least the two aforementioned plants in order to produce a visionary effect. The active hallucinogenic substance is N,N-Dimethyltryptamine (DMT), which is present in several plants, is not orally active, due to inactivation by peripheral Monoamine Oxidase (MAO) in the human gut and liver (Shulgin, 1976; McKenna, 1984). It can however become orally active if administered with a MAO inhibitor—such as harmine and other β -carboline alkaloids present in *B. caapi* (Rivier and Lindgren, 1972; McKenna, 1984). The MAO inhibitors in the brew have been associated with its purgative effects, and since the brew is consumed among westerners primarily for its visionary effects, purging is sometimes approached as a side effect as opposed to being central to the experi-

This paper contributes to the anthropology of the body and embodiment by focusing on the gut as a mediator between nature and culture. Taking steps towards an anthropology of the 'gut', Thomas Cousins considers how the "stomach, intestines, colon, and enteric nervous system that envelops them" mediates not just foods and drugs, but that it may simultaneously reproduce social relations through such mediation (2015, 2). Cousins tells the story of a KwaZulu-Natal laborer

E-mail addresses: efotiou@kent.edu (E. Fotiou), akgearin@gmail.com (A.K. Gearin).

^{*} Corresponding author.

in South Africa who described battling an ill-causing translucent snake in his belly that was believed to be sent by jealous kin wanting to kill him because of his job and earning. Along with seeking help from a faith healer, he treated his malady by purging the snake with various emetic substances (Cousins, 2015, 7). By thinking with the gut and approaching the "boundaries that define kin relations as irritable, permeable membranes, one facing the self and the other facing out", Cousins explains that the laborer's "actions on his gut influence the neuronal, immunological, and microbiological milieus in which a vision of an ethical self and harmonious (or at least livable) kin relations are effected" (2015, 15). Local tropes of bodily strength, power, and capacity simultaneously bring together the bodily mediation of gut materials and the kinship boundaries of relatedness. Such an approach to the gut considers not simply the tropes and narratives about substances ingested, but also "what is doing the ingestion" (2015, 13). By examining the gut as a "zone of exchange between nature and culture" (2015, 17), situated experiences, tropes and narratives of purging may be considered in greater proximity to biological processes.

From a physiological point of view, scientists have suggested ayahuasca vomiting is a result of higher levels of serotonin, particularly in the gastrointestinal tract, which can cause direct stimulation of the vagus nerve, as well as diarrhea (McManis and Talley, 1997). Permeating the digestive tract of the body, the enteric nervous system is a complex biochemical and anatomical network that may function independently of the central nervous system. Its complexity and ability to function independently have lent it the title 'the brain of the gut' or the 'second brain' (Wilson, 2004, 101). Various types of bidirectional communication have been observed between the gut and the brain, including communication from the gut to brain areas of higher cognitive functioning, such as those associated with intuitive decision making (Mayer, 2011). These observations suggest a biological basis to the common trope of "gut feelings" or the idea that intuitive thinking is lodged in the gut. Both top-down and bottom-up modulation of stress and emotion between the gut and the brain have been reported in preliminary observations (Mayer, 2011). Furthermore, changes in the composition of gut microbiota may be associated with various mood and neurological disorders, including depression, and anxiety (Kim et al., 2018; Pearson-Leary et al., 2019). Some research suggests that yoga can alleviate depression by stimulating the vagus nerve, which is linked to gut microbiota (Breit et al., 2018). The action of ayahuasca on the gut and the potential relation of this to the brain has yet to be examined in any depth. Brain scans of people under the effects of ayahuasca have revealed neurological modulations associated with emotion, memory, imagination, and intention (de Araújo et al., 2012). The bidirectional modulation of stress and emotion between the brain and gut, along with the link observed between sensory neurons in the upper gut and striatal dopamine release in the brain (Han et al., 2018), suggests the possibility that beliefs and discourse surrounding the use of purgatives in Amazonian pharmacopeia may work to modulate and give tangible expression to the gut-brain axis.

Drawing upon Shweder (2004, 83), this paper employs the notion of emotion as a complex of particularities (e.g. guilt, sadness, envy, and love) that relate to various combinations of feelings, beliefs, wants, and values. Circumventing anthropological approaches to emotion that employ detailed person-centered narratives or biographies and aim at cultural diversity, difference, or change (see Beatty, 2013), we undertake an expansion and generalization aimed at consistency in the relationship between the gut and emotion across disparate cultural locales of ayahuasca use. The approach resonates with Maurice Bloch's reminder that cultural and social processes are inherently transformative and therefore that which is resilient to change and diversity may be particularly "odd", exceptional, and significant to social analysis (Bloch, 2013).

Sometimes referred to among Amazonian peoples as the cinema of the jungle (Calavia Saéz, 2014, xxi), ayahuasca has become renowned for its ability to promote mental imagery or visualization during the acute period of inebriation. Phenomenological reports of ayahuasca drinking often involve enhanced emotional states and conflations of mind and body that entangle mental imagery and interoception. An imaginative mental perception of bodily processes, married with an enhanced visceral disposition, can intimately bring together the gut and emotion during ayahuasca experiences. Ismael Apud says that "vomiting sometimes seems to be related to a basic psychological-bodily mechanism of contents expulsion, when the visionary experiences become uncontrollable or the contents that appear to the consciousness are extremely chaotic, conflictive, or unpleasant" (2015, 15). Among avahuasca drinkers we interviewed or spent time with, it was relatively common to hear that ayahuasca purging helps expel or discharge troubling, stagnant, or negative emotions from the body. While many elements of indigenous Amazonian shamanism have hardly been adopted by neo-shamanic, western ayahuasca drinkers-such as sorcery, perspectivism, and the moral ambiguity of spirits—the idea that ayahuasca purging involves the bodily purification of a negativity that has an emotional resonance, appears to have traveled extremely widely. This is possibly related to the long-standing appeal of similar ideas in western cultures.

The idea of emotional renewal and restoration through purgation is not new. Catharsis (from the Greek κάθαρσις, katharsis, meaning "purification" or "cleansing") is the purification and purgation of emotions—particularly pity and fear—through theater and literature. It is a metaphor originally used by Aristotle in Poetics, comparing the effects of tragedy on the mind of a spectator to the effect of a cathartic on the body. For Aristotle, the function of tragedy was the purgation of emotions, but he gave no further explanation (Aristotle and Janko, 1987, xvi). Jacob Bernay compared this catharsis to the "healing of people suffering from hysterical outbreaks of emotion," whereby aroused emotions can be released (Aristotle and Janko, 1987, xvi). Aristotle argues that the same feelings that might be unpleasant in real life might bring about pleasure in the context of tragedy (Aristotle and Janko, 1987, xvii). He considered emotions important in taking correct decisions and forming a correct character when one has the correct emotional reactions toward a given situation. Thus, he argued, poetry and tragedy can teach humans the correct emotional reactions through representation (Aristotle and Janko, 1987, xviii). Aristotle considered catharsis an integral part of poetry from which everyone—not just those with emotional problems—can benefit (Aristotle and Janko, 1987, xix).

The notion of catharsis was first employed in psychology by Sigmund Freud's colleague Josef Breuer as part of a hypnosis treatment for hysteria. Patients were directed during hypnosis to encounter and express repressed and forgotten distress in a "cathartic" approach to psychotherapy. While Freud largely dropped the cathartic model in favor of his psychoanalytic approach, Breuer's early approach inspired a range of cathartic psychotherapeutic techniques during the 1900s, including psychodrama, primal therapy, and emotion-focused therapy. Cathartic psychotherapies typically employ an "hydraulic" model of emotion (Scheff, 1979, 49) that portrays socialization as suppressing the emotional expressions of individuals. The analogy of a fluid of suppressed emotional material building up in the body is often employed in this model. When the reservoir of fluid gets too large, the individual uncontrollably discharges it, as represented by anger or crying outbursts. We agree that the hydraulic model of emotion is certainly not an encompassing explanation of emotional functioning (Solomon, 2008). The view that socialization suppresses emotion into a "pressure-cooker" scenario cannot account for indigenous and neoshamanic models of emotion and purging with ayahuasca. However, as our analysis and fieldwork demonstrate below, the notion that ayahuasca amplifies and discharges emotion and invisible substances or entities from the body appears to fit a variety of emic descriptions of ayahuasca purging. Indigenous medical systems and beliefs regarding the body have often been approached by scholars as symbolic or magical despite their clear empirical basis. Here we argue that beliefs about purging the body both among Amazonian peoples and western

participants are not merely symbolic but are pragmatic "material semiotics of life" (Cousins, 2015, 17) that stem from empirical processes. Anthropologists have previously argued that "pragmatic and symbolic reasoning are not mutually exclusive" (Laderman, 1981, 468) and ethnographic evidence from ayahuasca shamanism suggest this as well. Therapeutic approaches to ayahuasca point to combined modulations of the gut and the mind, the bodily and the social, and the natural and the cultural that become entangled in visionary perception and visceral bodily sensations as part of the healing process. We will discuss how the body and purging are conceptualized in native Amazonian cultures and other contexts within Latin America as well as contemporary avahuasca neo-shamanism demonstrating the cross-cultural appeal of the idea that healing comes from purging negative things-including emotions-from the body. We echo the assessment of others who discussed purging as a meaningful activity, "performed and understood by socially and historically constituted embodied persons" (Lea, 1999, 15) and aim to expand scholarly understanding of these healing practices.

2. Purging and the body in indigenous medical systems

Although a biological process, purging is loaded with symbolic meaning cross-culturally. The idea that balance or equilibrium in the body is central to health is the most widespread medical belief crossculturally and health and vitality is often restored through medicinal plants (Choffnes, 2016, 3; Schaffler, 2009, 7), some of which are purgatives used to expel what causes imbalance. Notably, there is a lack of clear separation between body and emotion in native medical systems that emphasize the importance of physical, emotional and spiritual balance for wellbeing. For some Amazonians, the body is where emotion and even knowledge live (McCallum, 1996). The concept of energy is also a key metaphor in Amazonia and is related to the soul, power, desire, and intention. Power is thought to reside in the human body and is affected by the ingestion or expulsion of substances. Object intrusion is considered a common cause of illness and is often considered to be the consequence of malevolent intent and ascribed to sorcery and witchcraft. Healing often involves sucking foreign objects from the patient's body and spitting them out. While healing involves active manipulation of these principles, there is a variety of remedies for purposes beyond healing. The Iquito used to use Banisteriopsis caapi and Potalia amara to cleanse the body of impurities (Jernigan, 2011). Tobacco is used by the Arakmbut in healing to expel harmful spirits—which do not like bitter substances—from a patient's body (Gray, 1997, 71). Similarly, the Barasana theory of the body "places extreme value on the regulation of exits and entrances" (Hugh-Jones, 1979, 119) with purging being an important component. Among the Matsigenka a variety of "emetics, purgatives, hallucinogens, and other toxic (kepigari) plants purify the soul and expel pathogens from the body" (Shepard, 2004, 260). In some cases, hunters recover their aim by taking special purgative, emetic, and hallucinogenic plants, purifying their body-soul and reestablishing contact with the guardian spirits (Shepard, 1998).

While these processes are utilized throughout a person's life, they are instrumental in shamanic apprenticeships during which knowledge and power are embedded in the shaman's body. For the Achuar, shamanic apprenticeship involves "a change in the ecology of his physical system" (Descola, 1997, 338). This is achieved through "ascetic discipline" involving purging and a strict diet (Descola, 1997). At the end of the Desana shaman's training, a closing ceremony leaves the knowledge acquired dormant in the initiate's body; therapeutic spells are placed in his brain, while evil ones in his belly (Buchillet, 2004). A similar process is present with the shamanic phlegm and *virotes* (darts) found among the Shuar as well as mestizo shamans in the area around Iquitos today, who still practice purging, fasting and sexual abstinence during their apprenticeship. Jauregui et al. in a study during which 29 curanderos were interviewed in East-Central Peru, list 21 plant species that are used in initiation for their purgative, laxative, anthelmintic,

and emetic properties (2011). They are taken in the first phase of the initiation diet during which the initiates go through a purgative process, a journey to the underworld inhabited by the shacharunas and yacurunas (nonhuman persons). According to the authors, "in this period, deep fears, traumas, and negative patterns of the personality emerge and the initiates have to confront them and go through this by themselves. It is a process by which the initiates expand their consciousness with regard to themselves and the world around them" (Jauregui et al., 2011, 746). Tobacco among other plants is used to "physically and spiritually cleanse the initiates of negative energies that they have accumulated during their lifetimes" (Jauregui et al., 2011, 746). Many other plants are taken with the aim to purify the circulatory system since blood is a "potential storehouse of physical and spiritual impurities" (Jauregui et al., 2011, 747). This is followed by the consumption of plants that enhance the initiates' intuition and others to strengthen body and spirit (Jauregui et al., 2011).

These ideas are widespread among other Latin American medical systems. In the Andes, the use of purgatives and laxatives, to literally "expel" evil spirits is also very common (Bussmann and Sharon, 2014). The word "purgas" denotes plants that "acting as drastic purges, are claimed to be useful in expelling "bad spirits" from the patient body" (De Feo, 2003, 252). The Qollahuaya Andeans who have a hydraulic model for understanding the physiology of the human body, use a variety of carminatives, emetics, enemas, fasting, dietary restrictions, and baths to eliminate accumulated secondary fluids (Bastien, 1985). Andean groups also use a variety of plants for their purgative effects either as a standalone treatment or as preparation for other treatment (Armijos et al., 2014). The San Pedro cactus (Echinopsis pachanoi) is one of these purgatives and is known to cause emotional release in the form of tears (Armijos et al., 2014, 7). Purgatives are also used in Dominican Creole medicine to expel "bad fluids and agents from the patient's body" (Schaffler, 2009, 3) based on a hydraulic model of the human body that places great importance on keeping the blood clean. Disequilibrium within the body and several diseases considered the result of "bad blood" are treated with purgatives (Schaffler, 2009).

Finally, purgatives are at the center of the therapeutic process at the addiction rehabilitation center Takiwasi, located in the Peruvian Amazon, which has been combining western psychotherapy with Amazonian shamanic techniques for decades. "Purges" (purgas) are administered collectively and they are considered to deliver physical, mental and emotional catharsis (Giove Nakazawa, 2012). After drinking the juice of a purgative plant, a large amount of water is drank to initiate the vomiting. Each plant is considered to have its own spirit, which gives rise to the specific uses for the plant as well as its own curative songs (Bourgogne, 2012). Purgahuasca ceremonies are administered for recovering addicts every two months. The ritual is a revival of an Awajun ritual, and the brew administered is a diluted decoction of banisteriopsis vine and a few leaves of Diplopterys cabrerana, which along with intense vomiting causes dizziness, shaking and sweating (Horák and Torres Romero n.d.). The ceremony coupled with psychotherapy "permits to convert its symbolic content to the concrete and behavioural" which is an important process in the rehabilitation of the patients (Horák and Torres Romero n.d., 6). Both therapists and ceremony participants agree on the therapeutic value of purging not only as an aid to the detoxification process, but also as a way to "release tensions, physical blockages, and psychological burdens, inducing a subjective feeling of relief, inner peace, and mental clarity" (Loizaga-Velder, 2013, 37). Considering George Foster's argument on the influence of European humoral medicine-emphasizing maintaining bodily equilibrium of humors through purging-on Latin American medical systems (Foster, 1987), the parallels and continuities discussed thus far are not surprising.

3. Methods

This paper is based on ethnographic research on shamanic tourism

in Iquitos, Peru, a large city in the Peruvian Amazon, as well as ayahuasca ritual circles in Australia. Fotiou collected data between 2003 and 2015 in and around Iquitos working primarily with mestizo ayahuasqueros (specialists working with ayahuasca) or curanderos (the word for healer in Spanish) who work with western visitors as well as locals. Iquitos was chosen as a research site because as a gateway to the eco- and shamanic tourism in the area it provided a locale where shamanism is reinvented as local shamanic practices converge with western ideas of spirituality and healing. Some of the data discussed here were collected in specialized ayahuasca retreats catering to tourists located in the jungle near Iquitos. These retreats lasted 10 days each and involved participation in avahuasca rituals every other day and following a specific diet throughout. Participants were mostly from the United States and Europe, who traveled to Peru specifically to participate in ayahuasca ceremonies. Some of them were experienced ayahuasca partakers while others were trying it for the first time. The ceremonies were led by what we call shamans, although this is not the traditional word for this type of practitioner in the area. We acknowledge that the term "shaman" is problematic (Atkinson, 1992), however we still use it here since it has become commonly used among Peruvians as well as western visitors although often used in Spanish—chamán. The most appropriate term for the Peruvian context would be ayahuasquero, which denotes a healer who specializes in ayahuasca ceremonies. In addition to attending 60 ceremonies, Fotiou worked closely with some of the ayahuasqueros and observed the preparation of ayahuasca. The number of ceremony participants ranged from 2 to 20. She observed ceremonies with nine shamans, seven male and two female and conducted 82 semi-structured interviews. Most shamans were mestizos-of mixed descent-with only two being Euroamerican who had apprenticed with mestizo shamans in the area. Among the people interviewed were 60 males and 22 females and their ages ranged from 20 to 61 years. Thirty-six were from the United States and Canada. Thirteen were Peruvian and the remaining were mostly from Europe. They came from a variety of backgrounds with some being middle class professionals. At least 23 said they never tried other hallucinogens before ayahuasca. The author used snowballing techniques to recruit participants and interviews lasted from 30 to 120 min and were subsequently transcribed and analyzed to identify common themes, which were compared to data from participant observation as well as against the literature. The original research questions were about the participants' motivations and the ways that they conceptualized ayahuasca shamanism. The data showed that the main motives of western visitors for pursuing ayahuasca experiences were healing and personal transformation with purging playing a central role in both processes as we discuss in the following section.

Gearin conducted fieldwork during 2011–2014 among neoshamanic ayahuasca circles in Australia. He began his research examining how the narratives of spiritual crisis and healing that ayahuasca drinkers describe after ceremonies of drinking ayahuasca represent a process of rearticulating everyday ethical commitments. This developed into an analysis of how the body and the senses provide the grounds for an ecstatic reorganization of everyday ethics framed in terms of spiritual illness and healing. He attended 30 ayahuasca ceremonies, conducted 40 unstructured interviews, and collected an Australian-wide email questionnaire which received 105 qualitative responses. He attended one particular network's ceremony retreats primarily while also attending five other retreats that are each conducted by different ritual specialists. Drinkers were predominantly of Anglo-Celtic and European descent; average age was 35-45 (range 18-76); average annual income AUD \$66,000; dominant occupations included 32% therapists, healers, or health related services, and 17% artists or musicians; and 28% were self-employed. The participants attended ayahuasca ceremonies, on average, once every three months. Two-night retreats cost between \$320 – \$550. Given the drinking of ayahuasca is currently criminalized in Australia, no informants or locations have been named. The ayahuasca ceremonies included between 15 and 70 persons and were conducted at various locations on the east coast of Australia. The data in this article is drawn from the oldest ayahuasca network in Australia that is intimately connected to shamanic tourism in Iquitos and Pucallpa in Peru. Ayahuasca ceremony specialists in Australia train with Peruvian shamanic practitioners who sometimes travel to Australia to conduct ceremonies.

The human research protocol for this research was approved by the University of Wisconsin – Madison and Luther College Institutional Review Boards (IRB) as well as the University of Queensland, Human Research Ethics Committee (HREC). Informed consent was obtained by all participants.

4. Purging and the body in ayahuasca tourism and neoshamanism

The use of ayahuasca in the shamanic tourism milieu of Iquitos, Peru and the neoshamanic networks of Australia involve important differences. The close encounter between western medical tourists and indigenous or mestizo healers in Peru represents a different social space compared to the Australian context where indigenous Peruvian shamans travel to occasionally conduct rituals. In Australia, the individuals leading ceremonies-often called "facilitators" and specifically "not shamans" (Gearin 2015)—have usually undergone some level of training in Peru, Brazil, or Colombia with indigenous ayahuasca specialists. The Australian ceremonies may be defined by a greater sense of social belonging, or an attempt at "community", given that many individuals attend the events approximately every two months and in an ongoing fashion. In Peru, aside from international visitors apprenticing to become ayahuasca facilitators or undergoing more long-term healing regimes, most ayahuasca drinkers are visitors staying for several weeks in the area. For the purpose of this article, we circumvent these differences to focus on the bodily acts of ayahuasca purging across the two related, but different, milieus. We highlight important similarities across these locales and trace dominant therapeutic modes of avahuasca purging that are emerging in the context of the globalization of avahuasca. Our data shows that at both locations, purging rather than a side effect of drinking the brew is approached by participants as playing a central role in the process of healing. As others have noted, medicines travel from one place to another and they transform as well as get transformed by local contexts (Reynolds-Whyte et al., 2003). In the case of ayahuasca as it traveled to locales outside of Amazonia, discourse about purging traveled with it, although unlike Latin American medical systems that often focus on removal of objects placed there by sorcery, western discourse tends to be more psychological and individualist in focus. In both cases, our data show that purging, far from being a merely natural act, is culturally meaningful and carefully managed.

Physical purification is thought to be instrumental to healing and not only is it a part of the ayahuasca experience itself, known in Peru and elsewhere as purga (purge), but it often precedes ayahuasca ceremonies by means of a restricted diet and administration of other plant purgatives. This purging is perceived as spiritual, as well as physical cleansing, where "inner" and "outer" levels of perception, such as bodily processes and ecstatic visions, become entangled. The act of vomiting in avahuasca ceremonies can become infectious and shape other participants' visions through various synesthetic registers and thus the bodily act may extend to an immediate social field in ways that are typically not possible without drinking ayahuasca. Ayahuasca purging, drinkers explain, is a means of purifying and healing a polluted mind and body of afflictive psychic entities, substances, emptiness, past experiences, and states of being. While vomiting is perhaps the dominant bodily technique (Fotiou, 2019) of purging, people reported that yawning, crying, sweating, fever, burping, moaning, defecating, and physical contortion are parallel mediums of ayahuasca purging. These bodily acts are typically described as being uncontrollable.

Certain dietary restrictions, which are beyond the scope of this article (Fotiou, 2018; Gearin and Labate, 2018), aim to purify the body and mind before the ceremony. In the Peruvian Amazon purgative

plants are often used on the morning of the day of an ayahuasca ceremony. These plants induce vomiting or diarrhea or both. A popular purgative is the latex of the *ojé* plant (*Ficus insipida Willd.*), which is mentioned in the literature as a powerful plant teacher (Luna, 1992). *Ojé* is quite toxic and its ingestion is accompanied by drinking copious amounts of water, to induce powerful purging. Fotiou has also witnessed a mestizo healer administer *piñones blancos* (probably the nut of the *Jatropha curcas* L.), to a large group at an ayahuasca retreat. Most people retired in their individual rooms but throughout the day purging sounds were audible throughout the camp. The healer said that she did this so people would have less to purge during the ceremony and suffer less. A similar practice is reported by Langdon among the Siona who use emetics to make the body lighter before ayahuasca ceremonies (1992, 56).

Fotiou's own experience with purgation is also typical of the way purgative plants are used alongside ayahuasca in contemporary ayahuasca retreats. In 2015, she was in Iquitos ready to head to the jungle to begin a series of ayahuasca ceremonies with a shaman, when her purse containing her passport was stolen on the night before leaving for the jungle. Interpreting this in the context of sorcery attacks he had been experiencing, the ayahuasquero determined that shamanic intervention was warranted. They were collaborating on a book and he was concerned that their work was not welcome by other healers in the area. He decided that a powerful purging followed by a protective bath was necessary to cleanse and fortify her body against future attacks. The protective bath contained tobacco, toé leaves and patiquina negra, which is generally known in the area to be a protective plant (see Fig. 1). To induce the purge, he procured ojé, which is often ingested to get rid of intestinal parasites. A mestizo healer also present emphasized that after the cleanse her body would "glow" and feel stronger. For him none of this was a metaphor, as such beliefs are often approached in the literature but was based on his own experimentation with plants and the effects he had observed in his own body. Taking such local knowledges seriously has been a persistent call in recent anthropological literature (Daly et al., 2016; Daly and Shepard, 2019). The ethnographer following the healers' instructions, ingested the resin of the ojé tree and spent the rest of the day by the side of a creek drinking several gallons of water, which induced vomiting and diarrhea. By late afternoon she was exhausted and hungry, after which she rested and had a light meal. This was followed by several ayahuasca ceremonies over the next few days. Ritual specialists in Australia rarely incorporate extra purgative plants into their retreat service. Although the emphasis on purging is most likely not universal throughout Amazonia-a researcher working with the Napo Runa has not found it to be the case (Highpine 2012)—it is central in Peruvian shamanism where these data



Fig. 1. Preparing a ritual bath with patiquina, tobacco and toé leaves.

were collected.

Purging during the ceremony is also extremely important and central in many testimonies or reports of ayahuasca experiences, some of whom report the feeling of purging negative things that have accumulated in the body over years, often referred to as "psychic garbage." When asked, one of the participants in Peru said that he kept the medicine down as long as it was still medicine and he vomited when it stopped being medicine. Another participant said that in one of the ceremonies when she tried to vomit it felt like giving birth to a strange and ugly creature from the mouth. Another shared that when she vomited, she saw spirits that were encouraging her and sometimes seemed to be waiting to collect what she vomited.

Descriptions of the putative content of ayahuasca purging may vary considerably. A common theme of descriptions of ayahuasca purging was the expulsion of past traumatic experiences. Drinkers describe "letting-go", "releasing", and "unblocking" past experiences and healing trauma through the act of ayahuasca purging. In both milieus, there was an emphasis on purging sexual abuse, domestic violence, and social or familial disagreement and disorder as well as addictive patterns or negative aspects of one's personality. Medicines make disorder and its correction tangible (Reynolds-Whyte et al., 2003) and in the case of ayahuasca, the physical fluids of purging—whether vomit, sweat, tears, or feces—act as media for emotional release and they may index a complex variety of etiological themes.

Often the purged fluids were described as containing types of afflictive residue linked to family histories. Mary, an Australian graphic designer and art therapist in her 30s, described an experience of ayahuasca purging where she "cleared out four generations of past conditioning" lodged in her "cells and body". She explained that ayahuasca "gave me answers to things like life purpose, how the spirit world connects to the physical world, and massive purges of past generations of conditioning". She situates the act of "clearing" family "conditioning" from the body as a paramount healing act that can also be achieved through the sober and spontaneous creation of art framed also as a kind of bodily release. Similarly, people may describe purging the spirit of other people from their own body. For example, Rachel, an Australian I.T. software developer in her 40s, described:

Most of my vision centered around my mother and maternal concepts. I had an amazing vision of being connected to a long line of maternal ancestors and they were supporting me and passing down wisdom. When I was purging, I asked the question what I am trying to get rid of and it was my mother.

Other less common descriptions of the contents of purging included residue from pharmaceutical medications, effects of media or news programs, electromagnetic radiation, non-organic or "artificial" foods, and sometimes simply put as "toxins from society". These minor themes reflect a broader emphasis on cultural critique in the ethnomedical system of ayahuasca neo-shamanism (Gearin, 2016). For example, in a ceremony held in Peru, in which a young man purged more than anyone else, on the following day participants commented that having recently arrived from a "problematic lifestyle" in Europe, that he was still carrying a lot of negativity that he needed to purge.

Ayahuasca visions and the other altered sensory modes of the inebriation are not necessarily separated from bodily processes of purging and may dynamically integrate and inform each other in a phenomenological whole. Sometimes narrative accounts of ayahuasca purging involved altering meaning as well as personal narratives of the participants—psychotherapeutic processes that have been found to be part of ayahuasca inebriations by several researchers (Wolff et al., 2019). For example, Richard, a Caucasian Australian academic in his 50s, described an ayahuasca healing experience in which he was physically sitting on a toilet defecating while having visions of defecating on his father who had never accepted or approved of his homosexuality. Drinkers describe experiencing a rise in psychoactive effects or visions during processes of purging, and some drinkers describe visualizing

what is being purged. For instance, Kathy, a Caucasian self-employed Australian healer and artist in her 20s, explained:

You are extremely uncomfortable in your skin, often feel like you cannot breathe and you are being subjected to some form of torture. Though it feels extremely cathartic once it has been released and then you become relaxed. The more subtle states such as nose running, eyes watering, comes when the body or mind is releasing something out of what we are consciously being shown.

Similarly, sensations of the skin and whole body may be incorporated in the act of purging.

A 35-year old Peruvian graduate student described it like this:

During the vomiting, I felt like my skin had turned red and bat wings had appeared in my back. When I vomited, I felt like I was cleansing myself and throwing out all the shit I had inside: physical, emotional, psychological. I kind of saw that when I vomited, during the act of vomiting, my skin turned from red to pink and then white, I wanted white, so I wanted to vomit, I didn't want to be a 'demon', I wanted to be an 'angel' ... I could feel the shit been sucked from my toe, coming up and accumulating and then thrown out to the bucket. I wanted to be white, not red.

Ayahuasca purging was approached by drinkers as a catalyst for healing and positive psychological transformation and the stage where all this happened was the body. Shamans encouraged participants to sit up during rituals to help the energy flow in their body and to prevent them from falling asleep. In one retreat, several suggestions were offered in the booklet provided to the participants giving instructions on manipulating or grounding the energy in their body. The notion of "straightening" bodily energy was a major goal of taking ayahuasca. An American ayahuasquero in his 30s working in a retreat center in Peru that focuses on transformative psychological work explained their philosophy as follows. Both light and darkness, coming from fears, traumas, fright, and negative thoughts, exist in the human body, with the darkness usually hiding the light. The body's energy becomes "crossed" (cruzada) from anger or negative thoughts that people hold onto. It is important for one to "straighten their energy" (enderezar), which was seen as a long-term process and participants were encouraged to establish straightening their energy as their intent before rituals. This was perceived as the foundation for healing and personal transformation. They claimed that it is not the ayahuasca that makes one nauseous and sick, but rather the negative things residing in the body, such as anger, fear, sadness and depression, which are resisting leaving the body.

We foreground emotional regulation as one of the most common therapeutic techniques or outcomes of purging. This regulation may include varied emotional expressions and is part of an overall therapeutic goal of reducing distress and suffering through the often-challenging act of purging. Crying during ayahuasca ceremonies was understood as a particularly powerful means of purification because it sharply targets an emotional level. Descriptions of purging involve, as one Australian explained, the "purging of stored emotion, bad energy, sickness in the body". It is generally thought that once a bout of purging is over, avahuasca may take the person to an ecstatic state; a state that is physically easier and during which helping spirits, spiritual medicine, and positive qualities may enter the body. This is sometimes framed as a gift from ayahuasca for doing the challenging personal "work" of purging. People described experiencing the most beautiful, ecstatic, and pleasurable experiences emerging immediately after purging. This phenomenological dynamic may point to a rebound effect in which the depths of emotional suffering or distress encountered during purging may encourage an equally strong encounter with the heights of pleasurable ecstasy afterwards.

Such discourse about the body informed the ways that purging was sought and encouraged in this context. In retreats in the Peruvian Amazon, during ceremonies participants were invited to be active agents in this process by "letting go of anything that does not serve them" and were told that the shamans would handle that energy and send it away. They were also told to think about why they were holding onto something and explore whether it was serving them in some way. For example, it was believed that people often hold on to their anger because some part of them does not want to let it go and once one truly stops wanting it, the anger will go away. Negative emotions were believed to cause cravings that weaken the energetic body. The more one straightens one's energy through ayahuasca the less the body craves things that weaken their energy, such as alcohol, coffee and sugar. One can protect themselves by smudging with sage, meditation and concentration. Human suffering was attributed to the fact that the darkness does not want to leave the body and creates confusion. One Peruvian mestizo healer in her 60s explained the effect of negative feelings on the body thusly:

It's quite known that nobody should hold on to rancor against anyone who insulted us. We shouldn't carry any hatred or remorse. Because this makes us hurt ourselves, day by day, as if you were taking a drop of poison; the same way the body is poisoned by the hatred and the rancor; and from there come all the different types of diseases, even cancer.

The same healer often encouraged participants during rituals to forgive anyone who had hurt or wronged them in any way, so they would release negative feelings from their body. If a participant was having a hard time vomiting, a mestizo healer would urge them to dispose of everything that is not useful (bota todo lo que no vale).

The physical purging of emotional content deemed not serving the person was also framed in terms of afflictive thought and emotion. Sometimes particular parts of the body, such as the digestive tract or abdominal area, were associated with negative emotions and combined mental and physical pathologies. Drinkers may explain that they are not sure of the origins of the bodily illness, adding that it does not matter where the problem came from, but rather if it has been purged. Some drinkers drew causal links between bodily concerns and particular social or personal histories. For example, Nick, an Australian nurse in his early 30s, described purging an embodied trauma of teenage bullying and in doing so releasing "blocked" negative emotion. At the end of explaining this, he specifically linked the challenge of purging to the challenge of expressing grief:

Learning how to cry and not be embarrassed or ashamed or worried about that ... I relate that very closely to the vomiting experience and when I've vomited on ayahuasca. The whole letting vomit out, I seem to have great difficulty with ... I find that it is a very similar thing for me when it comes to being emotional and crying ...

In other cases, descriptions of purging involve a process of learning how to become aware of and change afflictive thought and emotion in daily life. For example, Sally, an Australian self-employed jeweler in her 50s, described:

I would like to share one particular journey, which stays with me as a constant reminder. My intention was to release my inner anger and I spent much of the night outside purging up a huge black snake. When I had finally pulled the last of it from my body, I crawled back into the circle [ceremony space] where the mother [ayahuasca] showed me how the snake was formed. Every nasty little thought can take to seed, and continued, negative thoughts and feelings would germinate and grow that seed into a snake; and one can have many such snakes inside. Whenever I fall into darkness in a challenging situation, the vision of those seeds always comes to mind and immediately I change my perception and feel compassion, forgiveness, acceptance and understanding. Such has been the greatest lesson of my life to date.

In these two examples of purging, the act is described as involving the release of traumatic experience and corresponding afflictive thought and emotion. Here, purging fluids from the body entangles a process of emotional learning. This bodily process is aimed at regulating emotion through purging past afflictions and learning how to frame future afflictions.

The boundaries between individual bodies and minds sometimes blur during ayahuasca purging as people report purging for others. An American shaman who had apprenticed in Peru pointed out that shamans might also deal with things that they need to expel while being responsible for disposing what is being purged by others during a ritual to prevent it from affecting other participants. He said:

Everybody that has negative self-critical voices, low self-esteem, all suffer from the same spirits; and you heal them in the avahuasca sense by expelling those spirits out and those spirits when they come into ceremony they will try to get into another person's head.; and when you are healing them, they will even start talking bad things about you. 'Your medicine doesn't work, you can't heal, what are you doing? This isn't going to work!' That's how they talk; and you grab them, and you expel them. But depending on what's going on in ceremony, those can be in you, that you picked up somewhere throughout your life, transferred energy from some other person, or somebody who said that stuff to you or whatever, it's not difficult to figure out; and as they release, they can go into somebody else. So, the role of the master shaman in the ceremony is to expel them and to not let them go into the head of anybody else. So, there is no transference of dark energy that is coming out of people's bodies they are purging in ceremony.

Drinkers sometimes described purging for other people who were present, or in some cases not present, at the ceremony. Sometimes they describe feeling a kind of group psychic dynamic and contributing or helping others purge. For example, multiple drinkers at one retreat in Australia reflected on feeling a "sexual abuse" energy that everyone was "holding space" to help purge during the ceremony. In some instances, drinkers describe purging for groups of people. An Australian woman described purging for all the women in India that have experienced sexual abuse. During this period, the Australian popular media was reporting an increase in sexual abuse in India. For another example, Paul, a Caucasian Australian mechanic in his 30s, described:

The purge is the best part. I love a good purge, spew, shit, yawn, laughing, tears. It most certainly removes unwanted energies. I have even purged for other people in my journeys. Once I felt I purged for the indigenous peoples of this land. I have so much gratitude for the experience.

In these relational modes of purging, the body comes to represent a medium of and for the social, yet this medium is defined by narrative acts orated, ultimately, by the individual who undergoes the ayahuasca healing. The individual's "intentions" that he or she cultivates during the "dieta" period before an ayahuasca ceremony are linked to the visionary content of ayahuasca inebriation on the level of the body and

While uncommon, some ayahuasca ceremony specialists in Australia explain that vomiting is not a necessary or a recommended therapeutic technique of drinking ayahuasca. In one of these groups, a ceremony specialist explained that he witnessed people receive profound healing without vomiting, stating also that LSD and MDMA psychedelic therapy can occasion equal types of healing without purging. During the introduction and welcoming talk at the beginning of his ceremony, he informed the participants that everyone has a bucket present "in case you cannot make it to the toilet or outside", implying that vomiting is best done outside the circle. In contrast, one of the authors has heard other ceremony specialists in Australia state, "if you are not purging then you are not healing". The ceremony specialist that rejected the need to vomit with ayahuasca also distanced himself from indigenous ayahuasca practices, describing them as "unevolved" and not as sophisticated as "modern" psychedelic healing practices. He

explained that indigenous ayahuasca shamans have only activated the "lower three chakras" (or energy points of the body) and that is why they practice "sorcery and sexual abuse". Civilized people, on the other hand, he explained, have activated seven chakras and are more "spiritually evolved". His rejection of purging reflects a racist ideology of "othering" that draws upon colonial categories of the civilized and primitive. However, based on our data, purging is a dominant therapeutic technique among ayahuasca drinkers in Australia and the resistance to it represents a minor, alternative codification.

5. Conclusion

The ethnographic data discussed above contributes to the anthropology of the body, bodiliness, and embodiment, while presenting possibilities for future multidisciplinary research on the relationship between bodily purging and emotional healing. The anthropology of the body emerged as a series of alternative ways to conceptualize and understand cultural and social realities that relate, but cannot be easily reduced, to Cartesian and biological notions of the body. Scheper-Hughes and Lock (1987) introduced the notion of the "mindful body" to account for lived experiences and phenomenologies of the "body self", "social body"—where the body is approached as a symbol with which to think about nature, society, culture-and "body politic". Al-Mohammad (2011) demonstrated that culturally constructed limitations of embodiment, or the body, have "existential, social and historical import", and the role of the body to culture links the phenomenon to central concerns of anthropology. The anthropology of embodiment-and its common phenomenological back-bone-have been critiqued for focusing too closely on the subjective domains of culture, in what Moran has called "the apotheosis of bourgeois individualism" (2008, 21). However, central to anthropological research on embodiment is the understanding that different socio-cultural lifeworlds are constituted by intersubjective encounters and thus tend towards mutual and shared forms of experience.

We showed that ayahuasca experiences are partially characterized by dramatic acts of purging, vomiting, sweating, and, at times, bodily contortion and defecation, and these acts are codified by drinkers with complex and idiosyncratic meanings of healing and wisdom that have social and cultural import. Drinkers typically explain that ayahuasca experiences are ineffable, and that part of the task is to find new language and ways of "grounding" or materializing the experiences. Bodily processes of purging represent key means by which the meaning of ayahuasca experiences, along with their emotional charge, are materialized and processed. The body provides not simply the semiotic grounds by which articulations of illness and wellbeing are made, but a visceral medium that aims at a deeply experiential expulsion of painful memories, fears, and other afflictions. It is akin to what Michael Uzendoski called "somatic poetry" when discussing his experience after a Napo Runa steam bath when he "went from feeling ill to feeling overwhelmed by extreme heat to feeling cleansed and refreshed" (2008, 18). "Somatic poetry" is thus a process of working through one's imperfections and weaknesses, which are revealed through physical and psychological pain (2008, 19). The altered embodied experience of ayahuasca inspires into consciousness pain or stress that is purged in ways that rearticulate the psychological and social realities of the drinkers. The entangling of corporeal sensations with phantasmagoric visions-and the diversity of things drinkers may see therein-lends a wide degree of potential social and cultural import to ayahuasca purging and its therapeutic processes. Ayahuasca helps make spiritual or psychological maladies tangible, and sometimes visible, and the act of expelling such maladies through purging has been adopted across many cultural contexts of ayahuasca use. The biological constituents of the brew, along with the ceremonial techniques of its use-which are not possible to cover in this short article—inspire dramatic bodily acts of expulsion that effect the sensory neurons of the gut and the social, emotional and psychological vision of the drinker. The ayahuasca vine

entangles social and emotional life through the intensely corporeal experience of purging it often causes.

Finally, the purgative practices we discussed in this article are culturally and socially meaningful while also serving very practical purposes that need to be explored further—for example by analyzing and comparing the microbiome of long-term ayahuasca partakers versus non-partakers. Akin to how the social life of other medicines becomes imbued with practical purpose (Reynolds-Whyte et al., 2003), we speculate that ayahuasca purging involves processes that reinforce links between the gut microbiome and mental health reflected in the scientific literature. While practices of ayahuasca purging may address psychological, spiritual and bodily pollutants—potentially emphasizing one more than the other depending on context—we suggest that they might also serve the practical purpose of altering the microbiome, or engaging the neurological apparatus of the gut, in ways that affect mental health, and thus warrant further multidisciplinary research.

Declarations of interest

None.

Acknowledgements

Research for this article was funded by the State Scholarship Foundation (Idryma Kratikon Ypotrofion: IKY), Athens, Greece (2002–2005), by a Vilas International Research Travel Grant by the Graduate Student Council at the University of Wisconsin – Madison (2003), by an ACM-Mellon Postdoctoral Fellowship (2012–2014) and the Australian Federal Government as an Australian Postgraduate Award (2011–2015). We would like to thank all participants who generously offered their time and insights for this research.

References

- Al-Mohammad, H., 2011. Less methodology more epistemology please: the body, metaphysics and "certainty. Critiq. Anthropol. 31, 121–138.
- Apud, I., 2015. Ayahuasca from Peru to Uruguay: ritual design and redesign through a distributed cognition approach. Anthropol. Conscious. 26, 1–27.
- Aristotle, Janko, R., 1987. Aristotle: Poetics. Hackett Publishing.
- Armijos, C., Cota, I., González, S., 2014. Traditional medicine applied by the Saraguro yachakkuna: a preliminary approach to the use of sacred and psychoactive plant species in the southern region of Ecuador. J. Ethnobiol. Ethnomed. 10, 26. https://doi.org/10.1186/1746-4269-10-26.
- Atkinson, J.M., 1992. Shamanisms today. Annu. Rev. Anthropol. 21, 307-330.
- Bastien, J.W., 1985. Qollahuaya-andean body concepts: a topographical-hydraulic model of physiology. Am. Anthropol. 87, 595–611.
- Beatty, A., 2013. Current emotion research in anthropology: reporting from the field. Emotion Review 5 (4), 414–422.
- Bloch, M., 2013. An Extraordinary Fact. Anthropology of This Century, vol. 7. http://aotcpress.com/articles/extraordinary-fact/.
- Bourgogne, G., 2012. Uso de las Purgas de Tabaco en el Proceso Terapéutico. In: D'Abaddie, R., Mabit, J., Mikaelian, C., Díaz, P. (Eds.), Medicinas Tradicionales, Interculturalidad y Salud Mental: Memorias del Congreso Internacional Tarapoto 2009. Centro Takiwasi, pp. 143–150.
- Breit, S., Kupferberg, A., Rogler, G., Hasler, G., 2018. Vagus nerve as modulator of the brain–gut Axis in psychiatric and inflammatory disorders. Front. Psychiatry 9. https://doi.org/10.3389/fpsyt.2018.00044.
- Buchillet, D., 2004. Sorcery beliefs, transmission of shamanic knowledge, and therapeutic practice among the Desana of the Upper Rio Negro Region, Brazil. In: Whitehead, N.L., Wright, R. (Eds.), In Darkness and Secrecy: the Anthropology of Assault Sorcery and Witchcraft in Amazonia. Duke University Press, Durham, pp. 109–131.
- Bussmann, R., Sharon, D., 2014. Two decades of ethnobotanical research in Southern Ecuador and Northern Peru. Ethnobiology and Conservation 2014, 1–50.
- Calavia Saéz, O., 2014. Foreword: authentic ayahuasca. In: Labate, B.C., Cavnar, C. (Eds.), Ayahuasca Shamanism in the Amazon and beyond. Oxford University Press, New York, pp. xix–xxv.
- Choffnes, D., 2016. Nature's Pharmacopeia: A World of Medicinal Plants. Columbia University Press.
- Cousins, T., 2015. A mediating capacity: toward an anthropology of the gut. Medicine Anthropology Theory 2, 1. https://doi.org/10.17157/mat.2.2.175.
- Daly, L., French, K., Miller, T.L., Nic Eoin, L., 2016. Integrating ontology into ethnobotanical research. J. Ethnobiol. 36, 1–9.
- Daly, L., Shepard, G.H.J., 2019. Magic darts and messenger molecules: toward a phytoethnography of indigenous Amazonia. Anthropol. Today 35, 13–17.
- de Araújo, D.B., Ribeiro, S., Cecchi, G.A., Carvalho, F.M., Sanchez, T.A., Pinto, J.P., de

- Martinis, B.S., Crippa, J.A., Hallak, J.E.C., Santos, A.C., 2012. Seeing with the eyes shut: neural basis of enhanced imagery following ayahuasca ingestion. Hum. Brain Mapp. 33, 2550–2560. https://doi.org/10.1002/hbm.21381.
- De Feo, V., 2003. Ethnomedical field study in northern Peruvian Andes with particular reference to divination practices. J. Ethnopharmacol. 85, 243–256. https://doi.org/ 10.1016/S0378-8741(03)00017-5.
- Descola, P., 1997. The Spears of Twilight: Life and Death in the Amazon Jungle. New Press. New York.
- Foster, G.M., 1987. On the origin of humoral medicine in Latin America. Med. Anthropol. O. 1, 355–393.
- Fotiou, Evgenia, 2016. The globalization of ayahuasca shamanism and the erasure of indigenous shamanism. Anthropol. Conscious. 27 (2), 151–179. https://doi.org/10. 1111/anoc.12056.
- Fotiou, E., 2019. Technologies of the body in contemporary amazonian shamanism: implications for future research. Hum. Ecol. 47 (1), 145–151. https://doi.org/10.1007/s10745-018-0043-6.
- Fotiou, E., 2018. Plant use and shamanic dietas in contemporary Ayahuasca shamanism in Peru. In: Prance, G.T., McKenna, D.J., Loenen, B. de, Davis, W. (Eds.), Ethnopharmacologic Search for Psychoactive Drugs 2017: 50th Anniversary Symposium. Synergetic Press, in association with Heffter Research Institute, Santa Fe, pp. 55–69.
- Gearin, A.K., 2016. Good mother nature: ayahuasca neo-shamanism as cultural critique in Australia. In: Labate, B.C., Cavnar, C., Gearin, A.K. (Eds.), The World Ayahuasca Diaspora: Reinventions and Controversies. Routledge, London, pp. 123–141.
- Gearin, A.K., 2015. 'Whatever you want to believe': kaleidoscopic individualism and ayahuasca healing in Australia. Aust. J. Anthropol. 26, 442–455.
- Gearin, A.K., Labate, B.C., 2018. "La dieta": the western reinvention of indigenous amazonian food shamanism. In: Labate, B.C., Cavnar, C. (Eds.), The Expanding World Ayahuasca Diaspora: Appropriation, Integration, and Legislation. Routledge, London and New York.
- Giove Nakazawa, R.A., 2012. Plantas de fuego en el proceso terapéutico en el Centro Takiwasi. In: Presented at the VII Foro del Consejo Interamericano Sobre Espiritualidad Indígena. CISEI), Buenos Aires, Argentina, pp. 183–190.
- Gray, A., 1997. The Last Shaman: Change in an Amazonian Community. Berghahn Books, Providence, Oxford.
- Han, W., Tellez, L.A., Perkins, M.H., Perez, I.O., Qu, T., Ferreira, J., Ferreira, T.L., Quinn, D., Liu, Z.-W., Gao, X.-B., Kaelberer, M.M., Bohórquez, D.V., Shammah-Lagnado, S.J., de Lartigue, G., de Araújo, I.E., 2018. A neural circuit for gut-induced reward. Cell 887–888. https://doi.org/10.1016/j.cell.2018.08.049.
- Highpine, G., 2012. Unraveling the Mystery of the Origin of Ayahuasca. http://neip.info/texto/unraveling-the-mystery-of-the-origin-of-ayahuasca/.
- Horák, M., Torres Romero, J., n.d. Contribution of the Awajún Culture to the Drug Addiction Treatment. http://www.takiwasi.com/docs/arti_ing/ ContributionOfTheAwajunCulture.pdf.
- Hugh-Jones, C., 1979. From the Milk River. Cambridge University Press, Cambridge. Jauregui, X., Clavo, Z.M., Jovel, E.M., Pardo-de-Santayana, M., 2011. "Plantas con madre": plants that teach and guide in the shamanic initiation process in the East-Central Peruvian Amazon. J. Ethnopharmacol. 134, 739–752.
- Jernigan, K.A., 2011. Dietary restrictions in healing among speakers of Iquito, an endangered language of the Peruvian Amazon. J. Ethnobiol. Ethnomed. 7, 20. https://doi.org/10.1186/1746-4269-7-20.
- Kim, N., Yun, M., Oh, Y.J., Choi, H.-J., 2018. Mind-altering with the gut: modulation of the gut-brain axis with probiotics. J. Microbiol. 56, 172–182.
- Labate, B., Cavnar, C., Gearin, A.K. (Eds.), 2017. The World Ayahuasca Diaspora: Controversies and Reinventions. Routledge, New York.
- Laderman, C., 1981. Symbolic and empirical reality: a new approach to the analysis of food avoidances. Am. Ethnol. 8, 468–493.
- Langdon, E.J.M., 1992. Dau: shamanic power in Siona religion and medicine. In: Langdon, E.J.M., Baer, G. (Eds.), Portals of Power: Shamanism in South America. University of New Mexico Press, Albuquerque, pp. 41–61.
- Lea, R., 1999. 'The shitful body': excretion and control. Medische Antropologie 11, 7–18.
 Loizaga-Velder, A., 2013. A psychotherapeutic view on the therapeutic effects of ritual ayahuasca use in the treatment of addiction. MAPS Bulletin Special Edition 36–40.
- Luna, L.E., 1992. Icaros: magic melodies among the mestizo shamans of the Peruvian Amazon. In: Langdon, E.J.M., Baer, G. (Eds.), Portals of Power: Shamanism in South America. University of New Mexico Press, Albuquerque, pp. 231–253.
- Mayer, E.A., 2011. Gut feelings: the emerging biology of gut-brain communication. Nat. Rev. Neurosci. 12, 453–466.
- McCallum, C., 1996. The body that knows: from cashinahua epistemology to a medical anthropology of lowland South America. Med. Anthropol. Q. 10, 347–372.
- McKenna, D.J., 1984. Monoamine Oxidase Inhibitors in Amazonian Hallucinogenic Plants: Ethnobotanical, Phytochemical, and Pharmacological Investigations. The University of British Columbia (Canada).
- McKenna, D.J., Luna, L.E., Towers, G.H., 1995. Biodynamic constituents in ayahuasca admixture plants: an uninvestigated folk pharmacopoeia. Ethnobotany: Evolution of a Discipline. Dioscorides Press, Portland Or., pp. 349–361.
- McManis, P.G., Talley, N.J., 1997. Nausea and vomiting associated with selective serotonin reuptake inhibitors. CNS Drugs 8, 394–401. https://doi.org/10.2165/ 00023210-199708050-00005.
- Moran, D., 2008. Introduction to Phenomenology. Routledge, London.
- Pearson-Leary, J., Zhao, C., Bittinger, K., Eacret, D., Luz, S., Vigderman, A.S., Dayanim, G., Bhatnagar, S., 2019. The gut microbiome regulates the increases in depressive-type behaviors and in inflammatory processes in the ventral hippocampus of stress vulnerable rats. Mol. Psychiatry 1. https://doi.org/10.1038/s41380-019-0380-x.
- Reynolds-Whyte, S., van der Geest, S., Hardon, A., 2003. An anthropology of materia medica. In: Social Lives of Medicines. Cambridge University Press, New York, pp.

3-19

- Rivier, L., Lindgren, J.-E., 1972. Ayahuasca, the South American hallucinogenic drink: an ethnobotanical and chemical investigation. Econ. Bot. 26, 101–129.
- Schaffler, Y., 2009. Medicinal plants use in the Dominican republic: a delicate topic. Ven. Viennese Ethnomedicine Newsletter 9, 3–10.
- Scheff, T.J., 1979. Catharsis in Healing, Ritual, and Drama. University of California Press, Berkeley.
- Scheper-Hughes, N., Lock, M.M., 1987. The mindful body: a prolegomenon to future work in medical anthropology. Med. Anthropol. Q. 1, 6–41.
- Shepard, G.H.J., 2004. A sensory ecology of medicinal plant therapy in two amazonian societies. Am. Anthropol. 106, 252–266.
- Shepard, G.H.J., 1998. Psychoactive plants and ethnopsychiatric medicines of the Matsigenka. J. Psychoact. Drugs 30, 321–332.
- Shulgin, A., 1976. Profiles of psychedelic drugs. I. DMT. J. Psychedelic Drugs 8, 167-168.

- Solomon, R.C., 2008. True to Our Feelings what Our Emotions Are Really Telling Us. Oxford University Press, Oxford.
- Shweder, R.A., 2004. Deconstructing the emotions for the sake of comparative research. In: R Manstead, A.S., H Frijda, N., Fischer, A. (Eds.), Feelings and Emotions: the Amsterdam Symposium. Guilford Press, New York, pp. 81–97.
- Taussig, M.T., 1987. Shamanism, Colonialism, and the Wild Man: a Study in Terror and Healing. University of Chicago Press, Chicago.
- Uzendoski, M., 2008. Somatic poetry in amazonian Ecuador. Anthropol. Humanism 33, 12–29.
- Wilson, E.A., 2004. Psychosomatic: Feminism and the Neurological Body. Duke University Press, Durham, N.C.; London.
- Wolff, T.J., Ruffell, S., Netzband, N., Passie, T., 2019. A phenomenology of subjectively relevant experiences induced by ayahuasca in Upper Amazon vegetalismo tourism. Journal of Psychedelic Studies 1–13. https://doi.org/10.1556/2054.2019.007.