



## Teacher plants — Indigenous Peruvian-Amazonian dietary practices as a method for using psychoactives

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### ABSTRACT

**Ethnopharmacological relevance:** Indigenous groups of the Amazon have developed intricate methods for the application of psychoactives, among which particularly the *dieta* or diet method of Peruvian-Amazonian traditional medicine stands out. It is a retreat-like intervention involving lengthy periods of social, behavioural, and alimentary restrictions, while ingesting specially prepared plant substances. The interplay of the dietary conditions and plants ingested sensitizes the dieter to receive healing, strength, guidance, and knowledge. From a clinical scientific point of view, the method has remained largely underexplored, but seems more pertinent than ever given the increasing interest in Amazonian psychoactive preparations including ayahuasca (*Banisteriopsis caapi*) and the burgeoning field of psychedelic-assisted therapies in general.

**Aim of the study:** This study offers a descriptive account and emic interpretation of the Peruvian-Amazonian *dieta*. More specifically we document in detail the procedure, its context and purpose of application, effects, modes of action, adverse effects, and risks, from the perspectives of a sample of Peruvian traditional healers. The Peruvian-Amazonian *dieta* is a multi-purpose method for making use of medicinal plants, many of which (but not all), are psychoactive; the current work especially focuses on its therapeutic applications in conjunction with psychoactives.

**Methods:** We interviewed 16 healers working in the Ucayali, San Martín, and Loreto provinces of Peru using a semi-structured interview approach. Interviews were audio-recorded and transcribed verbatim. The extensive data derived from these interviews were analysed by means of computer-assisted manifest qualitative content analysis using a theory-advancing approach. Over 500 coded text segments were categorized, resulting in 7 main theme clusters and corresponding sub-themes.

**Results:** The interviewed healers described a complex intervention with multifaceted applications (treatment, prevention, training) and effects in various domains (body, mind, spirit, energy). The process was portrayed as transformative, with benefits attributed to the effects of the so-called teacher plants in conjunction with the diet's conditions, along with the skill of the healer guiding the intervention. Further, a detailed risk assessment revealed sophisticated safety measures and tools designed to address adverse responses. The importance of adequate training of the healer that administers the diet was particularly highlighted in this context.

**Conclusions:** The *dieta* is a central therapeutic concept and tool in Peruvian-Amazonian traditional medicine and a unique method for using psychoactive plants. Multidisciplinary health research that includes traditional treatment methods from Indigenous cultures, Amazonian and other, should not be neglected in the current global interest in psychedelic therapies; such research may in the long-term contribute to a more inclusive psychedelic

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research paradigm as well as healthcare practice in countries where rich traditional healing systems exist, and perhaps beyond. It may also contribute to the recognition of the Indigenous healers as not only historical forerunners, but also current leading experts in psychedelic medicine.

## 1. Introduction

After decades of dormancy, ‘psychedelic science’ (research on psychoactives<sup>2</sup>, especially for therapeutic purposes) has well and truly returned. With mainstream medical research in this context occurring from as early as 2008 (Morris, 2008), the field has now entered a much anticipated “renaissance” phase. An impressive body of research has been developed and is evolving rapidly—from the accumulation of promising results for a range of psychiatric disorders such as mood and anxiety disorders or addictions (Carhart-Harris et al., 2021; Chi and Gold, 2020; Hesselgrave et al., 2021; Noorani et al., 2018; Ross et al., 2021), to FDA “breakthrough” designations for psychedelic-assisted therapies, through to an influx of investment and corporate activity seeking to capitalize on what appears poised to become the next revolution in psychiatry (Business Wire, 2019; Carhart-Harris et al., 2021; Jacobs, 2021; Multidisciplinary Association for Psychedelic Studies, 2017). Yet the Indigenous use of psychoactive plant medicines not only precedes the scientific study of psychedelics by hundreds if not thousands of years (El-Seedi et al., 2005; Furst, 1990; Miller et al., 2019), but has also provided foundational intellectual inspiration for science (George et al., 2020; Gerber et al., 2021; Grob, 1994). While this history has often been acknowledged in academic publications, it has had little practical implication thus far for public healthcare and clinical research institutions. Instead, Indigenous and traditional ways of working with plant medicines have frequently been structurally denied pathways towards medical legitimacy (Caceres Guido, Ribas, Gaioli, Quattrone and Macchi, 2015; Guan and Chen, 2012).

One example of a healing system with rich usage of psychoactive plants is Peruvian traditional medicine, and particularly its Amazonian branch, a sophisticated healing system using plants across hundreds of species (Bussmann and Sharon, 2006; Jovel et al., 1996; Kamppinen, 1988; Kvist et al., 2006; Sanz-Biset, Campos-de-la-Cruz, Epiquien-Rivera and Cañigüeral, 2009). Peruvian-Amazonian medicine involves intricate methods for the application of psychoactives (Berlowitz et al., 2020; Berlowitz et al., 2017; Shepard, 1998), among which the *dieta* or diet<sup>3</sup> method stands out. The diet is a retreat-like intervention involving lengthy periods of social, behavioural, and alimentary restrictions, while ingesting specially prepared plant substances. The term “diet” in this usage therefore does not refer to weight control and is not limited to principles of nutrition, much in line with the word’s etymological origin in the Greek *diaita*, which denotes a regime or way of living (Waife, 1955).

Although dietary rules and restrictions are mentioned in the ethnographic literature with respect to the medicinal practices of various Amazonian Indigenous groups (e.g., Matsigenka, Cholones, Shuar, Shipibo; Jernigan, 2011; Luna, 1986; Luziatelli et al., 2010; Odonne et al.,

<sup>2</sup> A psychoactive substance is defined as “a substance that, when ingested, affects mental processes, e.g. cognition or affect. This term and its equivalent, psychotropic drug, are the most neutral and descriptive terms for the whole class of substances [...]” (p. 53; Babor, Campbell, Room, & Saunders, 1994). In the present work we also use the term ‘mind-altering’ as a synonym to psychoactive. We reserve the term ‘psychedelic’ to denote the specific class of psychoactives also referred to as ‘hallucinogens’. An exception to this is its usage in conjunction with pre-established terms such as ‘psychedelic renaissance’, ‘psychedelic medicine’, etc., which are commonly used in the research literature (even though the development would perhaps more faithfully be represented as a ‘psychoactive renaissance’ etc.).

<sup>3</sup> The Spanish (*dieta*) and English (diet) terms are used interchangeably in this paper.

2013; Sanz-Biset and Cañigüeral, 2011), the *dieta* as a generic method for using psychoactives has remained largely underexplored from a clinical-scientific perspective. *Dietas* may include psychoactives but also other medicinal plants, depending on the specific patient or issue the intervention aims to address. Ethnopharmacological surveys of the Peruvian Amazon have pointed out that they play a role in treating health problems, from the somatic (e.g., respiratory, gastrointestinal, musculoskeletal; Bussmann and Sharon, 2006; Jovel et al., 1996; Kvist et al., 2006; Sanz-Biset et al., 2009) to conditions held to have energetic or spiritual origins (Kamppinen, 1988). Plant-based retreats have further been reported in rites of passage to adulthood and hunting (Sanz-Biset and Cañigüeral, 2011) and as a method of initiation and training, where a permeable space between plant and human life is believed to unfold, allowing for the receipt of new information, understanding, and skill (Jauregui, Clavo, Jovel, & Pardo-de-Santayana, 2011; Luna, 1984a). However, a systematic description of the procedure itself, its purposes, effects, and risks, particularly in conjunction with psychoactives, is still absent from the literature.

In recent years Amazonian medicine has gained some prominence largely due to ayahuasca, a psychoactive decoction that is produced from the ayahuasca vine (*Banisteriopsis caapi* [Spruce ex Griseb.] Morton) and often plants containing *N,N*-dimethyltryptamine (DMT), such as *Psychotria viridis* Ruiz & Pav. or others (Pinkley, 1969; Rodd, 2008; Schultes, 1987). Public, academic, and clinical interest in ayahuasca has spiked over the past years in conjunction with the psychedelic revival, with a range of studies associating its use with positive therapeutic outcomes and healthy functioning (e.g., Barbosa et al., 2012; Bouska et al., 2012; Dominguez-Clave et al., 2016; Fabregas et al., 2010; Frecska et al., 2016; Grob et al., 1996; Labate and Cavnar, 2014; Nunes et al., 2016; Rodrigues et al., 2021; Soler et al., 2018; Zeifman et al., 2021). Ayahuasca falls within the scope of psychedelic medicine at least from a pharmacological perspective, as the vine contains monoamine oxidase inhibitors which render DMT orally active, thereby unleashing potent psychoactive effects through gut absorption (Luna and White, 2000; McKenna et al., 1984; Riba et al., 2003). However, the view that ayahuasca is primarily a vehicle for DMT facilitates its positioning as a type of western pharmacological therapy and obscures its Indigenous context and manner of use, which, in turn, promotes a discarding of traditional knowledge and practices around this plant. For instance, in the Peruvian-Amazonian tradition, a specific dietary regime is considered essential when ingesting ayahuasca (Dobkin de Rios and Rumrill, 2009; Fotiou, 2019; Gearin and Labate, 2018; Luna, 2011), as with other psychoactive plants. Thus, despite its fundamental nature in Peruvian-Amazonian medicine, and notwithstanding its relevance to the current psychedelic revival, the *dieta* method has received comparatively little scientific attention, especially when contrasted with the growing ayahuasca literature. As a partial corrective to this absence here we aim to offer an in-depth descriptive account of Peruvian-Amazonian dietary concepts, focusing especially on its uses of mind-altering plants for therapeutic purposes (health-related or clinical focus). More specifically, using an emic approach, we aimed to document in detail the procedure of the diet method, its context of application, purposes, effects, modes of action, adverse effects, and risks, from the perspectives of traditional Amazonian healers of Peru.

## 2. Methods

### 2.1. Sample and data collection

Participants were recruited in the Peruvian Amazon (Ucayali, San

Martín, and Loreto provinces) in the scope of a study focusing on Peruvian-Amazonian diet techniques and medical epistemologies (data collection: 2015–2017 [San Martín], 2019–2021 [Loreto, Ucayali]). The initial data pool consisted of 18 participants, but since inclusion criteria required the participants to be born in Peru, aside from being knowledgeable in Peruvian-Amazonian medicine practice, 2 participants were excluded from the study as they were born elsewhere. The remaining 16 participants<sup>4</sup> identified themselves as *Mestizo* (mixed) or Indigenous Amazonian associated ancestrally and/or via medicine teachers with one or several of the following Amazonian cultures: Yine (1; 6%), Asháninka (1; 6%), Kechwa (1; 6%), Cocama-Cocamilla (1; 6%), Cocama (2; 13%), Lamista (1; 6%), Shipibo (2; 13%), Murato (1; 6%), Awajún (1; 6%), Chazutino (3; 19%). All participants were carefully informed about the details of the study and gave written informed consent. The study was approved by the ethics committee (University Fribourg, Switzerland) and was conducted in accordance with relevant national and international regulations. Using a semi-structured interview approach, the healers were interviewed in 1–3 sittings each by a health professional highly experienced in research on Amazonian medicine (first author of this work). The guiding questions included: *What do you use plant diets for? What is the procedure of the diet? What are the functions of the different elements, rules, and restrictions you mentioned? What are the effects of the diet? Are there contraindications? Are there risks and dangers or adverse effects?* All interviews were held in Spanish<sup>5</sup> and audio-recorded. The extensive data derived from this sample was determined to be suitably rich in terms of information power (Malterud et al., 2016; similar to the concept of saturation; Morse, 1995).

## 2.2. Data analysis

We took a theory-advancing approach for content analysis in order to develop a detailed description of the *dieta* as a traditional Peruvian-Amazonian concept and process (Hannah and Lautsch, 2011). This type of qualitative analysis aims to develop rich, novel information from the data in order to advance the theoretical understanding of a given phenomenon, in this case, the Peruvian-Amazonian diet method. The recorded interview data was transcribed verbatim and the textual material was then processed using a computer-assisted (MAXQDA 2020; VERBI Software, 2019) manifest content analytic approach (Bengtsson, 2016). We inductively constructed several main categories derived from our research question and the existing literature on the Peruvian-Amazonian *dieta* (*procedure of the dieta, key factors, therapeutic effects, modes of action, risks, adverse effects, fields of application, training via diets*). Subcategories were then developed from the data deductively, working through the material in an iterative fashion. Over 500 coded text segments were grouped into theme clusters and organized along the emerging category system. The exact wording of main categories was adapted to fit the emerging sub-themes, and some categories were merged or split. The material was then condensed while conserving the substantive meaning and breadth (Kracauer, 1952) in order to provide a concise summary here. Wherever possible, we relied on direct quotes, aiming to represent the data as faithfully as possible by letting the healers express themselves in their own words, using their own concepts. The quotes (referred to as Participant A [PA], Participant [PB], etc.) have been translated to English and, in some instances, slightly

<sup>4</sup> Six of the healers participating in the current study had also participated in a previous work in which we used features of the training process to become an Amazonian healer via diets to illustrate their fit (or lack thereof) within the “set and setting framework” commonly used in psychedelic research (O’Shaughnessy and Berlowitz, 2021). We took care not to repeat data reported from these 6 healers in the current work.

<sup>5</sup> All healers were native speakers of Spanish, which is common in the Peruvian Amazon due to the rubber boom period and presence of extractive industries (Katalin, 2020), and some also spoke an Indigenous language.

adapted to ensure confidentiality and anonymity of the participants. Furthermore, although this study did not aim to investigate or report plant species, some healers spontaneously mentioned plants or remedies in the context of case examples or illustrations. We have opted to mask these names as a means to comply with the informants’ wish to not make public their plant remedies. Some healers expressed concern that Westerners use information on plant remedies for their personal enrichment. Indeed, at present there is an increasing number of investors and for-profit companies searching particularly for novel psychoactive compounds. Moreover, some Amazonian healers may be aware of the historical US patent on the ayahuasca vine itself, which expired in 2003. It was granted to a US American pharmaceutical entrepreneur and existed for over 15 years in spite of considerable outrage and protest by indigenous healers (Fecteau, 2001). By masking the plant names we thus intend to respect our informants’ wish for discretion and avoid that information revealed based on a relationship of trust be used for bioprospecting, as such endeavors rarely share benefits with the Indigenous communities, in the spirit of the Nagoya Protocol (Buck and Hamilton, 2011; Heinrich and Hesketh, 2019). For information on plant species used in Peruvian-Amazonian diets we refer to the ethnobotanical literature cited in the introductory section (e.g., Sanz-Biset and Cañigueral, 2011; Shepard, 1998).

## 3. Results

The resulting coding system consisted of 7 main themes (*procedure of the dieta, purposes, participants and constituents, effects and modes of action, safety, medical training via diets, foreign health-seekers and Peruvian-Amazonian dietas*) and corresponding sub-themes (see Table 1). A description of each theme and sub-theme follows next, reflecting a condensed summary of the healers’ perspective (emic approach).

**Table 1**  
Main and sub-themes.

Main themes	Sub-themes
1. Procedure of the <i>dieta</i>	- Diagnostic consultation - Plant medicine ingestion: strict phase of diet - <i>Cortar la dieta</i> : ending the strict diet phase - Transitional phase with milder diet regime - Functionality of dietary conditions: safety and effectiveness
2. Purposes	- Health-related purposes - Skill or knowledge acquisition-related purposes
3. Participants and constituents	- The plants of the diet - Critical role of curandero - Patient-related factors
4. Effects and modes of action	- Psychological domain - Altered states of consciousness - Spirit- and energy-related domain - Physical domain - Multi-layered complexity of diet mechanisms and effects
5. Safety	- Contraindications - Risks related to patient behaviour and diet rules - Interventions in case of adverse effects - Risks related to healer training and conduct
6. Medical training via diets	- Characteristics of the learning process and instruction by teacher plants - Becoming a healer entails a personal healing process - Challenges and choices of the training process
7. Foreign health-seekers and Peruvian-Amazonian <i>dietas</i>	- Dissimilar underlying concepts of Amazonian and biomedical treatments - Commercialization of Peruvian-Amazonian healing landscape

### 3.1. Procedure of the diet

While the specifics of the diet procedure may vary across different purposes and healers, certain principles are common. It generally involves a period of retreat during which plant medicines are ingested along with a strict behavioural and alimentary regime. This is followed by a second phase, in which plant ingestion is discontinued and the person is no longer in retreat, but where a set of restrictions on eating habits and other behaviours still apply: “From the moment that the treatment starts, the person is in diet. Dieting does not mean ‘not eating’ [...] There are specific diets in which the person does not eat at all, but in the context of a normal diet, the person will eat, but they will only eat a specific kind of food.” [PK]. The term *dieta* and the verb *dietar* were, however, used by the respondents in different manners, often to refer to the method or overall intervention (plant ingestion under specific conditions and restrictions), but sometimes also to selectively refer to only the strict diet phase (see 3.1.2.). It is common for a Peruvian-Amazonian healer to speak of dieting *something*, such as dieting pork meat (*dietar chancho*), dieting sex (*dietar sexo*), meaning that this object or activity is to be omitted during the diet period; with the exception of “dieting a medicinal plant”, which conversely implies ingesting said plant under dietary conditions (e.g., *dietar planta X*; also: *dietar con* [with] *planta X*). A chronological description of the generic procedure of diets for healing purposes is next presented.

#### 3.1.1. Diagnostic consultation

The process was described to begin with determining treatment specifics and plant selection: “First is the consultation, I consult about what the person has, what is happening for them, how their body is. According to this I give them the prescription—‘you will drink this plant’.” [PC]. The initial consultation between healer and patient tends to be relatively brief, but the duration may vary from patient to patient, depending on the case at hand. However, it is considered important to carefully explain to the patient beforehand what exactly the diet process entails and demands from them, since the treatment will require a high level of commitment and collaboration: “If it is something that I can cure I tell them yes, I can treat this with plants, but it has a *dieta*. I explain to them very clearly the diet process. I explain to them carefully the diet rules and also what kind of medicines they will drink. And if they agree with these things, then they can do the treatment” [PL].

#### 3.1.2. Plant medicine ingestion: strict phase of diet

The patient is accommodated in a basic hut (often only a bed or hammock under a roof) either in a forest clearing (*chacra*) or the healer’s facilities. The healer will visit the person daily and bring them their plant medicine, but other than that the patient remains in solitude: “The diet is in isolation, away from contact with other people. The only contact is with the *Maestro* [healer] or the person that brings the food or water. One does not have conversations with others in the diet [...]. There are plants that are ingested every day, twice a day, or there are plants that you take only every other day. It depends on the case” [PG]. While the healer is looking after the person in diet, he or she is required to follow some (attenuated) level of diet regime as well: “The only one that is in contact with you, or that can see you, that takes care of you, is the curandero [Spanish for ‘healer’] and their helpers, but they must also be dieting” [PB]. Furthermore, the patient is instructed to stay put and not engage in work or distracting activities (e.g., cell phone use, listening to music) so that “the plant can do its work”. This retreat-like seclusion combined with the plant intake induces an altered state of mind: “During the diet you feel very different ... your hammock, your bed, your hammock, your bed— no activity at all. Only plantain, nothing else. No rice, no oats, only plantains. And there you are, dizzy/intoxicated [*mareadito*] with the effects of the plants” [PJ].

The restrictions that must be observed during this diet phase generally concern the domains of food intake, social contact, sexual activity, exposure to temperatures and environmental conditions, and

sometimes the usage of toiletries is added. “The diet generally varies according to what one wants to cure with it” [PD], explained one healer, with the specifics depending on the diet’s purpose, individual case, and healer. However, “some rules are nearly universal, such as the omission of salt and sugar” [PB] or the suspension of sexual activity for the diet period. The respondents listed foods that they provide during the strict diet phase, for example “only green plantains”, “only cooked vegetables”, “only plantains and rice soup”, or “only *fariña*” (powdered dried manioc). All variants have in common that the food must be natural and plainly prepared, with no salt or spices added. If necessary, the food regime is adapted in the process: “There are people that can’t withstand the diet, they feel faint, see dark spots and all of this, weak. For these people there is another form [modified food regime].” [PC].

Further mentioned was the importance of periodically rinsing oneself with water during the strict diet period and taking care with the management of bodily temperatures: “If you expose yourself to the sun during the diet, too much sun, sunbathing, that is dangerous, because your energy body is open, you are more sensitive, and this heat is very strong, it can leave an imprint in the body. The same happens with the cold, if you bathe in the river and stay in the water for a long time, or if it starts to rain and you are under the rain, you can get permeated with cold, and this has consequences.” [PB] (further detail on said consequences in conjunction with the various restrictions will be discussed in later sections). The duration of the strict diet phase can range between several days to several months, depending on the diet’s purpose. A duration of about a week is commonly reported for healing purposes, but more severe health problems tend to require longer or repeated diets. The timeframe of diets for training in Peruvian-Amazonian medicine, on the other hand, is extensive and can range from several months to years.

#### 3.1.3. Cortar la dieta: ending the strict diet phase

After completion of the designated time for strict dietary conditions, the healer proceeds to cut the diet (*cortar la dieta*) using specific Amazonian techniques (e.g., *soplar*; see section 3.3) and foods (e.g., salt, garlic): “When the patient has been dieting for a week, not eating sugar, nor salt, nothing—to cut that diet you prepare a salad of tomato, cucumber, garlic, onion, and on the day that the patient will be finishing, you cut his diet. You blow tobacco (*soplar*) and you give him a bit of this to eat, a little bit, so he eats a bit of salt and lemon in this way, and his diet gets cut. And before leaving he will have a broth.” [PE]. Another healer described the cutting process in terms of the sensitivity and permeability of the energy body: “To cut the diet [means] to end the process, as well as to close you up; it is like sealing. To begin to close so that you are not too sensitive and not negatively affected when you go back to the city, when you meet people. [...] So you are not that vulnerable anymore. You may not yet be fully protected after that, and this is why there are also the rules for after the diet, but [thanks to cutting the diet] you will already be closed to a significant degree.” [PB].

#### 3.1.4. Transitional phase with milder diet regime

Once the diet has been cut, the person leaves the retreat context, but continues to maintain food and behavioural restrictions for a certain period of time from their home. Some healers use the term *post-dieta* to refer to this phase, which we adopt for convenience. The restrictions for this period commonly involve the avoidance of pork, alcohol/drugs, spicy foods, cold drinks and foods, and sexual activity. This applies for some additional weeks, but the precise set of rules and timeframes may vary according to the plant medicine used and specific healer. For example, some respondents’ prohibited food list also included sugar, red meats, certain types of fish, or tinned foods. There was general agreement that the return to regular eating habits should be gradual and measured: “After the diet, once the person is returning to town, they won’t directly go and eat cakes, ceviches, no—they wait and take it slow. If you directly eat such things it will impact on the effect of the diet.” [PC]. The return to social contact was likewise recommended to be gradual: “The post-diet needs to be calm; you can’t go home and

immediately have gatherings, dinners, or see lots of people and let yourself become absorbed. The post-diet is important, your entire process gets integrated there.” [PM]. Or as expressed by another healer: “One has to give time for the body to metabolize, digest the diet; for it to be closing and accommodating itself” [PB].

### 3.1.5. Functionality of dietary conditions: safety and effectiveness

“The diet is there to protect the patient, it’s his safety” [PE], explained one healer, pointing out that the dietary conditions reflect past Amazonian healers’ observations regarding which kinds of foods, activities, or circumstances would unfavourably affect the treatment. The rules and restrictions of the diet were thus explained to maximize the desired effects of the medicinal plant, on the one hand, and minimize undesired effects, on the other: “The rules of the diet, the abstinences during the diet and the post-diet, are so that this work will be highly effective.” [PB]. “The plants can heal you, but you have to follow the diet—everything is in the diet. [...] The patient needs to diet well, so that the medicine will not cause clashes” [PA]. Viewed from a different angle, the dietary conditions are explained to be a technique for accessing the energy or spirit-aspect of plants, enabling the “energy of the plant to come and accommodate itself in the body and structure of the person” [PD]; as one healer expressed: “it permeates you, incorporates itself in the body, and there it will stay. And it can be called forth later using the *icaros*” (see following section). Another respondent similarly noted: “They [the elders] would always apply plants with the *dieta*, otherwise it doesn’t work; the plant does not penetrate you” [PJ].

## 3.2. Purposes

The *dieta* was described as a process that is “curative and instructive” [PB], aimed for “prevention and treatment” [PC], as well as “for acquiring self-knowledge, knowledge about the power of plants; knowledge about oneself and knowledge about other things” [PD]. Accordingly, the application of diets can be subdivided into (a) diets for health-related purposes (treatment, rehabilitation, prevention) and (b) diets for knowledge or skill acquisition (training to be a healer, other skills). Differing outcomes are attained via the distinctive medicinal plants, as well as variations in format and particularities of the process. The present work focuses mainly on health-related applications, but we address diets for learning purposes briefly in the last section of the results. The two types of purposes are next described.

### 3.2.1. Health-related purposes

Peruvian-Amazonian diets are generally used to strengthen, improve, recover, or restore health. They may be prescribed for general health and vigour (“The diet removes fatigue; it gets rid of sluggishness.” [PL]) or targeted physical problems or states, for example musculoskeletal (e.g., “people who have pain in their knees, their hands, what one calls arthritis, this can be cured with medicinal plants, but one needs to diet well” [PA]) or post-partum care (“My grandmother was also a midwife, she had something like a hospital at home. My grandmother would accommodate them [the women] in her home and give them food. [...] 8 days of *dieta* drinking tree bark medicines.” [PF]). Psychological health was another application mentioned, for instance a “plant that is prescribed for stress and issues of the psyche. [Plant X] helps you to cleanse [*desinfectar*] your brain, it works directly on the psychology and nerves and starts to clean you” [PG]. The diet was also explained to “manifest one’s internal world, via dreams, thoughts, reflections” [PB] and lead to profound personal changes (“I used to be a restless person, explosive, violent, so the diet with [plants X, Y] gradually balanced my impulses” [PH]). Moreover, the informants also reported prescribing diets to prevent and treat energy- and spirit-related illnesses, such as witchcraft (*daño*, *maldad de gente*): “For example with that patient, he felt his arm was very hot, as if it were burning, burning like chili peppers. [...] It was due to a *daño* [energetic harm inflicted by another]” [PI]. Finally, the healers pointed to diets for enhancing the

overall strength and vigour of generally healthy persons, sometimes as a means of preparation for a specific goal or event. This is often applied for youths, “to prepare their body, for example for them to become good workers” [PB]. As another healer explained: “Our elders and ancestors [*los viejos antiguos*] would always drink their tree medicines, since they were young they would drink this, so they would become very strong, heal their body, so they won’t have many aches and pains. Of course, while you are in the process of dieting [your strength] decreases a bit, physically you feel a bit weak, tired. But once you start to eat again the energy comes back and then you feel as if you were younger, that is, with more strength and more drive” [PJ].

### 3.2.2. Skill or knowledge acquisition-related purposes

The acquisition of knowledge or skill is a distinct application of Peruvian-Amazonian diets. For our informants this concerned mainly the study of traditional medicine, that is, training to become a healer: “There are people that do diets for the purpose of apprenticeship” [PH], explained one healer. “For this, they successively diet different plants, this is the study process” [PC], explained another. It was emphasized that the plants instruct the apprentice through their own agency, teaching the neophyte about subtle aspects of the body, health, and sickness: “The master plants are the ones that you can diet to get to know the aspect of energy. [...] It is a science. If you want to know the heart, a cardiologist has to study the heart, very deeply, know the arteries and so on. It is similar, from the leaves, the fruits, the resin, the bark, the roots. [...] Dieting the plant itself, you can become aware of the plant’s spirit” [PK].

Within the apprenticeship, the trainee may select distinctive types of diets in order to learn specific skills: “[Plant X] is a kind of vine, it likes to grow in large trees, and it twists around the tree until it kills it. It does not grow from the earth, but in the middle of the tree. This plant has a lot of power. If someone wants to learn massage techniques [*sobar*], he has to diet this plant. If you are a mathematician, you have to study in order to learn; it’s the same here.” [PI]. Thus, via diets the trainee may choose to train in a variety of healing subspecialties. He or she may also choose to specialize in practices of a more ethically dubious character: “It depends on the nature of the diets. There are diets to become a sorcerer [*brujo*], a healer [*médico*], to learn love spells [*amarres espirituales*]; there are different types of plants that teach these things.” [PI].

Finally, diets are traditionally also applied to acquire other important skills related to life in the forest, such as hunting. One healer narrated: “I told [my sons] ‘you are young and one day you will have your own family’. In those times there were not really guns yet, and I told them ‘You will drink this, so that you’ll have good marksmanship, to catch fish, and to catch animals, birds.’ ‘Yes father’. I had them diet one month, they were to eat neither sweet, not salty foods, and have no sexual intercourse [...] Like this for one month, and then that’s it. They could eat normal foods and go ahead to try their hunting, and they brought back loads of fish. With their bow [...] The diet gives them good marksmanship.” [PA].

## 3.3. Participants and constituents

The constituents and participating actors of the diet, essentially consisting of the plants, the healer, and the patient, were explained as jointly determining the intervention’s quality and outcomes.

### 3.3.1. The plants of the diet

*Preparation of the remedies.* The respondents mentioned many different plant remedies, depending on what kind of objective or health problem is being addressed, and many of them are said to make you feel intoxicated or dizzy [*mareado*], albeit in varying intensities (from subtle to very strong). The process begins with the correct manner of harvesting the plant, which involves respect for the plant and ritual knowledge, as does processing the plant material (bark, roots, leaves, etc.) into medicine. Preparation of the remedies is done in various ways

(extraction, decoction, infusion, maceration), leading to different levels of concentration: “The plants have measures. Some are in drops, others in spoons, others in cups.” [PC], explained one healer.

*Plant agency and subtle dimensions.* The diet plants are generally described not as objects, but as person-like subjects with agency and superior knowledge, often referred to as “teacher”, “doctor”, or “master” plants: “Because the trees have more wisdom than us the humans, in the spiritual or energetic domain. [...] We humans should learn from them, that is why we take them in diet. It is marvellous, but no one can believe it before having experienced it; to believe it you have to directly experience it, in practice.” [PL]. Some healers specify that the diet plants have a spirit or a mother: “For example [plant X], this one has a mother. Also [plants Y, Z], these are trees that have a mother. That is why if you ingest them without the diet, it will cause problems, your face might swell up. All the ones that have a mother [are like this].” [PA]. One healer explained that these plants are associated with spirit-doctors, which act upon the subtle body of the patient in the course of the diet: “The sick person needs to stay in bed and not see anyone, with a strong diet, so that they can recover. And in accordance with their *dieta*, specialized doctors will arrive and cure them. But it is only if the *dieta* is applied.” [PI]. Thus, from the Amazonian viewpoint, the diet plant is not merely a substance, but an active participant in the diet process. The healers reported using *icaros* to interact with the subtle aspects of the plant (its energy, its spirit-dimension), described as “chants with healing properties, songs with medicinal function” [PK]. They are often given to the healer by the plants themselves (see section 3.6.), and there are many different types of *icaros*, with very specific functions. One healer stressed that the *icaro* “is not just a poetic or figurative thing” [PD], but instead represents a central working tool of the Peruvian-Amazonian healer, as does the skilled usage of tobacco.<sup>6</sup>

*Tobacco.* The tobacco plant is considered essential for all stages of the diet process. A healer trained in the skill of blowing tobacco (*soplar*) must do so as part of the remedy’s preparation procedure, which is considered a critical step: “This must be done at any rate, it’s part of the procedure. It’s like when you want to prepare a juice, a lemonade, but if you don’t have lemon—it’s not lemonade. It’s the same thing, this is the process, it needs to have this in any case. [...] If I prepare a remedy, I blow on it with tobacco (*lo sopro*.)” [PK]. The usage of tobacco is understood to impart therapeutic directionality to the remedy, as it “gives them protection, strength” [PN]. Furthermore, during the diet process a *curandero* may apply tobacco smoke (*soplar*, *soplada*) on the patient’s body “to help the person energetically” [PE], “to protect the person from negative energies” [PG], or as an intervention to deal with adverse effects. One healer explains: “When I give someone a diet, when I bring them their medicine, I blow tobacco on their medicine and also their body, but I won’t be doing this simply for the sake of doing it—there is always a motive. And later, when I close their diet, there is also a *soplada*” [PM]. Another respondent described the usage of tobacco for assisting patients that feel uneasy: “In case you get scared, the *curandero* blows tobacco on you (*te soplá tabaco*), for it to protect you. Or if I see the person has a negative face and doesn’t know what to do, I blow [smoke] (*le sopro*), and they become calm. The tobacco gives you protection.” [PC].

*Laxative/emetic plants.* Some healers mention using emetic or laxative plants (*purgantes*) in diets, either in selected cases (“there are some people that require a laxative first, a cleaning; others not, they will have the diet remedy directly, without the laxative” [PE]) or as standard practice (“First of all a purge [*una purga*], to begin the diet. Getting out the little devils [*los diablitos*], on the first day.” [PC]). The process was explained as cleaning the person energetically via the digestive system, and as facilitating the subsequent absorption of the diet plant: “The

remedy enters fast if they have cleansed the body like this, it flows. It’s to detoxify the body from what was eaten. One eats a lot of things and your body becomes murky, so you may want to clean it. That is why I give a laxative, this cleans you.” [PE].

*Ayahuasca.* Some healers report using ayahuasca as part of the diet process. In these examples, in addition to the primary diet plant the patient would drink ayahuasca on certain occasions, such as at the beginning of the diet “for initiating the work, initiating the process of the diet, like opening the door in order to enter” [PG], or at later stages of the diet. The function of ayahuasca in this context was described as a means with which “you will diagnose yourself, assess your fears; it’s a process of self-evaluation” [PG].

### 3.3.2. Critical role of the *curandero/a*

Referring to the key constituents of the diet, one informant listed “the conditions of the diet, the plants”, but also “the *curandero* as well, who takes care, supervises, reassures, and intervenes when necessary. [...] So, I think there are always these factors, the conditions, the plant itself, and the *curandero*. Because a diet may fail, that is, the person may say ‘I don’t want to go on, I’m leaving, I can’t take any more of this’; but after the *curandero* attends to them and helps them with the Amazonian techniques, they continue, even after a crisis.” [PB]. The importance of the skill of the *curandero* was highlighted: “Only someone that knows the plants can do this, otherwise instead of healing, they may cause harm” [PI]. The healer’s proficiency in this context is derived from his/her training via personal diets: “The extent to which we are prepared and able to resolve a problem or an illness, which presents itself in a person, has much to do with our own diets. This is very important for the *curandero*, it is our force, our energy, because we transmit energy. [...] Without personal diets, the *curandero* is nothing.” [PK].

Further, it is essential for the healer to possess the capacity and commitment to address adverse reactions (further explained in subsequent sections) if needed: “A good *curandero* must also learn to repair diets, and it is important that they are committed, that is almost vital. The person that receives people to diet must also have the commitment to continue providing them assistance afterwards.” [PB]. The *curandero*’s presence was pointed out by another respondent: “We are always present, in contact with them [the people in diet]. In the morning, at noon, and at night, including if they call us at night, we are also there. Then we talk, sometimes they tell us something and because of the experience we have, depending on how they feel, we help them to calm down. We have learned this in the course of the work, and to this day we continue to learn.” [PJ]. In addition, the respondents explained that the healer is required to keep a diet regime while attending to dieting patients (a smaller set of restrictions, more akin to the post-diet phase rules): “The patient is in diet, and in order to have a good result the healer must also be in diet. He will not be curing while at the same time drinking beers, for instance” [PM], as this may negatively impact the patient’s well-being via energetic processes.

### 3.3.3. Patient-related factors

The patient’s conduct is considered crucial for the outcome. A lack of compliance with the diet rules was explained to compromise treatment success and to imply risks: “If the person does not diet, if they don’t fulfil the requirements, or only halfway, there will never be a good result—even if the *curandero* does his very best.” [PK]. “Do the diet well and it will have its fruits. There are people that are disobedient, but one needs to respect the rules” [PC]. Healers frequently phrased this as the necessity for the patient to contribute their share: “Someone as patient has to do his part. [...] Sometimes people don’t comply, and then they blame the *curandero*. But that is not how it works; because, the two are at work—the *curandero*, as well as the patient. The *curandero* indicates to the patient where his responsibilities lie, about what he needs to do, and the patient also does his share by complying with it. If not, he does a diet in vain.” [PO]. Another healer emphasized self-discipline in this process: “To work with the plants you need to be disciplined. The rules of the diet

<sup>6</sup> The word *icaro* (also spelled *ikaro*) is hypothesized to derive from the Quichua *ikaray*, which in Quichua (an Amazonian dialect of Quechua) means healing by blowing smoke (Bustos, 2008; Luna, 1986).

have to be followed exactly as they are indicated” [PG]. Thus, there was an emphasis on the patient taking responsibility in the process: “If you are in diet, it is not the curandero that does the cleaning work, it is the patient himself. You can see that there is a responsibility, you involve yourself in your process of transformation. When you do the things well, and if you are well guided, the results can be marvellous.” [PM]. “One has to do the diet with motivation” [PH], explained another healer, adding sincerity with and acceptance of the process as important factors on the side of the patient.

### 3.4. Effects and modes of action

“The effects of the diet are according to the plant” [PO], explained one healer. However, the diet is said to generally produce “a change, a transformation” [PM]. One healer articulated this as: “Basically the diet is aimed to promote profound changes that are at a very, very deep level of the body.” [PD]. Another respondent echoed this: “In a week of diet there is a lot of time to go deeply into one’s problems, be they psychological or physical. I can’t say that any of the patients I’ve seen had a superficial result; the plants are for this deep work, for excavating things that have been inside for a long time. [...] at the end of the diet, [you see] that the person’s countenance has changed, they look calm, at peace. The person has a different appearance.” [PM]. Effects were commonly portrayed as multi-layered, referring to body, mind, soul, spirit: “When one works with the plants, one works on three levels. By doing the work with the plants you heal your soul, doing the diets you clean your own consciousness. It’s the spiritual, the psychological—working on your mind, cleaning the mind so it gets straight—and the physical, you will heal ills that are in your body. So you work on the three levels [...]. It is one single work, one single therapy, but the three aspects get addressed—three in one.” [PG].

#### 3.4.1. Psychological domain

One healer explains: “They [patients] may arrive to the diet with a lot of problems, but when they leave, they look calm, more sensitive, sociable [...] when they drink the plants they feel more forgiveness, the person softens, the heart becomes more open” [PE]. It was further observed that over the course of a diet “the mind is calmed, anxiety diminishes, and then the person can sleep well” [PP] or similarly, that “when you are dieting and have been drinking the plants, there comes a concentration, you become calm” [PC]. “All plants make you sensitive” [PE], adds another healer. Further, an improvement of mood and general emotional well-being is reported after diets: “People emerge with more optimism, hope; they are content, joyful, because during the diet they were able to release feelings, emotions, memories, they were able to understand, to analyse certain experiences from a different angle, in a different manner [...], they may experience appreciation for their parents, for their spouse. That is, there is a process of coming to terms, of becoming aware; and after that the person feels calm, in peace.” [PB]. Another healer made similar observations: “A lot of things that you have inside come out, things that you had stored up, things from your past. A lot of things tend to come out, psychological abuses, and so many things that may have happened to the person. With the diet, with the medicine, these things can come out, release, release, they are not kept in. So this gets it out, and you feel fine.” [PC]. Moreover, the diet was described as leading to changes that are deep and transformational, as it may “facilitate a structural change, including aspects related to one’s personality” [PD]. Several healers indeed mentioned changes in personal characteristics as a result of diets, for example increased assertiveness and self-efficacy or more patience.

More specific effects in the psychological domain are dependent on the plant used, for example, one diet plant was described to “help you if you are very scattered/absent-minded; you can think with more clarity” [PN]. Another plant was explained to be good “for people that are a bit tough in their heart, it makes them more sensitive” [PJ] or “to connect the head with the heart” [PN]. However, the effects were generally

conceived as resulting from the combined impact of the ingested plant and the unique circumstances of the diet: “The person isolates himself in the wilderness, cuts off the contact with the external world, with the worries, the people, the foods, and so on, in order to be alone, in a state of reflectivity and meditation that is assisted by the plants. Which will stimulate a sensitivity; and from this place then, their inner world reveals itself.” [PB]. The dietary conditions thus encourage inwardness and introspection “because you will be alone, you will reflect about many things” [PH], which in turn promotes “self-knowledge; a revisiting of internal spaces, so to speak” [PD]. The plant’s agency was emphasized in this context: “It is not that I said to myself ‘I will diet this plant in order to solve such and such problem’, but it was the plant herself that took me to that place within myself, where it turned out that I had wounds which needed healing. But I had not even been aware of these things” [PD]. One healer likens the role of the teacher plant to that of a psychotherapist, highlighting the advantage of its non-human character: “The plant is an important component because it enables a non-verbal work; it’s not like a psychologist who says, ‘I think that you are this or that’, or to whom the patient may not want to disclose personal things. So the plant is an important component in the process, because one cannot lie to it, one cannot cheat, one will simply feel it.” [PB].

#### 3.4.2. Altered states of consciousness

The informants pointed to the mind-altering qualities of many diet plants: “[Plant X] makes you *mareado* [dizzy, intoxicated]; you can be sitting and not feel anything, but then you get up and realize you are *mareado*. [Plant Y] as well, it does that sometimes, without warning. You might be resting and suddenly—*prum!* It is strong.” [PO]. The diet experience can involve mild or intense forms of altered states: “It is as if you enter a process, a trance, where you feel that you are experiencing something, but you can’t do anything, you’re observing, you feel what is happening and then, *puh*, it’s over.” [PB]. Or in the words of another healer: “I would enter into this, one could say, dream-like state, from the effect of the plant. One is not asleep, you are present, with the eyes open, knowing that you have ingested a plant and all that, but suddenly it creates an interlude, and a vision appears, or a perception, something like that. And then you realize that you are again back in reality, as if there had been some sort of continuity” [PD]. The contents of these visions and trance states were described as deeply meaningful, involving insights or teachings from the plant linked to personal history or the healing process (or, in case of apprenticing healers, to their training): “[Plant X] gives you quite a lot of insights, you are there, having visions that are very, very clear, with a lot of affective content, but all the while you are with your eyes open.” [PD].

#### 3.4.3. Spirit- and energy-related domain

As evident in the former examples, the diet involves experiences or phenomena that are described as spirit- or energy-related: “In general, any diet cleans you energetically, it cleans you spiritually.” [PO]. Among these experiences, being given instructions, explanations, or assistance from a conscious other—the plant’s spirit, as it is often framed—is common. Such interactions are described to frequently occur during sleep: “The spirits come through dreams; they give us information” [PK]. Another informant explained that “almost all plants give you visions during sleep” [PO]. Such dream experiences of the diet were described as unlike ordinary dreams, representing “a dialogue, a direct communication between spirit” [PM]. Another informant illustrates: “You take the remedy and in the dream the plant will explain things to you. [...] If you drink a master plant from our Amazon forest, this master plant teaches you, it gives you knowledge, it offers you things. It shows you your past, or the way ahead—it makes you see.” [PE].

In addition, the diet was commonly described as a process of “energetic purification” [PH] or as “a period of very strong energetic cleaning” [PD]. “In the diets the person is working on their own energy” [PL], explained another healer. Some specific plants were said to have pronounced effects of this nature: “[Plant X] works energetically. All of

these plants work energetically to some extent, but with this one, you feel it clearly, you directly experience it" [PH]. In some cases, the healers pointed to specific diet plants that are used to prevent or treat illnesses caused by sorcery, malevolent spirits, or energetic pathogens. One healer for instance mentioned a plant of which "we use the root, we grate it, and drink it in order to get out bad energies that we have inside the body; to expel them" [PJ]. Another plant was explained to "block the negative spirits that you have in your body" [PO]. A prevention aspect was pointed out by some informants, describing a diet plant that offers "a lot of good protection, negative things cannot enter you then, it gives you good protection; the plant watches out for you." [PC]. Similarly, another informant explained that a certain plant "serves for protection from negative energies. It is a good protector, and it is also a good cleanser. So, let me tell you, this plant is primordial for everything that concerns energetic cleansing and it also has a protective effect" [PH].

Finally, the healers reported that dieting with the teacher plants also has spiritual effects relating to "the sacred dimension of life" [PB]. One healer illustrated: "Thanks to the medicine of the diets, people become aware that there is a spirit, and that there is God. That is why I am saying that it is a healing process which is spiritual, energetic, and physically purifying [...] The spirit of the person awakens, and the person takes more interest in their self, their person; and in everything that surrounds them." [PL]. Or in the words of another healer: "You work the spiritual aspect, the mental and the spiritual. Because during the diet when you drink the plants, you become spiritually sensitive. You may feel humbled; transparency, forgiveness—this is the spiritual part of the work" [PH]. Another healer similarly described: "You heal your soul doing the work with the plants; doing the diets is like cleaning your own consciousness, this is the spiritual part of it." [PG].

#### 3.4.4. Physical domain

The diet process was reported to have a generally cleansing or detoxifying effect: "In general there is an improvement of the physical state. The person loses a bit of weight—because usually we are a little bit chubby—the person detoxifies themselves from the sugars, from salt, from the chemicals, whatever it may be, as if the body becomes levelled again. There is a recuperation of health, in general terms. Even though some people may look a bit skinny after the diet, they are physically better than before they started" [PB]. Aside from this general effect of the diet on physical health, the plants used, including the teacher plants, also have specific medicinal properties, for example: "[Plant X] cures anaemia, and it gets out the parasites. It has these two effects, on parasites and anaemia. It heals you and afterwards you'll again be able to gain a bit of weight" [PE]. It was explained that "many of the plants also have an antirheumatic effect" [PD], which traditionally is referred to as the plant's capacity to "extract cold out of the body" [PO]. This aspect was described as being experienced during the diet via initial discomfort: "For example, many people in diet start to have pains, in their back, their lumbar region, their neck. But in their daily life they may not experience such pains, but without the salt and sugar they are sensitive, and the plant will be working on these spots or areas of the body, where there is an issue of some kind, muscular, or the bones; so the person will experience more pain, because the issue is in the process of healing. The curandero's understanding is that the plant is operating on you, like a surgical operation. You have pains, in the neck for example, or in the lumbar region, and while in diet—aaah, a lot of pain, and the curandero tells you 'aha, the plant [*el vegetal*] is working on you ... one has to bear with it.'" [PB].

#### 3.4.5. Multi-layered complexity of diet mechanisms and effects

As many of these examples indicate, the modes of action of the diet are understood to involve synergistic effects and an interplay between the domains of the body, psyche, energy, and spirit. One healer expressed the complexities of this process as follows: "I think the diet impacts the physical level, in the sense that each plant, besides the fact that each of them also has a specific psychological impact—such as

strengthening willpower, connecting with emotions, with old memories, increasing flexibility, reducing shyness, etc. I think there is also a physical effect which impacts the body [...] on a very refined, basic level of physiology. On top of that, I think there is an effect that is facilitated by the circumstances, due to the fact of being isolated, with less sensory stimulation [...], but there is visibly also this phenomenon of cleaning, releasing, physically eliminating, reorganizing. And beyond that, there is the element of structuring, and this aspect then is specific to each plant; each plant will contribute its specific energy, which leads the process in a particular direction. [...] It is like cleaning a room, cleaning a lounge room of a house. You clean it, you may throw out things but not everything; you will reorganize the furniture that's in there, but the plant will contribute something new. And this something has to do with the perspective of the plant, its fundamental essence. It's as if into your body—your house—enters a new energy, which will order all the things that you have in there in a different manner. [...] So, while there is a global frame, which has to do with cleaning, ordering, clarifying, clearing, with consciousness; there is also a distinctive part to it, which is the contribution of the energy of each plant." [PD].

### 3.5. Safety

The healers drew attention to two main sources of risk in diets: (a) non-compliance with the diet rules by the patient, and (b) deficits on the side of the healer regarding training or integrity of practice. They also pointed to a few contraindications.

#### 3.5.1. Contraindications

While some plants may have specific contraindications, a few general principles for deciding whether a person is apt to diet or not were pointed out. Thus, the healer must consider underlying health deficits, allergies, or pregnancy; also the "structure of the personality" [PB] should be taken into account. For example, solitude in the forest could potentially trigger a fearful response in people with anxiety issues, but a healer will evaluate on a case by case basis if this anxiety represents a contraindication, or if it can be addressed as part of the diet's treatment. The person's willingness and capacity to adhere to the diet restrictions were considered particularly important, for reasons that will become clear in the following section.

#### 3.5.2. Risks related to patient behaviour and diet rules

Risks were reported if the patient does not comply with the prescribed rules and restrictions of their diet. Such situations are referred to as  *cruzar(se)*,  *quebrar*,  *errar*, or  *malograr la dieta* (cross, break, err, or spoil the diet, respectively). The terminology of "crossing one's diet" not only denotes the act of breaking the diet, but also the consequences in terms of adverse effects, which are referred to as "crossing oneself" ( *cruzarse*) or becoming "crossed" ( *cruzado*), suffering an energetic clash ( *choque*) or a "crossing of energy" ( *cruze de energía*;  *cruzadera*). Thus, the impact of crossing a diet is considered energetic in essence. The symptoms that manifest, however, are described as often psychological or physical; they may include diarrhoea, itchiness and blisters on the skin, vomiting, bloating of the belly, swelling of body parts, anhedonia, depressed mood, irritability, hypomania, or delusional states. One healer explained that the pattern is specific to the dietary context: "To cross the diet is when a person who is drinking the plants does something against the rules and then begins to have symptoms that don't belong to the original clinical picture; anxiety, fears, confused thoughts, hypersensitivity, sometimes pains in some body part, sensation of chills, of heat, of threat—effects that have nothing to do with the plant itself, nor with the immediate circumstances." [PD]. The symptoms of a crossed diet may thus range from very mild to serious. One healer pointedly summarized the worst-case scenario: "If you don't stick to the diet rules—death or madness" [PG]. Another healer added that often "the first symptoms are physical: a headache, diarrhoea, and then if there is not an intervention from a healer soon, there can be psychological

symptoms, anxiety, depressed mood. If the *cruzadera* is spirit-related, there can be psychotic features, madness, delirium—an exacerbation.” [PB]. The syndrome’s severity was explained to depend on multiple factors. One is the type of plant medicine in question, with some being more delicate than others: “The strongest one in terms of risks is [plant X]. It is mild when you drink it, but then to manage it is more complicated because if you don’t respect the diet, this plant can make you crazy.” [PE]. Interestingly, some healers made the observation that while a crossed diet in foreigners is more prone to manifest in psychological symptoms, in locals it tends to produce physical symptoms, particularly on the skin.

The patient’s prior health state and personal susceptibilities, the length of a diet, and the specific restriction that has been broken are factors mentioned to play a role. The rule on sexual intercourse, for example, is pointed out as particularly unsafe to break: “The main danger of the diet is that they will have sexual relations during the diet. This is terrible. If you do not get treated in time by a curandero, you can die. It leads to madness, a total loss of control—the plants are not for joking.” [PJ]. Another healer expressed similar observations: “After you have completed the entire diet process, you can do that, but if done before completion, the patient falls sick. You may die. These are strong tree medicines!” [PC]. Likewise, breaking specific food prohibitions (e.g., certain meats) may lead to more serious complications (“if a sick person has been treated with natural medicine and is already significantly improved apparently, but then eats piranha—the person can die; the diet is very important there” [PL]; “one should not play with the plants, it needs a lot of discipline, you need to go with it until the end, respect the diet and the post-diet” [PM]); other foods were pointed out as not dangerous *per se*, but rather as blocking or diminishing the effectiveness of the treatment (e.g., “sugar has the property of eliminating the effect of the plants” [PC]). Further, one healer explained: “When you drink this plant, it produces inner heat, so after taking it you need to wash over with water; if not, your body remains like a hot motor. This is why the prescription for this plant is drinking it and directly showering, otherwise it can cause problems.” [PI]. Another healer illustrated this with the example of a patient who did not shower, even though the diet plant required showering twice a day. After a weeklong treatment the diet was cut as usual. The next day, however, the patient was found to have wandered off into the forest in a sudden-onset psychotic-like state. After being treated with the appropriate Amazonian techniques (see next section), the symptoms immediately subsided: “So after this, when we talked, she told me she had not rinsed herself with water even once during the diet! She said she started to feel odd after eating the salt, after cutting the diet, and later, in her hut, felt dizzy [mareada] and lost touch with reality. We found her quite far off somewhere next to the river, very dangerous. So problems of this nature can sometimes arise, either in the moment, or at times later on.” [PB].

Finally, the informants mentioned that adverse effects may arise if the person ingests other potent plant medicines not belonging to the diet: “It’s not about accumulating plants in one’s body, one needs to give it time, so the plant can work, with its energy, with its force, give it its time. Otherwise this can result in a *cruzadera*, taking additional plants which are not part of the process of the diet, without having given it time to metabolize, get digested. Sometimes there are people that are quite sensitive after a specific diet plant, a little fragile, and if they then proceed to take another plant somewhere around, one that is even stronger, they may become destabilized. [...] Too many plants can ruin a diet.” [PB]. The sensitivity (also described as energetic openness or permeability) after a diet that can lead to proneness to a *cruzadera* is said to greatly diminish once the diet is cut, but it persists to a lesser degree for some time, which is the reason for the post-diet phase. The healers therefore recommend a gradual return to previous social and alimentary habits.

### 3.5.3. Interventions in case of adverse effects

The timely intervention of a qualified healer was considered

imperative in the case of crossed diets, as symptoms otherwise may gradually aggravate. The process of remedying a crossed diet was referred to as *enderezar* (straighten) or *arreglar* (fix, repair), which requires the energetic dexterity and know-how of a curandero using “physical-energetic interventions” [PB] designed especially for this purpose. Examples include the skilled usage of tobacco smoke (*sopladas*), medicated showers (*baño de plantas*), which “helps them, it clears the energy; the external gets introduced internally, and there is a change of energy” [PG], certain remedies for ingestion, or manual techniques. In some cases the patient is required to return to the retreat format of the diet. They stressed that even though the symptoms may present in the physical or psychological domain, at its root the problem is energetic in nature, and therefore the help of a knowledgeable curandero is essential. Other approaches are considered ineffective or may even cause further damage, for example in the case of psychological symptoms: “It must be fixed with procedures from traditional medicine, baths, *sopladas*, plants, etc. Because if people sometimes do not fix it with the means from traditional medicine, it does not get fixed at all, and the person remains unhinged. Some people may have a bit of psychological strength and can stick it out, put up with it, but there is something that remains crooked. And if they start taking pharmaceuticals to try to get better—this is a no-go.” [PB]. Another respondent made the same observation in the case of a patient with itchy blisters due to a crossed diet: “This is not something to be treated with injections or ointments. For it to disappear again the person needs to be working with the same plants that they have dieted” [PI]. The healers mentioned different preparations of the plant for this purpose, and also stressed the relational aspect between the person and the plant: “To throw in the towel before the diet period is over, that is a lack of respect to the plant. Because the plant has been cut for that person, or part of it was taken off, and then if the person doesn’t take it seriously, the medicine does not like it; it can harm the person. Here we call that *cutipar*, the person will get stains on the skin.” [PL]

### 3.5.4. Risks related to healer training and conduct

The other main source of risk identified by the informants was inadequate training or lack of ethical standards of the person administering the diet. As outlined earlier, the type of healer seen as qualified to conduct diets is one that has him- or herself dieted extensively. Further, knowledge of the medicinal plants, their preparation and correct dosage was seen as critical, as the diet plants are generally described as “strong” (potent, mind-altering): “Any plant may be therapeutic or harmful, it depends on the person that prepares it. If the person does not know to dose; it might heal something, but negatively affect some other organs” [PK]. “Many of the plants are toxic, one needs to know the correct dose, even more with plants like [plants X,Y,Z]” [PH]. Moreover, the healer must be able to correctly diagnose patients, recognize contraindications, and attend to different types of complications in the diet process, including the crucial skill of *enderezar* (straighten) crossed diets. “This is why you need to know where you are drinking these plants, who is facilitating it. The skill of how to *enderezar*—many don’t have it.” [PE]. The latter skill is pointed out as what distinguishes a genuine curandero from one lacking qualification.

Additionally, the healer’s integrity was considered of utmost importance. Unethical conduct towards the patient (e.g., sexual impropriety, financial exploitation) has obvious implications, and additionally, the healers’ personal integrity (or lack thereof) is seen to impact the patient via energy transmission, which is why “the person that is looking after the person in diet must also be keeping the principles of energetic care and diet” [PD]. Dieting with a highly skilled, but at the same time highly unethical practitioner (usually referred to as *brujo* or *malero*) was pointed out as particularly perilous. This kind of practitioner was describing as having the capacity to “steal” the benefits of the diet from a person: “One more thing that can spoil diets are the bad energies from a certain type of *curandero*. For example, if you have dieted with a *curandero*, and then you go to another “*curandero*”—in inverted commas because at that stage, you do not know if he is a good or a bad

practitioner—but in reality, he is a *brujo*. Because, someone that knows the work and has accumulated a lot of force, a lot of capacity, he is able to have a look at you and see your energy from your diets—and may just aspirate it from you, like a vampire. I've seen this happen. People that are doing their diet, happily, and then another takes it for himself, to increase his own power. The person that has done the diet then feels depleted, perturbed." [PB]. Another respondent recounted this phenomenon in trainees of Peruvian-Amazonian medicine: "Formerly I would see that happen, they would make someone diet for a year, two years, and then the same person would take it from him—the teacher himself! And the trainee would be left with nothing. And the teacher, no matter how old he already was, would get very strong. I've seen this in many instances." [PL].

### 3.6. Medical training via diets

Peruvian-Amazonian healers use variants of the diet procedure described here for training purposes: "To learn to heal, you have to do long diets. You must continue to diet a year, two years, just then you begin to understand and to be able to heal. [...] You get to know the entire process of the plants and learn; and gradually, your body will sense that it will be healing, that it will serve plants, that it has gained knowledge. It's not a process of a month or two; it's one or two years of dieting with the plants." [PE]. Here we briefly touch upon some aspects that were highlighted by the respondents on this topic.

#### 3.6.1. Characteristics of the learning process and instruction by teacher plants

As a general principle, the healer's training occurs through direct, personal experience: "One learns the medicines by drinking them [*tomando se aprende*]. You'll know which quantity to drink yourself and which quantity you can serve. If I don't know the process of a plant—I have to know which quantity I must give, how its intoxicant effect feels [*cómo marea*], how its effect does not feel. There are plants that do not intoxicate [*no te marean*] but that make you purge [*te purgan*], and there are remedies that do intoxicate, but they don't make you purge; and there are remedies that do both. None of the remedies are pleasant in taste, all of them are strong." [PE]. Another healer likewise emphasized: "Because I have drunk this plant myself, I can give it to someone else. I serve the plants that I know in this way, how they function" [PC]. One informant pointed out that the ingestion of master plants brings about "a kind of learning that is in the body, that does not involve reasoning" [PB]. This body-based learning ensues as a result of "integrating the plant's energy, which then becomes part of you" [PM]. "It's as if you have read a book, so then you acquire knowledge, information. Later when you go to work, this information is already integrated in your scheme and you already act with this new information as a part of your approach. That is how I feel the plants. You drink them, you have experiences, there is learning happening, it inserts itself into your mode of acting and into your mode of working the medicine, until it flows; it flows from your work" [PB].

The healers also described more explicit modes of learning to heal via diets, for instance by acquiring concrete working tools: "Primarily, I was given *icaros*. [...] In the diets I have also received plant recipes. Or I have seen how to work with a rather complicated patient; there was a lot of information" [PD]. Such teachings are often conveyed in visions or dreams and instruct the healer about the realms of spirit: "When you are dieting, the spirits present themselves" [PF], said one informant. The plant's spirit may manifest in a dream and "may present as a man or a woman, depending on which tree it is; it differentiates itself via its clothes. And they may indicate something to you." [PL]. Another healer summarized: "The plant gives you everything, it gives you the chants, it gives you knowledge [...]. And in dreams, it makes me see other plants that I have never taken, that I don't know, but I am shown that these plants are good. It teaches you; it gives you knowledge. As I live in the forest, close to the plants, it makes me see them directly, 'such and such

plant is good for this'." [PE]. One healer narrated such an instructional dream: "I was taken to a mountain and was shown plants. I wanted to express my opinion, to say that I also knew plants—'No, you are the guest here, just listen to what we are going to tell you.' So they started teaching me, we arrived at a *patiquinal* [where plants of the *patiquina* family are cultivated], a large *patiquinal*, where they would tell me 'this heals this kind of ailment', and they showed me a variety of different forms to prepare them." [PH].

#### 3.6.2. Becoming a healer entails a personal healing process

The healer's training was described to inevitably "pass through a healing process which is personal" [PB], due to the very nature of the diet method. The training diets involve learning about medicine, "but also things about work life, about family—the plant is good, it is beautiful, if it is done consciously and respectfully, it heals you from a lot of things." [PJ]. It is common for a healer to discover their capacity to cure while in diet for a personal health issue. One participant recounted being sent to diet as a youth for a broken bone due to an accident. After drinking the plant medicines for some time, unusual dreams appeared: "I would see that they would come and get me, blow tobacco on me [*soplar*], take my hand and tell me 'you are capable'. I had no idea what they were talking about. They showed me some plants in my dreams. I would tell my dad 'Why am I dreaming about this?' My dad would just say to me 'This is the plant bugging you'. [...] That is how I would be dreaming, sensing that I was with *curanderos*." [PO].

#### 3.6.3. Challenges and choices of the training process

Diets for training present the trainee with choices. Prominent among them is the selection of what type of practitioner one wants to become, that is, which skills and practices to learn. One respondent narrated a story from his youth about meeting an Indigenous healer from the Peruvian-Amazonian highlands, himself being from the lowlands. He advised the respondent to diet with a specific tree from his natal region: "You can drink the medicine of this tree's bark in order to learn, to become a healer. But this same tree can also give you other kinds of ideas, for you to become bad, for you to kill people". "No this is not for me," I told him, "what should I be drinking this for—then you become a murderer [*mata-hombre*]!" I told him. He was laughing. I have never killed; I drank that medicine, but not for killing, no. I learned to cure *malaire*, diarrhoea and other things". [PA]. Another informant similarly noted the range of what can be learned in diets, pointing out one plant that "is especially for causing harm, and for defending yourself," and also that "there are plants to make a woman suffer, to make a woman suffer if she does not like a man. And there are plants to make men suffer too." [PI].

Thus, the path of becoming a curer may involve the acceptance or rejection of obscure practices, seductive traps, and distractions. Given the complexity of this landscape, having a human teacher with integrity and knowledge of the field is considered essential for the neophyte: "You need to have a guide in order to learn, there should be a guide. It is like when you are a child, they take you by the hand and you start to walk. The path of the medicine is the same way. Someone needs to be your support, your backing, your help, telling you to go ahead and walk" [PG]. At the same time, the direct manner of learning, that is, from the master plants themselves, in diets, was underlined: "For me there is no serious learning if it does not pass through one's own diet. [...] Even if you are studying with the very best *curandero*, the *maestro* will not be able to give you the energetic knowledge; he can perhaps give you some verbal knowledge, but you will not have the power to use the plants in the manner that they are meant to." [PM]. The healer's challenges are not over once the training period has been completed. The informants invariably maintained that the work of a healer operating in the energetic realm entails risks for the healer, particularly when curing illnesses due to sorcery. Undertaking periodic strict diets is considered to be the healer's protection from such risks, as well as necessary for maintaining curative force and personal health: "The *curandero* lives by dieting,

drinking the plants” [PG].

### 3.7. Foreign health-seekers and Peruvian-Amazonian diets

In conjunction with the recent popularization of ayahuasca, and perhaps especially among individuals suffering from health problems unresolved through biomedical approaches, the healers observed a sharp increase in foreign health-seekers to the Peruvian Amazon. This interaction between Amazonian medicine and health-seekers from non-Amazonian cultures was addressed by the informants in various forms. On the one hand, the individuals from other medical cultures may hold a different understanding of relevant basic concepts (what constitutes sickness and healing, for instance), leading to misunderstandings between healer and patient, and in some cases complications in the treatment process. On the other hand, the influx of foreign treatment-seekers requesting Amazonian treatments (and particularly ayahuasca) was described to have significantly impacted Peruvian-Amazonian healing practice, as the profession has attracted more commercially motivated practitioners, resulting in a dilution of traditional knowledge.

#### 3.7.1. Dissimilar underlying concepts of Amazonian and biomedical treatments

The healers point to an epistemological disjunct between biomedical and Amazonian approaches, which is particularly evident with energy- and spirit-related concepts. Learning to grasp this domain and work with it is an essential part of any Peruvian-Amazonian healer’s training: “Just through my own diets I began to understand this dimension of the plants, of *curanderismo* [traditional healing], of this manner of work, of the energetic and spiritual dimension.” [PB]. However, a lack of familiarity or disbelief regarding these concepts is common among health-seekers from cultures based on biomedical education. This was described to sometimes lead to problems, for example in conjunction with *cruzaдерas*: Since this condition, albeit energetic in essence, may manifest as psychological symptoms, the problem may be misconceived as a mental disorder by westerners and “the person may be taken to a psychiatrist” [PE]. This was considered unlikely to resolve the problem, given that the underlying issue is understood not as psychological, but energetic, and thus the non-resolving issue may lead to long-term pharmaceutical/psychiatric treatment. In contrast, healers maintain that the symptoms would stop if the Amazonian methods for repairing the diet were applied, as these techniques address the problem at its root, and “the diet gets straightened” (*la dieta se endereza*).

Problems may also arise from a lack of understanding of the role and function of master plants in Peruvian-Amazonian medicine, and misguided attitudes with which they may be sought: “In the Western context, people come for example from Europe or from North America to Peru and they want to do everything in 3 weeks, and this can’t be done. I know that the flight tickets are expensive, but you can only do one diet, it’s not possible to organize an ‘intensive-treatments’ type of trip. And there are people that don’t understand that, so they come here or there, do diets, then go to some other healer and continue taking plants. So this is problematic.” [PB]. It is seen as problematic because it may lead to adverse reactions: “This happens to a lot of foreigners, they go to different places drinking ayahuasca, San Pedro, peyote, mushrooms, and whatnot. Then they return to their country and find themselves feeling very bad; Why? Because they have taken lots of medicinal plants that have power, and they haven’t completed the corresponding diets for example. To illustrate, I can carry 20 kilos, but if someone puts 200 kilos on me, it will kill me. It’s similar to that. Each of these medicinal plants, which the curandero uses for healing others, has its time, its preparation, its diet time; and when applied like this, they are very useful. But if you are going to just amass things, that is not how this works.” [PL]. Furthermore, given its international popularity, a misconception of ayahuasca in particular was mentioned to be common. Unrealistic or exaggerated expectations regarding what this plant medicine is indicated for were described as common among foreigners, who may insist

to be treated with ayahuasca even though the healer may suggest other treatments: “Ayahuasca may be interesting, as a visionary experience, but it is the diet that goes deeper, that can break deeply rooted patterns and restructure them” [PD]. “The visionary plant ayahuasca is also a master plant, but to have a good result you need plant diets.” [PM].

#### 3.7.2. Commercialization of the Peruvian-Amazonian healing landscape

The informants also explained that with the increased interest in Peruvian-Amazonian healing among foreigners there is a greater commercialization of this field. There is a proliferation of practitioners or healing centers in the Amazon, many of which may be ill-prepared for genuine healing work: As one informant put it, many practitioners “simply see it as a business—they don’t know the real essence of traditional medicine.” [PK]. Another healer added that “traditional curanderos are beginning to do things differently than how it was done before, for convenience” [PB]. As a consequence, “it’s difficult to determine these days who is a traditional *curandero* that really represents the field, because nowadays anyone calls themselves ‘*curandero*’. The people call themselves ‘*curandero*’, but I think they are not *curanderos*, they offer the plants, the treatments, without taking into account the medical, without considering the patient. They don’t take these things into account because they are not healers, or *curanderos*, or doctors. These are people that have learned this just like one learns to cut the fish for a ceviche—they learn how to prepare it and then they serve it to patients, without any therapeutic criterion, just for the person to have some sort of psychedelic experience, of the eagle, the hummingbird, the jaguar, the *otorongo*. But there is no therapeutic aspect to it.” [PB].

## 4. Discussion and conclusions

The *dieta* is a central therapeutic concept and tool in Peruvian-Amazonian traditional medicine and a unique method for using psychoactive plants. The interviewed healers described multifaceted applications (treatment, prevention, training) and effects, which can vary across plant species, purpose of the diet, and administering healer. The process was portrayed as transformative in the domains of body and mind, but also energy and spirit, with the benefits being attributed to the effects of the teacher plants in conjunction with the diet’s conditions (solitude, proximity to nature, little sensory stimulation, etc.) and skill of the healer guiding the intervention.

The holistic approach and understanding of therapeutic process in Amazonian healing is shared with other forms of *curanderismo*, or Latin American traditional medicines (Arizaga, 1999; Del Castillo, Fernandez and Luna, 2020; Harding, 1999; Maduro, 1983). In contrast to, for instance, *spiritualism* (*espiritualismo*; Finkler, 1994), Peruvian-Amazonian healing is distinctively defined via its close-knit relationship with the rainforest’s vegetal world (the plant teachers, doctors, surgeons, etc.), and the tradition is therefore sometimes referred to as *vegetalismo* (Luna, 1984b, 1986). The informants insisted on the plants’ agency in the dietary process, describing them as powerful, wise, or knowledgeable “non-human persons”, a concept consistently found in the literature on Amazonian healing (Jauregui et al., 2011; Luna, 1984a; Viveiros de Castro, 1998). Wisdom and sacredness of certain plants is also a recurrent theme in Andean medicinal systems (see e.g., Armijos et al., 2014; Martin, 1970; Schultes and Hofmann, 1979), but the Peruvian-Amazonian tradition is unique in using a generic and culturally well circumscribed method for establishing systematic relationships with those plants personified. For instance, to become a healer in the Peruvian-Amazonian tradition, the trainee complies with extensive diets in order to form alliances with the teacher plants and to learn to communicate with them (e.g., via icaros, see Callicott, 2013). Interestingly, the concepts of plant cognition and intelligence are increasingly discussed in the natural sciences, inspired to some degree by a recognition of the ecological utility of Indigenous perspectives on plants (Baluska and Mancuso, 2018; Gagliano, 2013;

Parise et al., 2020). Relevant in this context (although not the focus of the present work) is also our informants' emphasis on know-how and respect when harvesting the plants in the form of defined procedures, taboos, and rituals. Such processes for plant collection are not uncommon in traditional medicines (e.g., Ayurveda, African healing systems) and have been related to sustainability practice and conservation (Anuradha, 2018; Harding, 1999; Magoro et al., 2010; Msuya and Kideghesho, 2009; Tresca et al., 2020).

Furthermore the healers' stress on tobacco as a critical medicinal plant is noteworthy, with one informant likening its importance in the *dieta* to that of "lemon in lemonade". The accentuation is in line with descriptions of tobacco as one of the main medicinal plants across the Americas, and especially in Amazonia, where the plant is believed to have originated (Russell and Rahman, 2015; Wilbert, 1993). Indeed, some Peruvian-Amazonian healers—so-called *tabaqueros/as*—specialize in these species (especially *Nicotiana rustica* L.<sup>7</sup>), preparing tobacco-based medicines for ingestion or topical application to treat a broad range of ailments (Berlowitz et al., 2020). Among some ethnic groups like the *Yanasha*, the *tabaquero* (or *pa'ller* in this language) is considered the most important figure in the field of healing (Valadeau et al., 2010).

The use of ayahuasca in conjunction with diets was also reported in the sample. Interestingly, its function in this context was described not as treatment *per se*, but as diagnostic, similar to early ethnographic observations that ayahuasca served not as a panacea, but as "an important diagnostic and revelatory tool used by skilled folk healers to determine the cause of illness" (Dobkin de Rios, 1970, p. 1421). Indeed, the informants mentioned misconceptions and false expectations regarding ayahuasca to be common among foreign visitors. Evidently, diverse manners of usage and preparation of ayahuasca, with or without varying admixture plants, exist across Amazonian traditions (Luna, 2011; Pinkley, 1969). Research examining the range of treatment concepts around this plant in comparison with emerging Western uses is warranted in this context.

Nevertheless, our findings clearly suggest that an exclusive focus on ayahuasca will not adequately capture the breadth of Amazonian medicine's uses of psychoactive plants. The intricate frame of understanding of such plants evident in our results included not only ample knowledge of effects, mechanisms, and risks, but also sophisticated safety measures to address adverse responses and tools to modulate outcomes. The healers' risk assessment of the *dieta* stands out in this context, an aspect often neglected in research but highly relevant in view of emerging Western therapies using Amazonian plants. According to the informants' explanations, a view of these plants (including ayahuasca) as *a priori* safe would be misguided, as their safety crucially depends on the corresponding diet frame and administering healer. A healer's capacity to address adverse effects (conditions like *cruze de energia* or *cutipa*) was stressed in this context; it was a skill considered essential for a person administering such plants, acquired via extensive training diets. Furthermore, the *curandero's* ethical conduct and motives were highlighted by the informants. The latter makes sense considering the intimacy of the *dieta's* context where the patient is in contact only with the healer, coupled with the described sensitivity inherent in the process, as well as suggestibility known to be induced by many psychoactives. The concepts of set and setting developed in early psychedelic research (Hartogsohn, 2017) may have merit in this context, but, as we have argued elsewhere (O'Shaughnessy and Berlowitz, 2021), are insufficient to account for the multilayered complexity of the Peruvian-Amazonian approach of psychoactive plant use.

A novelty of the current study was its systematic description of the diet method using a health-scientific lens, whereby the intervention was investigated along the same parameters as a Western-developed clinical

intervention would be (i.e., in terms of procedure, mechanisms, effects, adverse effects, risks, etc.), while equally allowing for the non-Western concepts emerging from the data to be represented in the description. The study was conducted by a set of clinical scientists of various disciplinary backgrounds (medicine, clinical/health psychology, complementary/integrative medicine, pharmacology), drawing on extensive accounts of a sample of healers of diverse Amazonian ethnic groups of Peru. We did not investigate differences in dietary practices between the various Amazonian cultures represented among participants in the scope of this study, but research using larger sub-samples per ethnic group would be of interest to investigate intercultural variations in this context.

Our work expands on ethnobotanical surveys (e.g., San Martín region; Sanz-Biset et al., 2009; Sanz-Biset and Cañigüeral, 2011) by focusing particularly on the *manner* of using these plants, reporting emic views of therapeutic effects, modes of action, and safety parameters. Allowing for an emic understanding of dietary concepts was a key aspect and strength of our methodology. Indeed, our findings suggest that from the perspectives of the traditional healers consulted, the *dieta* resists easy categorization within Western medical or scientific frameworks. For example, the effects of the plants within the *dieta* complex as a whole cannot be understood through a biomedical lens alone. Based on the synergistic importance of context, behaviour, and associated taboos, to the relevance of non-human others (e.g., plant spirits), and through to the insistence on an energetic-spiritual aspect of reality which trained healers influence to their patients' benefit (or in case of sorcerers, to their detriment), the *dieta* presents a gateway to an entire framework of natural medicine that has remained largely under-explored from a health-scientific point of view.

Furthermore, as Pedersen and Baruffati (1985) aptly expressed, "a strictly biochemical approach [to Amerindian plant medicines], while expanding the modern pharmacopoeia with medicinal plants of 'verifiable' pharmacological properties, leads to the undermining of traditional medicine practices and the subsequent enrichment of the pharmaceutical industry and trade" (p. 8). When the psychedelic renaissance was in its infancy nearly 30 years ago, Grob (1994) called on the field to incorporate Indigenous ways of working with such plants into the psychedelic research program. Yet while Indigenous modes of utilizing substances like ayahuasca, iboga, or peyote are often acknowledged in principle, they remain on the periphery of clinical research, with associated traditional knowledge systems rarely being considered alongside the substance. This is relevant especially given the successes of the psychedelic research program thus far and the likelihood that at least some aspects of psychiatric practice will become radically altered as a result of mainstream integration (Schenberg, 2018). Attendant attempts of investors and pharmaceutical companies to patent relevant compounds are already occurring (Aday et al., 2020; Gerber et al., 2021), and an increased commercialization of the field and dilution of traditional knowledge was also noted by our informants.

Conversely, research that includes the traditional practices around psychoactives, such as the present study, but also research on such methods from other Amazonian/Amerindian cultures using psychoactives, may prompt a reappraisal of Indigenous forms of medicine and contribute to their preservation in the face of these developments. However, such a reappraisal will require that Indigenous practices be allowed to stand on their own terms and not be glossed over as simply ancient forms of, or precursors to, psychedelic medicine. In the realm of traditional Amazonian medicine, the complexity and varied application of the *dieta* exemplifies this need. However, as this thorough description of the *dieta* shows, grasping the differences will not be straightforward. The complexities of actual practice, along with associated epistemological and ontological challenges will call for creative, trans-disciplinary, and intercultural investigations which include traditional healers and allow for medical pluralism.

Such intercultural health research has relevance not only for the psychedelic renaissance but is also pivotal for working towards greater

<sup>7</sup> As well as other tobacco species, with debates about the most frequently used one still ongoing (Fotiou, 2018).

recognition of Indigenous medicines in the Americas in a more general sense, and inclusion of Indigenous healing modalities into formal healthcare systems of the corresponding regions, and perhaps beyond. The *dieta* method, for instance, is idiosyncratic to Peru and not generally found in other regions of the Amazon, although medical cultures from other Amazonian regions (e.g., in Colombia, Brazil) may hold equally sophisticated application methods in this context, which should also be investigated. In countries like Peru where a large proportion of the population is Indigenous, severe health inequalities and poor access to healthcare for Indigenous people are far too common (Brierley et al., 2014; Cianconi et al., 2019). Intercultural healthcare frames are increasingly discussed to overcome these challenges by offering accessible and affordable treatment options (Cardenas et al., 2017; Mignone, Bartlett, O'Neil and Orchard, 2007; Torri and Hollenberg, 2013), but barriers remain, with the lack of basic research on traditional medicines being a central issue (Caceres Guido et al., 2015; Gallego-Pérez et al., 2021; Ouellet et al., 2018). Work like the present one investigating treatment methods from Indigenous cultures, Amazonian and other, should not be neglected in the current global interest in psychedelic therapies and the scientific efforts in this context. Studies that point to this gap and investigate the importance of bridging knowledge between traditional and Western medicine in the context of psychedelics are already beginning to emerge (Fogg et al., 2021; Gerber et al., 2021; Ona et al., 2021; Tupper and C Labate, 2014). Such research may in the long-term contribute to a more inclusive psychedelic research paradigm, as well as more inclusive healthcare practice in the Americas, where rich traditional healing systems abound, and to the recognition of their Indigenous healers as not only historical forerunners, but also current leading experts in psychedelic medicine.

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## Declaration of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## CRediT authorship contribution statement

**Iliana Berlowitz:** Conceptualization, Methodology, data collection, Formal analysis, Writing – original draft, Writing – review & editing, Funding acquisition. **David M. O'Shaughnessy:** Writing – original draft, Writing – review & editing. **Michael Heinrich:** Writing – review & editing. **Ursula Wolf:** Methodology, Writing – review & editing. **Caroline Maake:** Methodology, Writing – review & editing, Funding acquisition. **Chantal Martin-Soelch:** Methodology, Writing – review & editing, Funding acquisition.

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