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Dialogue of knowledge in traditional herbal medicine in Mé'pháá and Tu'un savi indigenous peoples in the mountain of Guerrero Mexico

[Diálogo de saberes en la medicina tradicional herbolaria en pueblos indígenas Mé'pháá y Tu'un savi en la Montaña de Guerrero, México]

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Abstract: In the indigenous peoples Tu'un savi and Mé'pháá of the mountain region of Guerrero, allopathic medicine and traditional herbal medicine are used, due to this, we consider that dialogues of knowledge should be established between the practitioners of both medicines. We collaborated with 46 individuals to discuss the forms of using medicinal species, preparing treatments, and using allopathic medicine. Through semi-structured and in-depth interviews, 121 plant species were recorded, with which more than 40 diseases are treated, which are distributed in the digestive, muscular, respiratory, and urinary systems: chronic-degenerative and cultural diseases. The dialogue of knowledge between specialists in traditional medicine and allopathic doctors could contribute to the development of their own health project, with which a regional ethnodevelopment plan could be created.

Keywords: Knowledge system; Traditional medicine system; Intercultural and intracultural knowledge dialogue; Ethnodevelopment; Good living.

Resumen: En los pueblos indígenas Tu'un savi y Mé'pháá de la montaña de Guerrero se utiliza la medicina alopática y la medicina tradicional herbolaria, debido a ello, consideramos que deberían establecerse diálogos de saberes entre los practicantes de ambas medicinas. Se trabajó con 46 colaboradores, con los cuales se dialogó acerca de las formas de uso de las especies medicinales, preparación de los tratamientos y utilización de la medicina alopática. A través de entrevistas semiestructuradas y a profundidad se registraron 121 especies de plantas, con las que se tratan más de 40 enfermedades, las cuales están distribuidas en los sistemas digestivo, respiratorio y urinario; también se atienden enfermedades crónico-degenerativas y culturales. El diálogo de saberes entre especialistas de la medicina tradicional y médicos alópatas podría contribuir a la elaboración de un proyecto de salud propio, con el cual se podría crear un plan de etnodesarrollo regional.

Palabras clave: Sistema de saberes; Sistema de medicina tradicional; Diálogo de saberes intercultural e intracultural; Etnodesarrollo; Buen vivir.

INTRODUCTION

Indigenous peoples have created their own systems of knowledge, which enable them to explain the world surrounding them and solve the most immediate issues. For example, they know the healing and symbolic effects of plants, animals, and fungi; they know about constellations and physical, biological, ecological, and sociocultural processes, such as life cycles, flowering periods, manual work in the field; in addition, their members have experience in community positions (Toledo, 2005). Ethnomedicine and ethnoagronomy are ethnosciences that study the knowledge that peasants, housewives, midwives and indigenous and mestizo healers put into practice during the process of exploiting natural resources, through agricultural, livestock, forestry, medicinal and fauna activities to obtain the necessary satisfiers for survival, health, social reproduction and development (Cruz-León *et al*., 2015). This knowledge is an expression of the complex forms of rationality, reflection, systematization, and transmission of knowledge (Pérez-Ruiz & Argueta-Villamar, 2022), generated, preserved, applied and used for centuries, and it constitutes a fundamental pillar of the cultural heritage of these peoples as their knowledge and practices are transmitted and learned through collective and generational processes (Olivé, 2009).

Indigenous peoples and groups can adopt cultural elements that are available and are generated in any place and historical time. For example, they appropriate material resources such as land, medicinal plants, energy sources, tools and utensils, natural products, etc., either in their current state or transformed. They also appropriate intellectual resources (which are formal or non-formal knowledge), such as those related to the preparation of herbal remedies; likewise, they adopt symbolic and emotional resources from other peoples and cultures, such as crosses and candles, which they use in their healing, petition, and gratitude rituals. The social capacity to decide on these cultural elements will depend on each people and this is what Bonfil (1991), calls *cultural control*, which he characterizes as a central element of his theory of the same name. Thus, cultural elements, whether one's own or others, constitute an enormous cultural wealth for the solution of social, educational, economic, health, and environmental problems, which can contribute to ethnodevelopment, that is, to one's own development that considers the historical experience and cultural resources mentioned above (Bonfil, 1982; Olivé, 2009).

To achieve ethnodevelopment, it is essential to consider the worldview of indigenous peoples, in this case, Mixtecs and Tlapanecs, in which traditional medicine is still present in the form of herbalism, midwifery and healers. Traditional Mexican indigenous medicine is a system of concepts, beliefs, practices, and symbolic and normative material resources that are derived from the principles of a millenary worldview and are dedicated to health-disease care in contemporary Mexico.

Among the elements that make up traditional Mexican indigenous medicine are traditional doctors, procedures and methods of diagnosis and healing, causes of demand for care, therapeutic resources (material and symbolic) and the relationships that traditional medicine maintains with the rest of medical knowledge and with health care systems (Argueta-Villamar *et al.*, 2012).

Among the elements of diagnosis and therapeutic resources of traditional Mexican indigenous medicine is divination by means of cards or corn grains, the interpretation of dreams, dialogues with blood, cleansing, use of plants, animals, fungi, minerals, massage techniques, cupping, magical-religious practices, acupuncture, use of temazcal, bioenergy and midwifery, among others (López-Gómez, 2015).

In this article reference is made to the traditional Mixtec and Tlapanec indigenous herbal medicines of the mountain region in the state of Guerrero, Mexico, which include as elements a great variety of herbs, trees and shrubs, domesticated, semi-domesticated or wild, from which leaves, fruits, flowers, barks and roots are used, with which teas, infusions, ointments, syrups and soaps are made (Carrillo-Esper *et al.*, 2010). These elements are also used in *cleansing*, healing, and childbirth, as well as in the rituals of healing, petition and gratitude to request the support of mother earth, water, fire and air.

In this type of rituals, the participation of the healer is essential. According to Mellado-Campos *et al*. (1994), healers-herbalists or *ñaatana* predominate in the *Tu'un savi* people, followed by healers-midwives, healers-bonesetters, masseurs, diviners, spiritualists, pulse takers, and praying men. The health specialists of the *Mé'pháá* people are known

by the general name of *xapunaniitaana*, and among their specialties are that of midwife, bonesetter, herbalist and praying man, although there are also those who have a double specialization, like their *Tu'un savi* neighbors, as is the case of the midwives-bonesetters and the midwives-praying men.

In addition to traditional herbal medicine, the indigenous peoples mentioned also practice self-consumption, bartering, *change of arm*, community work, community organization, communal celebration, and community assembly. This way of life, known as *Good Living* or *Living Well*, reflects the worldview of the balance of the whole and its proposals call to reconstitute the world from diversity and difference, a world *from below*, whose beneficiaries are the local actors themselves (Escobar, 2011), for this the dialogue of knowledge is fundamental, which is proposed as a strategy of common benefit, of utmost importance for decolonization and the recognition of indigenous knowledge (Leff, 2019) such as that related to herbal medicine.

The principle of the dialogue of knowledge implies the diversity of beliefs and values, which, beyond the acceptance of the existence of other points of view, is expressed as respect, recognition of their legitimacy and as the interest in understanding their reasons (Argueta-Villamar, 2011). The dialogue between different forms and systems of knowledge, such as the herbal medicine of the *Mé'pháá* and *Tu'un savi* cultures and the scientific allopathic medicine of Western culture, must be developed in a context that allows us to appreciate reciprocally how these medicinal practices relate to specific ethical values and how these are articulated to a globalizing understanding of the relationship between social, natural, material and spiritual life (Rist, 2002).

Traditional knowledge and scientific knowledge, although they are systems of knowledge that start from different perspectives, operate under different processes, and serve different purposes, can reach comparable results (Leff *et al*., 2003). An example of this, regarding health-disease, is the fact that in the indigenous peoples who inhabit the study area, most of the interviewees treated the conditions of Covid-19 only with herbal medicine, although there were those who also used it in combination with allopathic medicine. In rural mestizo and indigenous communities in Latin America, some similar examples can be observed, such as those documented by Argueta-Villamar and Pérez-Ortega (2022), who mention that the Garífuna community of Honduras, the Shipibo-Konibo indigenous people of Peru, the Kichwa of Ecuador and the Mayans of Campeche, Mexico, among others, used both health systems to counteract the effects of Covid-19. This form of mixed use of therapeutic resources clearly raises the possibility of establishing various dialogues between both knowledge systems, which can contribute to establishing mixed and complementary health systems in our countries.

In this paper, it is proposed to analyze the dialogues of knowledge between housewives, midwives, peasants and healers of the *Mé'pháá* and *Tu'un savi* cultures, who, as *connoisseurs* and practitioners of traditional herbal medicine, exercise daily an intracultural dialogue, that is, within each culture in the domestic units, regarding plants and their medicinal uses; the intercultural dialogue will also be analyzed, first between the two cultures, comparing knowledge in relation to the forms of use of herbal medicine (Betancourt-Posada, 2015) and later, between allopathic medicine, in relation to diseases and medicines to treat them. Through this dialogue of knowledge, the community health system will be strengthened in the indigenous peoples of the study area, who have limited access to the modern institutional health system, that is, they lack medical clinics, doctors, and medicines. It is also intended to build a collaborative and decolonizing intercultural dialogue, where actors with different knowledge systems are willing to talk and combine their knowledge and experiences to achieve a common goal, always under the principles and according to what each actor is willing to contribute to achieve this common goal (Pérez-Ruiz & Argueta-Villamar, 2019; Pérez-Ruiz & Argueta-Villamar, 2022).

To concretize this type of dialogue of knowledge with the indigenous peoples mentioned, it is necessary to incorporate intuition, feelings and imagination, central elements of the native cultures (Pérez-Ruiz & Argueta-Villamar, 2019) and with which, according to Fals-Borda (1985), it is possible to hear “clearly the repressed voice of the people and the rich structure of popular knowledge that has remained hidden under layers of contempt and distrust is exposed".

On the other hand, the dialogue of knowledge not only enables an approach in relation to what can be exchanged between people, but also raises the

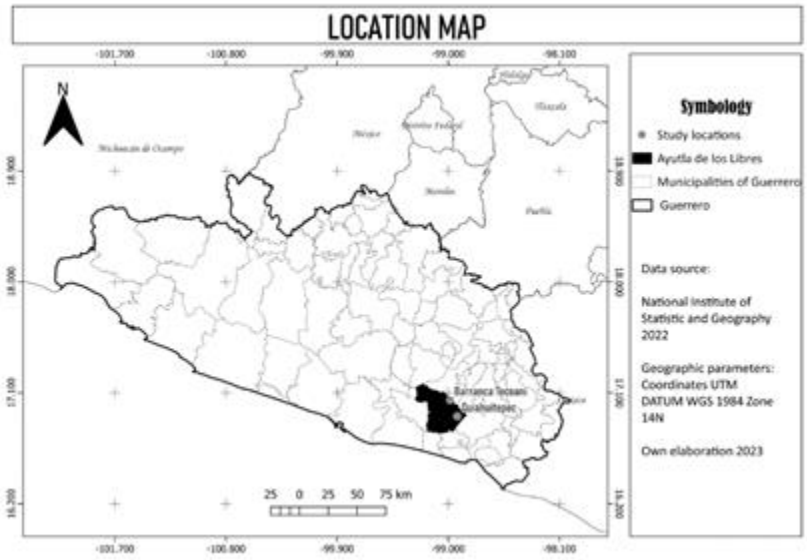
possibility of approaching the way in which other beings know the planet, and how this interaction between humans is established (Bernal-Acevedo, 2014). For the purposes of this research, it is proposed to know the interaction between humans, supernatural beings and plants, and through the uses (medicinal and ceremonial) of plants in herbal medicine.

MATERIALS AND METHODS

Area of study

The research was conducted in the communities of Barranca Tecoani and Quiahuitepec. Barranca Tecoani is an indigenous *Mé'pháá* locality; the center of the population is located at 17°02´28´´ north and 98°59´04´´ west of the city of Ayutla de los Libres, which is the capital of the municipality that has the same name, belonging to the region of Costa Chica located in the State of Guerrero, Mexico. Meanwhile, Quiahuitepec is a community of *Tu'un savi* origin, located at 16°54´34´´ north and 98°55´38´´ west of the same municipality (Figure No. 1). In this municipality, 47.6% of the population speaks some native language, mainly *Tu'un savi* or Mixtec and *Mé'pháá* or Tlapanec (INPI, 2017). Barranca Tecoani has 355 inhabitants (54% men and 46% women), while Quiahuitepec has 229 inhabitants (55% women and 45% men) (INEGI, 2020).

Figure No. 1
Geographical location of the study communities



Data collection

Through the qualitative and quantitative methodology, the systematization of knowledge of experts in traditional herbal medicine was developed. To determine the number of people with whom the dialogue was established, intentional sampling was used, which consists of determining the sample according to the criteria of the researcher, considering that it must be representative of the population (Hueso-González & Cascant-Sempere, 2012). According to López (2004), the recommended minimum is 30% of the population. The selection of the interviewees was established by the snowball technique, which consists of selecting an initial sample of individuals and establishing in each interview which new individual has to be interviewed in order to integrate the complete sample (Goodman, 1961). For the application of the interview in the population of Barranca Tecoani, a sample of 25 of the 74 households in the locality was considered, which is equivalent to 33%[a] of the households, while in the locality of Quiahuitepec, 15 of the 45 households were interviewed, which is equivalent to 33%[b] of the study universe. In total, 35 women and five men were interviewed in the two communities, in addition to three healers per community, the only ones recognized in them.

Between January and June 2022, communities were visited to talk with experts, which

[a] Formula for BT: 100x25= 2500/74= 33%
[b] Formula for QT: 100x15= 1500/45= 33%

was possible through semi-structured and in-depth interviews. Through this dialogue, it was possible to explore the local knowledge of herbal medicine and its relationship with species, health-disease and with their own worldview, in a context where cultural diseases such as *vergüenza* and *susto* are present. The conversations were audio-recorded and later transcribed into text to analyze and retrieve the main content; likewise, the triangulation with the literature and sources previously analyzed was carried out. It should be noted that most of the conversations with the *Mé'pháá* people were in this language and were translated by our collaborators.

In addition to the interviews, botanical samples of each of the plants used were collected, which are deposited in the IMSSM Herbarium of the City of Mexico. The samples were botanically identified in this same institution, in addition, the databases WFO World Flora Online and Tropicos were consulted. The species collected will be part of a collection that will be deposited in the same communities where they were collected, with the intention of strengthening the dialogue of knowledge. Finally, the information collected was quantified and validated statistically through the application of the Friedman *et al*. (1986), which allows estimating the relative importance of each species based on the degree of consensus of the interviewees, for which the following mathematical formula was applied:

$$FL = \frac{I_p \times 100}{}$$

I_p equals the number of interviewees who mentioned a species (frequency of mention), while I_u equals the total number of interviewees.

Another index used was the Jaccard Similarity Index (Cj), which evaluates the similarity of species between two areas or communities. This index is based on the presence-absence between the number of common species in two communities and in the total number of species (Badii *et al.*, 2008). The mathematical expression of this index is as follows:

$$SIj = [c/(a+b+c)]100$$

a equals the number of species exclusive to community A, b equals the number of species exclusive to community B, and c refers to the number of species common to both communities.

RESULTS

Plants

Through interviews and consensual dialogue with women, peasants, midwives and healers from the Mixtec and Tlapanec peoples, 121 species of plants were recorded (Table No. 1), of which 62 were used by the *Tu'un savi* with which 43 diseases were treated, while 59 species were used by the *Mé'pháá* with which they treated 42 health conditions. It is worth mentioning that, of the 121 plant species identified, 30 were used in both indigenous peoples.

Table No. 1
Identified plants in the people *Tu´un savi* and *Mé´pháá*

Family	Scientific name	Local name	Indigenous name	Diseases	Indigenous people
Acanthaceae	*Justicia spicigera* Schltdl.	Muicle	*Tun yin kui'i*	Cough and anemia	*Tu´un savi*
Aloaceae	*Aloe vera* L.	Sábila	*Yavi sábila* *Xtiu´wa sábila*	Wounds, burns and headache, gastritis and diarrhea	*Mé´pháá* and *Tu´un savi*
Alliaceae	*Allium sativum* L.	Ajo	*Tikumi yakò*	Gastritis, parasites, flu, cough, and Covid-19 symptoms	*Tu´un savi* and *Mé´pháá*
Alliaceae	*Allium cepa* L.	Cebolla morada	*Tikumi kua'a*	Cough and for Covid-19 symptoms	*Tu´un savi*
Anacardiaceae	*Mangifera indica* L.	Mango	Yuku tun	Flu, cough, and	*Tu´un savi* and

			mango *Íxe xkode*	dysentery	*Mé´pháá*
Anacardiaceae	*Anacardium occidentale* L.	Marañona	*Íxe rgañu*	Stomachache	*Mé´pháá*
Annonaceae	*Annona reticulata* L.	Anona	*Ndoko tiun*	Diarrhea	*Tu´un savi*
Annonaceae	*Annona muricata* L.	Guanábana	*Ndoko iñu*	Cholesterol	*Tu´un savi*
Apiaceae	*Cuminun cyminum* L.	Comino	It does not exist	Flu, cough, and for Covid-19 symptoms	*Tu´un savi*
Apocynaceae	*Rauvolfia tetraphylla* L.	Paulillo	*Yuku tatan*	Wound healing	*Tu´un savi*
Apocynaceae	*Plumeria rubra* L.	Cacaloxochitl	*Íxe re´su mi´xá*	Fractures and for coraje	*Mé´pháá* and *Tu´un savi*
Araceae	Not determined	It does not exist	*Iná rixuáa*	Espanto	*Mé´pháá*
Araceae	*Xanthosoma sagittifolium* (L.) Schott.	Quequeite	*Ina gudi ba´u*	Fever	*Mé´pháá*
Arecaceae	*Cryosophila nana* Kunth.	Soyamiche	*Yita tu'un tu*	Diabetes	*Tu´un savi*
Asteraceae	*Artemisia ludoviciana* Nutt.	Estafiate	*Yuku ti ndaku*	Diarrhea, vomiting and for coraje	*Tu´un savi*
Asteraceae	*Gnaphalium chartaceum* Greenm.	Gordolobo	*Yita patyi*	Cough and fever	*Tu´un savi*
Asteraceae	*Matricaria recutita* L.	Manzanilla	It does not exist	Menstrual cramps and stomachache, menstrual cramps and for coraje	*Tu´un savi*
Asteraceae	*Stevia microchaeta* Sch.Bip.	Hoja de borracho	*Iná skemba*	Mal aire	*Mé´pháá*
Asteraceae	*Archibaccharis* sp.	It does not exist	*Thana xawa kidu*	Relapse of any disease	*Mé´pháá*
Asteraceae	*Tagetes erecta* L.	Cempasúchil	*Re´e ngajon*	Serious illnesses and conjunctivitis	*Tu´un savi* and *Mé´pháá*
Asteraceae	*Heterotheca inuloides* Cass.	Árnica	*Iná xini* *Yuku árnica*	To disinfect skin wounds and to deflate blows	*Tu´un savi* and *Mé´pháá*

Asteraceae	*Eclipta prostrata* L.	Epazotillo	It does not exist	For Covid-19 symptoms	*Tu´un savi*
Basellaceae	*Anredera scandens* Moq.	Suelda con suelda	*Ita nuni*	Fractures	*Tu´un savi*
Bombacaceae	*Pseudobombax ellipticum* Kunth.	Ceibo or clavelina roja	*Xtugua maña'*	Red dysentery and to cleanse the blood	*Mé´pháá*
Bromeliaceae	*Bromelia karatas* L.	Piñuela	*Tia ña* *Xtiu' wa rugu*	Auxiliary in urine retention	*Tu´un savi* and *Mé´pháá*
Bromeliaceae	*Tillandsia caput-medusae* É.Morren.	It does not exist	*Bardendi*	Heart pain	*Mé´pháá*
Bromeliaceae	*Ananas comosus* L.	Piña	*Xtiu'wa rakijuan* *Xiñú*	Urine retention and dysentery	*Mé´pháá* and *Tu´un savi*
Burseraceae	*Bursera copallifera* Sessé & Moc.	Copal	*Tu'un suxà va'á* *Nɥgɥ*	Espanto and when they become seriously ill, even if the disease has not been identified	*Tu´un savi* and *Mé´pháá*
Caesalpiniaceae	*Hymenaea courbaril* L.	Coapinol	*Ndi tyuu* *Íxe rge' ni*	Blows, back pain, kidney pain, and kidney stones	*Tu´un savi* and *Mé´pháá*
Campanulaceae	*Lobelia laxiflora* Kunth.	It does not exist	*Iná´ya´dú*	Madness (memory loss)	*Mé´pháá*
Caprifoliaceae	*Sambucus mexicana* C. Presl.	Saúco	*Íxe suku´*	Stomachache and vomiting	*Mé´pháá*
Caricaceae	*Carica papaya* L.	Papayo	*Íxe kapaya*	Fever	*Mé´pháá* and *Tu´un savi*
Cecropiaceae	*Cecropia obtusifolia* Bertol.	Guarumbo	*Íxe aphu*	Burns, constipation, and for urine retention	*Mé´pháá*
Commelinaceae	*Zebrina pendula* Schnizl.	Siemprevive	*Yuku nduvá*	Espanto	*Tu´un savi*
Compositae	*Artemisa absinthium* L.	Hoja amarga	*Iná mi´khun*	Beating (stomachache) and worms	*Mé´pháá*

Convolvulaceae	*Cuscuta jalapensis* Schltdl.	It does not exist	*Ajma snate*	Beating (stomachache), vomiting, worms, and empacho	*Mé´pháá*
Crassulaceae	*Kalanchoe pinnata* (Lam.) Pers.	It does not exist	*Iná midu*	Fever	*Mé´pháá*
Cyatheaceae	*Cyathea caracasana* Klotzsch Domin.	Helecho arborescente	*Íxe nijthun*	Burns, and it helps expel the placenta after childbirth	*Mé´pháá*
Equisetaceae	*Equisetum myriochaetum* Schltdl.	Cola de caballo	*Tun yo'ò tatan Raxa tsiyu guayo*	For menstrual cramps, chest and kidney pain, it also eliminates kidney stones, it is also auxiliary in urine retention and in childbirth and helps to expel the placenta after childbirth	*Tu´un savi* and *Mé´pháá*
Fagaceae	*Quercus peduncularis* Née	Encino	*Ta'an ta*	To heal wounds	*Tu´un savi*
Heliconiaceae	*Heliconia latispatha* Benth.	It does not exist	*Nandi*	Red dysentery	*Mé´pháá*
Lamiaceae	*Ocimum basilicum* L.	Albahaca	*Yuku xevixin* It does not exist	Coraje, vergüenza, espanto and heart pain	*Tu´un savi* and *Mé´pháá*
Lamiaceae	*Mentha arvensis* L.	Hierbabuena	*Minu xtila Miña xtíloo*	Empacho (Stomachache, vomiting and diarrhea)	*Tu´un savi* and *Mé´pháá*
Lamiaceae	*Hyptis albida* Kunth.	Salvarreal	*Yita titu´un*	Mal aire	*Tu´un savi*
Lamiaceae	*Plectranthus purpuratus* Harv.	Vaporrub	*Yuku tyikle*	Cough, bone pain, and fever	*Tu´un savi*
Lauraceae	*Persea americana* Mill.	Aguacate Aguacate silvestre	*Yuku tityi Íxe ndudiin riya*	For fractures and it helps expel the placenta after childbirth	*Tu´un savi* and *Mé´pháá*

Lauraceae	*Cinnamomum verum* J. Presl.	Canela	It does not exist	Bone pain, sore throat, headache, fever, empacho, coraje and for Covid-19 symptoms	*Tu´un savi*
Leguminosae	*Gliricidia sepium* Jacq.	Cacahuananche	*Tun ita kuii*	Fever, headache, enojo and vergüenza.	*Tu´un savi*
Leguminosae	*Tamarindus indica* L.	Tamarindo	*Íxe tramindu*	Erysipelas	*Mé´pháá*
Leguminosae	*Erythrina americana* Mill.	Colorín	*Íxe randu*	Fever and malaria	*Mé´pháá*
Magnoliaceae	*Magnolia iltisiana* A. Vázquez	Flor de corazón	*Ita ini*	Heart pain, flu, cough and for coraje	*Tu´un savi*
Malpighiaceae	*Byrsonima crassifolia* L.	Nanche	*Ndoxa´á* *Íxe luxu*	Diarrhea and stomachache	*Tu´un savi* and *Mé´pháá*
Malvaceae	*Hibiscus sabdariffa* L	Jamaica	*Ndú kuá* Does not exist	Dysentery and to cleanse the kidney (remove stones)	*Tu´un savi* and *Mé´pháá*
Mimosaceae	*Pithecellobium dulce* Roxb.	Huamuchi	*Tithykun*	Dysentery, stomachache, vomiting, and diarrhea	*Tu´un savi*
Moraceae	*Artocarpus heterophyllus* Lam.	Yaca	It does not exist	Cancer prevention	*Tu´un savi*
Moringaceae	*Moringa oleifera* Lam.	Moringa	It does not exist	Diabetes	*Tu´un savi* and *Mé´pháá*
Musaceae	*Musa x paradisiaca* L.	Plátano	*Yuku tyitia*	Cuts, animal bites, and asthma	*Tu´un savi*
Musaceae	*Musa x sapientum* L.	Plátano guineo	*Ndxama giñá*	Auxiliary in urine retention	*Mé´pháá*
Myrtaceae	*Psidium guajava* L.	Guayabo	*Íxe ndijya´ thaun* *Tun tikuaá*	Stomachache, vomiting, diarrhea, and dysentery	*Mé´pháá* and *Tu´un savi*
Myrtaceae	*Syzygium aromaticum* L. Merr. & L. M. Perry	Clavo	It does not exist	For Covid-19 symptoms	*Tu´un savi*

Nyctaginaceae	*Bougainvillea spectabilis* Willd.	Bugambilia	*Yita tutu*	Cough and espanto	*Tu´un savi*
Opiliaceae	*Agonandra racemosa* Standl.	Palo de golpe	*Yuku tun yoko ñunti*	Muscle pains	*Tu´un savi*
Passifloraceae	*Passiflora ligularis* Juss.	Granada	*Tikuaa tatá*	Dysentery	*Tu´un savi*
Phytolaccaceae	*Petiveria alliacea* L.	Zorrillo	*Yuku xa'à*	Cough	*Tu´un savi*
Pinaceae	*Pinus* sp.	Pino-ocote	*Tun xa'a* *Xti´kha*	Cough, espanto, for the worms of the newborn and to warm a woman's belly after childbirth	*Tu´un savi* and *Mé´pháá*
Piperaceae	*Piper auritum* Kunth.	Yerbasanta	*Nda ndo'ó* *Awua´*	Cough, flu, fever, varicose veins and Covid-19 symptoms	*Tu´un savi* and *Mé´pháá*
Piperaceae	*Piper nigrum* L.	Pimienta	It does not exist	Diarrhea and Covid-19 symptoms	*Mé´pháá* and *Tu´un savi*
Poaceae	*Cymbopogon citratus* hort. ex DC. Stapf.	Zacate-limón	*Raxa limu*	Stomachache	*Mé´pháá*
Chenopodiaceae	*Teloxys ambrosioides* L.	Epazote	*Minu nduxi* *Miña tsiga´*	Diarrhea, worms, and to not have complications during childbirth, and it helps to expel the placenta after childbirth	*Tu´un savi* and *Mé´pháá*
Rhamnaceae	*Karwinskia humboldtiana* Schult.	Guayabillo	*Tikua ikú*	Empacho (stomachache, vomiting, and diarrhea)	*Tu´un savi*
Rubiaceae	*Coutarea latiflora* Sessé & Moc.	Quina	*So'ò quina* It does not exist	Wounds, burns, blood pressure, and diabetes	*Tu´un savi* and *Mé´pháá*
Rubiaceae	*Coffea arabica* L.	Café	*Kafe xiama*	Red dysentery	*Mé´pháá*

Rutaceae	*Citrus limón* L.	Limón	*Limón iyaa*	Fever, flu, wounds, and Covid-19 symptoms	*Tu´un savi* and *Mé´pháá*
Rutaceae	*Casimiroa edulis* La Llave	Zapote blanco	*Ndoko yaa* *Íxe raga*	Erysipelas and foot pain	*Tu´un savi* and *Mé´pháá*
Rutaceae	*Citrus x aurantium* L.	Cajel	*Laxa caje*	Flu and cough	*Mé´pháá*
Rutaceae	*Citrus paradisi* Macfad.	Toronja	*Laxá*	Fever	*Tu´un savi*
Rutaceae	*Citrus x sinensis* L. Osbeck.	Naranja	*Kiele*	Dysentery	*Tu´un savi*
Rutaceae	*Ruta chalepensis* L.	Ruda	It does not exist	Bone pain and fever	*Tu´un savi*
Salicaceae	*Salix pallida* Kunth.	Sauce	*Íxe rngi´i*	Fever and Covid-19 symptoms	*Mé´pháá* and *Tu´un savi*
Sapotaceae	*Chrysophyllum mexicanum* Brandegee ex Standl.	It does not exist	*Ixe rujti*	To deflate blows	*Mé´pháá*
Sapotaceae	*Pouteria sapota* Jacq.	Mamey	It does not exist	Dysentery and diarrhea	*Mé´pháá*
Solanaceae	*Nicotiana tabacum* L.	Tabaco	*Kunu nda* *Iná ndii*	Muscle, arthritic, and rheumatic pain and coraje	*Tu´un savi* and *Mé´pháá*
Solanaceae	*Solanum americanum* Mill.	Yerbamora	*Yuva tiín* *Ya´o rambo*	Toothache and flu	*Tu´un savi* and *Mé´pháá*
Solanaceae	*Capsicum annuum* L.	Chile	*Duun*	Mal aire	*Mé´pháá*
Solanaceae	*Lycopersicon esculentum* Mill.	Jitomate pajarito	*Rambo xkika*	Flu	*Mé´pháá*
Solanaceae	*Brugmansia candida* Pers.	Floripondio	*Re´e bundia*	Red erysipelas	*Mé´pháá*
Sterculiaceae	*Guazuma ulmifolia* Lam.	Cuahilote	*Xndu ruthaa*	Diabetes	*Mé´pháá*
Tiliaceae	*Tilia houghii* Rose.	Tila	It does not exist	Stress and tiredness	*Tu´un savi*
Verbenaceae	*Lippia* ssp.	It does not exist	*Ixe ndpii*	To warm a woman’s belly	*Mé´pháá*

				after childbirth	
Verbenaceae	*Lantana* sp.	Cinco negritos	*Iná nduchaan ri´i maña´*	Empacho (stomachache, diarrhea and vomiting)	*Mé´pháá*
Zingiberaceae	*Zingiber officinale* Roscoe.	Jengibre	*Ya´a ixtila Ajma duun*	Cough, flu, headache and worms	*Tu´un savi* and *Mé´pháá*

Cultural diseases such as coraje, mal aire, vergüenza and espanto, are based on the worldview of these peoples, that is, in the particular way in which they are conceived. These diseases have their own classification, which, according to their worldview, are acquired by supernatural deities or by a spiritual imbalance. Among the cultural diseases mentioned in the previous table is coraje, which is acquired especially by babies, in an interview with the Mixtec healer Maurilio Jiménez (2022), he tells us how this disease is transmitted: "if a person makes very strong corajes and then approaches a baby, they transmit their anger, the baby is restless, crying and sleepless".

On the other hand, the symptoms of coraje in adults are only manifested by having a bitter mouth and, in some cases, a headache. To cure this cultural disease in the Mixtec people, infusions are prepared by combining Cacaloxochitl (*Plumeria rubra* L.), estafiate (*Yuku ti ndaku*) (*Artemisia ludoviciana* Nutt.), tabaco (*Kunu nda*) (*Nicotiana tabacum* L.), albahaca (*Yuku xevixin*) (*Ocimum basilicum* L.), flor de corazón (*Ita ini*) (*Magnolia iltisiana* A. Vázquez), cacahuananche (*Tun ita kuii*) (*Gliricidia sepium* Jacq.), manzanilla (*Matricaria recutita* L.) and canela (*Cinnamomum verum* J. Presl.), of which one cup of infusion per day is consumed, for three days in adults and, for babies, two tablespoons a day are recommended, also for three days.

Another cultural disease is mal de aire, which is caused by evil spirits, which are directed by people who seek to cause harm. Mal aire, in the initial stage, presents symptoms such as fever and difficulty sleeping due to the nightmares that may occur. This disease can be cured at home with the plants mentioned above, for example, in the *Mé´pháá* people, hoja de borracho (*Stevia microchaeta* Sch, Bip.) is burned and the sick is smoked with it, however, when the evil spirit seizes the spirit of the person, it is necessary the presence of the healer, who performs a ritual, which is not mentioned in this article because none of the six healers interviewed performs it. Finally, the etiology and symptomatology of cultural diseases, vergüenza and espanto, are mentioned below because healing requires rituals performed by healers, where in addition to the use of plants, the use of prayers to natural and supernatural deities is also required.

According to Friedman's methodology, the plants with the greatest use in the *Mé'pháá* people are: hierbabuena (*Miña xtíloo*) (*Mentha arvensis* L), epazote (*Miña tsiga´*) (*Teloxys ambrosioides* L.), saúco (*Íxe suku´*) (*Sambucus mexicana* C. Presl.), jengibre (*Ajma duun*) (*Zingiber officinale* Roscoe.), (*Iná midu*), (*Kalanchoe pinnata* (Lam.) Pers.) and yerbasanta (*Awua´*) (*Piper auritum* Kunth.), all with the same mention index value of 36. In contrast, the plants with a lower index with a value of 4 correspond to café (*Kafe xiama*) (*Coffea arabica* L.), quequeite (*Iná gudi ba´u*) (*Xanthosoma sagittifolium* (L.) Schott.), chile (Duun) (*Capsicum annuum* L.) jitomate pajarito (*Rambo xkika*) (*Lycopersicon esculentum* Mill.), helecho arborescente (*Íxe nijthun*) (*Cyathea caracasana* Klotzsch Domin.) and Ceibo or clavelina roja (*Xtugua maña'*) (*Pseudobombax ellipticum* Kunth.), among others, (Table No. 2).

On the other hand, in the *Tu'un savi* people, the plants with the highest mention index correspond to epazote (*Minu nduxi*) (*Teloxys ambrosioides* L.), hierbabuena (*Minu xtila*) (*Mentha arvensis* L.) and jengibre (*Ya'a ixtila*) (*Zingiber officinale* Roscoe.), all with the same mention index value of 66. In contrast, the plants with the lowest index with a value of 6 correspond to granada (*Tikuaa tatá*) (*Passiflora ligularis* Juss.), zapote blanco *(Ndoko yaa*) (*Casimiroa edulis* La Llave.), toronja (*Laxá*) (*Citrus*

paradisi Macfad.), naranja (*Kiele*) (*Citrus x sinensis* L. Osbeck) and encino (*Ta'an ta*) *(Quercus peduncularis* Née.) (Table No. 2).

Table No. 2
Mention frequency in the people *Tu´un savi* and *Mé´pháá*

	Tu´un savi people		*Mé´pháá* people	
Scientific name	Numbers of mentions	Mention index value	Numbers of mentions	Mention index value
Agonandra racemosa	2	13	0	0
Aloe vera	7	46	8	32
Allium cepa	7	46	0	0
Allium sativum	7	46	7	28
Anacardium occidentale	0	0	3	12
Ananas comosus	3	20	2	8
Annona muricata	2	13	0	0
Annona *reticulata*	1	6	0	0
Anredera scandens	2	13	0	0
Archibaccharis sp.	0	0	5	20
Artemisa absinthium	0	0	3	12
Artemisia ludoviciana	5	33	0	0
Artocarpus heterophyllus	2	13	0	0
Bougainvillea spectabilis	5	33	0	0
Bromelia karatas	3	20	4	16
Brugmansia candida	0	0	3	12
Bursera copallifera	3	20	3	12
Byrsonima crassifolia	5	33	4	16
Capsicum annuum	0	0	1	4
Carica papaya	3	20	5	20
Casimiroa edulis	1	6	2	8
Cecropia obtusifolia	0	0	5	20
Chrysophyllum mexicanum	0	0	3	12
Citrus limón	9	60	6	24
Citrus paradisi	1	6	0	0
Citrus x aurantium	0	0	2	8
Citrus x sinensis	1	6	0	0
Coffea arabica	0	0	1	4
Coutarea latiflora	3	20	2	8
Cryosophila nana	1	6	0	0
Cuminun cyminum	5	33	0	0
Cuscuta jalapensis	0	0	2	8
Cyathea caracasana	0	0	1	4
Cymbopogon citratus	0	0	7	28
Eclipta prostrata	3	20	0	0
Equisetum myriochaetum	8	53	6	24
Erythrina americana	0	0	5	20
Gliricidia sepium	4	26	0	0
Gnaphalium chartaceum	4	26	0	0
Guazuma ulmifolia	0	0	2	8

Heliconia latispatha	0	0	3	12
Heterotheca inuloides	9	60	8	32
Hibiscus sabdariffa	2	13	4	16
Hymenaea courbaril	2	13	2	8
Hyptis albida	3	20	0	0
Justicia spicigera	2	13	0	0
Kalanchoe pinnata	0	0	2	8
Karwinskia humboldtiana	3	20	0	0
Lantana sp.	0	0	7	28
Lippia asp.	0	0	3	12
Lobelia laxiflora	0	0	4	16
Lycopersicon esculentum	0	0	1	4
Mangifera indica	6	40	6	24
Matricaria recutita	6	40	0	0
Mentha arvensis	10	66	9	36
Moringa oleifera	3	20	2	8
Musa x paradisiaca	4	26	0	0
Musa x sapientum	0	0	2	8
Nicotiana tabacum	7	46	6	24
Ocimum basilicum	4	26	5	20
Passiflora ligularis	1	6	0	0
Persea americana	3	20	6	24
Petiveria alliacea	2	13	0	0
Pinus sp.	3	20	4	16
Piper auritum	9	60	9	36
Piper nigrum	2	13	1	4
Pithecellobium dulce	5	33	0	0
Plectranthus purpuratus	1	6	0	0
Plumeria rubra	4	26	5	20
Pouteria sapota	0	0	3	12
Psidium guajava	7	46	3	12
Pseudobombax ellipticum	0	0	1	4
Quercus peduncularis	1	6	0	0
Rauvolfia tetraphylla	4	26	0	0
Ruta chalepensis	2	13	0	0
Salix pallida	5	33	7	28
Sambucus mexicana	0	0	9	36
Not determined	0	0	5	20
Solanum americanum	4	26	5	20
Stevia microchaeta	0	0	2	8
Syzygium aromaticum	2	13	0	0
Tagetes erecta	4	26	7	28
Tamarindus indica	0	0	3	12
Teloxys ambrosioides	10	66	9	36
Tilia houghii	1	6	0	0
Tillandsia caput-medusae	0	0	3	12
Xanthosoma sagittifolium	0	0	1	4
Zebrina pendula	3	20	0	0

Zingiber officinale	10	66	9	36

In addition to the Friedman *et al*. (1986), the Jaccard similarity index was also used, with which the similarity index of medicinal species between the two study communities was determined (Table No. 3).

Table No. 3
Jaccard similarity index

Exclusive species		Shared species	Jaccard similarity index
Tu´un savi	***Mé´pháá***		
32	**29**	**30**	**32%**

Between the *Tu´un savi* community of Quiahuitepec and the *Mé´pháá* from Barranca Tecoani, there is an index of similarity between medicinal species of 32%. Some of the species shared by both peoples are hierbabuena (*Mentha arvensis* L.), epazote (*Teloxys ambrosioides* L.), and jengibre (*Zingiber officinale* Roscoe.), with these species being also the most used in each people, which were mentioned above.

Forms of preparation for consumption

The form of consumption of medicinal plants in the two indigenous peoples is very similar, with infusion being the most common. It is possible to find differences between the two communities in some aspects; for instance, for the Tlapanec people plants are commonly used macerated, applied topically, unlike the Mixtec people where plants processed in this way are the least used. Another important difference is that the Mixtec people regularly use the plants for bathing, while the Tlapanecs rarely use the plants in this way. Plants ingested without processing, that is, without being subjected to any type of process, as well as washed, blended, soaked plants, fresh waters and juices are also present in both peoples (Table No. 4), which mainly use leaves, flowers, bark, fruits, roots, stems, seeds, resin and sap.

Table No. 4
Forms of consumption of plants in both indigenous peoples

Form of consumption	Number of species	
	***Tu'un savi* people**	***Mé'pháá* people**
Infusion	32	24
Ingested unprocessed	10	7
Baths	9	3
Decoction	9	11
Washed	2	1
Blended	2	2
Roasted	2	1
Macerated applied topically	4	15
Soaked	1	3
Fresh waters	1	0
Juices	1	1

Grouping of diseases

Among the diseases treated with plants by the *Mé'pháá* people are those associated with the digestive system, such as stomach pain, diarrhea, gastritis, *indigestion*, constipation, red and white dysentery and vomiting, for which 19 species of plants are used for healing purposes; for conditions of the respiratory system (flu, cough, sore throat and Covid-19) ten plants are used; in the muscular system (muscle, arthritic and rheumatic aches, from minor blows to fractures) nine species are used; in the urinary system (fluid retention, pain, and kidney

stones) eight, and for skin diseases (burns, cuts, and erysipelas) six species of plants are used (Table No. 5). This indigenous people also uses herbal medicine for cultural diseases such as espanto and vergüenza; for chronic-degenerative diseases (cholesterol and diabetes) and for pregnancy, childbirth and puerperium; as an example, epazote (*Miña tsiga´*) (*Teloxys ambrosioides* L.) is used to avoid having complications during childbirth and helps to deliver the placenta after childbirth, for this an infusion must be consumed, which is prepared with five branches dissolved in a liter of water.

On the other hand, the 43 health conditions of the *Tu'un savi* people are linked, like the Tlapanecs, to the digestive system (stomach pain, diarrhea, gastritis, indigestion, dysentery and vomiting) for which 17 plants are used; in the respiratory system (flu, cough, sore throat, asthma and Covid-19) the same number of plants is used as in the digestive system; for diseases of the muscular system (muscle, arthritic and rheumatic aches, from minor blows to fractures) 15 species are used, in skin diseases (wounds, burns and animal bites) seven; and in those of the urinary system (fluid retention, pain and kidney stones) three botanical species are used (Table No. 5). This people, like the *Mé'pháá*, also use herbal medicine for cultural diseases such as espanto and vergüenza, for pregnancy, childbirth and puerperium and for chronic-degenerative diseases such as diabetes and blood pressure. For example, soyamiche (*Yita tu'un tu*) (*Cryosophila nana* Kunth.) is used to control diabetes, for which a roasted stem of approximately ten centimeters should be eaten twice a week. The diseases are the same for the two peoples, what changes is the order of importance.

Table No. 5
Diseases and number of plants used, grouped by body systems

Diseases	Number of species	
	***Tu'un savi* people**	***Mé'pháá* people**
Digestive system	**17**	**19**
Respiratory system	**17**	**10**
Muscular system	**15**	**9**
Skin diseases	**7**	**6**
Urinary system	**3**	**8**
Fevers	**9**	**5**
Chronic-degenerative diseases	**4**	**2**
Childbirth and puerperium	**3**	**5**
Cultural diseases	**6**	**2**

Medicinal plants used to treat Covid-19

In the Mixtec people, three women who said they had suffered from Covid-19 were interviewed, while in the Tlapanec people, a man and a woman who also suffered from this disease were interviewed. In general, the symptoms mentioned by the interviewees were sore throat, eye pain, headache, runny nose, cough and fever, although none reported feeling shortness of breath. In both communities the disease was treated only with medicinal plants. In the Tlapanec community, combined infusions of jengibre (*Ajma duun*) (*Zingiber officinale* Roscoe.), ajo (*Axu*) (*Allium sativum* L.), limón (*Íxe limu*) (*Citrus limon* L.), yerbasanta (*Awua´*) (*Piper auritum* Kunth.) and moringa (*Moringa oleifera* Lam.) were used. On the other hand, infusions were also used in the Mixtec community, but combining a greater number of plants: cebolla morada (*Tikumi kua'a*) (*Allium cepa* L.), ajo (*Tikumi yakò*) (*Allium sativum* L.), jengibre (*Ya´a ixtila*) (*Zingiber officinale* Roscoe.), limón (*Limón iyaa*) (*Citrus limón* L.), clavo (*Syzygium aromaticum* L. Merr. & L. M. Perry.), yerbasanta (*Piper auritum* Kunth.) and comino (*Cuminun cyminum* L.), in addition, this people used sauce (*Tun yiñu yivi*) (*Salix pallida* Kunth.) and epazotillo (*Eclipta prostrata* L.) to bathe and thus lower the fever, associated with the disease.

Healing rituals

The medicinal plants in both indigenous peoples are also used in healing rituals, where the participation of the healer: herbalist-praying man-diviner is essential, and they consist of various activities carried out in

different places depending on the ailment, where diagnosis is made by divination using different means, lighting of votive candles, cleansing, spraying of liquids, and prayers in native language or Spanish. Invocation to Catholic saints or natural elements, animal sacrifices, waste of the participating elements in different places depending on the ailment.

Tu'un savi people

The cultural diseases that require healing rituals in the Mixtec people are known as espanto and vergüenza, for these diseases six species of plants are used, which are considered sacred. Each of the rituals of this indigenous people are mentioned below:

Vergüenza According to the healers interviewed, this disease is caused by exposure to uncomfortable situations. For example, in an interview with the healer Maurilio Jiménez (2022), Mixtec healer, mentions the following: "vergüenza is when you spend a moment of "embarrassment" on public roads. This "embarrassment" can fall on any part of the body, eyes, stomach or head, although most of the time it falls into the eyes". According to healers, when vergüenza falls into the eyes, it manifests itself through infection, itching and pain. Two of the three healers mention that, to cure this disease, they light a white votive candle, later, a cleansing is made, that is, a bunch of leaves of cacahuananche (*Tun ita kuii*) (*Gliricidia sepium* Jacq.) and a chicken egg are passed over the body, salt water is placed in the mouth and the sick person is blown, and through prayers the saints are invoked to ask for healing. When the curing is finished, the egg is thrown into the fire. On the other hand, in an interview with the healer Juan Jiménez (2022), one of the three healers interviewed, mentions that he does not use salt water or cacahuananche, "to cure vergüenza, I pray to Apostle James, Saint John, Saint Michael, the Virgin Mary and Jesus Christ, with a bunch of albahaca (*Yuku xevixin*) (*Ocimum basilicum* L.) and an egg, I clean the sick person, while I pray to the saints and then I blow the sick person with water. When I finish, I throw the egg into the fire, so that the vergüenza burns because it was there". According to the healers interviewed, this practice should be performed once a day, for three days.

***Espanto*.** The espanto or susto, as it is also known, is commonly caused by water, fire and the earth of the graveyard. For example, in an interview with the healer Maurilio Jiménez (2022) mentions the following: "they have brought me people who were frightened by drowning in the river, there are also people who come because they hear noises in their house or see shadows, this happens when earth of the graveyard is placed in their house". The symptoms are different in each type of susto. For example, for water susto the common symptoms are: diarrhea, cold feet and hands; the fire susto is characterized by fever and headache and the graveyard susto, which is the strongest of the three, is characterized by lack of appetite, fever and severe headaches. Like vergüenza, the symptoms manifest themselves after having experienced a moment of susto.

To cure this disease, the three healers interviewed mention that a table is made with leaves of siemprevive[c] (*Yuku nduvá*) (*Zebrina pendula* Schnizl.), in which a chicken egg, 100 milliliters of cane alcohol, a piece of copal (*Tu'un suxà va'á*) (*Bursera copallifera* Sessé & Moc.) and pino-ocote (*Tun xa'a*) (*Pinus* sp.) of approximately ten centimeters each are placed, flowers of bugambilia (*Yita tutu*) (*Bougainvillea spectabilis* Willd.) and yarns, 48 strips per person, are also placed, the latter is burned with wax before being placed on the table; later, next to the table a votive candle of seven colors is placed and the prayers begin, mainly invoking St. Augustine, the person is blown, the egg and flowers of bugambilia (*Yita tutu*) (*Bougainvillea spectabilis* Willd.) are passed over the body while continuing to pray in their original language. After finishing the ritual, the table is buried where the person has been frightened. This type of ritual is used when the susto is strong. When it is a minor susto, the ritual is different, for this, first, mezcal is spread around the chair where the curing is taking place, later, a bunch of albahaca (*Yuku xevixin*) (*Ocimum basilicum* L.), bougainvillea flowers (*Yita tutu*) (*Bougainvillea spectabilis* Willd.) and a chicken egg are passed over the body of the sick person, while the saints are invoked asking for healing, finally, the healer places mezcal in his mouth and blows the sick person (Figure No. 2).

[c] Seven leaves are placed across the width and 12 across the length, forming the rectangle of a table.

Figure No. 2
Mixtec healer curing from espanto

Mé'pháá people
This indigenous people use two species of plants to treat cultural diseases, among which, as in the *Tu'un savi* people, espanto and vergüenza stand out. Each of these rituals is described below.

Espanto Evil in which the loss of spirit occurs. As in the *Tu ́un savi* people, espanto occurs from drowning, from hearing noises at home or from seeing shadows of supernatural spirits. The Tlapanec people perform the following ritual to cure this disease: on a plastic pan, pure river water is added, which is collected before five in the morning, earth is also added in the form of a cross, collected from the place where the person was frightened; later, mud is made with the earth and placed on the forehead, nape, throat and wrist of both hands, then the healer takes a stone and together with the water, he places it in the mouth and begins to inhale the spirit of the person, later, he places a leaf of *Iná rixuáa* (*Araceae*) on the forehead and begins to throw the water, if the healer fails to appreciate the "rainbow", that is, the spirit of the person, he begins to pray, mentions the saints and virgins and, at the end of the prayers, he emits a whistle calling the spirit to return to the body of the frightened person.

Vergüenza For the Tlapanec healers, as for the Mixtecs, vergüenza is acquired when uncomfortable situations are shown in public. The characteristic symptoms of this disease are fever, headache, bone pain and chills, which occur after a moment of embarrassment. To cure this disease, in a plastic pan, salt, leaves of epazote (*Miña tsiga ́*) (*Teloxys ambrosioides* L.) ash and nejayote are mixed, which are placed eight times on the forehead, neck, nape and wrists of the hands, subsequently, supplications are made to the saints and vergüenza to leave the body of the sick person. This prayer is also repeated eight times. To finish the ritual, a handful of the previously made mixture is taken and blown all over the body of the sick person, this procedure is also repeated eight times. Healing comes after an hour or two of performing the ritual.

Intercultural knowledge dialogue
To promote a dialogue of knowledge between the traditional herbal and allopathic health systems, it is proposed to hold health meetings between allopathic doctors and traditional doctors, where a true exchange of knowledge is generated. In the Mixtec and Tlapanec zone of the study area, with the new system of government of uses and customs, the House of Health of the Indigenous Woman was created, where traditional midwives were invited to training courses. It is worth mentioning that traditional midwives have a wide range of knowledge about pregnancy, childbirth and puerperium; for example, Mrs. Encarnación (2022), Tlapanec midwife, mentions the following: "at 57 years old, I have helped more than 70 women give birth and some births have been difficult, because the baby is transverse, but I have known how to solve it" (translated by Nohemí Maurilio, 2022).

The midwives were trained by doctors, who told them about the woman's period, the stages of pregnancy and pre- and postpartum hygiene techniques. These trainings were once a week, however, none of the three midwives interviewed lasted more than six months, due to the lack of economic resources to move to the municipal seat, in addition, one of the Tlapanec midwives argued that she did not like it because the topics were always the same.

On the other hand, in addition to this dialogue between different knowledge systems, a dialogic interaction between actors from the same cultural view is also proposed. The closest thing to a dialogue of knowledge of this type in the study areas was generated in a workshop held between January and June 2022, where herbal remedies were prepared

in collaboration with the communities (Figure No. 3). In Quiahuitepec, four Mixtec housewives and a midwife prepared ointments of arnica (*Yuku árnica*) (*Heterotheca inuloides* Cass.) with palo de golpe (*Yuku tun yoko ñunti*) (*Agonandra racemosa* Standl.), while in Barranca Tecoani, a healer and two Tlapanec women made soaps from sábila (*Xtiu´wa sábila*) (*Aloe vera* L.). The plants used were collected from the family gardens of each of the participants. In this exchange of knowledge, the participants contributed the plants and knowledge about the medicinal uses of these plants, while the process to prepare the herbal remedies was contributed by the first author of the present paper.

Figure No. 3
Mixtec women making ointments

Herbal medicine and its relationship with allopathic medicine

The indigenous peoples of the study area, in addition to using medicinal plants to treat their health problems, also use allopathic medicine; for instance, healers mention that when they receive a sick person with a strong infection, they send him to the doctor to prescribe antibiotics. On the other hand, the interviewees mention that their first health option is always the plants that are in places close to their home or territories of the community such as gardens, forests, rainforests, and the communal territory and that they only go to the doctor when they do not see results with herbal medicine, when the disease is serious or requires surgery.

For example, most of the interviewees from Quiahuitepec, when they do not see favorable results with herbal medicine, go to the health center of La Concordia, because it is the town that is closest to them. The main diseases for which they go are usually of the digestive system, such as typhoid fever or viral diseases such as dengue. For example, Mrs. Petra mentions the following:

"*When I got typhoid fever, my belly hurt a lot and the fever did not lower with anything, that is why I had to go to the doctor to La Concordia, he gave me pills and injected me, the disease reduced, but it did not go away, I returned again with the doctor and he sent me to the health center of Ayutla, they did studies and it came out that I had typhoid fever, right there they gave me the medicine and with that I was cured*".

When the Tlapanec natives, like the Mixtecs, do not perceive favorable results with herbal medicine or when they suffer serious diseases, they go to the health center or hospital in Ayutla; nevertheless, it is important to mention that the road conditions are very bad and in the rainy season, it is very complicated to move. Germán Maurilio tells us the following: "when my wife's cesarean section opened, it was difficult for me to take her to the hospital in Ayutla, because the rain was very heavy, and the van stuck on the road". In these indigenous localities, the roads are dirt and there is only one collective transport van that goes to the municipal seat once a day.

DISCUSSION

Dialogue of knowledge between the Mé'pháá and Tu'un savi peoples

The more than 100 species of plants and the more

than 40 diseases identified were the product of interviews and consensual dialogues, because sometimes the interviewee went with their family (husband, wife, mother, father and children) to corroborate or expand the information about the plants and their medicinal uses. This approach agrees with that pointed out by Argueta-Villamar (2011), who mentions that in ethnobotanical studies, when the interviewees were asked the name and use of a plant, in the first instance the answer was direct, however, that same person addresses the members of their family to know if there are other knowledges or other versions of the same plant. These approaches indicate that traditional knowledge is expressed in a dialogued and consensual manner.

The plants used in the Mixtec and Tlapanec peoples, both by species and by number, are very similar; in the *Tu'un savi* people 62 species were recorded, while in the *Mé'pháá* community 59 species, these findings resemble other studies carried out in indigenous peoples of Mexico, for example, Mendoza-Maldonado *et al*. (2020), recorded 104 species of medicinal plants with Mixtecs from the Mountain of Guerrero. On the other hand, Arellano (2017) identified 103 species of medicinal plants with Tlapanecs from the Ciénega de Malinaltepec, also in the Mountain of Guerrero. In other places in Mexico, such as X-Mejia, municipality of Hopelchén, Campeche, Cahuich-Campos *et al*. (2014), identified that the Mayans from that place use 70 species of plants with medicinal attributes. This extensive herbal knowledge contributes to the conservation of medicinal species and local knowledge, which is transmitted orally intra- and intergenerationally (Cosme-Pérez, 2008).

The most used plants in both indigenous peoples are: hierbabuena (*Miña xtilos*) (*Minu xtila*) (*Mentha arvensis* L.) and epazote (*Minu nduxi*) (Miña tsiga´) (*Teloxys ambrosioides* L.), which have been documented in other studies in Guerrero (Ochoa-Hernández, 1989; Uriosteguí-Flores & Villaseñor-Franco, 2021), their availability and abundance may be due to the fact that they are used for problems of the digestive system, which are the most frequent diseases in both peoples and where there is a greater number of plants, which coincides with other studies carried out in Mexico (Bello-González & Salgado-Garciglia, 2007; White-Olascoaga *et al*., 2013).

The most used part of the plant in both communities are the leaves, this may be due to their abundance and availability practically all year round. This part of the plant has been documented in Tlapanec indigenous people of Acapulco, Guerrero (Rodríguez *et al*., 2015) and by Mixtecs from the Baja Poblana region (Maldonado-Almanza *et al*., 2017), to name a few. In both indigenous peoples, the form of consumption of the plants is in infusion, which has been documented in Nahuatl and Mixtec indigenous people of Xalpatlahuac, Guerrero (Juárez-Vázquez *et al*., 2013).

With the plants used in these indigenous peoples, more than 40 diseases are treated, distributed mainly in the digestive and respiratory systems. There are also cultural diseases, with espanto and vergüenza being those that stand out in both communities, which were also documented by Santiago-Martínez (2018) in San Sebastián Coatlán, Miahutlán, Oaxaca and by Villalva-Hernández & Barrera-Catalán (2016) in Pochotillo, Tecoanapa, Guerrero, to mention a few examples. The inhabitants of these communities believe that these diseases have supernatural or magical origins (Peretti, 2010) or that they are the product of actions of people who seek to cause harm.

The medicinal plants used to treat cultural diseases are considered sacred, magical or powerful, because they are used as mediators of knowledge and portals of communication with the sacred. Their proper use allows a transcendent and attention state that teaches and heals (Sánchez *et al*., 2019). This communication can be considered a form of dialogue of knowledge because the healer, through the herbs, engages in a sacred conversation with the spirits to convince them to extract negative energies from the patient's body (Alulema-Pichasaca, 2020).

For the contributions to integral health (physical body, emotional, spiritual and symbolic), medicine and herbal medicine, and in general the wisdom of the native indigenous peoples, should be considered as a true system of knowledge, as Leff *et al*. (2003), point out. Other authors such as Delgado & Rist (2022) and Betancourt-Posada (2015) have called traditional knowledge a science because they have their own epistemology and ontology, from which they reconfigure the dialogue of knowledge towards an interscientific dialogue.

The non-dialogue of knowledge between specialists of allopathic medicine and traditional herbal medicine

Between midwives and allopathic doctors, in the experience indicated above, there was no dialogue of knowledge, because it was not possible to exchange knowledge between both parties, since the arrogance of scientific knowledge in believing itself superior to traditional knowledge does not allow these spaces to be generated. Doctors, who represent modern Western science, considered themselves knowledgeable about the subject and theirs is the only valid knowledge; therefore, doctors trained midwives without allowing them to share their knowledge, specialized as well as that of doctors, backed by the experience of having attended more than 50 childbirths per each of the midwives that attended.

This approach indicates that traditional midwives are therapists specialized in the care of pregnancy, childbirth and puerperium (SSA, s.f.), like the doctors, hence the importance of carrying out joint work actions, but, firstly, it will be essential to decolonize both indigenous and Eurocentric knowledge to contribute to the reconfiguration of the ecosystem of knowledge and its valorization (Leff, 2022; Santos, 2009) and thus be able to establish a communicative interaction where the interest to listen and to be updated according to the construction of knowledge about phenomena of interest to both is recognized (Ibarra-Ojeda & Quintero-Ávila, 2021).

Mixed health system

The dialogue of knowledge between herbal medicine and allopathic medicine should begin by strengthening indigenous knowledge systems, so that later, on a plane of horizontality and symmetry, dialogue can be held with modern Western science, mainly to find solutions to the problems that afflict humanity (Argueta-Villamar, 2011; Pérez-Ruiz, 2021) among them, the current health crisis, where peoples and communities treated Covid-19 with plants, with allopathic medicine or with both medicinal systems. It should be noted that in the communities of Barranca Tecoani and Quiahuitepec, most of the interviewees treated themselves only with plants, mainly jengibre (*Ya'a ixtila*) (*Ajma duun*) (*Zingiber officinale* Roscoe.) and ajo (*Tikumi yakò*) (*Axu*) (*Allium sativum* L.), also used in Cañar, Ecuador (De los Ángeles *et al.,* 2020) and in the Health Micro Network of Jesús Cajamarca, Huancayo, Peru (Castillo-León, 2021).

Zingiber officinale Roscoe is a common and widely used species, with antiviral effect against retroviruses. This species is used to counteract respiratory syncytial virus, which can lead to serious lung infections (García-Ishimine *et al*., 2021). On the other hand, laboratory studies found that *Allium sativum* L. extract inhibits the penetration and proliferation of influenza virus AH1N1 (Ashish-Singh *et al*., 2021), for this reason, since Covid-19 is a viral disease of the respiratory tract caused by retrovirus, it is believed that these plants help to counteract its effects.

In addition to these plant resources, in various communities in Mexico and Latin America, others were used to counteract the symptoms of Covid-19. In Peru, for example, yerbasanta (*Piper auritum* Kunth.), popularly known there as *matico*, gave its name to a very important collective effort called Comando Matico, which developed a manual, disseminated it digitally and led to permanent visits to various communities in that country, to care for Covid-19 patients (Argueta-Villamar & Pérez-Ortega, 2022). It should be noted that this same plant is also used in the Tlapanec people of the study area to also counteract the symptoms of Covid-19. Studies such as those of Valdivia-Ávila *et al*. (2018), show great antibacterial and anti-inflammatory potential.

In the communities visited, in addition to using medicinal plants, there were those who also went to the doctor and used both medicines. By imposition or own will, indigenous peoples have adopted elements and knowledge systems from other cultures, among them, Western culture (Pérez-Ruiz, 2021). This combination of medicines used by both indigenous peoples coincides with the findings of Espinoza-Cortés & Ysunza-Ogazón (2009), who mention that, in practice, health care in the rural and indigenous sectors has been developed under a mixed care model, or convergence model, where traditional and allopathic medicines coexist.

Although this convergence of medicines is present in the indigenous peoples of the study area, it is necessary for the hegemonic Western health system to recognize the importance of the traditional health system which serves 80% of the world's population (OMS, 1993), which has its own epistemology, languages and methods, which makes it just as important as the Western health system.

Along with the recognition of the indigenous health system, the space for the encounter and interaction between both health systems should be created, which must happen from respect, horizontality, epistemological pluralism and from the contributions of each knowledge system (Pérez-Ruiz, 2021).

Preparation of herbal remedies as a form of dialogue of knowledge

On the other hand, in addition to the dialogue between different knowledge systems, there is also a dialogic interaction between actors from the same cultural view, where they interact to exchange experiences and knowledge in order to face a problem together, as well as to forge an alliance with other social actors in order to transform their social environment for the common good (Pérez-Ruiz & Argueta-Villamar, 2019).

Although the preparation of herbal remedies in the indigenous peoples of the study area represents a first effort of this type of dialogue of knowledge, Argueta-Villamar (2021) mentions that a necessary precondition for a dialogue of knowledge is a new empowerment from the local level, from the formation of promoters of communality, in which decisions are taken in community assemblies in which the municipal-local service is free and obligatory, and in which the tequio, the change of arm, the reciprocity of humans with nature, the use of their own language, the strengthening of the worldview and the validity of ceremonial rituals are present. Although many of these activities are present in the indigenous peoples of the study area, what is needed is to promote the strengthening and development of these practices in the new generations, which will contribute to their social reproduction.

Proposals for the dialogue of knowledge

One way to contribute to the strengthening of traditional knowledge systems and to the intra- and intercultural dialogue of knowledge is, among other means, the preparation of brochures, manuals or recipe books where plants and their medicinal uses are established, as did the indigenous peoples of Bolivia, Ecuador, Guatemala, Honduras, Mexico and Peru, who, due to the current health emergency, prepared manuals of recommendations with elements of traditional medicine useful against Covid-19, among which are a large number of plants. As an example, we have the Kichwa people in Amazonia, Ecuador, whose manual, in addition to including the main medicinal plants to counteract the symptoms of Covid-19 and their forms of use, also shows the procedure to prepare the remedies, such as macerations, syrups and vaporizations (Argueta-Villamar and Pérez-Ortega, 2022). Something similar could be done with the Mixtec and Tlapanec indigenous peoples of the study area, since, in dialogue with them, the possibility of developing recipes has been raised, in which the more than 100 plants they use, their forms of use and the process to prepare the remedies in the form of soaps, syrups, tinctures, shampoos, ointments and microdoses, among others, are included.

Another way to exchange knowledge is through the establishment of a community herbarium that includes the plant species collected with the experts; of the two copies that were produced in each community, one is for them. Finally, a final proposal to strengthen the dialogue with the Mixtec and Tlapanec indigenous peoples of the study area will be to build a community medicinal garden, under ethnoagronomic guidelines (Cruz-León *et al*., 2015), in each of the two communities, where the more than 100 species of plants inventoried are established. In previous experiences with mestizo women from the same municipality, it has been documented that this type of activities, in addition to representing strategies of social organization, contributes to health, monetary savings, social recognition, the generation of economic income (from the sale of plants and their derivatives) and above all contributes to the strengthening of memory about plants and knowledge associated with their medicinal uses (Mayo-Mayo *et al.*, 2020), hence the importance of promoting this type of activities.

A final proposal to exchange knowledge would be through the creation of a municipal health program that incorporates traditional herbal medicine and allopathic medicine; to this end, the Secretariat of Health (2013) proposes to start with an intercultural awareness course for all health personnel; subsequently, basic knowledge in allopathic medicine will be imparted to traditional therapists, for example, applying injections or the properties of some medicines to treat primary care diseases. Also, within this program, it will be important to establish medicinal gardens in the health centers of the municipality, since it is essential to have within reach

the medicinal resources that will be prescribed in the visits. Finally, to realize this proposal, it is crucial to carry out a consultation with the community to ask if they are interested in the existence of this medicinal garden in the hospital and if they are willing to receive a comprehensive treatment that combines allopathic and traditional herbal medicines.

The dialogue of knowledge as a proposal for development

Through traditional medicine, indigenous peoples have developed self-management practices to cure their diseases (doctors, medicines and concepts). For centuries there was no participation of the State in the health care of indigenous peoples, who, with their own resources, had the capacity to generate health conditions to carry out their daily activities (Maldonado, 2003). For this reason and for the aforementioned benefits that herbal medicine brings to the *Mé'pháá* and *Tu'un savi* indigenous communities in the Mountain of Guerrero, we consider that alternative health, economic, cultural and development models can be built, which must start from their cultural worldview, considering their historical experience and their own and external resources, such as medicinal plants, crosses, candles and prayers, which are used in healing rituals.

In the *Mé'pháá* and *Tu'un savi* indigenous worldview, the following are present: the tequio, bartering, change of arm, community organization, community assembly, communal celebration, work, self-consumption and traditional medicine (herbal medicine, midwifery, healing and temazcal). From the academy, this way of life is translated as Good Living or Living Well. From this perspective, there are studies in herbal medicine; for example, Duarte-Abadía & Osejo-Varona (2015) mention that medicinal plants are considered as an articulating element for Good Living and that for the peasants of the páramos of Guerrero and Rabanal, in Colombia, plants not only contribute to integral health and individual well-being, but also to the collective one, for the contributions of healers to the well-being of the community. Likewise, indigenous Oaxacan women mention that medicinal plants help them to have a good life and to live fully, thanks to the contributions to integral health, as well as to economic and cultural aspects (Méndez-Hernández, 2009).

These examples indicate that the *Mé'pháá* and *Tu'un savi* indigenous herbal medicine of the mountain of Guerrero could contribute to a project of ethnodevelopment, Good Living or own well-being. For this, it is essential, first, that the specialists in herbal medicine dialogue with other specialists of traditional medicine (herbal doctor, midwives, shamans, bonesetters, praying men, etc.), because each one would contribute important elements for the creation of this project of own development. After this dialogue between specialists, it is necessary to establish dialogue with peasants, housewives, young people and older adults of the same indigenous people, because each of them has something to contribute in the enrichment of knowledge in traditional medicine and herbal medicine, subsequently, a dialogue between actors of the *Mé'pháá* and *Tu'un savi* cultures will be necessary, not only to exchange knowledge and thus enrich both cultures, but to join efforts in this project of own development.

Finally, another dialogue that is essential to carry out is with doctors and nurses, representatives of allopathic medicine, because indigenous peoples are also related to this health system. But this dialogue needs to be developed horizontally, recognizing that both knowledge systems (scientific and indigenous) are equally important for the social well-being of the community and humanity at large. Once these dialogues of knowledge have been fostered, the first steps can be taken so that, with traditional medicine and herbal medicine, a project of own development can be created, which will surely contribute to Good Living (Huanacuni-Mamani, 2010), Living Well (PNUD, 2010) or the Good Life (Hernández-Medina & Sandoval-Forero, 2020) in the indigenous peoples of Mexico.

CONCLUSION

The traditional *Mé'pháá* and *Tu'un savi* indigenous herbal medicines are part of the community health system present in the memory and practice of housewives, midwives, peasants and healers, which, despite the epistemicides committed since the colony, which have worsened more strongly with the capitalist modernizing project, are still active in the treatment of diseases called “cultural specific syndromes” (Zolla-Luque and Argueta-Villamar, 2009) or what others call cultural diseases (Peretti,

2010), chronic-degenerative diseases and emerging diseases, such as Covid-19.

Through the dialogues of knowledge that were established with midwives, housewives, healers and peasants, 121 species of medicinal plants were identified, with which more than 40 diseases are treated. These dialogues also contributed to the preparation of herbal remedies, mainly soaps and ointments, and allowed knowing the relationships that specialists in herbal medicine maintain with allopathic medicine and its representatives, mainly doctors and nurses.

Dialogues of knowledge between specialists in traditional medicine (healers, herbalists, midwives, praying men and bonesetters) with housewives, peasants, young people and older adults and with allopathic specialists could contribute to the development of their own health project that integrates their own and others' cultural elements, using elements of traditional medicine (medicinal herbs, animals, fungi, minerals, prayers, letters, candles, holy water, crosses, etc.) and those of allopathic medicine (mainly, medicines). Through this own health project and considering the cultural worldview of these indigenous peoples (self-consumption, bartering, change of arm, work, community assembly and community organization), the first steps could be taken for the creation of an ethnodevelopment project, which will surely contribute to Good Living, Living Well or Own Well-being in the *Mé'pha* and *Tu'un savi* indigenous peoples in the Mountain of Guerrero, Mexico.

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