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Phytotherapy Used in Ailments of the Digestive System by Andean Inhabitants of Pampas, Huancavelica, Peru

Charles Frank Saldaña-Chafloque [1,*], Mercedes Acosta-Román [2], José Torres-Huamaní [3] and José Luis Castillo-Zavala [4]

[1] Faculty of Engineering, Professional School of Forestry and Environmental Engineering, National Autonomous University of Tayacaja Daniel Hernández Morillo, Huancavelica 09156, Peru
[2] Faculty of Health Sciences, Professional School of Nursing, National Autonomous University of Tayacaja Daniel Hernández Morillo, Huancavelica 09156, Peru; mercedesacosta@unat.edu.pe
[3] Faculty of Engineering, Professional School of Industrial Engineering, National Autonomous University of Tayacaja Daniel Hernández Morillo, Huancavelica 09156, Peru; josetorres@unat.edu.pe
[4] Faculty of Biological Sciences, Professional School of Biological Sciences, Universidad Nacional Trujillo, Trujillo 13001, Peru; castillo.zavala.jl@gmail.com
* Correspondence: charlessaldana@unat.edu.pe; Tel.: +51-936-047-980

Abstract: The use of medicinal plants for the therapy of diseases of the digestive system, where the Andean peoples developed various forms of administration. The objective is to identify medicinal plants used in the therapy of ailments of the digestive system by the Andean inhabitants of Pampas, Tayacaja, Huancavelica, Peru. Methods: Non-probabilistic sampling, using the "snowball" technique, carrying out semi-structured surveys, allowing information to be collected on the prevalence of ailments or diseases of the digestive system treated with medicinal plants, with inhabitants over 20 years of age participating and using the medicinal plants in the therapy of your digestive system ailments, and exclude those inhabitants who do not comply with it. Results: A total of 16 families, 33 genera, and 34 species are reported, where the families that present the greatest abundance of species are Asteraceae and Lamiaceae. The widely used species are *Minthostachys mollis* (11.9%), *Aloe vera* (10.4%), *Clinopodium bolivianum* (9%), *Artemisia absinthium* (9%), and *Matricaria chamomilla* (8.2%). Concluding with the identification of a diversity of medicinal flora, used in the therapy of diseases of the digestive system, such as stomach pain, constipation, gallbladder ailments, gastritis, and gastrointestinal, and liver diseases.

Keywords: phytotherapy; digestive system; Andean community; traditional medicine; Peruvian Andes

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1. Introduction

The high cases of diseases of the digestive system generate a high mortality and morbidity rate worldwide. These diseases of the digestive system are usually known as gastrointestinal disorders, frequently reported by inhabitants of Andean communities, where poor sanitation practices are more common [1]. These disorders range from mild, such as indigestion, to severe cases such as chronic diseases, which influence mortality and morbidity [2]. In 2021, studies on diseases of the digestive system reported 40.3% of cases worldwide, with a higher prevalence occurring in women than in men [3]. Likewise, around 1.7 billion children suffer from diarrhea annually, causing approximately 1.5 million to die [4].

There is a trend in the world regarding the renewed focus on traditional medicine [5–9]. Recent studies on medicinal plants are of vital importance in various programs that deal with health conservation and care, the "World Health Organization" (WHO) gives the respective validation to the role of traditional medicine in the health system "primary health care" [10]. In developing countries, medicinal plants continue to be the potential

source of medicines; around 88% of the inhabitants of underdeveloped countries widely use traditional medicine in the therapy of their diseases [9].

The use of herbs in traditional medicine is very widespread, for the treatment of ailments of the digestive system [2,11]. In the digestion process, food and liquids are transported in the digestive tract, then they are broken down into tiny parts, called nutrients, at which time the body carries out absorption processes and uses them as an energy source. Disorders of the digestive or gastrointestinal tract include propulsion, ingestion, mechanical, physical, or chemical digestion, absorption, and defecation [2,5,7,11,12]. In this context, the disorders present in the digestive system are interrelated, where, when using medicinal plants, they have various purposes, depending on the types of symptoms and digestive disorders [12].

That said, residents can treat diseases related to the digestive system through the regular use of preparations based on medicinal plants, improving the function of the digestive system [2,5,7,11,13]. These preparations act, for example, in healing the lining of the intestine, optimizing the digestive process and stimulating bowel movements, increasing bowel movements, detoxification, relieving stomach discomfort, reducing gas, bloating, and various digestive discomforts [13].

Medicinal plants present phytochemicals, also called secondary metabolites, which have certain characteristics such as being anti-inflammatory, anticancer, antiplasmodial, antioxidant, etc. These plants or parts of them contain active ingredients that provide the desired action, they are used throughout the world [13], such as essential oils, tannins, alkaloids, coumarins, mucilages, flavonoids [14], constituting part of medicinal plants such as "fennel" *Foeniculum vulgare* Mill, which contains essential oil with a high amount of acetol, organic acids, flavonoids, proteins, and mineral salts; "chamomile" *Matricaria chamomilla* L., which has sesquiterpene lactones, essential oil, and flavonoids; "star anise" *Illicium verum* Hook, containing catechuic tannin, carbohydrates, organic acids, its most important active ingredient being anethole and terpene carbides, anise ketones, aldehydes, estragole, safrole and cineol [15].

Peru has a variety of ecological floors, presenting diverse climates, thus conserving a high biodiversity of flora and fauna; with a variety of medicinal plants, used mostly by Andean inhabitants [10,16]. The Peruvian Andes preserve their traditions and culture regarding the usefulness of medicinal plants, using language to transfer their knowledge through generations; Furthermore, the Andean peoples present their health system based on the worldview and are based on various health care practices, such as the use of medicinal plants, forming part of their cultures, conserving their medicinal flora [17–20].

The Andean Community of Pampas, located in the Huancavelica region of Peru, which is very far from the big cities of the country, is being abandoned by the rulers, presenting high levels of poverty and extreme poverty [21], frequently resorting to the use of nature to treat their health problems, using plants to do so. Medicinal in the therapy of various ailments or diseases presented by the inhabitants. In this context, the use of medicinal plants by the inhabitants of the Andean Community of Pampas for the treatment of diseases of the digestive system is well known, given that these are an alternative in their therapies, have minimal cost, and do not present adverse reactions. The reason that prompted the present study, whose objective was the identification of medicinal plants used in the therapy of ailments of the digestive system by the Andean inhabitants of Pampas.

2. Materials and Methods

2.1. Study Area

Our study was carried out in the Andean community of Pampas, Tayacaja province, Huancavelica region, Peru, which is located in the mountains of the center of the country, at 3276 m above sea level. With a surface of 109.07 km^2 (12°23′42″ L.S. and 74°52′02″ L.W.), this region presents a temperate climate with moderate rains and dry winters, annual rainfall ranges from 500–1500 mm, and its main source of income is livestock and agriculture.

2.2. Sample

The sample consisted of 370 inhabitants (N), determined through the population and unknown variance, where the population was 10,061 inhabitants (N), margin of error of 0.05 (d), confidence level of 0.95 (Z), and success of 0.50 (p) and $q = 1 - p$ [22].

$$\frac{NZ^2pq}{d^2(N-1)+Z^2pq}$$

2.3. Sampling Method

The sampling was of the non-probabilistic type, selecting the study subjects to be surveyed, comprising mostly buyers and sellers of medicinal plants from the markets of the community of Pampas. The inclusion criteria included being an inhabitant over 20 years of age and using medicinal plants in the therapy of their digestive system ailments. The exclusion criterion included inhabitants who did not meet the inclusion criteria or presented signs of falsehood in their answers.

The surveys were carried out monthly from January 2021 to December 2022, obtaining information on the medicinal plants used in the therapy of ailments of the digestive system. Using the "snowball" technique, which included asking questions to the first respondent, classifying him as "knowledgeable", at the end of the interview he proposed the name of the next inhabitant to be interviewed, calling him "knowledgeable" and following that methodology until finishing 370 surveys [23].

2.4. Technique and Instrument of Collecting Information

Using semi-structured interviews, before this, the validation and reliability of the instrument were carried out. Then, the collection of medicinal plants made known by the inhabitants was carried out, with taxonomic determinations being carried out in the Department of Botany and the Herbarium Truxillensis of the National University of Trujillo; collecting information regarding the use of medicinal plants of the Andean inhabitants of Pampas in the therapy of ailments of the digestive system, regarding the classification of diseases and conditions of the World Health Organization (WHO) [24].

2.5. Analysis of Data

The information was organized in Microsoft Excel spreadsheets and complemented through various sources in the area of interest [25].

2.6. Ethical Aspects

In this research, the informed consent of the Andean inhabitants of Pampas was obtained, maintaining the anonymity of the respondents.

3. Results

A total of 16 families, 33 genera, and 34 species are reported to be used in phytotherapy for ailments of the digestive system by the Andean inhabitants of Pampas. The families that present the greatest number of species are Lamiaceae, Asteraceae, and Apiaceae with 7, 6, and 5 species, respectively, followed by the Cactaceaea and Piperaceae with 3 and 2 species, respectively, and, those with the smallest number of species are the Amaranthaceae, Bromeliaceae, Fabaceae, Gentianaceae, Monimiaceae, Plantaginaceae, Rubiaceae, Rutaceae, Solanaceae, and Xanthorroeaceae, with one species each. Likewise, the ethnomedicinal utility, form of use, part of the plant used, and the institution where each reported species is located are detailed (Table 1).

Table 1. Taxonomy and ethnobotanical utility of medicinal plants reported by the Andean inhabitants of Pampas.

Family	Scientific Name	Common Name	Ethnomedicinal Utility	How to Use	Part of the Plant Used	Institution Where the Species Is Located
Amaranthaceae	*Chenopodium ambrosioides* L.	"paico"	Stomachache	Infusion, Juices	Fresh leaf, Root, Stem	National Herbarium of Mexico (MEXU), Institute of Biology, of the National Autonomous University of Mexico (UNAM).
Apiaceae	*Apium graveolens* L.	"apio"	Stomachache, constipation	Infusion, Extracts	Fresh leaf, Dry leaf, Root, Stem, Bark	National Herbarium of Mexico (MEXU), Institute of Biology, of the National Autonomous University of Mexico (UNAM).
	Eryngium foetidum L.	"sacha culantro"	Stomachache	Infusion	Fresh leaf	National Herbarium of Mexico (MEXU), Institute of Biology, of the National Autonomous University of Mexico (UNAM).
	Foeniculum vulgare Mill.	"hinojo"	Stomachache	Juices	Stem	National Herbarium of Mexico (MEXU), Institute of Biology, of the National Autonomous University of Mexico (UNAM).
	Petroselinum crispum (Mill.) Fuss	"perejil"	Stomachache	Infusion, Juices, Extracts	Fresh leaf, Stem, Seeds	National Herbarium of Mexico (MEXU), Institute of Biology, of the National Autonomous University of Mexico (UNAM).
	Pimpinella anisum L	"anís"	Stomachache	Infusion	Fresh leaf, Dry leaf	Herbarium Truxillense (HUT), from the National University of Trujillo, Peru.
Asteraceae	*Ambrosia peruviana* Willd.	"marco"	Stomachache	Juices, pastes, creams, infusions, plasters, powders	fresh leaf, stem, dried leaf, stems, flowers, bark, root	National Herbarium of Mexico (MEXU), Institute of Biology, of the National Autonomous University of Mexico (UNAM).
	Artemisia absinthium L.	"ajenjo"	Stomachache, gallbladder infection	Infusion, plasters	Fresh leaf, Dry leaf, Stem, root	National Herbarium of Mexico (MEXU), Institute of Biology, of the National Autonomous University of Mexico (UNAM).
	Cynara cardunculus L.	"alcachofa"	Gastritis	Infusion	Fresh leaf, stem	National Herbarium of Mexico (MEXU), Institute of Biology, of the National Autonomous University of Mexico (UNAM).

Table 1. *Cont.*

Family	Scientific Name	Common Name	Ethnomedicinal Utility	How to Use	Part of the Plant Used	Institution Where the Species Is Located
	Matricaria chamomilla L.	"manzanilla"	Gastritis, Stomachache, Gastrointestinal infection	Infusion, Pastes, Juices, Maceration, Extracts, Plasters, Tisane	Fresh leaf, Dry leaf, Stem, Root, Bark, Flowers	National Herbarium of Mexico (MEXU), Institute of Biology, of the National Autonomous University of Mexico (UNAM).
	Smallanthus sonchifolius (Poepp.) H. Rob.	"yacón", "llacón"	Gastritis	Infusion, Extracts	Root, Fruits	Herbarium Truxillense (HUT), from the National University of Trujillo, Peru.
	Taraxacum officinale FH Wigg.	"diente de león"	Liver inflammation, Stomachache, gastritis	Infusion, Extracts, Maceration, Juices, Tinctures	Fresh leaf, Root, Flowers	National Herbarium of Mexico (MEXU), Institute of Biology, of the National Autonomous University of Mexico (UNAM).
Brassicaceae	*Rorippa nasturtium-aquaticum* (L.) Hayek	"berro"	Liver inflammation	Juices	fresh leaf	National Herbarium of Mexico (MEXU), Institute of Biology, of the National Autonomous University of Mexico (UNAM).
Bromeliaceae	*Tillandsia cacticola* L.B. Sm	"siempreviva"	Gastritis	Juices, Extracts	Fresh leaf, Root, Stem	Herbarium Truxillense (HUT), from the National University of Trujillo, Peru.
Cactaceae	*Austrocylindropuntia floccosa* (Salm-Dyck) F.Ritter	"huaracco", "huaraco", "waraqu"	Gastritis	Infusion	Fruits	Herbarium Truxillense (HUT), from the National University of Trujillo, Peru.
	Corryocactus odoratus F. Ritter	"cactus"	Gastritis	Juices, Extracts	fresh leaf	Herbarium Truxillense (HUT), from the National University of Trujillo, Peru.
	Opuntia ficus-indica (L.) Miller	"tuna"	Stomachache, gastritis	Infusion, Juices, Extracts, Maceration, Plaster	fresh leaf, bark, stem	Herbarium Truxillense (HUT), from the National University of Trujillo, Peru.
Fabaceae	*Psoralea glandulosa* L.	"huallhua", "wallwa", "culé", "culén", "hierba de san agustín"	Stomachache	Infusion	Fresh leaf, Dry leaf	Herbarium Truxillense (HUT), from the National University of Trujillo, Peru.
Gentianaceae	*Gentianella alborosea* (Gilg) Fabris	"hercampuri"	Stomachache	Infusion, Maceration, Plasters, Essential oils, juices	Fresh leaf, Dry leaf, Flowers	Herbarium Truxillense (HUT), from the National University of Trujillo, Peru.

Table 1. *Cont.*

Family	Scientific Name	Common Name	Ethnomedicinal Utility	How to Use	Part of the Plant Used	Institution Where the Species Is Located
Lamiaceae	*Clinopodium bolivianum* Kuntze	"inka muña"	Gastritis, Stomachache	Infusion	Fresh leaf, Dry leaf, Root, Stem	Herbarium Truxillense (HUT), from the National University of Trujillo, Peru.
	Hedeoma mandoniana Wedd	"pacha muña"	Stomachache	Infusion	Fresh leaf	Herbarium Truxillense (HUT), from the National University of Trujillo, Peru.
	Melissa officinalis L.	"toronjil"	Gastritis, Stomachache	Infusion	Fresh leaf, Dry leaf, Stem	National Herbarium of Mexico (MEXU), Institute of Biology, of the National Autonomous University of Mexico (UNAM).
	Mentha piperita L.	"menta"	Stomachache, gastritis	Infusion, Pastes, Creams, Maceration, Essential oils, Extracts, Plasters	Fresh leaf, Dry leaf, Stem, Flowers	National Herbarium of Mexico (MEXU), Institute of Biology, of the National Autonomous University of Mexico (UNAM).
	Mentha spicata L.	"hierba buena"	Stomachache, intestinal parasites	Infusion, Juices	Fresh leaf, Dry leaf, Stem	National Herbarium of Mexico (MEXU), Institute of Biology, of the National Autonomous University of Mexico (UNAM).
	Minthostachys mollis (Kunth) Griseb.	"muña"	Stomachache, gastritis.	Infusion, Maceration, Pastes, creams, Ointments, Essential oils, Plasters, Powders, Herbal tea	Fresh leaf, Dry leaf, Root, Stem	Herbarium Truxillense (HUT), from the National University of Trujillo, Peru.
	Rosmarinus officinalis L.	"romero"	Stomachache, colon infection, liver inflammation	Infusion, Creams, Juices, Plasters, Extracts, Powders, Tinctures or essences, Essential oils, Herbal tea	Fresh leaf, Dry leaf, Flowers, Stem, Seeds, Root	National Herbarium of Mexico (MEXU), Institute of Biology, of the National Autonomous University of Mexico (UNAM).
Monimiaceae	*Peumus boldus* Molina	"boldo"	intestinal parasites	Infusion	Fresh leaf, stem	Herbarium Truxillense (HUT), from the National University of Trujillo, Peru.
Piperaceae	*Peperomia inaequalifolia* Ruíz. & Pav.	"congona"	Stomachache	Infusion	Fresh leaf, stem	Herbarium Truxillense (HUT), from the National University of Trujillo, Peru.
	Piper aduncum L.	"matico"	Stomachache	Infusion, Juices, Creams, Essential oils, Plasters, Ointments	Fresh leaf, Dry leaf, Stem, Root.	National Herbarium of Mexico (MEXU), Institute of Biology, of the National Autonomous University of Mexico (UNAM).

Table 1. *Cont.*

Family	Scientific Name	Common Name	Ethnomedicinal Utility	How to Use	Part of the Plant Used	Institution Where the Species Is Located
Plantaginaceae	*Plantago major* L.	"llantén"	intestinal gases	Infusion, Pastes, Plasters, Tinctures or essences, Creams, Ointments, Decoction or knowledge	Fresh leaf, Dry leaf, Root, Stem, Flowers	National Herbarium of Mexico (MEXU), Institute of Biology, of the National Autonomous University of Mexico (UNAM).
Rubiaceae	*Uncaria tormentosa* DC.	"uña de gato"	Gastritis	Juices, Maceration, Tinctures or essences, Powders	Bark, Seeds, Flowers	National Herbarium of Mexico (MEXU), Institute of Biology, of the National Autonomous University of Mexico (UNAM).
Rutaceae	*Ruta graveolens* L.	"ruda"	Stomachache	Infusion, Juices, Maceration, Plasters, Ointments, Decoction or knowledge, Tinctures or essences, Extracts	Fresh leaf, Dry leaf, Stem, Flowers	National Herbarium of Mexico (MEXU), Institute of Biology, of the National Autonomous University of Mexico (UNAM).
Solanaceae	*Solanum tuberosum* L.	"papa"	Gastritis	Juices, Extracts, Tocosh	Tuber	Herbarium Truxillense (HUT), from the National University of Trujillo, Peru.
Xanthorroeaceae	*Aloe vera* (L.) Burm.f.	"sábila"	Gastritis, burns, scars, wounds	Maceration, creams, poultices, extracts, juices, ointments, pastes	fresh leaf, bark, stem	National Herbarium of Mexico (MEXU), Institute of Biology, of the National Autonomous University of Mexico (UNAM).

Figure 1 details the percentage of ethnobotanical families reported by the Andean inhabitants of Pampas, in the therapy of their ailments presented in the digestive system, where the families Lamiaceae (32.8%; 121 reports) and Asteraceae (28.4%; 105 reports) are the widely used ones, and the families with the least use are the Rubiaceae, Plantaginaceae, Monimiaceae, Bromeliaceae, and Brassicaceae with 0.7% and 3 reports each.

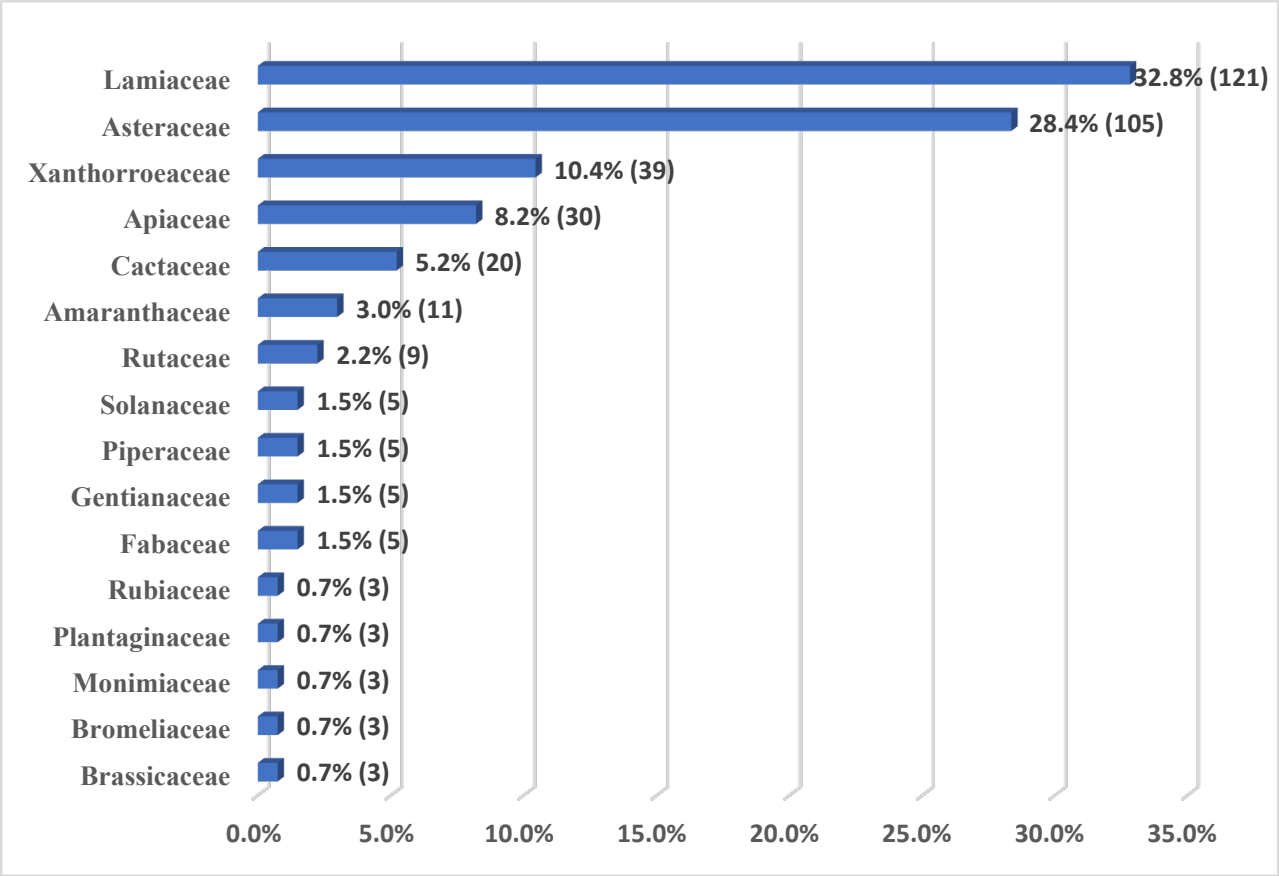

Figure 1. Ethnobotanical families reported by the Andean inhabitants of Pampas.

Figure 2 reports the ethnobotanical species used in the therapy of ailments of the digestive system by the Andean inhabitants of Pampas, where the most used species are *Minthostachys mollis* (11.9%; 44 reports), *Aloe vera* (10.4%; 37 reports), *Clinopodium bolivianum* (9%; 33 reports), *Artemisia absinthium* (9%; 33 reports) and *Matricaria chamomilla* (8.2%; 30 reports), and the species of lesser use are *Uncaria tormentosa, Tillandsia cacticola, Smallanthus sonchifolius, Rorippa nasturtium-aquaticum, Plantago major, Piper aduncum, Pimpinella anisum, Peumus boldus, Petroselinum crispum, Peperomia inaequalifolia, Hedeoma mandoniana, Foeniculum vulgare, Eryngium foetidum, Cynara cardunculus, Corryocactus odoratus,* and *Austrocylindropuntia floccosa* with 0.7% and 3 reports each.

Figure 3 reports the forms of use of the ethnobotanical species used in the therapy of ailments of the digestive system, by the Andean inhabitants of Pampas, where infusion (22.4%; 26 reports) and juices (18.1%; 21 reports) are widely used, followed by extracts (10.3%; 12 reports), plasters (9.5%; 11 reports), maceration (7.8%; 9 reports), and the least used forms of use are decoction (1.7%; 2 reports), herbal tea (1.7%; 2 reports), and poultices (0.9%; 1 report).

Figure 4 reports the parts of the plants used from the ethnobotanical species used in the therapy of ailments of the digestive system, by the Andean inhabitants of Pampas, where fresh leaves (29.4%; 30 reports) and the stem (21.6%; 22 reports) are the most used, followed by dried leaves (15.7%; 16 reports), root (12, 7%; 13 reports), flowers (8.8%; 9 reports), bark (5.9%; 6 reports, and the least used are fruits (2%; 2 reports) and tubers (1%; 1 report).

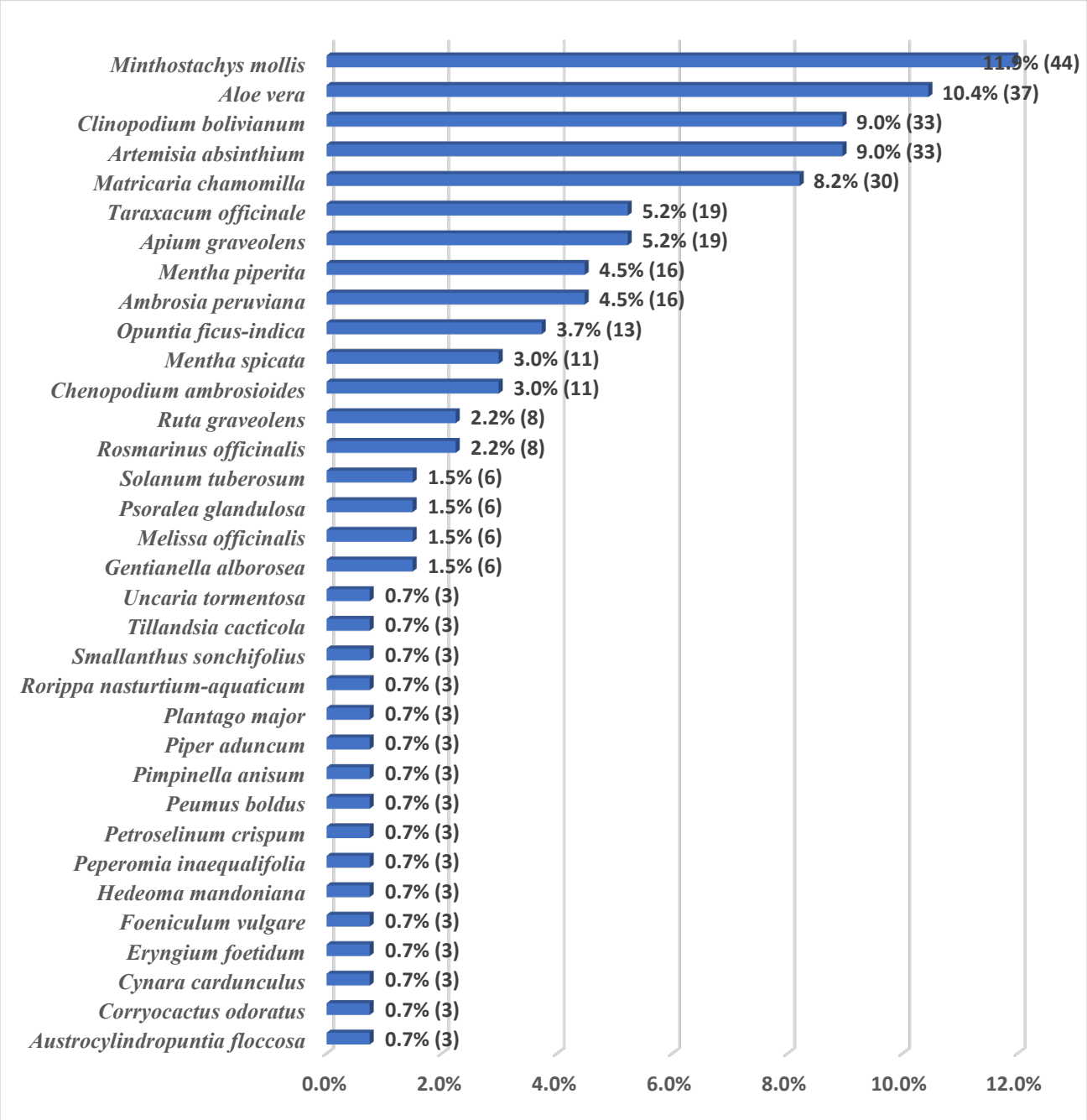

Figure 2. Ethnobotanical species reported by the Andean inhabitants of Pampas, in the therapy of ailments of the digestive system.

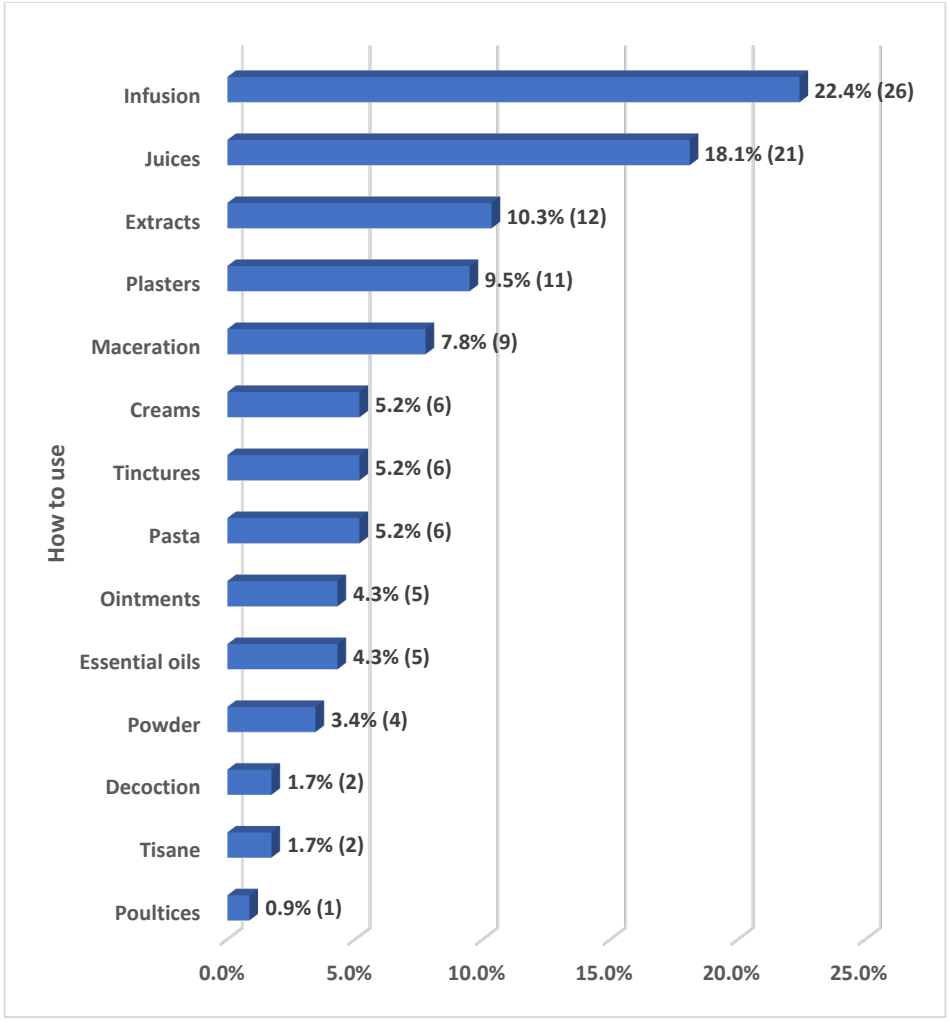

Figure 3. Forms of use of ethnobotanical species reported by the Andean inhabitants of Pampas, in the therapy of ailments of the digestive system.

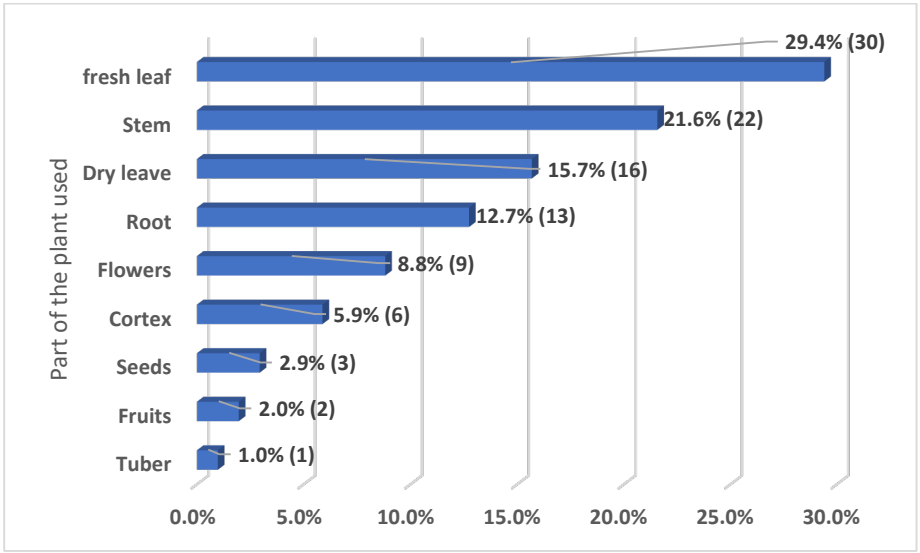

Figure 4. Parts of the plants used from the ethnobotanical species reported by the Andean inhabitants of Pampas, in the therapy of ailments of the digestive system.

4. Discussion

A total of 16 families, 33 genera, and 34 species of plants were identified to be used in the therapy of ailments of the digestive system, such as in the gallbladder, liver, gastritis, and various gastrointestinal diseases (Table 1). Likewise, of the 16 families reported, those most used by locals are the Lamiaceae and Asteraceae (Table 1 and Figure 1). However, Asteraceae and Lamiaceae are widely used in traditional medicine worldwide [20,26,27]. The prevalence of the use of these families is due to the fact that they are herbs, cosmopolitan distribution, and richness in the study site, in addition to the members of these families being known for their aromatic quality [28,29]. Likewise, the species members of these families are characterized by synthesizing secondary metabolites with potential biological activity being used in traditional medicine in the treatment of diseases of the digestive system [20,30].

The most reported species were *Minthostachys mollis*, *Aloe vera*, *Clinopodium bolivianum*, *Artemisia absinthium,* and *Matricaria chamomilla*, and the species of lesser use are *Uncaria tormentosa*, *Tillandsia cacticola*, *Smallanthus sonchifolius*, *Rorippa nasturtium-aquaticum*, *Plantago major*, *Piper aduncum*, *Pimpinella anisum*, *Peumus boldus*, *Petroselinum crispum*, *Peperomia inaequalifolia*, *Hedeoma mandoniana*, *Foeniculum vulgare*, *Eryngium foetidum*, *Cynara cardunculus*, *Corryocactus odoratus,* and *Austrocylindropuntia floccosa* (Figure 2). Likewise, this report is similar to other studies carried out on medicinal plants used in the treatment of diseases of the digestive system in cities such as Ancash, Huancayo, and Huancavelica, in Peru and studies carried out in the countries of Bolivia, Chile, Colombia, Ecuador, Peru, and Venezuela, which are part of the Andean subregion of South America [14,15,31,32].

In addition to the taxonomy, the form of use was also studied, including infusion and juices as the most used, followed by extracts, plasters, maceration, creams, tinctures, pastes, ointments, essential oils, powders, and the least used are decoction, herbal tea, and poultices (Figure 3). The daily use of medicinal plants could be due to the high effectiveness of their use for the treatment of diseases, given the different forms of use [33], such as pastes that are widely used worldwide [34]. Where most of the medicinal preparations are made from a medicinal plant. Likewise, they are mostly prepared with fresh plants, which is consistent with various research worldwide [33,35].

In this context, the leaves of *M. piperita* are used in various forms of use, mixing with leaves of *Allium cepa* and *A. maritime* for the therapy of vomiting, antioxidant, antispasmodic, antidiabetic, analgesic, antipyretic, hepatoprotective, carminative, antimicrobial, analgesic, antidiarrheal, diaphoretic, irritable bowel syndrome, and liver diseases [36,37].

The Andean inhabitants of Pampas use various forms of *Plantago major* for the treatment of intestinal gases. However, other studies on *Plantago himalaica* leaves use them for the treatment of diarrhea, and dysentery, and for stopping nosebleeds [38,39]. Studies on fresh leaves of *Artemisia annua*, use them to cure severe vomiting, their use is also reported as antimalarial, anti-inflammatory, antimicrobial, wound healing, eye infections, fever, anemia, jaundice, diarrhea, asthma, cholera, dengue, foot athlete, viral hepatitis, schistosomiasis, eczema, Chagas disease and as a sedative [40].

Regarding the parts of the plants used, include fresh leaves and the stem, which are the most used, followed by dried leaves, roots, flowers, and bark; and those of least use are fruits and tubers (Figure 4). These results are similar to various studies, where communities use leaves [41]. This is possible because the leaves are easily accessible in the harvesting process, compared to the other parts of the plant [42]. Furthermore, it is where photosynthesis and therefore bioactive molecules are carried out [43].

The present study reports the preference of Andean inhabitants to the use of medicinal plants in the therapy of their digestive system ailments; being the preparations mostly used to relieve their ailments without presenting side effects [44]. Likewise, some reasons related to the high use of medicinal plants, being a taboo linked to these ailments, an example of this, is inhabitants who frequently hesitate to mention their ailments to health personnel, such as intestinal gas [45]. However, these inhabitants make their ailments known to parents or elders, who suggest the use of medicinal plants found in the Andean community,

another reason being the distance from the Andean communities and the absence or lack of health centers. state health [2].

Recently, ailments of the digestive system have attracted the interest of scientists, and based on this, an idea emerged regarding the functional brain-gut axis for the conservation of the balance of the human being [9]. The function of medicinal plants is reiterated in some way not only for the treatment of ailments of the digestive system but it is also reflected in the reduction of neurological and psychological diseases that would be altered due to gastrointestinal disorders [46]. Therefore, it is necessary to expand research on medicinal plants, thus obtaining promising results for humanity with a holistic approach [2].

However, various studies emphasize the use of medicinal plants in the cure of gastrointestinal disorders, presenting varied applications in local and other therapies, such as urogenital, dermatological, and musculoskeletal diseases. respiratory tract, etc. [11]. Therefore, the Andean inhabitants developed over time various ways of collecting, processing, and administering preparations of these medicinal plants, in the treatment of different diseases linked to the stomach [2].

5. Conclusions

The medicinal plants used by the Andean inhabitants of Pampas were identified in the therapy of ailments of the digestive system, the most used species being *Minthostachys mollis*, *Aloe vera*, *Clinopodium bolivianum*, *Artemisia absinthium* and *Matricaria chamomilla*. Likewise, the Lamiaceae and Asteraceae families are the most widely used.

The evidence provided by the Andean inhabitants of Pampas, based on medicinal plants, serves as a basis for future research for the development of alternative treatments for the cure of digestive diseases and to discover new biological molecules.

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