Revista ARACÊ
ISSN: 2358-2472

EVIDENCE-BASED AND EXPERIENCE-BASED PHYTOTHERAPY FOR THE MANAGEMENT OF DIARRHEA IN BRAZIL

https://doi.org/10.56238/arev7n2-098

Submitted on: 01/10/2025 **Publication date:** 02/10/2025

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ABSTRACT

Diarrhea is a condition of high morbidity and mortality, characterized by an increase in the frequency and liquidity of bowel movements, which can lead to severe dehydration. This study performed a narrative review using the Evidence- and Experience-Based Phytotherapy method, following Direct Validation – Level 1 (VD1) in line with the Official Phytotherapy and the prerogatives of the National Health Surveillance Agency (ANVISA). Ten plant species validated for the management of mild and non-infectious diarrhea were identified, including Anacardium occidentale (cashew tree), Eugenia uniflora (pitangueira), and Psidium guajava (guava tree), the latter also effective against rotavirus enteritis. The therapeutic effects of these plants are related to the presence of tannins and flavonoids, which promote astringent, antimicrobial, and anti-inflammatory action. Medicinal teas, in the form of infusion or decoction, are the most common preparations, requiring proper preparation to ensure effectiveness. Despite the validation, there is a shortage of herbal medicines registered with ANVISA for this purpose, evidencing the need to expand research, and encourage the manipulation/production of herbal medicines and the supply of these plants in the SUS. It is concluded that phytotherapy represents a promising alternative for the management of diarrhea, and it is essential to train health professionals and develop public policies that favor its access and rational and safe use.

Keywords: Medicinal Plants. Herbal. Gastrointestinal disorders. Integrative and Complementary Practices.

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INTRODUCTION

Diarrhea is an important cause of morbidity and mortality and is defined by the change in bowel habits, causing the passage of malformed stools, with reduced or softened consistency. Thus, there is an increase in the weight of the feces, in the amount of the liquid part, due to the imbalance between absorption and secretion, and in the frequency of bowel movements, more than twice a day. Thus promoting the loss of nutrients, such as water and electrolytes, and enabling the occurrence of the main complication of diarrhea, which is dehydration (CORINALDESI *et al.*, 2012; HAMMER, 2015; SILBERNAGL, 2016).

Its manifestation can occur acutely and can be classified as watery, bloody and persistent, with a prevalence of cases lasting less than two weeks (BRANDT; ANTUNES; SILVA, 2015; CORINALDESI *et al.*, 2012; HAMMER, 2015; MARTIN; CASTRO, 2014) or chronic, and can be classified as watery, fatty and hemorrhagic, manifesting itself in four to six weeks (CORINALDESI *et al.*, 2012; HAMMER, 2015; JUCKETT; TRIVEDI, 2011).

Both can occur due to two main pathophysiological mechanisms, such as secretory character, which promotes increased secretion of water and fluids into the lumen of the gastrointestinal tract, and/or osmotic character, through insufficient absorption of fluids, electrolytes and nutrients, being retained within the lumen (CORINALDESI *et al.*, 2012; HAMMER, 2015; JUCKETT; TRIVEDI, 2011; SILBERNAGL, 2016). In addition, they may be accompanied by some symptoms, such as abdominal cramps, abdominal pain, fever, nausea, or vomiting (CORINALDESI *et al.*, 2012; DANTAS, 2004; JUCKETT; TRIVEDI, 2011; MCCLARREN; LYNCH; NYAYAPATI, 2011).

The diagnosis of the etiology of diarrhea must be accurate and carried out through an appropriate anamnesis, thus enabling the promotion of appropriate treatment for the patient's clinical condition. Diagnostic measures are mainly based on the duration of diarrhea, the daily number of bowel movements, the main symptoms, and feeding practices (CORINALDESI *et al.*, 2012; MARTIN; CASTRO, 2014). As needed, other diagnostic methods can be performed (MS, 2020; SCHILLER; PARDI; SELLIN, 2017; BRAZILIAN SOCIETY OF PEDIATRICS, 2017).

Treatment consists primarily of oral rehydration therapy (ORT), adequate nutrition, fiber and zinc supplementation, and the use of probiotics. There may also be a need for medications, such as antimotility drugs, which increase intestinal transit time (opioid agonists), absorption stimulants and inhibitors of fluid and electrolyte secretion, which also

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increase intestinal transit time (α2-adrenergic receptor agonists), antisecretory agents (somatostatin analogue), antispasmodics (anticholinergics), peristalsis production inhibitors (serotonin 5-HT3 receptor antagonists), antibiotics, in cases of infections, and others (BRUNTON, 2018; KATZUNG, 2017; SCHILLER, 2017; BRAZILIAN SOCIETY OF PEDIATRICS, 2017).

In addition to conventional treatments, the use of medicinal plants for the treatment of diarrhea has its origin and use since ancient times (ANTONIO; TESSER; MORETTI-PIRES, 2013; PALOMBO, 2006; RAWAT; SINGH; KUMAR, 2017; THUMANN *et al.*, 2019)element. Their use is justified by the fact that they have phytochemical constituents that are responsible for various antidiarrheal activities and because they demonstrate a lower profile of adverse effects compared to synthetic drugs, with a consequent reduction in complications related to the worsening of diarrhea (PALOMBO, 2006; RAWAT; SINGH; KUMAR, 2017; THUMANN *et al.*, 2019)element.

Currently, phytotherapy is recognized as an Integrative and Complementary Practice (PIC) within the scope of the Unified Health System (SUS), characterized as a therapeutic modality based on the use of medicinal plants and their extracts, without the use of isolated active substances (BRASIL, 2006). Despite its official inclusion, the indication and prescription of medicinal plants and herbal medicines by health professionals is still limited. This reality is largely related to the incipient training on the subject during graduation. In addition, the lack of access to safe and reliable sources of scientific information compromises the safety and the necessary preparation for the recommendation and prescription of these treatments (BEZERRA *et al.*, 2020; FONTENELE *et al.*, 2013; MENGUE *et al.*, 2019; ROSSATO; DAL-BÓ; CITADINI-ZANETTE, 2024).

Thus, this study aims to systematize and unify clinical information clearly and objectively, promoting its practical application in the prescription and self-care in health for the management of diarrhea. The proposal is to identify safe and effective therapeutic options, based on *Evidence- and Experience-Based Phytotherapy*, aligned with the standards of Official Phytotherapy in Brazil, contributing to the expansion of knowledge and the strengthening of the rational use of medicinal plants and herbal medicines as part of the available therapeutic strategies.

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METHODOLOGY

The present study carried out a narrative review following the data systematization pattern of *Direct Validation - Level 1*, proposed by Rossato (2024) in the model called *Evidence- and Experience-Based Phytotherapy applied to Clinical Practice* , researching medicinal plants validated for the management of diarrhea.

Direct Validation - Level 1 (VD1), consists of accessing Normative Instruction No. 2 of May 13, 2014 (ANVISA, 2014), Monographs of plant species of the *European Medicines Agency* in its Final Version (EMA, 2025); Herbal Medicine Form of the Brazilian Pharmacopoeia, updated (ANVISA, 2021), Herbal Medicine Methodology of the Brazilian Pharmacopoeia (ANVISA, 2016) and in the active registrations of herbal medicines with ANVISA (ANVISA, 2024). The species were listed by pharmagen, main secondary metabolites, therapeutic indication, pharmaceutical forms/extracts, route of administration, dosage, drug:extract ratio (RDE) (g:mL), prescription restriction and active registration on the ANVISA website as simple herbal medicine.

RESULT

Based on the criteria established in this study, ten plant species validated for the treatment of diarrhea were identified, illustrated in Figure 1. Among them, two are native to Brazil (N): *Anacardium occidentale* L. (cashew tree) and *Eugenia uniflora* L. (pitangueira). The species *Psidium guajava* L. (guava tree) is exotic, but it is already naturalized in the country (EN). In addition, five species are exotic cultivated in Brazil (EC): *Cinnamomum verum* J. Presl (cinnamon), *Fragaria vesca* L. (wild strawberry), *Quercus robur* L. (oak), *Rubus idaeus* L. (raspberry) and *Vaccinium myrtillus* L. (blueberry). Finally, two exotic species do not occur in Brazil (E): *Agrimonia eupatoria* L. (agrimonia) and *Potentilla erecta* (L.) Raeusch. (tormentila).

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FIGURE 1 - Mosaic of the ten Medicinal Plants[3] validated for the management of Diarrhea

Legend: 1 - *Agrimonia eupatoria* (agrimonia); 2 - *Cinnamomum verum* (cinnamon); 3 - *Anacardium occidentale* (cashew tree); 4 - *Eugenia uniflora* (pitangueira); 5 - *Fragaria vesca* (wild strawberry); 6 - *Potentilla erecta* (tormentila); 7 - *Psidium guajava* (guava tree); 8 - *Quercus robur* (oak); 9 - *Rubus idaeus (raspberry tree); 10 - Vaccinium myrtillus* (blueberry).
Source: Authors, 2025

Table 1 describes the data such as: botanical nomenclature, popular name, origin[4], pharmacogen consisting of the part of the plant validated for the preparation of extracts, class of secondary metabolites, therapeutic indication, route of administration, age group, pharmaceutical forms, and the extract drug ratio [RDE g:mL] when described. The age restriction is also described, to facilitate clinical practice, in addition to the references consulted to access complementary information, especially safety aspects, which are not described in the table.

Table 1 - Systematized Information on the Ten Medicinal Plants Validated in Brazil for Diarrhea Management

Scientific name Popular name/Origin Pharmaceutical Bibliography	**Class of Secondary Metabolites**	**Therapeutic indication**	**Route of Administration Age group Dosage Forms Plant Drug Extract Ratio (RDE) (g:mL)**
Agrimonia eupatoria L. [agrimonia][E] Dry Grass (flowering tips) [(EMA, 2015c)]	Phenolic Acids, Flavonoids, Essential Oils and Tannins	Symptomatic treatment of mild diarrhea	**Oral Adult and pediatric use over 12 years old** **Infusion** (one cup): 1.5 to 4 g of the dried flowering tips to 250 mL of water. Prepare the tea by infusion, let it smother for 10 to 15 minutes, strain. Take 250 mL of the preparation two to three times a day. **Tincture:** (RDE 1: 5 in 45% alcohol): Take 1 to 4 ml, three times a day.

[3] The images were mostly extracted from the Botanical Garden of the University of Trás-os-Montes and Alto Douro (JBUTAD), Portugal and with less representation from other official sites.
[4] The classification of plant species according to their origin (native, exotic, naturalized, cultivated or not occurring in Brazil) was consulted on the Flora e Funga do Brasil platform (FLORA E FUNGA DO BRASIL, 2025)

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			Liquid Extract: (RDE 1:1 in 25% alcohol): Take 1 to 3 ml, three times a day.
Anacardium occidentale L. [cashew][N] Dry peel (ANVISA, 2021)	Alkaloids, Steroids, Flavonoids, Saponins, Tannins and Terpenes	Symptomatic treatment of mild non-infectious diarrhea	**Oral** **Adult use** **Decocto** (one cup): 0.4 to 3.75 g of dry peel for 150 mL of water. Prepare the tea by decoction, letting it boil for 5 minutes. Take 150 mL of the preparation, up to four times a day.
Cinnamomum verum J. Presl [cinnamon][EC] Dry peel (ANVISA, 2021; EMA, 2011b)	Cinnamic Acid, Phenolic Acids, Sugars, Diterpenes, Flavonoids, Volatile Oils and Tannins	Symptomatic treatment of mild diarrhea and non-infectious mild diarrhea	**Oral** **Adult use** **Infusion** (one cup): 0.5 to 1 g of the dried peel to 150 mL to 200 mL of water. Prepare the tea by infusion, let it smother for 10 to 15 minutes, strain. Take the preparation up to four times a day.
Eugenia uniflora L. [pitangueira][N] Leaf (ANVISA, 2021)	Anthocyanins, Catechins, Flavonoids, Saponins, Tannins and Terpenes	Symptomatic treatment of mild non-infectious diarrhea	**Oral** **Adult use** **Infusion** (one cup): 3 g of the leaf to 150 mL of water. Prepare the tea by infusion, let it smother for 10 to 15 minutes, strain. Take 30 mL of the preparation after each episode of diarrhea, no more than ten times a day.
Fragaria vesca L. and/or F. moschata and/or, F. viridis and/or F. ananassa [wild strawberry tree] [EC] Leaf (EMA, 2018b)	Phenolic Acids, Flavonoids, Tannins and Terpenes	Symptomatic treatment of mild diarrhea	**Oral** **Adult and pediatric use over 12 years old** **Infusion** (one cup): 1 g of the leaf to 200 mL of water. Prepare the tea by infusion, let it smother for 10 to 15 minutes, strain. Take the preparation two to three times a day.
Potentilla erecta (L.) Raeusch. [tormentila][E] Dried rhizome (EMA, 2010c)	Flavonoids, Carboxylic phenolic acids, Fatty acids, Triterpene saponins and Tannins	Symptomatic treatment of mild diarrhea	**Oral** **Adult use** **Infusion** (one cup): 1.4 to 4 g of the dried rhizome to 150 to 200 mL of water. Prepare the tea by infusion, let it smother for 10 to 15 minutes, strain. Take the preparation several times a day up to a maximum daily dose of 12 g. **Decocto** (one cup): 1.4 to 3 g of the dried rhizome to 150 to 200 mL of water. Prepare the tea by decoction, letting the system boil for 5 minutes. Take the preparation several times a day up to a maximum daily dose of 6 g. **Tincture 1:** (RDE 1 g: 5 mL in 70% alcohol): Take 1 to 2 mL, three times daily. **Tincture 2:** (RDE 1 g: 5 mL in 45% alcohol): Take 2 to 4 mL, three times daily. **Liquid Extract:** (RDE 1 g: 1 mL at 25% alcohol): 2 to 4 mL, 3 times daily. **Dry extract:** (RDE 3.5 to 4.5 g: 1 mL at 60% alcohol): 400 mg, three times daily.
Psidium guajava L. [guava tree][EN] Dry young leaf (ANVISA, 2016, 2021)	Flavonoids, Essential Oils & Tannins	Symptomatic treatment of mild and acute non-infectious diarrhea;	**Oral** **Adult and pediatric use over 12 years old** **Infusion** (one cup): 0.5 g of the young dried leaf to 150 mL of water. Prepare by infusion, let it smother for 10 to 15 minutes, strain. Take the infusion three to four times a day.

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		Treatment of rotavirus enteritis	**Dried vegetable drug** : 500 mg of the dried vegetable drug powder, three or four times a day. **Dry extract:** 250 to 350 mg, three to four times a day.
Quercus robur L. [oak][EC] Dry peel (EMA, 2010d)	Volatile Acids, Flavonoids, Tannins and Triterpenes	Symptomatic treatment of mild diarrhea	**Oral** **Adult Use** **Infusion** (one cup): 3 g of dried peel to 250 mL of water. Prepare by infusion, leave smothered for 10 to 15 minutes, strain. Take the preparation up to three times a day. **Dried vegetable drug:** 1 g of the dried peel powder (capsules/tablets), three times a day. **Dry extract:** 140 mg, four times daily.
Rubus idaeus L. [raspberry][EC] Dry leaf (EMA, 2014b)	Phenolic Acids, Alcohols, Aldehydes, Flavonoids and Tannins	Symptomatic treatment of mild diarrhea	**Oral** **Adult use** **Infusion** (one cup): 1.5 to 8 g of the dried leaf for 150 mL of water: Prepare by infusion, leave smothered for 10 to 15 minutes, strain. Take the preparation up to three times a day.
Vaccinium myrtillus L. [blueberry][EC] Dried ripe fruit (ANVISA, 2021; EMA, 2015d)	Organic Acids, Alkaloids, Anthocyanins, Flavonoids, Iridoids, Pectins and Tannins	Symptomatic treatment of mild diarrhea and non-infectious mild diarrhea	**Oral** **Adult and pediatric use over 12 years old** **Decocto** (one cup): 5 to 15 g of the dried ripe fruit to 250 mL of water. Prepare by decoction leaving the system to boil for 5 minutes. Take 250 mL of decoction three to four times a day.

Legend: N - Native species of Brazil; E - Exotic species from Brazil; EC - Exotic species cultivated in Brazil; EN - Exotic species naturalized in Brazil

Source: Authors, 2025.

Regarding the pharmacogen, for four species the leaves are described, for three the bark, and respectively grass (the flowering tips), rhizome and ripe fruit described for one species. The plant extracts from the species are for oral use and the teas are described for all species, the most frequent being the infusion, with eight citations, followed by decoction for three species, with less representation of the other extracts, described for four species.

Of the ten species found, five are described only for the symptomatic treatment of mild diarrhea, two only for the symptomatic treatment of mild non-infectious diarrhea, and the species, *Cinnamomum verum* (cinnamon), *Vaccinium myrtillus* (blueberry) and *Psidium guajava* (guava tree) are validated for both indications. In addition, *P. guajava* is also indicated for the treatment of rotavirus enteritis. In a search on the ANVISA website, in January 2025, no registration was found as simple herbal medicine of the species containing the therapeutic indication for diarrhea.

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DISCUSSION

Diarrhea is recognized as one of the most relevant public health problems globally, especially due to the serious complications it can cause, such as dehydration resulting from fluid and electrolyte imbalance. Early diagnosis and appropriate treatment, according to the signs and symptoms presented, are essential to prevent complications (CORINALDESI *et al.*, 2012; GARCÍA; SOLÍS, 2016; GUTIÉRREZ; MITCHELL; SOLIS, 2008; BRAZILIAN SOCIETY OF PEDIATRICS, 2017).

Among the therapeutic options available, phytotherapy stands out as a promising complementary approach, especially for cases of mild or non-infectious diarrhea. Medicinal plants contain bioactive compounds from secondary metabolism, such as tannins and flavonoids, which play important pharmacological roles, including antidiarrheal activity (LANGHORST *et al.*, 2013; MOSS; CHEIFETZ, 2007; PALOMBO, 2006). This strategy is particularly relevant for patients with diarrhea associated with toxicity from chemotherapy treatments (ZHENG *et al.*, 2023)element.

Based on the bibliographies consulted, ten species validated for the symptomatic treatment of mild or non-infectious diarrhea were identified (ANVISA, 2021; EMA, 2010c, d, 2011b, 2014b, 2015c, d, 2018b). Among them, *Psidium guajava* (guava) has an additional indication for rotavirus enteritis (ANVISA, 2021).

For all species, and some exclusively, medicinal teas are described as a form of preparation, and it is important to highlight that inffusion and decoction are extemporaneous solutions that must be prepared at home according to the correct preparation technique and at the time of use. This recommendation is essential to ensure the effectiveness of these preparations, avoiding the degradation of bioactive compounds, such as polyphenols and flavonoids, due to exposure to air, light and heat, in addition to preventing the proliferation of microorganisms, such as bacteria and fungi, which can develop in stored aqueous solutions (CAROCHO *et al.*, 2015; GUIMARÃES *et al.*, 2011)element.

The infusion process consists of adding water previously heated to the standardized pharmacogen (such as leaves), usually dried and previously crushed or scratched, to boiling water. The container should be kept stuffy for 10 to 15 minutes at room temperature, unless otherwise specifically directed, and then the liquid should be strained. It is recommended to consume the preparation immediately after preparation, at a temperature that is pleasant to the palate. The decoction, on the other hand, consists of adding water at

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room temperature to the pharmagen, also usually dried and previously crushed or erased, heating the system and keeping the container semi-stuffed. After reaching boiling, heat should be maintained for 5 to 10 minutes, unless specifically directed. Then, turn off the heat, wait until the preparation is warm, strain and consume the recommended dose (ANVISA, 2021; SIMÕES *et al.*, 2017)element.

Similarly, all species contain flavonoids and tannins in their chemical composition (BONE; MILLS, 2013; EMA, 2010a, b, 2011a, 2014a, 2015a, b, 2018a; ESCOP, 2003; FINTELMANN; WEISS, 2010; GARCÍA; SOLÍS, 2016; GRUENWALD, 2000; LORENZI; MATOS, 2002; WHO, 1999), and tannins are the main responsible for the antidiarrheal activity due to their high molecular weight, which favors the formation of the tannin-protein complex when it comes into contact with the proteins of intestinal epithelial cells. This interaction promotes an astringent action, which makes the intestinal mucosa more rigid and less permeable, reducing the secretion and influx of fluids into the intestinal lumen, while increasing absorption (BONE; MILLS, 2013).

In addition, tannins form a protective layer of coagulated protein in the intestinal mucosa, which prevents the action of irritants and microorganisms, protecting the underlying layers and contributing to the neutralization of pro-inflammatory proteins (BONE; MILLS, 2013). This action is complemented by its vasoconstrictor effect on small intestinal vessels and by its ability to reduce peristaltic activity by numbing enteric nerve endings (BONE; MILLS, 2013; EMA, 2010a; GARCÍA; SOLÍS, 2016).

Tannins also demonstrate antibacterial activity against diarrhea-causing pathogens such as *Shigella spp.*, *Escherichia coli* and *Staphylococcus aureus*, microorganisms often associated with food poisoning. Other bacteria, such as *Bacillus anthracis*, *Proteus vulgaris,* and *Pseudomonas aeruginosa*, are also sensitive to the action of tannins, which inhibit their proliferation by binding to the proteins of their cell walls and precipitating extracellular enzymes essential for their survival (LEVINSON, 2016; MCCLARREN; LYNCH; NYAYAPATI, 2011; MONTEIRO *et al.*, 2005; TORTORA, 2017).

In a complementary way, flavonoids exert antibacterial action, modulating the permeability of biological membranes and promoting the destruction of the phospholipid bilayer and bacterial lipopolysaccharide (LPS). They are also capable of inhibiting the synthesis of nucleic acids, interfering with the replication of bacterial DNA and RNA through the inhibition of the enzyme topoisomerase. In addition, they have neutralizing activity of bacterial virulence factors, including toxins, and are capable of inhibiting multidrug

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resistance mechanisms, such as bacterial efflux pumps (EMA, 2015b; KOWALSKI *et al.*, 2020)element. Like tannins, flavonoids have shown efficacy against *E. coli*, *Salmonella enterica*, *Vibrio cholerae,* and *Staphylococcus aureus* (BYLKA; MATLAWSKA; PILEWSKI, 2004; KOWALSKI *et al.*, 2020)element.

Flavonoids still have a spasmolytic effect, especially through the quercetin subgroup, identified in the chemical composition of several validated species, such as *Anacardium occidentale* (cashew tree) and *Cinnamomum verum* (cinnamon), although the latter has quercetin only in the leaves and not in the bark, which is the validated pharmacogen. Quercetin acts as a calcium antagonist, inhibiting intestinal motility and reducing capillary permeability, contributing to the relief of symptoms (LOZOYA *et al.*, 2002; METWALLY *et al.*, 2010)element. In addition, flavonoids such as those present in *Psidium guajava* also exhibit antiviral activity, inhibiting rotavirus replication and protecting cells against viral invasion (BAE *et al.*, 2000; CECÍLIO *et al.*, 2012)element. A clinical study indicates that the decoction of *P. guajava* is effective in the treatment of childhood rotaviral enteritis, promoting negative virus conversion rates of 87.1% compared to 58.1% in the control group, in addition to reducing the duration of symptoms (WEI; READ; CHEN, 2000).

Species native to Brazil, such as *Anacardium occidentale* (cashew tree) and *Eugenia uniflora* (pitangueira) and the exotic *Cinnamomum verum* (cinnamon), but cultivated in Brazil, also demonstrate antibacterial efficacy against pathogens that cause diarrhea, especially due to the presence of essential oils in their composition, reinforcing both their popular indication and their scientific validation (ANDRADE JÚNIOR *et al.*, 2018; COSTA *et al.*, 2020)element. Despite this, there are limitations related to the registration of herbal products in Brazil, with *Cinnamomum verum* being the only species registered in the category of Compound Herbal Medicine in association with the plant *Syzygium aromaticum* (cloves) and exempt from medical prescription (ANVISA, 2024), however its therapeutic indication is as an antiflatulent in cases of digestive problems (CP, 2019), not to mention the management of diarrhea.

Considering the pharmacological profile of the species and their validation as herbal medicines, the scarcity of registered products for diarrhea somewhat limits the prescription, but reveals the importance of other means of access to extracts and/or plants. Among them, the Magistral Pharmacies (BRASIL, 2007), Living Pharmacies in the SUS (BRASIL, 2010), Therapeutic Gardens and Domestic Backyards (ANTONIO; TESSER; MORETTI-PIRES, 2013).

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Although the use of medicinal plants is promising, their administration requires caution, especially in specific populations, such as children, pregnant and breastfeeding women, due to the scarcity of studies or ethnobotanical and ethnopharmacological records that guarantee safety for these groups. Some species, such as *Agrimonia eupatoria*, *Cinnamomum verum,* and *Vaccinium myrtillus*, may potentiate the effects of antidiabetic and antihypertensive medications, including angiotensin-converting enzyme (ACE) inhibitors and diuretics, by interfering with blood glucose and blood pressure control (BLACKMORES INSTITUTE, 2019; BONE; MILLS, 2013; ESCOP, 2003; WHO, 2009).

However, considering the severity of a diarrheal condition and its implications for the absorption of medications and food, in addition to malaise and fluid and electrolyte imbalance, reversal of the condition is paramount. However, this approach does not exempt the need for risk-benefit assessment, as well as monitoring by health professionals, ensuring the safety and efficacy of the use of medicinal plants.

In addition, in cases of diarrhea with worsening or persistence of symptoms for more than three days, or in recurrent episodes and bloody stools, it is essential to seek medical help or help from a qualified health professional (ANVISA, 2021; EMA, 2010c, d, 2011b, 2014b, 2015c, d, 2018b; WHO, 2009).

Based on the identified properties, such as those described for *Psidium guajava*, future studies could explore the potential of these plants in the management of diarrhea associated with chemotherapy treatments. However, additional clinical trials are needed to validate safety and efficacy in specific contexts, broadening its use in the treatment of diarrhea and other related conditions.

CONCLUSION

The research revealed ten validated medicinal plants with multiple pharmacological profile, due to the presence of tannins and flavonoids in their composition. These substances stand out for their astringent action, which promotes the rigidity and protection of the intestinal mucosa, in addition to exerting antimicrobial and anti-inflammatory activity, as observed in species such as *Psidium guajava* (guava tree), with proven efficacy also against rotavirus.

These plants have a low toxicity profile and adverse reactions, as long as they are ingested at the recommended dosage, but the presence of tannins requires attention due to their interference in the absorption of nutrients and medications. However, considering

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the severity of diarrhea, which can cause the same effects described, the risk-benefit ratio for each patient should be evaluated based on quality information, such as that gathered in this study.

In addition to contributing to clinical practice, the results presented provide subsidies for the development of new research and foster discussions on public policies, such as the expansion of the use of herbal medicines and medicinal plants in the Unified Health System (SUS), in addition to encouraging the manipulation, production and registration of extracts for this purpose. The absence of registered herbal medicines for the treatment of diarrhea highlights the importance of encouraging Therapeutic Gardens linked to Basic Health Units, as well as continuing education for health professionals, especially about the prescription of extemporaneous solutions, considering the scarcity of products available on the market.

Finally, this study reinforces the role of phytotherapy as an integrative and effective practice in the management of diarrhea, promoting health care based on biodiversity and scientific knowledge. The systematization presented here serves as a valuable tool to increase the safety and efficacy in the use of medicinal plants, consolidating its relevance as a therapeutic option in the clinical and social context.

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REFERENCES

1. Andrade Júnior, F. P., & et al. (2018). Antibacterial and antifungal potential of extracts of Anacardium occidentale. Periódico Tchê Química, 15(31), 313–321. https://www.researchgate.net/publication/326990146_Antibacterial_and_antifungal_potential_of_extracts_of_anacardium_occidentale

2. Antonio, G. D., Tesser, C. D., & Moretti-Pires, R. O. (2013). Contribuições das plantas medicinais para o cuidado e a promoção da saúde na atenção primária. Interface, 17(46), 615–633. https://doi.org/10.1590/1807-57622013.0071

3. Agência Nacional de Vigilância Sanitária. (n.d.). Consulta de produtos: Medicamentos registrados. Retrieved January 29, 2025, from https://consultas.anvisa.gov.br/#/medicamentos/

4. Agência Nacional de Vigilância Sanitária. (2021). Formulário de fitoterápicos da Farmacopeia Brasileira (2nd ed.). Brasília, DF: Author.

5. Agência Nacional de Vigilância Sanitária. (2014, May 13). Instrução Normativa nº 02, de 13 de maio de 2014: Publica a "Lista de Medicamentos Fitoterápicos de Registro Simplificado" e a "Lista de Produtos Fitoterápicos Tradicionais de Registro Simplificado". Diário Oficial da União. http://bvsms.saude.gov.br/bvs/saudelegis/anvisa/2014/int0002_13_05_2014.pdf

6. Agência Nacional de Vigilância Sanitária. (2016). Memento de fitoterápicos da Farmacopeia Brasileira (1st ed.). Brasília, DF: Author. http://www.farmacia.pe.gov.br/sites/farmacia.saude.pe.gov.br/files/memento_fitoterapico.pdf

7. Bae, E. A., & et al. (2000). In vitro inhibitory effect of some flavonoids on rotavirus infectivity. Biological and Pharmaceutical Bulletin, 23(9), 1122–1124. https://doi.org/10.1248/bpb.23.1122

8. Bezerra, A. S. C. E., & et al. (2020). Situational diagnosis of professionals of family health units on phytotherapy. Brazilian Journal of Biology, 81(3), 551–556. https://doi.org/10.1590/1519-6984.224557

9. Blackmores Institute. (2019). Complementary medicine interactions guide: For healthcare professionals (10th ed.). Sydney, Australia: Author.

10. Bone, K., & Mills, S. (2013). Principles and practice of phytotherapy: Modern herbal medicine (2nd ed.). London, England: Elsevier.

11. Brandt, K. G., Antunes, M. M. C., & Silva, G. A. P. (2015). Acute diarrhea: Evidence-based management. Journal of Pediatrics, 91(6, Suppl. 1), S36–S43. https://doi.org/10.1016/j.jped.2015.06.002

12. Brasil. (2010, April 20). Portaria nº 886, de 20 de abril de 2010. Estabelece a Farmácia Viva no âmbito do Sistema Único de Saúde (SUS). Brasília, DF: Agência Nacional de Vigilância Sanitária. https://bvsms.saude.gov.br/bvs/saudelegis/gm/2010/prt0886_20_04_2010.html

13. Brasil. (2006, May 3). Portaria nº 971, de 3 de maio de 2006. Aprova a Política Nacional de Práticas Integrativas e Complementares (PNPIC) no Sistema Único de Saúde. Brasília, DF: Ministério da Saúde. https://bvsms.saude.gov.br/bvs/saudelegis/gm/2006/prt0971_03_05_2006.html

Revista ARACÊ
ISSN: 2358-2472

14. Brasil. (2007, October 8). Resolução da Diretoria Colegiada nº 67, de 8 de outubro de 2007. Dispõe sobre Boas Práticas de Manipulação de Preparações Magistrais e Oficinais para Uso Humano em farmácias. Brasília, DF: Agência Nacional de Vigilância Sanitária. https://bvsms.saude.gov.br/bvs/saudelegis/anvisa/2007/rdc0067_08_10_2007.html

15. Brunton, L. L. (2018). Goodman & Gilman: As bases farmacológicas da terapêutica (13th ed.). Porto Alegre, Brazil: AMGH.

16. Bylka, W., Matlawska, I., & Pilewski, N. A. (2004). Natural flavonoids as antimicrobial agents. JANA, 7(2), 24–31. https://www.researchgate.net/publication/228800384_Natural_flavonoids_as_antimicrobial_agents

17. Carocho, M., & et al. (2015). Melissa officinalis L. decoctions as functional beverages: A bioactive approach and chemical characterization. Food & Function, 6(7), 2240–2248. https://doi.org/10.1039/c5fo00309a

18. Cecílio, A. B., & et al. (2012). Screening of Brazilian medicinal plants for antiviral activity against rotavirus. Journal of Ethnopharmacology, 141(3), 975–981. https://doi.org/10.1016/j.jep.2012.03.031

19. Corinaldesi, R., & et al. (2012). Clinical approach to diarrhea. Internal and Emergency Medicine, 7(Suppl. 3), S255–S262. https://doi.org/10.1007/s11739-012-0827-4

20. Costa, J. S., & et al. (2020). Essential oils from Brazilian Eugenia and Syzygium species and their biological activities. Biomolecules, 10(8), Article 1155. https://doi.org/10.3390/biom10081155

21. CP. (n.d.). Bálsamo branco. Retrieved September 7, 2021, from https://catarinensepharma.com.br/produtos/balsamo-branco/

22. Dantas, R. O. (2004). Diarréia e constipação. Medicina, 37(3/4), 262–266. https://doi.org/10.11606/issn.2176-7262.v37i3/4p262-266

23. European Medicines Agency. (2015a). Assessment report on Agrimonia eupatoria L., herba. London, United Kingdom: Author. https://www.ema.europa.eu/en/documents/herbal-report/final-assessment-report-agrimonia-eupatoria-l-herba_en.pdf

24. European Medicines Agency. (2011a). Assessment report on Cinnamomum verum J. S. Presl, cortex and corticis aetheroleum. London, United Kingdom: Author. https://www.ema.europa.eu/en/documents/herbal-report/assessment-report-cinnamomum-verum-j-s-presl-cortex-corticis-aetheroleum_en.pdf

25. European Medicines Agency. (2018a). Assessment report on Fragaria vesca L., Fragaria moschata Weston, Fragaria viridis Weston and Fragaria x ananassa (Weston) Duchesne ex Rozier, folium. Amsterdam, The Netherlands: Author. https://www.ema.europa.eu/en/documents/herbal-report/final-assessment-report-fragaria-vesca-l-fragaria-moschata-weston-fragaria-viridis-weston-fragaria-x_en.pdf

26. European Medicines Agency. (2010a). Assessment report on Potentilla erecta (L.) Raeusch., rhizoma. London, United Kingdom: Author. https://www.ema.europa.eu/en/documents/herbal-report/final-assessment-report-potentilla-erecta-l-raeusch-rhizoma_en.pdf

Revista ARACÊ
ISSN: 2358-2472

27. European Medicines Agency. (2010b). Assessment report on Quercus robur L., Quercus petraea (Matt.) Liebl., Quercus pubescens Willd., cortex. London, United Kingdom: Author. https://www.ema.europa.eu/en/documents/herbal-report/final-assessment-report-quercus-robur-l-quercus-petraea-matt-liebl-quercus-pubescens-willd-cortex_en.pdf

28. European Medicines Agency. (2014a). Assessment report on Rubus idaeus L., folium. London, United Kingdom: Author. https://www.ema.europa.eu/en/documents/herbal-report/final-assessment-report-rubus-idaeus-l-folium_en.pdf

29. European Medicines Agency. (2015b). Assessment report on Vaccinium myrtillus L., fructus recens and Vaccinium myrtillus L., fructus siccus. London, United Kingdom: Author. https://www.ema.europa.eu/en/documents/herbal-report/final-assessment-report-vaccinium-myrtillus-l-fructus-recens-vaccinium-myrtillus-l-fructus-siccus_en.pdf

30. European Medicines Agency. (2011b). Community herbal monograph on Cinnamomum verum J.S. Presl, cortex. London, United Kingdom: Author. https://www.ema.europa.eu/en/documents/herbal-monograph/community-herbal-monograph-cinnamomum-verum-js-presl-cortex_en.pdf

31. European Medicines Agency. (2010c). Community herbal monograph on Potentilla erecta (L.) Raeusch., rhizoma. London, United Kingdom: Author. https://www.ema.europa.eu/en/documents/herbal-monograph/final-community-herbal-monograph-potentilla-erecta-l-raeusch-rhizoma_en.pdf

32. European Medicines Agency. (2010d). Community herbal monograph on Quercus robur L., Quercus petraea (Matt.) Liebl., Quercus pubescens Willd., cortex. London, United Kingdom: Author. https://www.ema.europa.eu/en/documents/herbal-monograph/final-community-herbal-monograph-quercus-robur-l-quercus-petraea-matt-liebl-quercus-pubescens-willd_en.pdf

33. European Medicines Agency. (2014b). Community herbal monograph on Rubus idaeus L., folium. London, United Kingdom: Author. https://www.ema.europa.eu/en/documents/herbal-monograph/final-community-herbal-monograph-rubus-idaeus-l-folium_en.pdf

34. European Medicines Agency. (n.d.). Medicines search: European Union herbal and monograph. Retrieved January 29, 2025, from https://www.ema.europa.eu/en/medicines/field_ema_web_categories%253Aname_field/Herbal/field_ema_herb_outcome/european-union-herbal-monograph-254

35. European Medicines Agency. (2015c). European Union herbal monograph on Agrimonia eupatoria L., herba. London, United Kingdom: Author. https://www.ema.europa.eu/en/documents/herbal-monograph/final-european-union-herbal-monograph-agrimonia-eupatoria-l-herba_en.pdf

36. European Medicines Agency. (2018b). European Union herbal monograph on Fragaria vesca L., Fragaria moschata Weston, Fragaria viridis Weston and Fragaria x ananassa (Weston) Duchesne ex Rozier, folium. Amsterdam, The Netherlands: Author. https://www.ema.europa.eu/en/documents/herbal-monograph/final-european-union-herbal-monograph-fragaria-vesca-l-fragaria-moschata-weston-fragaria-viridis_en.pdf

37. European Medicines Agency. (2015d). European Union herbal monograph on Vaccinium myrtillus L., fructus siccus. London, United Kingdom: Author. https://www.ema.europa.eu/en/documents/herbal-monograph/final-european-union-herbal-monograph-vaccinium-myrtillus-l-fructus-siccus_en.pdf

Revista ARACÊ
ISSN: 2358-2472

38. ESCOP. (2003). Monographs: The scientific foundation for herbal medicinal products (2nd ed.). Exeter, United Kingdom: Author.

39. Fintelmann, V., & Weiss, R. F. (2010). Manual de fitoterapia (11th rev. ed.). Rio de Janeiro, Brazil: Guanabara Koogan.

40. Flora and Funga of Brazil. (n.d.). Flora and Funga do Brasil 2020 under construction. Retrieved January 29, 2025, from http://floradobrasil.jbrj.gov.br

41. Fontenele, R. P., & et al. (2013). Fitoterapia na atenção primária: Visões de gestores e profissionais da Estratégia Saúde da Família de Teresina (PI), Brasil. Ciência & Saúde Coletiva, 18(8), 2385–2394. https://doi.org/10.1590/S1413-81232013000800023

42. García, E. C., & Solís, I. M. (2016). Manual de fitoterapia (2nd ed.). Barcelona, Spain: Elsevier.

43. Gruenwald, J., & et al. (2000). PDR for herbal medicines. Montvale, NJ: Medical Economics Company.

44. Guimarães, R., & et al. (2011). Effects of oral dosage form and storage period on the antioxidant properties of four species used in traditional herbal medicine. Phytotherapy Research, 25(4), 484–492. https://doi.org/10.1002/ptr.3284

45. Gutiérrez, R. M. P., Mitchell, S., & Solis, R. V. (2008). Psidium guajava: A review of its traditional uses, phytochemistry and pharmacology. Journal of Ethnopharmacology, 117(1), 1–27. https://doi.org/10.1016/j.jep.2008.01.025

46. Hammer, G. D. (2015). Fisiopatologia da doença (7th ed.). Porto Alegre, Brazil: AMGH.

47. Juckett, G., & Trivedi, R. (2011). Evaluation of chronic diarrhea. American Family Physician, 84(10), 1119–1126. https://www.aafp.org/afp/2011/1115/p1119.html

48. Katzung, B. (2017). Farmacologia básica e clínica (13th ed.). Porto Alegre, Brazil: AMGH.

49. Kowalski, L., & et al. (2020). Antimicrobial activity of flavonoids: A literature review. Interdisciplinary Journal in Health and Biological Sciences, 4(1), 51–65. https://san.uri.br/revistas/index.php/ricsb/article/view/119

50. Langhorst, J., & et al. (2013). Randomised clinical trial: A herbal preparation of myrrh, chamomile and coffee charcoal compared with mesalazine in maintaining remission in ulcerative colitis—A double-blind, double-dummy study. Alimentary Pharmacology & Therapeutics, 38(5), 490–500. https://doi.org/10.1111/apt.12397

51. Levinson, W. (2016). Microbiologia médica e imunologia (13th ed.). Porto Alegre, Brazil: AMGH.

52. Lorenzi, H., & Matos, F. J. A. (2002). Plantas medicinais no Brasil: Nativas e exóticas. Nova Odessa, SP: Instituto Plantarum.

53. Lozoya, X., & et al. (2002). Intestinal anti-spasmodic effect of a phytodrug of Psidium guajava folia in the treatment of acute diarrheic disease. Journal of Ethnopharmacology, 83(1-2), 19–24. https://doi.org/10.1016/S0378-8741(02)00185-X

Revista ARACÊ
ISSN: 2358-2472

54. McClarren, R. L., Lynch, B., & Nyayapati, N. (2011). Acute infectious diarrhea. Primary Care: Clinics in Office Practice, 38(3), 539–564. https://doi.org/10.1016/j.pop.2011.05.006

55. Mengue, K. A., & et al. (2019). Quinta do Chá: Troca de saberes sobre plantas medicinais na atenção primária à saúde. In L. B. Ceretta & et al. (Eds.), Práticas e saberes da extensão (Vol. 6, pp. 80–97). Florianópolis, SC: Two by Four. http://www.unesc.net/portal/resources/files/71/ebooks/ebook-praticas-e-saberes-da-extensao-volume-11-1.pdf

56. Metwally, A. M., & et al. (2010). Phytochemical investigation and antimicrobial activity of Psidium guajava L. leaves. Pharmacognosy Magazine, 6(23), 212–218. https://doi.org/10.4103/0973-1296.66939

57. Monteiro, J. M., & et al. (2005). Taninos: Uma abordagem da química à ecologia. Química Nova, 28(5), 892–896. https://doi.org/10.1590/S0100-40422005000500027

58. Moraes, A. C., & Castro, F. M. M. (2014). Diarreia aguda. Jornal Brasileiro de Medicina, 102(2), 21–28. http://files.bvs.br/upload/S/0047-2077/2014/v102n2/a4191.pdf

59. Moss, A. C., & Cheifetz, A. S. (2007). Reducing the torment of diarrhea: Tormentil for active ulcerative colitis. Journal of Clinical Gastroenterology, 41(9), 797–798. https://doi.org/10.1097/MCG.0b013e3180684255

60. Ministério da Saúde. (2020). Doenças diarreicas agudas (DDA). Brasília, DF: Author. https://www.gov.br/saude/pt-br/assuntos/saude-de-a-a-z-1/d/doencas-diarreicas-agudas-dda

61. Palombo, E. A. (2006). Phytochemicals from traditional medicinal plants used in the treatment of diarrhoea: Modes of action and effects on intestinal function. Phytotherapy Research, 20(9), 717–724. https://doi.org/10.1002/ptr.1907

62. Rawat, P., Singh, P. K., & Kumar, V. (2017). Evidence based traditional anti-diarrheal medicinal plants and their phytocompounds. Biomedicine & Pharmacotherapy, 96, 1453–1464. https://doi.org/10.1016/j.biopha.2017.11.036

63. Rossato, A. E. (2024). Modelo de busca e sistematização de dados: Fitoterapia baseada em evidências e experiências aplicadas à prática clínica. In A. E. Rossato, S. Dal-Bó, & V. Citadini-Zanette (Eds.), Fitoterapia baseada em evidências e experiências aplicada à prática clínica (pp. 16–47). Ponta Grossa, PR: Atena.

64. Rossato, A. E., Dal-Bó, S., & Citadini-Zanette, V. (Eds.). (2024). Fitoterapia baseada em evidências e experiências aplicada à prática clínica. Ponta Grossa, PR: Atena Editora. https://doi.org/10.22533/at.ed.720242602

65. Schiller, L. R. (2017). Antidiarrheal drug therapy. Current Gastroenterology Reports, 19(5), Article 18. https://doi.org/10.1007/s11894-017-0557-x

66. Schiller, L. R., Pardi, D. S., & Sellin, J. H. (2017). Chronic diarrhea: Diagnosis and management. Clinical Gastroenterology and Hepatology, 15(2), 182–193.e3. https://doi.org/10.1016/j.cgh.2016.07.028

67. Silbernagl, S. (2016). Texto e atlas de fisiopatologia (2nd ed.). Porto Alegre, Brazil: ArtMed.

Revista ARACÊ
ISSN: 2358-2472

68. Simões, C. M. O., & et al. (2017). Farmacognosia: Do produto natural ao medicamento. Porto Alegre, Brazil: Artemed.

69. Sociedade Brasileira de Pediatria. (2017). Diarreia aguda: Diagnóstico e tratamento. Departamento Científico de Gastroenterologia, (1), 1–15. https://www.sbp.com.br/fileadmin/user_upload/2017/03/Guia-Pratico-Diarreia-Aguda.pdf

70. Thumann, T. A., & et al. (2019). The role of gut microbiota for the activity of medicinal plants traditionally used in the European Union for gastrointestinal disorders. Journal of Ethnopharmacology, 245, Article 112153. https://doi.org/10.1016/j.jep.2019.112153

71. Tortora, G. J. (2017). Microbiologia (12th ed.). Porto Alegre, Brazil: ArtMed.

72. Wei, L., Li, Z., & Chen, B. (2000). Clinical study on treatment of infantile rotaviral enteritis with Psidium guajava L. Zhongguo Zhong Xi Yi Jie He Za Zhi, 20(12), 893–895. https://pubmed.ncbi.nlm.nih.gov/11938857/

73. World Health Organization. (1999). WHO monographs on selected medicinal plants (Vol. 1). Geneva, Switzerland: Author.

74. World Health Organization. (2009). WHO monographs on selected medicinal plants (Vol. 4). Geneva, Switzerland: Author.

75. Zheng, Z., & et al. (2023). Herbal medicines as adjuvants for the treatment of chemotherapy-induced diarrhea. Current Drug Metabolism, 24(6), 422–433. https://doi.org/10.2174/1389200224666230817102224