



An Appraisal of Therapeutic Potential of *Bilvadi Churna* (Granules) and its Components in Light of Pharmacological Evidences

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ABSTRACT

Introduction: *Bilvadi Churna* is a classical *Ayurvedic* formulation described in *Chakradatta* under *Balaroga Chikitsa* for the management of *Atisara* (diarrhoea) in children. The formulation comprises *Bilva* (*Aegle marmelos*), *Dhataki* (*Woodfordia fruticosa*), *Sugandha Bala* (*Valeriana wallichii*), *Gajapippali* (*Scindapsus officinalis*) and *Lodhra* (*Symplocos racemosa*). The granule dosage form has the benefits of easy administration, better palatability, and longer shelf life.

Objective: To study the pharmacological evidences of *Bilvadi Churna* (Granules) and its components.

Materials and Methods: A comprehensive literature review was conducted using databases such as PubMed, Scopus, Google Scholar, DHARA, and AYUSH Research Portal. Classical *Ayurvedic* texts were also reviewed. Relevant studies from the last two decades were included.

Observations: The components of drug, *Bilvadi Churna* have shown several pharmacological properties including anti-diarrhoeal, antimicrobial, anti-inflammatory, antioxidant, and digestive stimulant activities.

Conclusion: *Bilvadi Churna* (Granules) shows promising therapeutic potential in diarrhoea. However, further well-designed clinical trials are necessary to establish its efficacy and safety in children.

KEYWORDS: *Atisara* in children, diarrhoea in children, pharmacological evidence of *Bilvadi Churna*, *Bilvadi* Granules.

INTRODUCTION

Granules are an extensively used pharmaceutical dosage form and have advantages such as easy administration, better palatability, and longer shelf life, which make them especially suitable for pediatric use [1]. In *Chakradatta*, *Bilvadi Churna* is described under *Balaroga Chikitsa* as an effective formulation for the management of *Atisara*. The composition of this drug is *Bilva* (*Aegle marmelos*), *Dhataki* (*Woodfordia fruticosa*), *Sugandha Bala* (*Valeriana wallichii*), *Gajapippali* (*Scindapsus officinalis*) and *Lodhra* (*Symplocos racemosa*) [2]. Since pediatric patients often have difficulty consuming powders due to poor palatability, the granule form provides a more acceptable and convenient dosage form. In the current era, evidence-based validation of classical *Ayurvedic* formulations is essential for their wider acceptance; therefore, the present review attempts to critically appraise *Bilvadi Churna* (Granules) and its ingredients in light of pharmacological evidences.

Aim and Objective

To study the pharmacological evidences of *Bilvadi Churna* (Granules) and its components.

MATERIALS AND METHODS

Available research literature in PubMed, Scopus, Google Scholar, DHARA and Ayush Research Portal was searched extensively for the drug, *Bilvadi Churna* and its components. Classical *Ayurvedic* texts such as *Chakradatta*, *Bhavaprakasha Nighantu*, and *Dhanvantari Nighantu* were also referred. Keywords such as pharmacological evidence of *Bilva* (*Aegle marmelos*), *Dhataki* (*Woodfordia fruticosa*), *Sugandha Bala* (*Valeriana wallichii*), *Gajapippali* (*Scindapsus officinalis*) and *Lodhra* (*Symplocos racemosa*) were used for searching relevant literature. Journals published within the last 20 years were primarily considered.

Review observations

Bilvadi Churna (Granules)

It is composed of *Bilva* (*Aegle marmelos*), *Dhataki* (*Woodfordia fruticosa*), *Sugandha Bala* (*Valeriana wallichii*), *Gajapippali* (*Scindapsus officinalis*) and *Lodhra* (*Symplocos racemosa*), and is indicated in diarrhoea due to its *Deepana* (enhancing digestive fire), *Pachana* (digestive action), and *Grahi* (absorbent and stool-binding) properties as described in classical texts [3]. A clinical study on a *Bilva*-based formulation (*Bilvadileha*) in patients of irritable bowel syndrome (IBS) showed statistically significant improvement in clinical features and IBS severity score without any adverse drug reactions during the study period [4]. In another randomized controlled clinical trial on 48 patients of IBS, *Bilva*-based therapy demonstrated significant improvement in bowel habits, abdominal pain, and overall gastrointestinal symptoms after completion of treatment [5]. A comparative clinical study on *Bilva Churna* in patients of *Grahani* (Malabsorption syndrome) showed that the drug was effective in alleviating symptoms such as irregular bowel movements and digestive impairment and was found comparable or superior to the control drug, *Mustaka Churna* [6]. In a clinical study on *Bal-Bilva phal majja* (Pulp of unripe *Bilva* fruit) administered with *Takra* (buttermilk) for 28 days, 56.66% of patients showed complete relief and 43.33% showed marked improvement in symptoms of *Grahani* [7]. Furthermore, observational studies on *Bilvadi Churna* have shown significant improvement in IBS severity scores when used as adjuvant therapy [8]. Experimental studies also support these findings, demonstrating significant anti-diarrheal activity of *Aegle marmelos* by reducing intestinal motility, secretion, and microbial activity [9]. These findings collectively suggest that *Bilvadi Churna* (Granules) is effective in the management of *Atisara* and *Grahani*.

Bilva (*Aegle marmelos*)

It belongs to the family Rutaceae and is a medium-sized deciduous tree, commonly found throughout India, particularly in sub-Himalayan regions and dry forests. The part used for medicinal purposes is mainly the unripe fruit pulp. It is chemically composed of tannins, marmelosin, aegeline, skimmianine, and essential oils [10]. It is described under *Guduchyadi Varga* in *Dhanvantari Nighantu* and *Haritakyadi Varga* in *Bhavaprakasha Nighantu* [11,12]. According to *Ayurvedic* pharmacology, the drug possesses *Kashaya* (astringent) and *Tikta* (bitter) *Rasa*, *Laghu* (light) and *Ruksha* (dry) *Guna*, *Ushna* (hot) *Virya*, and *Katu* (pungent) *Vipaka*, and exhibits *Kapha-Vata shamaka* (pacifying *Kapha* and *Vata*) properties. [13] It is indicated in the management of *Atisara* (diarrhoea), *Grahani* (malabsorption syndrome), *Aruchi* (loss of appetite), and *Agnimandya* (impaired digestion) [14]. Experimental studies have demonstrated that *Aegle marmelos* exhibits significant anti-diarrheal activity by reducing intestinal motility and secretion in induced diarrhea models [15]. The plant has also shown antimicrobial activity against various enteric pathogens [16]. The methanolic and aqueous extracts of the fruit pulp have demonstrated anti-inflammatory and antioxidant activities [17]. In experimental studies, *Aegle marmelos* has been found to inhibit intestinal secretions induced by enterotoxins of *Escherichia coli* and *Vibrio cholerae* [18]. Additionally, it has shown gastroprotective and cytoprotective effects, supporting its role in gastrointestinal disorders [19].

Dhataki (Woodfordia fruticosa)

It belongs to the family Lythraceae and is a deciduous shrub, commonly found throughout India, especially in dry regions. The flowers are mainly used for medicinal purposes. It is chemically composed of tannins, flavonoids, glycosides, and phenolic compounds [20]. It is described under *Pushpa Varga* in *Dhanvantari Nighantu* and *Haritakyadi Varga* in *Bhavaprakasha Nighantu* [21,22]. According to *Ayurvedic* pharmacology, the drug possesses *Kashaya* (astringent) *Rasa*, *Laghu* (light) and *Ruksha* (dry) *Guna*, *Sheeta* (cold) *Virya*, and *Katu* (pungent) *Vipaka*, and exhibits *Kapha-Pitta shamaka* (pacifying *Kapha* and *Pitta*) properties. It is indicated in the management of diarrhoea, *Raktapitta* (bleeding disorders), *Pradara* (abnormal vaginal discharge), and other conditions associated with excessive discharge [23]. Pharmacological studies have demonstrated that *Woodfordia fruticosa* exhibits significant antimicrobial activity against various pathogenic microorganisms. The plant has also shown anti-inflammatory and antioxidant properties in experimental studies [24]. The tannin-rich composition contributes to its astringent action, which helps in reducing intestinal secretions in diarrheal conditions [20]. Additionally, extracts of *Woodfordia fruticosa* have shown potential in inhibiting microbial growth associated with gastrointestinal infections, supporting its traditional use in diarrhoea [24].

Sugandha Bala (Valeriana wallichii)

It belongs to the family Valerianaceae and is a perennial herb found in the temperate Himalayan regions. The root and rhizome are used for medicinal purposes. It is chemically composed of valepotriates, alkaloids, essential oils, and sesquiterpenes [25]. It is described under *Sugandhadravaya Varga* in classical texts such as *Bhavaprakasha Nighantu* [26]. According to *Ayurvedic* pharmacology, the drug possesses *Tikta* (bitter) and *Kashaya* (astringent) *Rasa*, *Laghu* (light) and *Snigdha* (unctuous) *Guna*, *Ushna* (hot) *Virya*, and *Katu* (pungent) *Vipaka*, and exhibits *Vata-Kapha shamaka* (pacifying *Vata* and *Kapha*) properties. It is indicated in disorders such as diarrhoea, *Shoola* (abdominal pain), *Anidra* (insomnia), and *Unmada* (psychotic disorders) [27]. Pharmacological studies have demonstrated that *Valeriana wallichii* exhibits significant antispasmodic and central nervous system depressant activities, which help in relieving intestinal spasms and discomfort. The plant has also shown anti-inflammatory and antioxidant properties in experimental studies [28]. Additionally, its mild sedative effect contributes to reducing stress-related gastrointestinal disturbances, supporting its role in conditions like *Atisara* and *Grahani* [29].

Gajapipali (Scindapsus officinalis)

It belongs to the family Araceae and is a large climber found in tropical and subtropical regions of India. The fruit is mainly used for medicinal purposes. It is chemically composed of alkaloids, flavonoids, essential oils, and other bioactive compounds [30]. It is described in classical *Ayurvedic* texts under *Pippalyadi Varga* [31]. According to *Ayurvedic* pharmacology, the drug possesses *Katu* (pungent) *Rasa*, *Laghu* (light) and *Snigdha* (unctuous) *Guna*, *Ushna* (hot) *Virya*, and *Madhura* (sweet) *Vipaka*, and exhibits *Vata-Kapha shamaka* (pacifying *Vata* and *Kapha*) properties. It is indicated in conditions such as diarrhoea, *Grahani* (malabsorption syndrome), *Shwasa* (dyspnoea/asthma), and *Kasa* (cough) [32]. Pharmacological studies have demonstrated that *Scindapsus officinalis* exhibits significant digestive stimulant (*Deepana*) and carminative (*Pachana*) activities, improving gastrointestinal function. The plant has also shown antimicrobial properties against various pathogens, supporting its role in gastrointestinal infections [33]. Additionally, it has been reported to possess anti-inflammatory and bronchodilatory activities, which contribute to its wide therapeutic applications [34].

Lodhra (Symplocos racemosa)

It belongs to the family Symplocaceae and is a small to medium-sized evergreen tree found throughout India, especially in hilly regions. The bark is mainly used for medicinal purposes. It is chemically composed of

alkaloids, glycosides, flavonoids, and tannins [35]. It is described under *Lodhradi Varga* in *Dhanvantari Nighantu* and *Haritakyadi Varga* in *Bhavaprakasha Nighantu* [36,37]. According to *Ayurvedic* pharmacology, the drug possesses *Kashaya* (astringent) *Rasa*, *Laghu* (light) and *Ruksha* (dry) *Guna*, *Sheeta* (cold) *Virya*, and *Katu* (pungent) *Vipaka*, and exhibits *Kapha-Pitta shamaka* (pacifying *Kapha* and *Pitta*) properties. It is indicated in diarrhoea, *Raktapitta* (bleeding disorders), *Pradara* (abnormal vaginal discharge), and other conditions associated with excessive discharge [38]. Pharmacological studies have demonstrated that *Symplocos racemosa* exhibits significant astringent and anti-inflammatory activities, which help in reducing intestinal secretions and inflammation. The plant has also shown antimicrobial and antioxidant properties in experimental studies. Additionally, its wound healing and mucosal protective effects support its role in gastrointestinal disorders such as *Atisara* and *Grahani* [39].

DISCUSSION

Bilvadi Churna (Granules) is a classical *Ayurvedic* formulation described for the management of *Atisara*. The clinical presentation of *Atisara* closely resembles diarrhea, which remains a major cause of morbidity and mortality, especially in the pediatric population [40]. Children are more susceptible due to immature immunity, improper feeding practices, and increased vulnerability to infections [41]. Diarrhoea not only led to fluid and electrolyte imbalance but also contribute to malnutrition and impaired growth and development [42]. In pediatric practice, formulations that ensure better palatability and ease of administration are preferred. The granule dosage form will have the benefits of easy administration, better palatability, and longer shelf life, thereby improving compliance in children [43]. *Bilvadi Churna* is composed of drugs having predominantly *Deepana* (enhancing digestive fire), *Pachana* (digestive action), and *Grahi* (absorbent and stool-binding) properties, which play a key role in the management of diarrhoea [44]. Most of the ingredients exhibit *Kapha-Vata shamaka* (pacifying *Vata* and *Kapha*) properties, thereby helping in correcting the underlying *Dosha dushti* (vitiation of *Doshas*) [45]. Since diarrhoea involves impairment of *Agni* (digestive fire) and vitiation of *Doshas* (bio-energies), drugs with *Deepana* (appetizer) and *Pachana* (digestive) actions help restore *Jatharagni* (primary digestive fire) and improve digestion [46]. *Bilva* and *Lodhra* possess strong *Grahi* (absorbent) and *Kashaya* (astringent) properties, which aid in reducing intestinal motility and excessive fluid loss [47]. *Dhataki*, being rich in tannins, contributes to astringent action and helps in controlling intestinal secretions [48]. *Sugandha Bala* exhibits antispasmodic and mild sedative properties, which help in relieving abdominal discomfort and intestinal spasms [49]. *Gajapippali* acts as a digestive stimulant and enhances *Agni* (digestive fire), thereby reducing *Ama* (metabolic toxins) formation and improving gastrointestinal function [50]. From a pharmacological perspective, the ingredients of *Bilvadi Churna* exhibit anti-diarrheal, antimicrobial, anti-inflammatory, antioxidant, and digestive stimulant activities [51]. These actions collectively help in reducing intestinal motility, controlling infection, alleviating inflammation, and improving digestion. Thus, the formulation acts through a multi-targeted approach, aligning with the *Ayurvedic* concept of *Samprapti Vighatana* (breakdown of disease pathogenesis) [52]. Furthermore, the presence of drugs predominantly having light, dry, astringent, and pungent properties contribute to channel cleansing, thereby correcting the underlying pathology of *Grahani* (malabsorption syndrome) [53]. Clinical and experimental studies on *Bilva*-based formulations have demonstrated significant improvement in symptoms such as stool frequency, consistency, and associated gastrointestinal disturbances [54]. Thus, the combined effect of the constituents of *Bilvadi Churna*, owing to their digestive-stimulant, absorbent, channel-cleansing, and antimicrobial properties, may offer significant therapeutic potential in the management of diarrhoea, with improved tolerability and patient compliance [55].

CONCLUSION

Bilvadi Churna (Granules) is a classical *Ayurvedic* formulation with significant therapeutic potential in the management of diarrhoea. The pharmacological properties of its ingredients support its traditional indications, particularly due to their anti-diarrheal, antimicrobial, anti-inflammatory, and digestive-stimulant activities, and available clinical and experimental evidences on *Bilva*-based formulations show promising results in gastrointestinal disorders. However, further well-designed, multicentric randomized controlled trials with larger sample sizes and standardized outcome measures are required to establish its efficacy conclusively, and detailed pharmacological evaluation, safety profiling, and standardization of the formulation are necessary for its wider acceptance and integration into evidence-based clinical practice.

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Conflict of interest

None declared.

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