



UNVEILING THE POTENTIAL OF HERBAL REMEDIES FOR MANAGING TYPHOID FEVER: A COMPREHENSIVE REVIEW

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Abstract : This comprehensive review delves into the realm of typhoid fever management, emphasizing the formulation and evaluation of herbal remedies as potential alternatives. Through an exhaustive exploration of various herbal compounds, this review scrutinizes their potential efficacy in addressing the multifaceted challenges posed by typhoid fever. Delving into the formulation processes, the review meticulously highlights crucial considerations and methodologies, offering a nuanced understanding of how these remedies are crafted. Furthermore, it meticulously examines the methods employed to assess the effectiveness of herbal remedies, providing a thorough analysis of their impact on the course of typhoid fever. This review aims to contribute valuable insights into the ongoing quest for alternative and holistic approaches to managing typhoid fever. In doing so, it not only sheds light on the potential of herbal remedies but also underscores the importance of exploring diverse therapeutic avenues in combating this persistent infectious disease. This review not only help the scientific community but also serves as a resource for clinicians and researchers striving to enhance the arsenal of treatments available for typhoid fever.

Keywords: Typhoid fever, Herbal remedies, Management, Alternative medicine, Natural compounds

INTRODUCTION: Typhoid fever, also known as enteric fever, is a significant and multisystemic illness that remains a pressing public health concern, particularly in developing nations. It is primarily caused by the bacteria *Salmonella typhi* and *Salmonella paratyphi* [1]. The term "enteric fever" encompasses both typhoid and paratyphoid fevers, with paratyphoid fever clinically resembling typhoid fever closely, leading to interchangeable use of the terms.

Typhoid fever stands as a major contributor to mortality and morbidity, particularly in densely populated and unsanitary areas. However, concerted efforts in comprehensive research and public health interventions have resulted in a decline in its prevalence. Despite these advancements, the disease's progression varies, initially presenting as gastrointestinal distress and evolving into nonspecific systemic illness, potentially leading to numerous complications.

Salmonella, the causative agent, is notorious for its transmission via what is commonly referred to as the "four Fs" - flies, fingers, feces, and fomites. The fever associated with typhoid fever typically follows a distinctive pattern characterized by alternating rises and falls, often accompanied by symptoms such as headache and abdominal pain.

Typhoid Fever:

Caused by: Primarily by the bacteria *Salmonella typhi*.

Public Health Concern: Remains a pressing public health issue, particularly in developing nations.

Prevalence: Major cause of mortality and morbidity, especially in densely populated and unsanitary areas.

Disease progression: Exhibits variability, ranging from early gastrointestinal distress to nonspecific systemic illness, often accompanied by potential complications.

Transmission: Typically spreads through the "four Fs" - flies, fingers, feces, and fomites.

Fever Presentation: Defined by a distinct pattern of fluctuating increases and decreases, frequently accompanied by headaches and discomfort in the abdomen.

Paratyphoid Fever:

Caused by: Mainly by *Salmonella paratyphi*.

Similarity to Typhoid: Clinically indistinct from typhoid fever, leading to interchangeable use of terms like "enteric fever" and "typhoid fever".

Prevalence: Also contributes to morbidity and mortality, although typically less prevalent compared to typhoid fever.

Disease Progression: Similar to typhoid fever, with gastrointestinal and systemic symptoms and potential complications.

Transmission: Shares similar transmission routes with typhoid fever, spreading through contaminated food, water, and poor sanitation practices.

Fever Pattern: Likely to exhibit a step-wise fever pattern akin to typhoid fever.

Comparative Analysis:

Causative Agents: While both diseases are caused by *Salmonella* bacteria, typhoid fever is primarily caused by *Salmonella typhi*, whereas paratyphoid fever is mainly caused by *Salmonella paratyphi*.

Public Health Impact: Typhoid fever tends to have a higher impact on public health due to its widespread prevalence, especially in overcrowded and unsanitary conditions.

Prevalence: Typhoid fever is generally more prevalent than paratyphoid fever.

Clinical Indistinctness: The clinical presentation of paratyphoid fever closely resembles that of typhoid fever, making differentiation challenging without laboratory testing.

Transmission Routes: Both diseases share similar transmission routes, emphasizing the importance of sanitation and hygiene measures in prevention.

ETIOLOGY

The etiology of typhoid fever lies intricately within the realm of microbiology, predominantly orchestrated by two formidable culprits: *Salmonella typhi* and *Salmonella paratyphi*, esteemed members of the Enterobacteriaceae family. Within the expansive genus of *Salmonella*, these perpetrators are distinguished as serotypes under *Salmonella enterica*, meticulously delineated through rigorous multiplex quantitative polymerase chain reaction (PCR) analyses [3]. Notably, while *Salmonella enterica* encompasses a multitude of serovars, it is the resilient *Salmonella typhi* and its counterparts, *Salmonella paratyphi* (A, B, C), that cast their shadows over the domain of enteric fevers.

Nontyphoidal salmonella (NTS), in stark contrast, tends to grace the gastrointestinal tracts of children, manifesting primarily as gastroenteritis, a milder affliction compared to the relentless typhoid fever.

The transmission of *Salmonella* orchestrates through the treacherous fecal-oral route, exploiting contaminated water sources, undercooked culinary delights, and the unsuspecting fomites of infected individuals. Flourishing particularly in locales marred by overcrowding, societal upheaval, and sanitation woes, *Salmonella*'s reign is sustained by its exclusive affinity for human hosts. Amongst its eclectic array of origins, poultry and eggs reign supreme, occasionally joined by the enigmatic presence of turtles in this microbial symphony. A study delving into the dark alleys of chicken slaughterhouses in China revealed a staggering 57% positivity rate in *Salmonella* isolates [4], underscoring the omnipresence of this microbial menace.

The symbiotic alliance between the gut's normal flora and the human host serves as a bastion of defense against *Salmonella*'s advances. However, the introduction of antibiotics, such as the formidable streptomycin, wages war on this protective barrier, paving the way for invasive onslaughts. Malnutrition further cripples this defense mechanism, dismantling the normal gut flora and rendering the host vulnerable to the clutches of infection [5]. Thus, the pernicious collusion between broad-spectrum antibiotics and nutritional deficits acts as a catalyst, propelling the incidence of typhoid fever to towering heights.

EPIDEMIOLOGY

In the intricate tapestry of global epidemiology, typhoid fever and paratyphoid infections emerge as formidable adversaries, perpetuating their reign of illness and mortality worldwide. Since 2008, the United States has consistently reported a modest count of approximately 350 culture-confirmed cases of typhoid fever and fewer than 100 cases of paratyphi A annually burden remains staggering. An alarming 215,000 lives succumb to the ravages of typhoid fever, with an additional 5 million souls ensnared by the clutches of paratyphoid infection, amidst a backdrop of over 26 million cases each year [6].

The scourge of enteric fever finds fertile ground in low and middle-income regions of south-central Asia and southern Africa, where the shadows of poverty and inadequate sanitation loom large. Developed nations, albeit relatively spared from endemic transmission, serve as reservoirs through returning travelers from afflicted regions and individuals with ties to high-risk locales, oftentimes neglectful in their vigilance towards contaminated sources of sustenance. Those foregoing vaccination and pretravel consultation further gamble with fate upon their ventures [6].

The tropics and temperate climes serve as incubators for the proliferation of typhoid fever, intricately entwined with the state of sanitation, sewage management, and access to potable water. *Salmonella typhi* reigns supreme over its paratyphoid counterparts, with *Salmonella paratyphi* A claiming a larger share of the burden than its B counterpart. The specter of typhoid fever casts a lengthening shadow worldwide, fueled by burgeoning population growth, environmental pollution, and the scarcity of untainted drinking water [6].

Despite this bleak landscape, strides in medical science have notched commendable victories against the tide of morbidity and mortality. Aided by extensive research endeavors, shifts in treatment paradigms, and the advent of novel therapeutic agents, mortality rates have witnessed a decline, even in the face of burgeoning multidrug-resistance [6].

However, the cloak of chronic carriage shrouds up to 4% of typhoid fever survivors, concealing a latent threat beneath a veil of asymptomaticity. These carriers, predominantly women and those afflicted with biliary abnormalities such as cholelithiasis, harbor *Salmonella* within their midst, unwittingly disseminating the pathogen through stool or, less frequently, urine for up to a year post-acute illness [8]. The intricate dance between blood group antigens and susceptibility to chronic carriage further adds layers of complexity to this enigmatic phenomenon [9].

PATHOPHYSIOLOGY

The pathophysiology of typhoid fever hinges on several critical factors, including the infecting species, virulence, host immunity, and infectious dose. Notably, a larger infectious dose correlates with a shorter incubation period and a higher attack rate, while the severity of typhoid fever escalates in debilitated or immunocompromised individuals [1].

Salmonella, being acid-sensitive, is typically neutralized by gastric acid in the stomach, unless a substantial dose overwhelms this defense mechanism. Factors like achlorhydria, intake of antacids, and food buffers can facilitate *Salmonella* colonization in the gut [2].

Virulence factors such as the typhoid toxin, Vi antigen, lipopolysaccharide O antigen, and flagellar H antigen play pivotal roles in *Salmonella*'s pathogenicity. The Vi antigen shields the bacterium from macrophages, aiding its survival, while flagellar H antigen facilitates mobility and adherence to the gut mucosa [3].

Bacterial invasion of the gut wall is facilitated by flagella and type III secretion systems, with M cells serving as gateways for entry. Proliferation leads to proliferation of Peyer's patches, eventually causing ulceration and necrosis. Pathogens disseminate via the bloodstream and lymphatic system, predominantly affecting organs like the gallbladder [4].

The early bacteremic phase, characterized by asymptomatic primary bacteremia, transitions into secondary bacteremia, marked by symptomatic disease manifestation. Endotoxins play a crucial role in pathogenesis, triggering shock-like reactions and vascular disturbances [5].

HISTORY AND DIAGNOSTICS

History and Physical examination findings play pivotal roles in unraveling the enigmatic puzzle of *Salmonella* typhoid and *Salmonella* paratyphoid infections. Arthralgia, more commonly associated with typhoid, underscores the need for a comprehensive assessment.

Diagnostic Journey:

Delving into the patient's history reveals crucial details such as permanent residence, travel to endemic areas, immunization status, and lifestyle factors. The exploration of exposure history, encompassing impure drinking water, animal contacts, and dietary habits, aids in excluding other infectious etiologies.

Nonspecific Symptoms:

Typhoid fever manifests with nonspecific symptoms, commencing with enterocolitis within 12 to 48 hours post-inoculation. Patients typically present with nausea, vomiting, diffuse abdominal pain, bloating, anorexia, and diarrhea, varying in severity. Immunocompromised individuals, especially those with HIV, may exhibit more severe manifestations [1].

Classic Presentation:

Classic typhoid fever unfolds approximately one week post-ingestion, characterized by a "step-ladder" fever pattern and abdominal distress, often exacerbated by the hypertrophy of Peyer's patches. Physical examination may reveal nonspecific findings initially, progressing to manifestations like abdominal distention and tenderness in later stages. Rarely, visible rose spots and jaundice may manifest, signifying advanced disease states [2].

Complications and Uncommon Presentations:

Delayed diagnosis heralds an escalation of toxicity, anorexia, and weight loss, with heightened risks of bowel perforation and metastatic complications.

Neurological manifestations, including delirium and psychosis, may be more pronounced in endemic regions like India and Africa, while atypical presentations such as severe epigastric pain or bone pain demand vigilance for rare complications [3].

In essence, a meticulous history and astute physical examination serve as indispensable tools in unraveling the complexities of typhoid and paratyphoid infections, guiding timely interventions and mitigating potential complications.

EVALUATION:

The evaluation of patients suspected of typhoid fever primarily relies on clinical judgment, especially in areas with poor sanitation or a history of travel from endemic regions. Clinical suspicion arises in individuals presenting with febrile illness lasting more than three days, accompanied by gastrointestinal manifestations [1].

Diagnostic Modalities:

Blood Culture: Considered the gold standard, blood culture confirms typhoid fever diagnosis, with increased efficacy during secondary bacteremia. However, false negatives are possible depending on technique and timing [2].

Stool Culture: Less effective during the bacteremic phase, stool culture becomes diagnostic in the second and third weeks, especially when antibiotic therapy has not been initiated. Chronic carriers may intermittently shed pathogens, necessitating multiple samples [3].

Bone Marrow Culture: Despite being invasive and expensive, bone marrow culture remains highly sensitive due to the abundance of microorganisms, offering diagnostic value, especially in refractory cases [4].

Widal Test: This serological test detects antibodies against O and H antigens. While commonly used, its reliability is compromised by false positives and negatives, limiting its utility in diagnosis [5].

Skin Snip Test: Biopsies from rose spots may yield positive cultures, particularly in treated cases, providing additional diagnostic clues [3].

Polymerase Chain Reaction (PCR) Assay: PCR can identify specific serotypes but may have limited sensitivity during bacteremia and is often cost-prohibitive [6].

Enzyme-Linked Immunosorbent Assay (ELISA): ELISA detects antibodies to Vi antigens and may aid in identifying carriers, albeit with limited utility in acute illness [7].

Additional Evaluations:

Other investigations, including urine cultures, duodenal content culture, and various laboratory tests, such as leukocyte counts, liver function tests, and C-reactive protein levels, may provide supportive evidence or identify complications [8].

PROGNOSIS

Typhoid fever imposes a significant global health burden, with its impact particularly pronounced in South Asia and African countries. However, advancements in treatment modalities and the production of antibiotics have led to a remarkable reduction in the current mortality rate to less than 1%, compared to the staggering. The prevalence peaked at 12.75% during the 1940s when treatment primarily involved symptomatic and supportive care [43].

Early diagnosis and timely treatment play pivotal roles in preventing complications, resulting in a notable decrease in mortality rates despite the high frequency of episodes with complications [44]. Nevertheless, among individuals not receiving treatment, about 10% are prone to relapse, with 4% progressing to become chronic carriers.

REQUISITE FOR HERBAL REMEDIATION IN TYPHOID FEVER

- ✓ Assess the risks associated with the use of synthetic medicines on human health, including potential side effects, drug interactions, and long-term complications.
- ✓ Identify the specific diseases or conditions where synthetic medicines pose a significant risk to human well-being, considering factors such as chronicity, prevalence, and severity of symptoms.
- ✓ Evaluate the potential benefits of utilizing herbal medicines as an alternative approach for diagnosing and treating specific diseases, emphasizing their natural composition and perceived safety profile.
- ✓ Investigate the efficacy and safety of herbal remedies in comparison to synthetic medicines through clinical trials, meta-analyses, and systematic reviews.
- ✓ Explore the traditional knowledge and practices surrounding herbal medicine formulations within diverse cultural contexts, recognizing their historical significance and therapeutic potential.
- ✓ Develop standardized protocols for formulating herbal medicines to ensure consistency, quality, and safety in diagnosis and treatment.
- ✓ Educate healthcare professionals, patients, and the public about the advantages of integrating herbal medicine into healthcare practices, promoting informed decision-making and holistic approaches to wellness.
- ✓ Collaborate with regulatory bodies, research institutions, and pharmaceutical companies to establish guidelines and regulations for the production, distribution, and usage of herbal medicines, ensuring adherence to quality standards and ethical considerations.
- ✓ Address challenges and barriers hindering the widespread adoption of herbal medicines, including limited research funding, lack of standardized methodologies, and cultural biases.
- ✓ Advocate for policy changes and public health initiatives that support the incorporation of herbal medicine into mainstream healthcare systems, recognizing its potential to enhance patient outcomes and reduce the burden of synthetic drug-related adverse effects.

AYURVEDIC ASPECT OF TYPHOID

In the Ayurvedic perspective of typhoid, Gananath Sen introduced the concept of "AntrikJwar," attributing it to the ingestion of food and water contaminated with bacteria. He was the first to identify "Jivanu," or bacteria, as the causative microorganism behind AntrikJwar. This highlights the ancient understanding within Ayurveda of infectious diseases transmitted through contaminated sources, emphasizing the importance of maintaining hygiene and sanitation practices to prevent illnesses like typhoid [22].

Folk medicine, also known as traditional, alternative, indigenous, complementary, or natural medicine, refers to healing practices and health preservation beliefs known to specific cultural segments, transmitted informally and practiced based on prior experience [23]. The terms "indigenous medicine" and "Traditional medicine" most accurately capture the essence of folk medicine [24]. It involves a blend of traditional healing methods, including herbal remedies, spiritual practices, and manual therapies, aimed at diagnosing, treating, or preventing various ailments and illnesses [25].

Table 1: Folk medicines for typhoid used in India .^[26]

S. No	Herb	Family Name	Vernacular Name	Part Used
1	Aloe vera	Liliaceae	Kumari	Whole Plant
2	Abrusprecatorious	Fabaceae	Gunja	Seed
3	Achyranthesaspera	Amaranthaceae	Apamarga	Root, Leaf
4	Ocimum sanctum	Labiatae	Tulasi	Leaves
5	Ammanniabaccifera	Lythraceae	Agnigarba	Leaf Juice
6	Boerhaviadifusa	Nyctaginaceae	Punarnava	Root Juice
7	Clerodendrum	seratum	Verbenaceae	Bharngi Leaf
8	Holiotropiumindicum	Boraginaceae Indian	Heliotrope	Whole Plant
9	Rutagraveolens	Rutaceae	Sudapa	Leaf Powder
10	Tinospora	cardifolia	Menispermaceae Guduci	Juice

Table 2: Herbal species that can be used to treat typhoid fever.^{[26][23][12]}

No.	Vernacular/ Indonesia name	Species	Identified substances	Pharmacological Data
1	Daun basil (basilleaves)	OcimumbasilicumL.	Essential oils (linalool, estragol and eugenol),tannins, flavonoids,	Antibacterial activity on Salmonella typhi
2	Bawangputih (garlic)	Allium sativum	Allin, allicin	Antibacterial activity on Salmonella typhi
3	Cengkeh (cloves)	SyzygiumaromaticumL.,	Essential oils (eugenol), tannins, flavonoids, fatty acids(linoleic and oleic), stearic and palmitic acids, tocols, , caryophyllene, eugenolacetate,	Effectiveness of essential oils against Salmonella enterica serovar Typhi.
4	Kunyit (turmeric)	Curcuma longa	Alkaloid, tannin, flavonoid, curcumin, glicoside, proteins, mineral	Antibacterial activity on Salmonella typhi
5	Cranberi (cranberry)	Vacciniummacrocarpon	Proanthocyanidin, phenolic compounds (flavone, quercetine, naringenin)	Antibacterial activity on Salmonella typhimurium
6	Kismis (raisins)	Vitisvinifera	Polyphenolic compounds	Little antibacterial activity on S. typhimurium
7	Temulawak (Curcuma)	Curcuma xanthorrhiza	Xanthorrhizol	Antibacterial activity on Salmonella typhimurium
8	Daunjarakmerah (castor leaves)	Jatropha gossypifolia	Terpenoids and lignoid	Antibacterial activity on S. typhi

MEDICATION USE AS HERBAL DRUG IN TYPHOID

Folk medicine is used all over India by Traditional practiser or Tribes for enteric fever, but generally practice of folk medicine found in rural, tribal and backward region. Many plants traditionally used by practitioners and indigenous tribes exhibit notable antimicrobial properties, particularly against *S. typhi*, the causative agent of enteric fever. Most of the plants have alkaloid as a major chemical constituent and active principle. Alkaloids have an anti-microbial property which helps to act as a bactericidal or bacteriostatic action. But alkaloids from bitter plant have more intense anti-microbial activity than other. Acharya Charak has also stated that Tikta Rasatmak Dravya (Bitter Drugs) is acts as a

Krimighna (anti-microbial) along with Jvaraghna (anti-pyretic). Even most of the herbs mentioned by Charak for VishamaJwar have bitter property.

Table 3: Review of medicinal plants in typhoid. ^{[9][13]}

No	Plants	LocalName	Uses	Extraction	Effects	MIC	Zone Inhibition
1	Azadirachtaindica	BuahMimba	Bark	Ethanol & Methanol	Growth inhibition of bacterial on medium DPPH radical	NM	20-25mm
2	Aegelmarmelous	Buah Maja	Fruit Pulp	Methanol	Strong antimicrobial agent	≥ 256 L	$\geq 9-15$ mm
4	Myristic fragrans	Buah Pala	Fruit	Methanol	Strong antimicrobial	$\geq 69\mu$ g/mL	$\geq 9-15$ mm
5	Crinum purpurascens	Lili Jawa	Leaves	CH ₂ Cl ₂ /O H	Bactericidal	6mg/ mL	25mm
6	Houttuyniacordata	TanamanPangkal Racun	Powder	Water	Phagocytic stimulation effect	NM	NM
7	Bidenspilosa	Ketus	Leaves	NM	Against typhoid fever	512g/m L	12.5 ± 0.4mm
8	Carica Papaya	Pepaya	Leaves	Chloroform	Potential Natural Antibacterial compounds	NM	8.8mm
9	Cocusnucifera	Kelapa	Crude	Diethylether	antibacterial against. Typhii with high zone of nhhibition	NM	20±0.5mm

Herbal remedies are extensively used throughout India, particularly by traditional practitioners and tribes, as a form of folk medicine for treating enteric fever.

RATIONAL

- I. **Reduced Toxicity:** Herbal medicines are often perceived to have lower toxicity compared to synthetic drugs. Many herbal remedies are derived from natural sources, such as plants, and are believed to have fewer adverse effects on the body. Synthetic drugs, on the other hand, are often associated with a higher risk of side effects and toxicity, as they may contain artificial or chemical compounds that can be harmful to health.
- II. **Natural Composition:** Herbal medicines typically consist of natural ingredients, such as plant extracts, roots, leaves, and flowers, which are believed to work synergistically with the body's natural processes. These natural compounds are often rich in bioactive phytochemicals, including antioxidants, polyphenols, and flavonoids, which can have beneficial effects on health without causing harmful side effects.
- III. **Comprehensive Method:** Herbal medicine adopts a holistic perspective on health and well-being, prioritizing addressing the underlying causes of ailments rather than merely relieving symptoms. Many herbal remedies are formulated to support the body's innate healing mechanisms, strengthen the immune system, and restore balance to bodily functions, thereby promoting overall health and well-being.
- IV. **Traditional Wisdom:** Herbal medicine draws upon centuries-old traditional knowledge and wisdom passed down through generations. Many cultures around the world have long relied on herbal remedies as primary sources of healthcare, recognizing their efficacy in treating a wide range of ailments and promoting longevity. This traditional wisdom provides a rich reservoir of knowledge on the therapeutic properties of medicinal plants and their applications in healthcare.
- V. **Personalized Medicine:** Herbal medicine offers the potential for personalized and individualized treatment approaches, as herbal remedies can be tailored to suit each person's unique constitution, health condition, and specific needs. Herbalists often take into account a person's lifestyle, dietary habits, and overall health status when recommending herbal remedies, allowing for a more personalized and holistic approach to healing.

DELIBERATION

The discourse on herbal remedies versus synthetic drugs centers on various focal points, each emphasizing the potential advantages of herbal medicine in enhancing health and diminishing toxicity.

Primarily, herbal remedies are often perceived as possessing lower toxicity compared to synthetic drugs due to their natural composition, primarily comprised of plant-derived ingredients abundant in bioactive compounds. These compounds are believed to interact with the body's natural processes in a more harmonious manner, potentially reducing the risk of adverse effects and long-term toxicity associated with synthetic drugs.

Additionally, herbal medicine embraces a holistic approach to health and wellness, aiming to address the root cause of illness rather than merely managing symptoms. By bolstering the body's inherent healing mechanisms and promoting overall balance and well-being, herbal remedies may provide comprehensive and enduring benefits beyond mere symptom relief.

Moreover, traditional wisdom and cultural heritage play a significant role in the discourse. Herbal medicine draws upon centuries-old knowledge and practices passed down through generations, reflecting the accumulated wisdom of diverse cultures worldwide. This traditional knowledge offers valuable insights into the therapeutic properties of medicinal plants and their applications in healthcare, providing a rich source of alternative treatment options rooted in cultural heritage.

Furthermore, the personalized nature of herbal medicine allows for tailored treatment approaches that consider individual differences in health status, lifestyle, and dietary habits.

Overall, the discourse underscores the potential benefits of herbal medicine in reducing toxicity and promoting natural healing. While further research and scientific validation are necessary to fully elucidate the efficacy and safety of herbal remedies, their longstanding history of use and holistic approach to health make them an appealing option for individuals seeking alternative and complementary healthcare solutions.

CONCLUSION

In conclusion herbal medicine offers a promising avenue for addressing inflammation and combating infectious diseases like typhoid fever. The plethora of medicinal plants with documented anti-inflammatory and antibacterial properties underscores the potential of herbal remedies in promoting health and wellness. Folk medicine practices revealed that a significant proportion of traditional herbs used for treating typhoid fever exhibit potent antibacterial activity against *Salmonella typhi*.

This review has highlighted the efficacy of certain herbs, its requisite as herbal medicine in typhoid fever, rational of use herbal medicine in typhoid fever. Overall, the diverse array of medicinal plants with anti-inflammatory and antibacterial properties holds promise for the development of novel therapeutic strategies in the management of inflammation and infectious diseases. Through continued exploration and validation, herbal medicine may emerge as a valuable complement to conventional healthcare practices, offering effective, natural alternatives for promoting health and well-being.

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