

BOON ON MEDICINAL HERB FOR THE TREATMENT OF TYPHOID**Kalyani R. Nirwan*, Swati J. Tembhurne and Upadesh B. Lade**Chhatrapati Shivaji College of Pharmacy, Chichgadh Road, Deori, Gondia,
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12 June 2021,Revised on 02 July 2021,
Accepted on 22 July 2021

DOI: 10.20959/wjpr202110-21221

Corresponding Author*Kalyani R. Nirwan**Chhatrapati Shivaji College
of Pharmacy, Chichgadh
Road, Deori, Gondia,
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India.**ABSTRACT**

Typhoid fever is now becoming a tedious disease day by day because of the fighting power developed by *Salmonella typhi*, *Salmonella paratyphi A*, and *Salmonella paratyphi B*; which is responsible for typhoid fever respectively. The antibodies obtain from the natural products increase acceptance of herbal medicines, it contains new active compounds has become a significant source of novel antibiotics. Alternative herbal medicine has been used to treat various infections for centuries. Natural plants contain phytoconstituent having similar chemical properties as synthetic antibiotics. This review focus on herbal medicine for effective treatments against typhoid and many more diseases.

KEYWORDS: Typhoid, Paratyphi A, Paratyphi B, folk medicine, Anti-typhoid drugs.**INTRODUCTION**

Typhoid fever, a common and sometimes fatal infection of both adults and children cause's bacteria and inflammatory demolition of the intestine and other organs,^[1] Typhoid fever is caused by gram-negative bacteria, *Salmonella typhoid*, with the most common clinical manifestations in the form of fever, vomiting, constipation, dizziness, nausea, decreased appetite, abdominal pain. Diagnosis of typhoid in a patient has collaborated from history taking, symptoms, and laboratory findings from blood, urine, or feces. Methods for diagnosing typhoid fever have been well-developed at a global level. Some studies have been tried and found one of the diagnostic tests for typhoid fever by OMP latex with 95.65% of sensitivity and 50% of specificity but an adjuvant treatment for typhoid from plants has yet to be discovered.^[3-4] Diagnosis of typhoid in a patient has collaborated from history taking, symptoms, and laboratory findings from blood, urine, or feces. Methods for diagnosing typhoid fever have been well-developed at a global level. Some studies have been tried and

found one of the diagnostic tests for typhoid fever by OMP latex with 95.65% of sensitivity and 50% of specificity but an adjuvant treatment for typhoid from plants has yet to be discovered.^[5] The prevalence of typhoid is still an issue. The highest incidence of typhoid is > 100 / 100,000 cases per year in South-Central Asia and South-East Asia.^[6,7] Highlighted that the risks factor of typhoid depends on family conditions, such as sanitation, availability of clean water,^[8-10] individual hygiene habits, knowledge of the prevention and the spread of typhoid.^[11,12] Since 2001, especially in South Sulawesi, the number of antibiotic resistance for typhoid therapy is reported to be very low (respectively increasing through 2007 to 8.13%, 7.96%, 7.84%, 3.90%, 6.83%.^[13] Despite this increase, Chien Shun (2014) found that the level of antibiotic resistance for *Salmonella typhi* in Indonesia is still relatively low in Asia compared to Bangladesh, Taiwan, and Vietnam.^[14] In Indonesia, some researchers have focused their study to discover other plants that can be used as medicinal therapy not only for infectious disease but also metabolic disease.^[15] In the second case of acute toxoplasmosis, extract of *Curcuma longa* has antitoxoplasmosis immunoglobulin G and immunoglobulin M.^[16,17] *Plectranthus scutellarioides* and *Coleus scutellaroides* extract also have a good response as therapy for candida *Albicans* infection.^[18,19] Considering this condition, several studies are trying to bring their study to medicinal herbs or medicinal plants for typhoid management.^[20]

Clinical feature

A prodrome of nonspecific symptoms often precedes fever and includes chills, headache, anorexia, cough, weakness, sore throat, dizziness, and muscle pains. Gastrointestinal symptoms are quite variable. Patients can be presented with either diarrhea or constipation. Early physical findings of enteric fever include rash (“rose spots”), hepato- splenomegaly, epistaxis, and relative bradycardia. Rose spots make up a faint, salmon-colored, blanching, maculopapular rash located primarily on the trunk and chest.^[21]

Ayurvedic aspect of typhoid

Gananath Sen mentioned the AntrikJwar caused due to ingestion of bacterial contaminated food and water, which is spread by contaminated stool and urine. He is the first author who mentioned the Jivanu means bacteria as a causative microorganism of AntrikJwar.^[22]

Folk medicine

The term folk medicine refers to healing practices and ideas of body physiology and health preservation known to a limited segment of the population in a culture, transmitted informally

as general knowledge, and practiced or applied by anyone in the culture having prior experience. Folk medicine may also be referred to as Traditional medicine, Alternative medicine, Indigenous medicine,^[23] Complementary medicine, Natural medicine. In fact, out of these terms perhaps only indigenous medicine and Traditional medicine are the terms well congruent with folk medicine.^[24] Folk medicine is the mixture of traditional healing practices and beliefs that involve herbal medicine, spirituality, and manual therapies or exercises to diagnose treat, or prevent any ailment or illness.^[25]

Table 1: Folk medicine 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 with Sugar

Aloe vera

The study revitalizes the traditional system of medicine to achieve self-reliance in health care and health for all by analyzing the antimicrobial property of aqueous extracts of Aloe vera and to assess the reason for inhibition of growth of pathogenic organisms by DNA and protein analysis.^[27] Various aqueous extracts showed inhibition to microorganisms *Salmonella typhi*.^[28]



Fig. no. 1: Aloe vera plant.

Abrusprecatorious

Abrusprecatorious seed powder is given in Amarantak Region Madhya Pradesh, India for treatment of Typhoid.^[28] Antimicrobial studies show Gujna exhibited significant antimicrobial activities against *Salmonella typhi*.^[29-30]



Fig. no. 2: Abrusprecatorious.

Achyranthesaspera

Achyranthesaspera root decoction is given in Shekhavati Rajasthan^[31] and Leaf 10 g with 7 black pepper seeds in Orissa^[32] to cure Typhoid. Extracts in organic solvents of Achyranthesaspera but neither the leaf nor stem parts of A. Aspera in any organic extractions showed antibacterial activity.^[33] The whole plant of Actiniopterisdichotoma is used in Rajasthan.^[34]



Fig. no. 3: Achyranthesasper.

Tulsi

India uses *Ocimum sanctum* leaves Juice and Pudina leaves with 5 g sugar.^[35] The antibacterial results showed methanol extracts (0.4 g/ml) of *Ocimum gratissimum* and *Ocimum sanctum* showed maximum zone of inhibition (30 mm and 25.5 mm, respectively) against *Salmonella typhi*.^[36] In vitro and in vivo study, among all the extracts methanolic

extracts of both the plants had stronger antibacterial activity. On prolonged incubation bacterial colonies reappeared within the zone of inhibition indicating bacteriostatic effect than bactericidal activity. 250 mg/kg bodyweight oral dose of *O. sanctum* and *A. Mexicana* was found ideal and nontoxic in chickens and experimental chickens were fed this dose for 21 days for determination of *in vivo* antibacterial effect. On the 22nd day, respective groups of chickens were challenged orally with an ID50 dose of *Salmonella enteric*, Serovar Typhimurium, and *Escherichia coli*. 83% chickens of OS fed groups and 66 % chickens of AM fed groups were protected from the challenge of *S. enteric* Serovar Typhimurium and *E. coli*. *O. sanctum* provided better clearance of both the pathogens from blood as compared to *A. Mexicana*.^[37,38]



Fig. no. 4: Tulsi.

Ammanniabaccifera

Ammanniabaccifera with honey is given an empty stomach in south Orissa [39]. The ethanolic extract of leaf of *A. baccifera* exhibited the highest and lowest (22.0 ± 0.8 and 10.9 ± 0.11 mm) inhibition against *S. Typhi* and *S. aureus*, respectively. *S. Typhi* was also strongly inhibited (18.5 ± 0.27 mm) whereas *E. coli* was inhibited poorly (10.1 ± 0.13 mm) by its root extract.^[40]

Boerhaviadifusa

Bhils and its Sub tribes give *Boerhaviadifusa* root Juice 5g twice a day for 7 days orally with Ghee.^[41] Among the three extracts, methanol crude extract of aerial part of a plant of *Boerhaviadifusa* exhibited strong antibacterial activity compared to petroleum ether extract and chloroform extract.^[42]



Fig. no. 5: Boerhaviadifusa.

Clerodendrum

The tribes of Khammam Andra Pradesh, India use Clerodendrumeratum leaf for enteric fever.^[43]



Fig. no. 6: Clerodendrum.

Holiotropiumindicum

The whole plant of Holiotropiumindicum is given in primary health care Karnataka, India to treat Typhoid.^[44] The carbon tetrachloride soluble materials of H.



Fig. no. 7: Holiotropiumindicum.

Rutagraveolens

Rutagraveolens leaf powder with a cup of hot water is given in Bhadravati Taluka Shimoga District Karnataka, India.^[46] The ethanolic stem extract of *R. graveolens* showed pronounced inhibition of growth than other extracts.^[47]



Fig. no. 8: Rutagraveolens.

Tinospora

Tribes in Satpuda region of Dhule and Jalgaon (Maharashtra), India uses *Tinosporacardifolia* juice with sugar.^[48] The methanolic extract of *T. cardifolia* plant was found to have antimicrobial activity against *Bacillus subtilis*, *E coli*, *Staphylococcus aureus* and *Salmonella typhi*.^[49]



Fig. no. 9: Tinospora.

Table 2: Herbal information that can be used to treat typhoid fever.

No.	Vernacular/ Indonesia name	Species	Identified substances	Pharmacological Data
1	Daun basil (basil leaves)	Ocimum basilicum L.	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)	Syzygium aromaticum L.	Essential oils (eugenol), tannins, flavonoids, fatty acids (linoleic and oleic), stearic and palmitic acids, tocopherols, caryophyllene, eugenol acetate,	Activity of the essential oils against Salmonella enteritidis
4	Kunyit (turmeric)	Curcuma longa	Alkaloid, tannin, flavonoid, curcumin, glycoside, proteins, mineral	Antibacterial activity on Salmonella typhi
5	Cranberi (cranberry)	Vaccinium macrocarpon	Proanthocyanidin, phenolic compounds (flavone, quercetin, naringenin)	Antibacterial activity on Salmonella typhimurium
6	Kismis (raisins)	Vitis vinifera	Polyphenolic compounds	Little antibacterial activity on S. typhimurium
7	Temulawak (Curcuma)	Curcuma xanthorrhiza	Xanthorrhizol	Antibacterial activity on Salmonella typhimurium
8	Daun jarak merah (castor leaves)	Jatropha gossypifolia	Terpenoids and lignoid	Antibacterial activity on S. typhi

Table 3: Review of medicinal plants in typhoid.

No.	Plants	Local Name	Uses	Extraction	Effects	MIC	Zone Inhibition
1	Azadirachta indica	Buah Mimba	Bark	Ethanol & Methanol	Growth inhibition of bacterial on medium DPPH radical	NM	20-25mm
2	Aegle marmelos	Buah Maja	Fruit Pulp	Methanol	Strong antimicrobial agent	≥256 μg/mL	≥9-15mm
4	Myristic fragrans	Buah Pala	Fruit	Methanol	Strong antimicrobial	≥64 μg/mL	≥9-15mm
5	Crinum purpurascens	Lili Jawa	Leaves	CH ₂ Cl ₂ /O ₂ H	Bactericidal	6mg/mL	25mm
6	Houttuynia cordata	Tanaman Pangkal Racun	Powder	Water	Phagocytic stimulation effect	NM	NM
7	Bidens pilosa	Ketus	Leaves	NM	Against typhoid fever	512g/mL	12.5 ± 0,4mm
8	Carica Papaya	Pepaya	Leaves	Chloroform	Potential Natural antibacterial compounds	NM	8.8mm
9	Cocos nucifera	Kelapa	Crude	Diethyl ether	antibacterial against S. typhi with high zone of inhibition	NM	20±0.5mm

10	Cymbopogon citratus	Serai	Leaves	Ethanol	highest zone inhibition as antibacterial against <i>S. typhi</i>	5-50mg/ml	22.67±0.88
11	Mangifera Indica	Mangga	Leaves	Ethanol	antimicrobial activity against <i>S. typhi</i>	100mg/ml	18mm
12	Momordica charantia	Peria / Pare	Leaves	Methanol	Potent antimicrobial agents against <i>S. typhi</i>	NM	14mm

DISCUSSION

Folk medicine is used all over India by Traditional practitioner or Tribes for enteric fever, but generally practice of folk medicine found in rural, tribal and backward region. Maximum plants which are given by Traditional practitioner or Tribes for enteric fever have significant anti-microbial activity including *S. typhi*. 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).^[92] Even most of the herbs mentioned by Charak for VishamaJwar have bitter property.^[93]

CONCLUSION

Most of the mentioned folk herbs used for Typhoid have significant result in vitro and vivo anti-microbial activity as well as clinical efficacy and also justify the concept of Ayurveda. Hence it can be stated that Typhoid can be treated by giving herbal drug which is already used by Traditional Vaidya and Tribes in India, though there is further need of documentation by experimental and clinical study on large scale to give validity.

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