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Traditional Medicinal Flora of the District Buxar (Bihar, India)

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Buxar district (Bihar, India) is one of the less floristically studied regions of central Gangetic plain. The district lacks dense forests and its medicinal flora exclusively consists of dicot angiosperms. A total of 84 species belonging to 27 families were reported in this study. Majority of the reported plants were herbs with highest contribution from family Fabaceae (12). The present paper deals with the traditional uses of these plants. Plants and their part thereof were used to treat diseases such as - malaria, small pox, leprosy, diarrhea, diabetes, rheumatism, hepatitis A, heart problems, elephantiasis, STDs, asthma, dysentery, in pregnancy complications and against snake and scorpion poisons. Findings will help in conservation and cultivation of these plants.

Keyword: Ethnobotany, Fabaceae family, Herbal prophylaxis, Buxar.

1. Introduction

Traditional medicine is the sum total of all knowledge and practices whether explicable or not used in diagnosis, prevention and elimination of physical, mental or social imbalance and relying exclusively on practical experience and observation transferred by individuals from generation to generation. India is one of the world's 12 mega diversity centres with 47000 plant species. About 600 to 700 species are in much use mostly by the tribal's and rural populations and nearly 200 species are used medicinally and commercially on fairly large scale. The plants have degraded rigorously due to changing life perception and socioeconomic transformation on a global scale. Plants are diminishing at an alarming rate due to lack of

organized and sustainable cultivation based on scientific data and lack of awareness of society influencing plant use. About 60% of the population of world and 80% of population in developing countries rely on traditional medicine and mostly plant drugs for their need of primary health care. An account of 70% of the population of India is dependent traditional plants based medicines. Biodiversity is the basis of human survival and their economic well being and constitutes the resources upon which families, communities, nations and future generation depends. The ethnic people of the districts are quite aware of the uses of the plant species having ethno-botanical values. Very few works have been reported on ethno-botanical uses of plant species found in coastal area. The current

deforestation scenario which threatens the existence of medicinal plants encourages conservation of plants in coastal area. Therefore, an attempt has been taken to document the ethnomedicinal plants and their indigenous knowledge prior to its extinction.

Table 1: A list of medicinal plants used by traditional health practicers of the district Buxar, India.

S. N.	Botanical name	Family	Vernacular name	Method of preparation and medicinal use
01	<i>Azadirachtha indica</i>	Meliaceae	Neem	Bark powder used in malaria, leaf paste in small pox, root powder in leprosy, and aqueous leaf extract as antiseptic
02	<i>Euphorbia officinarum</i>	Euphorbiaceae	-	Milky sap used in ear ache and as emetic
03	<i>Putranjiva roxburghii</i>	Euphorbiaceae	Pitaujiya	Fruit and leaf decoction used in fever, seed pasted on boils to relieve pain
04	<i>Euphorbia hirta</i>	Euphorbiaceae	Duddhi	Milky sap in skin disease and ring-worm, root decoction in dysentery and vomiting
05	<i>Acalypha indica</i>	Euphorbiaceae	Kuppi/Amabhaji	Whole plant used as emetic and also in skin-disease
06	<i>Phyllanthus niruri</i>	Euphorbiaceae	Bhui-Amla	Hot infusion of whole plant in malaria and ascites, root powder with milk in hepatitis-A
07	<i>Butea monosperma</i>	Fabaceae	Palas	Root decoction in tuberculosis, gum in diarrhea and dysentery, leaf poultice on boils
08	<i>Cassia fistula</i>	Fabaceae	Amaltas	Seed used as emetic, resin with sanai (<i>Cassia angustifolia</i>) used as mild laxative, jam used in constipation
09	<i>Acacia Arabica</i>	Fabaceae	Babul/Kiker	Gum used to cure diarrhea, diabetes and dysuria
10	<i>Caesalpinia crista</i>	Fabaceae	Kant-Karanj	Seed powder with black piper (<i>Piper nigrum</i>) used in malaria, powdered seed mixed with Ricinus oil applied externally to reduce inflammation
11	<i>Abrus precatorius</i>	Fabaceae	Gunja/Rati	Seed paste used in ring-worm and itch
12	<i>Alhagi pseudalhagi</i>	Fabaceae	Yawasa	Smoke in bronchial asthma, sun-dried paste and decoction in piles
13	<i>Desmodium gangeticum</i>	Fabaceae	Sariwan/Salwan	Leaf decoction with black piper (<i>Piper nigrum</i>) used as blood purifier, and to cure fever
14	<i>Cassia sophera</i>	Fabaceae	Kasaudi	Root as diuretic, leaf paste used in wound, ring-worm and skin irritation
15	<i>Cassia tora</i>	Fabaceae	Chakwad	Seed powder with Citrus limon fruit juice in Ring-worm,
16	<i>Pongamia glabra</i>	Fabaceae	Karanj	Oil with Citrus limon fruit juice used in eczema, ring-worm and scabies, fresh juice of root in

				gonorrhoea, hot infusion of flower in diabetes
17	<i>Mucuna puriens</i>	Fabaceae	Kewach	Pod hair with ghee, gum and honey in cholera
18	<i>Feronea limonea</i>	Rutaceae	Kath	Bark decoction in asthma and bronchitis, unripe fruit in diarrhea and dysentery
19	<i>Aegle marmalose</i>	Rutaceae	Bel	Fruit flesh in diarrhea, root powder as sedative, leaf decoction in asthma, fresh leaf juice with black piper (<i>Piper nigrum</i>) in jaundice.
20	<i>Alstonia scholaris</i>	Apocynaceae	Satwan	Bark decoction in diarrhea and dysentery, milky sap in skin disease
21	<i>Rauvolfia serpentina</i>	Apocynaceae	Nakulkand	Root decoction used in bronchial asthma, root powder with bark powder of kutaj in dysentery
22	<i>Nyctanthes arbor-tristis</i>	<u>Oleaceae</u>	Harsingar	Leaf fresh juice with sugar in ascariasis, seed paste in baldness, and leaf decoction in sciatica
23	<i>Terminalia arjuna</i>	Combretaceae	Arjun	Bark boiled with milk is useful in heart disease
24	<i>Boerhavia diffusa</i>	Nyctaginaceae	Punarnava	Fresh root juice in jaundice, root decoction with kutki (<i>Picrorhiza kurroa</i>), chirayata (<i>Swertia chirata</i>) and sonth (<i>Zingiber officinale</i>) in ascites
25	<i>Cleome viscosa</i>	Capparidaceae	Peela-Hurhur	Seed in ascariasis, leaf paste as refrigerant
26	<i>Abutilon indicum</i>	Malvaceae	Kanghi	Seed and leaf decoction in gonorrhoea and dysuria, root powder with sugar and honey in abnormal menstrual bleeding
27	<i>Sida cordifolia</i>	Malvaceae	Bariyar	Root bark powder with sugar and milk in leucorrhoea and gonorrhoea
28	<i>Sida acuta</i>	Malvaceae	Jangli Methi	Leaf paste with coconut oil in dandruff and eczema and leaf paste with salt in panaris
29	<i>Sida rhomboidea</i>	Malvaceae	Dhamni	Root paste with As ₂ S ₃ (Arsenic trisulphide) in elephantiasis
30	<i>Calotropis gigantean</i>	Asclepiadaceae	Safed madar	Bark of the root with betel leaf (<i>Piper betel</i>) in malaria
31	<i>Calotropis procera</i>	Asclepiadaceae	Lal Madar	Flower decoction in cough and asthma, root bark in diarrhea, dysentery and skin diseases
32	<i>Cissampelos pareira</i>	Menispermaceae	Patha /Velvet leaf	Root's hot infusion in renal disorder and stone
33	<i>Tinospora cordifolia</i>	Menispermaceae	Guruch/Tinospora	Fresh juice in diabetes, gonorrhoea and renal disorder, fresh juice with honey in jaundice.
34	<i>Papaver somniferum</i>	Papaveraceae	Posta/Opium	Unripe fruit in diarrhea, asthma, inflammation and stone
35	<i>Argemone Mexicana</i>	Papaveraceae	Shailkanta/Mexican Ppoppy	Oil in ring-worm, scabies and inflammation.

36	<i>Polygonum plebajum</i>	<u>Polygoniaceae</u>	Muniyara	Root powder in intestinal disorder and pneumonia
37	<i>Chenopodium album</i>	Chenopodiaceae	Bathua	Leaf paste on burn
38	<i>Chenopodium murale</i>	Chenopodiaceae	Chmarbathua	Hot leaf infusion in asthma
39	<i>Achyranthes aspera</i>	Amaranthaceae	Latjira	Root with starch and honey in piles, root as tooth-stick in pyorrhea
40	<i>Amaranthus spinosus</i>	Amaranthaceae	Chaulai	Root decoction with Glycyrrhiza glabra root and Achyranthus aspera root in gonorrhoea, root with Emblica officinalis fruit and Saraca indica bark in abnormal menstrual bleeding
41	<i>Amaranthus viridis</i>	Amaranthaceae	Jangali Chaulai	Leaf paste on scorpion and snake-bite
42	<i>Eclipta alba</i>	Asteraceae	Bhringaraja	Fresh juice in jaundice and piles, leaf paste on boils, fresh juice with honey in cough
43	<i>Spilanthes achmella</i>	Asteraceae	Akarkara	Hot root infusion in common cold and cough, leaf paste on scabies and flower head chewed in toothache
44	<i>Tridax procumbens</i>	Asteraceae	Tal muria	Leaf paste on boils, and in skin disease
45	<i>Ageratum coenyzoides</i>	Asteraceae	Visadodi	Leaf paste on burn and wound
46	<i>Gnaphalium indicum</i>	Asteraceae	Balraksha	Leaf juice in gastric disorder
47	<i>Cichorium intybus</i>	Asteraceae	Kasni Vanya	Seed decoction in dysuria
48	<i>Bidens pilosa</i>	Asteraceae	Ara-kajhar/ Samsa	Leaf paste on leprosy and scabies
49	<i>Physalis peruviana</i>	Solanaceae	Rashbhari	Leaf fresh-juice in abdominal disorder during pregnancy
50	<i>Datura alba</i>	Solanaceae	Safed-Dhatura	Leaf paste in skin disease
51	<i>Datura metel</i>	Solanaceae	Kala-Dhatura	Seed in gall bladder stone, leaf-paste in hydrocele
52	<i>Datura stramonium</i>	Solanaceae	Raj-Dhatura	Leaf smoke in bronchial asthma, leaf paste as anti-inflammatory
53	<i>Solanum nigrum</i>	Solanaceae	Makoi	Leaf paste in psoriasis and other skin disease and fruit in diarrhea
54	<i>Withania somnifera</i>	Solanaceae	Ashagandha	Root powder in leucorrhoea seed decoction as diuretic
55	<i>Evolvulus alsinoides</i>	Convolvulaceae	Neel-Shankhpushpi/ Vishnukranta	Root in tumor, leaf fresh juice in dysuria
56	<i>Convolvulus pleuricaulis</i>	Convolvulaceae	-	Leaf fresh juice in constipation
57	<i>Ipomoea nil</i>	Convolvulaceae	Kala-Dana	Seed as purgative and galactagogue

58	<i>Peristrophe bicalyculata</i>	Acanthaceae	Masi	Root decoction in gout and rheumatism
59	<i>Rungia parviflora</i>	Acanthaceae	Khadsaliyo	Leaf paste on small-pox and leaf fresh-juice as diuretic
60	<i>Adhatoda vasica</i>	Acanthaceae	Adusa/Bakas	Antimicrobial, leprosy, pulmonary disease, expectorant, diuretic, malaria, asthma
61	<i>Ocimum sanctum</i>	Lamiaceae	Swet-Tulsi	Hot leaf infusion as wound wash, seed in dysuria, leaf-fresh juice in common cold
62	<i>Ocimum canum</i>	Lamiaceae	Kali-Tulsi	Leaf paste in skin-disease, leaf fresh juice in hemorrhage
63	<i>Asparagus racemosus</i>	<u>Liliaceae</u>	Satavari	Root juice used in curing hyper-acidity and peptic ulcer, urinary tract infections, powder boiled with milk is used to prevent abortion and increase milk production in cows, buffaloes and lactating women.
64	<i>Catharanthus roseus</i>	Apocynaceae	Sadabahar	Root is used as tonic, stomachic, hypotensive, sedative and Tranquilliser, leaves are used for curing Diabetes and wasp stings.
65	<i>Coleus aromaticus</i>	<u>Liliaceae</u>	Patharchur	Leaves are used in dyspepsia, colic, diarrhoea, cholera, asthma, bronchitis, and malarial fever.
66	<i>Allium sativum</i>	<u>Liliaceae</u>	<u>Lahasun</u>	Preparations are used in whooping cough, bronchitis, asthma, fever, helminthiasis, fatigue, leucoderma, leprosy, hysteria, sciatica, sore eyes.
67	<i>Punica granatum</i>	Punicaceae	Anar	The rind of the fruit is used in chronic diarrhea and dysentery, piles and uterine disorders. The root and stem bark are used against tapeworm. The flowers are useful in vomiting. The fruits are used in anaemia, hyperdipsia, Seeds are good for scabies.
68	<i>Murraya Koenigii</i>	Rutaceae	Mithinim	Leaves are used in emaciation, skin diseases, hemopathy, worm troubles, diarrhoea, dysentery, vomiting.
69	<i>Bacopa monnieri</i>	Scrophulariaceae	Brahmi	Used as brain tonic, in clearing of voice, improvement of digestion.
71	<i>Trigonella foenum-graecum</i>	Fabaceae	Meti	Seeds are used in fever, vomiting, anorexia, cough, bronchitis and colonitis.
72	<i>Bauhinia variegata</i>	Caesalpiniaceae	Kachnar	Used as an antidote to poison, in dysentery, diarrhoea, piles, skin diseases, leprosy, intestinal worms, tumours and wounds.

73	<i>Croton tiglium</i>	Euphorbiaceae	Jamalgota	Used in ascites, cold, cough, asthma, dropsy, fever and seed paste in skin diseases, painful swellings and alopecia.
74	<i>Andrographis paniculata</i>	Acanthaceae	<u>kaalmegh</u>	Used in hyperdipsia, burning sensation, wounds, ulcers, malarial and intermittent fevers, cough, bronchitis, skin diseases, leprosy, pruritis, intestinal worms, diarrhoea, dysentery.
75	<i>Ficus racemosa</i>	Moraceae	Gular	Roots are used in dysentery. Bark is used as a wash for wounds, highly efficacious in threatened abortions. Tender fruits are used in diarrhoea, dyspepsia.
76	<i>Ficus benghalensis</i>	Moraceae	Bargad	Infusion of the bark cures dysentery, diarrhoea, leucorrhoea, nervous disorders and reduces blood sugar in diabetes.
77	<i>Ficus religiosa</i>	<u>Moraceae</u>	Pippal	Aqueous extract of the bark is used in the treatment of gonorrhoea, diarrhoea, dysentery, haemorrhoids. Fruits are laxative and digestive. laxative. The latex is good for neuralgia, and haemorrhages
78	<i>Ricinus communis</i>	Euphorbiaceae	Erand	The leaf preparations are used in burns, nyctalopia, strangury and for bathing and fermentation and vitiated conditions of vata, especially in rheumatoid arthritis.
79	<i>Trichosanthes dioica</i>	<u>Cucurbitaceae</u>	Parvar	Seeds are used in stomach disorders, leaf juice in liver congestion. The fruit in combination with other drugs is used in snakebite and scorpion sting.
80	<i>Lagenaria vulgaris</i>	Cucurbitaceae	Lauki	Leaves decoction are used in jaundice. Fruit is sweet oleagenous, cardiotonic, general tonic, aphrodisiac, laxative and cooling.
81	<i>Luffa acutangula</i>	<u>Cucurbitaceae</u>	Tori	Leaves are used in leprosy, conjunctivitis and ringworm. And seeds in dermatopathy
82	<i>Momordica charantia</i>	<u>Cucurbitaceae</u>	Karela	Leaves are used in helminthiasis, constipation and intermittent fever and fruits in skin diseases, leprosy, ulcers.
83	<i>Cucumis melo</i>	Cucurbitaceae	Kharbuja	Used in nutritive, diuretic and cooling drink.
84	<i>Citrullus vulgaris</i>	Cucurbitaceae	Tarbuji	Unripe fruit used in jaundice sore eyes, scabies and itching, seeds are tonic to the brain and used as a cooling agent.

2. Methodology

The area the Buxar district is an administrative district of Bihar. The district has its headquarters at Buxar. The river Ganges and Karmnasa divide it from Uttar Pradesh. The total area occupied by

the district is 1624sq. km. Buxar is located at 25 degree 34 minutes north and 85 degree 34 minutes east. It has an average elevation of 56 meters (186 feet) above the sea level. The rivers flowing through the district are Ganga and

Karamnasha. River Ganges (Ganga) forms the border in north and in the west river Karmanasa. The entire strip of land between the river Ganges and stretches in south beyond main line of the Eastern Railways. The land form is low lying alluvial plane of river Ganges and her tributaries-Thora and Karmanasa. The river Karmansa joins the Ganges near Chousa. The region is considered to be the best wheat growing area in the State and India. The present district of Buxar consists of areas under Buxar sadar and Dumraon Subdivision of the old Bhojpur district and came in existence in the year 1991. Buxar district is bounded on the north by Ballia district of

Uttarpradesh, on the south by Rohtas district, on the west by Ghazipur and Ballia districts, and on the east by Bhojpur district.

Medicinal plants were collected through survey-based field observations. To collect plant samples, several field trips to different parts of the District Buxar were conducted from March 2011 to December 2012. Traditional medicine practitioners and locales were interviewed to know the medicinal importance of these plants. Collected plants were pressed and latter on identified with the help of floras, herbaria as well as in consultation with experts.

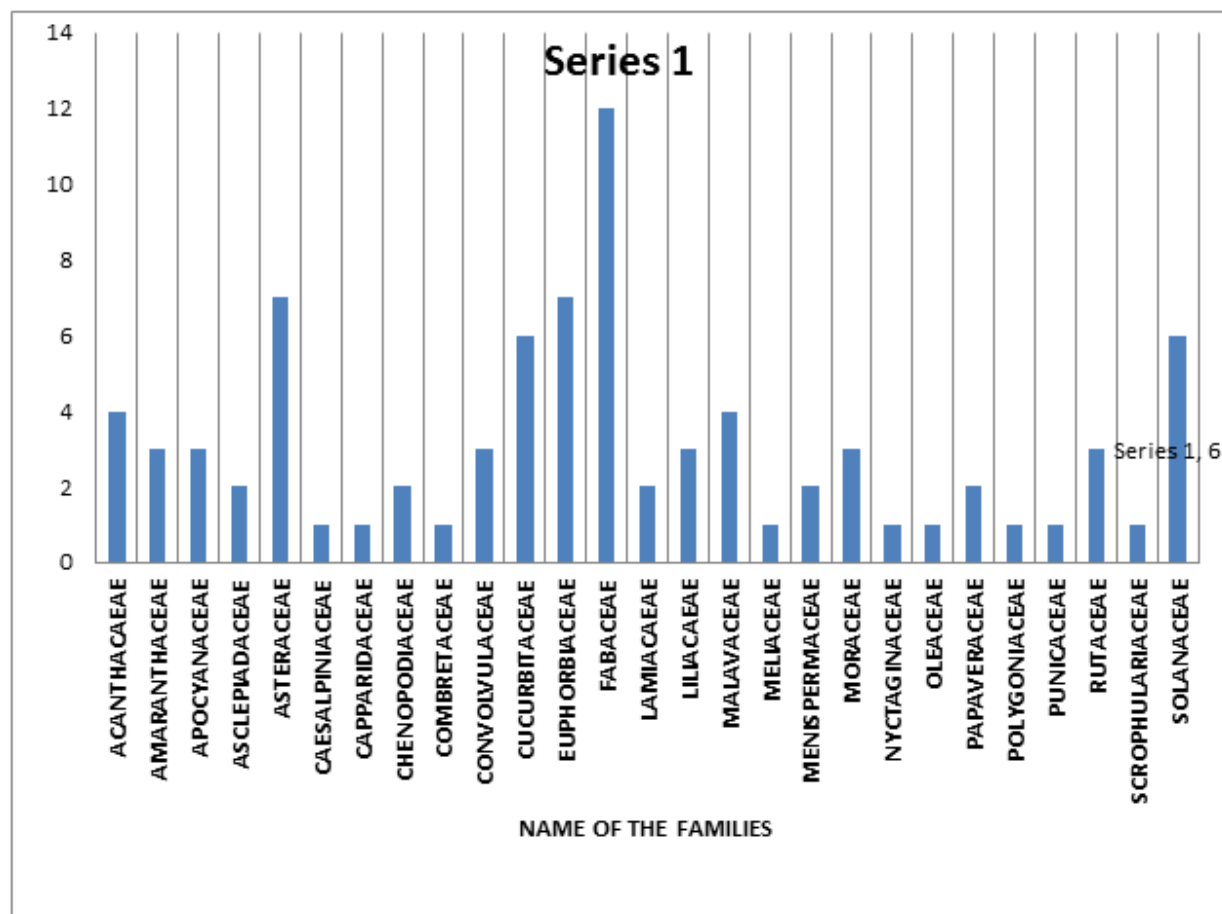


Fig 1: Relative contribution of the families in the medicinal flora of the district Buxar

3. Results & Discussion:

The results of the study are presented in Table 1. During the investigation a total of 84 species belonging to 27 families has been reported.

Traditional medicinal flora of the district is exclusively consists of dicot Angiosperms. With highest number^[12] of species are from family Fabaceae, followed by Asteraceae^[7],

Solanaceae^[7] and Euphorbiaceae^[5] (**Fig. 1**). The district Buxar lacks dense forest, therefore, majority of the plants are herbs followed by tree, climbers and shrubs.

Ethanomedicinal data revealed that plant preparations were used to treat skin problems, malaria, small pox, leprosy, cough, headache, diarrhea, toothache, wounds, diabetes, rheumatism, hepatitis A, heart problems, elephantiasis, STDs, asthma, dysentery, hair loss, in pregnancy, and against snake and scorpion poisons etc., An effective therapeutic formulation often contains more than one plant, and plant parts (Table 1). Leaves and roots were most widely used in the treatments. In many cases a particular plant part was to treat different diseases; and different part of the same plant was used to treat single or more than one diseases. Preparations via different methods from the same plant, or same plant part were used to treat different ailments. For example, leaf paste of *Azadirachta indica* is used against small pox, while its aqueous extract as antiseptics. Agricultural expansion was the principal threatening factor affecting the distribution of medicinal plants in the district. Documentation of the indigenous knowledge through ethanobotanical studies is important for the conservation and utilization of plant resources. The Council of Scientific and Industrial Research (CSIR), New Delhi has taken an initiative to build up a Traditional Knowledge Digital Library, which will contain >35,000 herbal medical formulation used in Ayurvedic system of medicine (Pushpangadan & Kumar 2005). In India, studies on medicinal plants have mainly been conducted in mountains and hilly areas of the country that harbors rich plant diversity. Survey and enumeration of the medicinal flora of the Gangetic plain (area 300,000 sq miles, 90-300 miles wide), which is amongst the most populous regions of the world, remain largely untouched. There are a few studies published from this region - Kirtikar & Basu (1935), Singh & Maheshwari (1983), Sebastian & Bhandari (1984), Singh & Prakash (1996), Singh et al (1996), Paranjape (2001), Khan & Ali (2003). A majority of these are super-fluent. Floristic

composition of the district is largely constituted of roadside flora. Arora and Nayar ((1984) argued that crop plants could also constitute a source of traditional medicine. A great majority of global ($\approx 80\%$) population use traditional medicinal plants to cure illness and ailments. Traditional people may not understand the scientific rationale of the use, but they do know their proper use from personal experience that are passed on by the ancestors to the next generation. It is generally believed that such preparations have less or no side effects compared to that of modern medicines. Moreover, they are easily available, and sometimes due to various socio-economic reasons the only source of healthcare available to the people. In many Asian countries, local and indigenous communities manufacture and sell the product based on their traditional knowledge, to earn their livelihood. Conclusively, traditional medicinal knowledge not only play important role in community health care but is also important for the present and future drug development plans.

4. Conclusion

84 species of plants belonging to 27 families were recorded to be used by the traditional medicine practitioners and locales of the district Buxar of Bihar. These medicinal plant remedies comparatively have certain advantages as these are easily accessible and affordable to the rural community. The data reported in this survey could assist in identifying plant species which could be considered for the developing drugs and formulations for many diseases and medicinal complications like skin problems, malaria, small pox, leprosy, cough, headache, diarrhea, toothache, wounds, diabetes, rheumatism, hepatitis A, heart problems, elephantiasis, STDs, asthma, dysentery, hair loss, in pregnancy, and against snake and scorpion poisons etc for the people living in remote and backward areas.

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