

Medicinal Plants Used by Raji Ethnic Tribe of Nepal in Treatment of Gastrointestinal Disorders

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Received: 17.11.2013; Accepted: 22.12.2013

Abstract

A total of 43 plant species belonging to 40 genera and 29 families have been recorded as medicinal plants used traditionally by Raji people of Nepal for treatment of gastrointestinal disorders. Different parts of medicinal plants in different forms were reported to be used for treatment of 16 types of gastrointestinal disorders. The traditional healers and elderly people were well experienced in traditional method of using medicinal plants but they were worried about negligence of people towards such traditional use of valuable medicinal plants.

Key words: Indigenous people, ethno-medicine, traditional healing, Nepal

Introduction

Scientific research on medicinal plants used in indigenous medical system is needed for effective treatments of various kinds of diseases (Kadir *et al.*, 2013). Gastrointestinal diseases are major causes of mortality in the world and among them infectious gastrointestinal diseases are becoming more complicated to treat due to drug resistance by infectious parasites (Culligan *et al.*, 2009). Traditional medicines play important role in health care system in developing countries (Alves and Rosa, 2007). Developing countries can take extensive profit through study and applied research on local medicinal plants which are used traditionally against various diseases (Houghton, 1995). WHO Regional Committee for the South-East Asia Region accepted the vital role of traditional medicine in health care system in 2004 and meeting of WHO Executive Board in 2009 aimed to promote

the potential of herbal medicines in national health system in the Region (WHO, 2009).

Indigenous and endangered Raji ethnic people distributed in Mid Western and Far Western Nepal have strong knowledge and belief in traditional healing practices but now this knowledge is in danger of loss due to several factors such as change in life style, urbanization, ignorance of new generation and biodiversity loss (Maskey, 2007; Thapa, 2012). These factors are major causes of significant decrease in traditional knowledge on medicinal plants among various ethnic communities of Nepal.

Number of studies such as Enayet Hossain, 2007; Giday *et al.*, 2009; Osawaru and Dania-Ogbe, 2010; Rout *et al.*, 2010; Namsa *et al.*, 2011 have documented valuable information on traditional use of medicinal plants. Also some studies (Moreno-Salazar *et al.*, 2008; Dey and De,

2012; Kadir *et al.*, 2013) have been carried out particularly for gastrointestinal disorders. Some studies conducted among various ethnic tribes of Nepal (Bhattarai, 1991; Manandhar, 1991; Manandhar, 1998; Shrestha, 1998; Siwakoti and Siwakoti, 2000; Rai, 2004; Acharya and Pokhrel, 2006) have documented various medicinal plants used traditionally for treatment of various ailments. Study among endangered Raji indigenous people of Nepal, this research was carried out to explore and document the medicinal plants used by Raji traditional healers for the treatment of gastrointestinal disorders.

Materials and methods

Study area

The study was carried out in Uttarganga, Chhinchu and Ghatgaun Village Development Committees (VDCs) of Surkhet district and two Village Development Committees (Chaumala and Khailad) of Kailali districts (Fig. 1). The Surkhet district lies between 28°40'26"N and 81°35'20"E is the original land of Rajis people. The population of Rajis in Uttarganga, Chhinchu and Ghatgaun VDCs is 50, 128 and 210, respectively. Kailali (28°34'N and 80°34'E) is one of the most populous district by Raji. Raji population in Khailad VDC is 811 and in Chaumala VDC is 238 (Raji Salma Samaj, 2012).

Data collection

Current study was conducted from September 2012 to March 2013. The key informants (Raji traditional healers, knowledgeable and old aged persons) from selected 32 households were interviewed to get

primary information on medicinal plants used in gastrointestinal disorders. Only those households were selected with the help of local informants from the VDCs where traditional healers, knowledgeable and old aged persons were available. A standard open ended semi-structured questionnaire was prepared for in-depth interview and verbal consent was obtained from the participants. Group discussion and informal meetings were also made. Plant collection for herbarium was made with key informants and knowledgeable people. The specimens were identified with the help of standard literature (Polunin and Stainton, 1984; Press *et al.*, 2000; Manandhar, 2002) and by comparing with specimens at Tribhuvan University Central Herbarium (TUCH). The herbarium specimens are deposited in TUCH.

Results

Taxonomic diversity and life form

A total of 43 species of 40 genera and 29 families were recorded as medicinal plants used traditionally by indigenous Raji people of Nepal for treatment of gastrointestinal disorders. Out of them, 35 species belonged to 24 families of Dicot and 8 species to 5 families of Monocot. The larger families each having 3 species were Combretaceae, Euphorbiaceae, Fabaceae, and Zingiberaceae. Two species were recorded from each Asteraceae, Liliaceae, Menispermaceae, Moraceae, Myrtaceae and Rutaceae and rest 19 families were represented by single species. Among recorded medicinal plants, 20 species were trees followed by shrubs (10 species), herbs (9 species) and climbers (4 species) (Fig. 2)

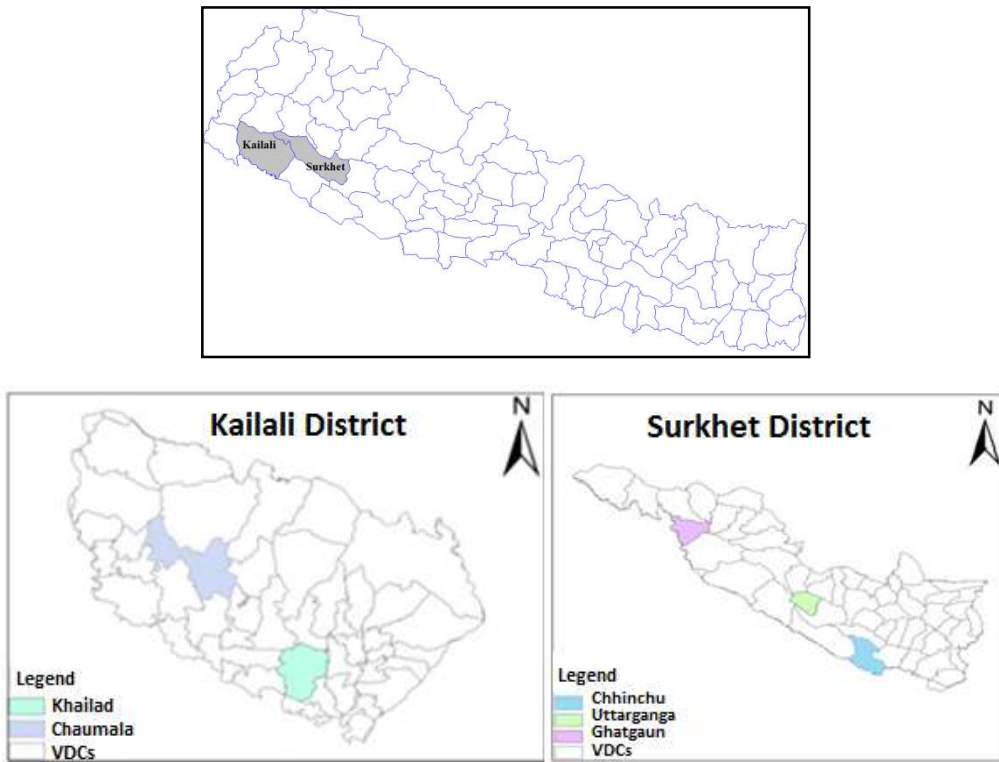


Figure 1. Study area, Surkhet and Kailali districts

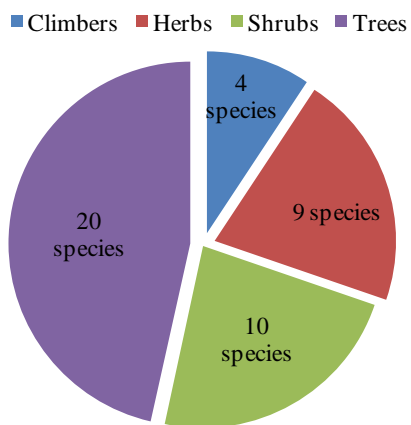


Figure 2. Life form (medicinal plants used by Rajis for gastrointestinal disorders)

Parts and forms used

Different parts of medicinal plants in different forms were reported to be used for treatment of gastrointestinal disorders in Raji community.

Bark was the most frequently used parts (17 species) followed by root (9 species); fruit (7 species); leaf (6 species); flower (4); rhizome (3 species); seed (2 species), whole plant (2 species), tuber (2 species) and sap (*Sapium insigne* (Royle) Benth. ex Hook. F. and *Ficus recemosa* L.) (Fig. 3). The major form of preparation of medicine was juice or extract (35 species) followed by paste and powder form (7 species), sap (2 species) and boiled tuber (*Discorea bulbifera* L.) (Fig. 4). The list of medicinal plants, parts and forms used is given in the table 1.

Gastrointestinal disorders

The present study showed that 16 species of plants were used to treat diarrhea, 14 species for dysentery, 13 for stomach-ache, 8 for constipation, 6 for indigestion; bloody stool and gastric, 5 for loss of appetite, 4 for stomach and intestine ulcer and helminthes parasites, 3 for nausea or vomiting and 1 for the treatment of the tongue inflammation, cholera and green stool. *Terminalia chebula* and *T. bellirica* were two important species used in 6 types of gastrointestinal disorders such as gastric, constipation, indigestion, ulcer, vomiting, and diarrhea. *Achyranthes aspera*, *Mirabilis jalapa*, *Curcuma zeodoaria* and *Hedychium spicatum* were used for treatment of 5 types of disorders followed by *Garuga pinnata*, *Cannabis sativa*, *Mallotus philippensis*, *Bauhinia variegata*, *Bauhinia vahlii*, *Aloe vera*, *Woodfordia fruticosa*, *Syzygium cumini*, and *Aegle marmelos* used for 3 types of disorders. Twenty four species were used

for less than 3 types of gastrointestinal disorders (Tab. 1).

Discussion

Raji is one of the endangered indigenous tribe of Nepal. They have not given up their tradition to collect mushrooms, tubers, wild edible and medicinal plants and other forest products. Traditional uses of medicinal plants can serve as the basic process to understand importance and phytochemical investigations (Dey and De, 2012). Rajis of Surkhet district have rich indigenous knowledge on medicine and they have practice to cure diseases by using different parts of plants (Maskey, 2007).

The larger families were Combretaceae, Euphorbiaceae, Fabaceae, and Zingiberaceae. Two species were recorded from each Asteraceae, Liliaceae, Menispermaceae, Moraceae, Myrtaceae and Rutaceae and rest 19 families were represented by single species. These families are also reported by several researchers as the families having important species used commonly in traditional medicine system (Rahmatullah *et al.*, 2010; Ayyanar and Ignacimuthu, 2011; Panda *et al.*, 2011).

Trees and herbs are reported as frequently used medicinal plants for gastrointestinal disorders (Palombo, 2006; Kadir *et al.*, 2013). Our study showed that most commonly used species for gastrointestinal disorders were trees followed by shrubs, herbs and climbers. Among the recorded medicinal plants, bark was the most frequently used parts followed by root; fruit; leaf; flower, rhizome; seed, whole plant, tuber and sap. Different parts of plants contain chemical compounds that work against bacteria, amoebae, fungi and nematods. The extract of various medicinal

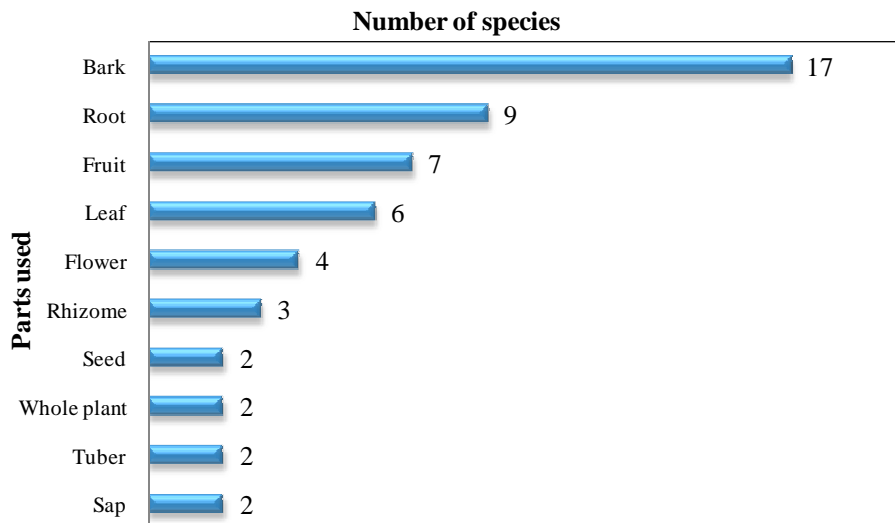


Figure 3. Parts used (medicinal plants used by Rajis for gastrointestinal disorders)

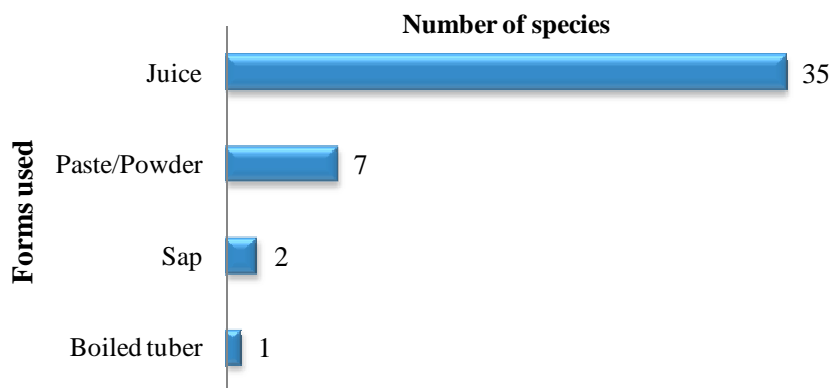


Figure 4. Forms used (medicinal plants used by Rajis for gastrointestinal disorders)

Table 1. Medicinal plants used for gastrointestinal disorders

SN	Botanical names	Habit	Parts used	Diseases	Method and forms used
Acanthaceae					
1	<i>Justicia adhatoda</i> L. Asuro (N), Asur (R)	Shrub	Root	Piles	Root is crushed to extract juice and taken orally
Amaranthaceae					
2	<i>Achyranthes aspera</i> L. Ulte Kuro (N), Chichibhata (R)	Herb	Root	Gastric, nausea, loss of appetite, tongue inflammation	Root is crushed and juice is given orally, root paste is applied in inflamed tongue
Anacardiaceae					

3	<i>Mangifera indica</i> L. Anp (N), Dang (R)	Tree	Bark	Diarrhoea, dysentery	Bark juice is extracted and given for treatment
Arecaceae					
4	<i>Phoenix acaulis</i> Buch.-Ham Khajuri (N/R)	Roxb.ex Shrub	Stem, fruit	Stomach problem	Inner part of stem or fruit is eaten as medicine for stomach problem
Asclepiadaceae					
5	<i>Calotropis gigantea</i> (L.) Dryand. Ank (N), Madar (R)	Shrub	Bark	Bloody stool	Bark juice extracted and given for treatment
Asteraceae					
6	<i>Spilanthes calva</i> DC Marethi (N), Biks (R)	Herb	Flower	Stomach disorder	Inflorescence is eaten raw or juice is extracted
7	<i>Artemisia vulgaris</i> L. Titepati (N), Pati (R)	Shrub	Root	Antihelminthic	Root and leaf Juice is extracted and given orally
Berberidaceae					
8	<i>Berberis aristata</i> DC. Chutro (N), Trikhula (R)	Shrub	Bark	Diarrhea	Bark juice is extracted and taken orally
Burseraceae					
9	<i>Garuga pinnata</i> Roxb. Dabdabe (N), Jyanda (R)	Tree	Bark	Diarrhea, dysentery, bloody stool	Bark juice is taken orally
Cannabaceae					
10	<i>Cannabis sativa</i> L. Bhang (N), Bhang (R)	Shrub	Leaf, seed	Indigestion, diarrhea, dysentery	Leaf juice or grinded seed paste can be taken orally
Combretaceae					
11	<i>Terminalia alata</i> Heyne Roth Saj (N), Sajha (R)	ex. Tree	Bark	Stomachache	Bark juice is given orally
12	<i>Terminalia chebula</i> Retz Harro (N), Harain (R)	Tree	Bark, fruit	Gastric, constipation, indigestion, ulcer, vomiting, diarrhea	Bark juice is given orally, fruit is chewed or powder is prepared and mixed with <i>Phyllanthus embellica</i>
13	<i>Terminalia bellirica</i> (Gaertn.) Roxb Barro (N), Barain (R)	Tree	Bark, fruit	Gastric, constipation, indigestion, ulcer, vomiting, diarrhea	Bark juice is given orally, fruit is chewed and powder is prepared and mixed with <i>Phyllanthus embellica</i>
Dioscoreaceae					
14	<i>Dioscorea bulbifera</i> L. Githa (N), Syak (R)	Climber	Tuber	Antihelminthic	Underground tubers or bulbils are boiled and eaten to kill pinworms
Dipterocarpaceae					
15	<i>Shorea robusta</i> Gaertn Sal (N), Salahn (R)	Tree	Bark	Stomachache, diarrhea	Bark juice is extracted and given orally
Ericaceae					
16	<i>Rhododendron arboreum</i> Roxb. Gurans (N/R)	Tree	Bark, flower	Dysentery, bloody stool	Bark or flower juice is given orally
Euphorbiaceae					
17	<i>Mallotus philippensis</i> (Lam.) Muell.-Arg. Royani (N), Rugnang (R)	Tree	Bark	Diarrhea, dysentery, stomachache	Bark Juice is extracted and given orally
18	<i>Phyllanthus urinaria</i> L.	Herb	Leaf	Diarrhoea, dysentery	Leaf juice is given orally

	Bhui Amala (N), Jhar (R)					
19	<i>Sapium insigne</i> (Royle) Benth. ex Hook. F Khirro (N), Khiri (R)	Tree	Sap	Cholera, green stool	Sap is applied around navel region for the treatment of cholera and green stool	
Fabaceae						
20	<i>Bauhinia variegata</i> L. Koiralo (N), Greainblack (R)	Tree	Bark	Diarrhea, dysentery, bloody stool	Bark is crushed and juice is given orally	
21	<i>Acacia catechu</i> (L.f.) Willd. Khayar (N), Khairang (R)	Tree	Bark, stem	Stomachache	The stem or bark is soaked in water and given orally	
22	<i>Bauhinia vahlii</i> Wight & Arn Malu (N), Mee/Mrak (R)	Climber	Bark, seed	Diarrhea, dysentery, stomachache	Bark juice is given orally, immature seed is also used	
Liliaceae						
23	<i>Aloe vera</i> (L.) Burn.f. Ghiu Kumari (N/R)	Herb	Leaf	Constipation, stomachache, tonic	Leaf juice is given orally	
24	<i>Asparagus racemosus</i> Willd. Kurilo (N), Kurila (R)	Shrub	Root	stomach problems	Root is crushed and juice is given orally	
Lythraceae						
25	<i>Woodfordia fruticosa</i> (L.) Kurz Dhairo (N), Dharee (R)	Tree	Bark	Diarrhea, stomachache, bloody stool	Bark juice is extracted and given, flower and leaf juice are also effective.	
Malvaceae						
26	<i>Urena repanda</i> Roxb. [Hort. Beng] Bamparag (R)	Herb	Root	Diarrhea, dysentery	Root extract is given	
Menispermaceae						
27	<i>Tinospora cordifolia</i> (Willd.) Miers. Gujar Gano (N), Bhrun (R)	Climber	Tuber	Gastric, diarrhea	Juice extracted from tuber & root is drunk in fever and stomach disorders	
28	<i>Cissampelos pareira</i> L. Badalpate (N), Khalite (R)	Climber	Whole plant	Bloody stool, stomachache	Plant is crushed to extract juice and given orally	
Moraceae						
29	<i>Ficus recemosa</i> L. Dumri (N), Uvring (R)	Tree	Fruit	Stomachache	Stem sap is applied and sticks paper over the affected part	
30	<i>Morus australis</i> Poir. Kimbu (N), Toont (R)	Tree	Root	Antihelminthic	Root is crushed and extracted juice is given orally to kill worms (<i>Ascaris</i>)	
Myricaceae						
31	<i>Myrica esculenta</i> Buch.-Ham ex D. Don Kafal (N), Kafila (R)	Tree	Bark	Diarrhea	Bark juice is given orally for treatment of stomach disorders	
Myrtaceae						
32	<i>Syzygium cumini</i> (L.) Skeels Jamun (N), Jamna (R)	Tree	Bark	Diarrhea, dysentery, stomachache	Bark Juice or immature fruits are taken orally	
33	<i>Cleistocalyx operculatus</i> (Roxb.) Merr. & Perry Kyamuna (N), Bhukijabu (R)	Tree	Fruit	Diarrhea, dysentery	Edible fruit is beneficial for diarrhea and dysentery	
Nyctaginaceae						
34	<i>Mirabilis jalapa</i> L. Malati (N), Lankafool (R)	Sub-Shrub	Root	Gastric, stomachache, ulcer,	Juice extracted from root is taken orally, root can be	

				constipation	dried and stored
Poaceae					
35	<i>Imperata cylindrica</i> (L.) Beauv Siru (N), Sirau (R)	P. Grass	Root	Antihelminthic	Root juice is extracted in half a glass of water and give two times a day for Ascariasis
Rosaceae					
36	<i>Rosa sp.</i> Gulab (N), Gulabi (R)	Shrub	Flower	Dysentery	Extracted juice of flower is given orally
Rutaceae					
37	<i>Zanthoxylum armatum</i> DC. Timur (N), Timru (R)	Tree	Fruit	Diarrhea	Fruits are boiled and juice is taken orally.
38	<i>Aegle marmelos</i> (L.) Corr. Bel (N), Belang/Bela (R)	Tree	Leaf, fruit	Gastric, ulcer, constipation, piles	Leaf extract or ripe fruit is eaten
Sapotaceae					
39	<i>Diploknema butyracea</i> (Roxb.) H.J.Lam Chiuri (N), Chiure (R)	Tree	Bark	Diarrhea, dysentery	Bark juice is effective for diarrhea and dysentery
Umbelliferae					
40	<i>Centella asiatica</i> (L.) Ghodtapre (N), Ghodthapa (R)	Urban Herb	Whole plant	Indigestion, loss of appetite	Whole plant is crushed and its juice is taken orally
Zingiberaceae					
41	<i>Zingiber officinale</i> Rosc. Aduwa (N), Adang (R)	Herb	Rhizome	Indigestion, loss of appetite, constipation	Rhizome piece is chewed or put in tea or used in powder form
42	<i>Curcuma zeodaria</i> Rosc. Kachur (N/R)	Herb	Rhizome	Indigestion, loss of appetite, constipation, stomachache	Rhizome piece is chewed, rhizome is crushed and paste is eaten with ghee and honey
43	<i>Hedychium spicatum</i> Sm Gaz Kachur (N/R)	Herb	Rhizome	Indigestion, loss of appetite, constipation, stomachache	Rhizome piece is chewed, rhizome is crushed and paste is eaten with ghee and honey

N = Nepali Name, R = Raji Name

plants used by traditional healers have antibacterial, anti-amoebic, antidiarrhoeic and antihelminthic properties (Tona *et al.*, 1998; McGaw *et al.*, 2000; Taylor *et al.*, 2001). The major mode of preparation of medicine was juice or extract (35 species) followed by paste and powder form (7 species), sap (2 species) and boiled tuber (*Dioscorea bulbifera* L.). The study found that there is practice to prepare fresh medicine in these forms and given orally for the treatment of gastrointestinal disorders.

Conclusions

The present study of the medicinal plants used for healing the gastrointestinal disorders revealed that Raji indigenous people of Nepal have good knowledge and practice based on their experiences and proved the potential to identify useful medicinal plants. The practitioners (traditional healers) and elderly people are well experienced but they are also worried about negligence of people on traditional uses of valuable medicinal plants. Therefore

it is important that the traditional knowledge should be explored and documented properly for future uses. Additional analyses of biological activities and pharmacological tests are recommended for the further investigation.

Acknowledgements

The authors are grateful to University Grants Commission, Bhaktapur, Nepal for providing financial support and we are highly grateful to Raji Salm Samaj, Central Office, Tikapur for every support in our research and all Raji informants of both Surkhet and Kailali district who shared their valuable knowledge.

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