

Traditional drugs sold by herbal healers in Haridwar, India

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Received 09.07.13, revised 31.01.2014

The herbal healers are descendants of ancient medicine men. They sell raw herbal drugs used against various common ailments at road side. A total of 22 herbal raw samples were purchased from these healers. The information on therapeutic properties, price, dosage and duration of treatment has been documented. Out of them, 13 plant species have been identified and their medicinal properties were compared with the Indian Materia Medica. It has been observed that medicinal systems of the herbal healers are independent (only 22.22% similarities) from Indian Materia Medica.

Keywords: Crude drug, Vendor, Medicinal plant, Haridwar, Traditional medicine, Herbal healer

IPC Int. Cl.⁸: A61K 36/00

As per the WHO report about 80% of the world population is dependent on traditional medicines for primary healthcare. In developing countries, it is commonly prevalent due to cultural acceptability, low cost, easy availability, and faith in system and lesser side effects¹. In addition, traditional medicines provide “socio-economic security” to millions of people against unemployment². Consequently, in recent past, the use of herbal medicines has been increased all over the world. In India, it is about one billion US \$ industry and export of plant based crude drugs is around \$ 80 million¹.

Haridwar is an important pilgrimage of Hindus. It is situated on the bank of river Ganges on the geographical coordinates of 29° 58' 0" N, 78° 10' 0" E in Uttarakhand, India. Every millions of pilgrims and tourists take holy bath in river Ganges. Since, the city is flooded with pilgrims and tourist throughout the year, road side herbal healers are commonly seen near center places like *Har-ki-Pauri*, railway station, etc. (Fig. 1). The herbal healers are frequently seen selling crude drugs on the busy streets. They come on busy streets around 8.00 AM and remain there till evening. The healers are descendants of ancient nomadic medicine men. Now-a-days they wander from cities to cities and sell crude drugs on road side³.

They have acquired therapeutic knowledge from their forefathers and give herbal drugs for many human ailments especially the common ones. Usually poor people purchase medicines from these herbal healers.

Identification of herbal drugs sold in local market is necessary to: (1) identify the species in commercial demand; (2) document and conserve traditional knowledge; (3) identify species may require special conservation efforts; (4) understand and access demand of species before preparation of successful conservation strategy for flagship species.

On market survey of crude drugs only few publications are available from India⁴⁻¹⁵. The identities of herbal crude drugs sold by herbal healers of Haridwar have not been studied so far. Therefore, the present study was undertaken with the following objectives:

1. to determine the identify of crude drugs sold by herbal healers
2. to identify the species in trade
3. to document and conserve traditional knowledge
4. to access the total number of plants species sold in local market by herbal healers

Methodology

The drugs were purchased from the herbal healers during April-May, 2012 in Haridwar by the first

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Fig. 1—A, Hari ki pauri; B, a vendor; C – F, vendors are selling crude drugs near Har ki pauri and railway station

author to determine the identities of species. Prior consent was taken and information about name of the drug, plant parts, and methods of remedy preparation, dosages and duration of treatment were recorded. In Haridwar, areas near *Har-ki-pauri* and railway station were selected because road side healers are common at these places. A total of 14 herbal healers were consulted and crude drugs were purchased. All the healers were male, aged between 22 - 37 yrs. Their ancestry is from Rajasthan and following the traditional family occupation. The healers collect plant part from wild and sell in road side market. The specimens of crude drugs were collected for identification. The specimens were identified with the help of relevant literatures¹⁶ and by morphological and microscopic studies. Further, the specimens were match with authentic specimens preserved in Raw Materials Herbarium and Museum (RHMD), New Delhi. The botanical names of the plant specimens

were updated according to the plant list (www.plantlist.org). The specimens have been deposited at Raw Materials Herbarium and Museum (RHMD), New Delhi. A comparative assessment with Indian Materia Medica was done to find out their correlation with existing information.

Results

Products of 22 species of plants were seen in road side market of Haridwar, these were being sold by herbal healers, of these 13 species have been identified (Table 1; Figs. 2 & 3) and nine species remain unidentified. The root is most frequently used plant parts (10 species), followed by stem (6 species), fruit (3 species), stem bark (2 species) and seed (1 species). It has been observed that most of healers have treatment for 4 broad groups of ailments: (a) digestive system, (b) sex power, (c) cold, cough & fever and (d) dermatological.

Table 1—List of identified crude drugs sold by herbal healers in Haridwar, Uttarakhand, India

S. No	Herbs sold as [name in Devnagari script]	Parts used: Uses	Botanical names [family] field No.	Mode of application	Cost in `* (US \$)
1.	<i>Satavar</i> [सतावर, सत्तावर]	Root: lactation	<i>Asparagus curillus</i> Buch.-Ham. ex Roxb. [Asparagaceae] KAB 14 Note: according to Ayurveda Satavar is <i>Asparagus racemosus</i> Willd.	Oral; about 100 gm powder with milk at morning, 1×1	@ ` 200-300 (\$ 3.63-5.45) per Kg.
2.	<i>Saymal ki Jar</i> [सेमल की जड़]	Root: increase sex power	<i>Bombax ceiba</i> L. [Malvaceae] KAB 15	Oral; about 100 gm powder with sugar, 1×1 for 2 weeks	@ ` 50- 60 (\$ 0.90-1.09) per 20 pieces
3.	<i>Nagar gutta</i> [नागर गट्टा]	Seed: stomach-ache in children	<i>Caesalpinia crista</i> L. [Fabaceae] KAB 12	Oral; one seed rubbed on stone given with mother's milk, 2×1	@ ` 20 (\$ 0.36) per 5-6 pieces
4.	<i>Kali haldi</i> [काली हल्दी]	Rhizome: cough and cold in children	<i>Curcuma caesia</i> Roxb. [Zingiberaceae]	Oral; about 20 gm powder with luke warm milk, 2×1	@ ` 10 (\$ 0.18) per 10 pieces
5.	<i>Kali musli</i> [काली मूसली]	Rhizome: tonic	<i>Delphinium denudatum</i> Wall. ex Hook.f. & Thomson [Ranunculaceae] KAB 31 Note: according to Ayurveda Kali Musli is <i>Curculigo orchioides</i> Gaertn. [Hypoxidaceae]	Oral; about 50 gm with milk, 2×1	@ ` 20 (\$ 0.36) per 5-8 pieces
6.	<i>Putay Jari</i> [पुटे जड़ी]	Root: indigestion, anorexia, flatulence	<i>Eruca vesicaria</i> (L.) Cav.; syn. <i>Eruca sativa</i> Mill. [Brassicaceae] KAB 22	Oral; about 20 gm powder, 2×1	@ ` 10 (\$ 0.18) each pieces
7.	<i>Jangli Bargad</i> [जंगली बरगद]	Stem bark: diarrhoea	<i>Ficus tinctoria</i> subsp. <i>gibbosa</i> (Blume) Corner; syn. <i>Ficus gibbosa</i> Blume [Moraceae] KAB 18	Oral; about 20gm powder, 4×1	@ ` 20 (\$ 0.36) per 100 gm
8.	<i>Ganwayl ki jar,</i> <i>Ratan purush</i> [गनवेल की जड़, रतन पुरुष]	Root: increase semen, erectile dysfunction	<i>Hybanthus enneaspermus</i> (L.) F.Muell. [Violaceae] KAB 16	Oral; about 50 gm powder with milk; 1×1 for one month	@ ` 50 (\$ 0.90) per 10 pieces
9.	<i>Balam kheera</i> [बालम खीरा]	Fruit: flatulence, indigestion	<i>Kigelia africana</i> (Lam.) Benth.; syn. <i>Kigelia pinnata</i> (Jacq.) DC. [Bignoniaceae] KAB 04	Oral; about 50 gm powder, 2×1	@ ` 70-100 (\$ 1.27-1.81) each
10.	<i>Arjun ki chaal</i> [अर्जुन की छाल]	Stem bark: furunculus/boil	<i>Terminalia arjuna</i> (Roxb. ex DC.) Wight & Arn. [Combretaceae] KAB 27	Oral; decoction, one glass (250 ml), 1×1 for 2 weeks	@ ` 20 (\$ 0.36) per 100 gm
11.	<i>Bahayra</i> [बहेड़ा]	Fruit: piles, anorexia, diarrhoea, sore throat	<i>Terminalia bellirica</i> (Gaertn.) Roxb. [Combretaceae] KAB 23	Oral; about 50 powder, 2×1	@ ` 10 (\$ 0.18) per 5 pieces
12.	<i>Harad</i> [हरड़]	Fruit: constipation, anorexia	<i>Terminalia chebula</i> Retz. [Combretaceae] KAB 19	Oral; about 50gm powder, 2×1	@ ` 10 (\$ 0.18) per 5 pieces
13.	<i>Geeloay</i> [गिलोय]	Stem: fever, jaundice	<i>Tinospora cordifolia</i> (Willd.) Miers [Menispermaceae] KAB 09	Oral; about 50 gm powder, 3×1 for one month	@ ` 10 (\$ 0.18) per 5-8 pieces

Abbreviations: ` Indian currency; US \$ 1 = ca 55 Indian rupees. *The prices are average vary with healer to healer.



Fig. 2—A, *Asparagus curillus* Buch.-Ham. ex Roxb.; B, *Bombax ceiba* L.; C, *Caesalpinia crista* L.; D, *Curcuma caesia* Roxb.; E, *Delphinium denudatum* Wall. ex Hook.f. & Thomson; F, *Eruca vesicaria* (L.) Cav.; G, *Ficus tinctoria* subsp. *gibbosa* (Blume) Corner; H, *Hybanthus enneaspermus* (L.) F.Muell.; I-J, *Kigelia africana* (Lam.) Benth; K-L, *Terminalia arjuna* (Roxb. ex DC.) Wight & Arn.; M, *Terminalia bellirica* (Gaertn.) Roxb.; N, *Terminalia chebula* Retz.; O, *Tinospora cordifolia* (Willd.) Miers

Discussion

Samples of 22 plant species were purchased from herbal healers. The healers sell remedies for common ailments like stomachache, cough, cold, indigestion, anorexia, flatulence, diarrhoea, dysentery, erectile dysfunction, piles, constipation, fever, weakness, joint pain, skin itching, etc. The plant parts were cutted in small pieces and most of them were coloured in dark red, yellow and green colour and tagged in thread (Figs. 3 & 4). It makes identification of crude drugs more difficult.

Almost all the healers have more or less similar types of herbal drugs, it indicates their medicinal knowledge have common origin. Single healer keeps 14-20 types of crude drugs. The rate of crude drugs varies from healers to healers. A total of 13 specimens have been identified (9 unidentified) are used in the treatment of 18 ailments of human beings: decrease

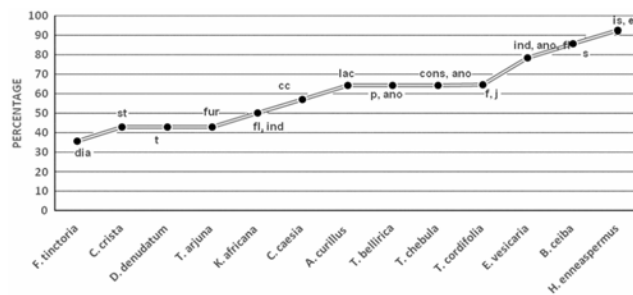


Fig. 3—Reported frequency of sell by herbal healers of 13 plant species; Abbreviations: ano, anorexia; cc, cough & cold; con, constipation; dia, diarrhoea; ed, erectile dysfunction; f, fever; fl, flatulence; fur, furunculosis/boil; ind, indigestion; is, increase semen; j, jaundice; lac, lactation; p, piles; s, sex power; st, stomachache; t, tonic

in lactation, fall in sex power, stomachache, cough, cold, weakness, indigestion, anorexia, flatulence, diarrhoea, decrease in semen, erectile dysfunction, furuncles/boil, piles, constipation, fever and jaundice

(Table 1). Two types of customers are common: (1) poor people; (2) seeking treatment for chronic diseases (not got relief from modern medicines). Most of the poor people prefer traditional medicine because of lower cost^{1,3,8,17}. The healing properties of medicines of these healers are different from Indian Materia Medica (Ayurveda, Unani, Siddha and Naturopathy) because only 4 remedies (22.22% similarity) were found similar with Nadkarni's Indian Materia Medica: *Curcuma caesia* for cough and cold, *Terminalia arjuna* for skin disease; *Terminalia bellirica* for Diarrhoea and *Tinospora cordifolia* for fever²⁰.

The frequency of drugs sold by herbal healers provides two interesting information: (1) identity of species having relatively high demand; (2) ailments for which people prefer to treat with traditional medicines^{2, 21}. It has been observed that most of the people approach healers for the treatment of ailments related to sex and digestive disorders. The high demand species are *Hybanthus enneaspermus*, *Bombax ceiba* and *Eruca vesicaria* (Fig. 2). About 73% of plant species are harvested for root and stem, which cause destruction of plant². Fortunately, these species are not enlisted in red-data book of plant, therefore conservation aspects were not studied^{18, 19}. All the identified species are collected from surroundings of Haridwar and some of them are under cultivation, viz. *Curcuma caesia*, *Kigelia africana*, *Terminalia bellirica* and *Terminalia chebula*.

Mismatch in identity of some crude drugs has been observed. It may be due to variation in regional/ethnic names or adulterants, viz. as per Hindi and Ayurvedic names, for example, *Satavari* is *Aspargus racemosus* but sample specimen was identified as *Asparagus curillus*; *Cucuculigo orchioides* is known as *Kali musli* but specimen was *Delphinium denudatum*. Similar mismatching was observed with unidentified specimens, e.g. according to Ayurvedic/Hindi names *Ashwagand nagori*, *Jimi kand*, *Karwai*, *Lal Chandan ki jar*, *Nag bailee* should be *Withania sominifera*, *Amorphophallus paeoniifolius*, *Cardiospermum halicacabum*, *Pterocarpus satalinus* and *Vitex peduncularis*, respectively but voucher specimens were something else²⁰. A total of 9 species remains unidentified, these are: *Ashwagand nagori* for vigor, strength and blood purification; *Gurbail* for fever and jaundice; *Horam kand* for indigestion, burning in throat and stomach; *Jimi kand* for impotency in man; *Kam raj modak* for stomachache; *Karwai* for joints

pain; *Lal Chandan ki Jar* for headache; *Nag bailee* for scorpion-sting; *Penda jari* for skin itching. The law of demand and supply is determined in the price of medicinal plants, popular medicines having short in supply possess relatively high price, like *Satavar* (*Asparagus curillus*) and *Balam Kheera* (*Kigelia africana*). The high price of *Balam Kheera* is due to its popularity and short supply in market². *Satavar* is popular medicine but it has mismatch in identity, may be due to adulterant or substitute, it has been observed that the gap in demand and supply is fulfilled by adulterant and substitute^{16, 22}.

New findings

Medicinal properties of 4 species (e.g. *Hybanthus enneaspermus*, *Terminalia arjuna*, *Terminalia chebula*, *Tinospora cordifolia*) sold by healers has already been reported^{4,10-12,14-15}. The identities of 9 crude drugs sold by healers like *Asparagus curillus*, *Bombax ceiba*, *Caesalpinia crista*, *Curcuma caesia*, *Delphinium denudatum*, *Eruca vesicaria*, *Ficus tinctoria* subsp. *gibbosa*, *Kigelia africana* and *Terminalia bellirica* are first time documented in present communication.

The present investigation will conserve the traditional knowledge of herbal healers through documentation, which is depleting due to advent of modern medicines. Apart from conservation of knowledge, the traditional remedies may have practical implication in discovering new medicines. New uses of 4 well known species have been identified (Table 1), these species may be used in Phytochemical and pharmacological studies. In addition, the study identified some species in trade on the road side, although the species are not under threat but information may be used while preparation of conservation strategies in near future.

Conclusion

Identity of 13 species sold by road side healers has been determined, among them most of the plant parts are root and stem (72.72%). New medicinal claims for nine species are first time documented. The herbal healers have homogenous knowledge may be due to common settlement and ancestry. Healers provide remedies for common ailments of human being. Majority of the people approached healers for the treatment of sex related problems (*Hybanthus enneaspermus*, *Bombax ceiba*), fever, jaundice

(*Tinospora cordifolia*), constipation (*Terminalia chebula*), indigestion, anorexia and flatulence (*Eruca vesicaria*), piles (*Terminalia bellirica*) and lactation related problems (*Asparagus curillus*).

Acknowledgement

Authors are thankful to all the healers for information. The corresponding author is thankful to the Director, NISCAIR for providing facilities and to CSIR for financial assistance.

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