Traditional drugs sold by herbal healers in Haridwar, India

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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

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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 wonder 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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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 literatures \footnote{16} 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

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

Abbreviations: * Indian currency; US $ 1 = ca 55 Indian rupees. *The prices are average vary with healer to healer.
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 in lactation, fall in sex power, stomachache, cough, cold, weakness, indigestion, anorexia, flatulence, diarrhoea, decrease in semen, erectile dysfunction, furuncules/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. 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 fever.

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. 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 plant. Fortunately, these species are not enlisted in red-data book of plant, therefore conservation aspects were not studied.

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, *Satavar* is *Asparagus racemosus* but sample specimen was identified as *Asparagus curillus; Cucuculigo orchioideis* is known as *Kali musli* but specimen was *Delphinum denudatum*. Similar mismatching was observed with unidentified specimens, e.g. according to Ayurvedic/Hindi names *Ashwagand nagori*, *Jim kand*, *Karwai*, *Lal Chandan ki jar*, *Nag bailee* should be *Withania sominifera, Amorphophallus paeniofolius, Cardiospermum halicacabum, Pterocarpus satalinus* and *Vitex peduncularis*, respectively but voucher specimens were something else. 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; *Jim 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 posses 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 market. *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 fulfill by adulterant and substitute.

**New findings**

Medicinal properties of 4 species (e.g. *Hybanthus enneaspermus*, *Terminalia arjuna*, *Terminalia chebula, Tinospora cordifolia*) sold by healers has already being reported. 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).

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