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Role of Medicinal Plants in Traditional Healthcare System in District Hoshiarpur, Punjab (India)

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ABSTRACT

The aim of the present study was to document medicinal plants and the associated traditional knowledge used to treat human as well as animal ailments by rural communities of block Talwara, District Hoshiarpur, Punjab. Information has been collected from seven villages through various modes. A total of 87 species of medicinal plants belonging to 77 genera and 42 families were enlisted which were used for the treatment of more than 40 diseases. Among these 87 species, majority of the plants were herbaceous (35) followed by trees (27), shrubs (17) and climbers (8) that were generally collected from wild as well as cultivated areas. Herbal medicines are prepared from these plants in the form of decoctions, infusions, poultice, powder, paste, *etc*. The most common route of administration for herbal medicine is oral, topical application; few are through nasal, ocular and otic. Commonly used plant parts were leaves, fruits, seeds, roots, whole plant, stem, bark, etc. The results of the study showed that local people depend upon primary healthcare system for the treatment and management of both human and animal ailments. Therefore, it would be significant to document such traditional knowledge of medicinal plants used by the locals for further scientific exploration.

KEYWORDS: Healthcare, Hoshiarpur, Medicinal plants, Talwara, Traditional knowledge

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INTRODUCTION

The relationship of human and their surrounding plant wealth is as old as human civilization. Since ancient times, humans have relied on plants not only for food, but also for medicines to fight against diseases and leading a healthy life. The oldest written evidence about the use of medicinal plants dates back to a Sumerian clay slab from Nagpur, which comprised 12 recipes for drug preparation referring over 250 plants[1]. Over the time, people were shifted to synthetic chemical drugs due to mass production of pharmaceuticals, economic growth, cultural transformation, quick mode of action of these drugs, availability of medical facilities at the door step, etc. However, with the rise of new diseases, unaffordable cost of treatment, side effects of some drugs and development of resistance to drugs have compelled people to think again towards traditional herbal medicines[2]. The trend of using herbal medicines or herbal products is coming back and the herbal knowledge is re-emerging all over the world. Today, the herbal products are considered safer than the synthetic ones that are observed as unsafe to human and environment. Even though herbs had been known for their medicinal and aromatic properties for centuries, modern synthetic drugs have surpassed their importance, for a while. However, the blind dependence on synthetic medicines is getting over gradually and people are returning to the herbals with hope of safety and security[3]. It is estimated that about 80% of the world's population still rely on medicinal plants as a primary source of healthcare and traditional medical practice which involves the use of herbs as an integral part of the culture in those communities[4].

In India, traditional system of medicine is widely practiced by different sections of the society. It is one of the centuries-old practice acquired by humans through many years of observation, experiences and experiments. From centuries, indigenous people have been using this unique system to treat various human as well as animal ailments. The traditional knowledge of plants used for various purposes depends on the availability of such plants in that particular area. Most of the medicinal plants used are collected from wild, relatively undisturbed areas situated far away from industrial and urban sites. This traditional knowledge has been passed on within the society and from generation to generation through oral communication[5]. The people having this indigenous knowledge are old age persons, ayurveda practitioners and traditional healers. This invaluable knowledge of medicinal plants is in the memories of the old age people and will vanish with them. Therefore, it is very important to preserve this age-old precious gift of nature to humankind. The main objective of the present study is to explore the significance of traditional medicinal plants as a primary health care modality in rural areas of Talwara block and keep a record of the updated knowledge available with such persons.

MATERIALS AND METHODS

For the present study, seven villages (i.e., Ramgarh Sikri, Bhambotar, Heer Beh, Kartoli, Beh Chuhar, Rehru patti and Chamuhi) falling under Dasuya forest division, located in Talwara block of District Hoshiarpur were selected (Fig. 1). In order to document the traditional uses of medicinal plants, frequent field surveys were carried out in each village from 2018 to 2019. The villages were visited in different seasons of the year, so as to get maximum information about the medicinal plants of that particular season. Verbal informed consent was obtained from all individual participants prior to the interview.

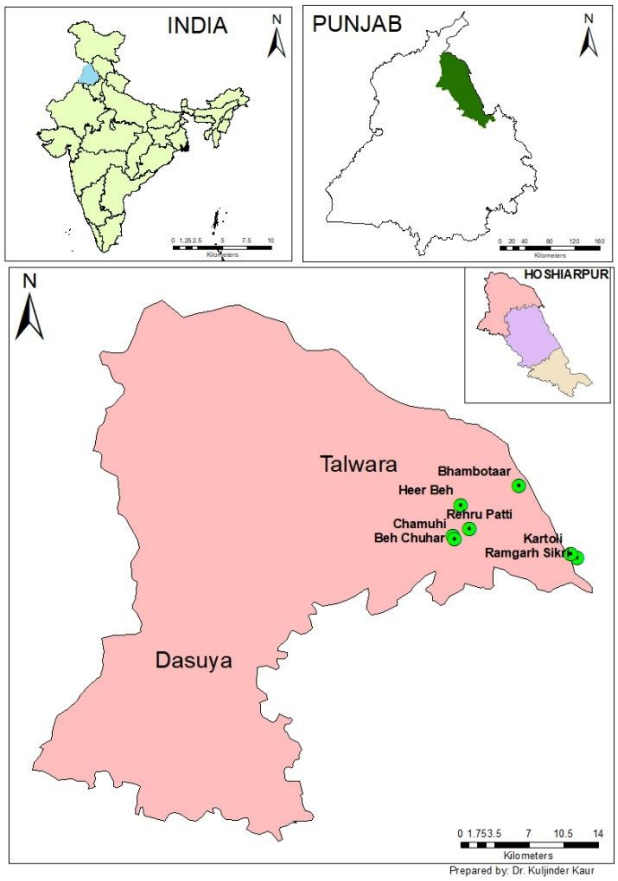

Figure 1. Location map of study area

The information was collected by various modes like people participatory approach, focus group discussion and personal interview using semi-structured questionnaire. In participatory activity, all village natives were gathered in a common place of the village, made them aware about the purpose and significance of the present study and then collectively asked about local medicinal plants and their utilization. In focused group discussion, group of 4-5 knowledgeable informants of various communities

and age groups were interviewed. In-depth knowledge about the uses of plant parts, various types of ailments, method of dosage, mode of preparation and administration were collected during group discussion. A detailed discussion with traditional healers, old age people and housewives were made by personal interview and the information gathered during participatory activity was cross checked. Information on local name of plants, source of plant material, habit, habitat, local status of plants, etc. was also recorded.

The interviews were preferably conducted in local language (mother tongue) *i.e.*, Punjabi, so that the respondents can easily understand the questions and interact in a better way. Short field visits to the forests were also organized with the village *Sarpanch* or *Vaids* to ascertain the correct identity of the plants, to know more about the species which they are using for the treatment of specific ailments in their routine and also to obtain first-hand information on their distributional pattern. Observations were also made on morphological features through which the local people used to identify the plant species. The information about the local status of the medicinal plants in the study area was also collected. As authors are trained taxonomists, so the plant materials were identified by themselves. Information about updated botanical names and families were verified by using websites www.worldfloraonline.org, http://www.flowersofindia.net and standard monographs. Keeping in view the conservation of plants, very few specimens were collected for identification and herbarium preparation depending upon their availability status and photographs of all the documented species were taken in their natural habitat.

RESULTS AND DISCUSSION

Talwara block of District Hoshiarpur is situated in the Shivalik belt popularly known as 'Kandi area' of Punjab. This region is sub-mountainous and has rich biodiversity including many useful species of medicinal plants. For the present investigation, seven villages have been selected randomly from the entire block. The geographical and demographical information of these villages is given in Table 1 [6]. The geographical parameters like latitude, longitude and elevation were recorded using GARMIN eTrex 30x GPS navigator.

Table No. 1: Geographical and Demographical Data of the Villages Under Study

Attributes	Bhambotar	Beh Chuhar	Chamuhi	Heer Beh	Kartoli	Ramgarh Sikri	Rehru patti
Latitude (DD)	31.91179	31.86587	31.8633	31.8941	31.84984	31.8459	31.8723
Longitude (DD)	75.90454	75.84396	75.8455	75.8513	75.95163	75.9578	75.8594
Elevation (meters)	252	570	573	252	252	252	252
Total area (hectares)	671	207	144	344	270	193	329
Total population (people)	4,094	2001	499	1459	917	281	1,596

Most of the informants contacted for the present study were in the age group of 40- 75 years. It has been observed that generally older people above the age of 50 years have better knowledge about traditional uses of the medicinal plants which may be due to their personal experience and interaction with the plants over a long period. Regarding transformation of this knowledge, most of the informants confessed that they got this knowledge from their ancestors and are trying to keep it alive by passing this to their next generation. But young generation showed little interest in these practices and medicinal plants available in their surroundings and is more inclined towards market resources. Male members knew more about the local medicinal plants than the females. This may be because of their active involvement in the field related activities outside their homes especially agriculture. Similar study was conducted in Tamil Nadu and reported that old age people have more traditional knowledge about medicinal plants as compared to young people[7]. It was also recorded that there were many self-help groups in these villages, whose members collected plants and plant parts from the forests to prepare herbal products which were then sold in nearby market or presented in various organized exhibitions to encourage the use of such plant remedies.

A total of 87 medicinal plants belonging to 77 genera and 42 families were documented from the study area. The collected information was screened for number of medicinal plants used, dominant plant families, commonly used plant parts and growth form, local conservation status, source of plants and plant products, different types of ailments treated by using these plants, methods of herbal formulations, mode of administration, etc. (Table 2).

Table No. 2: List of Plants with their Traditional Medicinal Uses

Scientific Name (Family)	Local Name	Habit	Local Status	Source	Part Used	Associated Traditional Knowledge
Abelmoschus esculentus (L.) Moench (Malvaceae)	Bhindi	Herb	C	KG	Roots, seeds, fruits	Decoction of dried roots is given for diabetes. Smoke of dry seeds is applied on teeth caries. Fruit vegetable is good for body-ache and joint pain.
Abelmoschus manihot (L.) Medik. (Malvaceae)	Jangli bhindi	Herb	VL	W	Seeds	Smoke of seeds is applied on caries of teeth.
Acacia catechu (L.f.) Willd. (Fabaceae)	Khair	Tree	C	F	Stem, Bark	Small pieces of wood or bark are dipped in water overnight and drinking that water in early morning is good to control diabetes.
Acacia nilotica (L.) Delile (Fabaceae)	Kikar	Tree	L	F	Dry pod, twigs	Powder of dry pod is taken orally for joint pain. Twigs are used as tooth brush
Achyranthes aspera L. (Amaranthaceae)	Puth kanda	Herb	C	W	Seeds	Seeds powder with honey is used to treat asthma.
Acmella oleracea (L.) R.K. Jansen (Asteraceae)	Karkra	Herb	L	W	Leaves	Leaf paste is applied on aching teeth.
Aegle marmelos (L.) Correa (Rutaceae)	Bil or bel pattar	Tree	L	F	Fruits	Fruit juice is used as coolant, for stomach disorders and to control diabetes.
Albizia lebbeck (L.) Benth. (Fabaceae)	Shri	Tree	C	F	Leaves	Leaf extract is used for cattle eye problems.
Allium cepa L. (Amaryllidaceae)	Piaz	Herb	C	KG	Bulb	Bulb extract act as carminative & taken orally to control vomiting, diarrhoea. Crushed bulb is applied directly on snake bite, wasp cut & burn. Dropped into ear for earache. Poultice made from bulb is applied

						on abscess and to remove splinter in the skin. Also used to treat zeharbad in cattle.
Allium sativum L. (Amaryllidaceae)	Lahsun	Herb	C	KG	Bulb	To treat aching teeth, lahsun extract is poured into ear of same side. Eating raw bulblets in empty stomach in early morning are good for cardiovascular diseases, rheumatic pain and to control cholesterol. Bulblet is fried into mustard oil and oil is poured into the ear to get relief from earache.
Argemone mexicana L. (Papaveraceae)	Kasumbadi	Herb	C	W	Flowers	Flowers are given to cattle during reproductive problems.
Artemisia scoparia Waldst. & Kitam. (Asteraceae)	Chuankhra	Herb	C	W	Seeds	Seeds cooked in daal and taken in winter to warm body. Young leaves are used to cure diarrhoea.
Asparagus officinalis L. (Asparagaceae)	Sat musali	Herb	L	W	Shoots	Vegetable of young shoots is used to cure skelto-muscular problems.
Asphodelus tenuifolius Cav. (Asphodelaceae)	Piazi	Herb	VL	W	Leaves	Leaf extract is used to treat many skin problems.
Azadirachta indica A. Juss. (Meliaceae)	Neem	Tree	C	F/ HG	Leaves, fruits	Decoction of leaves and fruits is used to treat many skin problems. It has anti-bacterial and antidiabetic properties. Twig is used as toothbrush. Leaves are kept in wardrobes due to insect repelling quality.
Barleria cristata L. (Acanthaceae)	Kali basuti	Shrub	C	F	Roots, whole plant	Ash of roots or whole plant mixed with honey is used to cure dry cough or whooping cough.
Brassica Rapa L. (Brassicaceae)	Sarho	Herb	C	KG	Seed, oil	Seed oil is used to cure many skin problems, skelto-muscular problems and ear ache.
Brassica rapa subsp.	Shalgum	Herb	C	KG	Roots	Boil roots are rubbed on feet to get

rapa L. (Brassicaceae)						relief from swelling of feet.
Calotropis procera (Aiton) Dryand. (Apocynaceae)	Akk	Shrub	L	W	Leaves, latex	Milky latex applied on aching teeth, wasp sting, skin problems, on tail infection in cattle. Leaves placed under feet sole in shoes for 2-3 hours is said to control diabetes.
Cannabis sativa L. (Cannabaceae)	Bhang	Shrub	C	W	Leaves	Young leaves are given to cattle to cure diarrhoea.
Capsicum annuum L. (Solanaceae)	Mirch	Shrub	C	KG	Fruits	Powder of fruit is applied topically on dog bite. Red chili is fried in mustard oil and a drop of this oil is poured into ear to get relief from earache.
Casearia tomentosa Roxb. (Salicaceae)	Cheela	Tree	C	F	Leaves, fruits	Fruit paste is applied on scorpion sting.
Cassia fistula L. (Fabaceae)	Kaniyaar / Reen fali	Tree	C	F	Fruits, flowers	Young fruits are good to cure constipation in cattle as well as human. Flower gulkand and muraba is also used as laxative.
Cicer arietinum L. (Fabaceae)	Kala chana	Herb	C	KG	Seeds	Roasted seeds are beneficial for diabetes & jaundice. Gram flour called 'Basin' is used topically for skin problems.
Cissampelos pareira L. (Menispermaceae)	Batindu or beldu	Climber	C	W	Leaves	Leaves are tied on skin blisters, wound
Citrus limon (L.) Osbeck (Rutaceae)	Nimbu	Shrub	C	KG	Fruits	Fruit juice is act as coolant, good for skin and digestive problems.
Coccinia grandis (L.) Voigt (Cucurbitaceae)	Maie	Climber	C	W	Fruits	Vegetable of unripe fruits is good to control diabetes.
Colebrookea oppositifolia Sm. (Lamiaceae)	Alah	Shrub	C	W	Inflorescence	Decoction of inflorescence is given to children during pneumonia
Coriandrum sativum L. (Apiaceae)	Dhania	Herb	C	KG	Leaves and seeds	Green leaves act as coolant, so good for piles. Leaf extract is given to control vomiting. Seeds and leaves

						are also good for many gastrointestinal problems.
Crateva religiosa G. Forst. (Capparaceae)	Barna	Tree	L	F	Fruits	Barna fruits are given to cattle to treat zeharbad.
Croton bonplandianus Baill. (Euphorbiaceae)	Jamal-ghota	Shrub	C	W	Milky exudate	Milky exudate of plant is used to treat many skin problems.
Curcuma longa L. (Zingiberaceae)	Haldi	Herb	C	KG	Rhizome	Rhizome powder is used as blood purifier, for skin disorders, gynaecological problems, diabetes and as pain reliever.
Cuscuta reflexa Roxb. (Convolvulaceae)	Hariol or amar vel	Climber	C	W	Whole plant	Plant decoction is given to cattle to cure zeharbad and many reproductive problems. Plant steam is given to swelling of organs. Decoction of plant is used to treat skelto-muscular problems.
Dalbergia sissoo DC. (Fabaceae)	Tali	Tree	L	F	Twigs, fruits	Young twigs are used as tooth brush. Fruit extract is poured into nose to stop nose bleeding.
Datura metel L. (Solanaceae)	Datura	Shrub	L	F	Leaves, fruits	Warm leaves are tied on painful joints. Flowers and young leaves are used to cure zeharbad and fever in cattle.
Daucus carota L. (Apiaceae)	Gajar	Herb	C	KG	Roots	Carrot juice improves eye sight, good for cardiovascular problems, gynaecological problems, used as body tonic and as anti-anaemic.
Diospyros melanoxylon Roxb. (Ebenaceae)	Kendu	Tree	C	F	Fruits	Fruits decoction is used to wash feet of animals during foot rot disease.
Dysphania ambrosioides (L.) Mosyakin & Clemants (Amaranthaceae)	Jangli ajwain	Herb	C	W	Leaves, seeds	Leaves and seeds are given to cattle to cure diarrhoea or other stomach problems.
Euphorbia hirta L. (Euphorbiaceae)	Dudri	Herb	C	W	Whole plant	Plant given to cattle during indigestion.
Euphorbia prostrata	Hajardane	Herb	C	W	Milky	Milky exudate is used to cure piles

Aiton. (Euphorbiaceae)					exudate	in human and cattle.
Euphorbia royleana Boiss. (Euphorbiaceae)	Danda thohar/ Shoo	Shrub	C	W	Milky exudate	Milky latex is used to remove spine or thorn from skin.
Ficus religiosa L. (Moraceae)	Peepal	Tree	C	F	Milky exudate, Leaves, Bark	Milky exudates are applied on many skin problems. Leaves are used to treat constipation. Bark is cooling and astringent and is useful in inflammations and swellings of neck.
Flacourtia indica (Burm.f.) Merr. (Salicaceae)	Kangu	Tree	L	F	Leaves, roots	Leaves and roots are used for the treatment of snake bite.
Foeniculum Vulgare Mill. (Apiaceae)	Saunf	Herb	C	KG	Fruits	Seeds are used to treat fever and indigestion, both in human as well as cattle.
Grewia multiflora Juss. (Tiliaceae)	Dhaman	Tree	L	F	Leaves	Paste of fresh boiled leaves is applied on painful joints.
Ichnocarpus frutescens (L.) W.T. Aiton (Apocynaceae)	Bakar vel	Climber	VL	F	Leaves	Leaf paste applied on skin problems.
Ipomoea carnea Jacq. (Convolvulaceae)	Akhra	Shrub	VL	W	Leaves	Leaves are effective for joint pain, flowers given to cattle to cure zeharbad.
Jatropha curcas L. (Euphorbiaceae)	Jalgota	Small tree	C	F	Seeds, twigs	Twigs are used as tooth brush to cure gum swelling. Seed decoction is good for constipation.
Justicia adhatoda L. (Acanthaceae)	Desi Basuti	Shrub	C	F	Leaves & flowers	Decoction of leaves and flowers is used to cure old cough, cold and fever.
Kyllinga odorata Vahl (Cyperaceae)	Nirvesi	Herb	VL	KG/ M	Roots	Root paste is applied on scorpion sting.
Lagenaria siceraria (Molina) Standl. (Cucurbitaceae)	Loki/ Gheiya	Climber	C	KG	Fruits	Fruit juice is good for diabetes, jaundice, epilepsy, obesity, constipation, cardiovascular and eye problems. Also act as cooling agent. Piece of fruit is rubbed under

						feet to get relief from burning sensations in feet.
Litsea glutinosa (Lour.) C.B. Rob. (Lauraceae)	Haryan or Rahen	Tree	C	F	Leaves, bark	Paste of bark is applied on wound. Bark powder fry in ghee is good for internal injury and joint pain.
Solanum lycopersicum L. (Solanaceae)	Tamatar	Herb	C	KG	Fruits	Eating fruit empty stomach is good for constipation and also acts as anthelmintic.
Magnolia grandiflora L. (Magnoliaceae)	None	Tree	VL	HG	Bark & flower buds	Bark & flower buds are used for the treatment of diarrhoea, heart problems, cough/cold and intestinal problems.
Mallotus philippensis (Lam.) Mull. Arg. (Euphorbiaceae)	Kambal	Tree	C	F	Fruits	Red powdery covering of fruits is used to cure piles.
Mangifera Indica L. (Anacardiaceae)	Amb	Tree	C	F/ HG	Fruits	Fruit pickle & chutney is good for indigestion in human as well as cattle.
Mentha arvensis L. (Lamiaceae)	Pudina	Herb	C	KG	Leaves	Plant is a good coolant, so used to make chutney especially in summer season. Cure many digestive disorders.
Momordica charantia L. (Cucurbitaceae)	Karela	Climber	C	KG	Fruits	Fruit juice or vegetable is good to control diabetes.
Moringa oleifera Lam. (Moringaceae)	Swajna	Tree	L	HG/ F	Fruits, gum	Fruits are used to increase haemoglobin. Gum is used for wound healing.
Murraya koenigii (L.) Spreng. (Rutaceae)	Gandla/ Curry patta	Shrub	C	F	Leaves	Leaves eaten in empty stomach to control uric acid, thyroid and diabetes.
Ocimum sanctum L. (Lamiaceae)	Tulsi	Herb	C	KG	Leaves	Leaves are used as anti-malarial and for respiration disorders.
Oryza sativa L. (Poaceae)	Johna/ Chaul	Herb	L	FL	Seeds	Khichdi prepared with rice & moong daal is given to patients during diarrhea & dysentery.
Oxalis corniculata L.	Kotri	Herb	C	W	Whole plant	Plant extract is poured in eye to

(Oxalidaceae)						reduce redness and to cure eye flue.
Phyllanthus emblica L. (Euphorbiaceae)	Amla	Tree	C	FL/ F	Fruits	Fruit is good for skin & hair problems. Decoction of kaniyaar, bahera & amla is given to cattle for bloating. Also given to cattle in constipation.
Prunus persica (L.) Batsch (Rosaceae)	Aru	Tree	L	KG	Fruits	Eating ripen fruit in early morning has anthelmintic property.
Psidium guajava L. (Myrtaceae)	Amrood	Tree	C	HG/ FL	Fruits, leaves	Fruits are good for diabetic patients. Young leaves are chewed to cure cough and mouth ulcers.
Punica granatum L. (Lythraceae)	Anaar	Shrub	L	HG	Seeds	Seeds of ripen fruits and their juice is used as anti-anaemic, body tonic and for cardiac problems.
Raphanus sativus L. (Brassicaceae)	Mooli	Herb	C	KG	Roots, leaves	Radish is a coolant, carminative and good for indigestion. Leaf extract is good for jaundice and kidney stone. Radish juice is taken to cure piles and diabetes.
Ricinus communis L. (Euphorbiaceae)	Arind	Tree	C	F	Leaves	Warm leaves are tied on painful joints.
Rosa indica L. (Rosaceae)	Gulab	Shrub	C	HG	Flowers	Gulkand" made from rose petals is good for constipation & as appetizer.
Saccharum officinarum L. (Poaceae)	Ganna	Herb	L	FL	Stem	Juice is good for jaundice, indigestion and diabetes. Sugar mixed in desi ghee is used to cure cough. Decoction of gur is good for constipation both in human and cattle.
Sesamum indicum L. (Pedaliaceae)	Til	Herb	L	FL	Seeds	Seeds oil is used to message painful joints.
Solanum nigrum L. (Solanaceae)	Kyu kothi	Shrub	C	W	Leaves	Leaves vegetable is good for body pain.
Solanum tuberosum L. (Solanaceae)	Aaloo	Herb	C	KG	Tuber	Paste of tuber is applied on burnt parts. Thin piece of potato is put on eyes to remove dark circle around

						eyes. Potato extract is also used to reduce hyper pigmentation of skin.
Solanum virginianum L. (Solanaceae)	Kandiari	Shrub	L	W	Fruits	Fruits are used for the treatment of backache or body pain.
Syzygium cumini (L.) Skeels (Myrtaceae)	Jamun	Tree	C	F/ FL	Fruit, leaves	Fruits and seeds have antidiabetic properties. Leaves are chewed for cough/cold and oral problems.
Terminalia arjuna (Roxb. ex DC.) Wight & Arn. (Combretaceae)	Arjun	Tree	C	F	Bark, fruits	Plant bark and fruits are used to cure cardiac disorders and diabetes.
Terminalia bellirica (Gaertn.) Roxb. (Combretaceae)	Baheda	Tree	L	F	Fruits	Decoction of fruit is given to cattle in bloating and constipation.
Terminalia chebula Retz. (Combretaceae)	Harad	Tree	L	F	Fruits	Fruits are good for digestive problems specially for constipation.
Tinospora sinensis (Lour.) Merr. (Menispermaceae)	Giloe	Climber	C	F	Stem	Stem juice or decoction is anti-pyretic especially for typhoid fever.
Trianthema portulacastrum L. (Aizoaceae)	Itsit	Climber	C	W	Whole plant	Whole plant decoction given to cattle to cure indigestion, fever, etc.
Tribulus terrestris L. (Zygophyllaceae)	Bakhra	Herb	L	W	Fruits	Fruit powder is used to make snakes called 'Panjiri' which is good for backache and gynaecological problems.
Trigonella foenum-graecum L. (Fabaceae)	Methi	Herb	C	KG	Seed, Leaves	Powder of seeds fry in ghee and taken orally for diabetes, rheumatic pain, body ache. Leaves are also used to cure these ailments.
Triticum aestivum L. (Poaceae)	Kanak	Herb	C	FL	Seeds	Wheat bran smoke is used to cure foot rot in human. Rural snack called "Takira" is made from immature seeds which acts as coolant & good for diarrhea

Withania somnifera (L.) Dunal (Solanaceae)	Aksin	Shrub	L	F	Leaves	Leaves are used to treat zeharbad in cow. Also used to treat cough/cold and as brain tonic.
Zea mays L. (Poaceae)	Makki	Herb	C	FL	Seeds	Paste of flour is applied on face for skin problems. It is also good for jaundice.
Zingiber officinale Roscoe (Zingiberaceae)	Adrak	Herb	C	KG	Rhizome	Powder of dry zinger is fried in ghee is good for backache, toothache, joint pain and gynaecological problems. Rhizome extract with honey is taken orally to cure cough/cold. Water-soaked dry zinger is given for diarrhoea. Act as appetizer, analgesic and expectorant.

Abbreviations: C- Common; L- Less; VL- Very less; F- Forests; W- Wild; KG- Kitchen Garden; HG- Home Garden; FL- Farmland; M- Market

Plants belonging to family Euphorbiaceae (8 species) were the most preferred and common, closely followed by Solanaceae and Fabaceae (7 species each) in different traditional remedies (Fig. 2). This may be due to their abundance in the areas under investigation or have strong medicinal properties. Various researchers have studied the therapeutic activities of the members of these families and have the opinion that plants of these families possess diverse range of phytochemicals (secondary metabolites) which have curative properties, hence, extensively used by humans as medicines [8, 9].

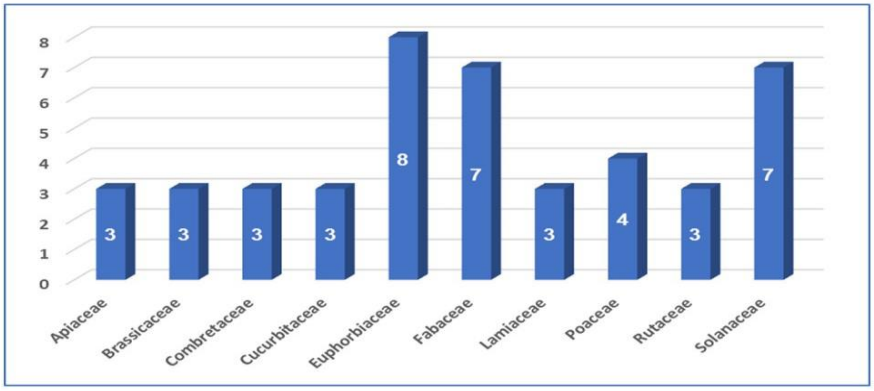

Figure 2. Dominant families with number of species used in herbal formulations

Majority of the species used in traditional herbal formulations included herbs followed by trees, shrubs and climbers (Fig. 3). Each plant or its individual part has its own significance in traditional remedies. The herbal formulations are prepared either from the whole plant or from different organs, like leaves, stem, bark, fruits, roots, flowers, seeds, etc. Some are also prepared from excretory plant product such as gum, resins and latex. However, the most commonly used plant parts were leaves and fruits (26%) followed by seeds (12%), roots (6%), latex (5%) *etc.* (Fig. 4). The higher utility of herbs and leaves for formulation of remedies may be due to their easy availability and efficiency in the treatment of ailments as compared to other growth forms and plant parts[10].

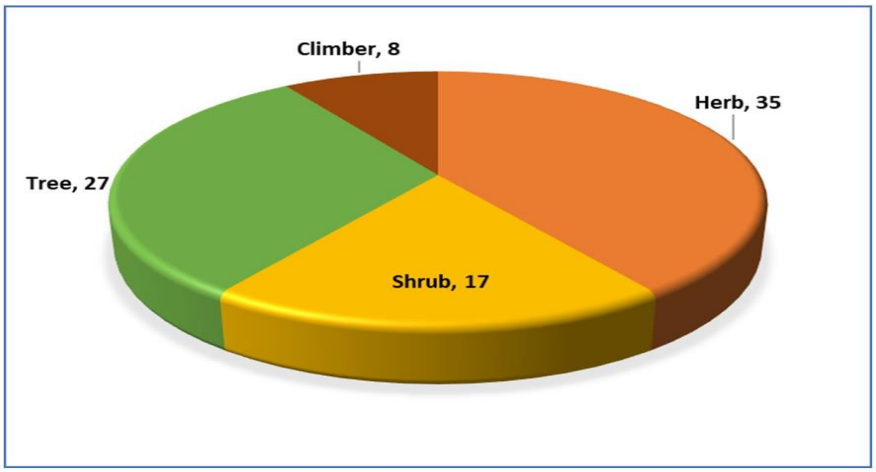

Figure 3. Different life forms used in traditional healthcare practices

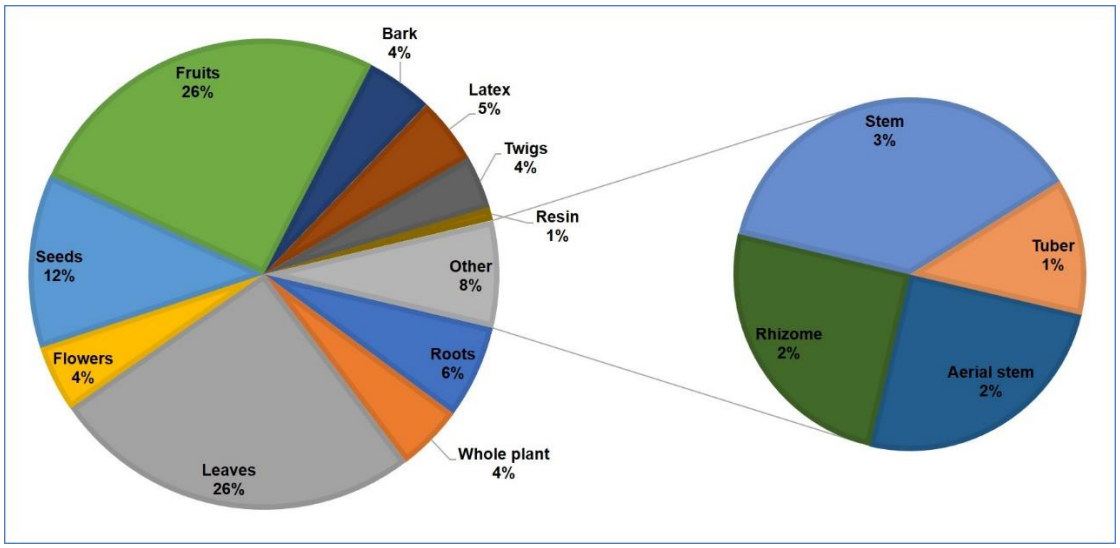

Figure 4. Various plant parts used to prepare traditional herbal remedies

The medicinal plants were usually collected from the forests or wild areas (50 species), some were harvested in the kitchen garden or farmland (32 species) and 5 species were gathered both from wild as well as cultivated area. The preferential use of wild plants in traditional medicines is an indicative of the fact that these plants are easily available in the study area and local people are well aware of their medicinal importance and can also identify them. Herbal medicines were prepared in the form of decoctions, infusions, poultice, powder, paste, etc. The most common route of herbal administration is oral, some are applied topically, very few are through ocular and otic route and the least were through nasal route. These plants were used in the treatment of more than 40 ailments of both humans as well as livestock which were further categorized into major diseases or disorders like respiratory, gastrointestinal, cardiovascular, skeletomuscular, gynaecological, skin, ear, eye, hair, etc. Maximum numbers of species were used to cure gastro-intestinal problems (23) followed by skeleto-muscular problems (19), diabetes, skin problems (16 each), respiratory disorders, dental problems (10 each) and 20 species were used to cure various cattle diseases (Fig. 5). Cattle diseases included fever, diarrhoea, constipation, bloating, reproductive problems, zeharbad, foot and mouth disease, etc. *Zeharbad* is a common term used by local farmers to describe the inflammation of any external body part or area due to accumulation of toxic substances in the body of cattle and natives commonly used six plant species to treat this disease in cattle.

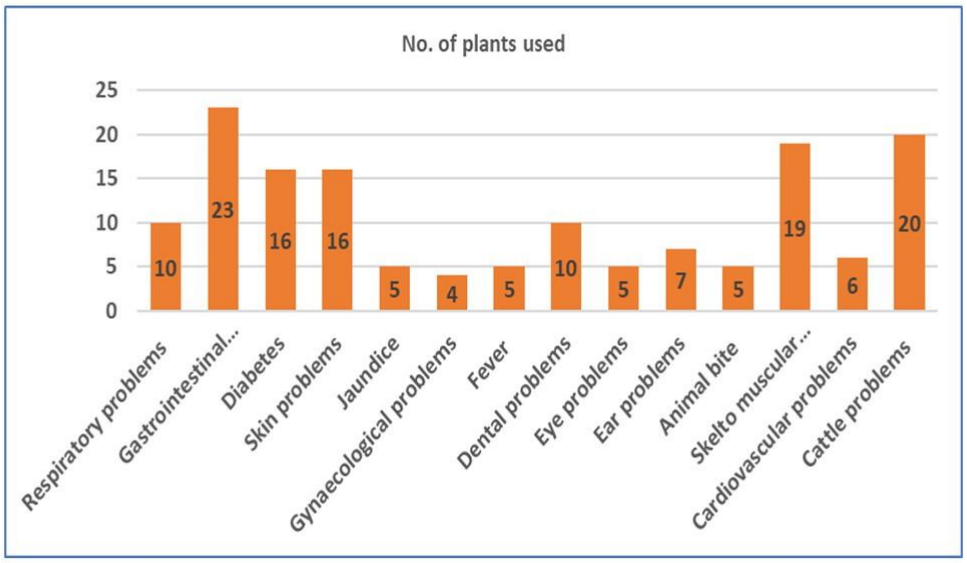

Figure 5. Number of plant species used to treat various diseases and ailments

Only single plant species has been recommended for the treatment of kidney stone, nose bleeding, typhoid, malaria and pneumonia. Five plants were used as an antidote against snake, wasp, scorpion and dog bite. During field visits, it was observed that among recorded medicinal plants, 60 species were very common and present abundantly in all the villages under investigation, 21 species were recorded from all the seven villages but their number is less and 6 species seems to be very less in number and recorded only in some villages. *Kyllinga odorata* was introduced by an informant of village Bhambotar in kitchen garden due to its high medicinal importance. Majority of the informants utilized this traditional medicinal plant expertise only for self-medication but some of them prepared medicines for others on demand or request. The results of this study revealed that the majority of the inhabitants, who participated in this study, depended on the local medicinal plants for the treatment and preventive measures against a number of diseases especially for minor ailments. As these villages come under the Dasuya Forest Division, there is rich diversity of wild plants and animals. Local people also informed that due to the destruction of crops by the wild animals and scarcity of water, farming is not possible in these villages. Crops and vegetables are grown on very low scale for their own consumption. Therefore, inhabitants of this area are dependent on surrounding natural resources for their livelihood and are shifting to other income sources like the collection of herbal plants and formulations.

CONCLUSION

Present study documented the first in depth traditional knowledge of medicinal plants in the Talwara block of District Hoshiarpur. Based on the study, it has been concluded that this area is rich in medicinal plant diversity and their associated traditional knowledge among rural people. Despite the declining trend of traditional knowledge among youngsters, the indigenous herbal remedies are still popular among the local inhabitants of the study area and the scientific validation and phytochemical analysis of these formulations will definitely attract young generation and pharmacologists. Cultivation of medicinal plants can provide numerous opportunities for the advancement of rural well-being, because medicinal plants are one of the few natural products that get good price even in the international market. Govt should provide essential training and financial assistance to the forest dwellers for commercial cultivation and conservation of medicinal plants. Such efforts will help to raise the income and employment of rural people and also contribute to the health of millions in a sustainable way. The present documentation of traditional knowledge and medicinal plants from Talwara block will not only provide recognition to them but also help to protect this knowledge from the cases of bio-piracy and can

provide clues to the researchers for further scientific investigation of these plants for the betterment of society.

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