



MEDICINAL PLANTS AND HERBAL DRUGS USED FOR HYPERTENSION AND HEART AILMENTS IN DISTRICT HISAR, HARYANA, INDIA

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Abstract

Since the beginning of human civilization, several plant species have been used in the production of medicinal products. Our relationship with the natural world predates the beginning of human civilization, and for thousands of years, people have been looking to the outdoors for healing remedies. People are increasingly becoming more aware of the harmful consequences that antihypertensive drugs may have, in addition to the importance of having herbal plants and ayurvedic remedies readily available in their immediate surroundings. So, the present study aimed to ethno botanical survey of district Hisar, Haryana and to enlist the plants used for hypertension and cardio-vascular disease. The data was collected through field surveys and in-depth interviews organized with different local informants from the region during July, 2021 to August, 2022. A total of 55 medicinal plants useful for heart disease belonging to 39 families were collected from different selected study sites. Families such as Solanaceae and Asteraceae were found to be dominant with maximum 4 genera followed by Apocynaceae and Asparagaceae with 3 genera. Majority of plants were herbs (29) followed by shrubs (12), trees (9) and climbers (5). The most commonly used plant parts were leaves and fruits. According to the findings of this study, the plant variety found in the region of Hisar district is rich in medicinal plants, particularly those that are utilised for the treatment of hypertension and other cardiovascular diseases. Thus, these types of sites can be considered useful for pharmaceuticals for development of herbal drugs in future.

Keywords: “Ethno-botany”, “Hypertension”, “Cardio-vascular disease”, “Pharmaceuticals”, “Herbal drugs”, “Remedies”.

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DOI: - 10.31838/ecb/2023.12.si5.060

I. INTRODUCTION

Different plant species have been employed as medicines since the dawn of human civilisation.

Due to each plant's unique properties, such as the quantity of active compounds it contains, people have been using plants for food, medicine, and relief from a variety of issues for centuries. As a priceless gift from nature, medicinal plants are a key source of biologically active molecules for the treatment of many ailments and play a significant role in the healthcare sector for poor countries. These are referred to as phyto-medicines, herbal products, plant medicines, or ayurvedic medicines.

Many ethnic groups and rural residents have extensive knowledge of the many ways in which surrounding medicinal and aromatic plants may be used to treat a variety of human and animal disorders. They developed their own body of knowledge on the sustainable use of plant resources, animal resources, and natural resources via repeated experimentation and the use of trial-and-error methods. Men in the past were intelligent enough to know how to employ various plants to meet their everyday requirements.

The majority of plants used for human consumption are therapeutic herbs [1]. Various pharma companies today extract, purify, modify, and sell a variety of active compounds as contemporary medications. About 25% of currently available commercial drugs are thought to be derived from plants that were once used to treat ailments by local people [2]. Due to limited access to vital contemporary pharmaceuticals and their ease of availability, cheap cost, higher acceptance, and fewer side effects, 10–12 million individuals in India are directly or indirectly involved in the plant-based pharmaceutical sectors. The majority of villagers and tribal people have extensive knowledge of medicinal plants, including how to utilise them, in what dosages, and for what disease.

The ethnic tribes in India employ over than 10,000 wild plants for different cures, culinary applications, and many other uses, based on a recent inquiry by the Ministry of Environment and Forests (MoEF), Government of India, under the All India Coordinate Research Project on Ethnobiology (AICRPE). These ethnic and rural people have produced, kept, and passed on this functional knowledge across generations based on interactions, observations, and experiences. In addition to that, ethnic groups provide viable

natural and herbal solutions for a range of human and veterinary illnesses, opening up opportunities for rural and unorganised sectors to generate revenue and reduce poverty.

In the past, numerous spices including pepper, cardamom, ginger, and sandalwood were transported from India's western coast and shipped to various nations. These plants and condiments are incredibly beneficial herbal items that work well in a variety of circumstances. Well over than 3,000 plant species from 60 major families were identified as having aromatic properties in an analysis of the aromatic plants of India. These plants are used for a wide range of products, including medicines, soaps, cosmetics, fragrances, pharmaceuticals, textiles, and many more [1].

The rate of urbanisation is negatively affecting people's way of life. Many other reason are also responsible like having Diabetes, high cholesterol level, age more than 45, high salt diet, drinking alcohol and smoking etc. Actually these are not only the reasons behind cardiovascular disease but for other disease also like - renal disease, respiratory disorder etc. Hypertension, another name for high blood pressure, is the third leading cause of globally responsible for 7.6 million premature deaths [3] (about 13.5 % of the total). Sometimes this disease remains asymptomatic so its cure is very difficult and only 29.9 % of patients who were under treatment have their blood pressure controlled.

Hypertension is the term used for when blood pressure rises over the usual range, and it stimulates several other heart-related issues. There are many different types of heart problems, including low blood pressure, peripheral artery disease, cardiac arrest or heart attack, dyslipidaemia, thromboembolic diseases and heart failure.

The most prevalent cause of heart disease is constriction or blockage of the coronary arteries, which are the blood channels that give oxygen and nutrients to the heart. This is known as coronary artery disease, and it develops gradually over time. It is the most common cause of heart attacks. Modern lifestyle is the primary risk factor for stress, which causes high blood pressure and other extremely common issues.

Diet, exercise, and drug regimens can all help lower blood pressure, but using herbs as a supplement or as a whole is a well-liked option. So,

several ethno botanical investigations conducted in various regions of the world revealed that a number of plants are used globally to heal different ailments.

So, the present study was carried out with objectives of (1) the ethno botanical survey of Hisar district of state Haryana, India for different medicinal plants used for hypertension and different heart diseases. (2) To identify the plant parts used for different Cardio-vascular diseases by villagers by means of interaction and questionnaires.

II. MATERIAL AND METHODS

A. Study site

Total area under Hisar district is 3,983 km² and it has an average elevation of 215 m (705ft) above the sea level [4]. The district shares border with District Bhiwani to the South, Fathabad to the North, and District Jind to the East. The present study was carried out on 5 villages belonging to three blocks of district Hisar, Haryana. Hisar is located in north western region of state. All of the research locations have a semi-arid environment and fertile alluvial soil known by different names as Bhur and Sand on ridges, Matiyar or clay in depressions, and Domat or Loam in the Plains. Climate of study site is hot in summer and cold in winter with average annual rainfall [5] of 472 mm and annual average maximum and minimum temperature at Hisar is 31.5 and 16.2⁰ C, respectively.

Table-I. Showing Different Study Sites With Their Coordinates

Study Site	Block	Latitude	Longitude
Bagla	Adampur	29.190803	75.47325
Kabrel	Adampur	29.176604	75.50565
Gangwa	Hisar-1	29.115917	75.69225
Dhani Khan Bahadur	Barwala	29.325029	75.89351
Shikarpur	Hisar-1	29.150116	75.82452

Study area map- Hisar

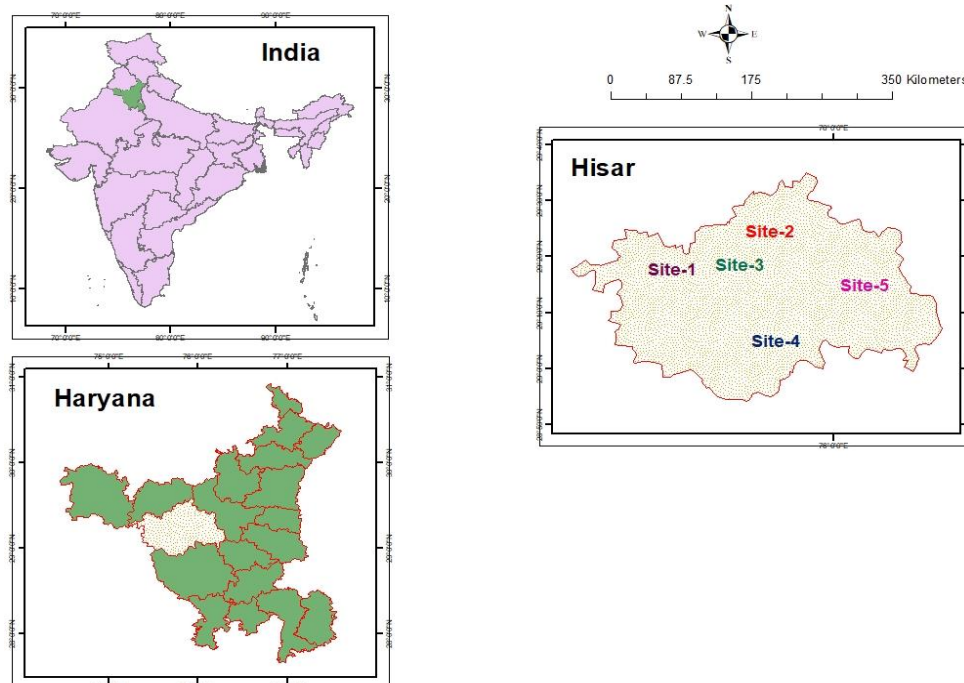


Fig. 1. Map showing locations of study sites in district Hisar, Haryana

B. Methods

The goal of ethno botanical studies is to investigate and catalogue quickly diminishing indigenous knowledge systems based on the explicit and entire link between human civilizations and plants. For the present study standard methods of ethno

botanical studies were used [6] [7]. Field surveys were carried out from July, 2021 to August, 2022 in the selected villages of Hisar district.

Two main ethno botanical study methodologies were taken into account following [8]. The

substantial and labour-intensive fieldwork in the rural areas was conducted directly. This is often done through direct interactions with locals, and data from all of the research sites was gathered directly. Information for the indirect method was gathered in a variety of ways, including through historical writings, the private journals of pioneers, local hermits and doctors, plant collectors, etc. To properly comprehend the ethno medicinal applications of plants, both direct and indirect methods were used in the current inquiry.

The fieldwork began with a brief interview in which some fundamental questions concerning herbal plants used to treat hypertension and heart problems were posed to persons of different age groups. More than 30 healers were questioned using semi-structured questionnaires, and their conventional ethno-medical knowledge, as well as data on how to apply them and their level of efficacy, was documented on a regular basis. Their local names and distinguishing characteristics were also questioned about and recorded.

Plant specimens were collected from the field, photographed, and identified using the floras available. All identified plants were compared to the literature and resources accessible before being used for any of these therapeutic purposes, such as the Flora of Haryana [9].

III. RESULTS

The present study on “medicinal plants and herbal drugs used for hypertension and heart ailments in district Hisar, Haryana” is based on intensive study of medicinal plants in village Bagla (Site-1), Kabrel (Site-2), Gangwa (Site-3), Dhani Khan Bahadur (Site-4) and Shikarpur (Site-5) of district Hisar. Information about uses of medicinal plants was obtained from Vaidhya or Hakims and local people of nearby villages.

The purpose of this study was to gather ethno-medicinal information on indigenous herbal remedies and medicinal plants employed in the therapy of hypertension and other cardiac ailments. Major aim of the present work is to increase awareness among peoples about medicinal plant’s importance in healthcare system. But different degradation factors like climate change, invasive species, population expansion etc. are accountable for loss of biodiversity targeting mainly our medicinal plants [10]. Thus, it becomes necessary to aware people and to take a step forward for their conservation.

During the present study a total of 55 medicinal plants useful for heart disease belonging to 39 families were collected from different selected study sites. A total of 9 trees, 12 shrubs, 29 herbs and 5 climbers were reported on the 5 selected sites. The study examined that Solanaceae and Asteraceae are dominant families with max. 4 genera followed by Apocynaceae and Asparagaceae with 3 genera. Most extensively used plant part includes leaf and fruit. Different plants recorded namely *Allium sativum* Linn., *Achyranthes aspera* Linn., *Annona muricata* Linn., *Apium graveolens* Linn., *Bidens pilosa* Linn., *Brassica compestris* Linn. Var *botrytis*., *Bryophyllum* Linn., *Catharanthus roseus* (Linn.) G. Don., *Camellia sinensis*, *Capsicum annum* Linn., *Carica papaya* Linn., *Carum copticum* (Linn.) Benth. & Hook. f., *Chinopodium umbrosum* Linn., *Cuscuta reflexa* Roxb., *Dacus carota* Linn.var. *sativa* DC., *Eclipta alba* Linn. *Eclipta prostrate* Linn., *Ficus carica* Linn., *Glycine max*(Linn.) Merr., *Gossypium barbadense* Linn., *Gundelia tournefortii* Linn., *Hibiscus sabdariffa* Linn., *Linum usitatissimum* Linn., *Lycopersicon Esculantum* Mill., *Melilotis indica* (Linn.) All., *Mentha longifolia* (Linn.) Huds., *Momordica charantia* Linn., *Morus alba* Linn., *Musa indica* Linn., *Murraya koenigii* Linn., *Nerium oleander* Linn., *Nyctanthes arbor-tristis* Linn., *Ocimum basilicum* Linn., *Piper nigrum* Linn. *Plantago ovate*, *Phyllanthus emblica* Linn., *Portulaca oleracea* Linn., *Punica granatum* Linn., *Rauwolfia serpentine* Benth.ex Kurz., *Raphanus sativus* Linn., *Rosa indica* Mill., *Rosmarinus officinales* Linn., *Rumex crispus* Linn., *Ruscus aculeatus* Linn., *Sesamum indicum* Linn., *Solanum nigrum* Linn., *Syzygium aromaticum* (Linn.)Skeels, *Terminalia arjuna* (Roxb.)W.&A., *Terminalia bellirica* (Gaertn.) Roxb., *Terminalia chebula* Retz. *Tinospora cordifolia* (Willd.) Miers ex Hook. F.& Thoms., *Vitis vinifera* Linn., *Withania somnifera* (Linn.), *Zinziber officinales* Ros., and *Zizyphus jujube* Mill. Some of the medicinal plants reported frequently on all the selected 5 sites such as *Allium sativum*, *Avena sativa*, *Brassica compestris*, *Catharanthus roseus*, *Capsicum annum*, *Chinopodium umbrosum*, *Dacus carota*, *Eclipta alba*, *Gossypium barbadense*, *Lycopersicon esculantum* etc.

These medicinal species were found to be used in the treatment for various diseases along with hypertension and heart problems by the rural people of these villages. A lot of attention has been paid to herbal extracts and molecules with pharmacologically active properties that have been

isolated from a variety of plant species that have historically been utilised in traditional medicine. Due to the fact that these are effective against a wide variety of cardiovascular conditions, agriculture and plant scientists are working tirelessly on the preservation of the majority of wild medicinal and aromatic plants through the process of cultivation as part of a number of different research projects. This is the only solution that will actually work to preserve naturally occurring aromatic and medicinal plants all over the world. On the other hand, it will provide better financial assignments to all of the farmers, employability to the rural people, and an uninterrupted supply to herbal industries as well.

IV. DISCUSSION

The ethno-medicinal information collected from senior villager, studies substantiate number of traditional claims of above medicinal plants. The results of the present study anticipated that the use of herbal plants in our daily meal will be very much helpful in the maintenance of health. The similar kind of results were obtained by [11] during their study of medicinal plants of district Karnal, Haryana where they obtained a total of 90 plant species belonging to 83 genera and 46 families. During their field visits in 2018-2019 in the Charkhi Dadri district of Haryana, [12] recorded a total of 90 ethno-medicinal plants.

These plants belonged to 79 different genera and 41 different families, and they were used to treat a total of 64 different ailments, including cardiovascular diseases and hypertension. The findings have also shown that the local community contains an enormous amount of information

regarding ethno-medicines. Studies conducted in the Aravalli hill range by [13] and in the Mahendergarh district of Haryana by [14] found that members of the family Leguminosaceae were the most prevalent.

The dominant families that were found on our selected sites were the Solanaceae and the Asteraceae families. Herbaceous plants were dominating life forms in this region followed by shrubs, trees and climbers. These findings are in accordance with [15] [16] [17]. One possible explanation for this is that they are more readily available in the surrounding regions than other species of vegetation, such as trees and bushes.

According to the findings of this research, the plant component that is utilised the most commonly is the leaf, followed by fruits, seeds, and other plant parts. Many additional ethno-pharmacological and ethno-medicinal investigations, such as the ones conducted by [18] [15] [16] have found that the leaves are the plant portion that is utilised the most frequently. This can be due to the fact that leaves contain a vast reservoir of a wide variety of phyto-compounds. In contrast to the roots, stem bark, and entire plant, the harvesting of the leaves is the only activity that assures the plants' continued existence.

It was observed that the younger generation in the study area is less interested in traditional medicines as the same was observed by [19] [17] possibly due to the modernization. Our research provided evidence in support of the availability hypothesis and demonstrated that the vast majority of therapeutic plants may be found growing naturally as part of the local flora.

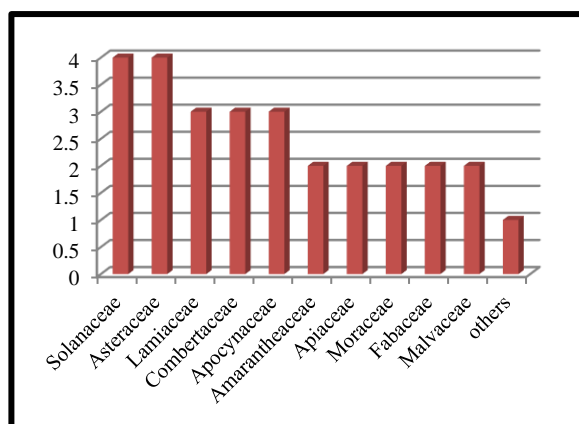


Fig. 2. Showing number of species in leading families on selected sites of district Hisar.

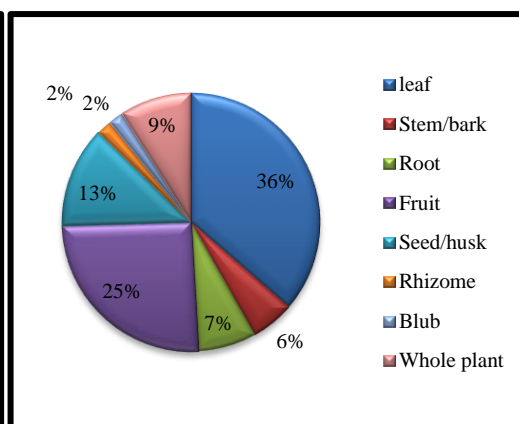


Fig. 3. Showing percentage of different plant parts used in Traditional medicines on selected sites

Table II. List Showing Family Wise Number Of Genera And Species Present On The Selected Study Sites

Sr. No.	Family	No. Of Genera	No. Of Species	Sr. No.	Family	No. Of Genera	No. Of Species
1	Alliaceae	1	1	21	Myrtaceae	1	1
2	Amaranthaceae	2	2	22	Oleaceae	1	1
3	Annonaceae	1	1	23	Plantaginaceae	1	1
4	Apiaceae	2	2	24	Portulacaceae	1	1
5	Apocynaceae	3	3	25	Phyllanthaceae	1	1
6	Asparagaceae	3	3	26	Piperaceae	1	1
7	Asteraceae	4	5	27	Polygoaceae	1	1
8	Brassicaceae	1	1	28	Pedaliaceae	1	1
9	Caricaceae	1	1	29	Punicaceae	1	1
10	Combretaceae	1	3	30	Poaceae	1	1
11	Convolvulaceae	1	1	31	Rosaceae	1	1
12	Crassulaceae	1	1	32	Rutaceae	1	1
13	Cucurbitaceae	1	1	33	Raphanaceae	1	1
14	Fabaceae	2	2	34	Rhamnaceae	1	1
15	Lamiaceae	3	3	35	Solanaceae	4	4
16	Linaceae	1	1	36	Theaceae	1	1
17	Moraceae	2	2	37	Umbelliferae	1	1
18	Malvaceae	2	2	38	Vitaceae	1	1
19	Musaceae	2	2	39	Zinziberaceae	1	1
20	Menispermaceae	2	2				

Table III. Enumeration of medicinally important plant species collected from selected study sites

S.N	Botanical name	Family	Local name	Part used	Significance	Presence or absence at study site (village 1-5)				
						1	2	3	4	5
1	Allium sativum Linn.	Alliaceae	Garlic	Blub	Hypotensive	+	+	+	+	+
1	Achyranthes aspera Linn.	Amaranthaceae	Ula kanta plant	Whole plant	Cure heart disease	+	-	+	+	-
2	Avena sativa Linn.	Poaceae	Oat	Whole plant	Antihypertensive	+	+	+	+	+
3	Annona muricata	Annonaceae	Mamphal or sitaphal	leaf	Anti-hypertensive	-	-	+	+	+
4	Apium graveolens Linn.	Apiaceae	Celery	Seed	Hypolipidemic, antidiabetic and Anti-hypertensive	+	-	+	-	+
5	Bidens pilosa Linn.	Asteraceae	Vertica natr	Leaves	Antihypertensive	+	+	+	-	+
6	Brassica compestries Linn. Var botrytis.	Brassicaceae	Mustard	Seed	Reduce risk of cardiovascular disease	+	+	+	+	+
7	Bryophyllum Linn.	Crassulaceae	Patherchat	Leaf extract	Anti-hypertensive	+	+	-	+	+
8	Catharanthus roseus (Linn.) G. Don.	Apocynaceae	Sadabahar	Leaves	Lipid lowering and anti atherosclerotic activity.	+	+	+	+	+
9	Camellia sinensis	Theaceae	Tea	Leaves	Reduce BP and cholesterol level	-	-	-	-	-
10	Capsicum annum Linn.	Solanaceae	Chili	Fruits/pods	Full of vitamin C, reduce cholesterol	+	+	+	+	+
11	Carica papaya Linn.	Caricaceae	Papaya	Leaf extract	Lower blood pressure	+	-	+	-	+
12	Carum copticum (Linn.) Benth.& Hook.f.	Apiaceae	Ajwain	seed	Blood purifier	+	+	+	+	-
13	Chinopodium umbrosum Linn.	Amaranthaceae	Bathua	Leaves	Heart tonic	+	+	+	+	+
14	Cuscuta reflexa Roxb.	Convolvulaceae	Amarbel	Stem extract	antidiabeticactivity Antidiabetic and anti hypertensive	+	-	+	+	+
15	Dacus carota Linn.var. sativa DC.	Umbelliferae	Carrot	Fleshy root	Reduce BP	+	+	+	+	+
16	Eclipta alba Linn.	Asteraceae	False daisy	Whole plant	Anti-hypertensive, reduce cholesterol	+	+	+	+	+

17	Eclipta prostrata Linn.	Asteraceae	Bhringraj	Whole plant	Anti-hypertensive, reduce cholesterol	+	-	+	+	+
18	Ficus carica Linn.	Moraceae	Fig	Leaf extract and fruit	Free radical scavenging activity	+	+	-	+	+
19	Glycine max(Linn.) Merr.	Fabaceae	Soyabean	Seed	Anti-hypertensive	-	+	-	-	+
20	Gossypium barbadense Linn.	Malvaceae	Pima cotton	leaves	Reduce BP	+	+	+	+	+
21	Gundelia tournefortii Linn.	Asteraceae	Gundelia	Leaf extract	Lower blood fat	-	+	+	+	+
22	Hibiscus sabdariffa Linn.	Malvaceae	Rosella	Infusions of calyx and leaves	Anti-hypertensive	-	+	+	-	-
23	Linum usitatissimum Linn.	Linaceae	flaxseed	Seed	Antihypertensive, and cholesterol-lowering	+	+	-	+	+
24	Lycopersicon esculantum Mill.	Solanaceae	Wild tomato	Fruit	Antihypertensive effects	+	+	+	+	+
25	Melilotis indica (Linn.) All.	Fabaceae	Wild fenugreek	Leaves	Reduce blood glucose level	+	+	+	+	+
26	Mentha longifolia (Linn.) Huds.	Lamiaceae	Podina	leaves	Reduce blood fat	+	+	+	+	+
27	Momordica charantia Linn.	Cucurbitaceae	Bitter melon	Fruit	Lower blood Cholesterol	+	+	+	+	+
28	Morus alba Linn.	Moraceae	Shahtut	Fruit	Lower blood glucose	+	+	+	+	+
29	Musa indica Linn.	Musaceae	Banana	fruit	Reduce risk of heart attack	+	-	+	+	+
30	Murraya koenigii Linn.	Rutaceae	Curry patta	Leaf extract	Anti-hypertensive, Reduce blood cholesterol	+	+	+	+	+
31	Nerium oleander Linn.	Apocynaceae	Kaner	Leaves	Antioxidant protection, anti-inflammatory	+	+	+	+	+
32	Nyctanthes arbor-tristis Linn.	Oleaceae	Harsingar	Leaves	Antihyperlipidemic activity	+	+	+	+	+
33	Ocimum basilicum Linn.	Lamiaceae	Kali tulsi	Leaves	Hypocholesterolemic and hypotriglyceridemic	+	+	+	+	+
34	Piper nigrum Linn.	Piperaceae	Black pepper	Fruit	Prevents lipid peroxidation,	-	+	+	-	-
35	Plantago ovata	Plantaginaceae	Blond psyllium	Seed and husk	Reduce blood cholesterol	+	+	+	+	+
36	Phyllanthus emblica Linn.	Phyllanthaceae	Emblic, Indian gooseberry	fruit	Reduce BP, cholesterol Antioxidant	+	+	+	+	+
37	Portulaca oleracea Linn.	Portulacaceae	Little hogweed	Leaves	Blood purifier	+	+	-	+	+
38	Punica granatum Linn.	Punicaceae	Anar	Fruit	prevention from cardiovascular disease, diabetes	+	+	+	+	+
39	Rauwolfia serpentina Benth.ex Kurz.	Apocynaceae	Sarpagandha	Root	Induces bradycardia, hypotensive	+	+	+	-	+
40	Raphanus sativus Linn.	Raphanaceae	Radish	Fleshy root	Hypotensive	+	+	+	+	+
41	Rosa indica Mill.	Rosaceae	Rose	Flower	Cardioprotactant	+	+	+	+	+
42	Rosmarinus officinalis Linn.	Lamiaceae	Mint	Leaves	Hypoglycemic, hypolipidemic, hypotensive, anti-atherosclerotic	+	-	+	-	+
43	Rumex crispus Linn.	Polygonaceae	Palkiya	Leaves	Reduce blood fat & blood pressure	+	+	+	+	+
44	Ruscus aculeatus Linn.	Asparagaceae	Shatavar	Whole plant extract	Decreased venous hypertension	-	+	+	+	+

45	Sesamum indicum Linn.	Pedaliaceae	Till	Seed	Reduce blood fat	+	+	+	-	-
46	Solanum nigrum Linn.	Solanaceae	Makoy	Leaves and fruit	Cure heart ailments	+	+	+	+	+
47	Syzygium aromaticum (Linn.) Skeels	Myrtaceae	Laung	Closed bud	Reduce blood fat	-	-	-	-	-
48	Terminalia arjuna (Roxb.)W.&A.	Combretaceae	Arjuna	Bark	Cardiac tonic, Hypotensive	+	+	+	+	+
49	Terminalia bellirica (Gaertn.) Roxb	Combretaceae	Bahera	Fruit	Anti-hypertensive, anti heart stroke, Cardiac tonic	-	+	+	-	+
50	Terminalia chebula Retz.	Combretaceae	Hard	Stem/bark	Cardiac tonic	+	-	+	+	+
51	Tinospora cordifolia (Willd.) Miers ex Hook. F.& Thoms.	Menispermaceae	Mol-shri	fruit	Cardioprotectant	+	+	+	+	+
52	Vitis vinifera Linn.	vitaceae	Grape	fruit	Lower	+	+	+	+	+
53	Withania somnifera (Linn.)	Solanaceae	Asgand, Ashwagandha	Root	Reduce blood cholesterol	+	+	+	+	+
54	Zinziber officinales Ros.	Zinziberaceae	Ginger	Rhizome (underground stem)	Anti-inflammatory, antioxidant, anti-platelet, hypotensive and hypolipidemic	-	+	+	-	+
55	Zizyphus jujube Mill.	Rhamnaceae	Chhota ber	Fruit	Blood purifier, Anti-hypertensive,	+	+	+	+	+

V. CONCLUSION

Our connection with nature is as old as human civilization, and man has been searching for medicines in nature for thousands of years. There is much proof of this, including preserved monuments, written records, ethno-medical knowledge, and even original plant medicines. People are now becoming more aware of the negative effects of antihypertensive medications as well as the value of having nearby herbal plants and ayurvedic treatments. Scientists are doing a number of ethno-botanical researches to learn more about plants that have historically been used by people to treat hypertension and other heart-related illnesses. Thus, the present study concluded that the plant diversity at district Hisar is full of medicinal plants particularly used for hypertension and cardio-vascular disease. By presenting them with information on the nature, make-up, and production of a number of other ayurvedic medications, whose benefits and usefulness in severe instances are already well recognised, the general public will become more knowledgeable. However, inadequate attempts are being made to preserve these medicinal resources and the associated traditional knowledge. In order to preserve the indigenous medicinal plant resource, it is advised to construct nurseries for medicinal plants and to increase local community involvement.

CONFLICT OF INTERESTS

The authors declare that they have no conflict of interest regarding the present research work.

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