



Journal of Plant and Environmental Research (ISSN: 2475-6385)



Herbal home garden and ex-situ conservation of medicinal plants for promotion and conservation of traditional health knowledge: a geographical perspective

Nitu

University of Delhi, Delhi

ABSTRACT

Herbal home remedies have a long history which is in the form of oral tradition. Herbs and other locally available medicinal plants have been used for healing purposes and maintaining good health since time immemorial. These practices of healthy living and use of herbs for curing diseases enunciated in Ayurveda and are in vogue in Indian households even today. The current status of herbal home garden along with government and private run herbal gardens have been studied in Haridwar (Uttarakhand), and Kangra district of Himachal Pradesh in the year 2008-2009 and 2012-2013 respectively. From Haridwar, total of 75 households were chosen from three distinct geographical locations by using random sampling method. Herbal gardens of Brahmavarchas located at Shatikunj, and Patanjali Yogpeeth, Haridwar were also taken for the study. From the district Kangra, two governments and one private owned herbal gardens were chosen for the study. For the collection of primary information, well-structured questionnaires were used during the field surveys. Focus Group Discussion and personal interviews were applied to document the uses of medicinal plants as health care measure. Besides a review of relevant literature, the research used a variety of qualitative techniques, such as semi-structured, in-depth interviews and participant observations. The present study facilitates a better understanding of the present status of indigenous knowledge system, local innovations and practice of herbal based home remedies and the traditional knowledge is diffused in the society. The cultural set up and old aged traditional knowledge system is a way of life in Indian households and Indian kitchen and herbal home garden render valuable health care system. Irrespective of geographical localities viz. rural and urban settlements, the role of herbal home garden (kitchen garden) is very significant in providing accessible health facilities. Sixty four per cent respondents including traditional healers (Vaidyas) consider kitchen garden as source of good health. In the studied villages of Haridwar, 65 per cent respondents have herbal home garden (kitchen garden) and it is considered as source of good health.

Keywords: Herbal home garden (kitchen garden), medicinal plants, herbal home remedy, common ailments, geo-garden

*Correspondence to Author:

Nitu

University of Delhi, Delhi

Email: ngoswami650 @gmail.com

How to cite this article:

Nitu Goswami. Toxicological Herbal home garden and ex-situ conservation of medicinal plants for promotion and conservation of traditional health knowledge: a geographical perspective. Journal of Plant and Environmental Research, 2016, 1(1): 0031-0041.

eSciencePublisher®

eSciPub LLC, Houston, TX USA.

Website: <http://escipub.com/>

INTRODUCTION

In many parts of India, indigenous knowledge related to availability and uses of medicinal plants has not been thoroughly catalogued and the quantitative information on the role of medicinal species in the rural socio-economy is limited (Dobriyal et al., 1997 and Farooquee et al., 1996). Today the demand of medicinal plants has increased to such an extent that it leads to overexploitation of the natural resources. Rasayanas present in the medicinal plants are rejuvenators, nutritional supplements and possess strong antioxidant activities and act as immunomodulator and is in high demand for health benefits (Kumar et al., 2012). Medicinal plants' sector is a highly unorganised one degradation of Himalayan Bioresources leading to demand supply gap (Table 1). Herbs, Health and Livelihood have always been interlinked and provide promising future. The popularity of traditional healing system has increased considerably in the past one decade. The demand from the urban population and developed world had alarmingly increased the over-exploitation of forest resources. Herbal based activities have always had its impact on local families and livelihood. Earlier about a decade ago the dependence on forest and forest resources were ample in the forest based villages and consequently the villagers earn livelihood from it. But since last few years the extreme pressure on forest resources had led to ban the open access to the local people. This has severely hit those whose livelihood solely depends on the forest.

MATERIALS AND METHODS

The current status of herbal home garden along with government and private run herbal gardens have been studied in Haridwar (Uttarakhand), and Kangra district of Himachal Pradesh in the year 2008-2009 and 2012-2013 respectively. From Haridwar, total of 75 households were chosen by using random sampling method. Herbal gardens of *Brahmavarchas* located at Shatikunj, and Patanjali Yogpeeth, Haridwar were also taken for the study. From the district Kangra, two governments and one private owned herbal gardens were chosen for the study. For the collection of primary information, well-structured questionnaires were used during the field surveys. Focus Group Discussion and personal interviews were applied to document the uses of medicinal plants as health care measure. Besides a review of relevant literature, the research used a variety of qualitative techniques, such as

semi-structured, in-depth interviews and participant observations. The primary tools adopted include checklist of questions for key informants and case study (traditional healer). Statistical techniques such as factor analysis and correlation have been used using SPSS software.

RESULTS AND DISCUSSION

Medicinal plants used in India are still a living tradition. This is borne out by the fact that there exist around a million traditional, village-based carriers of herbal medicine traditions. Apart from these specialized carriers, millions of women and elders possess traditional knowledge of herbal home-remedies, food and nutrition reflecting distinct cultural value system. Kitchen garden has been a prime source of herbal home based remedies especially elder women are specialized in making home based herbal remedies since time immemorial. The knowledge of herbal medicinal formulations varied across the different genders in the society. There was about 81 per cent of the old females in the rural community of Haridwar possess significant knowledge as compared to old males and younger generation. The old women and grandmothers in the family are always known for their sound tips for treating common ailments who learnt the oral tradition from their elders commonly known as '*Daadi maa ke gharelu nuskhe*' (grandmother's tips of home remedies). With respect to belief in herbal home remedies, people show much belief in it but in terms of its use, the usage pattern has experienced a declining trend. The reasons for this came out by the findings is the easy accessibility and availability of allopathic medicine as compared to traditional home based healing system followed by declining state of forest and green cover (Nitu, 2010).

Non Communicable Diseases (life style diseases) contributes almost half of the all cause death in India. Health seeking behaviour of people in India is closely interwoven in the diverse geography and socio-cultural background. Codified system of Ayurveda possess symbiotic relation with the medical lore and acknowledge social and ecological factors along with mental make-up of the patient. But the problem is synergetic convergence of healing models for attaining holistic health and to address this Grassroot to Global Model (G to G) mapping is suggested (Nitu, et al. 2016). In Himachal Pradesh, 95 per cent of Tibetans and 70 per cent of Ayurvedic healers reported its popularity mainly for life style diseases i.e blood pressure, diabetes, arthritis,



Figure 1: Medicinal Plants at Kangra Herbs Pvt. Ltd.



Plate 2: A preview of kitchen garden in village Meerpur, Haridwar (Uttarakhand)

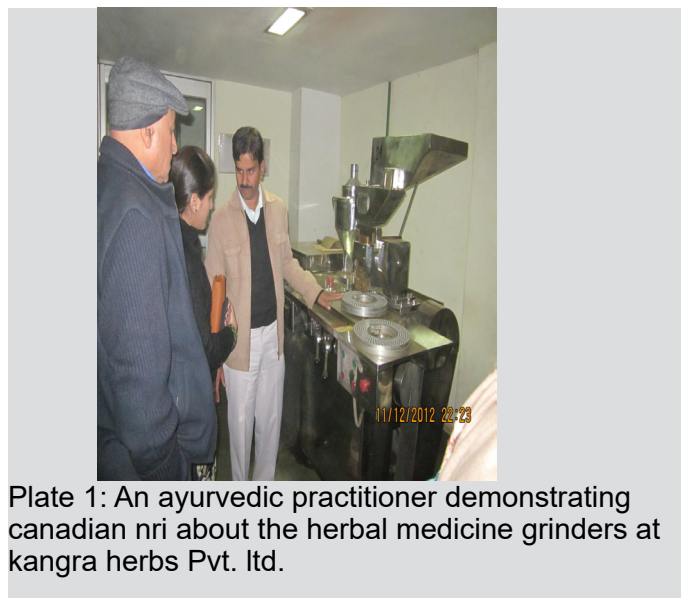


Plate 1: An ayurvedic practitioner demonstrating a canadian nri about the herbal medicine grinders at kangra herbs Pvt. Ltd.

Table 1: Demand and supply of medicinal plants in north-west Himalaya

Botanical name	Demand (tonnes)	Supply (tonnes)
<i>Orchis latifolia</i>	More than 5000	Less than 100
<i>Rauwolfia serpentina</i>	More than 5000	Less than 1000
<i>Gentiana kurrroo</i>	More than 5000	Less than 100
<i>Aconitum heterophyllum</i>	More than 1000	Less than 100
<i>Plumbago zeylanica</i>	More than 1000	Less than 100
<i>Onosma bracteatum</i>	More than 5000	Less than 100
<i>Picrorrhiza kurroa</i>	More than 5000	Less than 100
<i>Dioscorea deltoids</i>	More than 5000	Less than 100

Source: Ministry of Health, New Delhi. Quoted in Jain 1987.

obesity and liver problems. Two major trends in terms of herbal medicine system have been emerged in the study region. It may be categorized into two i.e. local Himachalis' initiatives and the Tibetans' initiatives in promotion of herbal medicine system. In terms of local Himachalis, the government subsidy have made very few local progressive farmers to establish small scale herbal unit. But the benefits are restricted to limited number of rich and influential people and the very aim of the government policy (*Har gaon Ki Kahani*) of dissemination of traditional medicine knowledge is far from success. Whereas, Tibetans in exile are doing good effort in sustaining this knowledge system and they are willing to receive government support in this area. A 95 year old Tibetan healer has repute of being an effective healer. Many urban people from different states of India along with various foreigners visit his clinic at least once in a year. The local shopkeepers and tourist service providers claim him to be an efficient healer for cancer. They claimed that they have seen many people got cured from his medicines and treatment pattern. Many patients out of love and affection have donated him big pieces of land and thus it shows the amount of impact of his treatment. The treatment of Tibetans depends on the raw materials for medicinal plants. They have reported the collection of herbs from Delhi or Chandigarh market. Some of the healers also reported the collection from the Dhauladhar mountains. There are several herbal factories situated in nearby Kangra district. The present pattern of collection not only exerts huge pressure on the Dhauladhar mountains but also diminish several species from the forest and hill region. Taking this into consideration, efforts have been made by the government to establish herbal gardens and subsidize private herbal gardens too.

Sustainable Cultivation of Medicinal Plants in Kangra district, Himachal Pradesh Institute of Himalayan Bio-resource Technology (IHBT) situated at Palampur, Himachal Pradesh is devoted to ex-situ cultivation of Himalayan medicinal plants. *Picrorhiza kurroa* is used for preparation of several drugs. IHBT has collected several accessions from different agroclimatic zone of HP and maintaining them in the farm under controlled condition. The plant has been successfully domesticated under agro-climatic condition. Research and development is also being carried out to understand the regulation of *picroside biosynthesis*. There are several medicinal plants which are at brink of extinction due to overexploitation. *Aconitum hetrophyllum* is

one among them which has been domesticated under ex-situ conservation technique and efforts are under way for cryopreservation of the seeds. *Gingko biloba*, *Salvia sclarea*, *Crocus sativus* and *Arnebia euchroma* are under domestication at IHBT. The institute has released its own variety called HIMBALA by years of study on *Valeriana jatamansi*, HIMKACHRI from *Hedychium spicatum* and HIMHALDI from *Curcuma aromatic*. Kangra Herbs Pvt. Ltd. is situated in Kangra district of Himachal Pradesh. It is owned by privately owned micro herbal factory. About 514 herbs are grown ex-situ and processing of those herbs is completed thereafter. About 11000 acres of land is devoted to organic farming of these herbs (Fig. 1 and plate 1). Herbal Garden Joginder Nagar situated at Mandi near Baijnath block of Kangra is devoted particularly for the ex-situ conservation of medicinal plants. The prime objective of herbal garden is to develop Agro-Techniques of medicinal plants for making cultivation of medicinal plants to supplement the income of the people of the state, generating awareness on the various aspects of the medicinal plants among the people and by providing practical demonstration to the students of Ayurvedic College, Paprola for identification of the medicinal plants. Varieties of tree, herbs and climber species are cultivated in the garden. For instance, about 28 tree species are maintained in the garden among which *Cinnamomum tamala* has 312 maintained plants and *Embllica officinalis Gaertn.* has 144 plants for conservation. Herb species contain 24 types among which *Ocimum kilimandscharicum Guerke* have about 1200 plants maintained and 230 plants maintained for *Plumbago zeylanica L.* species.

EXISTENCE OF HERBAL GARDEN IN HARIDWAR DISTRICT OF UTTARAKHAND

The rural people have special talent especially farmers who are near to nature and is experimenting with the resources available. Brahmavarchas, Shantikunj, Haridwar has a big herbal garden with varieties of medicinal plants which is indeed a good work carried by such institution and the students of the University also get benefit during their research work. Patanjali Yogpeeth situated at Haridwar has herbal garden for ex-situ conservation. Some common species are *Piper longum*, *Plumbago capensis*, *Plumbago zeylanica*; *Abroma augusta*, *Acorus calamus*; *Ricinus communis*, *T. chebula*, *Tinospora cordifolia*, *Tylophora indica*, *Uraria picta*, *Viola odorata*, *Vitex negundo*, *Withania somnifera*, etc.

Table 2: List of common spices in the Herbal Home Garden/Kitchen garden and kitchen

Species of Medicinal Plant/ Latin name	Local Name	Parts Used	Source
<i>Allium cepa</i>	Pyaz	Fruit	Kitchen garden
<i>Brassica rugosa</i>	Rai	Seed	Kitchen garden
<i>Foeniculum vulgare</i>	Saunf	Fruit	Kitchen, purchase
<i>Capsicum anum</i>	Mirch	Fruit	Kitchen garden
<i>Cinnamomum verum</i>	Dalchini	Fruit	Locally available/ Purchase
<i>Ferula narthex</i>	Heeng	Fruit	Kitchen, purchase
<i>Piper nigrum</i>	Kali-mirch	Fruit	Kitchen, purchase
<i>Cuminum cyminum</i>	Jira	Fruit	Kitchen, purchase
<i>Curcuma domestica</i>	Haldi	Fruit	Kitchen garden
<i>Zingiber officinale</i>	Adrak /sonth	Rhizome	Kitchen garden
<i>Coriandrum sativum</i>	Dhaniya	Leaves	Kitchen garden
<i>Foeniculum vulgare</i>	Saunf	Fruit	Kitchenpurchase
<i>Curcuma domestica</i>	Haldi	Rhizome	Kitchen, purchase
<i>Brassica campestris</i>	Sarson	Seed	Kitchen garden
<i>Trigonella foenum-graecum</i>	Methi	Seed,leaves	Kitchen,purchase garden
<i>Trachyspermum ammi</i>	Ajwain	Fruit /seed	Kitchen
<i>Allium sativum</i>	Lahsun	Bulb	Kitchen garden

Source: Primary Survey, 2009

Role of Herbal Home Garden (kitchen garden) in promoting herbal home remedies (HHR)

There is significant role of Herbal Home Garden (kitchen garden) in promoting Herbal Home Remedies (HHR) and maintaining good health in urban Delhi and rural Haridwar. The availability of spices in the kitchen and HerbalHome or kitchen garden of surveyed villages play significant role as a means of readily available ingredients for home-made herbal formulations (Table 2). 64 per cent respondents consider kitchen garden as a source of good health. It is the source of vegetables, spices, fruits etc. which are used as home remedies in common ailments i.e., ginger, garlic, basil, lemon etc. Spices in the kitchen are an ultimate source of daily food requirement as well as medication which is not only effective but cheaper also. Herbal Home /kitchen garden purifies the surroundings and has a very good impact on the health of an individual. 20 per cent respondents believe that sometimes it provides benefit to health but most of the time it is the source of providing eatables like vegetables, spices, fruits etc. which provides monetary gains too. Whereas very insignificant percentages of respondents (16 per cent) feel that it has nothing to do with good health. In the study villages of Haridwar also, sixty four per cent respondents consider kitchen garden as a source of good health. It easily provides them vegetables, spices, fruits etc. those are used as home remedies in common ailments i.e., ginger, garlic, basil, lemon etc. In the surveyed regions of North- West Delhi and Haridwar, there was significant percentage of open space earlier but at present it is declining fast. The reason behind is the land use change viz. concrete house, increase in the cost of land and multifold increase in the population. Although these villages have more open space as compared to city life but slowly it is also taking the pattern of city life. Though in rural Haridwar, sixty five per cent respondents have open space near their house which are used as kitchen garden called 'gher' a place where animals are kept, though earlier it was inside the house and people spent lots of time with the trees and green environment. 35 per cent respondents have no open space due to increase in family size and the space is consumed for making house and the size and shape of kitchen garden has shrunk considerably. Due to unavailability of open space, the kitchen garden is also decreasing, people prefer buying vegetables, fruits etc. from the market at high rates. The reason behind is that people are no more interested to

grow vegetables and other daily used food items, they have quite fair economic condition or buying capacity and good living standard. About 41 per cent respondent are not interested in growing plants as the younger generation are not interested in physical labour and prefer to enjoy lavish and easy life, instead of farming activity they mostly prefer taking jobs according to their educational background. Although 55 per cent of the respondents are interested in growing herbal plants in the kitchen garden and 4 per cent are such respondents who have little interest in growing plants as they often take interest in growing plants whenever they have free time. In the surveyed villages about 56 per cent of households grow vegetables and spices in the kitchen garden although this is quite less compared to past. The most commonly grown vegetables are *Palak*, *Pudina*, *Dhaniya*, *Neembu*, *Amrood*, *Neem*, *Jamun*, *Kumhda*, *Lauki*, *Gajar*, *Adrak*, *Kheera*, *Bhindi*, *Tulsi*, *Gulab*, *Sadabahaar*, *Pyaz*, *Lehsun* etc. The kitchen is a prime source of many useful medicinal items used by grandmothers and mothers for curing many minor ailments such as cough, cold, boils, headache etc. There are several herbal items in the form of spices in the Indian kitchen which are used to increase the taste of the food as well as for health ailments. 31 per cent are using it for other purposes like keeping animals, and other agricultural items and 13 per cent grow fruits like guava, *Jamun*, *Papita* etc. (Table 2 and 3). Factor analysis through SPSS software is calculated and one of the major component called common kitchen remedy have been analysed. Here *Allivum sativum* has got the maximum factor loading of 0.475 and mean of 2.9733. This shows that *Allivum sativum* play significant role as home remedy (Nitu, 2010). The impact of urbanization also play significant role in the two surveyed villages of Haridwar i.e, Pherupur and Salempur (near Roorkee city), the presence of kitchen garden is also under pressure. All houses have become concrete/ *pucca*. People have good purchasing power and young generation is more inclined towards urban life style. On the other hand the third surveyed village named Meerpur was about 8 km far from the city and there is lack of transportation. Here almost every household have kitchen garden and they are using it for maintaining their health. Young generation is also taking interest in growing plants considering it beneficial for cheap availability of spices, fruits and vegetables. Being far from the city and lack of transportation facilities especially after noon, people of Meer-

pur village utilizes the benefits of Herbal Home garden to meet their day to day requirements of vegetables, spices as well as readily available herbal plants. The data reveals that the villagers from Meerpur are more inclined in using herbal home remedies as compared to other villages which were quite near to the city and having good transportation connectivity. The respondents informed that the greenery has decreased remarkably since last two decades in the villages. About 55 per cent of the respondent believed that the greenery is under acute pressure due to urbanization and pollution. 60 – 70 per cent of land from adjacent villages has gone to Ro-orkee development belt, power stations building and residential uses. Every geographical area has some specific native plants naturally grown according to its climatic condition. The common plant species in the selected villages are Basil (*Tulsi*), *Neem*, Mango, *Jamun*, *Peepal*, *Amrood* etc. (Plate 2). These plants are also important due to its medicinal properties. Besides these plants species, many other trees and plant species are found here such as *Ashok*, *Ber*, *Nimbu*, *Bargad* and all have some medicinal properties which are known and administered by the village people. Basil (47 per cent) and *Neem* (35 per cent) are commonly used plants by the community in common ailments like cold, cough, sneezing, infections etc. Both the plants have antibacterial properties which benefits as home-made medicines. Also Basil plant is the symbol of spirituality and divinity among the Indian people and is worshipped due to its benefits which have already been scientifically proven (Nitu, 2010).

CONCLUSION

The development of herbal medicines from the rich traditional source requires an integrated approach. These institutions should be motivated at large scale and the awareness should reach not only to the progressive but the general farmers also. The advantages of herbal gardens and herbal home garden would be a practical approach in finding solution to conservation of medicinal plants. Every geographical region has its unique identification and thus promoting geo-garden certainly uplift the existing situation of herbal stream. The need for coordinated conservation action based on both *in situ* and *ex situ* strategies is the answer to current depleting situation. In case of Himachal Pradesh, mere subsidizing to few progressive farmers and leaving behind huge marginal farmers is not going to work for long.

The correlation of 0.078 is also not significant which confirms that farmers have not been benefitted from the government running scheme in the district. Rather it will lead to loss of government money without any positive output. These are certain loopholes act as challenge in the growth of herbal sector. In a nutshell, infrastructural development and herbal products cultivation and manufacturing are ways forward to promote rural economy vis a vis livelihood security. To address the issue of multiplicity of agencies involved in conservation, research, and usage of the medicinal plant resource base is important to boost tourism, rural livelihood and holistic rural development approach.

REFERENCES

- Dobriyal, R.M., Singh, G.S., Rao, K.S. and Saxena, K.G. (1997) Medicinal plant resources in Chhakinal watershed in the north-western Himalaya. *Journal of Herbs, spices and Medicinal Plants* 5:15-27.
- Farooque, N.A. and K.G. Saxena. 1996. Conservation and utilization of medicinal plants in high hills of the central Himalayas. *Environmental Conservation*, 23(1); 75-80
- Nitu (2010) Herbal home remedies in north-west district of Delhi and Haridwar district of Uttarakhand, M.phil. dissertation submitted to Department of Geography, Delhi School of Economics, University of Delhi, Delhi
- Nitu, 2016 Science-policy interface for transformation of Asian medicine: An insight into Ayurveda combating lifestyle diseases for promotion of global health, panel submitted to International Congress on Traditional Asian Medicine (ICTAM) to be held at University of Kiel, Germany Aug. 2017
- Kumar, Dinesh, Vikrant Kaur, Ranjeet, Bhat, Zufiqar Ali Gupta, Vivek Kumar, Kumar, Vijender (2012) A review of immunomodulators in the Indian traditional health care system, *Journal of Microbiology, Immunology and Infection* 45, 165-84

Web-References

www.google.com



Table 3: Herbs used in the Treatment of Various Common Ailments

Disease Description	Herbs used Vernacular / local name
Dental pain	<i>Laung</i> <i>Rai</i> <i>Chirchita</i> <i>Sarson tel</i> <i>Neem</i> <i>Palash</i> <i>Phitkari</i> <i>Papita</i> <i>Akarkara</i>
Itching	<i>Papita</i> <i>Nausadar</i> <i>Sarson tel</i>
Eye pain, boils in eyes	<i>Aloo</i> <i>doodh</i> <i>Gundi ghaas</i> <i>Gulab</i>
Blisters in mouth	<i>Pudina</i>
	<i>Ajwain</i> <i>Doodh</i> <i>Adrakh</i> <i>KucchaAmrood</i> <i>Neem</i> <i>Khajoor</i> <i>Haldi</i> <i>Mulethi</i>

Vomiting	<i>Pyaz</i> <i>Laung</i> <i>Pudina</i>
Sinusitis and headache	<i>Dakhni mirch, Badam</i>
Cough & cold	<i>Tulsi</i> <i>Sonth</i> <i>Kalimirch/ Dakhni mirch</i> <i>Paan</i> <i>Pipali</i> <i>Dalchini</i> <i>Adrakh</i> <i>Jaiphal</i> <i>Lyptus</i> <i>Jau</i> <i>Badam</i>
Boils	<i>Haldi</i> <i>Neem</i> <i>Ghritkumari</i>
Pimples	<i>Multani Mitti, Nimbu</i>
Acidity and indigestion	<i>Jeera</i> <i>Neebu</i> <i>Methi</i> <i>Heeng</i> <i>Panwar</i>
Constipation	<i>Triphla, doodh</i>
Earache	<i>Genda</i> <i>Sarson tel</i> <i>Lehsun</i> <i>Sudarsan patte</i>

Fever	<i>Lauki</i> <i>Karela</i> <i>Chirchita</i> <i>Giloy</i> <i>Ajwain</i> <i>Dronapushpi/ Gumma</i>
Insect bite	<i>Tulsi</i> <i>Sadabahaar</i> <i>Nausadhar</i>
Worms in stomach	<i>Madwa</i>
Loose motion, blood in stool	<i>Dhaniya</i> <i>Methi</i> <i>Jeera</i> <i>Sonth</i> <i>Neembu</i> <i>Chai ki Patti</i> <i>Dahi</i> <i>Isabgol, moong dal water</i>
Headache	<i>Kaalimirch, Tulsi, Adrak</i>
Broken bone	<i>Alsi</i>
Cold among children	<i>Kaalimirch</i>
Piles	<i>Nariyal</i>
Cracks in legs	<i>Sarson tel</i>
Stomachache	<i>Heeng</i> <i>Methi</i> <i>Tulsi</i>
Bodyache	<i>Nimbu</i> <i>Adhrakh</i>
Leg's pain	<i>Sonth</i> <i>Methi</i>
Diabetes	<i>Sadabahar</i> <i>Jamun</i> <i>Karela</i>
Leucorrhoea	<i>Sheesham</i> <i>Nariyal</i>
Swelling	<i>Namak</i>

Typhoid	<i>Munnaka</i> <i>Kala namak</i>
Breathing problem	<i>Arjun, methi</i> <i>Ajwain, lehsun,</i>
Backache	<i>Palaash</i> <i>Dhaak Ki Kani</i>
Snake bite	<i>Chirchita</i> <i>Tulsi</i> <i>Desi ghee</i>
Break in speech	<i>Gular</i>
Jaundice	<i>Papita</i>
Puss	<i>Akha</i>
Dysentry	<i>Mirch</i> <i>Nimbu</i>
	<i>Tambaku</i>
	<i>Gehun</i>
Dry Skin and hair	<i>Amla</i> <i>Reetha</i> <i>Neem</i> <i>Mehndi</i>
Any Pain	<i>haldi, choker, sarson tel</i>