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Research Article

AN ETHNO-PHARMACOBOTANICAL SURVEY IN GURAI VALLEY KASHMIR

Gowher Guna¹ and Nazima Rasool^{2*}

¹Department of Botany, ICSC, Hawal, Srinagar, J&K, India

²Department of Botany, Kargil Satellite Campus of Kashmir University,
Khumbathang, Suru Valley, Kargil, 194105, J&K, India

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ABSTRACT

Purpose: The therapeutic uses and methods of administration of plants/plant parts in the traditional system of medicine in Gurais Valley are documented in view of the need felt world over to preserve the valuable knowledge of traditional system of medicine.

Methods: A survey was conducted to assess such plants as are used to treat various kinds of ailments in the traditional system of medicine in the Gurais Valley inhabited by ethnic Dards/Shins. After the evaluation, only the plant species the medicinal use of which was confirmed by at least three resource persons were included in the results. Cross-checking was done for disorders treated, methods of use and preparation used for each of the species included.

Results: After the assessment of a total of 89 plant species only 56 species were found to have confirmed medicinal uses and were commonly found to treat various kinds of ailments. These 56 plant species belonging to 53 genera in 28 families, their scientific names, vernacular names along with their medicinal use, the part of plant used and method of preparation are reported in the present study.

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INTRODUCTION

The present study was carried out in the Gurais valley of the Jammu and Kashmir State. Gurais previously known as Kishenganga is located between 34.6494° N and 74.7366° E and comprises an area of about 4,143 hectares. The Valley, on an average is 35 km from north to south and 130 km from east to west (Figure 1). The Valley is surrounded by Ladakh in its north, Bandipora in south, Srinagar in southeast and Kupwara district in the west. The Valley lies at an altitude of about 2,370 m asl. The main road leading to the Valley from Srinagar crosses the Rajdhani Pass at about 3,660 m asl from where the road drops to Gurais. The maximum temperature is around 33 °C in July and the minimum temperature - 23.3 °C in January. The area receives less rainfall due to its high mountain ranges which act as a barrier to monsoon currents. On the other hand during winter months it receives heavier precipitation in comparison to Srinagar.

The Valley is occupied by ethnic Dards/Shins, who speak Dardi or Shina language. Local people largely draw their sustenance from the forest, being dependent on it for their food, fodder, medicinal and other requirements. The economy and day to day life of people is closely interwoven with the forest

reserves. Forests here, for long have been used in the traditional healthcare.

At the global level 70% of the world population has been reported to be dependent on plants for medicines and therapeutics for primary healthcare (Ghimire *et al.*, 2006; Ahmed *et al.*, 2013). The allopathic system of medicine also depends upon plants for invaluable drug mining. Unscientific and over exploitation of many medicinal plants has increased interest in ethno-botanical studies world over (PGPUB database 1, 2, 3; Harsha *et al.*, 2002). Ethnic knowledge is a global heritage (Lambert *et al.*, 1997; Ahmed *et al.*, 2013). This knowledge has been propagated mostly through the word of mouth from one generation to the next, therefore it needs to be documented and preserved (Rasool and Ganie, 2017). Of late, various studies have focused on the preservation and use of ethnic knowledge (Everest and Ozturk, 2005). Importance of ethno-botanical uses of plants has been fully recognized in the world however, in the developing world, where people are mostly poor and more heavily dependent upon the natural resources, this knowledge from different tribes and geographical locations needs proper documentation and consolidation for accessibility and the future use. The present study is a step in this direction.

*Corresponding author: Nazima Rasool

Department of Botany, ICSC, Hawal, Srinagar, J&K, India

MATERIALS AND METHODS

Data collection: The field surveys were conducted during the year 2014 and 2015 and information was collected by direct interviews with native people familiar with local system of treatment. Information on medicaments was gained through conversation with 50 persons, including men (65 %) and women (35%), in the age group of 45 to 70 years. For each species (initially 89 species) referred to as having medicinal use, precise questions were asked about the therapeutic applications and modes of administration and methods of preparation. All the plants recognized and identified by the people well versed with the local system of medicine (Hakeems and Vaid) were collected and taxonomically identified using 'Flora of British India' (Hooker, 1872-1879) and 'Flora of Pakistan' (Nasir and Ali, 1970). Voucher herbarium specimens are now preserved in Department of Pharmaceutical Science, University of Kashmir, Srinagar, J&K, India.

RESULTS

The results of the survey are reported in Tables 1 and 2. In all, 56 plant species belonging 53 genera distributed in 28 families have been reported. The families are arranged in alphabetical order and within each family plant species are also arranged alphabetically (Table 1).

Table 1 Species of the families studied during the study

S No.	Family	Species studies
1	Adiantaceae	<i>Adiantum capillus-veneris</i> L. <i>Carum carvi</i> L.
2	Apiaceae	<i>Chaerophyllum acuminatum</i> Lndl. <i>Prangos pabularia</i> Lndl. <i>Trachydium roylei</i> Lndl. <i>Achillea millefolium</i> L.
	Asteraceae	<i>Artemisia absinthium</i> L. <i>Cichorium intybus</i> L. <i>Inula racemosa</i> Hook. f. <i>Inula royleana</i> D.C <i>Jurinea ceratocarpa</i> D.C <i>Taraxacum officinale</i> L.
3	Balsaminaceae	<i>Impatiens brachycentra</i> Kar. and Kir.
4	Betulaceae	<i>Betula utilis</i> D. Don.
5	Boraginaceae	<i>Cynoglossum glochidiatum</i> Wall. ex Benth. <i>Lithospermum arvense</i> L. <i>Macrotomia benthamii</i> Wall. ex G. Don <i>Barbarea vulgaris</i> W. T. Aiton <i>Brassica campestris</i> L.
6	Brassicaceae	<i>Capsella bursa pastoris</i> L. <i>Cardamine impatiens</i> L. <i>Descurainia sophia</i> Webb ex. Prantl
7	Campanulaceae	<i>Campanula cashmeriana</i> Royle <i>Codonopsis rotundifolia</i> Benth.
8	Casculaceae	<i>Cuscuta europaea</i> L. <i>Cuscuta reflexa</i> Rox.
9	Dipsaceae	<i>Dipsacus mitis</i> D. Don.
10	Fumariaceae	<i>Corydalis falconeri</i> Hook. f. & Thom.
11	Gentianaceae	<i>Gentiana moorcroftiana</i> Wall. ex G. Don
12	Geraniaceae	<i>Geranium wallichianum</i> D. Don ex Sweet
13	Hypericaceae	<i>Hypericum perforatum</i> L.
14	Juglandaceae	<i>Juglans regia</i> L. <i>Mentha piperita</i> L.
15	Lamiaceae	<i>Prunella vulgaris</i> <i>Thymus serpyllum</i> L.
16	Linaceae	<i>Linum usitatissimum</i> L.
17	Parnassiaceae	<i>Parnassia nubicola</i> Wall.
18	Plantaginaceae	<i>Plantago major</i> L.
19	Poaceae	<i>Cynodon dactylon</i> L.
20	Polygonaceae	<i>Polygonum aviculare</i> L. <i>Rumex dentatus</i> L. <i>Rumex patientia</i> L.

22	Polyodiaceae	<i>Asplenium diantum - nigrum</i> L. <i>Aconitum violaceum</i> Jacq. <i>Androsace mucronifolia</i> Watt.
23	Ranunculaceae	<i>Anemone obtusiloba</i> D. Don <i>Caltha palustris</i> L. <i>Thalictrum cultratum</i> Wall. <i>Cydonia oblonga</i> M. <i>Geum urbanum</i> L.
24	Rosaceae	<i>Rosa webbiana</i> Wall. ex Royle
25	Rubiaceae	<i>Galium pauciflorum</i> Bunge
26	Rutaceae	<i>Dictamnus albus</i> L.
27	Solanaceae	<i>Hyoscyamus niger</i> L. <i>Solanum nigrum</i> L.
28	Urticaceae	<i>Urtica dioica</i> L.

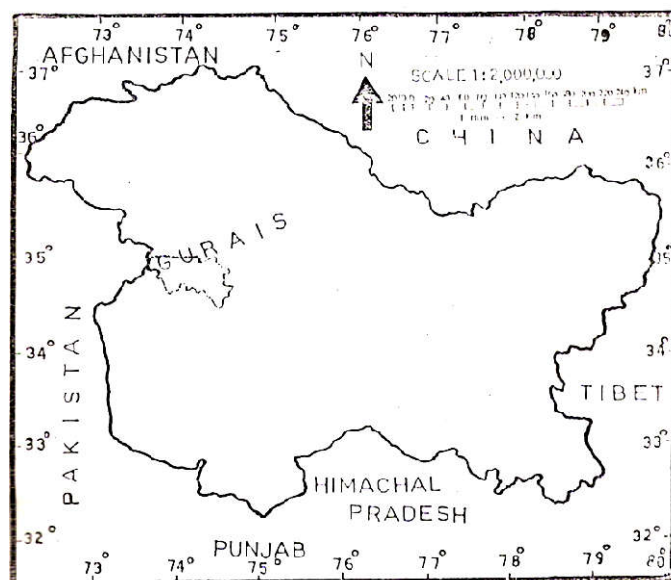


Figure 1 Map showing location of the study area

Only those species which were quoted by at least three informants have been included in the results and uncertain or equivocal data have been eliminated. For all the plants included in the list in Table 2, cross-checking was done for their medicinal value, disorders treated, method of use and preparation used. In the respective columns, botanical name, followed by family and voucher specimen number, the local name are given. Moreover, for each species, Fidelity Level was employed to determine the most important species for treating certain diseases by local herbal practitioners and elderly people living in the study area. The FL was calculated using the formula as proposed by Friedman *et al.* (1986).

$$FL(\%) = N_p \times 100/N$$

Where N_p is the number of informants that mentioned the specific plant species used to treat certain ailments, and N is the total number of the informants who utilized the plants as medicine for treating any given ailment.

DISCUSSION AND CONCLUSIONS

The survey carried out in the Gurais Valley showed that 56 species of plants, belonging to 28 families are still employed in folk medicine in more than 87 different remedies. The drugs mostly used are aerial parts (21 recipes using aerial parts), seeds (19 recipes), roots (15 recipes), leaves (14 recipes). With regard to the preparations, those for internal use (77.2 %) prevail over those for external use (22.8 %). Majority of preparations were used for gastrointestinal afflictions.

S No.	Botanical Name & Voucher Specimen	Local Names	Parts Used	Uses/ Ailments Treated	Preparation	Np	N	% FI
1	<i>Adiantum capillus-veneris</i> L. (GAG-72)	Gewtheer	Fron	Anti – odontalgic, anti inflammatory powdered fronds applied on gums and tooth cavities during toothache and dental abscesses.	Cataplasm	7 (3M, 4F)	16	43.7
2	<i>Carum carvi</i> L. (GAG-36)	Zeur	Aerial parts	Infusion taken for abdominal and digestive ailments; carminative and stomachic.	Infusion	14 (5M,9F)	22	63.63
				Seeds taken at night to cure sleep disorders.	Powder	20 (10M,10F)	22	90.90
3	<i>Chaerophyllum acuminatum</i> Lndl. (GAG-18)	Kao-kunk	Fruit	Powdered roots mixed with honey applied on skin in case of skin diseases.	Dry powder	15 (7M,8F)	22	68.18
				Dry powdered fruits mixed with honey are used to cure cold and other respiratory infections.	Dry powder	16 (8M, 8F)	20	80
4	<i>Prangos pabularia</i> Lndl. (GAG-33)	Krungus	Seeds	Analgesic: Extract of powdered seeds is used as a sedative and pain killer during serious injuries.	Extract	12 (7M, 5F)	16	75
5	<i>Trachydium roylei</i> Lndl. (GAG-106)	Churoo	Leaves	Used against post – delivery complications.	Infusion	9 (5M, 4F)	20	45
6	<i>Achillea millefolium</i> L. (GAG-70)	Pehail Gasse	Flowering tops/ whole plant	Extract is used as insecticide. Cures bile and liver troubles.	Decoction	10 (3M, 7F)	25	40
				Dry or fresh whole plant is applied to teeth for relieving tooth ache.	Decoction	12 (5M, 7F)	25	48
				Derma protective poultice is applied on skin infections.	Poultice	16 (9M,7F)	25	64
7	<i>Artemisia absinthium</i> L. (GAG- 21)	Damer	Aerial parts	Strong decoction of the herb in water or milk is given as a vermifuge particularly to children of 10 – 14 years	Decoction	15 (8M, 7F)	25	60
8	<i>Cichorium intybus</i> L. (GAG-20)	Handeposh	Flowers and Seeds	Flowers hepatoprotective Seed decoction used in problems of spleen.	Decoction	15 (8M, 7F)	18	83.33
9	<i>Inula racemosa</i> Hook. f. (GAG-100)	Poshker	Aerial parts	A paste of the dried shoots is used to cure dermatitis.	Poultice	18 (9M, 9F)	21	85.71
				Decoction of powdered roots used as antihelmenthic, carminative and in spleen disorders	Decoction	14 (8M, 6F)	21	66.66
10	<i>Inula royleana</i> D.C (GAG-102)	Poshker Mool	Roots	Treatment of cough, bronchial asthma, contagious fever, angina, pectoris, heart diseases, ischemic heart diseases and anorexia	Decoction	8 (6M, 2F)	10	80
11	<i>Jurinea ceratocarpa</i> D.C (GAG-97)	Dooph	Aerial parts	Decoction is used in headache, lumber pain, and for renal colic.	Decoction	10 (6M, 4F)	20	50
				Powdered roots taken to relieve constipation	Powder	14 (9M, 6F)	20	70
				Powdered roots made into paste are applied to skin eruptions.	Poultice	16 (9M, 7F)	20	80
12	<i>Taraxacum officinale</i> L. (GAG-101)	Handh	Aerial parts	Decoction of leaves is used in baths after delivery to relieve body ache and pain of joints.	Decoction	20 (14F, 6M)	25	80
				Dried herb as a poultice is used on fractured limbs as is considered a good – binder.	Poultice	16 (9M, 7F)	25	64
13	<i>Impatiens brachycentra</i> Kar. and Kir. (GAG-62)	Trual	Seeds	Extract of dried seeds used against infections of eye and ear.	Decoction	16 (8M, 8F)	20	80
14	<i>Betula utilis</i> D. Don. (GAG-42)	Burz	Bark	The burning bark is placed in a brass vessel which is used for fomentation. Useful in convulsions, bronchitis and diseases of the ear.	Decoction	26 (14M, 12F)	30	86.66
				Poultice of bark is used on rheumatoid affected joints.	Poultice	16 (8M, 8F)	30	53.33
15	<i>Cynoglossum glochidiatum</i> Wall. ex Benth. (GAG-39)	Lichkura	Seeds	Decoction is used for potency and fertility	Decoction	17 (4M,13F)	25	68
16	<i>Lithospermum arvense</i> L. (GAG-92)	Beejur	Seeds	Decoction of seeds diuretic and anti-gouty arthritis. Also used as blood purifier.	Decoction	12 (8M, 4F)	25	48
17	<i>Macrotomia benthamii</i> Wall. ex G. Don (GAG-45)	Gauzaban	Aerial parts	Decoction is Expectorant, cardi tonic.	Decoction	10 (5M, 5F)	10	100
				Flowering tops antipyretic.	Decoction	7 (2M, 5F)	10	70
	<i>Barbarea vulgaris</i> W.		Leaves		Pasta	21	25	

19	<i>Brassica campestris</i> L. (GAG-90)	Tille gogul	Seed	Anti-arthritic- warmed seed oil is used to relieve pain of swollen joints. Decoction of aerial parts is used as purgative	Oil Decoction	19 (14M, 5F) 12 (6M, 6F)	25 25	76 48
20	<i>Capsella bursa pastoris</i> L. (GAG-24)	Kralmund	Aerial parts Seeds	Diuretic and astringent Seeds cardiac stimulant.	Decoction Decoction	16 (7M,9F) 16 (7M,9F)	30 30	53.33 53.33
21	<i>Cardamine impatiens</i> L. (GAG-27)	Haagsuiner	Aerial parts	Extract used as stimulant and diuretic.	Decoction	14 (14M,9F)	20	70
22	<i>Descurainia sophia</i> Webb ex. Prantl (GAG-79)	Charilachij	Seeds	Powdered seeds dissolved in hot milk are used in chronic bronchitis, as an expectorant and as tonic for children. Decoction of seeds is used to cure fever.	Infusion Decoction	14 (5M, 9F) 9 (2M,7F)	14 14	100 64.28
23	<i>Campanula cashmeriana</i> Royle (GAG-66)	Chari haakh	Seeds	Powdered seeds mixed with butter and rolled into balls. Balls are used as appetizer, against indigestion and post vomiting nausea.	Dry powder	21 (11M, 10 F)	26	80.76
24	<i>Codonopsis rotundifolia</i> Benth. (GAG-80)	Tunda Jaide	Root	Poultice applied on For cutaneous eruptions.	Poultice	18 (11M, 7F)	18	100
25	<i>Cuscuta europaea</i> L. (GAG- 14)	Kuklipoth	Aerial parts	Infusion used in backache; with milk used in abdominal disorders.	Infusion	19 (14F, 5M)	40	47.5
26	<i>Cuscuta reflexa</i> Rox. (GAG-16)	Wozul kuklipoth	Aerial parts	Analgesic and anti-inflammatory. Decoction of entire plant is taken orally twice daily and paste is applied topically on all affected joints.	Decoction	14 (4M, 10F)	30	46.66
27	<i>Dipsacus mitis</i> D. Don. (GAG-85)	Wopel hak	Leaves	Decoction of leaves used as post natal analgesic bath.	Decoction	14 (7M, 7F)	28	50
28	<i>Corydalis falconeri</i> Hook. f. & Thom. (GAG-8)	Alnil	Root and seeds Aerial Parts	Powder is added to food as carminative Decoction of aerial parts is administered to cure colds and fever	Powder Decoction	12 (3M, 9F) 12 (6M,6F)	14 14	85.71 85.71
29	<i>Gentiana moorcroftiana</i> Wall. ex G. Don (GAG-74)	Jangly neilkanth	Whole plant Flowers	Decoction used against sore throat, chest congestion. Decoction is used to check nausea, headache and fever.	Decoction Decoction	18 (9M, 9F) 16 (8M,8F)	24 24	75 66.66
30	<i>Geranium wallichianum</i> D. Don ex Sweet (GAG-77)	Kawashud	Rhizome	Decoction used in chronic diarrhea and dysentery.	Decoction	18 (10M, 8F)	22	81.81
31	<i>Hypericum perforatum</i> L. (GAG-61)	Bealsuna	Leaves Flowers	Decoction used against rheumatic pains. Decoction used to cure urinary infections.	Poultice Decoction	13 (7M,6F) 20 (10M, 10F)	22 25	59.09 80
32	<i>Juglans regia</i> L. (GAG-107)	Doon	Seed	Roasted kernel is taken with tea to cure constipation.	Roasted seeds	16 (7M, 9F)	16	100
33	<i>Mentha piperita</i> L. (GAG-46)	Pudina	Leaves	Poultice is applied to cure skin disorders	Poultice	12 (7M,5M)	16	75
34	<i>Prunella vulgaris</i> L. (GAG-31)	Kalveoth	Seeds Flowers and leaves	Dried powder used in abdominal discomfort and dyspepsia. Decoction of seeds diuretic and in disease of the chest and lungs. Flowers and mixture of flowers and leaves is used in headache, cerebral disorders, cold and gastric disturbances.	Dry powder Decoction	13 (8M, 5F) 18 (13F, 5M) 23 (12M,11F)	20 25	65 72 92
35	<i>Thymus serpyllum</i> L. (GAG-105)	Javeind	Aerial parts	Decoction of whole plant is used to smoothen delivery.	Decoction	12 (5M, 7F)	18	66.66
36	<i>Linum usitatissimum</i> L. (GAG-95)	Alish	Seeds	Seeds boiled and made into cataplasm which is used to treat bronchitis or pneumonia. Crushed linseed is applied in the form of poultice for inflammation, ulcers and boils.	Cataplasm Poultice	11 (4M, 7F) 13 (7M,6F)	16 16	68.75 81.25
37	<i>Parnassia nubicola</i> Wall. (GAG-47)	Phutkya	Seeds and roots Root	Dried powder used to cure senility and other nervous disorders. Decoction is taken during fever and cough.	Dry powder Decoction	15 (8M, 7F) 13 (8F, 5M)	18 20	83.33 65
38	<i>Plantago major</i> L. (GAG-48)	Gulle	Seed	Decoction of seeds is used in inflammatory conditions of mucous membrane of gastro – intestinal and genitourinary tract.	Decoction	15 (8M,7F)	20	75
39	<i>Cynodon dactylon</i> L. (GAG-75)	Dramun	Aerial parts	Extract of fresh plant used as an oral application in catarrhal ophthalmia. Paste used as antiseptic.	Extract, poultice	15 (9M, 6F)	17	88.23

40	<i>Polygonum aviculare</i> L. (GAG-69)	Bikh anjaba	Aerial parts	Decoction is used for diabetes and rheumatism, in bleeding piles and in checking profuse menses.	Decoction	21 (11M, 20F)	25	84
			Seeds	Seeds given as purgative.	Decoction	20 (10M, 10F)	25	80
41	<i>Rumex dentatus</i> L. (GAG-121)	Obej	Leaves	Diuretic, antipyretic, antiseptic, antihypertensive. Used as laxative, in sore throat, skin diseases and furuncles.	Decoction and ointment	17 (7M, 10F)	20	85
42	<i>Rumex patientia</i> L. (GAG-114)	Jangly obej	Leaves	Used against stomach disorders	Decoction	12 (5M, 7F)	20	60
43	<i>Asplenium diantum - nigrum</i> L. (GAG-37)	Daeid	Aerial parts	The extract of the plant is considered effective in treatment of Jaundice. Also used as expectorant.	Decoction	28 (21M, 7F)	50	56
44	<i>Aconitum violaceum</i> Jacq. (GAG-35)	Patris	Seeds and roots	The dried seeds and roots are powdered and mixed with powdered dried animal fat. The mixture is rolled into rounded tablets using honey and is used as tonic in convalescence.	Dry powder	12 (8M, 4F)	20	60
45	<i>Androsace mucronifolia</i> Watt. (GAG-73)	Uzm posh	Aerial parts	Ringworms infections are cured by applying poultice of aerial parts on affected parts.	Poultice	12 (3M, 9F)	17	70.58
46	<i>Anemone obtusiloba</i> D. Don (GAG-55)	Ratttanjot	Roots	Powdered roots made into paste are applied to skin eruptions.	Decoction	12 (7M, 5F)	22	54.54
			Seeds	Finely powdered roots mixed with milk are heated, the decoction is used as a tonic during convalescence and against contusions.				
47	<i>Caltha palustris</i> L. (GAG-132)	Jungli	Aerial parts	Powdered seeds taken with water act as emetic and purgative	Powdered	11 (6M, 5F)	22	50
				Fresh plants are fed to patients suffering from joint pains.	Fresh plant	17 (8M, 9F)	21	80.95
48	<i>Thalictrum cultratum</i> Wall. (GAG-104)	Ghendoor	Root	Decoction of roots is used in urinary irritation.	Decoction	16 (7M, 9F)	18	88.88
49	<i>Cydonia oblonga</i> M. (GAG-25)	Bamchonth	Leaf and Seeds	Hypoglycaemic: Decoction of dried leaves is taken orally. Seeds Laxative	Decoction	17 (8M, 9F)	17	100
			Fruit	Fruit jam used against cough.	Jam	14 (7M, 7F)	17	82.35
50	<i>Geum urbanum</i> L. (GAG-83)	Goolemool	Root	Root extract given in ague and for catarrh. Also used against diarrhea, dysentery, sore throat and leucorrhoea.	Decoction	22 (13M, 9F)	30	73.33
51	<i>Rosa webbiana</i> Wall. ex Royle (GAG-120)	Jangly gulab	Ripened thalamus	Extract used as a gargle to relieve toothache and throat infection.	Decoction	19 (11M, 8F)	25	76
52	<i>Galium pauciflorum</i> Bunge (GAG-71)	Tropaer	Aerial parts	Anti- infectious: gargle to relieve throat infection.	Decoction	29 (22M, 7F)	60	48.3
53	<i>Dictamnus albus</i> L. (GAG-82)	Tuenale	Root Bark	Decoction is used in nervous diseases, intermittent fevers and hysteria. It is also used for scabies.	Decoction	15 (8M, 7F)	29	51.72
54	<i>Hyoscyamus niger</i> L. (GAG-91)	Bazarbagh	Leaves and flowering tops	Dried leaves and flowering tops are used as sedative in nervous afflictions and to relieve spasms of urinary tract.	Decoction	15 (9M, 6F)	28	53.57
55	<i>Solanum nigrum</i> L. (GAG-116)	Kambhai	Fruit	Antipyretic, also used against eye disease and hydrophobia. Juice of plant hydragogue, cathartic, diuretic, given in chronic enlargement of liver.	Fresh fruit and juice	14 (4M, 10F)	20	70
56	<i>Urtica dioica</i> L. (GAG-115)	Soi	Leaves and roots	Anti eczema, given in chronic cystitis, nervous disorders, prostate disorders. Anti-viral and anti allergic.	Paste and alcoholic extract	29 (7M, 22F)	38	76.31

Abbreviations: Np = Number of informants per species; M= Male; F= Female
N = Total number of informants; FL = Fidelity Level (Ratio of Np x 100/N)

A large number of drugs (52 %) are administered in the form of decoction followed by poultice (22%) and dry powder (10 %). Many of the records mentioned in the table are new with respect to survey performed in adjoining areas. Some of the recorded species such as *Androsace mucronifolia*, *Codonopsis rotundifolia*, *Corydalis falconeri*, *Galium pauciflorum*, *Jurinea ceratocarpa*, *Betula utilis*, *Primula cachmeriana*, *Chaerophyllum acuminatum*, *Impatiens brachycentra*, *Pragnos pabularia*, *Gentiana moorcroftiana*, *Hippophae rhamnoides*, *Thalictrum cultratum*, *Geranium wallichianum*, *Geum urbanum* have not been investigated well from a pharmacological or phytochemical point of view.

Many plants mentioned in the current list, despite being very popular in the local system of medicine, have not been mentioned even in the most recent pharmacological and ethnobotanical literature hence needed documentation immediately.

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Contribution of authors

GAG conducted the experimental work and NR drafted the manuscript.

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