



Ethnobotanical uses of home garden species around Lalitpur district, Nepal

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Abstract: Plants are used for their medicinal purposes since ancient times. Most of the plants that are found in our locality are very important for human health care. These plants are still used as traditional medicine for various diseases in rural areas; however, in urban areas, these species are treated as weeds. Most of the people are unaware about the ethno-botanical use of these locally available species. This study reveals that home garden species have lots of ethno-botanical uses. This paper helps to acquire knowledge about ethno-botanical and ethno-medicinal use of locally available species found in Lalitpur district. We have collected the data from 30 houses having kitchen gardens and listed 50 different species which are generally treated as weeds. Only a few species were used by local people for their medicinal purpose as they don't have knowledge about their medicinal value. Some of these species have toxic qualities, but the toxicity is overbalanced by their health benefits. These species should be further tested for their ethno-botanical properties and utilized after purification. The abundance of these species is declining very rapidly due to developmental activities and sparse distribution.

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Keywords: Medicinal plants, traditional, locally available, ethno medicine

INTRODUCTION

'Ethno botany' is the term coined by John W Harshberger in 1896. Since the beginning of human civilization, plants were used for medicinal purposes by people that can be known from Rigveda and Ayurvedas. Ethno botany is the traditional knowledge of local people in utilizing the plant. Ethno botany has great value in health care development and conservation programs (Balick, 1996). Ethno medicine is a part of ethno botany which is the set of traditional knowledge of different groups of people transmitted orally from one generation to another (Bussmann and Sharon, 2006). Indigenous knowledge is not being only culturally valued, but also scientifically important (Kunwar and Bussmann, 2008). Therefore, indigenous knowledge incorporated in scientific research can develop new hypotheses for a resource's sustainable conservation (Henfrey, 2002). Along with the day-to-day modernization and globalization, indigenous knowledge on utilizing plant resources is diminishing (Gadil et al., 1993). Ethno botanical studies are of utmost importance to preserve the traditional folklores from disappearing (Chaudhary, 1998).

Nepal, being geographically and climatically diversified, is rich in biodiversity with 35 forest types and 118 ecosystems serving habitat for more than 6500 species of phanerogams. More than 2000 species of plants having ethno botanical values and among them about 1600 plant species are estimated being used in traditional medicinal practices but most of them are still to be documented (Shrestha et al., 2002). Traditional medicinal practices are important health care sources for majority of people in rural areas (Kunwar et al., 2006). In Nepal, 2300 species are traditionally used as medicinal plants (Kadel et al., 2020). About 215 plant species are used to treat 139 types of diseases by major ethnic peoples in hilly region of Nepal (Miya et al., 2020). People mixed different parts of medicinal plants to boot up the immunity too (Gahatraj et al., 2020). Most of the NTFPs traded from Jajarkot district of Nepal have medicinal values (Lamichhane et al., 2021). Nevertheless, nowadays most of the people of urban areas are unaware about the ethno botanical importance of locally available plant species. Therefore, this study paper aims to document the ethno botanical and ethno medicinal values of the locally available plant species around home garden of Lalitpur district.

MATERIAL AND METHODS

Study area: Lalitpur is situated in middle hills of Nepal at latitude 27°32'53.88"N, longitude 85°20'15.00" E in Bagmati province of Nepal. Climate of Lalitpur is mild, generally warm and temperate. The total area of Lalitpur district is 385 sq. km. It is surrounded by Kathmandu, Bhaktapur, Kavre and Makwanpur district. The total population of Lalitpur according 2011 census is 468,132. The average altitude of Lalitpur is 1400m. Lalitpur metropolitan city is third largest city of Nepal after Kathmandu and Pokhara which is located in the south central part of Kathmandu valley. The ethnic community of this area constitutes mainly Bhramin, Chhetri and Newar.



Fig 1. Location of Lalitpur district (red) in the map of Nepal

Data collection and analysis: Data were collected during the month of October of 2020. During that period we have visited 30 houses having home garden and listed 50 species as medicinal plants by comparing with the published articles. Published articles were collected from online portals like research gate and Google scholar (Gautam et al., 2020; Timilsina et al., 2020). The collected data were logically interpreted with simple tables, bar diagrams and line graphs (Gautam and Khatri, 2021).

RESULTS AND DISCUSSION

Total fifty different species of commonly available plants were identified among which 9 species is that of family Asteraceae. Poudel et al. 2021 also studied 50 common garden species of Arghakanchi district, western Nepal and recorded six species of Asteraceae family as the most used species. Most of the species are herb and are commonly treated as weeds which can be used for treatment of various diseases. Many of these species were used for treatment of multiple diseases. Either whole plant or parts of the plants i.e. leaves, roots, flowers, seeds, inflorescence etc. are used. The plant parts used along with the disease it treats are mentioned in table 1.

Table 1: Name of the plants with their ethno-botanical use and part used

S. N	Scientific name	Local name/ common name	Family	Life forms	Part used	Uses	Source
	<i>Achyranthes aspera</i>	Datiban	Amaranthaceae	Herb	Flower, root, leaf,	Terminate pregnancy, expel placenta and dead fetus, leucoecoehoa, in rishipanchami festival, used by hindu women.	(Singh, 2015)
	<i>Ageratina adenophora</i>	Kalimunte	Asteraceae	Herb	Leaf	Burns, cuts, wound, diarrhea	Magar et al., 2020
	<i>Ageratum houstonianum</i>	Nilo Gandhejhar	Asteraceae	Herb	Leaf	Used in cuts and wounds to stop bleeding	Dani & Tiwari, 2018
	<i>Aloe barbadensis</i>	Ghuikumari	Asphodelaceae	Shrub	Leaf	Used for dry skin conditions, cough, wounds, ulcers, gastritis, diabetes, cancer, headache, juice is used for ulcerative colitis,	Rajeswari et al., 2012
	<i>Alternanthera philoxeroides</i>	Alligator grass	Amaranthaceae	Herb	Whole plant	Antiviral, antibacterial, detoxicating and disinhibiting urine	HBU, 2007
	<i>Amaranthus viridis</i>	Ludekando	Amaranthaceae	Herb	Leaf, root	Used for blood purifying, digestive agent, piles	Dani & Tiwari, 2018
	<i>Artemisia vulgaris</i>	Titepati	Asteraceae	Herb	Leaf, flower	Repellent and fumigant, liver disorder, diarrhea, asthma	Akbar, 2020
	<i>Berberis aristata</i>	Chutro	Berberidaceae	Shrub	root	Anti-inflammatory, analgesic, and antipyretic drug	Shahid, 2020
	<i>Boehmeria nivea</i>	Gaudich	Urticaceae	Herb	Stem and fiber	Textile, paper, household goods	Ray et al., 2017
	<i>Bryophyllum pinnatum</i>	Patharcha	Crassulaceae	Herb	leaf	Antinociceptive, anti-inflammatory and anti-diabetic	Ojewole, (2005)
	<i>Cannabis spss.</i>	Marijuana	Cannabaceae	Shrub	Leaf, flower bud	Managing chronic pain, muscle spasticity, cachexia and other debilitating problems.	Aggrawal et al., 2009
	<i>Catharanthus roseus</i>	Sadafuli	Apocynaceae	Herb	Whole plant	Used to neutralize poison, facilitating digestion, promoting weight gain, diabetes.	DeFilipps RA, Krupnick GA (2018)
	<i>Celosia sps.</i>		Amaranthaceae	Herb	Leaf, young flower,	Used for eyes disease, mouth sores, diarrhea, aphrodisiac.	DeFilipps &

					young stem		Krupnick , 2018
<i>Centella asiatica</i>	Ghodtapre	Umbeliferae	Herb	Leaf, root	Used in brain tonic, leprosy, weakness, elephantiasis.		Dani & Tiwari, 2018
<i>Commelina benghalensis</i>	Kannejhar	Commelinaceae	Herb	Leaf, root	Used for curing burns, boils, swelling, nervous disorder, leprosy		Dani & Tiwari, 2018
<i>Conyza Canadensis</i>	Mulapate	Asteraceae	Herb	Flower, leaf	Antioxidant, antiaggregatory on blood platelets, fodder, duratic and as stimulants		Olas et al., 2009; Farooq et al., 2012
<i>Crassocephalum crepidioides</i>	Anikaley jhar	Asteraceae	Herb	Whole plant	Used to treat indigestion, stomach ache, epilepsy, sleeping sickness, and swollen lips.		Tomimori et al., 2012
<i>Cynodon dactylon</i>	Dubo	Poaceae	Grass	Whole plant	Used to cure dysentery, piles, urinary troubles, insanity.		Dani & Tiwari, 2018
<i>Cyperus esculentus</i>	Mothe	Cyperaceae	Grass	Tuber	Eaten raw, roasted, dried, baked, heart, thrombosis, activate blood circulation, reduce risk of colon cancer, suitable for diabetic person, loose weight		Ekeanyan et al., 2010
<i>Digitaria sanguinalis</i>	Crab grass	Poaceae	Grass	Stem, leaf	Common weed, Fodder species		Chaudhari et al., 2013
<i>Duranta erecta</i>	Nilkanda	Verbenaceae	Shrub	Leaf, fruits	Antimalarial activity, bone formation, wound healing, brain development, normal growth process		Donker et al., 2019
<i>Eleusine indica</i>	Kodjhar	Poaceae	Grass	seed	Used in the treatment of influenza, hypertension, oliguria and retention of urine.		Nhu, N. V. 1989
<i>Erigeron annuus</i>	Phuntha	Asteraceae	Herb	Leaf, flower	Hypoglycemic drug for diabetes, diuretic properties, digestive disorders		Bashir & Ahmad, 2016
<i>Euphorbia grantii</i>	African milk bush	Euphorbiaceae	Herb	leaf	Psychosis by sniffing dried powder twice a day		Moshi et al., 2006
<i>Euphorbia peplus</i>	Abhijalo	Euphorbiaceae	Grass	Flower, leaf,	Treatment of Warts, corns, waxy growth, asthma, catarrh, skin cancers, cancer of stomach, liver, uterus.		Ramsay et al., 2011
<i>Galinsoga parviflora</i>	Chitlange jhar	Asteraceae	Herb	Leaves	Analgesic, anti-inflammatory, influenza, cough, cold, joint pain backache, eyes, biles, swelling of limbs, in wounds		Dani & Tiwari, 2018
<i>Hedychium coronarium</i>	Dudh kewara	Zingiberaceae	Herb	Leaves, flower, rhizome	Fever, antidote against allergy by Rhussucedean		Magar et al., 2020
<i>Imperata cylindrical</i>	Siru	Poaceae	Grass	Root, flowers	Antibacterial, haemorrhages, wound, urinary tract infections, fevers, nose bleed, haematuria and jaundice		Acharya & pokhrel, 2006
<i>Kyllinga brevifolia</i>	Mothe	Cyperaceae	Herb	Root, leaves	Fodder, Red nose and wound treatment by sniffing root and leaf powder		Dangol et al., 2014; Chetri et al., 2018)
<i>Lindenbergia muraria</i>	Baghmukhe ghas	Orobanchaceae	Herb	Shoots	Burns, cuts, wound		Magar et al., 2020
<i>Melastoma capitatum</i>	Angeri	Melastomataceae	Shrub	Whole plant	Antioxidant, anti-allergy, anti-cancer, anti-inflammatory, antiviral, antimicrobial		Ukwubile Cletus et al., 2015
<i>Melastoma malabathricum</i>	Chulesee	Melastomataceae	Shrub	Whole plant	Used for Skin disease, chicken pox, wounds, diarrhea, dysentery.		DeFilipps & Krupnick 2018
<i>Mentha spicata</i>	Babari	Lamiaceae	Herb	Leaves, stem	Used for treating of colds and flues, respiratory tract problems,		Kee la et al., 2017

						gastralgia, hemorrhoids and stomach ache.	
<i>Nephrolepis cordifolia</i>	Paani Amala	Nephrolepidaceae	Fern	Root		Tuber like root is eaten as food	Uprety et al., 2012
<i>Ocimum santum</i>	Tulsi	Lamiaceae	Herb	Whole plant		Reduce anxiety, malaria, skin diseases, diarrhea, fever, dysentery, arthrites, cough, vomiting, indigestion, hiccup, scorpion bites, eye diseases	MM Cohen, 2014
<i>Oplismenus burmanni</i>	Ote banso	Poaceae	Grass	Leaves, inflorescence		Used as antidotes (venomous stings, bites, etc.); cutaneous, subcutaneous parasitic infection; eye treatments; genital stimulants/depressants; pain-killers.	Neuwinga, 2000
<i>Oxalis latifolia</i>	Amilpatey	Oxalidaceae	Herb	Leaves		Used as cure for diarrhea, dysentery, stomach troubles.	Dani & Tiwari, 2018
<i>Peperomia pellucida</i>	JhyunJhyuro	Piperaceae	Herb	Whole plant		Analgesic, anti-inflammatory, antipyretic, antihyperuricemia, burn healing, depressant, gastroprotective, antimicrobial, antisickling and antidiarrhoeal	Kartika et al., 2016
<i>Persicaria punctate</i>	Dotted smartwood	Polygonaceae	Herb	Leaves, flowers, root		Intestinal pains, disinfectant in the treatment of skin infections	Breitbach, 2020
<i>Phytolacca Americana</i>	Jaringo saag	Phytolaccaceae	Herb	Leaves, root, shoot		Enzymatic matter in eukaryotic ribosome	Irvin, 1975
<i>Ricinus Communis</i>	Adir	Euphorbiaceae	Shrub	Seed, leaves, stalk, fruit		Antioxidant, antinociceptive, antiasthmatic, anti-fertility, antihistaminis, hepatoprotective, anti-inflammatory, antiulcer, antimicrobial, antidiabetic, wound heal, lipolytic	Jena & Gupta, 2012
<i>Rubus ellipticus</i>	Aiselu	Rosaceae	Shrub	Fruit, root		Ripen fruits eaten, root juice to cure typhoid and measles	Uprety et al., 2012
<i>Solanum nigrum</i>	kaligedi	Solanaceae	Herb	Fruits, leaves, young shoots		Used as cure for jaundice, cough, piles, ulcer, skin disease	Dani & Tiwari, 2018
<i>Solanum xanthocarpum</i>	Kantakari	Solanaceae	Shrub	Seed, root, fruit		Headache, body pain, abdominal pain	Parajuli, 2000
<i>Spilanthes oleracea</i>	Marauti	Asteraceae	Herb	Leaves, root, flowers		Used as antifungal, antipyretic, local anaesthetic, bioinsecticide, antioxidant, analgesic, antimicrobial, diuretic, toothache relieve and anti-inflammatory effects,	Dubeysuchitra et al., 2013
<i>Taraxacum officinale</i>	Tukiphool/ Dandelion	Asteraceae	Herb	Whole plant		Used to treat fever, hepatitis, jaundice, heart trouble. antibacterial	Dani & Tiwari, 2018
<i>Thysanolaena maxima</i>	Amriso	Poaceae	Grass	Roots		Broom, Root juice as antihelmentic	Acharya & Acharya, 2009
<i>Trifolium repens</i>	Tinpate	Fabaceae	Herb	Leaves, flowers		Used for coughs, colds, fevers; as an eyewash; as an ointment to gout.	Moerman. D, 1998
<i>Urtica dioica</i>	Sisnu	Urticaceae	Herb	Leaves, roots, inflorescence		Root juice for asthma, blood pressure, sugar, leaves and inflorescence as vegetables for lowering hypertension	Malla et al., 2013
<i>Zephyranthes carinata</i>	Rain lily	Amaryllidaceae	Herb	Leaves, bulbs		Used to treat simple problems from head ache, cough and cold, boils, breast cancer, tuberculosis, rheumatism, tumors.	Soule, 2005

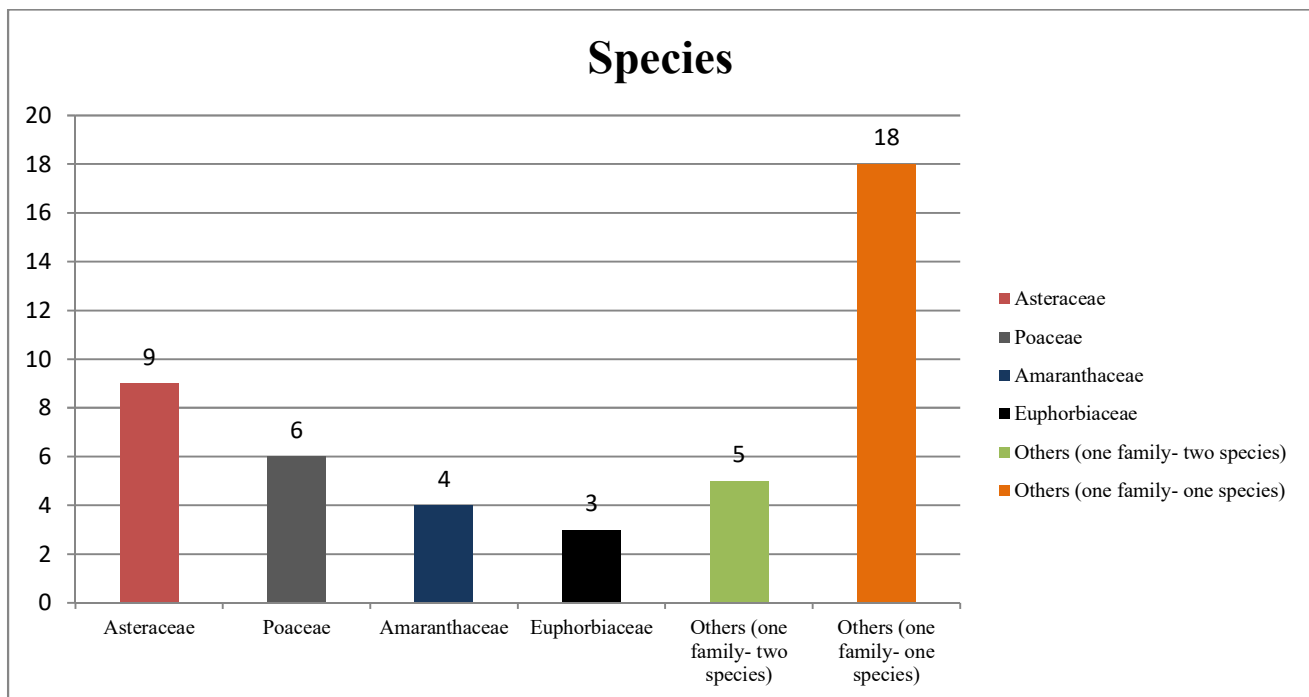


Figure 1 Division of species on the basis of their family

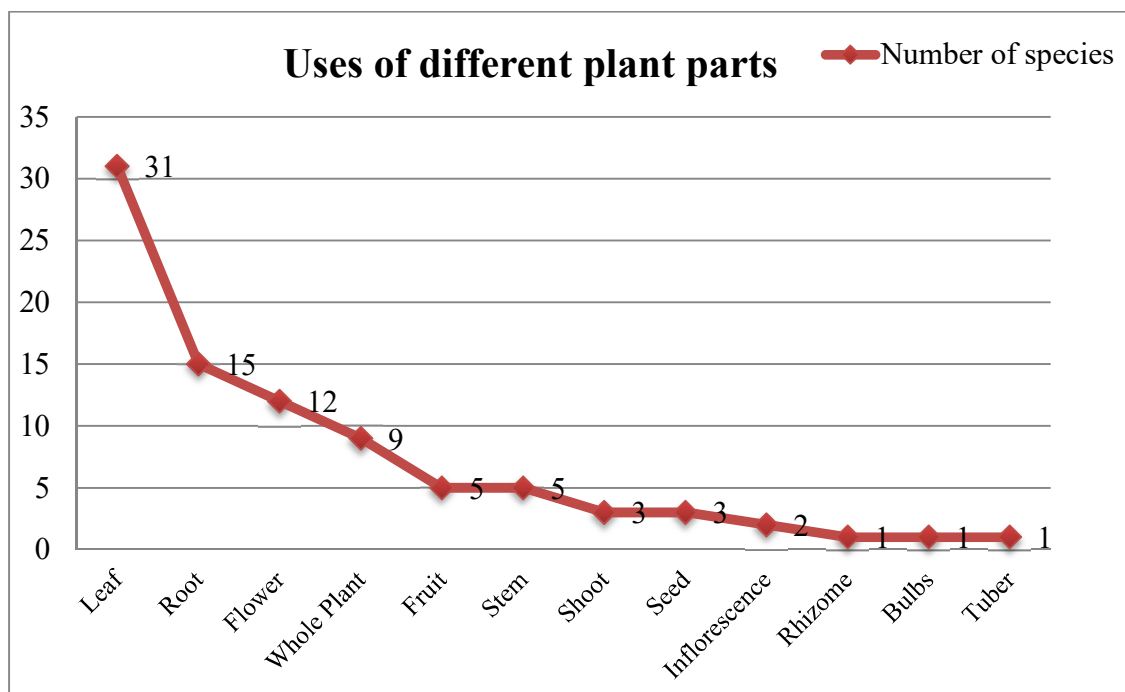


Figure 2 Line graph showing plant parts used

Above diagram represents the division of species based on their family. In which 9 species belongs to Asteraceae family, 6 species to Poaceae family, 4 species to Amaranthaceae family, 3 species to Euphorbiaceae family. Whereas 10 species are from 5 different family two in each family and 18 other species belongs to 18 different families. Most of the plants have its specific parts used (as shown in figure 2). Among which the most frequently used plant part was leaf (31 species), followed by root (15 species), flower (12 species), whole plant (9 species), fruit (5 species), stem (5 species), shoot (3 species), seed (3 species), inflorescence (2 species), tuber (1 species), bulb (1 species) and rhizome (1 species).

CONCLUSION

Fifty species of different family have different Ethno botanical uses. Only few species like Mint, Titepati (*Artemisia vulgaris*) etc. is used for their medicinal properties by their traditional knowledge. Most of the species identified were treated as weed in home garden without knowing its medicinal value. Due to over population and unmanaged settlement in Lalitpur abundance many of these species has been decreased drastically. In the selected where these species are available, they are either destroyed and used for mulching or their growth are inhibited by using different chemical herbicide and weedicides. If proper study is done about the ethno-botanical uses of these species and utilized after purification these species can be boon for local Ayurvedic medicine users.

DECLARATION OF CONFLICT OF INTEREST

No conflict of interest to declare.

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Appendix



Ageratum houstonianum



Aloevera



Alternanthera philoxeroides



Amaranthus viridis



Bryophyllum pinnatum



Catharanthus roseus



Urtica dioica



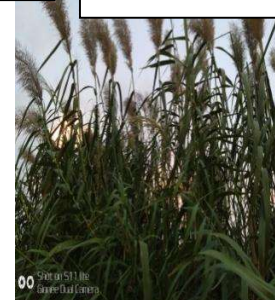
Imperata cylindrica



Artemisia vulgaris



Cyperus esculentus



Thysanolaena maxima



Ricinus communis



Cannabis spp



Solanum xanthocarpum



Rubus ellipticus



Zephyranthes carinata



Berberis aristata



Ocimum sanctum



Celosia



Commelina benghalensis



Crassocephalum crepidioides



Cynodactylon



Eleusine indica



Euphorbia grantii



Galinsoga parviflora



Lindenbergia muraria



Peperomia pellucida



Spilanthes oleracea



Taraxacum officinale



Solanum nigrum



Duranta erecta



Melastoma malabathricum



Phytolacca americana



Mentha spicata



Nephrolepis cordifolia



Oplismenus burmanni



Centella asiatica



Trifolium repens



Euphorbia peplus



Melastoma capitatum



Hedychium coronarium



Boehmeria nivea



Digitaria sanguinalis



Persicaria punctata



Erigeron annuus



Conyza canadensis