

MEDICINAL WEEDS IN THE RICE FIELD OF KATHMANDU VALLEY, NEPAL

Ram Sharan Dani¹ and Achyut Tiwari^{2*}

¹Department of Botany, Tri-Chandra College, Tribhuvan University, Kathmandu

²Central Department of Botany, Tribhuvan University, Kathmandu

*Corresponding email: achyutone@gmail.com

ABSTRACT

Weed management in the crop field is one of the major challenges of agriculture. It has been reported that new weeds are encroaching crop fields due to anthropogenic activities such as the use of insecticides, pesticides and chemical fertilizer, and also due to climatic changes including warming temperatures, erratic and unseasonal precipitation, flood and landslides. The agricultural history of Kathmandu valley is quite old, which represents one of the highly productive valleys in of Nepal for agricultural crops including rice, indicating the long history of weeds in the region. There are quite a lot number of medicinally important plants found in rice field as weeds. Traditional practitioners are using these weeds in curing diseases as primary health care, and the utilization of weeds is the best method of weed management. The objective of this present study was to enumerate the weeds in and around paddy field and gather their medicinal properties of weeds among the local people of Kathmandu valley in order to assist with the weed management of paddy field. The periodic field survey was conducted in 9 selected sites, 3 from each district (Kathmandu, Lalitpur, and Bhaktapur) during summer 2012-2014 (two times: crop matured seasons and just after harvesting). We found 104 weed species belonging to 36 families in the rice field of Kathmandu valley that have medicine values.

Key words: *Kathmandu valley, medicinal plants; rice; weeds*

INTRODUCTION

After the domestication of plants, man has inherited rich traditional knowledge on the use of surrounding plants for different daily activities of life like food, medicine, tannin, dye, resin, fodder, fibres, woods, fuel, cosmetics, and crafts and for religious ceremonies. Cultivation of food plants like rice, wheat, maize is very important for the survival of people contributing as the major source of energy. Rice (*Oryza sativa*) is one of the predominant cereal crops of Nepal with rice-wheat cropping as a major farming practice. It is cultivated mainly during June-July. Paddy covers about 20 percent of the gross domestic agricultural production

forming the supply of more than fifty percent calorie requires for Nepalese people (Basnet, 2004). Although the lowland of Nepal (Terai) alone contributes more than 80 percent rice production in Nepal, rice is cultivated in range of habitats up to the elevation of over 3000 m asl (NAARC, 2000). Due to the wide range of geographic location of rice, it also includes wide range of weeds that continuously interact with rice plantation challenging the production of the crop.

In agriculture ecosystem, weeds compete with crops for soil nutrients, moisture and light, etc. Weeds are any unwanted plant of the unwanted site and unwanted time, whether native or non-

native species (Aldrich, 1984). Weeds may become a source of disease and a host of insects or parasites. Literally, every weed is considered as unwanted plant of farmland at unwanted time. Those plants which usually grow where they are not wanted, and usually, interfere with the production of cultivated crops, are considered to be weeds (Ranjit and Bhattarai, 1988). Hence, the weeds are harmful to the crops as they decrease crop productivity by altering soil nutrients or by infecting crops directly. It was mentioned that about 12 percent of crop loss was attributed to weeds (Anaya, 1999). Weeds reduce the crop yield either by reducing the amount of harvestable product (grain, forage) or by reducing the amount of crop actually harvested (Aldrich, 1984). The energy expended for the weeding of man's crops is sometimes more than for any other single human task (Holm, 1971). The weeds cannot harm the crop yield in their low density instead they could stimulate crop growth (Thijssen, 1999). Meanwhile, it is not always true that all weeds are unwanted and harmful plants. Some weeds possess economic values as medicinal, nutrition, industries and fodder forms. Usually, weeds are destroyed during crops seasons by mechanically or by using chemicals or weedicides. It is not always beneficial to remove weeds from crops fields because of their role in nutrient cycling. Several pieces of literature emphasize to establish nutritional relationship between crops and weeds. There are quite numbers of available literatures about medicinal application of weeds (Cunningham, 2001); Dhanam and Elayraj, 2014). Traditional knowledge, practices and identification of medicinally important weeds should be explored to provide medicinal knowledge of weeds, thereby making their maximum use which complements with weed management system in cropland. This work

is designed with an objective of identifying the medicinal weeds and documentation of ethnomedicinal uses of weeds present in the paddy fields of Kathmandu valley.

MATERIALS AND METHODS

Study Area

Kathmandu Valley lies at 1,300 masl and is located between latitudes 27°32'13" and 27°49'10" north and longitudes 85°11'31" and 85°31'38" east. Its three districts, Kathmandu, Lalitpur, and Bhaktapur, cover an area of 899 square kilometres, whereas the area of the valley as a whole is 665 square kilometres. The valley is bowl shaped and surrounded by the Mahabharat mountain range on all sides. There are four hills acting as forts of the valley, Phulchowki in the South East, Chandragiri in the South West, Shivapuri in the North West, and Nagarkot in the North East. The highest altitudes are 2,166m (in Bhaktapur), 2,732m (in Kathmandu), and 2,831m (in Lalitpur).

The climate is good, the soil is fertile, and is endowed with rich forests and scenic beauty. The climate is subtropical, temperate, and cool-temperate, with four distinct seasons: spring from March to May; summer from June to September; autumn from October to November; and winter from December to February. In general, the annual maximum and minimum temperatures are between 29°C in June and 1°C in January. The annual rainfall records for Kathmandu from 1995 to 2003 show fluctuations between 1,171 to 1,868 mm.

The valley is surrounded by four major hills viz. Shivpuri, Phulchoki, Naagarjun and Chandragiri. This survey was conducted in the village area of three districts namely Kathmandu (Dahchok, K1; Matathirth, K2 and Sankhu, K3), Lalitpur (Khokana, L2; Badikhel, L3 and Jharuwarashi, L1), and Bhktapur (Nagdesch-Madhypur, B1;

Nalinchok, B2 and Chitpol, B3) (Fig. 1).

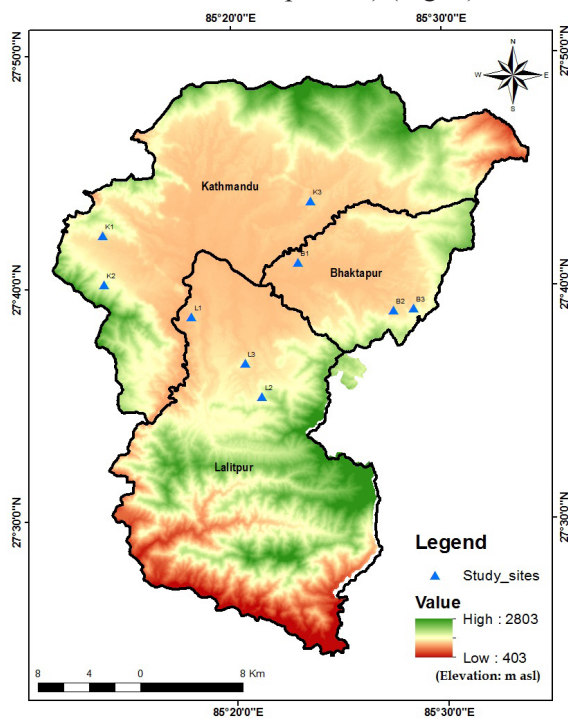


Fig. 1: Map showing Kathmandu valley with selected study area

Methodology

The study was conducted periodically. Field studies were conducted in summer season in September - October to collect all the weed plants in the flowering stage, due to similar phenological changes in rice. While working on a taxonomic and ethnomedicinal survey of Kathmandu valley, we collected weed plants in rice field and collected medicinal values of collected weeds from local people as well as from existing literature. Observation on habit, habitat, local name and uses were recorded in the field notebooks with the help of local people. Random quadrat method was adopted for studying Phyto socioecological attributes of weeds. We laid down 90 quadrats of 1 x 1 sqm in the studied locations. Plant species were identified in the field with available literature.

Specimens that were not identified in the field were collected, pressed and dried in order to prepare herbarium specimens (Siwakoti and Rajbhandari, 2015). All the collected specimens were reconfirmed with the help of standard literature (Hara et al., 1978, Hara and Williams, 1979; Hara et al., 1982; Stainton, 1972; Polunin and Stainton, 1984; Stainton, 1988, Press et al., 2000) and herbarium study. Nomenclature of the species was followed www.tropicos.org.

Ethnomedicinal information of weeds were compiled from local farmers during field visit and additional information with the help of published literatures like Chopra et al. (1956), Kirtikar (1980a), Kirtikar (1980b), Kirtikar (1981a), Kirtikar (1981b), Malla and Shakya (1984), Anonymous (1989), Tiwari and Joshi (1990), AVS (1994), DPR (1997), Rajbhandari and Joshi (1998), Chauhan (1999), Tiwari and Shrestha (2000), Bhattacharjee (2001), DPR (2001), Rajbhandari (2001), Manandhar (2002), Anonymous (2004), Watanabe et al. (2005), Baral and Kurmi (2006).

RESULT AND DISCUSSION

We found 104 species of weeds in the rice field of Kathmandu valley belonging to 36 families as medicinal plants. Among them, one is a non-flowering plant and 104 are flowering plants. The dominant plant family is Asteraceae (24 species), followed by Poaceae (8 species), Polygonaceae (6 species), Fabaceae (6 species), Euphorbiaceae (5 species), Cyperaceae (5 species), Amaranthaceae, Caryophyllaceae, Scrophulariaceae (4 species each), Malvaceae, Lamiaceae (3 species each), Verbenaceae, Umbeliferae, Solanaceae, Rosaceae, Plantaginaceae, Lathyraceae, Commelinaceae and Capparidaceae each having 2 species and Acanthaceae, Boraginaceae, Complanulaceae, Cannabaceae, Chenopodiaceae, Convolvulaceae, Cruciferae, Geraniaceae,

Nyctaginaceae, Ophioglossaceae, Oxalidaceae, Pedaliaceae, Ranunculaceae, Rubiaceae and Urticaceae with single species each.

Despite being the major crop throughout Nepal and Kathmandu valley, the diversity of weeds in paddy fields are less explored in Nepal with a preoccupied thought that weeds are useless plants. However, there has been significant progress in study of weeds in Nepal in recent years. The study from Paddy field of Kirtipur region (Kathmandu district) enumerated 52 weed species with the maximum weed density in the month of September (Manandhar et al. 2007). The diversity of medicinal weeds,

we have reported from Kathmandu valley is very high in comparison to the paddy field of Tamil Nadu India, from where out of reported 145 species, only 39 of them were medicinally used. The greater number of weeds in the paddy fields of Kathmandu valley was also due to the practice of paddy plantation in drier terraces with the rain fed during summer monsoon, and these terraces after paddy harvest remain barren with full of weeds due to the lack of irrigation. And the higher use value of weeds from Kathmandu could be due to the rich cultural diversity and rich traditional knowledge of use of plants from historical time till today.

Table 1- Enumeration of weeds in the rice fields of Kathmandu valley

SN	Weed species	Family	Local name	Therapeutics applications
1	<i>Abutilon indicum</i> (L.) Sweet.	Malvaceae		Used in dyspepsia, cough, leucorrhoea, piles, toothache, stomach-ache, tuberculosis.
2	<i>Acalypha indica</i> L.	Euphorbiaceae		Used in Asthma, bronchitis, bed sores, earache, tape worm, ringworm, pneumonia, rheumatism, scabies, ulcers, headache,
3	<i>Achyranthes aspera</i> L.	Amaranthaceae	Apamarga	Used in bleeding piles, bronchitis, cough, dropsy, diuretic, dysentery, dyspepsia, skin diseases, toothache, urinary, concretions, vomiting.
4	<i>Ageratum conyzoides</i> L.	Asteraceae	Gandhe jhar	Infusion of the herb is extensively used for curing flatulence, dysentery, colic and other gastrointestinal ailments.
5	<i>Ageratum houstonianum</i> Miller	Asteraceae	Nilo gandhe jhar	Used to stop bleeding on cut and wounds
6	<i>Alternanthera sessilis</i> (L.) R. Br. ex DC.	Amaranthaceae	Bhiringi jhar	Useful in body pain, eye disorders, nutritional disorders, piles, stomach-ache.
7	<i>Amaranthus spinosus</i> L.	Amaranthaceae	Ban lunde	Used in colic, eczema, gonorrhoea, menorrhagia.
8	<i>Amaranthus viridis</i> L.	Amaranthaceae	Lunde	Used as a blood purifier, digesting agent, piles.
9	<i>Ammannia baccifera</i> L.	Lathyraceae		Used as anti-typhoid, anti-tubercular properties, toxic prevention, ringworm, sore, Stomachic, purgative, deobstruent,
10	<i>Artemisia indica</i> Willd.	Asteraceae	Titepati	anthelmintic, Insecticidal, skin diseases, rheumatism, bronchitis, fever, headache
11	<i>Artemisia verlotorum</i> Lamotte	Asteraceae	Titepati	Used in Anthelmintic, emmengagoue, leucoderma, appetizer, disease of itching, sweating, amenorrhoea, dysmenorrhoea, cures tumours, antiseptic
12	<i>Aster stracheyi</i> Hook f.	Asteraceae		An antidote to food poison, contagious fever, headache, cures wounds

13	<i>Berleria cristata</i> L.	Acanthaceae	Bhedekuro	Useful in inflammations, fevers, bronchitis, blood diseases, biliousness, pains and asthma
14	<i>Bidens pilosa</i> L.	Asteraceae	Kuro	The extract of the plant is applied in Leprosy, tumour, fistulae diarrhea, and other skin disorder by rural peoples
15	<i>Blumea lacera</i> (Blume f.) DC.	Asteraceae	Kukur ghans	Astringent, anthelmintic, deobstruant, abdominal disorders, liver disorders, hematemesis, cough, bronchitis, cholera, hypertension, tranquiliser
16	<i>Blumeopsis flava</i> (DC) Gagnep.	Asteraceae		Used in cuts and wounds
17	<i>Boehmeria clidemioides</i> Miq [= <i>Boehmeria diffusa</i> L.]	Nyctaginaceae		Used as Anaemia, asthma, blood purifier, fever, hastens delivery, inflammation of urinary tract, jaundice, muscular pains, ophthalmic, swelling.
18	<i>Breea arvensis</i> (L.) Less. [= <i>Cirsium arvense</i> L.]	Asteraceae	Thaakal	Used in indigestion
19	<i>Cannabis sativa</i> var. <i>indica</i> L.	Cannabaceae	Ganja	The leaf part is used in resolving tumours
20	<i>Capsella bursa-pastoris</i> (L.) Medik.	Cruciferae	Chasure jhaar	Astringent, bleeding, most reliable medicine for staying fluxes of blood
21	<i>Cassia mimosoides</i> L.	Fabaceae	Tapre	Used in Jaundice, scabies, worm control.
22	<i>Cassia tora</i> L.	Fabaceae	Tapre	The leaf juice is specifically used for ringworm and also useful in curing other skin trouble in the rural area
23	<i>Centella asiatica</i> (L.) Urb.	Umbeliferae	Godtapre	Used in brain tonic, elephantiasis, leprosy, weakness.
24	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Dudhe jhaar	Used in Asthma, boils, bronchitis, cough, colic troubles, enriches the blood, laxative, piles, swellings, vomiting
25	<i>Chenopodium album</i> L.	Chenopodiaceae	Bethe Saag	Used as digestive, aphrodisiac, dyspepsia, decoction, bronchitis, stomach-ache, spleen enlargement
26	<i>Cirsium verutum</i> (D. Don) Spreng.	Asteraceae	Sungure kanda	Root paste is given to fever
27	<i>Cleome gynandra</i> L.	Capparidaceae	Junge phul	Used in earache, inflammation, rheumatic, stomach-ache.
28	<i>Cleome viscosa</i> L.	Capparidaceae	Ban tori	Used in cough, dyspepsia, fever.
29	<i>Clerodendrum serratum</i> (L.) Moon	Verbenaceae	Chuva, Andekhi	Used as expectorant, antispasmodic, epilepsy, cough, increase appetite, stimulant, antileech, febrifuge, dyspnoea, cough, catarrhal affections, cephalgia, ophthalmia, dropsy
30	<i>Clitoria ternatea</i> L.	Fabaceae	Aparaajeeta	Used for Eye diseases, headache, indigestion, itching, pox, snake bite, warts, worm control.
31	<i>Coix lachryma-jobi</i> L.	Poaceae	Bhirkaulo	Used in menstrual, disorder, intestinal worms, Diuretics, Pneumonia, Pectoral disease
32	<i>Commelina benghalensis</i> Blume	Commelinaceae	Kaane jhar	Used in burns, boils, laxative, leprosy, nervous disorders, swellings.
33	<i>Commelina paludosa</i> Bl	Commelinaceae	Kane saag	Used in vertigo, Fever, Bilious
34	<i>Convolvulus arvensis</i> L.	Convolvulaceae		Cathartic properties
35	<i>Conyza stricta</i> Wild.	Asteraceae		Cures dysentery and diarrhoea

36	<i>Crotalaria accicularis</i> Buch.-Ham ex Benth.	Fabaceae		Used in cure scabies, detoxicant.
37	<i>Croton bonplandianus</i> Baill.	Euphorbiaceae		Used in Arthritis, polio.
38	<i>Cuphea procumbens</i> L.	Lathyraceae	Sulpa phul	Used as anti-typhoid, anti-tubercular properties, toxic prevention, ringworm, sore,
39	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Dubo	Used in dysentery, insanity, leucorrhoea, piles, urinary troubles.
40	<i>Cynoglossum zeylanicum</i> (Vahl ex Hornem.) Thunb. ex Lehm.	Boraginaceae	Kanike phul	Healing agent for cuts, and wounds, treat ringworm, conjunctivitis, fractures bones, uterine tumours, boils,
41	<i>Cyperus difformis</i> L.	Cyperaceae	Mothe Jhar	Used as diuretic, Astringent, Diarrhoea, Gonorrhoea, Syphilis
42	<i>Cyperus iria</i> L.	Cyperaceae	Thulo mothe Jhar	Used as stimulant, Stomach-ache, Astringent
43	<i>Cyperus rotundus</i> L.	Cyperaceae		Tumour is used in Abscesses, cholera, cough, diarrhoea, epilepsy, fever, wounds, erysipelas,
44	<i>Desmodium gangeticum</i> (L.) DC	Fabaceae		Used in Asthma, diuretic, eczema, itching,
45	<i>Dichrocephala benthamii</i> CB Clarke	Asteraceae	Chhiuke jhar	For nasal infection
46	<i>Drymaria cordata</i> L.	Caryophyllaceae	Abhijalo	Used in headache, antipyretic, cold, throat problem, diarrhoea, dysentery
47	<i>Drymaria diandra</i> Blume	Caryophyllaceae	Abhijalo	Used as a laxative, peptic ulcer, cough and cold
48	<i>Echinochloa colona</i> (L.) Link	Poaceae	Sama	Useful in biliousness and constipation and flatulence
49	<i>Echinochloa crus-galli</i> (L.) P. Beauv.	Poaceae	Sama	Check haemorrhage, disease of the spleen
50	<i>Eclipta prostrata</i> (L.) L.	Asteraceae	Bhringraaj	Antiseptic for ulcers, emetic, jaundice, nerves problems, purgative, tonic, snakebite.
51	<i>Elephantopus scaber</i> L.	Asteraceae	Gomukhi, Buti jhar	Used as cardiac tonic, diuretics, febrifuge, dysuria, diarrhoea, toothache, rheumatism
52	<i>Emilia sonchifolia</i> (L.f.) DC.	Asteraceae	Chaulaane jhar	Astringent, ophthalmia, gastropathy, diarrhoea, intermittent fever, asthma, antiasthmatic, cuts and wounds
53	<i>Fimbristylis dichotoma</i> (L.) Vahl	Cyperaceae		Used in headache
54	<i>Galinsoga parviflora</i> Cav.	Asteraceae	Chitlange jhar	Used in a wound to check bleeding
55	<i>Geranium pratense</i> L.	Geraniaceae		Used as Analgesic, anti-inflammatory, influenza, cough, cold, joint pain backache, eyes, biles, swelling of limbs
56	<i>Gnaphalium affine</i> D.Don	Asteraceae	Buki phool	Used in cut and wounds
57	<i>Hydrocotyle sibthorpioides</i> Lam.	Umbeliferae	Sano ghodtapre	Used as a brain tonic, elephantiasis, leprosy, weakness.
58	<i>Imperata cylindrica</i> (L.) Beauv	Poaceae	Siru	Used as antipyretic, diuretic, hypertension, jaundice, wounds
59	<i>Indigofera linifolia</i> (L.f.) Retz.	Fabaceae		Used for febrile eruption, amenorrhoea

60	<i>Jatropha gossypifolia</i> L.	Euphorbiaceae	Sajiwan	Useful in convulsion, syphilis, neuralgia, dropsy, pleurisy, pneumonia
61	<i>Lantana camara</i> L.	Pedaliaceae	Banmara	Used in cuts, wounds
62	<i>Leucas plukenetii</i> (Roth) Spreng [= <i>Leucas aspera</i> L.]	Lamiaceae	Ban tulasi	Used in digestion, fever, head ache, jaundice, stomach disease, snakebite
63	<i>Lindernia oppositifolia</i> (L.) Mukerje	Scrophulariaceae	Kankare jhaar	Chronic bronchitis, mixed with coriander and applied to skin disease, cut and wounds Used in Asthma, anthelmintic, bronchitis, blood and eye disorders, bowels, burning sensation, fevers, colds, diseases of the heart, stomachic, thirst and loss of consciousness, ulcers, urinary concretions, wounds, vulnerary.
64	<i>Lippia nodiflora</i> L.	Verbenaceae		Snake bites, boils, ascites from cirrhosis, schistomiasis, nephritis, oedema, enteritis, diarrhoea
65	<i>Lobelia chinensis</i> Lour.	Campanulaceae	Eklebir	
66	<i>Mazus pumilus</i> (Burm. f.) Steen	Scrophulariaceae	Baghmukhe jhar	Used cure typhoid
67	<i>Mazus surculosus</i> D.Don	Scrophulariaceae		Used in hyperacidity, cut and wounds Antiseptic, anthelmintic, cardiogenic, febrifuge, Sudorific, Contraceptive, asthma, splenopathy, cough, jaundice, general weakness, rheumatism, fever, bronchitis, skin diseases, wounds and cuts
68	<i>Mentha arvensis</i> L.	Lamiaceae	Pudina, baabari	
69	<i>Ophioglossum petiolatum</i> Hook.	Ophioglossaceae	Jibre sag	Used to treat wounds, cuts, nasal bleeding and check vomiting
70	<i>Oxalis corniculata</i> L.	Oxalidaceae	Chari amili	Used as cooling effect, dysentery, diarrhoea, Stomach troubles.
71	<i>Persicaria barbata</i> (L.) Hara [<i>Polygonum barbatum</i> L.]	Polygonaceae	Pire, bikha	Astringent, stimulating wash for ulcers, swollen parts of body, scabies, also used as a fish poison
72	<i>Persicaria chinensis</i> (L.) H. Gross	Polygonaceae	Seto pire	Used and antiscorbutic and tonic
73	<i>Persicaria hydropiper</i> (L.) Spach [= <i>Polygonum hydropiper</i> L.]	Polygonaceae	Pire	Used as a fish poison, applied in skin disease, stomach-ache
74	<i>Persicaria perfoliata</i> (L.) H. Gross [<i>Polygonum perfolium</i> L.]	Polygonaceae	Amilo pire	Juice is used in backache
75	<i>Phragmites karka</i> (Retz.) Trin ex Steud.	Cyperaceae	Narkat	Used as cooling, diuretic and diaphoretic
76	<i>Phyllanthus amarus</i> Schumach. & Thonn	Euphorbiaceae	Amala jhar	Used in Jaundice, diabetes, urinary infections, intermittent fever.
77	<i>Plantago erosa</i> Wall.	Plantaginaceae	Isabgol	In the case of indigestion and boils Used as diuretics, antidysentric, expectorant, aphrodisiac, habitual constipation, chronic dysentery, colinalgia, gonorrhoea, nephropathy, duodenal ulcers, general debility, gout, diarrhoea,
78	<i>Plantago major</i> L.	Plantaginaceae	Isabgol	

79	<i>Polygonum plebeium</i> R. Br.	Polygonaceae	Bethe, balune saag	Used in pneumonia, sore throat, blood dysentery
80	<i>Portulaca oleracea</i> L.	Portulacaceae		Used in burns, cardio vascular diseases, cholesterol reducer, fever, diarrhoea, diabetes, headache, ulcers, urinary disorders, wounds.
81	<i>Duchesnea indica</i> (Andrews) Focke. [= <i>Fragaria indica</i> Andrew.]	Rosaceae	Bhui kaphal	Relief in profuse menstruation, fever, blemishes on the tongue
82	<i>Ranunculus laetus</i> Wall. ex D. Don.	Ranunculaceae	Naak kore	Used in stomach-ache, rheumatism, dysuria, asthma, skin trouble, pneumonia, kidney trouble
83	<i>Rosa sericea</i> Lindl	Rosaceae	Jungali Gulaph	Used in Jaundice, used to wash the eye, ant treat ophthalmia, control menstruation, headache, applied joint pain
84	<i>Rubia manjith</i> Roxb. ex Fleming	Rubiaceae	Majitho	Used as antidysergent, astringent, anthelmintic, rejuvenating, leprosy, skin diseases, jaundice, Diarrhoea, Wounds, and cuts, urinary diseases, leucorrhoea, otopathy, febrifuge, efficient blood purifier, ear and eye diseases, snake bite, leucoderma, rheumatic arthritis
85	<i>Rumex nepalensis</i> Spreng.	Polygonaceae	Hal-Hale	Used in sprain, cut and wounds, syphilis, ulcers
86	<i>Saccharum officinarum</i> Lindl.	Poaceae	Ukhu	Used as laxative, expectorant, cardiogenic, aphrodisiac, bronchitis, anaemia, seminal weakness
87	<i>Saccharum spontaneum</i> L.	Poaceae	Kans	Used as laxative, emollient, diuretics, lithotropic, haemostatics, aphrodisiac
88	<i>Salvia plebeia</i> R. Br.	Lamiaceae		Used as antiemetics, cardiogenic, dentrifuge, contraceptive, wounds, cuts, cough, peptic ulcers, splenopathy, dental caries, jaundice, fever and general weakness
89	<i>Setaria viridis</i> (L.) Beauv	Poaceae	Kukur ghans	Widely used in Bruises
90	<i>Sida cordifolia</i> L. (Burn. f) Borss	Malvaceae	Balu	Astringent, anti-rheumatic, gonorrhoea, leucorrhoea, heal cuts, nervous disorders, snake bite, scorpion sting, and wounds.
91	<i>Sida rhombifolia</i> L.	Malvaceae	Balu	Demulcent, diuretic, haemorrhoids, stomach-ache
92	<i>Solanum nigrum</i> L.	Solanaceae	Kali gedi	Used in Jaundice, cough, piles, skin diseases, ulcer
93	[= <i>Solanum xanthocarpum</i> Schard & Wendl.] <i>Solanum surattense</i> Burm. f	Solanaceae	Bhaise kanda	Used as an anti-inflammatory and in asthma, constipation, diuretic, fever, laxative, sore throat, stimulant, cough, stomach-ache,
94	<i>Sonchus oleraceus</i> L.	Asteraceae	Dudhe jhaar	Used in earache, eye diseases, fever, scars, stomach upset.
95	<i>Spergula arvensis</i> L.	Caryophyllaceae	Jhyaau jhaar	Used as a fermenting agent
96	<i>Spilanthes paniculata</i> Wall. ex. DC.	Asteraceae	Bhuin timur	Used in snake bite, toothache, stomach-ache,
97	<i>Stellaria media</i> (L.) Vill.	Caryophyllaceae	Armale jhaar	As plaster for broken bones and swelling
98	<i>Taraxacum officinale</i> Wigg.	Asteraceae		Used as antibacterial, chronic hepatitis, intermittent fever, insomnia, jaundice, biliary calculi and other hepatitis, heart trouble

99	<i>Torenia asiatica</i> L.	Scrophulariaceae	Pidhaa maari	The juice is used in cuts and wounds
100	<i>Tridax procumbens</i> L.	Asteraceae	Kurkure jhaar	Used in boils, cuts, eye diseases, dysentery, diarrhoea, wounds.
101	<i>Urtica dioica</i> L.	Urticaceae	Sinsnu	Used in diuretics, astringent, anthelmintic, nephritis, haematuria, menorrhagia, jaundice, toothache, emmenagogue
102	<i>Vernonia cinerea</i> (L.) Less.	Asteraceae	Phule jhaar	Used in Anthelmintic, cough, fever, diarrhoea, headache, insomnia, malaria, leucoderma, skin diseases, stomach ache
103	<i>Viola pilosa</i> Blume.	Violaceae	Ghatte ghans	Used for fever, boils, lung trouble, a blood disorder, emetic, emollient and laxative, diaphoretic, antispasmodic and stomachic
104	<i>Youngia japonica</i> (L.) DC.	Asteraceae		Used in indigestion

CONCLUSIONS

The rich diversity of weeds in paddy fields of Kathmandu valley indicated that the region is one of the potential areas for paddy plantation in Nepal. The higher weed diversity could also be attributed to rich variation in microtopography as well as the farming system of paddy including weeding technique, irrigation system, use of insecticides and pesticides in soil. The entire plant diversity including medicinal plant is threatened due to overexploitation, deforestation and land use changes, more particularly in big cities like Kathmandu. Despite heavy shrinkage in paddy field area in Kathmandu, the weeds are still highly diverse, but their survival could be critically challenged due to rapidly changing climate, emergence of invasive plant species and mainly due to the abandonment of paddy fields from Kathmandu valley.

Since many plants species and their products are used in pharmaceuticals, traditional, indigenous and ethnobotanical knowledge is very important to enhance our capacity to promote the use of weeds plant in primary health care as well as for drug formulation. Widely applied and easy allopathic practices in urban areas are sharply declining, which is highly critical in forming a huge gap in knowledge transfer regarding uses

and potentiality of medicinally important plants. The maximum use of locally available weeds from paddy fields is not only environmentally sustained but also highly cheaper against ever-increasing costly antibiotic and other synthetic medicine. Our findings could serve as baseline information for long term study of weed dynamics and be useful for farmers both in terms of weed management in paddy field and use of available weeds for primary health care, and also for people who are working on phytochemistry of medicinal weeds and drug formulation. Further exploration of ecological attributes, traditional knowledge documentation and phytochemical properties of medicinally important weeds are very important to scale up our understanding of weeds and their use as a part of their management technique.

ACKNOWLEDGMENTS

The authors are grateful to anonymous reviewers for their constructive comments. We would like to acknowledge National Herbarium and Plant Laboratory (KATH, Godabari) and Tribhuvan University Central Herbarium (TUCH, Kirtipur) for the valuable contribution during identification of weed species. We are grateful to Mr.

Basu Dev Paudel of Central Department of Botany, Tribhuvan University for the preparation of study area map.

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Received 14 May 2018

Revised Accepted 30 August 2018