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FOLK USES OF WEEDS FROM DISTRICT RUDRAPRAYAG, UTTARAKHAND, INDIA

Bharti Rautela^{1*} and Prabhawati Tiwari^{2*}

¹Department of Botany, LSM Govt. PG College, Pithoragarh, Uttarakhand, India

²Department of Botany and Microbiology, HNB Garhwal University, Srinagar (Garhwal), Uttarakhand, India

*E-mail: bhartirautela77@gmail.com

E-mail: ptiwari29@rediffmail.com

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ABSTRACT

Weeds adversely affect the crop yield. However, some weeds are traditionally used as fodder resources, wild edibles, medicinal plants, fibre yielding, etc. in different parts of the world. Present study aimed to document the local uses of weedy plants in Rudraprayag district of Uttarakhand. A total of 113 weed species belonging to 90 genera and 38 families were documented with various folk uses. The present study revealed that the local people use weed species mainly as fodder for cattle. Some species are effective in healing skin ailments, cuts, wounds and urinary problems.

Keywords: Uttarakhand, crop, weed, traditional uses, fodder

INTRODUCTION

Weeds are undesirable and obnoxious plant species which grow where they are not required (Tiwari *et al.*, 2020). Weedy plants pose a major threat to food security, biodiversity, ecosystem services and consequently to human health and wellbeing (Neve *et al.*, 2018). Weeds have become a serious threat to agricultural lands as they act as eternal pest to crop plants, reduce their productivity and cause a huge economic loss to the farmers. Weeds compete with economically valuable plants for nutrition, space, light, moisture, *etc.* They are usually allergic and cause health hazards to human and animals. Weeds can withstand in almost all environmental conditions and seasons favouring their vigorous growth in natural habitats (Singh *et al.*, 2004). Several weeds and invasive alien species can encroach into natural habitats of Himalaya, able to form large carpets of themselves on the land surface and change the natural habitats which may eradicate several habitat specific species from the area (Tiwari *et al.*, 2015; Rawat *et al.*, 2016). Hence, sustainable strategies for managing weeds are critical to meet agriculture's potential to feed the world's population while conserving the ecosystems and biodiversity on which we depend (MacLaren *et al.*, 2020).

Apart from the negative aspects, weeds are also used for some beneficial purposes like phytoremediation, biopesticides, compost, vermicompost, *etc.* (Singh and Srivastava, 2013). Some weeds are source of fodder, wild edible and traditional medicine (Govindiah, 1981). Several studies are available on weeds from different parts of Uttarakhand. However, studies on weeds from higher elevation like district Rudraprayag, Uttarakhand is limited. Hence, we recently conducted weed floristic and

phytosociological studies from the district (Rautela and Tiwari, 2020; Tiwari *et al.*, 2020). The present study is an attempt to document the folk uses of weeds in district Rudraprayag, Uttarakhand.

MATERIALS AND METHODS

The present study was conducted in the district Rudraprayag of Uttarakhand state, Western Himalaya. It is located between 30°12'58"–30°56'47" N latitude and 78°50'07"–79°22'58" E longitude. The district occupies the total geographical area of 2439 km². It covers an altitudinal range from 600 m a.s.l. to 7138 m a.s.l. and mean annual temperature range from –40°C to 34°C. The northern and western parts of the district are perennially under snow cover enriched with lofty Himalayan peaks including Kedarnath (6940 m) and Chaukhamba (7138 m) with alpine ridges up to 3800 m a.s.l. (Tungnath). The forests in the area are mainly dominated by different oak species, *viz.*, *Quercus glauca* (Harinj), *Q. leucotrichophora* (Banj), *Q. floribunda* (Moru), and *Q. semecarpifolia* (Kharsu), which form the climax vegetation at different climatic zones (Bhatt, 2020). Mandakini is the main river in the district. The district is famous for beautiful peaks, splendid glaciers, serene landscapes, alpine meadows, rich floral and faunal diversity.

Extensive field surveys were conducted to the district Rudraprayag, Uttarakhand during years 2016–2018 to document the folk uses of weeds. Plant specimens were collected pressed, dried and their identification was carried out with the help of floras (Naithani, 1984-1985; Gaur, 1999) and herbarium (GUH). Questionnaire was prepared for interviewing the local people, vaidyas, shepherds, and ethnic communities to gather information including local

Table 1: Folk uses of weeds in district Rudraprayag, Uttarakhand.

Botanical name	Family	Part used	Folk uses
<i>Abutilon indicum</i> (L.) Sweet	Malvaceae	Leaves	Diarrhoea, fever
<i>Achyranthes aspera</i> L.	Amaranthaceae	Leaves, roots	Fodder; cuts, wounds
<i>Achyranthes bidentata</i> Blume	Amaranthaceae	Leaves	Fodder; cuts, wounds
<i>Ageratum conyzoides</i> L.	Asteraceae	Leaves	Cuts, wounds, skin problems
<i>Ajuga bracteosa</i> Wallich ex Benth	Lamiaceae	Leaves	Astringent, cuts
<i>Amaranthus spinosus</i> L.	Amaranthaceae	Leaves, young shoots	Edible (vegetable); fodder
<i>Amaranthus viridis</i> L.	Amaranthaceae	Leaves, young shoots	Edible (vegetable); fodder
<i>Ammannia baccifera</i> L.	Lythraceae	Leaves	Skin rashes, parasitic skin infections
<i>Anaphalis contorta</i> (D.Don) Hook f.	Asteraceae	Leaves	Fire ignition, insect repellent
<i>Anaphalis nepalensis</i> (Spreng.) Hand.-Mazz.	Asteraceae	Leaves	Injuries, cuts
<i>Anisomeles indica</i> (L.) Kuntze	Lamiaceae	Leaves	Astringent, Gastro-intestinal problems
<i>Apluda mutica</i> L.	Poaceae	Whole plant	Fodder
<i>Argemone mexicana</i> L.	Papaveraceae	Roots	Antihelminthic
<i>Artemisia nilagirica</i> (Clarke) Pamp.	Asteraceae	Leaves	Antihelminthic
<i>Avena fatua</i> L.	Poaceae	Whole plant	Fodder
<i>Barleria cristata</i> L.	Acanthaceae	Leaves, roots	Antiseptic, wounds, skin diseases
<i>Bidens bipinnata</i> L.	Asteraceae	Leaves	Skin irritations, cuts, wounds
<i>Bidens pilosa</i> L.	Asteraceae	Whole plant	Skin problems; fodder
<i>Boehmeria platyphylla</i> D. Don	Urticaceae	Leaves	Fodder
<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Leaves	Urinary problems
<i>Calotropis gigantea</i> (L.) Dryander	Asclepiadaceae	Leaves, latex, root bark	Skin problems, dysentery, joint pains
<i>Calotropis procera</i> (Aiton) Dryander	Asclepiadaceae	Root bark; latex	Cough, skin diseases
<i>Cannabis sativa</i> L.	Cannabinaceae	Seeds; bark	Fibre, chutney, edible
<i>Capsella bursa-pastoris</i> (L.) Medik.	Brassicaceae	Whole plant	Cuts, wounds, urinary problems
<i>Cardiospermum halicacabum</i> L.	Sapindaceae	Whole plant	Rheumatic pain
<i>Cassia occidentalis</i> L.	Caesalpiniaceae	Leaves, roots	Skin diseases, worms
<i>Cassia tora</i> L.	Caesalpiniaceae	Leaves, roots, seeds	Cuts, wounds, skin problems, fever, worms
<i>Celosia argentea</i> L.	Amaranthaceae	Leaves	Fodder
<i>Centella asiatica</i> (L.) Urban	Apiaceae	Leaves	Skin diseases, fever
<i>Chenopodium album</i> L.	Chenopodiaceae	Leaves	Edible
<i>Cirsium wallichii</i> DC.	Asteraceae	Roots	Body ache
<i>Cleome viscosa</i> L.	Cleomaceae	Seeds	Condiment, gastro-intestinal problems
<i>Clinopodium umbrosum</i> (M.Bieb.) C. Koch	Lamiaceae	Leaves	Astringent, cuts, wounds; gastric problems
<i>Coccinia grandis</i> (L.) Voigt	Cucurbitaceae	Fruit, leaves	Edible
<i>Convolvulus arvensis</i> L.	Convolvulaceae	Leaves	Wounds, burns
<i>Cuscuta europaea</i> L.	Cuscutaceae	Whole plant	Skin problems
<i>Cynodon dactylon</i> (L.) Persoon	Poaceae	Whole plant	Fever, cuts, skin diseases; fodder
<i>Cyperus rotundus</i> L.	Cyperaceae	Whole plant	Astringent, diuretic
<i>Dactyloctenium aegypticum</i> (L.) P. Beauv.	Poaceae	Whole plant	Fodder
<i>Datura innoxia</i> Mill.	Solanaceae	Flowers, seeds	Cough, bronchitis
<i>Datura stramonium</i> L.	Solanaceae	Seeds	Rheumatic pain
<i>Desmodium microphyllum</i> (Thumb.) DC.	Fabaceae	Whole plant	Fodder

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<i>Desmodium triflorum</i> (L.) DC.	Fabaceae	Whole plant	Fodder
<i>Dichanthium annulatum</i> (Forsk.) Stapf	Poaceae	Whole plant	Fodder
<i>Dicliptera bupleuroides</i> Nees	Acanthaceae	Whole plant	Fodder; wounds, cuts
<i>Digera muricata</i> (L.) Mart.	Amaranthaceae	Leaves	Fodder
<i>Digitaria ciliaris</i> (Retz.) Koeler	Poaceae	Whole plant	Fodder
<i>Dioscorea bulbifera</i> L.	Dioscoreaceae	Tuber	Edible; antiseptic, cuts, wounds
<i>Echinochloa colona</i> (L.) Link	Poaceae	Whole plant	Fodder; edible
<i>Echinochloa crus-galli</i> (L.) P. Beauv.	Poaceae	Whole plant	Fodder
<i>Eclipta prostrata</i> (L.) L.	Asteraceae	Whole plant	Fever; laxative
<i>Eleusine indica</i> (L.) Gaertner	Poaceae	Whole plant	Fodder
<i>Emilia sonchifolia</i> (L.) DC.	Asteraceae	Leaves	Fever, eye infections
<i>Eriophorum comosum</i> (Wall.) Wall. ex Nees	Cyperaceae	Leaves	Fibre; making brooms
<i>Eupatorium adenophorum</i> Sprengel	Asteraceae	Leaves	Astringent, burns, cuts, wounds, antiseptic
<i>Euphorbia hirta</i> L.	Euphorbiaceae	Whole plant	Cough, bronchitis, urinary problems
<i>Euphorbia hypericifolia</i> L.	Euphorbiaceae	Leaves	Diarrhoea
<i>Euphorbia prostrata</i> Aiton	Euphorbiaceae	Whole plant	Laxative
<i>Evolvulus alsinoides</i> (L.) L.	Convolvulaceae	Whole plant	Cold, cough
<i>Fumaria indica</i> (Hauskn.) Pugsley	Fumariaceae	Whole plant	Diuretic, wounds
<i>Galinsoga parviflora</i> Cav.	Asteraceae	Whole plant	Fodder; against nettle stings
<i>Galium aparine</i> L.	Rubiaceae	Leaves	Astringent, skin diseases
<i>Geranium nepalense</i> Sweet	Geraniaceae	Whole plant	Fever, kidney problems, skin diseases
<i>Geranium ocellatum</i> Cambess.	Geraniaceae	Whole plant	Astringent, diuretic
<i>Gnaphalium hypoleucum</i> DC.	Asteraceae	Whole plant	Cuts, wounds
<i>Hedyotis corymbosa</i> (L.) Lam.	Rubiaceae	Whole plant	Fever, diuretic
<i>Imperata cylindrica</i> (L.) P. Beauv.	Poaceae	Whole plant	Fodder; cold, cough
<i>Ipomoea nil</i> (L.) Roth.	Convolvulaceae	Seeds	Fever, laxative
<i>Ipomoea purpurea</i> (L.) Roth.	Convolvulaceae	Whole plant	Fodder; laxative
<i>Ischaemum rugosum</i> Salisb.	Poaceae	Whole plant	Fodder
<i>Lantana camara</i> L.	Verbenaceae	Leaves	Antiseptic, rheumatism
<i>Lathyrus aphaca</i> L.	Fabaceae	Whole plant	Fodder
<i>Leucas cephalotes</i> (Roth) Sprengel	Lamiaceae	Whole plant	Anthelmintic, antiseptic
<i>Leucas lanata</i> Benth.	Lamiaceae	Leaves	Cuts, cough
<i>Malvastrum coromandelianum</i> (L.) Garcke	Malvaceae	Leaves	Wounds; cough, sore throat, dysentery
<i>Melilotus indica</i> (L.) Allioni	Fabaceae	Whole plant	Fodder; diarrhoea
<i>Micromeria biflora</i> (Buch.-Ham. ex D. Don) Benth.	Lamiaceae	Leaves	Nosal congestion, cold
<i>Oxalis corniculata</i> L.	Oxalidaceae	Leaves	Pimples, cuts, wounds; edible
<i>Paspalidium flavidum</i> (Retz.) A. Camus	Poaceae	Whole plant	Fodder
<i>Paspalum distichum</i> L.	Poaceae	Whole plant	Fodder
<i>Phyllanthus niruri</i> L.	Euphorbiaceae	Whole plant	Urinary, gastric problems
<i>Physalis minima</i> L.	Solanaceae	Leaves	Urinary problems
<i>Plantago lanceolata</i> L.	Plantaginaceae	Leaves	Cuts and wounds
<i>Plantago major</i> L.	Plantaginaceae	Leaves	Cuts and wounds
<i>Plumbago zeylanica</i> L.	Plumbaginaceae	Roots	Wounds, skin diseases
<i>Polypogon fugax</i> Nees ex Steudel	Poaceae	Whole plant	Fodder
<i>Portulaca oleracea</i> L.	Portulacaceae	Leaves	Edible
<i>Ranunculus arvensis</i> L.	Ranunculaceae	Whole plant	Skin problems, fever, asthma, rheumatic pain

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<i>Ranunculus sceleratus</i> L.	Ranunculaceae	Whole plant	Antihelminthic, skin ailments
<i>Rumex dentatus</i> L.	Polygonaceae	Leaves	Edible
<i>Rumex hastatus</i> D.Don	Polygonaceae	Leaves	Chutney and sauce; burns, cuts, skin rashes, against nettle sting
<i>Rumex nepalensis</i> Sprengel	Polygonaceae	Leaves	Edible; laxative
<i>Saussurea heteromalla</i> (D.Don) Hand.-Mazz.	Asteraceae	Leaves	Wounds
<i>Setaria glauca</i> (L.) P. Beauv.	Poaceae	Whole plant	Fodder
<i>Sida acuta</i> Burm. f.	Malvaceae	Leaves	Diuretic
<i>Sida cordifolia</i> L.	Malvaceae	Roots	Diuretic, astringent
<i>Sida rhombifolia</i> L.	Malvaceae	Leaves	Joint pain
<i>Silene conoidea</i> L.	Caryophyllaceae	Leaves	Skin problems
<i>Solanum nigrum</i> L.	Solanaceae	Leaves, fruits	Liver problems, dysentery, fever, diarrhoea
<i>Solanum surattense</i> Burm. f.	Solanaceae	Fruits	Fever, cough, liver problems
<i>Sonchus asper</i> (L.) Hill.	Asteraceae	Whole plant	Liver problems, wounds
<i>Sonchus oleraceus</i> L.	Asteraceae	Whole plant	Liver problems
<i>Stellaria media</i> (L.) Vill.	Caryophyllaceae	Whole plant	Fodder; cuts and wounds
<i>Thlaspi arvense</i> L.	Brassicaceae	Leaves	Edible; cuts and wounds
<i>Tribulus terrestris</i> L.	Zygophyllaceae	Fruits	Kidney stones, skin rashes
<i>Tridax procumbens</i> L.	Asteraceae	Leaves	Cuts and wounds
<i>Trifolium repens</i> L.	Fabaceae	Whole plant	Green manure; fodder
<i>Urena lobata</i> L.	Malvaceae	Flowers, roots	Rheumatic pain, cough, congestion
<i>Urtica dioica</i> L.	Urticaceae	Leaves, shoots	Edible (vegetable); rheumatic pain, diuretic, fodder
<i>Verbascum thapsus</i> L.	Scrophulariaceae	Whole plant	Skin irritations, bronchitis
<i>Vernonia cinerea</i> (L.) Less.	Asteraceae	Leaves, seeds	Diarrhoea, antihelminthic
<i>Vicia hirsuta</i> (L.) Gray	Fabaceae	Whole plant	Fodder
<i>Vicia sativa</i> L.	Fabaceae	Whole plant	Fodder



Figure 1: Views of study area



Figure 2: A) *Vicia hirsuta*; B) *Bidens pilosa*; C) *Oxalis corniculata*; D) *Urena lobata*; E) *Vicia sativa*; F) *Fumaria indica*; G) *Eriophorum comosum*; H) *Stellaria media*; I) *Chenopodium album*

name, local uses and part used.

RESULTS AND DISCUSSION

A total of 113 species (from 90 genera and 38 families) of weeds were recorded from the district Rudraprayag which are used by the local people for numerous purposes (Table 1). Of these, higher number of species belongs to family Asteraceae (17 species), Poaceae (15) and Fabaceae (7 species). The district represents a diverse weed flora (Rautela and Tiwari, 2020; Tiwari *et al.*, 2020). Among the part used, the majority of weed species used as whole plant (aerial part) especially for fodder source. Weeds of family Poaceae (e.g. *Avena fatua*, *Digitaria ciliaris*, *Echinochloa colona*, *Echinochloa crus-galli*, *Eleusine indica*, *Imperata cylindrica*, *Ischaemum rugosum*, *Paspalidium flavidum*, *Paspalum distichum* and *Setaria glauca*) are mainly used as fodder source for cattle in the area. The weed species used as fodder in district Rudraprayag are in agreement to other studies on fodder resource used patterns in nearby areas i.e., Gairsain (Rawat *et al.*, 2018), Josimath (Nautiyal *et al.*, 2018) and Pauri (Gaur, 1999). *Urtica dioica*, *Chenopodium album*, *Amaranthus spinosus*,

Amaranthus viridis, *Rumex nepalensis*, etc. are edible and cooked as vegetable in the study area. Similar uses of these species were reported from other part of Kedarnath Forest Division (Ballabha *et al.*, (2013).

Seeds of *Cleome viscosa* are used as condiments for flavouring 'curries' and 'raiya'. Some weed species are used as remedy against kidney stones, urinary problems, cold, cough, nasal congestion, skin rashes, cuts, wounds, burns, constipation and dysentery in the area (Table 1). Tripathi *et al.*, (2020) reported that the 48 invasive alien species were used in treatment of various ailments like cuts, wounds, headache, etc. in folk medical system of Kumaun Himalaya (Uttarakhand). Similarly, Dixit and Chaurasia (2015) published ethnomedicinal uses for 84 weed species which are effective to cure against day to day ailments from Guru Ghasidas University (Chhattisgarh). Radha and Manokari (2017) reported medicinal uses for 41 weeds growing in horticultural fields of Palayamkottai (Tamil Nadu).

The present study has provided the information on local uses of weed species from district Rudraprayag of

Uttarakhand state. The reported traditional knowledge on uses of weeds against various ailments like skin problems, cuts, wounds, burns, kidney stones, etc. is crucial and create database for future perspective.

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