

Pharmacological Properties of Selected Weeds

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Abstract

Generally, the weed plants are considered as troublesome, nuisance and problematic in the fields as well in the gardens where they are considered as the enemies (competitors) to the cultivated plants. There is one major misconception that these weeds are worthless. Several herbs which were used in medicinal formulations in Indian traditional system of medicine are now considered as weeds by many field botanists. Moreover, many of the weeds have high pharmacological importance but they are being destroyed due to lack of sufficient scientific knowledge among people. Some weeds do possess diverse group of phytochemicals which include flavonoids, phenolics, alkaloids, steroids, terpenes, saponins etc. these phytochemicals possess promising therapeutic potential like anti-malarial, diuretic, anti-diabetic, hepato-protective, anti-inflammatory, anti-microbial, anti-helminthic, anti-cancerous etc. These phytochemicals have been shown as a promising alternative to the synthetic drugs. The main aim of the present review is to provide information about the pharmacological importance of common weeds, and to create the awareness among the people and scientific community regarding their conservation, protection and sustainable use in medicine.

Key words: Weeds, Phytochemicals, Bioactive compounds, Natural products, Medicinal uses

Introduction

Natural products or herbal drugs have been used for their pharmacological properties and the main source of drugs since long time. According to WHO (world Health Organization) 80% population of the world are estimated to use some kind of herbal product for their well being [1]. In rural India, 70% of the people depend upon the “Ayurveda” which is an Indian traditional system of medicines. Plants are reported to possess very diverse range of phytoconstituents which are actually responsible for their pharmacological activities like, anti-bacterial, anti-oxidant, lipoprotective, hepatoprotective, anti-cancer, diuretic, anti-inflammatory, cardiovascular, anti-diabetic, anti-allergic, immunity booster, aphrodisiac etc. Some important plant derived drugs are artimesinin, ephedrine, physostigmine, quinine, reserpine, aspirin, colchicines, morphine, taxol, pilocarpine, atropine, quinidine, vincristine, tubocurarine, vinblastine and digoxin [2].

Weeds are those plants which are considered undesirable or unwanted in a particular situation. In other words it can be stated that the plants growing in the wrong place. Weeds are considered as the major constraint to the crop production of world by competing with crop plants for mineral nutrients, water, light and space. About 8000 plant species among the total plants are considered as weeds in the world [3]. Asteraceae, poaceae, malvaceae, and fabaceae are the four major families of the weeds [4]. The selected worst weeds of the world which reduce the crop production to a large extent are *Cynodon dactylon*, *Eleusine indica*, *Portulaca oleracea*, *Cyperus rotundus*, *Imperata cylindrical*, *Eichhornia crassipes*, *Echinochloa colonum*, *Chenopodium album* and *Sorghum halepense*. Rice, soya beans, sugar-cane, cotton, coffee, potatoes, sugar-beets, groundnuts, maize, rubber, grapes, sorghum, wheat and tea are the crops which are affected by these weeds [3]. In India there are total 45,000 species of plants are reported. Out of them 3000 species are officially listed as medicinally important. Besides that the traditional


practitioners used more than 6000 plant species. India is the largest producer of the herbal drugs and can be stated as the “Botanical garden of the world” [5], [6]. Total 337 species of weeds are reported in India belonging to 61 families. Out of them there are five prime classes of weeds these are Poaceae, Asteraceae, Fabaceae, Malvaceae and Euphorbiaceae which constitute 42, 40, 40, 18 and 17 weed species respectively [4]. Although weeds are considered as nuisance for commercial crops, but the raw materials obtained from weed plants yield various bioactive compounds which are used by pharmaceutical industries for drug formulations and also used by local communities for herbal preparations [7], [8]. However, in depth study of weed flora regarding their phyto-constituents is still lacking or limited to tribal or local communities as compared to other medicinal plants [9], [10]. As the demand for herbal formulation is increasing day by day, hence there is an urgent need to explore the ignored weed flora in order to find new phyto-constituents for their possible use in drug formulations for human health care. Some of the very important medicinal weeds, their distribution, plant parts used, bioactive compounds and medicinal uses are as shown in Table 1.


There are number of pharmaceuticals companies are present worldwide those manufacture many products from herbal drugs obtained from weeds. The body shop pvt. Ltd England, Nutiva inc. California, Shri baidyanath ayurved pvt ltd India, Hashman California, Nature’s plus New York, Swanson health product North Dakota, Rxhomeo New York, Patanjali Ayurveda India, these are some national and international industries which are manufacturing their products from *Alternanthera sessilis*, *Cannabis indica*, *Coleus forskohlii*, *Butea superba*, *Calotropis gigantea*, *Achyranthus japonica* respectively, for the treatment of various ailments.



Materials and methods

The present information was collected from databases such as CAB abstract, MEDLINE, EMBASE, J GATE, ERIC, Proquest, INMEDPLAN, NATTS, Indian biodiversity portal, The Plant List, Catalogue of Life, JSTOR, Google scholar, and websites such as www.sciencedirect.com, www.ncbi.nlm.nih.gov/pmc/articles, www.jstor.org, www.eflora.org, www.pfaf.org, www.springer.com, <https://onlinelibrary.wiley.com>, www.elsevier.com, <https://www.wikipedia.org> and www.feedipedia.org.




Table 1: Pharmacological activities of selected weeds.




Botanical name	Monocot /dicot	Family	Common name	Distribution	Part used	Bioactive compounds	Medicinal uses	Reference(s)
<p><i>Cynodon dactylon</i> (L.) Pers.</p> 	Monocot	Poaceae	Bermuda grass, doob, dub, dubra, khabbal, kaligas, neelee doob	Uttrakhand, Tamilnadu, Chennai, Punjab	Leaf and roots	<ul style="list-style-type: none"> • 1,6-anhydro-β-D-glucopyranose (levoglucosan), • 2,3,5,9- tetramethyl tricyclo[6.3.0.0(1,5)]undec-2-en-4-one, • 2,3-dihydro-3,5-dihydroxy-6-methyl-4H-pyran-4-one, • 2,4-dihydro-2,4,5-trimethyl-3H-pyrazol-3-one, • 2-methoxy-4-vinylphenol, • 2,3-dihydro benzofuran, • 3-(chloro acetoxy)- 4-methoxy benzaldehyde, • 3,7,11,15- Tetramethyl-2-hexadecen-1-ol, • 3-hydroxy-1-methylpyridinium hydroxide, • 3-Tert-butyl-4-hydroxyanisole, • 4-hydroxy-3-methoxy cinnamic acid, • 5- (hydroxymethyl)- 2-furancarboxaldehyde, • 5- methyl-2-furancarbox-aldehyde, • 5,6-dihydro-2H-pyran-2-one, • 9,9- Dimethoxy-bicyclo [3.3.1]nona-2,4-dione • 9,12- octadecadienoic acid ethyl ester, • Ar-tumerone, • Arundoin, • Benzoic acid, 2- hydroxy-methyl ester, • Curlone, • Cystibenetrimerol A • Cystibenetrimerol B • Decanoic acid ethyl ester, • D-mannose, • Ergonovine (aka Ergometrine), • Ergonovinine, 	Used to treat nasal bleeding, dysentery, central nervous, and cardiovascular and gastrointestinal problems; possess anti-diabetic, anti-oxidant, immunological, anti-allergic, anti-inflammatory, anti-pyretic, analgesic, anti-cancer, dermatological, diuretic, protective, anti-microbial, anti-parasitic, insecticidal properties.	[11], [4], [12] [75], [76]




						<ul style="list-style-type: none"> • Ethyl ester D-mannose, • Ethyl ester linolenic acid, • Friedelin, • Hexadecanoic acid • Hexadecanoic acid ethyl ester • Hydroquinone, • Levoglucosenone, • Menthol, • N-(2,4-cis dimethylcyclopent-3-enoyl)-pyrrolidin-2-one, • N,N'-dibenzoyloxy hexanediamide, • Octadecanoic acid ethyl ester, • o-hydroxyphenyl acetic acids, • Palmitic acid, • Pantolactone, • p-hydroxybenzoic, • Phytol, • Syringic acid, • Tumerone, • Vanillic acid, • β- sitosterol 		
<p><i>Imperata cylindrica</i> (L.) P.Beauv.</p> 	Monocot	Poaceae	Cogon grass	Kerala	Flower and roots	<ul style="list-style-type: none"> • 1-4,β-sitosterol-3-0-β-D-glucopyranosyl-6' tetradecanoate 5, 3-hydroxy 4-methoxy-benzaldehyde • Daucosterol, • α-amyrin, • β-sitosterol 	Used as diuretic, anti-bacterial, sialagogue, styptic, febrifuge; Used to treat haemorrhages, urinary tract infections, fevers, haematuria, oedema, nose bleeds, jaundice, diarrhea, indigestion, dysentery; Possess anti-vinous, astringent, anti-febrile, haemostatic, emollient, restorative, anti-bacterial, anti-helminthic, viricidal and anti-cancer properties.	[13], [4]



<p><i>Saccharum spontaneum</i> L.</p> 	<p>Monocot</p>	<p>Poaceae</p>	<p>Wild sugarcane, Talahib grass</p>	<p>Karnataka, Punjab, Himachal Pradesh, Maharashtra</p>	<p>Whole plant, roots</p>	<ul style="list-style-type: none"> • Bufotenine 	<p>Used to purify blood and treats mental illness, calculi dyspepsia, haemorrhoids, menorrhagia, constipation, kidney stones, dysentery, dyspepsia, piles, sexual weakness, gynaecological and respiratory troubles; Used as an immunity booster, astringent, aphrodisiac, agalactia phthisis, astringent, emollient, diuretic, lithontriptic, purgative and aphrodisiac.</p>	<p>[14], [4]</p>
<p><i>Ageratum conyzoides</i> L.</p> 	<p>Dicot</p>	<p>Asteraceae</p>	<p>Goat weed</p>	<p>Karnataka, Punjab, Maharashtra, Tamilnadu</p>	<p>Whole plant</p>	<ul style="list-style-type: none"> • 1.8-cineole, • 2-(2'-methylethyl)-5,6 dimethylbenzofuran, • 2-(1'- oxo2'methypropyl)-2-methylpropyl)-2-methyl-6,7-dimethoxychromene, • 2-(2-methylprop- 2-enyl)-2-methyl-6,7-dimethoxychromane-4-one, • 3-(2'- methylpropyl)- 2-methyl-6,8-demethoxychrom-4-one, • 3-(2-methylpropyl)-2-methyl-6,8-demethoxychrom-4-one, • 5,7,2',19' - tetrahydroxy-6,3'-di-(3,3-dimethylallyl)- isoflavone 5 o-α-L-rhamnopyrosyl- (1\rightarrow19)-α L-rhamnopyranoside, • 5,7,2,19-tetrahydroxy-6,3-di-(3,3-dimethylallyl)- isoflavone 5-O-α-L-rhamnopyranosyl-(1\rightarrow19)-α-L-rhamnopyranoside, • 6-(1-methoxyethyl)-7- methoxy-2,2-dimethylchromene, 	<p>Reduces spasms, kills bacteria, relieves inflammation, kills insects, fights free radicals, relaxes muscles, relieves pain, heals wounds and cures ulcers.</p>	<p>[15], [4] [77], [78]</p>




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| | | | | | <ul style="list-style-type: none"> • 6-(1-ethoxyethyl)-7-methoxy-2,2-dimethylchromene, • 6-angeloyloxy-7-methoxy-2,2-dimethylchromene, • 6-(1-hydroxyethyl)-7-methoxy-2,2-dimethylchromene, • Ageratochromene dimer, • Brassicasterol, • Caffeic acid, • Caryophyllene epoxide, • Dihydrobrassica sterol, • Dimethylchromene-7-o-β-glucopyranoside, • Echinatine, • Eugenol, • Eupalestin, • Friedeline, • Fumaric acid, • Kaempferol 3,7- digluco-piranoside, • Kaempferol, • Limonene, • Lycopsamine, • Methyleugenol, • Ocimene, • Precocene I (7-methoxy-2,2'-dimethylchromene), • Precocene II, • Quercetin-3- rhamnopyranoside, • Quercetin-3- rhamnopyranoside, • Sabinene, • Scutellarein-5,6,7,1-tetrahydroxyflavone, • Sesquiphellandrene, • Spinasterol, • Stigmasterol, • Terpenen-4-ol, • Transcaryophyllene, • α-Terpineol, • α-Pinene, • β-Sitosterol, | | |
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						<ul style="list-style-type: none"> • β-Pinene, • β-Phellandrene, • β-Caryophyllene, • δ- Cadinene 		
<p><i>Bidens pilosa</i> L.</p> 	Dicot	Asteraceae	Spanish needles	Nagaland, Meghalaya, Uttrakhand, New Delhi	Whole plant	<ul style="list-style-type: none"> • 21a-hydroxyfriedelan-3-one, • Eleosanoic acid, • Friedelin, • Friedelin-3β-ol-27-oic acid, • Friedelinol, • Lupeol, • n-tridecane, • Stigmasterol, • Stigmasterol-3-O-β-D-glucopyranoside • β-Sitosterol 	It possess anti-inflammatory, anti-hyperglycemic, anti-diabetic, immunomodulatory, anti-tumor, anti-oxidant, anti-bacterial, anti-malarial, anti-hypertensive, anti-fungal, anti-ulcerative and vasodilatory property.	[4], [16], [17]
<p><i>Erigeron canadensis</i> L.</p> 	Dicot	Asteraceae	Canadian horseweed	Himachal Pradesh, Chandigarh, Maharashtra, Karnataka	Whole plant	<ul style="list-style-type: none"> • Eugenyl β- primeveroside, • Luteolin, • Luteolin-7-O-β-D-glucuronide, • Quercetin, • Quercetin-3-O-β-D glucopyranoside, • Scutellarin 	Used as anti-rheumatic, emmenagogue, diuretic and astringent; Used to treat bladder problems, colon trouble, vermifuge, cholera, balsamic, tuberculosis, diabetes, fevers, nosebleeds, cystitis, dropsy, bronchitis and coughs.	[18], [4]
<p><i>Sonchus asper</i> (L.) Hill.</p> 	Dicot	Asteraceae	Spiny sowthistle	Maharashtra, Bengluru, Tamilnadu	Tender young leaves and stem tops	<ul style="list-style-type: none"> • 15-O- β -glucopyranosyl-11-β,13-dihydroourspermal A, • Loliolide, • Lupeol, • Ursolic acid. • β-sitoststerol-3-O-β-glucopyranoside 	Used to treat cough, asthma, bronchitis, gastrointestinal infection, wounds and burns, inflammation, cardiac dysfunction, diabetes, kidney, liver disorders and impotence (erectile dysfunction) in humans.	[21], [22], [23], [24], [25], [4] [79], [80]


<p><i>Spilanthes acmella</i> auct. non L.</p> 	<p>Dicot</p>	<p>Asteraceae</p>	<p>Pellitary</p>	<p>Throughout India</p>	<p>Roots and flowers</p>	<ul style="list-style-type: none"> • 3-acetyl aleuritic acid, • Limonene, • Scopolin, • Spilanthol, • Stigmasterol, • trans-ferulic acid, • trans-isoferulic acid, • Vanillic acid, • α-amyrin, • β-Amyrin, • β-Caryophyllene, • β-Sitostenone, • β-Sitosterol, 	<p>Used as anti-pyretic, anti-fungal, aphrodisiac, analgesic, anti-convulsant, bioinsecticide, anaesthetic, anti-oxidant, anti-microbial, anti-inflammatory, vasorelaxant, anti-nociception, diuretic and anti-human immunodeficiency virus; Used as pancreatic lipase inhibitor and relieves toothache.</p>	<p>[26], [27], [4], [28]</p>
<p><i>Tridax procumbens</i> (L.) L.</p> 	<p>Dicot</p>	<p>Asteraceae</p>	<p>Coatbuttons</p>	<p>Throughout India</p>	<p>Whole plant</p>	<ul style="list-style-type: none"> • (Z)-falcarinol, • Limonene, • Zerumbone, • α-Selinene 	<p>Used as anti-inflammatory, anti-diabetic, hepatoprotective, wound healing, activity, immunomodulating property, hypotensive effect, bronchial catarrh, dysentery, diarrhea, prevent hair fall, promote hair growth and anti-microbial.</p>	<p>[29], [4], [30]</p>
<p><i>Xanthium strumarium</i> L.</p> 	<p>Dicot</p>	<p>Asteraceae</p>	<p>Chota dhatura, Common Cocklebur</p>	<p>Throughout India</p>	<p>Roots, leaves and fruits</p>	<ul style="list-style-type: none"> • Caffeic acid, • Carboxyatractyloside, • Desacetyl lanthumin, • Quinic acid • Sesquiterpene lactones, • Thiazinedione, • Xanthanol, • Xanthanolide, • Xanthatin, • Xanthumin 	<p>Used as laxative, anthelmintic, anti-pyretic, improves appetite, anti-rheumatic, diaphoretic, diuretic, emollient, sedative, malaria, tuberculosis, rheumatism and kidney disorders.</p>	<p>[31], [4]</p>




<p><i>Abrus precatorius</i> L.</p> 	<p>Dicot</p>	<p>Fabaceae</p>	<p>Kuntumani, Ratti, Gunchi, Gunja, Crab's eye, Indian liquorice, Jequirity, Wild liquorice, Guncaci, Ratti Dhorgunj, Erragurivinda, Gurivinda, Guruginja</p>	<p>Forest tracts of India</p>	<p>Leaf, seeds, roots</p>	<ul style="list-style-type: none"> • Abricin, • Abrine, • Abrusgenic acid methylester, • Abrusgenic acid, • Abruslactone, • Abrusoside A-D , • Abrussic acid, • Hemiphloin, • Trigonellin, 	<p>Used to treat urinary complaints, purgative, headache, snake bite, cough, aphrodisiac, anti-spasmodic, emetic, ophthalmic, anti-diarrhoeal, anthelmintic, anti-convulsant, anti-bacterial, anti-spasmodic and insecticide.</p>	<p>[32], [33]</p>
<p><i>Aeschynomene indica</i> L.</p> 	<p>Dicot</p>	<p>Fabaceae</p>	<p>Tella-Jeeluga, (Telugu), Didhen, Phulan (Hindi), Netti, Attunetti (Tamil)</p>	<p>Maharashtra, Karnataka</p>	<p>Leaves and roots</p>	<ul style="list-style-type: none"> • Apigenin, • Delphinidin, • Isochlorogenic acid, • Kaempferol, • Malvidin, • Peonidin, • <i>p</i>-hydroxy benzoic acid 	<p>Used as spermicidal, treat kidney stones, urinary disorders, body pain and swelling.</p>	<p>[34], [35], [4]</p>
<p><i>Senna occidentalis</i> (L.) Link</p> 	<p>Dicot</p>	<p>Fabaceae</p>	<p>Kasundi, Kasonda</p>	<p>Throughout India</p>	<p>Whole plant</p>	<ul style="list-style-type: none"> • Cassiaoccidentalin A, • Emodine, • Physcion, • Physcion-1β-D-Glucopyranoside, • β-Sitosterol 	<p>Used to treat indigestion, acne, anemia, digestive, liver tonic, analgesic and anti-allergic.</p>	<p>[4]</p>
<p><i>Abutilon indicum</i> (L.) Sweet.</p>	<p>Dicot</p>	<p>Malvaceae</p>	<p>Country mallow, Kanghi, Petari</p>	<p>Throughout India</p>	<p>Whole plant</p>	<ul style="list-style-type: none"> • 1-lycoperodine, • 1-methoxycarbonyl-β-carboline, • 3,7-Dihydroxychromen-2-One, • 3-Hydroxy-β-Damascene, • 3-Hydroxy -β-ionol, 	<p>Used as aphrodisiac, sedative, diuretic, expectorant, laxative, demulcent, anti-inflammatory, astringent,</p>	<p>[36], [4]</p>


						<ul style="list-style-type: none"> • 4-hydroxy-3-methoxy- • Abutilin A, • Adenine, • Adenosine, • Aurantiamide acetate, • Methyl 4-hydroxyphenylacetate, • Methyl indole-3-carboxylate, • Methylcoumarate, • Methylparaben, • N-feruloyl tyrosine, • Riboflavin, • (R)-N-(1'-Methoxycarbonyl-2'-phenylethyl)-4-hydroxybenzamide, • Scoparone, • Scopoletin, • Stigmasterol, • Syringaldehyde, • Thymine, • trans-cinnamic acid methyl ester, • trans-<i>p</i>-coumaric acid, • Vanillic acid, • Vanillin, • β-Sitosterol, 	<p>anthelmintic, leprosy, analgesic, ulcers, gonorrhoea, headaches and bladder infection.</p>	
<p><i>Malva parviflora</i> L.</p> 	<p>Dicot</p>	<p>Malvaceae</p>	<p>Cheeseweed, Little mallow</p>	<p>Throughout India</p>	<p>Whole plant</p>	<ul style="list-style-type: none"> • 3-Methyl Triacontane, • 5α-Stigmast-9(11)-en-3β-ol, • Malvasterone 	<p>Used as emollient, and treats sores, boils, swellings, coughs, ulcers in bladder, anti-dandruff, promote hair growth and soften hairs.</p>	<p>[37], [4]</p>
<p><i>Sida cordifolia</i> L.</p>	<p>Dicot</p>	<p>Malvaceae</p>	<p>Bala, Country mallow</p>	<p>Throughout tropical and subtropical regions of India</p>	<p>Whole plant</p>	<ul style="list-style-type: none"> • Betaine, • Choline, • Ephedrine, • Hypaphorine, • S-(+)-Nb-methyl tryptophan methyl ester, 	<p>Used to treat asthma, tuberculosis, swine flu, bronchial colds, headaches, lack of perspiration, chills, nasal congestion, cough, wheezing, sore</p>	<p>[4], [81]</p>


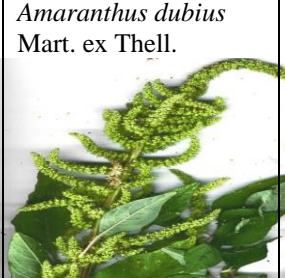

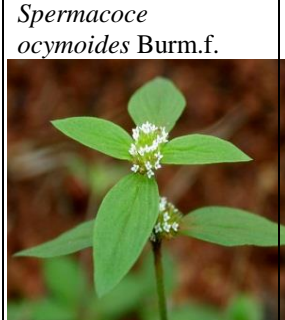
						<ul style="list-style-type: none"> • Vasicine, • Vasicinol, • Vasicinone, • β-Phenethylamine, • ψ-Ephedrine 	mouth, urinary infections, facial paralysis, heart disease, stroke, tissue pain and swelling, chronic rheumatism, unwanted weight loss, increase urine production, aphrodisiac, erectile dysfunction, allergy, sinus problems and throat diseases.	
<i>Acalypha indica</i> L.	Dicot	Euphorbiaceae	Kuppaimaeni, Indian copperleaf, Indian copperleaf, India acalypha, Kucing Galak	Throughout the plains of India, ascending hills in Orissa	Leaves	<ul style="list-style-type: none"> • Acalyphine, • Triacetoneamine 	Used to treat asthma, bed sores, headache, earache, ulcers, diuretic, bronchitis, pneumonia, purgative, anti-bacterial, anthelmintic, anti-fungal, gum problems, stomach aches, rheumatism, hernia, scabies and skin diseases.	[32], [4]
								
<i>Phyllanthus maderaspatensis</i> L.	Dicot	Euphorbiaceae	Hajarmani, Knocha	Kerala, Karnataka, Maharashtra, Tamilnadu	Leaves, seeds	<ul style="list-style-type: none"> • Linoleic acid, • Linolenic acid, • Myristic acid, • Oleic acid, • Palmitic acid, • Stearic acid 	Used as carminative, diuretic, liver tonic, expectorant, diaphoretic and astringent.	[4]
								
<i>Taraxacum campylodes</i> G.E.Haglund	Dicot	Asteraceae	Dandelion	North America, Europe, China	Leaves flower, roots	<ul style="list-style-type: none"> • Glucocorticoids, • Arachidonic acid 	Used to treat inflammation, diuretic, kidney and liver cleanser.	[38]



								
<p><i>Hygrophila auriculata</i> (Schumach.) Heine</p> 	<p>Dicot</p>	<p>Acanthaceae</p>	<p>Hygrophila, Temple plant, Marsh, B arbel</p>	<p>India, Sri Lanka, Burma, Malaysia and Nepal</p>	<p>Roots, seeds and aerial parts</p>	<ul style="list-style-type: none"> • 23-ethyl cholesta-11(12)-dien-3β-ol, • 23-ethyl cholesta-23(24)-dien-3β-ol • 25-Oxohentriacontyl acetate, • Apigenin, • Arabinose, • Asteracanthicine, • Asteracanthine, • Betulin, • Hentriacontane, • Histidine, • Hygosterol, • Leutolin, • Linoleic acid, • Lupeol, • Lysine, • Methyl 8-n-hexyltetracosanoate, • Myristic acid, • Oleic acid, • Palmitic acid, • Phenylalanine, • Stearic acid, • Stigmastereol, • Syringic acid, • Vanillic acid, • β-Sitosterol, 	<p>Used to treat stone of the urinary bladder and diuretic</p>	<p>[22], [82]</p>





<p><i>Cloeme rutidosperma</i></p> 	<p>Dicot</p>	<p>Cleomaceae</p>	<p>Fringed spider flower</p>	<p>Tropical Africa, Asia, the Americas and West Indies</p>	<p>Leaves</p>	<ul style="list-style-type: none"> • 1,5-Hexandien-3-ol , • 3,5-Dimethyl-1,2,4-Trithiolane, • 3,7,11-Trimethyldodeca-1,6,10- Triene, • 3-Methyl-2-Methylbutanitriole, • Arachidic acid, • Benzyl isothiocyanate, • Carotol, • Eicosenoic acid, • Linoleic acid, • Linolenic acid, • Oleic acid, • Palmitic acid, • Santene, • Stearic acid, • Z-Myroxide, • β-Eudesmol , • Δ-Cadinene 	<p>Used to treat ear problems, anti-helminthic and carminative.</p>	<p>[39], [40]</p>
<p><i>Achyranthus aspera</i> L.</p> 	<p>Monocot</p>	<p>Amaranthaceae</p>	<p>Chaff-flower, prickly chaff flower, devil's horsewhip</p>	<p>Tropical world</p>	<p>Seeds, roots, shoots and leaves</p>	<ul style="list-style-type: none"> • 6-Pentatriacontanone, • Hexatriacontane, • Bisdesmosidic Saponins (I-III), • Ecdysterone, • Oleanolic acid, • Pentatriacontane, • Saponins C (I) & D(II), • Tritriacontane 	<p>Used to treat gastrointestinal disorders, labor pain, anti-allergic and diuretic.</p>	<p>[41], [42]</p>
<p><i>Blumea lacera</i> (Burm. fil.) DC.</p> 	<p>Dicot</p>	<p>Asteraceae</p>	<p>Kakronda, Blumea, Jangli Muli, Pilo Kapurio, Tamrachuda</p>	<p>Malay Islands, Australia, China, Tropical Africa, north-west India</p>	<p>Roots, leaves, whole plant</p>	<ul style="list-style-type: none"> • (25R)-3β-{O-β-D-glucopyranosyl-(1→4)-O-α-L-rhamnopyranosyl-(1→4)-[O-α-L-rhamnopyranosyl-(1→2)-α-L-rhamnopyranosyl]-22-α-N-spirosol-5-ene, • Allo-ocimene, • Copaene, • Estragole • Linalool, • γ-Elemene , • γ-Terpinene 	<p>Used to treat cough, bronchitis, dysentery, wound healing, atherosclerosis, diabetes, neurological diseases and hypertension.</p>	<p>[43] [83]</p>

<p><i>Stellaria media</i> (L.) Vill.</p> 	<p>Dicot</p>	<p>Caryophyllaceae</p>	<p>Chickweed, chickweed, snow in the summer, starwort</p>	<p>Europe, Africa, America</p>	<p>Aerial parts</p>	<ul style="list-style-type: none"> • Linoleic acid, • β-Carotene 	<p>Used to treat asthma, congestive, contact dermatitis, diaper rash, inflamed joint, minor skin irritation, varicose ulcers, diuretic and demulcent.</p>	<p>[44]</p>
<p><i>Achillea millefolium</i> L.</p> 	<p>Dicot</p>	<p>Asteraceae</p>	<p>Gordal, nose bleed, devil's nettle, oldman's pepper</p>	<p>Temperate region of north America, New Zealand, Australia</p>	<p>Leaves, flower, stem</p>	<ul style="list-style-type: none"> • Chamazulene, • Isovaleric acid, • Salicylic acid, • β-Cadinol 	<p>Used to treat common cold, dysentery, diarrhea, toothache, cramp, stop bleeding, intestinal gas and anti-inflammatory.</p>	<p>[45]</p>
<p><i>Convolvulus arvensis</i> L.</p> 	<p>Dicot</p>	<p>Convolvulaceae</p>	<p>Bindweeds, possession vine, corn bind</p>	<p>Temperate region of the world</p>	<p>Leaves, flower, stem, roots</p>	<ul style="list-style-type: none"> • Arachidic acid, • Behenic acid, • Caffeic acid, • Calystegins, • Campesterol • Chlorogenic acid, • Convovulin, • Cuscohygrine, • Esculetin • Ferulic acid • Gentisic acid, • Kaempferol-3-O-α-L-rhamnoside, • Kaempferol-7-O-β-D-glucoside, • Kaempferol-3-O-β-D-glucoside, • Kaempferol-3-O-β-D-galactorhamnoside • Kaempferol-7-O-rutinoside, • Kaempferol-3-O-α-L-rhamnosyl, • Linoleic acid, • Linolenic acid, • Oleic acid, 	<p>Enhances immune function, diuretic, laxative and strongly purgative, fevers, anti-hemorrhagic, relieve intestinal and uterine pain and acute hepatitis.</p>	<p>[46]</p>




						<ul style="list-style-type: none"> • Palmitic acid , • <i>p</i>-Coumaric acid, • Protocatechic acid, • Quercetin , • Quercetin-3-O-α-L-rhamnoside, • Rutin, • Scopoletin, • Scopoletin-7-O-glucoside • Stearic acid, • Stigmasterol • Syringic acid, • Umbelliferone , • Vanillic acid, • α-Amyrin, • β-Methylesculetin, • β-Sitosterol 		
<p><i>Capsella bursa-pastoris</i> (L.) Medik.</p> 	Dicot	Brassicaceae	Shepherd's purse, shepherd's sprout	Europe, throughout the temperate parts	Seeds, leaves, roots	<ul style="list-style-type: none"> • Butylamine, • Butyl isothiocyanate 	Used to treat bleeding piles, diarrhea, dysentery, colorless discharge, chorea, asthma, dropsy, bronchitis and intermittent fever.	[47]
<p><i>Sida acuta</i> Burm.f.</p> 	Dicot	Malvaceae	Wireweed, Vernacular, Morning mallow	Throughout the world	Roots	<ul style="list-style-type: none"> • 3-Phenethylamine, • Betaine, • Choline, • Ephedrine, • Hypaphorine, • S-(+)-N_b,N_b-Dimethyltryptophan methyl ester, • Vasicine, • Vasicinol, • Vasicinone, • ψ-Ephedrine 	Used as hepatoprotective, anti-arthritic, gonorrhea, musculoskeletal diseases, anti-tumor, and anti-HIV.	[48], [84]
<p><i>Amaranthus spinosus</i> L.</p>	Dicot	Amaranthaceae	Spiny amaranth, spiny pigweed, prick	Asia, Africa, Europe, the Pacific region and Australia	Whole plant (leaf, stem,	<ul style="list-style-type: none"> • Ferulic acid, • Gallic acid, • <i>p</i>-Coumaric acid, • Salicylic acid, 	Used to treat eczema, broken bone, gonorrhea, colic, piles and dermatitis.	[49]


			ly amaranth or thorny amaranth		roots)	<ul style="list-style-type: none"> • Sinapic acid • Syringic acid, • Vanilic acid, 		
<i>Amaranthus dubius</i> Mart. ex Thell.	Dicot	Amaranthaceae	Red spinach, Chinese spinach	Native to South America and introduced to Asia, Europe and Africa	Roots, plant sap	Not reported	Used to treat broken bone and internal bleeding.	[50]
	Dicot	Scrophulariaceae	Licorice weed	India: Andhra Pradesh, Assam, Kerala, Odisha, Manipur, Meghalaya, Uttar Pradesh; America	roots, leaves and tops	<ul style="list-style-type: none"> • 4-epi-7α-hydroxydulcinodal-13-one, • 4-epi-7α-O-acetyl scoparic acid A, • 7α-Hydroxyscopadiol, • 7α-O-acetyl-8,17β-epoxyscoparic acid A, • Dulcinodal-13-One, • Neo-Dulcinol 	Used as anti-viral, and anti-tumour agent.	[51]
<i>Scoparia dulcis</i> L.	Dicot	Scrophulariaceae	Licorice weed	India: Andhra Pradesh, Assam, Kerala, Odisha, Manipur, Meghalaya, Uttar Pradesh; America	roots, leaves and tops	<ul style="list-style-type: none"> • 4-epi-7α-hydroxydulcinodal-13-one, • 4-epi-7α-O-acetyl scoparic acid A, • 7α-Hydroxyscopadiol, • 7α-O-acetyl-8,17β-epoxyscoparic acid A, • Dulcinodal-13-One, • Neo-Dulcinol 	Used as anti-viral, and anti-tumour agent.	[51]
	Dicot	Rubiaceae	Purple Leaved Button Weed	America, Asia, Europe and Africa	Roots, leaves, whole plant	<ul style="list-style-type: none"> • Borreline, • Borrerine, • Borreverine , • Dehydroborrecapine, • Isoborreverine, • Spermacoceine, • Tetrahydroisoquinoline 	Used as hepatoprotective, treats malaria, hemorrhage, headache, diarrhea, skin diseases, urinary and respiratory infections, fever, inflammation of eye and gums.	[52]
<i>Spermacoce ocymoides</i> Burm.f.	Dicot	Rubiaceae	Purple Leaved Button Weed	America, Asia, Europe and Africa	Roots, leaves, whole plant	<ul style="list-style-type: none"> • Borreline, • Borrerine, • Borreverine , • Dehydroborrecapine, • Isoborreverine, • Spermacoceine, • Tetrahydroisoquinoline 	Used as hepatoprotective, treats malaria, hemorrhage, headache, diarrhea, skin diseases, urinary and respiratory infections, fever, inflammation of eye and gums.	[52]
	Dicot	Asteraceae	Little iron weed	North America, South America, Africa, Asia	Seed, leaves,	<ul style="list-style-type: none"> • (3R)-3- hydroxy-ionone, • 8α-(2-methylacryloyloxy)- hirsutinolide-13-O-acetate, • 8α-(2-methylacryloyloxy)-hirsutinolide, • 8α-(2'Z-tigloyloxy)-hirsutinolide, 	Used as diuretic, analgesic, and anti-pyretic, anti-bacterial; used for treatment conjunctivitis, fever,	[53], [84]
<i>Cyanthillium cinereum</i> (L.) H. Rob.	Dicot	Asteraceae	Little iron weed	North America, South America, Africa, Asia	Seed, leaves,	<ul style="list-style-type: none"> • (3R)-3- hydroxy-ionone, • 8α-(2-methylacryloyloxy)- hirsutinolide-13-O-acetate, • 8α-(2-methylacryloyloxy)-hirsutinolide, • 8α-(2'Z-tigloyloxy)-hirsutinolide, 	Used as diuretic, analgesic, and anti-pyretic, anti-bacterial; used for treatment conjunctivitis, fever,	[53], [84]



						<ul style="list-style-type: none"> • 8α-(2'Z-tigloyloxy)-hirsutinolide-13-O-acetate, • 8α-(4-hydroxytigloyloxy)-hirsutinolide, • 8α-hydroxy-13-O-tigloyl-hirsutinolide • 8α-hydroxyhirsutinolide, • 8α-tigloyloxyhirsutinolide, • 8α-tigloyloxyhirsutinolide-13-O-acetate, • Apigenine, • Dihydroxy-9-octa Decanoic acid • Isololiolide, • Loliolide, • Vernolic acid, • Vernolide-A, • Vernolide-B 	<p>rheumatism, malaria fever, worms, pain, inflammation, cancer, abortion, and various gastrointestinal ailments.</p>	
<p><i>Tridax procumbens</i> (L.) L.</p> 	<p>Dicot</p>	<p>Asteraceae</p>	<p>Dhaman grass, tridax daisy</p>	<p>tropical, subtropical, and mild temperate region</p>	<p>Leaves, flower</p>	<ul style="list-style-type: none"> • (E)-Anethole, • (E)-α-Ionone, • (E)-β-Damascenone, • (E)-β-Ionone, • (Z)-Falcarinol, • (Z)-β-Curcumen-12-ol, • Cedr-8(15)-en-9-α-ol • cis-Myrtanol, • Cyclopentadecanolide, • epi-Longipinanol, • Humulene epoxide II, • Limonene, • Linalool, • Methyl chavicol, • n-Tricosane, • trans-Dihydrocarvone, • trans-Vertocitra, • Zerumbone, • α-Eudesmol, • α-Humulene , • α-Selinene, • α-Terpineol, • β-Acoradiene, • β-Bisabolene , • β-Pinene oxide 	<p>Exhibits anti-inflammatory, hepatoprotective, wound healing, anti-microbial, anti-septic, hypotensive and bradycardiac effects.</p>	<p>[54], [85]</p>



<p><i>Mikania cordata</i></p> 	Dicot	Compositae	Bitter vine	North, Central, and South America	Young shoot	<ul style="list-style-type: none"> • Dihydromikanolide, • Dioxymikanolide, • Methoxy benzoic acid, • Mikanolide, • Scandenolide Dihydroscandenolide 	Used to treat gastric pain, ulcer, fresh wounds and cuts.	[55]
<p><i>Richardia brasiliensis</i></p> 	Dicot	Rubiaceae	Tropical Mexican clover, Brazilian calla-lily, white-eye, and Brazil pusley	South America, Hawaii, Indonesia, Japan, Florida and Thailand	leaves	<ul style="list-style-type: none"> • Isorhamnetin-3-O-rutinoside, • m-Methoxy-p-hydroxy-benzoic acid, • Oleanoic acid, • Oleanolic acid, • Scopoletin, • Stigmasterol, • Ursolic acid, • β-sitosterol 	Cure for eczema, treatment of boils.	[39] [86], [87]
<p><i>Mimosa pudica L.</i></p> 	Dicot	Mimosaceae	Touch-me-not plant , shame plant, sensitive plant,	America, Australia, India	Whole plant	<ul style="list-style-type: none"> • 5,7,3',4'-teteahydroxy-6-C-[β-D-apiose-(1\rightarrow4)]-β-D-glucopyranosyl flavone, • 5,7,4'-trihydroxyl-8-C-β-D-glucopyranosyl flavones, • D-Pinitol, • β-Sitosterol 	Used to treat hemothermia, piles, diarrhea, persistent dysentery ulcers, and wounds, gynecological disorders, sinus and sores.	[56], [88]
<p><i>Agastache rugosa</i></p> 	Dicot	Lamiaceae	Korean mint, as blue licorice, purple giant hyssop, Indian mint, wrinkled giant hyssop,banga	Russian, Korea China, Japan, Taiwan, and Vietnam.	Seed, leaves, whole plant	<ul style="list-style-type: none"> • 4-Allylanisole, • Acacetin, • Apigenin, • Apigenin 7-Glucoside, • Bicyclogermacrene, • Cadina-4,9-diene, • Germacrene B, • Spatulanol, • Carvacrol, 	Used to treat digestive system, poor digestion, reduced vitality,anti-bacterial, anti-fungal, aromatic, carminative, diaphoretic, febrifuge and stomachic,abdominal	[57], [89], [90]

					<ul style="list-style-type: none"> • Caryophyllene oxide, • Caryophyllene, • cis-α-Farnesene, • Cumenic alcohol, Thymol, • D-Limonene, • Elixene, • Estragole, • Germacrene D, • Aromadendrene, • iso-Ledene, • L-Carveol, • L-Carveol, • Linalool, • Methyl eugenol, • Methyl hexadecanoate, • Pachypodol, Rosmarinic Acid, • <i>p</i>-Anisaldehyde • Protocatechuic acid, • Pulegone, • Pulegone, • Tilianin, • trans-<i>p</i>-Methoxycinnamaldehyde, • Ursolic acid, • Viridiflorol, • α-Cadinol, • α-Cubebene, • α-Caryophyllene, • α-Farnesene, • α-Muurolene, • α-Pinene, • α-Terpineol, • β-Bourbonene, • β-Caryophyllene, • Trans-<i>p</i>-Methoxycinnamaldehyde, • β-Elemene, • β-Pinene, • β-sitosterol, • γ-Muurolene, • γ-Terpinene, • δ-Cadinene, 	<p>bloating, indigestion, nausea and vomiting.</p>	
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						<ul style="list-style-type: none"> • τ-Muurolol, 		
<p><i>Asclepias curassavica</i></p> 	Dicot	Asclepiadaceae	Tropical milkweed, bloodflower, blood flower, cotton bush, hierba de lacucaracha, Mexican butterfly weed, redhead, scarlet milkweed, and wildipecacuanha	Southern North America, Central America, South America.	Leaves, root, flower	<ul style="list-style-type: none"> • Acetyl-β-Glucosaminidase, • Asclepin, • Calactin, • Calotropin, • Coroglucigenin, • Oleanolic acid, • Uzarigenin, • Uzarin and their free genins, • α-Galactosidase, • β- Sitosterol, • β-Fucosidase 	Treats vomiting, used as laxative, treats pneumonia and pleurisy and other lung problems, treats ringworm and used to stop bleeding, reduce fevers, constipation, venereal disease, kidney stones, asthma and cancer.	[58], [47]
<p><i>Parthenium integrifolium</i></p> 	Dicot	Asteraceae.	Wild quinine, American feverfew and eastern feverfew	USA, Texas to New York	Leaves, roots, flowers	<ul style="list-style-type: none"> • Acetylated monoglyceride, • Eicosapen • Gelatin, • Polyoxyethylene-Sorbitan, • Taenoic acid • γ-Linolenic acid 	Treats fevers, coughs, and sore throats, antibacterial, anti-septic and immunostimulant.	[59]
<p><i>Parthenium hysterophorus</i></p> 	Dicot	Asteraceae	Carrot grass, congress grass or Gajar Ghans. famine weed	Throughout the world	Roots	<ul style="list-style-type: none"> • Anisic acid, • Caffeic acid, • Chlorogenic acid, • Ferulic acid, • Germacrene-D, • Parthenin, • trans-β-ocimene, • Vanilic acid, • β-Myrcene, • ρ-Coumaric acid 	Treats skin inflammation, rheumatic pain, diarrhoea, urinary tract infections, dysentery, malaria neuralgia, asthma, bronchitis and contact dermatitis.	[4], [19], [20], [60]

<p><i>Conyza Canadensis</i></p> 	Dicot	Asteraceae	Canadian fleabane	Native to North America and spread to Europe, Asia and Australia	Leaves	<ul style="list-style-type: none"> • (E)-β-Ocimene, • 4E,8Z-matricaria-γ-lactone, • 4Z,8Z-matricaria-γ-lactone, • 9,12,13-trihydroxy-10(E)-octadecenoic acid, • Apigenin, • cis-L-achnophyllum ester, • Conyzapyranone A, • Conyzapyranone B, • Epifriedelanol, • Eugenyl-β- primeveroside, • Friedeline, • Germacrene D, • Herpene, • Limonene, • Luteolin, • Matricaria ester, • Quercetin, • Scutellarin, • Simiarenol, • Spinasterol, • Stigmasterol, • Taraxerol, • Trans-matricaria Ester, • β-Sitosterol, 	Used as diuretic, tonic, astringent and anti-hypertensive agent.	[61], [91], [92], [93]
<p><i>Uncaria tomentosa</i></p>	Dicot	Rubiaceae	cat's claw	Tropical of South and Central America, North	stem bark, leaves and	<ul style="list-style-type: none"> • Alloisopteropodine, • Allopteropodine, • Catechin, • Dihydrocorynantheine, 	Used to treat inflammation of the digestive tract, intestinal ulcers,	[62], [20], [21]

				<p>America and Europe</p>	<p>branches</p>	<ul style="list-style-type: none"> • Epicatechin, • Epigallocatechin gallate , • Epigallocatechin, • Hirsutine, • Isomitraphylline, • Isomitraphylline, • Isopteropodine, • Isorhynchophylline, • Mitraphylline, • Mitraphylline, • Oleanolic-acid, • Pteropodine, • Rhynchophylline, • Speciophylline, • Uncarine E, • Uncarine F, • Ursolic acid 	<p>hemorrhoids, parasites, chronic fatigue and leaky bowel syndrome, chicken pox and shingles.</p>	
<p><i>Harpagophytum procumbens</i></p> 	<p>Dicot</p>	<p>Pedaliaceae</p>	<p>Grapple plant, wood spider, devil's claw,</p>	<p>North American, southern Africa, South Africa</p>	<p>Whole plant</p>	<ul style="list-style-type: none"> • 6-acetylacteoside, • 6-diacetylacteoside, • 6'-O-acetylacteoside, • 8-cinnamoylmyoporoside, • 8-feruloylharpagide, • 8-p-coumaroylharpagide, • Acteoside, • Algophytum, • Caffeic acid, • cinnamic acid, • Isoacteoside, • Pagoside, • Ticlopidine 	<p>Used to treat gout, high cholesterol, loss of appetite, muscle pain, migraine headache, skin injuries, upset stomach and back pain.</p>	<p>[63]</p>
<p><i>Tanacetum parthenium</i></p>	<p>Dicot</p>	<p>Asteraceae</p>	<p>Feverfew, featherfew, altamisa, bachelor's button</p>	<p>Australia, Europe, China, Japan, and North Africa</p>	<p>Leaves</p>	<ul style="list-style-type: none"> • 10-Epicanin, Epoxyartemorin, • 1-β-Hydroxyarbusculin, 3-β-Hydroxycostunolide, • 3,4- β -Epoxy-8-deoxycumambrin, • 3-β-Hydroxyparthenolide, • 8-β- Hydroxyreynosin, • 9-Epipectachol Canin, • Costunolide, 	<p>Treats rheumatoid arthritis, fevers, migraine headaches, insect bites, stomach aches, tooth aches infertility, and gynaecological problems.</p>	<p>[64]</p>

						<ul style="list-style-type: none"> • Epoxysantamarine, • Manolialide, • Reynosin, • Santamarine, • Secotanaparthanolide A, • Secotanaparthanolide B, • Tanaparthin-α-peroxide, • Tanetin 		
<p><i>Glechoma hederacea</i></p> 	Dicot	Lamiaceae	ground-ivy, creeping charlie, cats foot, field balm, alehoof, tunhoof,	Ireland and northern Scotland, Japan, Europe	Leaves and roots	<ul style="list-style-type: none"> • 3'-O-methyl-rosmarinic acid, • 7S,7'S,8R,8'R-icariol A2-9-O-β-D-glucopyranoside, • 4-allyl-2-hydroxyphenyl 1-O-β-D-apiosyl-(1\rightarrow6)-β-D-glucopyranoside, • Apigenin 7-O-β-D-glucuronopyranoside, • benzyl-4'-hydroxy-benzoyl-3'-O-β-d-glucopyranoside, • Cistanoside E, • Cymaroside, • Cosmosyn, • Dihydrodehydrodiconiferyl alcohol- 4-O-β-D-glucopyranoside, • Ethyl rosmarinate, • Hyperoside, • Isoquercetrin, • Luteolin-7-Diglucoside, • Luteolin 7-O-β-D-glucopyranoside, • Methyl isoferuloyl-7-(3,4-dihydroxyphenyl) lactate, • Methyl rosmarinate, • n-Nonacosane, • Oleanolic acid, • Rosmarinic acid • Ursolic acid, • β-Sitosterol, • β-Ursolic acid 	Used to treat colds, coughs, congestion, kidney diseases, gastrointestinal and respiratory tract problems, indigestion, inflammation of the eyes, kidneys and urinary tract, fever, and flu.	[65], [96], [97], [98]
<p><i>Leonurus cardiac</i></p>	Dicot	Labiatae	Lion's tail, heartwort; Agripaume, Herbe	Throughout the world	Aerial part, seeds	<ul style="list-style-type: none"> • Caffeic acid, • Leonuridin, • Leonurine, 	Used to treat blood pressure, anxiety, menopause, pains and calms the nerves, sore	[66]



battudo,
Løvehale

- Leonurinine,
- Stachydrine

or tired eyes diuretic,
anti-spasmodic, anti-
rheumatic.

Results and conclusions:

The objective of the present review is to discuss the medicinal properties of selected weeds who are mostly thought of as useless. This report comprises 49 species of medicinally important weeds belonging to different families. Asteraceae was the most dominant family with 17 species, followed by malvaceae (4 species) and amaranthaceae (4 species), followed by poaceae, fabaceae and rubiaceae (3 species), followed by lamiaceae and euphorbiaceae (2 species), followed by acanthaceae, asclepiadaceae, brassicaceae, cleomaceae, compositae, convolvulaceae, cryophyllaceae, euphorbiaceae, labiatae, lamiaceae, mimosaceae, pedaliaceae and scrophulariaceae (1 species). Various ailments which were treated using these plants were mentioned in this review in a tabulated form. Certain previous studies have also revealed that these plants contains different bioactive compound such as polyphenolics, alkaloids [69], [70], flavonoids, glycosides, steroids, resins, saponins [71], glycosides, tannins, terpenoids and fatty acids that are able to cure number of diseases and disorders of human health [72], [73]. Various weed plants were used for diabetes treatments with an increase in the demand for natural remedies [74].

Focusing on the view that rapid loss of biodiversity and traditional uses of weed plants, there is an urgent need to record the data of medicinally important weed species. This recorded data will definitely help for recognition of ignored and threatened medicinal weeds and their conservation strategies. People must be aware of their medicinal importance, hence innovative research should be carried out or certain workshops, tutorials, programs or missions should be organized by government authorities in order to disseminate the medicinal value of important weed flora for their conservation and to fill the gap between economy, farmers and weeds. Furthermore, the use of phytochemicals obtained from weed plants requires clinical trials or standardization.

References

- [1] S. Kumar, and A.K. Pandey, "Chemistry and biological activities of flavonoids: An Overview," *Sci. World. J*, vol. 13, pp. 1-16, 2013.
- [2] T. Sekar, M. Ayyanar, and M. Gopalakrishnan, "Medicinal plants and herbal drugs," *Curr.Sci*, vol. 98, pp. 1558-1559, 2010.
- [3] L.G. Holm, "The world's worst weeds: distribution and biology," Krieger Publishing Company, pp. 609, 1991.
- [4] V.S.G.R. Naidu, "Hand Book on Weed Identification," Directorate of Weed Science Research, Jabalpur, India, pp. 354, 2012.
- [5] M. Ahmedullah, and M.P. Nayar, "Red data book of Indian plants (Peninsular India), Calcutta," Botanical Survey of India, 1999.
- [6] S. Bent, and R. Ko, "Commonly used herbal medicines in the United States: A review," *Am. J. Med*, vol. 116, pp. 478-485, 2004.
- [7] P. Oudhia, and R.S. Tripathi, "Medicinal weed flora of brinjal (*Solanum melongena* L.) fields in Chhattisgarh (India), *Crop Res*, vol. 20, ED-3, pp. 482-488, 2000.
- [8] P. Oudhia, "Medicinal weeds in groundnut fields of Chhattisgarh (India)", *Int. Arachis News Lett.(ICRISAT)*, vol. 19, pp. 62-64, 1999.
- [9] P.N. Prasad, A.J.A. Ranjith Singh, L.M. Narayanan, and C.R. Natarajan, "Ethnobotany of the Kannikars of South Tamil Nadu," *J. Econ.Tax.Bot*, vol. 12, pp. 292-298, 1996.
- [10] A. Subramaniam, "A survey of medicinal plants from Chiteri hills in Dharmapuri district, Tamil Nadu," *J. Econ.Tax.Bot*, vol. 23, pp. 395-416, 1999.
- [11] A. Asthana, A. Kumar, S. Gangwar, and J. Dora, "Pharmacological perspectives of *Cynodon dactylon*," *Res J Pharmaceut Biol Chem Sci*, vol. 3, ED-2, pp. 1135-1147, 2012.
- [12] A.E. Al-Snafi, "Chemical constituents and pharmacological effects of *Cynodon dactylon*-A review," *IOSR J Pharmacy*, vol. 6 ED-7, pp. 17-31, 2016.
- [13] G.A. Mohamed, A. Fouad, M.A. Ibrahim, S.R. Elkhayat, T. Okino, "Chemical composition and hepato-protective activity of *Imperata cylindrica* Beauv," *Pharm. Mag*, vol. 5, ED-17, pp. 28, 2009.
- [14] M. Khalid, and H.H. Siddiqui, "Pharmacognostical evaluation and qualitative analysis of *Saccharum spontaneum*(linn.) root," *Int. J. Pharm. Sci. Drug. Res*, vol. 3, ED-4, pp. 338-341, 2001.

- [15] M.D. Moreira, M.C. Picanco, L.C.A. Barbosa, R.N.C. Guedes, E.C. Barros, and M.R. Campos, "Compounds from *Ageratum conyzoides*: isolation, structural elucidation and insecticidal activity," *Pest Manag. Sci*, vol. 63, ED-6, pp. 615-62, 2007.
- [16] A.P. Bartolome, I.M. Villaseñor, and W.C. Yang, "*Bidens pilosa* L. (Asteraceae): botanical properties, traditional uses, phytochemistry, and pharmacology," *Evi. Comp. Alt. Med*, 2013.
- [17] J. Chen, J.H. Wei, S.F. Cai, H.J. Zhang, X.H. Zhang, W.J. Liang, and S.G. Wu, "Chemical constituents in whole herb of *Bidens pilosa* var. *radiata*," *J Chi. Med. Mat*, vol. 36, ED-3, pp. 410-413, 2013.
- [18] H.L. Liu, B.L. Liu, G.C. Wang, Y. Dai, W.C. Ye, and Y.L. Li, "Studies on the chemical constituents from *Conyza canadensis*," *J Chi. Med. Mater*, vol. 34, ED-5, pp. 718-720, 2011.
- [19] D.C. Roy, and M.M. Shaik, "Toxicology, phytochemistry, bioactive compounds and pharmacology of *Parthenium hysterophorus*," *J Med. Plants Stud*, vol. 1, ED-3, pp. 126-141, 2013
- [20] C.A.S. de Miranda, M.D.G. Cardoso, M.L.M. de Carvalho, A.C.S. Figueiredo, D.L. Nelson, C.M. de Oliveira, and L.R.M. de Albuquerque, "Chemical composition and allelopathic activity of *Parthenium hysterophorus* and *Ambrosia polystachya* weeds essential oils," *Amer. J Plant Sci*, vol. 9, pp. 1248, 2014.
- [21] P.G. Kareru, G.M. Kenji, A.N. Gachanja, J.M. Keriko, and G. Mungai, "Traditional medicine among the Embu and Mbeere peoples of Kenya," *Afr. J Trad. Compl. Altern. Med*, vol. 4, pp. 75-86, 2007.
- [22] K. Hussain, A. Shahazad, and U. Zia-ul-Hussnain, "Anethnobotanical survey of important wild medicinal plants of Hattar, District Haripur Pakistan," *Ethno. Leaflets*, vol. 12, pp. 29-35, 2008.
- [23] M. Sabeen, and A.A. Ahmad, "Exploring the Folk Medicinal Flora of Abbotabad City, Pakistan," *Ethno. Leaflets*, vol. 13, pp. 810-833. 2009.
- [24] R. Qureshi, A. Waheed, M. Arshad, and T. Umbreen, "Medicoethanobotanical inventory of tehsil Chakwal, Pakistan," *Pak. J Bot*, vol. 41, pp. 529-538, 2009.
- [25] J. Hussain, Z. Muhammad, R. Ullah, F.U. Khan, I.U. Khan, N. Khan, and S. Jan, "Evaluation of the chemical composition of *Sonchus eruca* and *Sonchus asper*," *J Am Sci*, vol. 6, ED-9, pp. 231-235, 2010.
- [26] S. Prachayasittikul, S. Suphamong, A. Wora-chartcheewan Lawung, S. Ruchirawat, and V. Prachayasittikul, "Bioactive metabolites from *Spilanthes acmella* Murr," *Mol*, vol. 14, pp. 850-867, 2009.

- [27] K.L. Tiwari, S.K. Jadhav, and V. Joshi, "An updated review on medicinal herb genus *Spilanthes*," *Chin. J Int. Med*, vol. 9, pp. 1170-1178, 2011.
- [28] S. Dubey, S. Maity, M. Singh, S.A. Saraf, and S. Saha, "Phytochemistry, pharmacology and toxicology of *Spilanthes acmella*: a review," *Adv. Pharma. Sci*, 2013.
- [29] S. Mundada, and R. Shivhare, "Pharmacology of *Tridax procumbens* a weed," *Int. J. Pharm. Tech. Res*, vol. 2, ED-2, pp. 1391-1394, 2010.
- [30] R.K. Joshi, and V. Badakar, "Chemical composition and in vitro anti-microbial activity of the essential oil of the flowers of *Tridax procumbens*," *Nat. Prod. Comm*, vol. 7, ED-7, pp. 941-942, 2012.
- [31] A. Kamboj, and A. Saluja, "Phytopharmacological review of *Xanthium strumarium* L. (Cocklebur)," *Int. J. Green Pharm*, Vol. 4, ED-3, pp. 129, 2010.
- [32] R.R. Immanuel, and L.L. Elizabeth, "Weeds in agroecosystems: A source of medicines for human healthcare," *Int. J Pharm. Tech. Res*, vol.1, ED-2, pp. 375-385, 2009.
- [33] N. Garaniya, and A. Bapodra, "Ethno botanical and phytopharmacological potential of *Abrus precatorius* L.: A review," *Asi Pac. J Trop. Biomed*, vol.4, pp. S27-S34, 2014.
- [34] S. Aron, and P. Mehalingam, "Pharmacognostic and preliminary phytochemical investigation on leaf of *Aeschynomene indica*," *Biosci.Res*, vol. 3, ED-1, PP. 100-105, 2012.
- [35] C. Aruna, D. Chaithra, C. Alekhya, and N. Yasodamma, "Pharmacognostic studies of *Aeschynomene indica* L.," *Int. J Pharm. Pharmaceut.Sci*, vol. 4, ED-4, pp.1, 2012.
- [36] P.C. Kuo, M.L. Yang, P.L. Wu, H.N. Shih, T.D. Thang, N.X. Dung, and T.S. Wu, "Chemical constituents from *Abutilon indicum*," *J Asi. Nat. Prod. Res*, vol. 10, ED-7, pp. 689-693, 2008.
- [37] S.K. Sharma, and M. Ali, "A new stigmastane derived from roots of *Malva parviflora*" *Ind. J Chem*, vol. 38, pp. 746-748, 1999.
- [38] J. Doll, and T. Trower, "Dandelion". *Weed Sci*, University of Wisconsin, 2008.
- [39] H.M. Burkill, "The useful Plants of West Tropical Africa," Royal Botanical Gardens, Kew, pp. 90-94, 1994.
- [40] L.S. Gills, "Ethnomedical uses of plants in Nigeria," University of Benin press, Nigeria, pp. 276, 1992.
- [41] W. Shibeshi, E. Makonnen, L. Zerihun, and A. Debella, "Effect of *Achyranthes aspera* L. on fetal abortion, uterine and pituitary weights, serum lipids and hormones," *Afr. Health Sci*, vol. 6, ED-2, pp. 65, 2006.

- [42] S. Srivastav, P. Singh, G. Mishra, K.K. Jha, and R.L. Khosa, "Achyranthes aspera-An important medicinal plant: A review," J Nat. Prod. Plant Res, vol. 1, ED-1, pp. 1-14, 2011.
- [43] P.P. Myint, A.N. Sann, and N.M. Soe, "Screening of phytochemicals, antioxidant and antimicrobial activities of *Blumea lacera* (Burm. f.) DC. leaf and root," J Med. Plants, vol. 5, ED- 4, pp. 31-35, 2017.
- [44] S. Chandra, and D.S. Rawat, "Medicinal plants of the family Caryophyllaceae: a review of ethno-medicinal uses and pharmacological properties," Int. Med. Res, vol. 4, pp. 123-131, 2015.
- [45] W.L. Applequist and D.E. Moerman, "Yarrow (*Achillea millefolium* L.): a neglected panacea? A review of ethnobotany, bioactivity, and biomedical research," Eco.Bot, vol. 65, ED-2, pp. 209, 2011.
- [46] M. Kaur, and A. Kalia, "*Convolvulus Arvensis*-A useful weed," Int. J Pharm. Sci, vol. 4, ED-1, pp. 38-40, 2011.
- [47] A.E. Al-Snafi, "The chemical constituents and pharmacological effects of *Capsella bursa-pastoris*-A review," Int. J Pharm. Toxicol, vol. 5, ED-2, pp. 76-81, 2015.
- [48] M.D. Subramanya, S.R. Pai, V. Upadhya, M. Gireesh, S. Shalini, and H.V. Hegde, "Total polyphenolic contents and in vitro anti-oxidant properties of eight *Sida* species from Western Ghatss, India," J Ayur. Integ.Med, vol. 6, ED-1, pp. 24-28, 2015.
- [49] M. Rahmatullah, D. Ferdausi, M. ArifulHaqueMollik, R. Jahan, and H. Majeedul, "A survey of medicinal plants," Afr. J Trad, vol. 7, ED-2, pp. 91-97, 2010.
- [50] D. Panda, S. Swarupa Rathinayak, and K.P. Sharat, "Crops weeds and its uses in the treatment of common ailment in Koraput District of Odisha, India," 2015.
- [51] T. Hayashi, K. Okamuka, M. Kawasaki, and N. Morita, "Production of Diterpenoids by cultured cells from two chemotype *sscopariadulcis*," Phytochem, vol. 35, ED-2, pp. 353-356, 1993.
- [52] L.M. Conserva, and J.C. Ferreira Júnior, "Borreria and Spermaceoce species (Rubiaceae): A review of their ethnomedicinal properties, chemical constituents, and biological activities," Pharmacogn. Rev, vol. 6, ED-11, pp. 46-55, 2012.
- [53] L.Y. Latha, I. Darah, K. Jain, and S. Sasidharan, "Toxicity study of *Vernonia cinerea*," Pharm. Biol, vol. 48, ED-1, pp. 101-104, 2009.
- [54] A.K. Maldhure, "Tridax Procumbens Medicine For life," Int. J Pharm. Bio.Sci, vol. 6, ED-1, pp. 810-815, 2015.
- [55] M. Mia, M.F. Kadir, M.D. ShahadatHossan, and M. Rahmatullah, "Medicinal plants of the Garo tribe inhabiting the Madhupur forest region of Bangladesh," American-Eurasian J Sus. Agri, vol. 3, ED-2, pp.165-171, 2009.

- [56] H. Ahmad, R. Mishra, S. Sehgal, and R. Gupta, “*Mimosa pudica* L. (Laajvanti): An overview,” *Pharm. Rev.*, vol. 6, ED-12, pp.115, 2012.
- [57] H. Moon, M.J. Kim, H.J. Son, H.J. Kweon, J.T. Kim, Y. Kim, J. Shim, S. Byung-Chang, and R. Mee-Ra, “Five hTRPA1 Agonists Found in Indigenous Korean Mint, *Agastacherugosa*,” *PLoS One*, vol. 10, ED-5, e0127060, 2015
- [58] S. Christman, “*Asclepias curassavica*: Floridata,” *Floridata*. 2004.
- [59] Q.L. Yang, Z. Wan, Y. Zhou, Q. Li, L. Yu, B. Liu, and C. Guo, “Parthenolide from *Parthenium integrifolium* reduces tumor burden and alleviate cachexia symptoms in the murine CT-26 model of colorectal carcinoma,” *Phytomed*, vol. 20, pp. 992-999, 2013.
- [60] A. Mishra, “*Parthenium hysterophorus*: A noxious weed for plant diversity,” *Int. J Sci. Res.*, vol. 2, pp. 2277-8179, 2013.
- [61] S.E. Weaver, “The biology of Canadian weeds *Conyza canadensis*,” *Can. J Plant Sci.*, vol. 81, pp. 867-875, 2001.
- [62] M.C. Peñaloza, S. Kaiser, P. Resende, V. Pittol, A.R. Carvalho, and G.G. Ortega, “Chemical composition variability in the *Uncaria tomentosa* (cat’s claw) wild population,” *Química Nova*, vol. 38, ED-3, pp. 378-386, 2015.
- [63] N. Mncwangi, W. Chen, I. Vermaak, A.M. Viljoen, and N. Gericke, “Devil's Claw-a review of the ethnobotany, phytochemistry and biological activity of *Harpagophytum procumbens*,” *J Ethnopharmacol*, pp. 755-771, 2012.
- [64] A. Pareek, M. Suthar, S. Garvendra, and V. Bansal, “Feverfew (*Tanacetum parthenium* L.): A systematic review,” *US National Library of Medicine. National Institutes of Health*, pp. 103-110, 2011.
- [65] M.J. Hutchings, and A.C.P. Elizabeth, “*Glechoma hederacea* L. (*Nepeta glechoma* Benth., *N. hederacea* (L.) Trev.),” *J Eco*, vol.87, pp. 347-364, 2003.
- [66] R. Maureen, “Motherwortm, HERBALPEDIA™ The Herb Growing & Marketing Network,” pp. 780-1237, 2000.
- [67] M.K Sen, S. Nasrin, S. Rahman, and A.H.M. Jamal, “In vitro callus induction and plantlet regeneration of *Achyranthes aspera* L., a high value medicinal plant. *Asi. Pac. J Trop. Biomed*, vol. 4, ED-1, pp. 40-46, 2014.
- [68] S.G. Pawar, and V.M. Kamble, “Diversity of Bioactive Components of *Achyranthes aspera* Linn leaves,” *Asi. J Multidis.Stud*, vol. 4, ED-3, pp. 49-52, 2016.

- [69] R. Kauri, and S. Arora, "Alkaloids-important therapeutic secondary metabolites of plant origin," J Crit. Rev, vol. 2, pp.1-8, 2015.
- [70] K. Jack, "The importance of herbs. The Farmer. Northeast Organic Farming Association, (NOFA), 411 Sheldon Rd., Barre, MA 01005, pp. 1-5, 2012.
- [71] O. Guclu-Ustundag, and G. Mazza, "Saponins: Properties, applications and processing," Crit. Rev. Food Sci. Nut, vol. 47, pp. 231-258, 2007.
- [72] S.S. Yadav, and H.S. Patil, "Traditional medicines and health care system of tribal of Satpuda Region, Maharashtra State," Plant Arch, vol. 1, pp. 1-2, 2001.
- [73] E. Demmaa, T. Gebre-Mariamb, K. Asresc, W. Ergetied, and E. Engidaworka, "Toxicological study on *Glinus lotoides*: A traditionally used taenicidal herb in Ethiopia," J Ethnopharmacol, vol.111, ED-3, pp. 451-457, 2007.
- [74] D.R. Chhetri, P. Parajuli, and G.C. Subba "Antidiabetic plants used by Sikkim and Darjeeling Himalayan tribes, India," J Ethnopharmacol, vol. 99, pp. 199-202, 2005.
- [75] B. J. Li, Y. Liu, A. T. Gu, Q. Zhang, L. Chen, S.M.Wang, F. Wang "Two new stilbenetrimers from *Cynodonactylon*." Nat. Prod. Res. vol. 31(21) pp. 2479-2483, 2017.
- [76] A. A. Esmail "Chemical constituents and pharmacological effects of *Cynodon dactylon*- A Review," IOSR Journal Of Pharmacy, Vol. 6(7) pp17-31, 2016.
- [77] K. Anjoo, S. A. Kumar "Ageratum conyzoides L.: a review on its phytochemical and pharmacological profile" International Journal of Green Pharmacy, vol 2(2), pp 59-68, 2008.
- [78] A. Chauhan, S. Rijhwani "A comprehensive review on phytochemistry of *Ageratum conyzoides* Linn. (Goat weed)" International Journal of Engineering Technology, Management and Applied Sciences, vol. 3 , pp348-358, 2015.
- [79] X. Li, P. Yang "Research progress of *Sonchus* species" Int. J. Food Prop, vol 21(1), pp 147-157, 2018.
- [80] E.S. Elkhayat, "Cytotoxic and antibacterial constituents from the roots of *Sonchus oleraceus* L. growing in Egypt" Pharmacognosy Magazine, vol 5(20), pp 324-328, 2009.
- [81] S. Ghosal, R. Ballav, P.S. Chauhan, R. Mehta "Alkaloids of *Sida cordifolia*" Phytochemistry, vol 14(3), pp 830-832, 1975.
- [82] S. Saha, S. Paul "Potential of *Hygrophila auriculata* (Schumach.) Heine as a source of future anti-cancer drugs: A comprehensive review" Journal of Pharmacognosy and Phytochemistry vol. 6(4), pp 1725-1740, 2017.

- [83] R. Akter, S. J. Uddin, J. Tiralongo, I. D. Grice, E. Tiralongo “A new cytotoxic steroidal glycoalkaloid from the methanol extract of *Blumea lacera* Leaves” J Pharm PharmSci, vol.18(4), pp. 616 - 633, 2015.
- [84] U.J. Youn, G. Miklossy, X. Chai, S. Wongwiwatthanakit, O. Toyama, T. Songsak, J. Turkson, L. C. Chang “Bioactive sesquiterpene lactones and other compounds isolated from *Vernonia cinerea*” Fitoterapia, vol. 93, pp.194-200, 2014.
- [85] R. K. Joshi, V. Badakar “Chemical composition and in vitro antimicrobial activity of the essential oil of the flowers of *Tridax procumbens*” Natural Product Communications Vol. 7 (7) pp. 941 – 942, 2012.
- [86] R. Matias, F. S. Canale, B. O. Corrêa, J. A. M. Bono, A. K. M. de Oliveira, D. M. Dourado, A. R. Roel, C. L. G. Rivero-Wendt, D. R. Pedrino “Chemical constituents and antifungal potential of the *Richardia brasiliensis* (Gomes) ethanolic extract” Tropical and Subtropical Agroecosystems, Vol. 21 pp. 457 – 465, 2018.
- [87] D.S. Pinto, A. C. de A. Tomaz, J.F. Tavares, F. H. Tenório-Souza, C. S. Dias, R. Braz-Filho, E.V. L. da-Cunha “Secondary metabolites isolated from *Richardia brasiliensis* Gomes (Rubiaceae)” Brazilian Journal of Pharmacognosy vol. 8(3) pp. 367-372, 2008
- [88] K. Yuan, A. Jia, J.L. Lu, J.X. Zhu “Structural identification of new C-Glycosyl flavones from *Mimosa pudica*” Chinese Journal of Analytical Chemistry, vo. 35, pp.739-742, 2007.
- [89] P. Cao, P. Xie, X. Wang et al “Chemical constituents and coagulation activity of *Agastache rugosa*” BMC Complement Altern Med vol. 17 Article 93, 2017.
- [90] H. Q. Li , Q. Z. Liu, Z. L. Liu, S. S. Du, Z. W. Deng “Chemical composition and nematocidal activity of essential oil of *Agastache rugosa* against *Meloidogyne incognita*” Molecules vol.18 pp. 4170-4180, 2013.
- [91] B. Csupor-Löffler , Z. Hajdú , I. Zupkó , J. Molnár , P. Forgo , A. Vasas , Z. Kele , J. Hohmann “Antiproliferative constituents of the roots of *Conyza canadensis*” Planta Med vol.77(11) pp.1183-1188, 2011.
- [92] O. Tzakou, C. Vagias, A. Gani, A. Yannitsaros “Volatile constituents of essential oils isolated at different growth stages from three *Conyza* species growing in Greece” Flavour Frag J., vol. 20(4), pp.425-428, 2005.
- [93] H.L. Liu, B.L. Liu, G.C. Wang, Y. Dai, W.C. Ye, Y.L. Li “Studies on the chemical constituents from *Conyza canadensis*” Journal of Chinese medicinal materials, vol. 34(5), pp. 718-720, 2011.
- [94] Dr. Duke's Phytochemical and Ethnobotanical Databases

- [95] M. Sandoval, N. N. Okuhama , X.-J. Zhang , L. A. Condezo , J. Lao, F. M. Angeles , R. A. Musah , P. Bobrowski, M. J. S. Miller “Anti-inflammatory and antioxidant activities of cat’s claw (*Uncaria tomentosa* and *Uncaria guianensis*) are independent of their alkaloid content” *Phytomedicine* vol. 9, pp.325–337, 2002.
- [96] H. Yamauchi, R. Kakuda, Y. Yaoita, K. Machida, M. Kikuchi “Two new glycosides from the whole plants of *Glechoma hederacea* L.” *Chem. Pharm. Bull.* vol. 55(2) pp.346—347, 2007
- [97] J. Kim, S. Song, I. Lee, Y. Kim, I. Yoo, I. Ryoo, K. Bae. “Anti-inflammatory activity of constituents from *Glechoma hederacea* var. *longituba*” *Bioorg. Med. Chem. Lett.* vol. 21 pp. 3483 – 3487, 2011.
- [98] D. Jo, L. Jungeun, J. Noh, K. Ok-Kyung, K. Joong-Hoo “Chemical composition and electron donating and nitrite scavenging activities of *Glechoma hederacea* var. *longituba*” vol. 6(3), pp.142-146, 2001.