



Invasive Alien Plants: Valuable Elixir with Pharmacological and Ethnomedicinal Attributes

Shaiphali Saxena, P. B. Rao

Department of Biological Sciences, College of Basic Sciences & Humanities,
G.B. Pant University of Agriculture & Technology, Pantnagar, Uttarakhand, India

ABSTRACT

Use of herbal medicines is propagating day-by-day and several tribes still rely upon this green treasure against their ailments. Being unfortunate to the environment, invasive plants species hold supreme remedies that are unique. Besides ethnomedicinal uses they embrace anticancerous, antidiabetic, antimicrobial, antitubercular and other pharmacological attributes in them. In the present review, authors aimed to compile the segregated ethnomedicinal information of invasive plant species. The literature study revealed a significant ethnomedicinal importance of invasive alien weeds that may serve to establish a ground for future researchers to explore in pharmacognostic field with safe and natural drug resource.

Keyword: *Ethnomedicines, invasive species, medicinal plants, pharmacological attributes*

INTRODUCTION

India is advanced with approximately 17,000 plant species out of 270,000 breathing on earth. An enthusiasm for about 65 plant species is established in the world commerce with potential utilization in pharmaceutical industries (Hegde 2008). Out of world's twelve Vavilovian centres of cultivated plants for their origin and diversification, one is occupied by India. In fact, India makes its position amongst 17 megadiversity centres and stands 3rd in Asia and 11th on the planet. On global scale, four biodiversity hotspots fall in our country. Indian invasive alien flora encompasses 1,599 (8.5%) vascular plant species, of which, angiosperms comprise 1,552 species from 825

genera and 152 families; gymnosperms unfold 46 species from 16 genera and 8 families; whereas single species materializes the Pteridophytes (Khuroo *et al.* 2012). The latest survey on invasive flora by Inderjit *et al.* (2017) states about 471 naturalized species of vascular alien flora (2.6 %) of total species richness. Human, for thousands of years, has been created opportunistic holes for these plants for inhabiting in different environment as most of them are deliberately acquainted in new habitats. The man introduced and cultivated these non-natives for economically beneficiary aspects as many of them may furnish with different facilities like food, fuel, medicines or fodder to local populace. But most of them endanger the native flora towards extinction because of their advanced prolificacy, better resilience in environment and thus, reflect their negative shade too. But we cannot neglect that no species on this planet is deprived of possessing medicinal attributes. In fact each and every plant species grabs more than one remedial peculiarity (Bhatt *et al.* 2011).

Data Source

The information compiled in this present review regarding therapeutic features has been covered from varying scientific literatures like Elsevier, Springer, Google Scholar, NCBI, PubMed, allied books (online or offline), etc.

Purpose of Present Study

Predominantly, invasive weeds have been judged as misfortunes by most of the researchers in several studies. In this review, I have been attempted to focus on their beneficent personality with therapeutic

aspects as they successfully expand their wings in the field of pharmacognosy, food chemistry, ethnobotany, etc.

1. Pharmacological Features

1.1. Hypoglycaemic Activities

Diabetes mellitus is a consequence of disturbed metabolic functioning leading to hyperglycemia (Kerner and Brückel 2014). A remarkable decline in blood-glucose level was detected in hyperglycemic rats (diabetes induced by alloxan) when administered orally with methanolic leaf extract of *Lantana camara*. About 400 mg/kg extract indicated 121.94 mg/dl reduction in blood-glucose level (Sen *et al.* 2016). In an anti-hyperglycemic study conducted by Girija *et al.* (2011) in streptozotocin (STZ)-induced diabetic rats, a significant reduction (64.13% and 61.92%) in blood serum glucose was exhibited by *Amaranthus spinosus* methanolic extract at 400 and 200 mg/kg doses, respectively. An appropriate inhibitory effect of *Cassia alata* leaf extracts against α -glycosidase with IC_{50} values 25.80 ± 2.01 and 2.95 ± 0.47 μ g/ml was observed in n-butanol and ethyl acetate solvent extracts, respectively. Predominantly, the inhibitory effect was due to the active principals kampeferol 3-o-gentiobioside (50.0 ± 8.5 μ M) and kampeferol (56.7 ± 7.7 μ M) in their respective fractions namely, n-butanol and ethyl acetate (Varghese *et al.* 2013). Anti-hyperglycemic effect of hydro-alcoholic *Argemone Mexicana* extract was investigated by Rout *et al.* (2011), in which 400 and 200 mg/kg oral doses lowered serum-glucose concentration by 51.90% and 39.26%, respectively in STZ-induced hyperglycemic rats.

1.2. Anticancerous Activities

Cancer is the second largest dreadful menace of death worldwide (Prakash 2013). The word 'cancer' is supposed to be proposed by Hippocrates. Naturally derived phytochemicals ameliorate the plants and maintain their sustainability by the commencement of apoptosis and restraining the cancerous cells (Greenwell and Rahman 2015). Ethanolic *Parthenium hysterophorous* extract unveiled the active cytotoxic inhibition of the proliferation of prostate (DU-145), leukemia (THP-1), breast cancer (MCF-7) and promyelocytic leukemia (HL-60) cell lines (Kumar *et al.* 2013). Parthenin (sesquiterpene lactone) procured from the plant synthesizes a key element nitric oxide (NO) via overexpression of iNOS (inducible NO synthase) in cancer cells and resulting in

tumorigenesis inhibition (Vannini *et al.* 2015). Chief cannabinoid compound, Δ^9 -tetrahydrocannabinol (THC), derived from *Cannabis sativa* triggers direct autophagy-mediated stimulation of apoptosis in variety of cancer cells like hepatic, pancreatic, melanoma, glioma, etc. (Velasco *et al.* 2016). Active principals present in *Euphorbia hirta* namely Euphorbianins; Euphorbins A, B, C, D, E; camphol, leucocyanidol, quercitol and quercetin, gallic acid and myricitrin actively engaged in hampering squamous cell carcinoma and malignant melanomas (Kour 2014). A peculiar anticancerous compound named as 1-(4-hydroxy-2-methoxybenzofuran-5-yl)-3-phenylpropane-1,3-dione (a phenol) derived from *Celosia argentea* has evinced cytotoxicity against SiHa (cervix cancer), MCF-7 (breast adenocarcinoma), HCT-15 (colon cancer) and kidney Vero cells from normal monkey (Rub 2016). Glycoalkaloids (solanin, solamargine, solsonine) and quercetin (flavonoid) from *Solanum nigrum* (Chavan 2013) against several cancer cell lines such as MCF-7 (breast), HeLa (cervical), HepG2 (liver), HCT-116 and HT29 (colon) (Gabrani *et al.* 2012); and oleanonic acid from *Lantana camara* have shown antiproliferative activity against U937 (lymphoma), Hep2 (epithelial laryngeal carcinoma) A375 (malignant skin melanoma) (Reddy 2013).

1.3. Anti-tubercular Properties

One of the worldwide threatening diseases terrorizing people is tuberculosis caused by *Mycobacterium tuberculosis*, which preferentially affects lungs. Aquamethanolic (80%) extract of *Ageratum conyzoides* evinced 1600 μ g/ml MIC (minimum inhibitory concentration) against H37Rv (*M. tuberculosis*) by using TEMA (Tetrazolium bromide microplate assay) (Mohamad *et al.* 2011). The *Chromolaena odorata* chloroform flower extract comprised two flavones, luteolin (5,7,3',4'-tetrahydroxyflavone) and acacetin (5,7-dihydroxy-4'-methoxyflavone); four flavanones, persicogenin (5,3'-dihydroxy-7,4'-dimethoxyflavanone), isosakuranetin (5,7-dihydroxy-4'-methoxyflavanone), 4'-hydroxy-5,6,7-trimethoxyflavanone and 4'-hydroxy-5,6,7-trimethoxyflavanone; and two chalcones, 4,2'-dihydroxy-4',5',6'-trimethoxychalcone and 2'-hydroxy-4,4',5',6'-tetramethoxychalcone. Moderate antitubercular activity was exhibited by isosakuranetin (5,7-dihydroxy-4'-methoxyflavanone) with 174.8 μ M MIC against H37Ra strain of bacterium followed by 4'-hydroxy-5,6,7-trimethoxyflavanone (606.0 μ M), acacetin (5,7-

dihydroxy-4'-methoxyflavone) (704.2 μM) and luteolin (5,7,3',4'-tetrahydroxyflavone) (699.3 μM) (Suksamran *et al.* 2004). A significant inhibition against H37Ra strain was unveiled by methanol, chloroform and water extracts of *Eclipta prostrata* plant with MIC values 1000 $\mu\text{g/ml}$, 125 $\mu\text{g/ml}$ and 62.5 $\mu\text{g/ml}$, respectively in MABA (Microplate Alamar Blue Assay) (Pukumpuang *et al.* 2014).

1.4. Anti-HIV Features

HIV (human immune deficiency virus) primary infection leads to the progression towards advanced chronic stage called AIDS (acquired immune deficiency syndrome). The very first case of this pandemic spotted in U.S.A. in 1981 when five homosexual men were diagnosed with the infection of PCP (*Pneumocystis carinii* pneumonia) by CDC (US Centers for Disease Control and Prevention) (Klimas *et al.* 2008). Now it has been transformed into a tribulation on global scale (Maartens *et al.* 2014). A remarkable anti-HIV activity was exhibited by (+/-)-6-acetyl-dihydrochelerythrine and benzophenanthridine type of alkaloids derived from *Argemone mexicana* methanolic extracts (Kumar and Pandey 2014). Active compounds of *Eclipta prostrata* such as wedelolactone (coumarin) and orobol

(isoflavone) have been detected to have anti-HIV inhibiting potential against HIV-1 IN, while terthiophene derivatives (5-hydroxymethyl-(2,2':5',2'')-terthienyl tiglate; 5-hydroxymethyl-(2,2':5',2'')-terthienyl acetate; ecliptal and 5-hydroxymethyl-(2,2':5',2'')-terthienyl agelate) against HIV-1 PR (Tewtrakul *et al.* 2007). The compounds aromadendrin-7- β -D-glucopyranoside, pruning, 3,5,7,8,4'-pentahydroxyflavanone and 3,4-odicaffeoylquinic acid in *Cuscuta reflexa* were found to be more potent against HIV infection (Mahmood *et al.* 1997). Chandran and Saj (2015) reported a compound 4-Methyl-dl-tryptophan (monoterpenoid) in *Catharanthus pusillus* to be effectual against HIV.

2. Other Miscellaneous Uses

P. hysterophorus can be exploited for bioremediation of heavy metals like nickel, cadmium from waste water (Lata *et al.* 2008, Ajmal *et al.* 2006). Stalks of *L. camara* can be moulded into baskets, pulped into paper for writing, wrapping and serve for biofuel. Flowers provide source of nectar for insects like butterflies (Priyanka and Joshi 2013). *Portulaca oleracea* surveyed as a high omega-3 fatty acid source (Uddin *et al.*, 2014).

Table I. Ethnomedicinal uses of some palatable invasive plant species.

Plant species	Nativity	Used parts	Uses	References
Acanthaceae				
<i>Peristrophe paniculata</i> (Forssk.) I. Darbysh.	Trop. America	L	Leaf decoction for cough, cold, fever, conjunctivitis; antidote in snake bite.	Rashmi <i>et al.</i> 2010.
<i>Ruellia tuberosa</i> L.	Trop. America	L, R, Wp, T	Leaf in boils and dermatitis, roots anthelmintic, whole plant in bronchitis and bladder stone. Tubers in stomachache.	Afzal <i>et al.</i> 2015.
Amaranthaceae				
<i>Aerva javanica</i> (Burm.f.)	Trop. America	R, Fl	Flowers and roots in treating kidney stones and rheumatism.	Movaliya and Zaveri 2014.
<i>Alternanthera paronychioides</i> St. Hill.	Trop. America	Wp	Plant purges antigluco-toxicity in the body.	Wu <i>et al.</i> 2013.
<i>Alternanthera philoxeroides</i> (Mart.) Griseb.	Trop. America	L, Wp	Leaves in eye disease and liver problems and as anthelmintic. Whole plant in influenza.	Panda and Misra 2011, Hundiwal <i>et al.</i> 2012, Rahman

				and Roy 2014.
<i>Alternanthera pungens</i> Kunth	Trop. America	Wp, Fl, L, R	Whole Plant against stomachache, headache, measles and gripes; inflorescence in vermifuge. Leaves in preventing oedema, asthma, alcohol poisoning, rheumatism, vermifuge, etc. and roots as cathartic and abortifacient.	Hundiwale <i>et al.</i> 2012, Vijayashali ni <i>et al.</i> 2017.
<i>Alternanthera sessilis</i> (L.) R.Br. ex DC.	Trop. America	Wp, L, St	Plant decoction in ulcer and fever. Leaves and stems in stomachache, ulcer, night blindness, lactation in cattle, etc. Leaf juice in treating leucorrhoea and fever.	Panda and Misra 2011, Hundiwale <i>et al.</i> 2012, Rao <i>et al.</i> 2015, Neamsuvan and Ruangrit 2017.
<i>Alternanthera tenella</i> Colla	Trop. America	L, R	Leaves in fever, inflammations, urinary infections; roots against female sterility.	Hundiwale <i>et al.</i> 2012.
<i>Amaranthus spinosus</i> L.	Brazil	R, L	Used for treating broken bones, roots for treating eczema, ulcer. Leaves as laxative.	Sahu 1984, Panda <i>et al.</i> 2014, Rao <i>et al.</i> 2015, Neamsuvan and Ruangrit 2017.
<i>Celosia argentea</i> L.	Trop. Africa	L, Wp, St, S	Leaf decoction in fever. Plant in treating postpartum hemorrhaging. Stem and leaves in purging ulcer, skin inflammation, bleeding caused due to surgery. Seed paste in uterine and ovarian diseases.	Jain <i>et al.</i> 2005, Shil <i>et al.</i> 2014, Tang <i>et al.</i> 2016.
<i>Chenopodium ambrosioides</i> L.	Trop. America	L, F, Wp	Leaves and fruits as anthelmintic, antiparasitic, etc. Plant decoction in cough, stomachache, fever, asthma and oedema, etc.	Kayode <i>et al.</i> 2008, Griselda <i>et al.</i> 2016, Vijayashali ni <i>et al.</i> 2017.
<i>Digera muricata</i> (L.) Mart.	SW Asia	Wp	Whole plant for purging urinary troubles, diabetes, intestinal worms, liver problems, etc.	Shah <i>et al.</i> 2013, Vijayashali ni <i>et al.</i> 2017.
<i>Gomphrena serrata</i> L.	Trop. America	L, Fl	Flowers and leaves in treating jaundice, hoarsness, kidney problem, hypertension and oligouria.	Vijayashali ni <i>et al.</i> 2017.

Apocynaceae				
<i>Asclepias curassavica</i> L.	Trop. America	Wp, Fl, St, Lt, L, R	Plant as cathartic, emetic, against ringworm, vermifuge; flowers in eye trouble; latex in cardiac troubles, malaria, gonorrhoea, boils, blood coagulation; stem in asthma; leaves in diarrhoea, fever. Root paste as blood coagulant.	Shil <i>et al.</i> 2014, Sundararajan and Koduru 2014.
<i>Calotropis gigantea</i> (L.) R.Br.	Trop. Africa	Fl, L, Lt, R	Flowers in improving digestion, appetite; leaves in stomach problems, toothache, paralysis, asthma, cough; roots and latex in cough, sprains and bone fracture.	Dangol 2008, Saha 2013, Rao <i>et al.</i> 2015.
<i>Calotropis procera</i> (Ait.) R. Br.	Trop. Africa	Lt, R	Latex in leprosy, fever, rheumatism, cold, eczema, diarrhoea; roots in asthma, bronchitis, cardiac stimulation.	Upadhyay 2014.
<i>Catharanthus pusillus</i> (Murray) Don	Trop. America	Wp	Plant possesses antihyperglycaemic property.	Navitha <i>et al.</i> 2012.
<i>Cryptostegia grandiflora</i> R.Br.	Madagascar	R	Root paste applied on chest for purging asthma.	Ray <i>et al.</i> 2011.
Araceae				
<i>Pistia stratiotes</i> L.	Trop. America	Wp, L	Boiled plant is tied on rheumatic joints to relief swelling. Boiled leaf juice applied with coconut oil for purging skin diseases, eczema, and leprosy. Decoction of plant for treating irregular urination. Plant used for cancer treatment.	Kayode <i>et al.</i> 2008, Panda and Misra 2011.
Arecaceae				
<i>Borassus flabellifer</i> L.	Trop. Africa	L, R	Leaf paste applied on wounds and cuts. Root secretion orally taken to treat seminal weakness.	Rahaman and Karmakar 2015.
Asteraceae				
<i>Acanthospermum hispidum</i> DC.	Brazil	Wp, L	Decoction of plant with gun powder treats asthma. Leaf decoction for treating diarrhoea.	Makinde <i>et al.</i> 2015, Sharaibi and Osuntogun 2017.
<i>Acmella radicans</i> (Jacq.) R.K. Jansen.	Trop. America	Fl, S, Wp	Flower heads for treating stammering, tincture against jaw-bone inflammation. Seeds for cold cough and fever. Plant decoction against dysentery, psoriasis, rheumatism, kidney stone.	Rahman <i>et al.</i> 2016.
<i>Ageratina adenophora</i> (Spreng.) King & Robinson	Trop. America	L	Leaf decoction for malaria treatment and paste for wounds and cuts.	Singh 2015.
<i>Ageratum conyzoides</i> (L.) L.	Trop. America	L, St	Plant leaf juice to treat cuts and wounds and applied on skin diseases as an antiseptic. Leaves for treating typhoid and as a snakebite	Neogi <i>et al.</i> 1989, Shukla <i>et</i>

			antidote. Fomented leaves and stems in leprosy.	<i>al.</i> 2010, Padal <i>et al.</i> 2013, Rahman and Roy 2014.
<i>Ageratum haustonianum</i> Mill.	Trop. America	L	Leaf juice as antiseptic, and for curing wounds and cuts.	Kumar <i>et al.</i> 2017.
<i>Bidens pilosa</i> L.		L, Wp	Useful in kidney deficiency, throat ache, jaundice, menstrual disorder, leaves for anti-diabetic treatment. Plant juice to treat skin diseases.	Satapathy <i>et al.</i> 2012, Semenya <i>et al.</i> 2012, Hong <i>et al.</i> 2015, Khumukcham <i>et al.</i> 2016.
<i>Blainvillea acmella</i> (L. f) Philipson	Trop. America	L	Leaf juice for alcohol deaddiction.	Jagtap 2009.
<i>Blumea eriantha</i> DC.	Trop. America	L	Leaf paste to stop bleeding.	Kokni <i>et al.</i> 2016.
<i>Blumea lacera</i> (Burm. f.) DC.	Trop. America	L	Crushed leaves for treating boils and blisters, fever, earache and as anthelmintic.	Sahu 1984, Shukla <i>et al.</i> 2010.
<i>Blumea obliqua</i> (L.) Druce	Trop. America	Wp	Plant is remedial in malaria, bronchitis, asthma, influenza, etc.	Ahmad and Alam 1995.
<i>Chromolaena odorata</i> L.	Trop. America	L, Wp	Leaf paste in cuts, rashes and wounds. Plant prevents diabetes.	Das and Duarah 2013, Vijayashalini <i>et al.</i> 2017.
<i>Conyza bipinnatifida</i> Wall.	Trop. America		Nil	Nil
<i>Conyza canadensis</i> (L.) Cronquist	South America	Wp	Plant acts as diuretic, anti-inflammatory, astringent, antibacterial, antihemorrhagic and stimulant. Plant also treats dysentery and diarrhoea.	Ayaz <i>et al.</i> 2016, Aziz <i>et al.</i> 2016.
<i>Crassocephalum crepidioides</i> (Benth.) Moore	Trop. America	Wp, L	Plant treats cuts and wounds and maintains homeostasis. Leaf soothes inflammation.	Jorim <i>et al.</i> 2012, Chaitanya <i>et al.</i> 2013.
<i>Dicoma tomentosa</i> Cass.	Trop. Africa	Wp	Plant decoction to treat malaria.	Jansen <i>et al.</i> 2010.
<i>Echinops echinatus</i> Roxb.	Afghanistan	R, L	Root powder is consumed orally as well as applied externally for curing sexual disability and as an antidote for scorpion sting. Leaf paste in diabetes and leaf fumes in asthma.	Maurya <i>et al.</i> 2015.
<i>Eclipta prostrata</i> (L.) L.	Trop. America	Wp	Whole plant poultice in wounds and cuts and as hair tonic.	Shukla <i>et al.</i> 2010, Rao <i>et al.</i> 2015.

<i>Emilia sonchifolia</i> (L.) DC.	Trop. America	L	Leaf juice with coconut oil treats tonsillitis.	Priya and Gopalan 2014.
<i>Flaveria trinervia</i> (Spreng.) C. Mohr.	Trop. C. America	L	Leaves with curd and cow's milk to treat jaundice.	Shanthamm a <i>et al.</i> 1986.
<i>Galinosoga parviflora</i> Cav.	Trop. America	L, St, Fl	Leaves and stem for treating sores and cold. Chopped flowers in tooth ache.	Matu and Staden 2003, Tolossa <i>et al.</i> 2013.
<i>Glossocardia bosvallea</i> (L.f.) DC.	East Indies	Wp	Plant decoction to treat typhoid.	Biradar and Ghorband 2010.
<i>Gnaphalium coarctatum</i> Willd.	Trop. America	Nil	Nil	Nil
<i>Gnaphalium pennsylvanicum</i> Willd.	Trop. America	L	Leaves as vegetable.	Angami <i>et al.</i> 2006.
<i>Gnaphalium polycaulon</i> Pers.	Trop. America	Wp	Plant acts as astringent and wound healer.	Rahman 2013.
<i>Grangea maderspatana</i> (L.) Poir.	Trop. S. America	L	Leaf juice treats earache, coughs and increases emmenagogue.	Rahman 2013.
<i>Lagascea mollis</i> Cav.	Trop. C. America	Wp, Infl	Plant paste is applied externally on chest along with mustard oil and camphor to cure cough, nasal congestion and cold. Inflorescence paste with cow milk and black pepper cures dysentery.	Shrivastava and Jain 2014.
<i>Mikania micrantha</i> Kunth.	Trop. America	Wp, L	Leaves are good antihemorrhagic agent. Plant is used to cure jaundice, dysentery, fever, colds, rheumatism, scorpion stings, snake bites, gout, flatulence, etc.	Sathi <i>et al.</i> 2015.
<i>Parthenium hysterophorus</i> L.	Trop. N. America	L, Fl	Leaves as carminative. Leaf and flower against diabetes.	Mahmood <i>et al.</i> 2011.
<i>Sonchus asper</i> (L.) Hill	Medit.	Sh, L	Shoot for indigestion. Leaf decoction against constipation and fever.	Kala 2005, Abbasi <i>et al.</i> 2013.
<i>Sonchus oleraceus</i> L.	Medit.	L	Leaf juice is drunk in constipation and weakness.	Abbasi <i>et al.</i> 2013.
<i>Synedrella nodiflora</i> (L.) Gaertn.	West Indies	St, L, Wp	Stem and leaf curry helps in relieving body pain and as laxative. Plant harbors analgesic, antioxidant, anti-inflammatory, antipyretic and antimicrobial features.	Basumatary <i>et al.</i> 2014, Vijayashalini <i>et al.</i> 2017.
<i>Tridax procumbens</i> (L.) L.	Central America	L, Wp	Leaves for purging chest complaints, toothache, cough and as styptic. Plant against blisters, boils and as coagulant.	Hillocks 1998, Jain <i>et al.</i> 2005, Rajkumar and Shivanna 2009, Rao <i>et al.</i> 2015.

<i>Xanthium strumarium</i> L.	Trop. America	L, F, WP	Leaf paste with mustard oil against headache and eczema. Fruit or whole plant paste against joint pain.	Acharya and Pokhrel 2006, Rao <i>et al.</i> 2015.
<i>Youngia japonica</i> (L.) DC.	South America	Wp, L, R	Plant used in curing boils, constipation, as blood purifier and appetizer. Root juice as antilithic and leaf paste heals wounds.	Acharya and Pokhrel 2006, Rahman 2013.
Balsaminaceae				
<i>Imptiens balsamina</i> L.	Trop. America	L	Leaf paste for purging athlete's foot, antiphlogistic, wounds, swelling and boils.	Katewa and Galav 2005, Rao <i>et al.</i> 2015.
Brassicaceae				
<i>Cardamine hirsuta</i> L.	Trop. America	L	Leaves help in soothing indigestion.	Kala 2005.
<i>Cardamine trichocarpa</i> Hochst. Ex A. Rich.	Trop. America	L	Burnt leaves are squeezed on the feet to cure Athletes foot. Leaf decoction cures ringworm.	Tugume <i>et al.</i> 2016.
<i>Rorippa dubia</i> (Pers.) H. Hara	South America	L	Leaves as vegetable.	Brahma and Brahma 2016.
Cactaceae				
<i>Opuntia elatior</i> Mill.	Trop. America	F	Fruit juice lowers blood pressure, treats gonorrhoea, spermatorrhoea, inflammation and acts as snake antidote and aphrodisiac.	Ramyashree <i>et al.</i> 2012.
<i>Opuntia stricta</i> (Haw.) Haw.	Trop. America	C	Juice soothes burns, hyperlipidemia, inflammation, ulcer and act as diuretic.	Pawar <i>et al.</i> 2017.
Caesalpiniaceae				
<i>Chamaecrista pumila</i> (Lam.) K. Laesen.	Trop. America	Wp	Plant for getting galactogogues.	Jain <i>et al.</i> 2005.
<i>Chamaecrista rotundifolia</i> (Pers.) Greene	Trop. S. America		Decoction of aerial parts taken orally to cure malaria.	Lagnika <i>et al.</i> 2016.
<i>Chamaecrista absus</i> (L.) H.S. Irwin & Barneby	Trop. America	S	Seeds paste treats headache and dermatitis.	Muthu <i>et al.</i> 2006.
<i>Senna alata</i> (L.) Roxb.	South America	L	Leaf paste against ringworm and dermatitis.	Kala 2005, Shil <i>et al.</i> 2014.
<i>Senna hirsuta</i> (L.) H.S. Irwin & Barneby	Trop. America	L	Leaf juice in stomachache, hernia, headache and pneumonia.	Amri and Kisangau 2012.
<i>Senna obtusifolia</i> (L.)	Trop.	R, L	Root paste and fried leaf against foul ulcer,	Jain <i>et al.</i>

H.S.Irwin & Barneby	America		tuberculosis and ringworms.	2005.
<i>Senna occidentalis</i> (L.) Link.	Trop. S. America	L, S, R	Seeds in treating headache. Root decoction as anthelmintic and leaf decoction in malaria, fever, earache and stomachache.	Dangol 2008, Jain <i>et al.</i> 2005, Moshi 2012, Rao <i>et al.</i> 2015.
<i>Senna tora</i> (L.) Roxb.	South America	S, L	Roasted seeds in cough. Leaf decoction purges dyspepsia, low blood pressure and dermatitis.	Kala 2005, Dangol 2008, Rao <i>et al.</i> 2015.
<i>Senna uniflora</i> (Mill.) H.S. Irwin & Barneby	Trop. S. America	L	Leaves bear wound healing and anti-inflammatory properties.	Chaudhari <i>et al.</i> 2012.
Cannabaceae				
<i>Cannabis sativa</i> L.	C. Asia	L	Leaf poultice in tuberculosis, piles, anticancerous and as narcotic.	Semenya <i>et al.</i> 2012, Velasco <i>et al.</i> 2016, Kumar <i>et al.</i> 2017.
Cleomaceae				
<i>Cleome gynandra</i> L.	Trop. America	L	Leaf decoction in earache, toothache and paste applied externally in skin disorders.	Hebbar <i>et al.</i> 2004, Katewa and Galav 2005.
<i>Cleome monophylla</i> L.	Trop. Africa	Wp, F, S, L	Plant averts swelling and pus. Fruits treat cough and seeds as rubefacient and carminative. Oral leaf decoction as antipyretic.	Venkatachala lathani <i>et al.</i> 2016, Vijayashalini <i>et al.</i> 2017.
<i>Cleome rutidosperma</i> DC.	Trop. America	L, R, Wp	Leaf sap treats deafness and earache. Roots have anti-inflammatory, analgesic, vermifuge properties. Plant is important to treat spasm, epilepsy, skin complaints, convulsions, paralysis, etc.	Schmid 2001, Bose <i>et al.</i> 2013.
<i>Cleome viscosa</i> L.	Trop. America	S	Oral consumption of seed powder for bleeding piles.	Katewa and Galav 2005.
Convolvulaceae				
<i>Convolvulus arvensis</i> L.	Europe	R	Root as purgative.	Shukla <i>et al.</i> 2010.
<i>Evolvulus nummularius</i> (L.) L.	Trop. America	L	Leaves as memory booster and blood purifier.	Vijayashalini <i>et al.</i> 2017.
<i>Ipomoea carnea</i> Jacq.	Trop. America	L	Leaf paste in oil for treating joint pain and muscle strain.	Rao <i>et al.</i> 2015, Londhe <i>et al.</i> 2017.

<i>Ipomoea eriocarpa</i> R.Br.	Trop. Africa	L, Wp	Leaves treat inflammatory, hyperglycemia and arthritis. Plant as antipyretic, anti-ulcerative and antirheumatic.	Londhe <i>et al.</i> 2017.
<i>Ipomoea hederifolia</i> L.	Trop. America			
<i>Ipomoea obscura</i> (L.) Ker.-Gawl.	Trop. Africa	L, S	Leaf juice against dysentery and snake bite. Seeds in ameliorating vision, dyspnea, etc.	Londhe <i>et al.</i> 2017.
<i>Ipomoea pes-tigridis</i> L.	Trop. E. Africa	Wp	Plant juice cures rabies, wound healing, swellings, headache, snake bite, stings, etc.	Selvam and Acharya 2015.
<i>Ipomoea quamoclit</i> L.	Trop. America	Wp	Plant juice is given during weakness, piles and bleeding dysentery.	Londhe <i>et al.</i> 2017.
<i>Ipomoea staphylina</i> Roem. & Schult.	Trop. Africa	St, R	Stem latex in dermatitis. Root paste as an antidote for snake bite.	Anitha <i>et al.</i> 2008, Rekha <i>et al.</i> 2013.
<i>Merremia aegyptia</i> (L.) Urban.	Trop. America	WP	Whole plant internally cures stomach troubles.	Sathiyaraj <i>et al.</i> 2015.
Cuscutaceae				
<i>Cuscuta chinensis</i> Lam.	Medit.	Wp, L, St, S	Plant paste applied on wounds and ulcers. Boiled plant water treats jaundice. Leaves help in improving lactation. Stem cures inflamed eyes, dandruff and sore heads. Seeds treat sexual problems.	Donnappee <i>et al.</i> 2014.
<i>Cuscuta reflexa</i> Roxb.	Medit.	Wp	Plant as purgative, in swelling and tonsilitis.	Kala 2005, Acharya and Pokhrel 2006.
Cyperaceae				
<i>Cyperus difformis</i> L.	Trop. America	Wp	Plant paste purges dermatitis.	Amjad <i>et al.</i> 2015.
<i>Cyperus iria</i> L.	Trop. America		Nil	Nil
<i>Fuirena ciliaris</i> (L.) Roxb.	Trop. America		Nil	Nil
Euphorbiaceae				
<i>Chrozophora rotleri</i> (Geis.) Spreng.	Trop. Africa	Wp, L, F, St	Plant purifies blood and treats jaundice. Stem shows wound healing effects. Leaf possesses anthelmintic and laxative properties. Fruits purge cough and cold.	Dipankar <i>et al.</i> 2011.
<i>Croton bonplandianum</i> Baill.	South America	S, L	Stem latex and leaf juice help in blood clotting of wounds.	Chakraborty and Duary 2014.
<i>Euphorbia cyathophora</i> Murray	Trop. America	Wp	Plant harbors antimicrobial and wound healing properties.	Vijayashalini <i>et al.</i> 2017.

<i>Euphorbia heterophylla</i> L.	Trop. America	R, L	Roots and leaves for headache. Leaves induce dysentery.	Hillocks 1998, Vaidyanath an <i>et al.</i> 2013.
<i>Euphorbia hirta</i> L.	Trop. America	L, Wp, Fl, F	Leaf poultice in throat pain, constipation, peptic ulcer, haemorrhoides; flower and fruit decoction against asthma respiratory tract infections. Plant paste in water for enema, ring worm.	Shukla <i>et al.</i> 2010, Satapathy <i>et al.</i> 2012, Rajamanoharan 2014, Shil <i>et al.</i> 2014, Neamsuvan and Ruangrit 2017.
<i>Euphorbia indica</i> Lam.	Trop. S. America	Lt	Latex treats ringworm.	Haq <i>et al.</i> 2011.
<i>Phyllanthus tenellus</i> Roxb.	Mascarene Islands	Wp	Plant extract for controlling urolithiasis, diabetes, bowel diseases, etc.	Silva <i>et al.</i> 2012.
<i>Synadenium grantii</i> Hook. f.	Trop. America	Lt	Latex infusion treats cancer, gastritis and peptic ulcer.	Costa <i>et al.</i> 2012.
Lamiaceae <i>Hyptis suaveolens</i> (L.) Poit.	Trop. America	L	Leaf decoction purges headache, cough, cold, itching, stomachache inflammation, rheumatism, wounds, burns and cuts, infertility and skin disorders. Seed decoction is taken in empty stomach for dysuria.	Sahu 1984, Kala 2005, Majumdar and Dutta 2007, Rahman and Roy 2014, Pappan and Thomas 2017.
<i>Leonotis nepetifolia</i> (L.) R.Br.	Trop. Africa	L	Leaves used against burns.	Kala 2005.
<i>Ocimum americanum</i> L.	Trop. America	Wp, L	Plant against diarrhoea, epilepsy, sun stroke, influenza, inflammation and fever. Leaf decoction against mental sickness, menstrual irregularities, cough, ear infection, stomach problems and sore eyes.	Prabhu <i>et al.</i> 2009, Majumdar and Dutta 2007.
Liliaceae <i>Asphodelus tenuifolius</i> Cav.	Trop. America	L, S	Leaf juice against kidney stone and paste against swellings. Seeds as diuretic and externally applied against inflammation.	Mahmood <i>et al.</i> 2011.
Malvaceae <i>Corchorus aestuens</i> L.	Trop. America	Wp	Plant decoction taken orally checks diarrhoea.	Shukla <i>et al.</i> 2010.

<i>Corchorus fascicularis</i> Lam.	Trop. America	Wp, S	Seeds used to treat stomach problems, dermatitis, tumour, etc. Whole plant decoction in anaemia.	Rajput and Rajput 2011.
<i>Corchorus olerius</i> L.	Trop. Africa	S	Seed paste applied over head kills louses and checks hair fall.	Shukla <i>et al.</i> 2010.
<i>Corchorus tridens</i> L.	Trop. Africa	R	Root extract relieves backache.	Maroyi 2013.
<i>Corchorus trilocularis</i> L.	Trop. Africa	Wp, R, S	Plant is demulcent. Root and seed powder treat syphilis.	Muhamma d and Khan 2008, Dhanalaksh mi and Manavalan 2014.
<i>Malachra capitata</i> (L.) L.	Trop. America	R	Roots are remedy for inflammation, convulsion, fever, dementia, ulcer, liver cirrhosis, wound healing, diarrhoea, etc.	Deodhar 2016.
<i>Malvastrum coromandelianum</i> (L.) Garcke	Trop. America	L, Rh	Rhizome powder for curing diarrhoea and fever, muscular pain; leaves for curing carbuncles, wounds cleansing, stop bleeding and dysentery.	Dichoso (ERDB) 2012, Ghani and Batool 2012, Rao <i>et al.</i> 2015.
<i>Melochia corchorifolia</i> L.	Trop. America	L	Leaf eases free motion.	Muthu <i>et al.</i> 2006.
<i>Sida acuta</i> Burm. f.	Trop. America	Wp, L	Whole plant useful in fractured part, diarrhoea, jaundice, dysentery. Leaves applied on cuts and bruises.	Thomas <i>et al.</i> 2012, Panda <i>et al.</i> 2014, Neamsuvan and Ruangrit 2017.
<i>Triumfetta rhombidea</i> Jacq.	Trop. America	L, R	Root paste in carbuncle; leaves in rheumatism and body ache.	Rahman and Roy 2014, Shil <i>et al.</i> 2014.
<i>Urena lobata</i> L.	Trop. Africa	L, R, S	Leaves for rheumatoid arthritis; root decoction as antipyretic. Seed powder drink against cardiac troubles.	Shil <i>et al.</i> 2014, Khumukch am <i>et al.</i> 2016, Kokni <i>et al.</i> 2016.
<i>Waltheria americana</i> L.	Trop. America	R	Root extract for treating spermatorrhoea and leucorrhoea.	Katewa and Galav 2005.
<i>Waltheria indica</i> L.	Trop. America	Wp, R	Plant purges several ailments like cough, sore throat, inflammations, diarrhoea, malaria, dysentery, epilepsy, cancer, impotency, rheumatism, ulcer, convulsion, asthma,	Zongo <i>et al.</i> 2013.

			gingivitis, eye problems, anaemia, etc.	
Martyniaceae				
<i>Martynia annua</i> L.	Trop. America	L, R	Leaf paste in epilepsy, antidote to venoms. Root paste as sedative. Seeds prevent graying of hair and seed oil in skin irritations.	Dhingra <i>et al.</i> 2013.
Melastomataceae				
<i>Clidemia hirta</i> (L.) D. Don	Trop. America	L, R	Leaf and root decoction either inhaled or orally taken to treat stomachache, malaria and diarrhoea.	Rakotoarivelo <i>et al.</i> 2015.
Mimosaceae				
<i>Acacia farnesiana</i> (L.) Willd.	Trop. S. America	L	Leaf extract for curing conjunctivitis and eye inflammation.	Jain <i>et al.</i> 2005.
<i>Acacia mearnsii</i> De wild. (Mimosaceae)	SE Australia	B	Bark against tuberculosis.	Tabuti <i>et al.</i> 2010.
<i>Leucaena leucocephala</i> (Lam.) de Wit	Trop. America	S, Wp, R, B	Seeds in treating stomachache via abortion and contraception, soothes skin. Plant as vermifuge. Root and bark decoction as emmenagogue and abortifacient.	Lim 2012, Devi <i>et al.</i> 2013.
<i>Mimosa pigra</i> L.	Trop. N. America	L	Infusion of roasted leaf powder treats weak heart.	Grosvenor <i>et al.</i> 1995.
<i>Mimosa pudica</i> L.	Brazil	Wp, L, R	Roots for snakebite antidote and toothache. Whole plant for inflammation, jaundice, piles, scabies and skin diseases. Leaf paste as styptic, for swelling and decoction against diabetes.	Panda <i>et al.</i> 2014, Rahman and Roy 2014, Rao <i>et al.</i> 2015, Kokni <i>et al.</i> 2016.
<i>Prosopis juliflora</i> (Sw.) DC.	Mexico	L	Leaf paste with lime and tobacco relieves toothache.	Hebbar <i>et al.</i> 2004.
Nyctaginaceae				
<i>Mirabilis jalapa</i> L.	Peru	Wp	Plant paste in sprain.	Shil <i>et al.</i> 2014.
Onagraceae				
<i>Ludwigia adscendens</i> (L.) Hara	Trop. America	Wp	Plant paste for curing ulcer and skin diseases.	Panda and Misra 2011.
<i>Ludwigia octovalvis</i> (Jacq.) Raven	Trop. Africa	L	Leaf decoction treats dysentery. Leaf paste purges eczema.	Mandal and Rath 2015, Savithramma <i>et al.</i> 2015.
<i>Ludwigia perennis</i> L.	Trop. America	Wp	Plant as antipyretic.	Dangol 2012.

Oxalidaceae				
<i>Oxalis corniculata</i> L.	Europe	L	Leaves useful in dysentery, halitosis, toothache. Juice as eye drop, blood purifier and antidote.	Panda <i>et al.</i> 2014, Rao <i>et al.</i> 2015.
Papaveraceae				
<i>Argemone mexicana</i> L.	South America	L, Wp	Leaves against ringworm, malaria and jaundice. Plant paste against eczema.	Poilepatel and Manikrao 2013, Sourabie <i>et al.</i> 2013, Rao <i>et al.</i> 2015.
<i>Argemone ochroleuca</i> Sweet	South America	R, St	Stem and roots purge diabetes.	Galicia <i>et al.</i> 2002.
Papilionaceae				
<i>Aeschynomene americana</i> L.	Trop. America		Nil	Nil
<i>Crotalaria pallid</i> Dryand	Trop. America	S	Seeds for detoxification.	Padal <i>et al.</i> 2013.
<i>Crotalaria retusa</i> L.	Trop. America	Wp	Plant treats impetigo and scabies.	Senthilkumar <i>et al.</i> 2006.
<i>Cytisus scoparius</i> (L.) Link	Europe	Wp	Plant is diuretic, sedative, hypnotic and treats liver diseases and hyperglycaemia.	Sundararajan <i>et al.</i> 2006.
<i>Indigofera astragalina</i> DC.	Trop. America		Nil	Nil
<i>Indigofera glandulosa</i> Roxb. ex Willd.	Trop. America	Wp, S	Plant serves as a tonic and seeds provide nourishment for man.	Deshmukh and Rothe 2013.
<i>Indigofera linifolia</i> (L.f.) Retz.	Trop. S. America	Wp	Plant treats amenorrhoea and skin infections.	Prashantkumar and Vidyasagar 2008, Mahmood <i>et al.</i> 2011.
<i>Indigofera linnaei</i> Ali	Trop. Africa	L, R	Oral administration of root and leaf paste treats asthma.	Padal <i>et al.</i> 2013.
<i>Indigofera trita</i> L.f.	Trop. Africa	Wp	Plant possesses anti-tumour, hepatoprotective and analgesic effect and treats inflammation, arthritis, rheumatism liver disorders, etc.	Deshmukh and Rothe 2013, Kumar <i>et al.</i> 2013.
<i>Macroptilium atropupureum</i> (DC.) Urban	Trop. America	Wp	Pasture plant.	Suthari <i>et al.</i> 2014.

<i>Macroptilium lathyroides</i> (L.) Urban	Trop. C. America		Nil	Nil
<i>Melilotus alba</i> Desv.	Europe	Wp	Plant bears strong antitumour effect.	Karkas <i>et al.</i> 2012.
<i>Melilotus albus</i> Medik. ex Desr.	Europe	L	Fresh leaf paste to cure joint pain and inflammation.	Abbasi <i>et al.</i> 2013.
<i>Sesbania bispinosa</i> (Jacq.) Wight	Trop. America	Wp, L, Fl	Plant possesses diuretic, laxative, astringent, anti-inflammatory, antipyretic, anti-tumour and antibacterial effects and treats sore throat, bruises, eye problems, small pox, etc. Decoction prepared from flowers and leaves treats internal illness.	Momin and Kadam 2011.
<i>Stylosanthes hamata</i> (L.) Taub.	Trop. America	L, B	Leaf and bark act snake bite antidote.	Ranjalkar 2015.
<i>Ulex europaeus</i> L.	Western Europe	Wp	Plant bears insecticidal effects.	Hewage <i>et al.</i> 1997.
Passifloraceae				
<i>Passiflora foetida</i> L.	Trop. S. America	F, Sp	Fruit in respiratory disorder. Stem diarrhoea, gastritis. Young shoots eaten in anaemia.	Kala 2005, Balangcod and Balangcod 2011.
Pedaliaceae				
<i>Pedaliium murex</i> L.	Trop. America	Wp	Plant shows hepatoprotective, aphrodisiac, antibacterial, antiulcer, anti-inflammatory, nephroprotective, anti-hyperlipidemic and insecticidal activities.	Rajashekar <i>et al.</i> 2012.
Piperaceae				
<i>Peperomia pellucida</i> (L.) Kunth	South America	Wp, R	Plant treats headache, kidney problems, rheumatism, boils, gout, haemorrhage, impotency, constipation, etc. Leaves purge mental disorders, eye inflammation, arthritis, etc.	Majumdar <i>et al.</i> 2011.
Poaceae				
<i>Cloris barbata</i> Sw.	Trop. America	Wp	Plant juice is hypoglycaemic, antimicrobial and dermatitis.	Natrajan <i>et al.</i> 2012.
<i>Dinebra retroflexa</i> (Vahl) panz.	Trop. America	Wp	Plant as fodder.	Kamatchi and Parvathi 2017.
<i>Echinochloa colona</i> (L.) Link	Trop. S. America	S	Cooked or raw seeds act as tonic for liver ailments.	Chakraborty and Duary 2014.
<i>Echinochloa crusgalli</i> (L.) P. Beauv.	Trop. S. America	Wp	Plant juice soothes spleen and ceases haemorrhage. Edible grains treat spleen disorders, jaundice, haemorrhage, catarrh and act as hair tonic.	Talukdar and Talukdar 2012,

				Chakraborty and Duary 2014.
<i>Imperata cylindrical</i> (L.) Raensch.	Trop. America	R	Root paste as antidote against scorpion sting.	Jain <i>et al.</i> 2005.
<i>Pennisetum purpureum</i> Schum.	Trop. America	Wp, L	Plant cooked as vegetable and decoction treats mammary inflammation. Leaves chewed or paste is smeared in belly for inducing labour.	Krief <i>et al.</i> 2005, Mugisha and Origa 2007, Negawo <i>et al.</i> 2017.
<i>Melinis repens</i> (Willd.) Zizka	Trop. America	Wp	Plant is exploited as fodder and is anti-diabetic.	De Paula <i>et al.</i> 2005, Bussmann <i>et al.</i> 2006.
<i>Saccharum spontaneum</i> L.	Trop. W. Asia	Wp, R, L, St	Plant purges stomach problems, mental illness, obesity, anaemia, etc. Roots are purgative, diuretic, astringent, lithotriptic and treat gynecological illness, dyspepsia, respiratory troubles, etc. Stem relieves dyspepsia, dysentery, etc. Leaves are diuretic and cathartic.	Kumar <i>et al.</i> 2010.
<i>Vetiveria zizanoides</i> L.		R	Roots in vomiting and dermatitis, skin diseases, burning sensation and hair problems, etc.	Vaidyanathan <i>et al.</i> 2013, Panda <i>et al.</i> 2014.
Polygonaceae				
<i>Antigonon leptopus</i> Hook. & Arn.	Trop. America	Wp	Plant prevents flu pain and cough and possesses anti-analgesic, anti-diabetic, antimicrobial, anthelmintic, anti-inflammatory, anti-thrombin and anti-lipid peroxidation effects. Tea is prepared from the aerial plant parts.	Mulabagal <i>et al.</i> 2011, Ranjan and Tripathi 2015.
Pontederiaceae				
<i>Eichhornia crassipes</i> (C. Martius.) Solms.	Trop. America	R, Fl	Root powder with honey is hepatoprotective. Cooked flowers are taken orally for relieving one sided swelling of abdomen (Pandu roga).	Rahmatullah <i>et al.</i> 2010.
<i>Monochoria vaginalis</i> (Burm.f.) C.Presl	Trop. America	Wp	Plant is cooked against digestion problems. Fresh root juice to cure nausea.	Majumdar and Dutta 2007.
Portulacaceae				
<i>Portulaca oleracea</i> L.	South America	L, S, Wp	Leaf poultice for relieving headache, eye inflammation, mental illness, acidity and suppressing gangrene, etc. Plant juice against bronchitis, jaundice and kidney stone. Seeds to cure respiratory problems,	Rao <i>et al.</i> 2015, Iranshahy <i>et al.</i> 2017.

			hypercholesterolemia, diabetes, intestinal ulcer, boil, toothache, etc. Cooked plant against blurred vision.	
<i>Portulaca quadrifida</i> L.	Trop. America	L	Leaf decoction in gastric troubles, cough, leucorrhoea, vomiting, urinary tract infection, ulcer and inflammation, joint swellings, etc.	Mahmood <i>et al.</i> 2011, Abbasi <i>et al.</i> 2013, Shil <i>et al.</i> 2014.
Primulaceae				
<i>Anagallis arvensis</i> L.	Europe	L, Wp	Leaves for purging liver problems, toothache and snakebites and paste against hair lice. Plant paste with mustard oil to treat dermatitis.	Rao <i>et al.</i> 2015, Vijayashalini <i>et al.</i> 2017.
Rubiaceae				
<i>Spermacoce hispida</i> L.	Trop. America	Fl, S	Flowers soothe boils swellings, eruptions, malaria and cough. Seeds relieve stomach ailments; purify blood, kidney and internal injuries.	Meti <i>et al.</i> 2013.
Salviniaceae				
<i>Salvinia molesta</i> D.S. Mitch.	Brazil	Wp	Plant possesses antifungal properties.	Benjamin and Manickam 2007.
Scrophulariaceae				
<i>Mecardonia procumbens</i> (Mill.) Small	Trop. N. America	Wp	Plant acts as neuro-stimulant and brain stimulant.	Das and Ghosh 2017.
<i>Scoparia dulcis</i> L.	Trop. America	L, Wp	Leaf paste used against gonorrhoea, diabetes and malaria, stomachache, blood purifier, menstrual disorders, malaria, heart and liver complaints, insect bite, etc. Plant against fever, snake bite, jaundice, warts, toothache, stomach problems, earache, etc.	Panda and Misra 2011, Vaidyanathan <i>et al.</i> 2013, Pappan and Thomas 2017.
<i>Torneria fourneri</i> Linden ex E. Fournier	Australia	Fl	Flowers are edible as salad and potent antioxidant power.	Shindo <i>et al.</i> 2008.
Solanaceae				
<i>Datura innoxia</i> Mill.	Trop. America	S, L, Wp	Seeds are toxic, used as sedative and rheumatism and premature ejaculation. Leaf juice for otitis. Plant as anticancerous.	Mahmood <i>et al.</i> 2011.

<i>Datura metel</i> L.	Trop. America	R, S, Infl	Root is tied over pregnant woman to check abortion. Seeds and inflorescence in purging wound, gonorrhoea, leprosy and as anthelmintic.	Stepp 2004, Jain <i>et al.</i> 2005, Shukla <i>et al.</i> 2010.
<i>Datura stramonium</i> L.	Trop. America	L, F, Infl	Leaf smoking in headache and asthma, leaf poultice in boils, abdominal pain, rheumatism, fruits in toothache, sore throat, tonsillitis. Flowers against joint dislocation, toothache and stomach complaints.	Hillocks 1998, Jain <i>et al.</i> 2005, Lewu and Afolayan 2009, Maroyi 2012.
<i>Nicotiana plumbaginifolia</i> Viv.	Trop. America	Wp	Plant paste against external parasites of animals.	Rao <i>et al.</i> 2015.
<i>Physalis angulata</i> L.	Trop. America	F, Wp	Fruits in gastric trouble. Plant treats fever, cough, sore throat and abscesses.	Kala 2005, Vijayashali ni <i>et al.</i> 2017.
<i>Physalis pruinosa</i> L.	Trop. America	Wp	Plant is remedial for asthma, liver problems and microbial infection.	Vijayashali ni <i>et al.</i> 2017.
<i>Solanum americanum</i> Mill.	Trop. America	L, F, Wp	Leaves repair malnutrition in children and treat conjunctivitis, rheumatism. Fruit treat herpes, cardiac disorders. Plant extract as diuretic, anti-inflammatory, blood purifier, antispasmodic, vermifuge and treats cancerous sores and wounds, ringworm, earache, etc.	Lim 2013.
<i>Solanum nigrum</i> L.	Trop. America	L, St, F	Leaf and stem extract as blood purifier, antipruritic, diuretic and sedative. Leaf juice in stomach ulcer, ringworm, piles, dysentery and cough. Fruit against anaemia.	Ghani and Batool 2012, Rajamanoharan 2014, Moshi 2012, Rao <i>et al.</i> 2015, Pappan and Thomas 2017.
<i>Solanum seafortianum</i> Andrews	Brazil	L	Leaf juice with cow milk cures stomachache.	Jagtap <i>et al.</i> 2009.
<i>Solanum torvum</i> Sw.	West Indies	F, Wp, L	Fruit for dermatitis and cough and bodyache. Leaves maintain homeostasis.	Kala 2005.
<i>Solanum viarum</i> Dunal	Trop. America	F	Fruit pulp as leech repellent.	Thomas <i>et al.</i> 2012.
<i>Solanum viarum</i> Dunal	Trop. America	F	Fruit pulp as leech repellent.	Thomas <i>et al.</i> 2012.

Turneraceae <i>Turnera subulata</i> J.E. Smith	Trop. America	Wp	Plant purges boils, bronchitis and cough.	Kumar <i>et al.</i> 2005, Chai and Wong 2012.
<i>Turnera ulmifolia</i> L.	Trop. America	Wp	Plant treats indigestion, bronchitis, rheumatism, chest problems, boils, fever and cold.	Kumar <i>et al.</i> 2005.
Typhaceae <i>Typha angustata</i> Bory. & Choub.	Trop. America	Rh	Decoction of rhizome as astringent.	Panda and Misra 2011.
<i>Typha angustifolia</i> L.	Trop. America	Infl, Pol	Inflorescence for wound healing, Pollens are haemostatic, diuretic, anticoagulant, emmenagogue, antihemorrhagic, anti-nephrolithiasis, etc.	Lim 2016.
Ulmaceae <i>Trema orientalis</i> (L.) Blume	Africa	R, L, B	Roots treat intestinal and stomach bleeding, act as haemostatic, trauma. Bark treats dysentery. Leaves in jaundice, bronchitis, cough, pneumonia and act as vermifuge.	Adinortey <i>et al.</i> 2013.
Urticaceae <i>Pilea microphylla</i> (L.) Liebm.	Trop. S. America	L	Leaves act as womb cleanser and treat inflammation.	Lans 2007.
Verbenaceae <i>Lantana camara</i> L.	Trop. America	L, St	Leaves for curing high blood pressure, headache; leaves and stems as antiseptic, joint pain, stop bleeding, skin diseases.	Maroyi 2012, Rahmanans Roy 2014, Shil <i>et al.</i> 2014.
<i>Stachytarpheta jamaicensis</i> (L.) Vahl	Trop. America	Wp	Plant used as antipyretic, abortifacient, in ulcer stomach diseases, inflammation, diarrhoea, cardiac problems, dysentery, bruises.	Vaidyanathan <i>et al.</i> 2013.
<i>Stachytarpheta urticaefolia</i> (Salisb.) Sims	Trop. America	Wp	Plant bears diuretic, analgesic, anthelmintic, sedative, laxative, hypotensive, anti-inflammatory, purgative properties, etc.	Pappan and Thomas 2017.
Zygophyllaceae <i>Tribulus lanuginosus</i> L.	Trop. America	F	Fruits are diuretic and help in treating kidney stone.	Kumar <i>et al.</i> 2017.
<i>Tribulus terrestris</i> L.	Trop. America	L, S, F	Leaves in healing wounds and decoction against enlarged spleen. Seed decoction as diuretic. Fruit powder massage relieves toothache and taken with milk for treating male impotency.	Hebbar <i>et al.</i> 2004, Ray <i>et al.</i> 2011, Galib <i>et al.</i> 2013, Rao <i>et al.</i> 2015.

Plant parts: Whole plant (*Wp*), Leaf (*L*), stem (*St*), shoot (*Sh*), bark (*B*), flower (*Fl*), inflorescence (*Infl*), fruit (*F*), seed (*S*), root (*R*), rhizome (*Rh*), tuber (*T*), cladode (*C*), latex (*Lt*), pollens (*Pol*).

Nativity: Tropical America (*Trop. Am*), Tropical South America (*Trop. S. America*), Trop. North America (*Trop. N. America*), Tropical Central America (*Trop. C. America*), Mediterranean (*Medit.*), Tropical West Asia (*Trop. W. Asia*), Tropical Africa (*Trop. Africa*), South East Australia (*SE Australia*), Tropical East Africa (*Trop. E. Africa*), Central Asia (*C. Asia*), South West Asia (*SW Asia*).

Source: Rastogi et al. (2015); Sekar et al. (2012); Aravindhan and Rajendran (2014); Wagh and Jain (2015); Reddy et al. (2008).

Note: The plants names are checked and updated with the plant list KEW Botanical Garden (<http://www.theplantlist.org>) (accessed 25.02.2018).

3. Fatal impact of Invasive Alien Plant Species

The catastrophies created by invasive plants are not hidden from anyone. Invasive species like *Parthenium hysterophorus*, *Ageratum conyzoides* and *Lantana camara* cause greater biodiversity loss of native plants in north western India. Several alien plants like *Bidens pilosa*, *Oxalis corniculata*, *Celosia argentea*, *Sida acuta*, *Portulaca oleracea* are main disturbing weeds of agricultural landscapes. They also compete with native forest flora to occupy the land. Aquatic weeds like *Alternanthera philoxeroides*, *Eichhornia crassipes* and *Pistia stratiotes* clog fresh water bodies and impede navigation. Decaying *E. crassipes* opens gateway for bacterial infections in water bodies. Pollens of *P. hysterophorus* create allergy in respiratory tract and skin (Kumar and Prasad, 2014).

4. Conclusions

On the basis of information mentioned in the Table 1, it can be inferred that mostly the invasive plant species having medicinal attributes belong to Asteraceae family and American species dominate with greater contribution in nativity terms than other continents. Ethnic people utilize these plant species for soothing their ailments in different pockets of the globe.

In the present review, an effort is made to compile the information regarding pharmacological and ethnoremedial knowledge about invasive alien weed

species. The most frequent ethnoremedial uses of plant species are antipyretic, antirheumatism, anthelmintic, antimicrobial, antiulcerative, anticancerous, anti-inflammatory, etc. Further, the plant species of main interest in this present review are *Pistia stratiodes*, *Synadenium grantii*, *Waltheria indica*, *Cannabis sativa*, *Datura innoxia* and *Solanum americanum* as anticancerous; *Acacia mearnsii*, *Cannabis sativa*, and *Senna obtusifolia* as anti-tubercular; *Digera muricata*, *Catharanthus pusillus*, *Bidens pilosa*, *Chromolaena odorata*, *Echinops echinatus*, *Parthenium hysterophorus*, *Ipomoea eriocarpa*, *Phyllanthus tenellus*, *Mimosa pudica*, *Argemone ochroleuca*, *Cytisus scoparius*, *Chloris barbata*, *Melinis repens*, *Antigonon leptopus*, *Portulaca oleracea* and *Scoparia dulcis* as hypoglycaemic; *Calotropis gigantea* and *Cleome rutidosperma* as antiparalytic, *Ipomoea pes-tigridis* in rabies infection; and *Solanum americanum* in herpes, etc.

Many plant derived compounds like Δ^9 -tetrahydrocannabinol from *Cannabis sativa*, parthenin from *Parthenium hysterophorus*, etc. exhibited remarkable anticancerous (melanoma, pancreatic and hepatic cancer) and antitumor activity. Isosakuranetin (a flavone) from *C. odorata* flower extract showed anti-tubercular potential against H37Ra bacterium strain. The alkaloids (6-acetyl-dihydro chelerythrine and benzophenanthredine) from *Argemone mexicana* and monoterpenoid (4-methyl-dl-tryptophan) from *Catharanthus pusillus* were found to be effective against HIV infection.

The information gathered in this review proves to be worthy that invasive alien weed species comprise various ethnoremedial and biochemical properties as they are packed with secondary metabolites.

5. Future Directions

Although many invasive plants are metabolically insecure and toxic to humans, but in diverse tribal pockets of the globe, these species are boon for their ailments and many bioactive phytoconstituents are to be explored from them in future. People, usually, discriminately eradicate these weeds without being aware of their hidden treasure of medicines. Although invasive plants may be outsider here, but in their native land surely they contribute in different aspects like medicine, food, decorative, construction, etc. These are genius in taking over other flora and may help in offering proficient nourishment to the populace than the cultivated ones. They can be a

better nourishment source than the cultivated ones. Encouragement for their edibility can promote their proper utilization and management with a worthwhile scope in. Furthermore, this requires antioxidative and pharmacognostic investigation to explore out their valuable secondary metabolites, which may compete synthetic medicines in future. Basic ethnobotanical knowledge in this communication may help out many future researchers to evaluate different parameters in pharmacognostic field.

Acknowledgement

Authors are sincerely obliged to the researchers whose studies have been mentioned in this review.

Competing Interest

None.

- 1) Abbasi, A.M., Khan, M.A., Shah, M.H., Shah, M.M., Pervez, A. and Ahmad, M. (2013). Ethnobotanical appraisal and cultural values of medicinally important wild edible vegetables of Lesser Himalayas-Pakistan. *J Ethnobiol Ethnomed.* 9(1): 66.
- 2) Acharya, E. and Pokhrel, B. (2006). Ethnomedicinal plants used by Bantar of Bhaudaha, Morang, Nepal. *Our Nature.* 4(1): 96-103.
- 3) Adinortey, M.B., Galyuon, I.K. and Asamoah, N.O. (2013). *Trema orientalis* Linn. Blume: A potential for prospecting for drugs for various uses. *Pharmacogn. Rev.* 7(13): 67-72.
- 4) Afzal, K., Uzair, M., Chaudhary, B.A., Ahmad A, Afzal S and Saadullah M. (2015). Genus *Ruellia*: Pharmacological and phytochemical importance in ethnopharmacology. *Acta Poloniae Pharmac. Drug Res.* 72(5): 821-827.
- 5) Ahmad, V.U. and Alam, N. 1995. New antifungal bithienylacetylenes from *Blumea obliqua*. *J. Nat. Prod.* 58(9): 1426-1429.
- 6) Ajmal, M., Rao, R.A.K., Ahmad, R. and Khan, M.A. (2006). Adsorption studies on *Parthenium hysterophorous* weed: Removal and recovery of Cd (II) from wastewater. *J. Hazard. Mater.* 135(1): 242-248.
- 7) Amjad, M.S., Arshad, M. and Qureshi, R. (2015). Ethnobotanical inventory and folk uses of indigenous plants from Pir Nasoora National Park, Azad Jammu and Kashmir. *Asian Pac J Trop Biomed.* 5(3): 234-241.
- 8) Amri, E. and Kisangau, D.P. (2012). Ethnomedicinal study of plants used in villages around Kimboza forest reserve in Morogoro, Tanzania. *J Ethnobiol Ethnomed.* 8(1): 1-9.
- 9) Angami, A., Gajurel, P.R, Rethy, P., Singh, B. and Kalita, S.K. (2006). Status and potential of wild edible plants of Arunachal Pradesh. *Indian J Tradit Know.* 5(4): 541-550.
- 10) Anitha, B. (2008). Ethnomedicinal plants used by the Kanikkars of Tirunelveli District, Tamil Nadu, India to treat skin diseases. *Ethnobot. Leaflets.* 12: 171-180.
- 11) Aqeel, M., Adeel, M., Iradat, H. and Kiyani, W.K. (2011). Indigenous medicinal knowledge of medicinal plants of Barnala area, District Bhimber, Pakistan. *Int. J. Med. Arom. Plants.* 1(3): 294-301.
- 12) Aravindhan, V. and Rajendran, A. (2014). Diversity of invasive plant species in Boluvampatti forest range, The Southern Western Ghats, India. *American-Eurasian J. Agric. & Environmen. Sci.* 14(8): 724-731.
- 13) Ayaz, F., Sarimahmut, M., Küçükboyaci, N. and Ulukaya, E. (2016). Cytotoxic Effect of *Conyza canadensis* (L.) Cronquist on human lung cancer cell lines. *Turk J Pharm Sci.* 13(3): 342-346.
- 14) Aziz, M.A., Adnan, M., Khan, A.H., Rehman, A.U., Jan, R. and Khan, J. (2016). Ethnomedicinal survey of important plants practiced by indigenous community at Ladha subdivision, South Waziristan agency, Pakistan. *J Ethnobiol Ethnomed.* 12(1): 53.
- 15) Balangcod, T.D. and Balangcod, A.K.D. (2011). Ethnomedicinal knowledge of plants and healthcare practices among the Kalanguya tribe in Tinoc, Ifugao, Luzon, Philippines. *Indian J. Tradit Knowl.* 10(2): 227-238.
- 16) Basumatary, N., Teron, R. and Saikia, M. (2014). Ethnomedicinal practices of the bodo-kachari tribe of Karbi Anglong district of Assam. *Int. J. Life Sci. Biotechnol. Pharma Res.* 3(1): 161-167.
- 17) Benjamin, A. and Manickam, V.S. (2007). Medicinal pteridophytes from the Western Ghats. *Indian J. Tradit Knowl.* 6(4): 611-618.
- 18) Bhatt, J.R., Singh, J.S., Singh, S.P., Tripathi, R.S. and Kohli, R.K. (2012). Invasive Alien Plants An Ecological Appraisal for the Indian Subcontinent (Vol. 1). CABI. Wallingford, UK.

- 19) Biradar, S.D. and Ghorband, D. P. (2010). Ethnomedicinal wisdom of tribals of Kinwat forest of Nanded district (Maharashtra). *Indian J Nat Prod Resour.* 1(2): 254-257.
- 20) Bose, A., Ray, S.D., Khuntia, A. and Dash, S. (2013). Pharmacognostic evaluation of aerial parts of *Cleome rutidosperma*. *Med. Aromat. Plant Sci. Biotechnol.* 7(1): 50-53.
- 21) Brahma, J. and Brahma, B.K. (2016). Nutritional and phytochemical evaluation of some wild aromatic plants used as sources of food and medicines by the Bodo tribes of Kokrajhar district, Assam, India. *Int J Conserv Sci.* 7(1): 136-146.
- 22) Busmann, R.W., Gilbreath, G.G., Solio, J., Lutura, M., Lutuluo, R., Kunguru, K., Wood, N. and Mathenge, S.G. (2006). Plant use of the Maasai of Sekenani Valley, Maasai Mara, Kenya. *J. Ethnobiol. Ethnomed.* 2(1): 22.
- 23) Chai, T.T. and Wong, F.C. (2012). Whole-plant profiling of total phenolic and flavonoid contents, antioxidant capacity and nitric oxide scavenging capacity of *Turnera subulata*. *J. Med. Plants Res.* 6(9): 1730-1735.
- 24) Chaitanya, M.V.N.L., Dhanabal, S.P. and Rajan, S. (2013). Pharmacodynamic and ethnomedicinal uses of weed species in nilgiris, Tamilnadu State, India: a review. *Afr. J. Agric. Res.* 8(27): 3505-3527.
- 25) Chakraborty, N.R. and Duary, B. (2014). Utilization of some weeds as medicine by the local people in Birbhum District of West Bengal, India. *Int J Bioresour Stress Manag.* 5(1): 148-152.
- 26) Chandran, A. and Saj, O.P. (2015). Phytochemical studies on the medicinal herb *Catharanthus pusillus*. *World J Pharm Res.* 5(1): 152-171.
- 27) Chaudhari, S.S., Chaudhari, S.R. and Chavan, M.J. (2012). Analgesic, anti-inflammatory and anti-arthritic activity of *Cassia uniflora* Mill. *Asian Pac J Trop Biomed.* 2(1): S181-S186.
- 28) Chavan, S.S., Damale, M.G., Shamkuwar, P.B. and Pawar, D.P. (2013). Traditional medicinal plants for anticancer activity. *Int J Curr Pharm Res.* 5(4): 50-54.
- 29) Costa, L.L., David, V.C., Pinto, R., Minozzo, B.R., Kozlowski Junior, V.A., Campos, L.A., Silva, R.Z. and Beltrame, F.L. (2012). Anti-ulcer activity of *Synadenium grantii* latex. *Rev. Bras. Farmacogn.* 22(5): 1070-1078.
- 30) Dangol, D.R. (2008). Traditional uses of plants of commonland habitats in western Chitwan, Nepal. *J. Inst. Agric. Anim. Sci.* 29: 71-78.
- 31) Das, D. and Ghosh, P. (2017). Some Important Medicinal Plants Used Widely in Southwest Bengal, India. *Int. J. Eng. Sci. Invention.* 6(6): 28-50.
- 32) Das, K. and Duarah, P. (2013). Invasive Alien Plant Species in the Roadside Areas of Jorhat, Assam: Their Harmful Effects and Beneficial Uses. *J. Eng. Res. Appl.* 3(5): 353-358.
- 33) De Paula, A.C.C.F.F., Sousa, R.V., Figueiredo-Ribeiro, R.C.L. and Buckeridge, M.S. (2005). Hypoglycemic activity of polysaccharide fractions containing β -glucans from extracts of *Rhynchelytrum repens* (Willd.) CE Hubb., Poaceae. Brazil. *J. Med. Biol. Res.* 38(6): 885-893.
- 34) Deodhar, K.A. (2016). A systematic review of *Malachra capitata*: Medicinal properties and constituents. *Asian J. Sci. Technol.* 7(8): 3310-3313.
- 35) Deshmukh, V.R. and Rothe, S.P. (2013). Exotic medicinal plants from west Vidarbha region VIth. *Biolife J.* 2(1): 387-391.
- 36) Devi, M., Ariharan, V.N. and Prasad, N.P. (2013). Nutritive value and potential uses of *Leucaena leucocephala* as biofuel- a mini review. *Res. J. Pharm. Biol. Chem. Sci.* 4(1): 515-521.
- 37) Dhanalakshmi, R. and Manavalan, R. (2014). Bioactive compounds in leaves of *Corchorus trilocularis* L. by GC-MS analysis. *Int. J. PharmTech Res.* 6(7): 1991-1998.
- 38) Dhingra, A.K., Chopra, B. and Mittal, S.K. (2013). *Martynia annua* L.: a review on its ethnobotany, phytochemical and pharmacological profile. *J Pharmacogn Phytochem.* 1(6): 135-140.
- 39) Dichoso. (2012). *Common Weed Species with Medicinal Uses- ecosystem research and development bureau (Report)*. vol. 24 (1). doi: http://erdb.dnr.gov.ph/images/publications/rise/r_v24n1.pdf.

- 40) Dipankar, C., Murugan, S. and Devi, P.U. (2011). Review on medicinal and pharmacological properties of *Iresine herbstii*, *Chrozophora rottleri* and *Ecbolium linneanum*. *Afri. J. Tradit. Complement. Altern. Med.* 8(S): 124-129.
- 41) Donnapee, S., Li, J., Yang, X., Ge, A.H., Donkor, P.O., Gao, X.M. and Chang, Y.X. (2014). *Cuscuta chinensis* Lam.: a systematic review on ethnopharmacology, phytochemistry and pharmacology of an important traditional herbal medicine. *J. Ethnopharmacol.* 157: 292-308.
- 42) Gabrani, R., Jain, R., Sharma, A., Sarethy, I.P., Dang, S. and Gupta, S. (2012). Antiproliferative effect of *Solanum nigrum* on human leukemic cell lines. *Indian J Pharm. Sci.* 74(5): 451-453.
- 43) Galib, G., Verma, P., Patgiri, B.J. and Prajapati, P.K. (2013). *Tribulus terrestris* Linn.: a phyto-pharmacological review. *J. Ayu. and Hol. Med.* 1(3): 37-43.
- 44) Galicia, H.E., Contreras, A.A., Santamaria, A.L., Ramos, R.R., Miranda, C.A.A., Vega, G.L.M., Saenz, F.J.L. and Aguilar, A.F.J. (2002). Studies on hypoglycemic activity of Mexican medicinal plants. *Proc. West. Pharmacol. Soc.* 45: 118-124.
- 45) Ghani, A. and Batool, M. (2012). Folk recipes of some medicinal plants used by the inhabitants of Soon valley Khushab (Pakistan). *Int. J. Curr. Pharm. Res.* 4 (1): 60-63.
- 46) Girija, K., Lakshman, K., Udaya, C., Sachi, G.S. and Divya, T. (2011). Anti-diabetic and anti-cholesterolemic activity of methanol extracts of three species of *Amaranthus*. *Asian Pac J Trop Biomed.* 1(2): 133-138.
- 47) Greenwell, M. and Rahman, P.K.S.M. (2015). Medicinal plants: their use in anticancer treatment. *Int J Pharm Sci Res.* 6(10): 4103.
- 48) Griselda, H., Horacio, M.G. and Jorge, E. (2016). Argentinean's Plants with Interest in Ethnomedicine as Wormers. *Int. J. Pharmacol., Phytochem. Ethnomed.* 5: 1-17.
- 49) Grosvenor, P.W., Gothard, P.K., McWilliam, N.C., Supriono, A. and Gray, D.O. (1995). Medicinal plants from Riau Province, Sumatra, Indonesia. Part 1: Uses. *J. Ethnopharmacol.* 45(2): 75-95.
- 50) Haq, F., Ahmad, H. and Alam, M. (2011). Traditional uses of medicinal plants of Nandiar Khuwarr catchment (District Battagram), Pakistan. *J. Med. Plants Res.* 5(1): 39-48.
- 51) Hebbar, S.S., Harsha, V.H., Shripathi, V. and Hegde, G.R. (2004). Ethnomedicine of Dharwad district in Karnataka, India—plants used in oral health care. *J. Ethnopharmacol.* 94(2): 261-266.
- 52) Hegde, N.G. (2008), March. Promotion of underutilized crops for income generation and environmental sustainability. In International Symposium on Underutilized Plants for Food Security, Nutrition, Income and Sustainable Development. *Acta Hort.* No. 806. 2: 563-577.
- 53) Hewage, C.M., Bandara, K.A.N.P., Karunaratne, V., Bandara, B.M.R. and Wijesundara, D.S.A. (1997). Insecticidal activity of some medicinal plants of Sri Lanka. *J. Natl. Sci. Found. Sri Lanka.* 25(3): 141-150.
- 54) Hillocks, R.J. (1998). The potential benefits of weeds with reference to small holder agriculture in Africa. *Integrated pest Manage Rev.* 3(3): 155-167.
- 55) Hong, L., Guo, Z., Huang, K., Wei, S., Liu, B., Meng, S. and Long, C. (2015). Ethnobotanical study on medicinal plants used by Maonan people in China. *J Ethnobiol Ethnomed.* 11(1): 32.
- 56) Hundiwale Jogendra, C., Patil Avinash, V., Kulkarni Mohan, V., Patil, D.A. and Mali Ravindra, G. (2012). A current update on phytopharmacology of the genus *Alternanthera*. *J. Pharm. Res.* 5(4): 1924-1929.
- 57) Hundiwale, J.C., Patil, A.V., Kulkarni, M.V., Patil, D.A. and Mali, R.G. (2012). A current update on phytopharmacology of the genus *Alternanthera*. *J Pharm Res.* 5: 1924-1929.
- 58) Inderjit, Pergl, J., van Kleunen, M., Babu, C.R., Majumdar, S., Singh, P., Singh, S.P., Salamma, S., Rao, B.R.P. and Pyšek, P. (2017). Naturalized alien flora of the Indian states: biogeographic patterns, taxonomic structure and drivers of species richness. *Biol Invas.* 1-14. doi: <https://doi.org/10.1007/s10530-017-1622-y>.
- 59) Iranshahy, M., Javadi, B., Iranshahi, M., Jahanbakhsh, S.P., Mahyari, S., Hassani, F.V. and Karimi, G. (2017). A review of traditional uses, phytochemistry and pharmacology of *Portulaca oleracea* L. *J. Ethnopharmacol.* 205: 158-172.

- 60) Jagtap, S.D., Deokule, S.S., Pawar, P.K. and Harsulkar, A.M. (2009). Traditional ethnomedicinal knowledge confined to the Pawra tribe of Satpura Hills, Maharashtra, India. *Ethnobot Leaflets*. 13: 98-115.
- 61) Jain, A., Katewa, S.S., Galav, P.K. and Sharma, P. (2005). Medicinal plant diversity of Sitamata wildlife sanctuary, Rajasthan, India. *J. Ethnopharmacol.* 102(2): 143-157.
- 62) Jansen, O., Angenot, L., Tits, M., Nicolas, J.P., De Mol, P., Nikiéma, J.B. and Frederich, M. (2010). Evaluation of 13 selected medicinal plants from Burkina Faso for their antiplasmodial properties. *J. Ethnopharmacol.* 130(1): 143-150.
- 63) Jorim, R.Y., Korape, S., Legu, W., Koch, M., Barrows, L.R., Matainaho, T.K. and Rai, P.P. (2012). An ethnobotanical survey of medicinal plants used in the eastern highlands of Papua New Guinea. *J Ethnobiol Ethnomed.* 8(1): 47.
- 64) Kala, C.P. (2005). Ethnomedicinal botany of the Apatani in the Eastern Himalayan region of India. *J Ethnobiol Ethnomed.* 1(1): 11.
- 65) Kamatchi, A. and Parvathi, A.S. (2017). Ethnomedico and ethnoeconomic studies of grasses utilization by Paliyar's tribal in Sadhuragiri hills, a part of Western Ghats, Tamil Nadu, India. *World J. Pharm. Pharm. Sci.* 6(8): 2478-2491.
- 66) Karakaş, F.P., Yildirim, A. and Türker, A. (2012). Biological screening of various medicinal plant extracts for antibacterial and antitumor activities. *Turkish J. Biol.* 36(6): 641-652.
- 67) Katewa, S.S. and Galav, P.K. (2005). Traditional herbal medicines from Shekhawati region of Rajasthan. *Indian J. Tradit. Know.* 4(3): 237-245.
- 68) Kayode, J., Aleshinloye, L. and Ige, O.E. (2008). Ethnomedicinal use of plant species in Ijesa Land of Osun State, Nigeria. *Ethnobot leaflets*. 12: 164-170.
- 69) Kerner, W. and Brückel, J. (2014). Definition, classification and diagnosis of diabetes mellitus. *Exp Clin Endocrinol Diabetes.* 122(07): 384-386.
- 70) Khumukcham, N., Biswas, D., Singh, N.S. and Deb, L. (2016). *Prospects for Development of Biomedicines from the Medicinal Plants of Northeastern India*. In: Vijay Veer, Gopalakrishnan R. (eds) *Herbal Insecticides, Repellents and Biomedicines: Effectiveness and Commercialization*. Springer, New Delhi, pp. 147-187. doi: https://doi.org/10.1007/978-81-322-2704-5_9.
- 71) Khuroo, A.A., Reshi, Z.A., Malik, A.H., Weber, E., Rashid, I., Dar, G.H. (2012). Alien flora of India: taxonomic composition, invasion status and biogeographic affiliations. *Biol Invasions.* 14:99–113.
- 72) Klimas, N., Koneru, A.O.B. and Fletcher, M.A. (2008). Overview of HIV. *Psychosom. Med.* 70(5): 523-530.
- 73) Kokni, F.K., Solanki, H.A. and Patel, D.D. (2016). Study of ethnomedicinal plants and its documentation of Waghai forest, Gujarat. *Life Sci. Leafl.* 81: 11-30.
- 74) Kour, A. (2014). Plants exhibiting potential for cancer treatment. *Int. J. Pharm. Sci. Rev. Res.* 27(2): 23-53.
- 75) Krief, S., Hladik, C.M. and Haxaire, C. (2005). Ethnomedicinal and bioactive properties of plants ingested by wild chimpanzees in Uganda. *J. Ethnopharmacol.* 101(1): 1-15.
- 76) Kumar, A. and Prasad, S. (2014). Threats of invasive alien plant species. *Int. Res. J. Manag. Sci. Technol.* 4(2): 605-624.
- 77) Kumar, C.A.S., Varadharajan, R., Muthumani, P., Meera, R., Devi, P. and Kameswari, B. (2010). Psychopharmacological studies on the stem of *Saccharum spontaneum*. *Int. J. PharmTech Res.* 2(1): 319-321.
- 78) Kumar, N. (2014). Biological potential of a weed *Ageratum houstonianum* Mill: a review. *Indo Am. J. Pharm. Res.* 4(6): 2683-2689.
- 79) Kumar, R.S., Moorthy, K., Vinodhini, R. and Punitha, T. (2013). Antimicrobial efficacy and phytochemical analysis of *Indigofera trita* Linn. Afr. J. Tradit. Complement. Altern. Med. 10(3): 518-525.
- 80) Kumar, S. and Pandey, A.K. (2014). Pharmacological activities of some common Indian weeds: a review. *Mintage J. Pharm. Med. Sci.* 3: 12-17.
- 81) Kumar, S., Chashoo, G., Saxena, A.K. and Pandey, A.K. (2013). *Parthenium hysterophorus*: a probable source of anticancer, antioxidant and

- anti-HIV agents. *BioMed Res. Int.* 2013: 1-11, Article ID 810734, doi: 10.1155/2013/810734
- 82) Kumar, S., Singh, B.S. and Singh, R.B. (2017). Ethnomedicinal plants uses to cure different human diseases by rural and tribal peoples of Hathras district of Uttar Pradesh. *J Pharmacogn Phytochem.* 6(2): 346-348.
- 83) Kumar, S., Taneja, R. and Sharma, A. (2005). The genus *Turnera*: a review update. *Pharm. Biol.* 43(5): 383-391.
- 84) Lagnika, L., Djehoue, R., Yedomonhan, H. and Sanni, A. (2016). Ethnobotanical survey of medicinal plants used in malaria management in South Benin. *J. Med. Plants Res.* 10(41): 748-756.
- 85) Lans, C. (2007). Ethnomedicines used in Trinidad and Tobago for reproductive problems. *J. Ethnobiol. Ethnomed.* 3(1): 13.
- 86) Lans, C.A. (2006). Ethnomedicines used in Trinidad and Tobago for urinary problems and diabetes mellitus. *J. Ethnobiol. Ethnomed.* 2(1): 45.
- 87) Lata, H., Garg, V.K. and Gupta, R.K. (2008). Sequestration of nickel from aqueous solution onto activated carbon prepared from *Parthenium hysterophorus* L. *J. Hazard. Mater.* 157(2): 503-509.
- 88) Lewu, F. B. and Afolayan, A. J. (2009). Ethnomedicine in South Africa: the role of weedy species. *Afr. J. Biotechnol.* 8(6): 929-934.
- 89) Lim, T.K. (2012). *Leucaena leucocephala*. In: Edible medicinal and non-medicinal plants. Springer, Dordrecht, 754-762.
- 90) Lim, T.K. (2016). *Typha angustifolia*. In edible medicinal and non-medicinal plants. Springer, Cham, 103-113.
- 91) Lim, T.K. (2013). *Solanum americanum*. In: Edible medicinal and non-medicinal plants. Springer Science & Business Media B.V., Dordrecht, Netherland, 318-325.
- 92) Londhe, D.K., Neel, R.S. and Bhuktar, A.S. (2017). Ethno-medicinal uses of some species of genus *Ipomoea* L. from Maharashtra state. *Int. J. Appl. Res.* 3(10): 82-84.
- 93) Maartens, G., Celum, C. and Lewin, S.R. (2014). HIV infection: epidemiology, pathogenesis, treatment, and prevention. *Lancet.* 384(9939): 258-271.
- 94) Mahmood, A., Mahmood, A., Shaheen, H., Qureshi, R.A., Sangi, Y. and Gilani, S.A. (2011). Ethno medicinal survey of plants from district Bhimber Azad Jammu and Kashmir, Pakistan. *J. Med. Plants Res.* 5(11): 2348-2360.
- 95) Mahmood, N., Piacente, S., Burke, A., Khan, A. and Pizza, C. (1997). Constituents of *Cuscuta reflexa* are anti-HIV Agents. *Antiviral chemistry and chemotherapy.* 8(1): 70-74.
- 96) Majumdar, K. and Datta, B.K. (2007). A study on ethnomedicinal usage of plants among the folklore herbalists and Tripuri medical practitioners: Part-II. *Nat Prod Rad.* 6: 66-73.
- 97) Majumder, P., Priya, A. and Satya, V. (2011). Ethno-medicinal, phytochemical and pharmacological review of an amazing medicinal herb *Peperomia pellucida* (L.) HBK. *Res J Pharm Biol Sci.* 2(4): 358-364.
- 98) Makinde, S.C.O., Ojekale, A.B., Oshinaike, T.S. and Awusinu, T.S. (2015). An ethnomedical and ethnobotanical survey of plants herbal therapy used for obesity, asthma, diabetes and fertility by the Badagry people of Lagos state, Nigeria. *J. Med. Plants studies.* 3(5): 1-6.
- 99) Mandal, S. and Rath, J. (2015). Phytochemical and antioxidant activities of ethno-medicinal plants used by fisher folks of Chilika lagoon for indigenous phytotherapy. *J. Pharmacogn. Phytochem.* 3(5): 55-65.
- 100) Maroyi, A. (2012). Garden Plants in Zimbabwe: Their ethnomedicinal uses and reported toxicity. *Ethnobot Res & Appl.* 10: 045-057.
- 101) Maroyi, A. (2013). Traditional use of medicinal plants in south-central Zimbabwe: review and perspectives. *J. Ethnobiol. Ethnomed.* 9(1): 31.
- 102) Matu, E.N. and Van Staden, J. (2003). Antibacterial and anti-inflammatory activities of some plants used for medicinal purposes in Kenya. *J. Ethnopharmacol.* 87(1): 35-41.
- 103) Maurya, S.K., Kushwaha, A.K. and Seth, A. (2015). Ethnomedicinal review of Usnakantaka (*Echinops echinatus* Roxb.). *Pharmacogn. Rev.* 9(18): 149-154.

- 104) Meti, V. and Mishra, S. (2013). Pharmacological activities of *Spermocoe hispida* Linn: a review. *Int. J. Res. Ayurveda Pharm.* 4(1): 18-22.
- 105) Mishra, A. K., Mir, S. M., Sharma, M. P. and Singh, H. (2015). Alien plant species in Delhi flora. *Int. J. Geol. Earth Environ Sci.* 5(2): 129-140.
- 106) Mohamad, S., Zin, N.M., Wahab, H.A., Ibrahim, P., Sulaiman, S.F., Zahariluddin, A.S.M. and Noor, S.S.M. (2011). Antituberculosis potential of some ethnobotanically selected Malaysian plants. *J. Ethnopharmacol.* 133(3): 1021-1026.
- 107) Momin, R.K. and Kadam, V.B. (2011). Determination of ash values of some medicinal plants of genus *Sesbania* of Marathwada region in Maharashtra. *J. Phytol.* 3(12): 52-54.
- 108) Moshi, M.J., Otieno, D.F. and Weisheit, A. (2012). Ethnomedicine of the Kagera Region, north western Tanzania. Part 3: plants used in traditional medicine in Kikuku village, Muleba District. *J Ethnobiol Ethnomed.* 8(1): 14.
- 109) Movaliya, V. and Zaveri, M. (2014). A review on the Pashanbheda plant *Aerva javanica*. *Int J Pharma Sci Rev Res.* 25(2): 268-275.
- 110) Mugisha, K.M. and Origa, O.H. (2007). Medicinal plants used to induce labour during childbirth in western Uganda. *J. Ethnopharmacol.* 109(1): 1-9.
- 111) Muhammad, I.C. and Khan, M.A. (2008). An ethnomedicinal inventory of plants used for family planning and sex diseases in Samahni valley, Pakistan. *Indian J. Tradit. Know.* 7(2): 277-283.
- 112) Mulabagal, V., Alexander-Lindo, R.L., DeWitt, D.L. and Nair, M.G. (2011). Health-beneficial phenolic aldehyde in *Antigonon leptopus* tea. *Evid. Based Compliment. Alternat. Med.* 2011: Article ID 601249.
- 113) Muthu, C., Ayyanar, M., Raja, N. and Ignacimuthu, S. (2006). Medicinal plants used by traditional healers in Kancheepuram District of Tamil Nadu, India. *J Ethnobiol Ethnomed.* 2(1): 43.
- 114) Natrajan, P., Elumalai, A., Soundarajan, C. and Iyyampalayam, T. (2012). Study of Antibacterial activity of *Chloris barbata* (SW) Leaves. *Int. Res. J. Pharm. App. Sci.* 2(2): 37-40.
- 115) Navitha, A., Helen Sheeba, D.A., Ramesh, C. and Sartaj Banu, M. (2012). Hypoglycemic and anti-diabetic activity of ethanolic extract of *Catharanthus pusillus* (Murray) G. Don. *IOSR J Pharm.* 2(4): 17-21.
- 116) Neamsuvan, O. and Ruangrit, T. (2017). A survey of herbal weeds that are used to treat gastrointestinal disorders from southern Thailand: Krabi and Songkhla provinces. *J Ethnobiol Ethnomed.* 196: 84-93.
- 117) Negawo, A.T., Teshome, A., Kumar, A., Hanson, J. and Jones, C.S. (2017). Opportunities for Napier Grass (*Pennisetum purpureum*) Improvement Using Molecular Genetics. *Agronomy.* 7(2): 28.
- 118) Neogi, B., Prasad, M.N.V. and Rao, R.R. (1989). Ethnobotany of some weeds of Khasi and Garo hills, Meghalaya, Northeastern India. *Econ. Bot.* 43(4): 471-479.
- 119) Padal, S.B., Chandrasekhar, P. and Vijayakumar, Y. (2013). Ethnomedicinal uses of some Fabaceae family plants of Narsipatnam division, Visakhapatnam district, Andhra Pradesh, India. *Int. J. Innov. Res. Dev.* 2(6): 808-822.
- 120) Padal, S.B., Sandhya Sri, B., Buchi Raju, J. and Rama Krishna, B. (2013). Floristic diversity and indigenous uses of dominated weeds in maize crop of Chinthapalli mandal, Visakhapatnam district, Andhra Pradesh, India. *IOSR J Agric Vet Sci.* 2: 56-63.
- 121) Panda, A. and Misra, M.K. (2011). Ethnomedicinal survey of some wetland plants of South Orissa and their conservation. *Indian J Tradit Know.* 10(2): 296-303.
- 122) Panda, D., Pradhan, S., Palita, S.K. and Nayak, J.K. (2014). Medicinal weed diversity and ethno medicinal weeds used by tribal's of Koraput, India. *Ecol. Environ. Conserv.* 20: S35-S38.
- 123) Pappan, A. and Thomas, B. (2017). Contribution of invasive plants in herbal medicinal practices. *Int. J. Herb. Med.* 5(2): 73-77.
- 124) Pawar, A.V., Killedar, S.G. and Dhuri, V.G. (2017). *Opuntia*: Medicinal plant. *International Journal of Advance Research, Ideas and Innovations in Technology.* 3(2): 148-154.
- 125) Policepatel, S.S. and Manikrao, V.G. (2013). Ethnomedicinal plants used in the treatment of skin diseases in Hyderabad Karnataka region,

- Karnataka, India. Asian Pac J Trop Biomed. 3(11): 882-886.
- 126)Prabhu, K.S., Lobo, R., Shirwaikar, A.A. and Shirwaikar, A. (2009). *Ocimum gratissimum*: a review of its chemical, pharmacological and ethnomedicinal properties. The Open Compl Med J. 1: 1-15.
- 127)Prakash, O.M., Kumar, A. and Kumar, P. (2013). Anticancer potential of plants and natural products: a review. Am. J. Pharmacol. Sci. 1(6): 104-115.
- 128)Prashantkumar, P. and Vidyasagar, G.M. (2013). Traditional knowledge on medicinal plants used for the treatment of skin diseases in Bidar district, Karnataka. Indian J. Tradit. Know. 7(2): 273-276.
- 129)Priya, V.K.J., Gopalan, R. (2014). Ethnomedicinal studies in selected medicinal plants of Dhoni forest, Western Ghats, Kerela. Asian J Pharm Clin Res. 7(3): 3-6.
- 130)Priyanka, N. and Joshi, P.K. (2013). A review of *Lantana camara* studies in India. Internat. J. Sci. Res. Publ. 3(10): 1-11.
- 131)Pukumpuang, W., Chansakaow, S. and Tragoolpua, Y. (2014). Antioxidant activity, phenolic compound content and phytochemical constituents of *Eclipta prostrata* (Linn.) Linn. Chiang Mai J Sci. 41(3): 568-76.
- 132)Rahaman, C.H. and Karmakar, S. (2015). Ethnomedicine of Santal tribe living around Susunia hill of Bankura district, West Bengal, India: The quantitative approach. J. Appl. Pharm. Sci. 5(02): 127-136.
- 133)Rahman, A.H.M.M. (2013). An ethno-botanical investigation on Asteraceae family at Rajshahi, Bangladesh. Acad. J. Med. Plants. 1(5): 92-100.
- 134)Rahman, M.H. and Roy, B. (2014). Population Structure and Curative Uses of Invasive Plants in and around the Protected Forests of Bangladesh: a means of utilization of potential invasive species. Journal of Ecosystems. 2014, Article 249807 (pp 14).
- 135)Rahman, M.M., Khan, S.A., Hossain, G.M., Jakaria, M. and Rahim, M.A. (2016). *Acmella radicans* (Jacq.) RK Jansen (Asteraceae)-a new angiosperm record for Bangladesh. Jahangirnagar University J. Biol. Sci. 5(1): 87-93.
- 136)Rahmatullah, M., Kabir, A.A.B.T., Rahman, M.M., Hossan, M.S., Khatun, Z., Khatun, M.A. and Jahan, R. (2010). Ethnomedicinal practices among a minority group of Christians residing in Mirzapur village of Dinajpur District, Bangladesh. Adv. Nat. Appl. Sci. 4(1): 45-51.
- 137)Rajakumar, N. and Shivanna, M.B. (2009). Ethno-medicinal application of plants in the eastern region of Shimoga district, Karnataka, India. J. Ethnopharmacol. 126(1): 64-73.
- 138)Rajamanoharan, P.R. (2014). An ethno botanical survey of medicinal plants in Sillalai, Jaffna, Northern Province, Sri Lanka. Int J Herb Med. 1: 22-30.
- 139)Rajashekar, V., Rao, E.U. and Srinivas, P. (2012). Biological activities and medicinal properties of Gokhru (*Pedalium murex* L.). Asian Pac J Trop Biomed. 2(7): 581-585.
- 140)Rajput, A.P. and Rajput, T.A. (2011). Pharmacognostic and preliminary phytochemical of Investigation *Corchorus fascicularis* Lam. leaves. Int. J. Pharm. Pharm. Sci. 3: 365-366.
- 141)Rakotoarivelo, N.H., Rakotoarivony, F., Ramarosandratana, A.V., Jeannoda, V.H., Kuhlman, A.R., Randrianasolo, A. and Bussmann, R.W. (2015). Medicinal plants used to treat the most frequent diseases encountered in Ambalabe rural community, Eastern Madagascar. J Ethnobiol Ethnomed. 11(1): 68.
- 142)Ramyashree, M. and Ram, H.K. (2012). Ethnomedicinal value of *Opuntia elatior* fruits and its effects in mice. J. Pharm. Res. 5(8): 4554-4558.
- 143)Ranjalkar, K.M. (2015). Ethnomedicinal uses of some angiospermic plants of Marathwada. BioChemistry: An Indian Journal. 9(5): 174-175.
- 144)Ranjan, P. and Tripathi, K. (2015). *Antigonon leptopus*: a review. Eur J Pharm Med Res. 2(2): 473-483.
- 145)Rao, P.K., Hasan, S.S., Bhellum, B.L. and Manhas, R.K. (2015). Ethnomedicinal plants of Kathua district, J&K, India. J. Ethnopharmacol. 171: 12-27.
- 146)Rashmi, G., Jaya, P., Hardik, P., Bhumi, M. and Shivani, A. (2010). *Peristrophe bicalyculata*- a review. Phcog J. 2(14): 39-45.

- 147) Rastogi, J., Rawat, D.S. and Chandra, S. (2015). Diversity of invasive alien species in Pantnagar flora. *Trop. Plant Res.* 2(3): 282–287.
- 148) Ray, S., Sheikh, M. and Mishra, S. (2011). Ethnomedicinal plants used by tribals of East Nimar region, Madhya Pradesh. *Indian J. Tradit. Know.* 10(2): 367-371.
- 149) Reddy, C.S. (2008). Catalogue of invasive alien flora of India. *Life Sci J.* 5(2): 84-89.
- 150) Reddy, C.S., Bagyanarayana, G., Reddy, K.N. and Raju, V.S. (2008). Invasive Alien Flora of India. National Biological Information Infrastructure, Usgs, USA. doi: http://www.bsienviis.nic.in/Database/Invasive_Alien_species_15896.aspx#.
- 151) Reddy, N.M. (2013). *Lantana camara* Linn. chemical constituents and medicinal properties: a review. *Scholars Acad. J. Pharm.* 2(6): 445-448.
- 152) Rekha, D. (2013). Study of medicinal plants used from Koothanoallur and Marakkadai, Thiruvapur district of Tamil Nadu, India. *Hygeia J. D. Med.* 5(1): 164-170.
- 153) Rout, S.P., Kar, D.M. and Mandal, P.K. (2011). Hypoglycaemic activity of aerial parts of *Argemone mexicana* L. in experimental rat models. *Int J Pharm Pharm sci.* 3: 533-540.
- 154) Rub, R.A., Pati, M.J., Siddiqui, A.A., Moghe, A.S. and Shaikh, N.N. (2016). Characterization of anticancer principles of *Celosia argentea* (Amaranthaceae). *Pharmacogn. Res.* 8(2): 97.
- 155) Saha, D. (2013). *Calotropis gigantea*: Rare traditional medicinal plants in Bangladesh having high potential ethnomedicinal value. *Unique J. Ayurvedic Herb. Med.* 1(1): 1-2.
- 156) Sahu, T.R. (1984). Less known uses of weeds as medicinal plants. *Anc Sci Life.* 3(4): 245-249.
- 157) Satapathy, K.B., Sahu, B.B. and Jena, G.S. (2012). Crop weeds diversity and their ethnomedicinal uses in the treatment of common ailments in Jajpur district of Odisha (India). *Int. J. Med. Arom. Plants.* 2(1): 80-89.
- 158) Sathi, S., Kalyan, M.S. and Habibur Rahman, C. (2015). Anato-pharmacognostic studies of *Mikania micrantha* Kunth: a promising medicinal climber of the family of Asteraceae. *Int J Res Ayurveda Pharm.* 6(6): 773-779.
- 159) Sathiyaraj, R., Sarvalingam, A.A. and Arulbalachandran, R.R. (2015). Diversity of ethnomedicinal plants in Bodamalai Hills Eastern Ghats, Namakkal District, Tamil Nadu. *J Plant Sci.* 3(2): 77-84.
- 160) Savithamma, N., Yugandhar, P. and Suhrulatha, D. (2015). Traditional medicinal plants used by local people of Kailasakona- A sacred grove of Chittoor District, Andhra Pradesh, India. *Int. J. Pharm. Pharm. Sci.* 7(3): 407-411.
- 161) Schmid, M.P. (2001). Fringed spider flower: (*Cleome rutidosperma*). Agnote-Northern Territory of Australia, (799). <https://www.cabi.org/isc/datasheet/14044>.
- 162) Sekar, K.C., Manikandan, R. and Srivastava, S.K. (2012). Invasive alien plants of Uttarakhand Himalaya. *Proc. Natl. Acad. Sci., India, Sect. B: Biol. Sci.* 82(3): 375-383.
- 163) Selvam, N.T. and Acharya, M.V. (2015). Review of *Ipomoea pes-tigridis* L.: traditional uses, botanical characteristics, chemistry and biological activities. *Int. J. Pharm. Sci. Res.* 6: 1443-1448.
- 164) Semenya, S., Potgieter, M., Tshisikhawe, M., Shava, S. and Maroyi, A. (2012). Medicinal utilization of exotic plants by Bapedi traditional healers to treat human ailments in Limpopo province, South Africa. *J. Ethnopharmacol.* 144(3): 646-655.
- 165) Sen, S. (2016). Pharmacognostic and anti-hyperglycemic evaluation of *Lantana camara* (L.) var. aculeate leaves in alloxan-induced hyperglycemic rats. *Int. J. Res. Pharm. Sci.* 1(3): 247-252.
- 166) Senthilkumar, M., Gurumoorthi, P. and Janardhanan, K. (2006). Some medicinal plants used by Irular, tribal people of Marudhamalai hills, Coimbatore, Tamil Nadu. *Nat. Prod. Rad.* 5(5): 382-388.
- 167) Shah, A., Marwat, S.K., Gohar, F., Khan, A., Bhatti, K.H., Amin, M., Din, N.U., Ahmad, M. and Zafar, M. (2013). Ethnobotanical study of medicinal plants of semi-tribal area of Makerwal & Gulla Khel (lying between Khyber Pakhtunkhwa and Punjab Provinces), Pakistan. *Am J Plant Sci.* 4(1): 98-116.
- 168) Shanthamma, C. and MS Sudarshana, R. (1986). *Flaveria trinervia* (sprengel) C. Mohr

- (compositae) a new herb to cure jaundice. *Anc Sci Life*. 6(2): 109-111.
- 169) Sharaibi, O.J. and Osuntogun, O.S. (2017). Ethnomedicinal information and phytochemical screening of medicinal plants used in the treatment of diarrhea in Lagos State, Nigeria. *European J Med Plants*. 19(4): 1-7.
- 170) Shil, S., Choudhury, M.D. and Das, S. (2014). Indigenous knowledge of medicinal plants used by the Reang tribe of Tripura state of India. *J. Ethnopharmacol*. 152(1): 135-141.
- 171) Shindo, K., Saito, E., Sekiya, M., Matsui, T. and Koike, Y. (2008). Antioxidative activity of the flower of *Torenia fournieri*. *J. Nat. Med.* 62(2): 247-248.
- 172) Shrivastava, C. and Jain, A. (2014). Phenological events and medicinal importance of some weeds of family Asteraceae. *Indian J. Applied & Pure Bio.* 29(2): 277-282.
- 173) Shukla, A.N., Srivastava, S. and Rawat, A.K.S. (2010). An ethnobotanical study of medicinal plants of Rewa district, Madhya Pradesh. *Indian J Tradit Knowle.* 9(1): 191-202.
- 174) Silva, T.C.D.L., Veras Filho, J., Souza, I.A., Albuquerque, U.P.D., de Araújo, E.C. and de Amorim, E.L.C. (2012). Acute toxicity study of stone-breaker (*Phyllanthus tenellus* Roxb.). *Rev. Ciênc. Farm. Básica Apl.* 33(2): 205-210.
- 175) Singh, N.P., Gajurel, P.R. and Rethy, P. (2015). Ethnomedicinal value of traditional food plants used by the Zeliang tribe of Nagaland. *Indian J Tradit Knowle.* 14(2): 298-305.
- 176) Sourabie, K.Y.N.J., Kinda, D., Yaro, B. and Nikiema, J.B. (2013). Ethnobotanical survey of medicinal plants used by the traditional medical healers in the villages of Bérégadougou and Fabédougou (Cascades Region, Burkina Faso). *IOSR J Pharm.* 3(7): 38-45.
- 177) Stepp, J.R., (2004). The role of weeds as sources of pharmaceuticals. *J. Ethnopharmacol.* 92(2): 163-166.
- 178) Suksamrarn, A., Chotipong, A., Suavansri, T., Boongird, S., Timsuksai, P., Vimuttipong, S. and Chuaynugul, A. (2004). Antimycobacterial activity and cytotoxicity of flavonoids from the flowers of *Chromolaena odorata*. *Arch Pharm Res.* 27(5): 507-511.
- 179) Sundararajan, R. and Koduru, R. (2014). *Asclepias curassavica*: a review of ethnomedical, phytochemical and pharmacological information. *Indo Am. J. Pharm. Res.* 4(04): 1739-1755.
- 180) Sundararajan, R., Haja, N.A., Venkatesan, K., Mukherjee, K., Saha, B.P., Bandyopadhyay, A. and Mukherjee, P.K. (2006). *Cytisus scoparius* Link-A natural antioxidant. *BMC Complement. Aaltern. Med.* 6(1): 1-7.
- 181) Suthari, S., Sreeramulu, N., Omkar, K. and Raju, V.S. (2014). The climbing plants of northern Telangana in India and their ethnomedicinal and economic uses. *Indian J Plant Sci.* 3(1): 86-100.
- 182) Tabuti, J.R., Kukunda, C.B. and Waako, P.J. (2010). Medicinal plants used by traditional medicine practitioners in the treatment of tuberculosis and related ailments in Uganda. *J. Ethnopharmacol.* 127(1): 130-136.
- 183) Talukdar, T. and Talukdar, D. (2013). Ethnomedicinal uses of plants by tribal communities in Hili block of Dakshin Dinajpur district, West Bengal. *Indian J. Nat. Prod. Resour.* 4(1): 110-118.
- 184) Tang, Y., Xin, H.L. and Guo, M.L. (2016). Review on research of the phytochemistry and pharmacological activities of *Celosia argentea*. *Revista Brasileira de Farmacognosia.* 26(6): 787-796.
- 185) Tang, Y., Xin, H.L. and Guo, M.L. 2016. Review on research of the phytochemistry and pharmacological activities of *Celosia argentea*. *Rev. Bras. Farmacogn.* 26(6): 787-796.
- 186) Tewtrakul, S., Subhadhirasakul, S., Cheenpracha, S. and Karalai, C., 2007. HIV-1 protease and HIV-1 integrase inhibitory substances from *Eclipta prostrata*. *Phytother Res.* 21(11): 1092-1095.
- 187) Thomas, B., Rajendran, A., Chandrashekara, U.M. and Sivalingam, R. (2012). Ethnomedicinal plant knowledge of tribe Muthuvas of Mannavan Shola Forest of Southern Western Ghats, Kerala, India. *Bot. Report.* 1(1): 5-9.
- 188) Tolossa, K., Debela, E., Athanasiadou, S., Tolera, A., Ganga, G. and Houdijk, J.G. (2013). Ethnomedicinal study of plants used for treatment of human and livestock ailments by traditional healers in South Omo, Southern Ethiopia. *J Ethnobiol Ethnomed.* 9(1): 32.

- 189) Tugume, P., Kakudidi, E.K., Buyinza, M., Namaalwa, J., Kamatenesi, M., Mucunguzi, P. and Kalema, J. (2016). Ethnobotanical survey of medicinal plant species used by communities around Mabira Central Forest Reserve, Uganda. *J Ethnobiol Ethnomed.* 12(1): 5.
- 190) Uddin, M.K., Juraimi, A.S., Hossain, M.S., Nahar, M.A.U., Ali, M.E. and Rahman, M.M., (2014). Purslane weed (*Portulaca oleracea*): a prospective plant source of nutrition, omega-3 fatty acid, and antioxidant attributes. *Sci. World J.* 2014, Article ID 951019, 6 pages. doi: <http://dx.doi.org/10.1155/2014/951019>.
- 191) Upadhyay, R. (2014). Ethnomedicinal, pharmaceutical and pesticidal uses of *Calotropis procera* (Aiton) (Family: Asclepiadaceae). *Int. J. Green Pharm.* 8(3): 135-146.
- 192) Vaidyanathan, D., Senthilkumar, M.S. and Basha, M.G. (2013). Studies on ethnomedicinal plants used by Malayali tribals in Kolli hills of Eastern ghats, Tamil Nadu, India. *Asian J. Plant Sci. Res.* 3(6): 29-45.
- 193) Vannini, F., Kashfi, K. and Nath, N. (2015). The dual role of iNOS in cancer. *Redox Biol.* 6: 334-343.
- 194) Varghese, G.K., Bose, L.V. and Habtemariam, S. (2013). Antidiabetic components of *Cassia alata* leaves: identification through α -glucosidase inhibition studies. *Pharm Biol.* 51(3): 345-349.
- 195) Velasco, G., Hernández-Tiedra, S., Dávila, D. and Lorente, M. (2016). The use of cannabinoids as anticancer agents. *Prog Neuropsychopharmacol Biol Psychiatry.* 64: 259-266.
- 196) Velasco, G., Sánchez, C. and Guzmán, M. (2016). Anticancer mechanisms of cannabinoids. *Curr. Oncol.* 23(2): S23-S32.
- 197) Venkatachalapathi, A., Sangeeth, T., Ali, M.A., Tamilselvi, S.S. and Paulsamy, S. (2016). Ethnomedicinal assessment of Irula tribes of Walayar valley of Southern Western Ghats, India. *Saudi J. Biol. Sci.* doi: <http://dx.doi.org/10.1016/j.sjbs.2016.10.011>.
- 198) Vijayashalini, P., Anjanadevi, N., Abirami, P. and Sharmila, M. (2017). Ethnomedicinal plants survey in Elanji Hill village Sathyamangalam range of reserve forest, Western Ghats Tamil Nadu India. *International Journal of Biology Research.* 2(1): 22-26.
- 199) Wagh, V.V. and Jain, A.K. (2015). Invasive alien flora of Jhabua district, Madhya Pradesh, India. *Int. J. Biodivers. Conserv.* 7(4): 227-237.
- 200) Wu, C.H., Hsieh, H.T., Lin, J.A. and Yen, G.C. (2013). *Alternanthera paronychioides* protects pancreatic β -cells from glucotoxicity by its antioxidant, antiapoptotic and insulin secretagogue actions. *Food Chem.* 139(1): 362-370.
- 201) Zongo, F., Ribouot, C., Boumendjel, A. and Guissou, I. (2013). Botany, traditional uses, phytochemistry and pharmacology of *Waltheria indica* L. (syn. *Waltheria americana*): a review. *J. Ethnopharmacol.* 148(1): 14-26.
- 202) <https://www.motherearthliving.com/In-the-Garden/embracing-invasive-plants-ze0z1011zdeb>. accessed 4 April-2018.
- 203) <http://www.simonandschuster.com/books/Invasive-Plant-Medicine/Timothy-Lee-Scott/9781594773051>. accessed 11 March-2018.
- 204) <http://www.theplantlist.org>. accessed 25 August-17.