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Determination of anti-inflammatory and phytochemical properties in medicinal plants (*Quisqualis indica* L.) Rangoon Creeper

Rajeev Ranjan Baitha, Aleya Siddiquee, Motilal Srivastava and *Md. Sarfaraz Ahmad

University Department of Botany, Jai Prakash University, Chapra - 841301 (India)
Corresponding author: *mdsarfarazahmad786@gmail.com

Abstract

Inflammation is reactive by pathogens, toxic chemical and mechanical agents, and autoimmune responses, inflammation is the composite process throughout which the body repairs tissue damage and defends itself against harmful agents. Skin is the external surface which comes on contact with the environment and protecting the human body from unfavorable external causes. The use of medicinal and therapeutic plants in treatment of inflammatory diseases shows the results plant are good source of the potent bioactive compounds like alkaloids, flavonoids and glycosides etc. There are various different types of climbers and twiners plants which grown in the nature and they are good sources of the medicinal properties. The proposed study is based on the studies of different types of climber and twiner plants grown in particular area which is West Champaran, Information was collected with questionnaires with the local people of different place like; Bettiah, Nautanwa, Ram Nagar, Balmiki-nagar *etc*. belonging to district of West Champaran proposed research site used by the local people to treat different types of inflammatory disease. The study focused on determining the quantitative phytochemical profile of medicinal plant like *Quisqualis indica* L. and the role of anti-inflammatory diseases on this medicinal plant. The extracts from plants were obtained by Soxhlet extraction method and the phytochemicals were identified by standard protocol The result of biological activity analysis demonstrates that the extracts are capable of carrying out the reasonable activity. The HPLC (High Performance Liquid Chromatography) analysis showed the presence of bioactive compound quercitin (flavonoid) in the extracts, which depict that the extracts may possess a good anti-inflammatory property too.

Key words : Flavonoids, HPLC, Inflammation, Rangoon Creeper.

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*Professor and Head

A plant or plant part contains a therapeutic substance to cure the disease called medicinal plants, Plants have been used as a medicinal persistence long be the fore early period time. Egyptian papyrus, Ancient Unani writings, and Chinese manuscripts described the uses of the herbs. Indian Vaids, European, Mediterranean cultures, and Unani Hakims, already used plant sources for more than 3500 years as medicines[15].

Primitive cultures namely America, Africa, Egypt, Iran, and Rome, were used plants sources in their healing rituals. Although Ayurveda, Chinese medicine, and Unani were developed in traditional medicine, in which herbal remedies were as used thoroughly. The traditional systems of medicine remain continue to be commonly adopted on many ways, population increase, excessive cost of treatments, insufficient source of medicines, a side effect of numerous medicine and development of drugs and remedies for the infectious diseases have augmented on the uses for herbs and some plant material as a way of development of drugs a wide variety of amendments[15].

Inflammation disease is the process that caused in burns, mechanical gradients microbial or fungal infection, and some other toxic stimuli that may be put the rise to the well-being of the hosts. It is a very common problem the people, it is forming a part of the complex biological response of our vascular tissues to harmful stimuli such as pathogens, damaged cells, and irritants. This process comprises enhanced the vascular permeability, changes in flood flow, migration of leucocytes with the synthesis of reactive oxidative burst, destruction of tissues via activation-synthesis thesis of local inflammatory mediator like, leukotrienes, prostaglandins (PGs), and platelet-activating factors induced by cyclooxygenases (COCoxs and phospholipase A2, and lipoxygenases. Burns, Chemical intents, Toxins, Infection by pathogens, Physical injury, Immune reactions due to hypersensitivity, ionizing radiation and foreign bodies like direst in debris are the main causes of inflammation[2]. Inflammation divided on two different group, acute and chronic. Medicinal plants have got curative properties due to presence of various complex chemical substances of different compositions, which are found as primary metabolites and secondary metabolites in different parts of plants. Plant metabolites as per their chemical composition are grouped as carbohydrate, protein essential oils, alkaloids, glycosides and terpins etc.[11]. The present study focused on determining the quantitative phytochemical profile of three medicinal plants like *Quisqualis indica* L. The extracts from these selected plants were obtained by Soxhlet extraction method and the phytochemicals were identified by standard protocol[16]. The extracts were undertaken the GC-MS (Gas Chromatography Mass Spectrometry), analysis in order to obtain a better profile of the chemical compounds present in them. The study revealed that all these three are rich in many potent bioactive compounds like phenols, flavonoids and alkaloids[9], (Tables 2,3&4).

Nature of plant sample and its chemistry:

Rangoon creeper or red jasmine is woody climbing yellow-green or green liana spear shaped leaves, and stems have the fine yellow color and hair like structure and sometimes forms the branches. This flower

Fig. 1. Plant of Rangoon Creeper

color change according when is getting mature, white color at the time of blooming and gradually pink and finally it reaches to the red color when it completely matured. This appealing plant entices the pollinators such as, butterflies, hawk, bees, moths, birds, etc.[13]. Other names of the plant include Quiscual (in Spanish), Niyogniyogan (in Filipino), Madhu Malti or Madhumalti (in Hindi), Madhuvi lota and Modhumonjori (in Bengali) named by Rabindranath Tagore, Malati (in Assamese), Madhumaloti (Manipuri) and Radha Manoharam (in Telegu)[5]. It is a tropical flowering vine or vigorous climber up to 2.5 meters to up to 8 meters, found in thickets or secondary forests of the Philippines, India, and Malaysia. It is found in many other parts of the world either as a cultivated ornamental or run wild. It occurs in shrub forty two and tree savanna, forest margins, along stream banks, also in distributed habitats, including roadsides, waste places, rice fields and railway tracks, from sea level up to 1800 m altitude. It prefers full sun, but light shade is tolerated. Once established, it is fairly drought tolerant, salt tolerant and tolerant of temporary flooding. This plant is not cold tolerant, but well-established plants can survive an occasional frost period to about -80^{o}C. It grows on a wide range of soils, but preferably on well-drained and sandy with silt added soils. It prefers a fertile humus-rich soil and regular fertilization is needed for optimal flowering. It can be found flowering throughout the year, if the temperature remains high enough and enough water is available. The growing seasons of this flower is March to April, it needs to provide the support, it will grow really fast and spread as well. The aqueous in nature and the biomolecules of the leaves support the significant role.

In tropical Asia *Combretum indicum* (L.) De Filippos is considered as an important medicinal plant. This plant lights off in traditional medicines over long period of time due to the presence of various secondary phytochemicals. Decoctions of roots, seeds and fruits used as anthelmintic, fruit decoction for gargling, leaves to relieve pain caused by fever and flowers are used to relieve headache. The roots are used to treat rheumatism. The seeds from the pods are useful for treating roundworm and pinworm. It is toxic to the parasite and kills it in the digestive tract. This plant mostly used against pyrexia, staphylococcal and helminth infection is also known to possess anti-diarrheal, anti-inflammatory, antiseptic and immunomodulatory activities.

Phytochemicals :

This plant has Quisqualis acid which shows marked anthelmintic activities. The flower extract showed significant and dose dependent activity in acute and chronic anti-inflammation[12]. The plant is mostly used against anti-inflammatory, antiseptic and immunomodulatory. The nature of leaves extract is aqueous. Biomolecules present in the leaf play a significant role as reducing agent as well as capping agent in the formation of RC-SNPs (silver nanoparticles, Rangoon creeper)[10].

Chemicals used :

The present study was carried out using chemicals purchased from Hi-Media, India. The chemicals and reagents used were of analytical grade. Plant material collection and their identification, the plants sample *Quisqualis indica* (Fig. 1) were collected from different areas of West Champaran district, Bihar (India). The samples were first processed by washing them thoroughly under running tap water and then dried in shade for 7 days at room temperature. After complete removal of moisture from plants, they were ground to powder using electric grinder and stored in air tight pouches for further analysis.

Extract preparation :

The powdered plant samples of *Quisqualis indica* were extracted separately with methanol and toluene using Soxhlet apparatus 80°C 3-cycles for 12 h. 10 g. plant materials were dissolved in 100 ml of solvent and extracted successively with toluene and methanol. The plant extracts were dried completely and then redissolved in respective solvents (10 mg extract in 10 ml of solvent). The extract was then used for preliminary phytochemical screening, antibacterial, antifungal and antioxidant analysis. Qualitative analysis of phytochemicals, uv-visible spectrum of the plant extracts, antioxidant activity (DPPH (2,2-diphenyl1-1-picryl-hydrazyl radical) free radical scavenging) of the plant extract, HPLC analysis was done.

Research site :

The proposed area named district West Champaran is located at North-West region of Bihar near Nepal and lies in between 26.16 to 27.31 North latitude. This place is bounded on north by hilly region of Nepal, south by Gopalganj and part of East Champaran, east by a part of East Champaran and West by Padrauna and Deoria districts of U.P. Total geographical area of this district is 4843.51 sq. km comprising 18 Blocks. Major crops of this district are paddy, potato, wheat, barley and

athar. Pre-monsoon water depth level is 1.48-5.16 m bgl while post-monsoon water depth level is 1.22-3.97 m of this district. The identification was done on the basis of literature and authentic specimen available in the herbarium center.

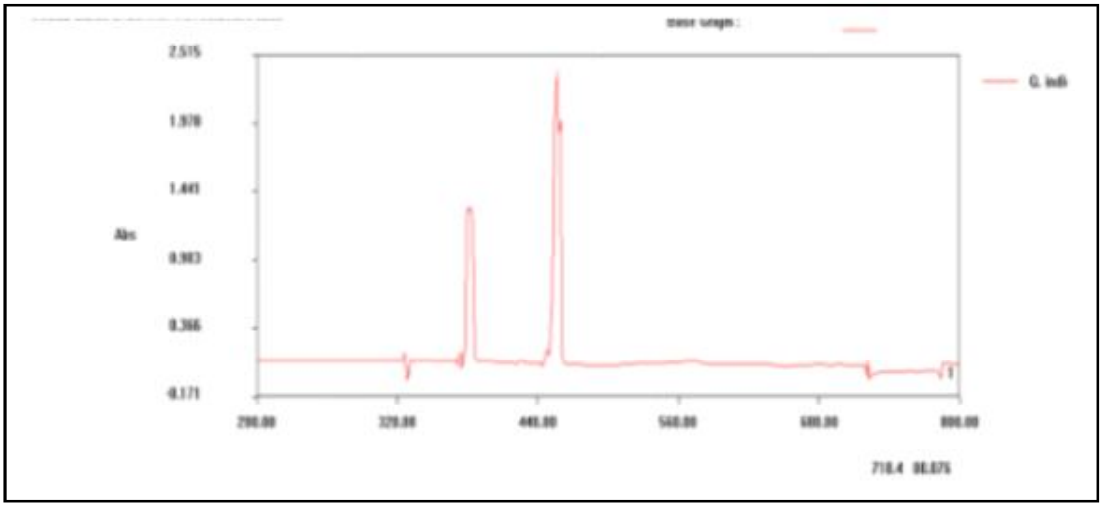
Phytochemical analysis :

The collected plant extract was undertaken for the analysis of their phyto-chemical compound. The phytochemical tests were carried out the finding the secondary metabolites or anti-nutritional properties, such as flavonoids, alkaloids, phenol, and glycosides. The test was done with both the solvents[17]. The test result shows the presence of all the bioactive compounds was present in this plant. The result obtained by the phytochemical analysis of the plant is summarized in table-2 given below.

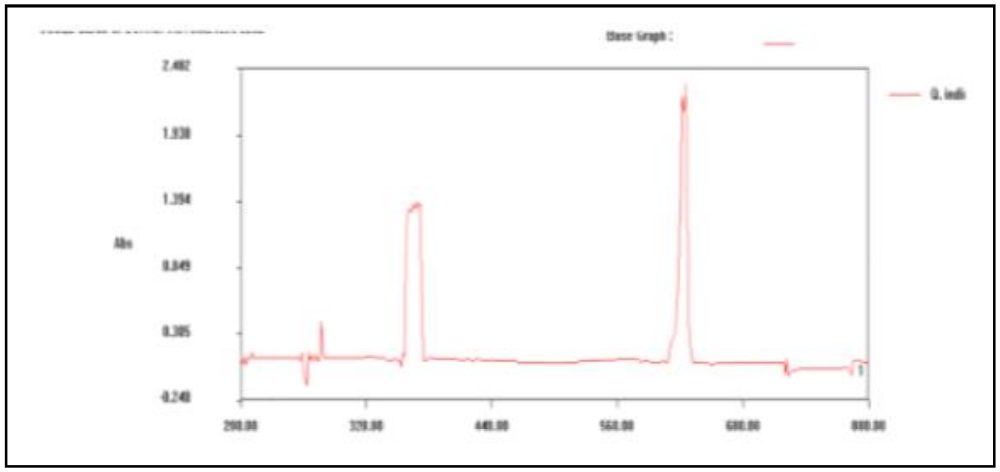
UV- visible spectrum :

The UV-Visible spectra for the plant extracts were taken by using a UV-Visible double beam spectrophotometer. The prepared sample was placed in the cuvette against the blank containing the solvent of plant which is toluene and methanol. The spectra were measured using the UV-Visible double beam spectrophotometer software of the instrument. The obtained result was revealed the dominating presence of phenols and flavonoids in the extract as the peak were prominent in the range of 300-400 nm as shown in the figure (Graph-1&2) of *Q. indica.*

The antioxidant activity of the plant was obtained with DPPH (2,2-diphenyl-1-picrylhydrazyl) radical scavenging activity. The plant sample was taken in concentrations and determine for the test. The decrease in the absorbance at 517 nm was taken as the antioxidant capacity of the sample. 150ul of DPPH solution was mixed in 3ml methanol and absorbance was taken immediately at 517nm for control reading. Methanol was used as blank. The antioxidant activity was



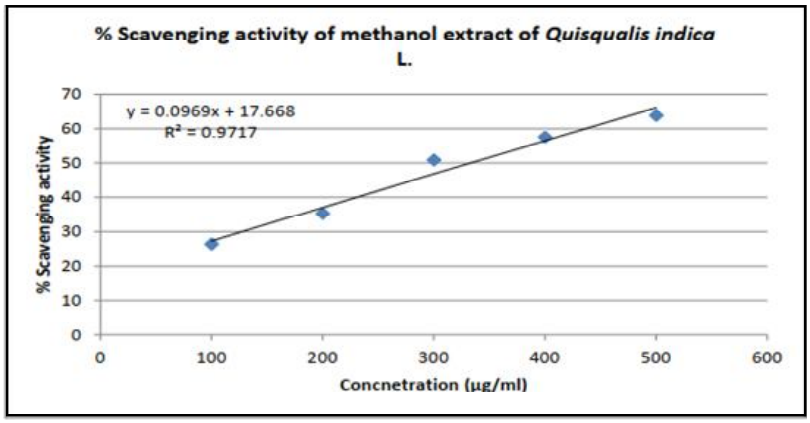
Graph. 1. Result of UV-Visible spectra for *Quisqualis indica* L. (Methanol extract)



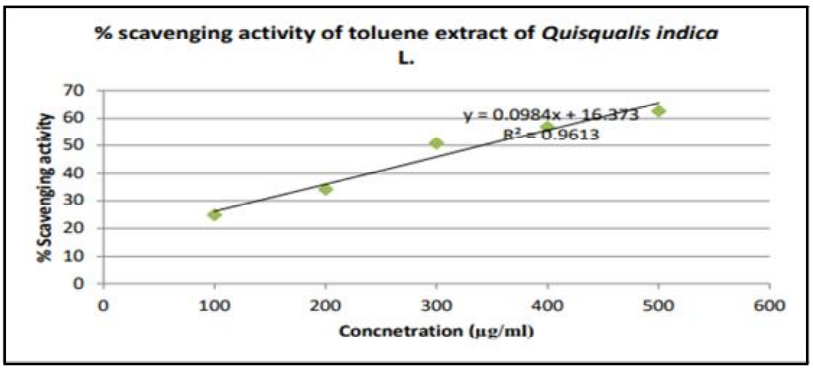
Graph. 2 Result of UV-Visible spectra for *Quisqualis indica* L. (Toluene extract)

calculated in the form of % scavenging activity using the formula and a graph was plotted from it; Percent (%) inhibition or scavenging = [(absorbance of control-absorbance of test sample)/absorbance of control]x100[4].

The results revealed that the plants sample having a good level of antioxidants present in a concentration dependent manner. The IC_{50} value for plant extract antioxidant was calculated and the least value was found with the methanolic extract of *Q. indica* L. indicating the best antioxidant property in compare to other. The value for IC_{50} for each extract was calculated from the graph placing the value of y=50 and calculating for the value of x. The value of % scavenging activity for plant extract at every concentration and the IC_{50} value for extract is depicted in the graphs 3&4 below :



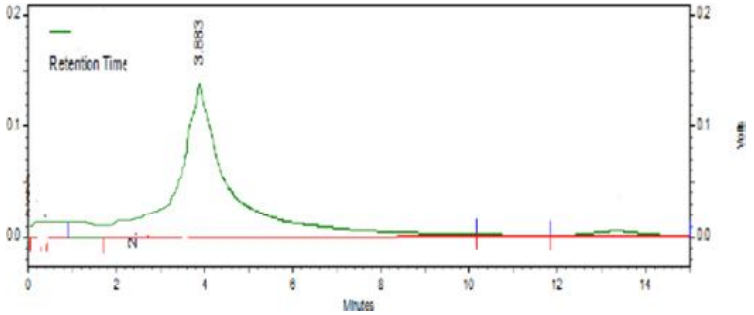
Graph. 3. Calibration graph for estimation of % scavenging activity of methanolic extract of *Quisqualis indica* L.



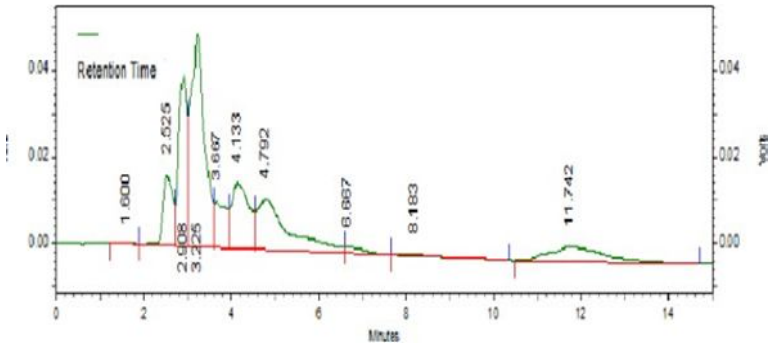
Graph 4: Calibration graph for estimation of % scavenging activity of toluene extract *Quisqualis indica* L.

Detection of Phytochemicals by HPLC :

The plant extracts were determined in the presence of bioactive compound by HPLC (Graphs 5&6). The analysis of bioactive compound (flavonoid) was measured. The presence of quercitin in extracts were confirmed by HPLC analysis of quercetin standard. The retention time and peak position of quercitin standard and sample extracts overlap indicating the active presence of quercitin in the plant extracts[1].



Graph. 5 HPLC chromatogram of standard quercetin



Graph. 6 HPLC chromatogram of methanolic extracts of *Antigonon leptopus*

Table-1. List of plants under consideration for survey:

S. No.	Botanical name	Common Name	Class	Family	Habit of plants	Parts used
1	*Abrus precatorius* L.	Ratti and Gunchi	Dicot	Fabaceae	Perennial high-climbing, twining, or trailing woody vine	Tha action of the seeds are Opthalmintic (eye inflammation).
2	*Albizzia lebbeck* (L.) Benth.	Siris Tree and Woman's Tongue	Dicot	Mimosaceae	Perennial, climber legume tree	The leaves and seeds are used in the treatment of inflammation in eye such as ophthalmia.
3	*Atylosia scarabaeoides* (L.) Benth.	Pigeonpea	Dicot	Fabaceae	Annual to perennial vine, climber or trailer	The paste of seeds is used in cutaneous affections.
4	*Argyreia nervosa* (Burm. F.) Boj.	Elephant Creeper, silky elephant glory	Dicot	Convulvulaceae	Perennial robust twiner	The pastes of leaves are applied on sore as poultice.
5	*Antigonon leptopus* Hook and Arn.	Coral vine	Dicot	Polygonaceae	Annual beautiful climber	Infusions of dried leaves are used in jaundice.
6	*Aristolochia littoralis* Parodi.	Calico Flower	Dicot	Aristolochiaceae	Perennial, twiner	Paste of leaves are used in pulmonary inflammation.
7	*Asparagus racemosus* Willd.	Satawari	Monocot	Asparagaceae	Perennial straggling vine climber	Root paste is applied externally in wound and inflammation.
8	*Basella alba* L.	Malabar spinach	Dicot	Basellaceae	Perennial twiner	The paste of seeds are used in diabetes.
9	*Benincasa hispida* (Thunb.) Cogn.	Bhatua, Petha;	Dicot	Cucurbitaceae	Annual, climber and trailing herb	The pulps are laxative (to reduce bowel inflammation).
10	*Bignonia unguis-cati* L.	Cat's claw creeper	Dicot	Bignoniaceae	Perennial much-branched climber,	Plants to treat snakebite, dysentery, inflammation and rheumatism.
11	*Boerhaavia diffusa* L.	Punanrnava or Santhi	Dicot	Nyctaginaceae	Annual, decumbent herb, creeper and twinner	Decoctions of roots are given in kidney inflammation and blood sugar.

12	*Bryonia palmata* (L.)	Mala, Shivlingani, Bon kakra	Dicot	Cucurbi-taceae	Annual climber, Stem more or less scabrous	Laxative to relieve constipation and as an emetic.
13	*Cayratia trifolia* L.	Gidardrak and Amalbel	Dicot	Vitaceae	Perennial, Glabrous tendril climbers	Whole plant is used as diuretic. Leaf, root and seeds are used as poultice to ulcers (intestinal inflm).
14	*Clematis dioscoreifolia* Levl. and Vaniot.	Sweet autumn clematis	Dicot	Ranuncul-aceae	Perennial, climbing shrub	The paste of leaves are applied externally in joint pains.
15	*Clematis roylei* Rehder.	Royal's Clematis	Dicot	Ranuncul-aceae.	Perennial climber vine	Aerial part is used for cold and skin inflammation.
16	*Clematis vitalba* L.	Old man's beard	Dicot	Ranuncul-aceae	Perennial, climbing shrub like woody vine	The paste of leaves is applied externally in rheumatic pains.
17	*Centella asiatica* (L.) Urban.	Gotukola or Thankuni	Dicot	Apiaceae	Perennial creeper	Leaves used for spinal injury, neuromuscular disorders and to increase brain function, memory.
18	*Cocculus hirsutus* (L.) Diels.	Broom creeper, ink berry	Dicot	Menisper-maceae	Annual twiner	Leaf juice is used externally in eczema (skin inflammation).
19	*Cryptolepis buchanani* Roem & Schult.	Indian Sarsaparilla (black var.)	Dicot	Asclepia-daceae	Perennial, wax leaved climber	Root is demulcent, alterative tonic and useful in loss of appetite, fever, skin disease etc.
20	*Cardiospermum halicacabum* L.	Kanphuta, kapalphodi	Dicot	Sapind-aceae	Annual climber	Decoction of fruits and roots are given in high blood sugar.
21	*Cuscuta reflexa* Roxb.	Amar Bel	Dicot	Cuscut-aceae	Annual to perennial, parasitic twiner	The plants are hepatic and laxative in action and its paste are used in urinary complaints, kidney and spleen and liver diseases.
22	*Cissus japonica* (Thunb.) Gagnep.	Bush killer	Dicot	Vitaceae	Annual to perennial, climber	Decoction of roots are applied externally in joint pains.
23	*Cissus quadrangularis* L.	Asthibhanga, Harajora	Dicot	Vitaceae	Perennial tendriled climber	All parts used in obesity, diabetes, metabolic syndrome

24	*Cissampelos pareira hirsuta* (Buch.Ham.ex DC.)Forman.	Pardhi, Akanadi	Dicot	Menisper-maceae	Perennial twining shrub	Leaves used in patha are used in the treatment of chronic non-healing ulcers and sinuses.
25	*Clitorea ternatea* Dalz.	Butterfly pea	Dicot	Fabaceae	Perennial twiner	The paste of seeds is diuratic and promotes urination in the patients suffering from kidney problems.
26	*Colocynthis citrullus* L.	Tarbooz	Dicot	Cucurbi-taceae	Climbing or trailing herb	Pulp of pepo are laxative. Seeds are emetic.
27	*Coccinia indica* Wt.and Arn.	Ivy gourd, gentleman's toes	Dicot	Cucurbi-taceae	Perennial slender climber	Traditional medicine for the treatment of leprosy, jaundice, asthma, bronchitis, skin eruptions, tongue sores, indigestion, eye infections, insect bites etc.
28	*Coccinia cordifolia* Cong. DC.	Kundri	Dicot	Cucurbi-taceae	Perennial, climbing herb	The unripe fruits are used in jaundice.
29	*Coccinia grandis* (L.) Voigt. Hort.	Ivy gourd	Dicot	Cucurbi-taceae	Perennial slender climber	Traditional medicine for treatment of leprosy, jaundice, asthma, bronchitis, skin eruptions, burns, tongue sores, eye infections, nausea etc.
30	*Convolvulus arvensis* L.	Field bindweed, Strain khuri	Dicot	Convolv-ulaceae	Perennial vine, twiner	The root is purgative and diuretic.
31	*Cucumis sativus* L.	Khira	Dicot	Cucurbi-taceae	Annual climber	Pepo are rich source of minerals and served in gastric inflammation.
32	*Clitoria ternatea* L.	Aparajita	Dicot	Fabaceae	Perennial climbing, scrambling or trailing herb	Flowers used to treat eye problems, powdered seeds are purgative, rootbark is diuretic and laxative
33	*Cucumis melo* (L.) Sp.Pl.	Kharbooja	Dicot	Cucurbi-taceae	Annul creeping herb	Ripe pepo is good source of minerals.

34	*Cucumis trigonus* Roxb.	Jangli Indrayan, Ghimaru	Dicot	Cucurbi-taceae	Annual climber	The fruits are used in fever, leprosy, jaundice, bronchitis, anaemia, constipation, other abdominal disorders and amentia.
35	*Cucurbita maxima* Duch.	Kumrha	Dicot	Cucurbit-aceae	Annual climbing or spreading, coarse, monoecious, herb	Pepo are laxative and given in gastric inflammation.
36	*Cucurbita moschata* Lam.	Halwa kaddu and kashiphal	Dicot	Cucurbit-aceae	Annual climbing plant	Seed is emollient and laxative and vermifuge, leaves are used to treat haemorrhages and infusion of the flowers is used as a treatment for jaundice (liver inflammation).
37	*Cuscuta reflexa* Roxb.	Amar Bel	Dicot	Cuscuta-ceae	Perennial, parasitic climber	The seeds are alterative, anthelmintic and carminative.
38	*Diplocyclos palmatus* (L.) C. Jeffrey.	Kauw-ajaur	Dicot	Cucurbi-taceae	Perennial climbing herb	Paste of roots is used in jaundice (liver inflammation).
39	*Dioscorea alata* L.	Purple Yam	Monocot	Dioscor-eaceae	Perennial climbing herb	Roots cooked- usually boiled or baked and used as a vegetable for skin inflammatory patient.
40	*Dioscorea belophylla* Voigt	Zimikand	Monocot	Dioscore-aceae	Perennial herbaceous vine with annual stems	The bulbils are laxative in nature.
41	*Dioscorea bulbifera* L.	Air potato	Monocot	Dioscore-aceae	Perennial glabrous, twiners	Bulbils are used as vegetable having laxative effects to cure inflammatory bowel disease.
42	*Dioscorea daemona* Roxb.	Karukandu, Kolo (Bihar)	Monocot	Dioscore-aceae	Annual twiners	Paste of leaves are applied externally in joint pains.
43	*Dioscorea glabra* Roxb.	Bon-aloo	Monocot	Dioscore-aceae	Annual twiner	Paste of leaves are applied externally in joint pains (rheumatoid arthritis).

44	*Dioscorea pentaphylla* L.	Five leaf yam	Monocot	Dioscore-aceae	Herbaceous twiners	Decoction of leaves are applied externally to clean abscess.
45	*Epipremnum aureum* Linden. Andre.	Golden pothos	Monocot	Araceae	Evergreen perennial climbing vines	Leaves are antirheumatic, tonic. Infusion of the leaves used for treatment of rheumatism, as a general tonic and anticancer agent.
46	*Ficus pumila* L.	Creeping fig	Dicot	Moraceae	Perennial, climbers and scandent	Leaves also used for dysentery, hematuria and locally to carbuncles.
47	*Ficus sarmentosa* Buch.Ham. ex Smith.	Fig tree	Dicot	Moraceae	Perennial, Shrubs or woody climbers	Used to cure allergies.
48	*Gouania leptostachya* DC.	Jwar-pat	Monocot	Rhamn-aceae	perennial herbs, woody vine climber	Leaves are used as medicinal plant in diarrhea.
49	*Gymnema sylvestre* R.Br.	Gurmar	Dicot	Apocy-naceae	Perennial climber	Leaf used for pain-killers and laxatives, plant used as diuretics.
50	*Gloriosa superba* L.	Bachnag	Monocot	Liliaceae	Perennial, Climber Forb/herb Vine	Tubers used in rheumatism (rheumatoid arthritis), sexual stimulant etc.
51	*Holostemma ada-kodien* Schult.	Jivanthi	Dicot	Asclepia-daceae	Perennial Climber and twiner	Leaves and roots alleviate oedema due to vitiation of pitta dosa.
52	*Hedera nepalensis* K. Koch.	Himalayan ivy	Dicot	Araliaceae	Perennial climbing vine	Leaves are useful for diabetes, cathartic and diaphoretic. Fruits are purgative and use to cure febrile disorders.
53	*Hemidesmus indicus* (L.) R.Br.	Nannari	Dicot	Asclepi-adaceae	Perennial creeper	Root used for fever, urinary inflammation and root powder can also be administered for dysentry, leucoderma and piles.
54	*Ichnocarpus frutescens* (L.) R.Br.	Black creeper	Dicot	Apocy-naceae	Perennial twining shrub	The roots are sweet, refrigerant, febrifuge, aphrodisiac, diuretic,

55	*Ipomoea angulata* Lamk.	Ivy-leaf morning glory	Dicot	Convol-vulaceae	Annual to perennial, twinner	Infusions of dried leaves are used in abdominal pains (inflammation).
56	*Ipomoea carnea* Jacq. Enum.	Behaya	Dicot	Convol-vulaceae	Perennial straggling climber	Paste of leaves are applied externally in joint pains.
57	*Ipomoea cairica* (L.) Sweet.	Neeli Bel	Dicot	Convol-vulaceae	Annual, much-branched twiner	Paste of leaves are used in cutaneous affection.
58	*Ipomoea nil* (L.) Roth.	Neel kalmi	Dicot	Convol-vulaceae	Annual or perennial plant, herbaceous climbers and twinner	Seed is anthelmintic, anticholinergic, antifungal, antispasmodic, antitumor, diuretic and laxative.
59	*Ipomoea obscura* (L.) Ker Gawl.	Wild petunia	Dicot	Convol-vulaceae	Annual or perennial herb, twinner	Leaf sap is used to treat fits of insanity.
60	*Ipomoea pestigridis* L.	Tiger-foot morning glory	Dicot	Convol-vulaceae	Annual, climber and twiner	Roots are used in boils, carbuncles, ulcers and as antidote to dog bite and snake bites, leaves extract is administered orally for treatment of intestinal worms.
61	*Ipomoea purpurea* (L.) Roth.	Common Morning Glory	Dicot	Convol-vulaceae	Annual climber	Seeds are anthelmintic, diuretic and laxative.
62	*Ipomoea quamoclit* L.	Kamlata	Dicot	Convol-vulaceae	Annual or perennial, herb, twining vine	The paste of leaves are used in jaundice.
63	*Ipomoea staphylina* Roem & Schult. Conv.)	Lesser Glory	Dicot	Convol-vulaceae	Annual and perennial herbaceous climber	Leaves are diuretic, anthelmintic, blood purifier, deobstruent, laxative etc.
64	*Ipomoea sinensis* (Desr.)	Chinese morning glory	Dicot	Convol-vulaceae	Annual twiner	Paste of fresh leaves and flowers are used in diabetes.
65	*Ipomoea triloba* L.	Aiea morning glory	Dicot	Convol-vulaceae	Perennial climber herb	Plant is used to cure chronic inflammation of digestive tract.
66	*Jasminum dispermum*	Pink jasmine	Dicot	Oleaceae	Perennial, woody	Plant is used to cure chronic

67	*Lablab purpurious* Dalz.	Sem	Dicot	Fabaceae	Annual twiner	Seeds are laxative and used in inflammatory bowel disease.
68	*Lathyrus aphaca* L.	Yellow pea	Dicot	Fabaceae	Annual climber	Ripe seeds used treatment of toothache; flowers are resolvent.
69	*Lagenaria sicecaria* (Molina).	Lauki	Dicot	Cucurbi-taceae	Annual climber or trailing herb	Pepo are laxative (bowel disease).
70	*Lonicera japonica* Thunb.	Juhee	Dicot	Caprifo-liaceae	Perennial, woody climber and twiner	Stems are used internally in the treatment of acute rheumatoid arthritis, mumps and hepatitis.
71	*Luffa acutangula* (L.) Roxb. Hort.	Satputiya	Dicot	Cucurbi-taceae	Annual tropical or subtropical climbing vine	Seeds are emetic and purgative.
72	*Luffa aegyptiaca* Mill.	Nenua	Dicot	Cucurbi-taceae	Annual much-branched climbing, scabrous herb	The pepo is laxative (bowel).
73	*Luffa cylindrica* Auct. M. Roem.	Ghia torai	Dicot	Cucurbi-taceae	Annual climbing, scabrous herb	Pepo are laxative (bowel).
74	*Luffa echinata* Roxb.	Khaksi	Dicot	Cucurbi-taceae	Annual climbing vines	Fruit is considered to be a remedy for dropsy.
75	*Mimosa pudica* L.	Lajwanti	Dicot	Mimosa-ceae	Perennial, twiner herb	The paste of leaf and root is used to cure inflammation of kidney.
76	*Mikania cordata* (Burm.f.) B.L. Rob.	Climbing Hempweed	Dicot	Asteraceae	Perennial climber Forb/herb Vine	Leaves used for itchiness and as wound plaster.
77	*Momordica charantia* L.	Kareli.	Dicot	Cucurbi-taceae	Perennial climbing herb	Fruits are said to be an effective blood purifier, tonic and stomachic and useful in rheumatic pains.
78	*Momordica cochinchinensis* (Lour.) Spreng.	Kantola	Dicot	Cucurbi-taceae	Perennial Climber	Roots froth in water and may be used as a soap and to kill head lice, fruits are a well-

79	*Momordica dioica* Roxb. ex. Willd.	Jungli-kareli.	Dicot	Cucurbi-taceae	Perennial, dioecious, cucurbitaceous climbing creeper	Pepo diuretic.
80	*Mukia maderaspatana* (L.) M. Roem.	Fula-Pulaar	Dicot	Cucurbi-taceae	Annual climber and trailing scabrous herb	Pepos are used in jaundice.
81	*Mucuna pruiens* (L.) DC.	Kawach.	Dicot	Fabaceae	Annual to a short-lived perennial, erbaceous twiner.	The paste of seeds is applied externally in joint pains.
82	*Operculina turpethum* L.	Pitohri	Dicot	Convul-vulaceae	Perennial twinner	Decoction of entire plants are used in cough (pulmonary inflammation) and cold.
83	*Oxalis corniculata* L.	Creeping wood sorrel	Dicot	Oxalida-ceaae	Annual or perennial creeping herb	Plant is used as a remedy for convulsions in children, leaves are eaten as chutney to help purify the blood.
84	*Piper betel* (L.) Sp. Pl.	Betel pepper	Dicot	Piperaceae	Perennial, climbing herb	Pastes of leaves are taken in bronchitis.
85	*Passiflora foetida* L.	Jhumka lata	Dicot	Passiflo-raceae	Annual climber	Pastes of flowers are applied externally in joint pains.
86	*Passiflora suberosa* L.	Corky Passion Flower and devil's pumpkin	Dicot	Passiflo-raceae	Perennial climber	Infusion of leaves are diuretic and taken with honey in kidney inflammation.
87	*Pergularis daemia* (Forsk.) Blatt. & M.C	Dholi dudhi, gadaria ki bel and utaran	Dicot	Asclepi-adaceae	Annual twiner	The paste of roots are used in asthma (bronchial inflammation).
88	*Petrea volubilis* L.	Nilmani lata	Dicot	Verben-aceae	Perennial woody climber	Infusion of leaves are applied externally in joint pains.
89	*Plumbago zeylanica* L.	Chitrak	Dicot	Plumba-ginaceae	Perennial climbing shrub	The roots in digestive system disorders piles, abdominal pain, skin burning.

90	*Porana paniculata* Roxb.	Safed bel and bel kamu	Dicot	Convulvu-laceae	Perennial climbing vine, twiner	Infusion of dried flowers and used in jaundice.
91	*Pothos scandens* L.	Climbing aroid	Monocot	Araceae	annual to perennial climber	Paste of roots are applied externally in cutaneous affection.
92	*Quisqualis indica* L.	Rangoon creeper, gargu	Dicot	Combre-taceae	Free-branching perennial climber	Infusion of dried petals are diuretic and causes urination to cure bladder inflammation.
93	*Raphidophora decursiva* Roxb.	Creeping Philodendron	Monocot	Araceae	Perennial climber	Paste of leaves are applied externally in cutaneous affections, eczema etc.
94	*Scindapsus officinalis* L.	Gaj-pipali, Gajapipal, Atti-tippili, Enugutippali	Monocot	Araceae	Perennial epiphytic climber	Infusion of dried leaves are diuretic and taken mixed with milk in kidney problems.
95	*Smilax macrophylla* Roxb.	Kumarika	Monocot	Smilac-aceae	Annual woody climber	Paste of leaves are applied externally in cutaneous affections.
96	*Tinospora cordifolia* (Willd.) Miers ex. Hook. f. et. Thom.	Guduchi and giloy	Dicot	Menisper-maceae	Perennial deciduous twiner	The decoction of stem is given in cold, fevers and urinary infections.
97	*Trichosanthes cucumerina* (L.)	Jangli-Chichinda	Dicot	Cucurbi-taceae	Annual climbing, scabrous herb	Young fruits are eaten as vegetable and are said to be useful in diabetes.
98	*Trichosanthes anguina* L.	Chchinda	Dicot	Cucurbi-taceae	Annual or perennial climbing herbaceous vine	Pepo are diuretic and served in kidney problems.
99	*Vernonia eleagnifolia* L.	Parda Vel	Dicot	Asteraceae	Perennial vine evergreen climber	Paste of leaves are applied externally in joint pains.
100	*Vicia hirsuta* (L.) S.F.	Jhunjhuni	Dicot	Fabaceae	Annual climber	Seeds are served to milching cattle which reduces inflammation and promotes lactation to the mammary gland.

Inflammation is defined as tissue-directed response to harmful and adverse internal and external stimuli, which is mainly refereed by arachidonic acid metabolites[11]. Drugs currently used for the management of pain and inflammatory circumstances cause toxic side-effects on chronic diseases. The medicinal properties of Rangoon creeper have been standard in the Ayurveda, Unani, Siddha, and other medical systems. The plant part is used for the treatment of ailments like anti-flatulence, anthelmintic, body pains, coughs, toothache, diarrhea, and cardiovascular system. Various pharmacological studies have revealed that *Q. indica* L. has anti-bacterial, anti-oxidant anti-inflammatory, antiseptic and anti-pyretic properties due to the presence of numerous bioactive compounds such as, flavonoids[5]. The plant leaves and seeds are used for therapeutic determinations, like anti-gelmintoznoe tool, especially against tapeworm as well as a sedative. It has also been stated to be used successfully against cold, rickettsia stomach pain and skin parasites[8]. There are some home remedies which we can use with Rangoon creeper plant parts. Spermatorrhoea (weakness) take leaves and flowers of Rangoon creeper, wash to clean dirt and then grind to extract the juice. Take this juice twice a day in empty stomach. This will help to increase the immunity and boost the energy. Leucorrhea (white discharge) or (shwetpradar) patients take drink of flowers and leaves juice of Rangoon creeper. For diabetes, extract juice of Rangoon creeper fresh leaves or flower, drink regularly twice a day. This juice can be mixed with karela juice. The major classes of anti-inflammatory agents are glucocorticoids and non-steroidal anti-inflammatory drugs (NSAIDs)[11]. Anti-inflammatory drugs can interfere in the pathophysiology of inflammation, seeking to minimize tissue damage and provide greater patient comfort. Fundamentally these differ in their mode of action[9]. In short, glucocorticoids act by inhibiting prostaglandins and proteins involved in inflammatory processes, such as corticosteroids, which among other indications are used in treatment for asthma and autoimmune inflammatory response[7], non-steroidal drugs, on the other hand, have an inhibitory action through the enzyme cyclooxygenase[6] and are indicated for moderate and mild pain and body temperature control. An example of a non-steroidal drug is acetylsalicylic acid. NSAIDs are the most commonly used drugs worldwide, utilized to treat acute and chronic pain resulting from an inflammatory process[3]. NSAIDs encompass a range of agents and, in general, all their effects are related to the inhibition of COX action in the production of prostaglandins and thromboxane. Apart from the Rangoon creeper various plants helps in the inflammation and some other disease. it is a universal herb that helps boost immunity". It is a powerhouse of antioxidants that fight free-radicals, keep your cells healthy, and get rid of diseases. It helps remove toxins, purifies blood, fights bacteria that cause diseases and also combats liver diseases and urinary tract infections. It is used by experts in treating heart related conditions, and is also found useful in treating infertility, Treats Chronic Fever helps get rid of recurrent fevers. Since giloy is anti- pyretic in nature, it can reduce signs and symptoms of several life-threatening conditions like Dengue, Swine Flu and Malaria as well. Improves Digestion it is very beneficial in improving digestion and treating bowel related issues Treats Diabetes it acts as a hypoglycemic agent and helps treat diabetes (particularly

Table-2. The summarized result of the phytochemical analysis of the plant extract for both solvent

S. No	Phytochemical test	*Q. indica* L	
		methanol	toluene
1	Phenol test	+	+
2	Glycoside test	+	+
3	Flavonoid test	+	+
4	Alkaloid test	+	+

Table-3.Absorbance and % inhibition for different concentrations of methanol extract of *Quisqualis indica* L.

S. No	Concentration (µg/ml)	Absorbance (517nm)	% Scavenging	IC_{50}
1	100	0.142	26.4248705	333.66µg
2	200	0.125	35.2331606	
3	300	0.095	50.7772021	
4	400	0.082	57.5129534	
5	500	0.07	63.7305699	

Table-4. Absorbance and % inhibition for different concentration of toluene extract of *Quisqualis indica* L.

S. No	Concentration (µg/ml)	Absorbance (517nm)	% Scavenging	IC_{50}
1	100	0.145	24.8704663	341.7 µl
2	200	0.127	34.1968912	
3	300	0.095	50.7772021	
4	400	0.083	56.9948187	
5	500	0.072	62.6943005	

Type 2 diabetes) its juice helps reduce high levels of blood sugar and works wonders. Reduces Stress and Anxiety It helps reduce mental stress as well as anxiety. It helps get rid of toxins, boosts the memory, calms you down and makes for an excellent health tonic if combined with other herbs fights respiratory problems[14]. *Giloy* is popularly known for its anti-inflammatory benefits and helps reduce respiratory problems like frequent cough, cold, tonsils & treats arthritis. Rangoon creeper contains anti-inflammatory and anti-arthritic

properties that help treat arthritis and its several symptoms. For joint pain, the powder from Rangoon creeper stem can be boiled with milk and consumed. It can be used along with ginger to treat rheumatoid arthritis. It is popularly known for its anti-inflammatory benefits and helps to reduce respiratory problems like frequent cough, cold, tonsils and reduces asthmatic symptoms. Asthma causes chest tightness, shortness of breath, coughing, wheezing, etc. which makes it very difficult to treat such a condition. Improves vision in several parts of India, creeper plant is applied to the eyes as it helps boost vision clarity, all need to do, it is boiled powder in water, let it cool down and apply over the eyelids. It reduces the sign of aging. This plant contains anti-aging properties that helps to reduce dark spots, pimples, fine lines and wrinkles. It gives flawless, glowing skin as always wanted.

The survey of medicinal plants the GC-MS analysis report has shown that plants undertaken the study is *Q. indica* L. Leaves contain various bio-active compounds like hydrocarbons, phenols, coumarins, quinazolines, terpenes and steroids like cadinene, juniper camphor *etc.* Quinazolines are having anti-cancerous and anti-malarial activities. Coumarins exhibit anticoagulant properties. Juniper cadinene and camphor and are commonly found in terpenes in the plant oils. All these available phyto-constituents are responsible for many pharmacological actions. The results of the present study showed that these plants' leaves contained considerable potential of parasitical activity. Their leaves could be used as a potential source for common medicine, to preserve foods, for the exploration of new compounds as anthelmintic agents. These plants have major qualities which act as backbone of numerous areas of research, and it needs to be good investigation in the society. This type of GC-MS analysis is the first step towards understanding the nature of bio-active principles in this plant and this type of study will be helpful for further study. The separation of pure phyto-chemical constituents and subjecting them to the screening of biological activity will be definitely giving productive results and will open a new area of investigation of individual components and their pharmacological power.

Conflict of interest :

There is no conflict with other interest in the manuscript content and I hope the paper will be published online and offline.

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