



COMPREHENSIVE ANALYSIS OF MAJITH (RUBIA CORDIFOLIA) FROM UNANI AND CONVENTIONAL PERSPECTIVES.

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ABSTRACT

Globally, intensive research is being carried on medicinal plants as they are seen as a potential source of novel drugs and used for treatment of many ailments in traditional and folklore medicine and this can act as a lead for new drug discovery. One such medicinal plant with diverse ethno-medicinal benefits is *Majith* or *Indian madar*. It is used as an effective blood purifier, astringent, tonic, antiseptic, de-obstruent, anti-cancer, anti-bacterial, anti-androgenic, immune-modulator, and hepato protective agent. This study aims to review the plant, collect the data from Unani and conventional literature including its description, ethno-medicinal uses and different pharmacological studies carried on this plant and to evaluate the scientific evaluation of *Rubiacordifolia* during Pharmacological, Ethanomedical uses, Phytochemicals and recent studies analysis to identify its various components and to distinguish it from various adulterants. It primarily covers the macroscopic and microscopic features as well as its medicinal properties, which are due to its abundance in phyto constituents like quinines (anthraquinones), glycosides, saponins, tanins, alkaloids, hexapeptide.

Keywords: *Rubaicordifolia*, *Majith*, *Indian madar*, *Climber*, *Detoxification*, *Anti-cancerous*, *Ethno medicinal plant*.

INTRODUCTION

Pernennial herbaceous, climbing; roots very long, cylindrical, flexuose, with a thin red bark; stems often many yard long rough grooved, becoming slightly woody at the base; branches scandent by means of numerous divaricate or deflexed branchlets and petioles, quadrangular, sometimes prickly on angles, glabrous, shining^[1]. Flowers white in terminal end axillary dichasial cymes. Fruit globose drupe, fleshy^[2]. The pharmacopodia of India recommends

the use of dried stem in blood, skin and urino genital disorders; dysentery piles, ulcers, inflammations, erysipelas, skin diseases and rheumatism. Roots, leaves and seeds of *Rubiaceae cordifolia* are used in amenorrhea^[3]. It is a climbing plant growing in north west Himalayas, Nilgiris and other hilly districts of India. *Maddar* is native to Mediterranean region and was once grown as dye plant. The generic name *Rubia* means red plant has traditionally been source of red dye^[4]. In Chinese medicine the root is also known as *Qiancao gen* and *Chian-Tsao*, better with cold property that removes pathogenic heat from blood and exerts hemostatic, eliminative and channel de-obstructant actions^[5]. The aim of the review is to bring/ enlighten the traditional, medical and scientific justifications.

Taxonomical Classification

Kingdom	<i>Plantae</i> ^[6]
Class	<i>Dicotyledonae</i> ^[6]
Subclass	<i>Sympetalac</i> ^[6]
Order	<i>Rubiales</i> ^[6]
Family	<i>Rubiaceae</i> ^[6]
Genus	<i>Rubia</i> ^[6]
Species	<i>Caordifolia</i> ^[6]
Taxonomic Rank	<i>Taxon</i> ^[7]

Mutardifat (Vernacular Names)

English	Indian Madder ^[8] .
Arabic	Arooqesabagh and Foo ulsabagh ^[8,24] .
Kashmiri	Dandlu ^[9] .
Urdu	Manjith ^[9] .
Persian	Roomans ^[8] .
Hindi	Majit and Manjit ^[8] .
Bengali	Manjistha ^[8] .
Nepali	Manjito ^[9] .
Marathi	Manjestha ^[9] .
Malayalum	Manjetti and Poont ^[9] .
Tamil	Manjatte ^[10] .
Assam	Phuvva ^[10] .
Gujarati	Manjitha ^[10] .
Punjab	Manjatte ^[10] .
Manipuri	Moyam ^[11] .

Methodology

The plant namely *Majith* was searched through literature analysis. The plant was looked up in several search engines by the word *Rubia cordifolia*. For secondary information about ethnomedical usage and for pharmacological study various search engines and scientific groups like Google, Google scholar, Research Gate,

PubMed, PMC and Science direct etc were the information source. A framework was created to symbolise the information available after reviewing all the sources, including traditional Unani literature and scientific research articles.

Distribution:

The prickly or scabrous Perennial herb plant has red rhizomatous base^[12]. It is extensively distributed in temperate and tropical forests of Asia, Africa and South India especially in the hilly areas with an elevation ranging up to 3500 m² that are close to river and streams in higher ghats^[13]. *Rubiocordifolia* can be easily found in hilly districts of India from N.W. Himalayas eastwards, ascending to 8000 ft and southwards to Ceylon. Its roots are recognized as official^[14]. It belongs to the family *Rubiaceae*, which comprises of 450 genera and 6500 species^[15]. 15 species are found in India^[16]. Indian madder utilised for commercial purposes is made up of short rootstocks with multiple quill-sized, straight, cylindrical, and smooth roots. These have a thin layer of brownish cork covering them, which flakes off to reveal a reddish-brown bark with longitudinal furrows^[11].

Botanical Description:

It is a perennial, climbing, or prostrate herb. Flowers grow in axillary panicles of dichotomous cymes and are greenish-yellow in colour. The fruits are 2-celled, globose, smooth, shining, and purplish-black when ripe. The stems are sharply 4-angled and minutely thorny^[17]. Perennial roots are long, cylindrical, and reddish brown in colour^[18].

Flowering and fruiting: June-October.

Cultivation:

The species can tolerate temperatures between 15 and 35 °C at high altitudes in the Himalayas. The plant prefers light, airy soil that is loose and moist with moderate shade. Because the root penetrates the ground deeply, cultivation benefits from soils that are permeable and well-aerated. To maintain moist conditions in the beds, irrigation is advised at weekly intervals. Stem fragments are directly inserted into the ground for vegetative propagation^[19].

Parts of Plant Used:

- **The stem** - is slender and rough, and the base is lignified. Its branching stems are 0.3 – 6m long with brittle stems, strong curved prickles on the four ribs, or fully pubescent, or at least hairy below the nodes^[20]. The stem's cambium ring is represented by two layers^[21].



Fig 1. Flowering stem of *Rubia cordifolia*

- **The Root** - Long, cylindrical, flexuous roots with a thin red bark are present. It is hard to break, brittle, and has a splintery texture. Bark on the outside is readily peeled. It has longitudinal ridges on its surface. The inner surface is wrinkled and dark purple in colour when peeled off^[11]. The root is sweet, bitter, acrid in taste^[11].



Fig 2. Roots of *Rubia cordifolia*



Fig 3. Market sample of dried roots

- **The Leaves** - The leaves are ovate-lanceolate, 5-7 nerved, 2-10 cm long, 2-5 cm wide, and they appear in whorls of 4-6. The base of the leaf is cordate. Upper leaves are smaller than lower leaves. There are tiny white prickles along the borders. A leaf has a single layer of epidermis, a cuticle covering it, and pyramidal hairs. In contrast to the spongy cells, which are multilayered and loosely distributed, the leaf section revealed a single layer of Palisade cells as well as a single layer of epidermis that is compactly packed. The Collenchymatous cells that make up the dorsal side of the midrib are arranged in 2-4 layers. Vascular bundles are definite in number, collateral and closed, and combined^[22].



Fig 4. Leaves of Rubia cordifolia

- **The Flower** - Flowers are tiny, fragrant, cymes that are white or greenish yellow in colour. In the months of August and October, the plant produces flowers and fruit^[11].



Fig 5. Flowers of Rubia cordifolia

- **The Fruit** - The fruit is didymous, globose, smooth, shiny, and purple black when it is ripe. It has red juice and is soft and succulent^[11].



Fig 6. Ripening Fruits of *Rubia cordifolia*

Morphology of Majith (*Rubiaccordifolia*)

Majith, also known as *Rubiaccordifolia*, is a perennial herbaceous climbing herb. Its roots have a long, cylinder-shaped shape, are flexible, and have thin red bark. The long, grooved stems that are woody at the base are rough and grooved. White describes the bark's colour. Petioles on *Rubiaccordifolia* are quadrangular, shiny, and glabrous. This plant produces didymous/globose fruits that are 4-6 mm in size. When fruits ripen, they turn purple black and glossy^[7].

Geographical distribution of *Rubiaccordifolia*

Asian nations like India, China, Japan, Afghanistan, Vietnam, and Malaysia are home to the *Rubiaccordifolia* plant. It is primarily found in India's hilly regions east of the North Western Himalayas, up to a height of 2500m. Africa and Greece also contain it^[7].

Phytochemical constituents of *Rubiaccordifolia*

Several different phytochemical components, primarily anthraquinones and their glycosides, naphthoquinones and their glycosides, terpenes, bicyclic hexapeptides, and miscellaneous, which includes iridoids, flavonoids, and carbohydrates, are present in *Rubia cordifolia*^[23]. Quinones are a significant component of *Rubia cordifolia*. The two main anthraquinones found in the plant's roots are purpurin (trihydroxyanthraquinone) and *manjistin* (xanthopurpurin-2-carboxylic acid). There is antigenotoxic action in purpurin. These two make up 90% of the total anthraquinone content^[7].

Description in Unani:

Majith is a climber with long branches that cling to and grow on adjacent trees for support, traveling long distances. On these branches, four leaves are arranged in the form of whorl at regular intervals. Leaves are oval but pointy with minute spines on the margins. Its roots are blackish red with bitter, astringent and fishy taste. Roots are medicinally used in USM. It is commonly found in mountainous areas of India^[23].

Afaal (Functions): In Unani System of Medicine, Pharmacological actions of *Majith* are mentioned as:

- It is used in various neurological disorders like *Fdij* (*Paralysis*), and *Amrāal Niswaan* (*Gynaecological diseases*)^{[24] [25]}.

- It is a strong Diuretic (*Mudirr-i-Bawl*), *Mudirr-i-Hayd* (*emmenogauge*) and *Mudirr-i-Laban* (*Galactagogue*)^[8].
- *Musaffī- i-Dam* (*Blood purifier*)^[24].
- *Muskhkhin* (*Calorific*)^[8].
- *Jāī* (*Detergent*)^[8].
- Detoxify kidney^[24].
- *Majith* along with vinegar works well in *Baras* (*leucoderma*)^[24].
- According to Najmul Ghani, it can be used for the skin lightning due to Sun tanning^[24].
- Roots are used to treat *Waja' al- Mafsil* (Rheumatoid arthritis), *Nafakh-e- Me'da* (*Flatulence*), *Is'haal-e-Safravi* (*dysentery*), *Juzam* (*Leprosy*), *Amraz-e-Jild* (*Skin diseases*), *Baras* (*Leucoderma*), wounds, *Qurūh* (*Ulcers*), *Dhayḥītus* (*Diabetes*), slow healing of broken bones and general debility^[24] ^[25].

Mizaj (Temperament):

- Hot and Dry in 2nd degree ^[8]^[24] ^[26].
- According to some Unani Physicans, its *mizaj* has been described as Cold and Dry ^[24] ^[25].

Tarkīb Istemaal (Theraputic uses)

- According to Ibn Sina, *Majith* along with Vinegar is an effective remedy for *Daad Qūba* (*Ring worm*), *Bahaq* (*Pityriasis*) or any other skin discoloration ^[27].
- Ibn Sina also mentioned that the fruit of this plant along with *Sikanjabircan* be used for treatment of diseases of liver and spleen ^[27].
- It is used for the treatment of *Irqun Nisa* (*Sciaticia*), *Waja al-Wark* (*Gluteal Pain*), *Falij* (*Paralysis*) and *Istarkha* with *Ma-ul-Asal*^[25].
- It is used with *Sirka* (*vinegar*) for the treatment of *Qūba* (*Tineacorporis*) and *Behak Abyaz* (*Pityriasis alba*)^[25].
 - 3.5gm *Majith* (*Rubia cordifolia*) with *Nabeez* (*Aconitum ferox*) and 7gm *Raewand Chini* (*Rheum palmatum*) in *Safū* form is recommended in *Zarb* (*Injury*) & *Sakta* (*Apoplexy*)^[25].



- *Gul e pista (Pistacia vera)*, *Samag-e-Dhak (Butea monosperma)*, *Gokhru (Tribulis terrestris linn)*, *Taj (Cassia cannamom)* and *Majith (Rubia cordifolia linn)* when taken in equal quantity and mixed with sugar and grounded to fine powder (*Saft*) is effective in *Sayalan al-Rahim (Leucorrhoea)* [28]. Dosage up to 25gms.
- Fruit of *Majith (Rubia cordifolia)* with *Sikanjabinis* used in the *'Izam al-Tihā (Splenomegaly)* [24].
- It is used with honey as Suppository to induce *Hayd (mensuration)* and also as *Mukhrij-i-Janin (abortifacient)* [24] [25].
- Its worn as a necklet for the treatment of *Waram al-Khusyatan (Orchitis)* [24] [25].
- For numbness of body, it is used along honey [24] [25].
- *Majith* is grinded to make powder and mixed with honey to make paste. This paste is applied on face for the treatment of *Kalaf (Melasma)* [25].
- Its branches are used as an antidote for *Hashratul Arz (Poisonous insect)* [24].
- Paste made from grinded *Majith* and *Mulethi* along with rice kanji is used to treat fractures [24].
- *Majith* is an effective treatment for dog bites when taken with meals [24] [25].
- *Majith* is used in the treatment of *Sayalan al-Rahim (Leucorrhea)* [28].

Ayurvedic Uses:

- *Rubia cordifolia* has been used in Ayurveda as a colouring ingredient for medicinal oils and topically for fractures, ulcers, and inflamed skin [20].
- *Rubia cordifolia* root has been used to treat different chronic inflammations [20].
- Applying a honey-based paste to the face helps to heal wounds by erasing freckles, brown spots, and other skin discolorations [20].
- Diseases of the Spleen can be cured by the fruit [1].
- According to *Ayurvedic Pharmacopoeia of India* the desiccated stem is advised for use in blood, skin, and urinogenital disorders, dysentery, piles, ulcers, and inflammations, as well as erysipelas, skin conditions, and rheumatism. [3].
- *Rubia cordifolia*'s roots, leaves, and seeds are used to treat gallbladder and kidney issues, amenorrhea, and liver ailments [3].
- In Ayurvedic material medicine, it is referred to as a plant that detoxifies. It eliminates the blood impurities known as "ama" [7].
- It improves metabolism, serves as an appetizer, and combats heliomphalitis. It is used to treat illnesses like anorexia, indigestion, diarrhea, and worm infection [7] [29] [30].
- It has properties of blood purification [7] [29] [30].
- It has mucolytic properties. It is used to treat cold and respiratory diseases [7] [29] [30].

- It improves the overall reproductive health of females. It is used for dysmenorrhea and amenorrhea. After birth, it cleanses the uterus. It improves lactation and raises the nutritional content of mother's milk [7] [29] [30].
- It has anti-diabetic properties [7] [29] [30].
- It is used to treat a number of skin conditions, including leprosy, psoriasis, and eczema [7] [29] [30].
- It has anti-pyretic properties. It is used in chronic fever [7] [29] [30].
- It works as a Rasayana and increases strength. It benefits epidermis and is also used as a poison antidote [7] [29] [30].

Muzir (Adverse effect)- It is harmful for Bladder, Head, Lungs [24] [25].

Muslih (Corrective)- *Tukhm Bartang (Plantago major)*, *Kateera (Tragacanth gum)*, *Anisoon (Pimpinella anisum L)* [8] [24].

- For bladder corrective is *Plantago ovata*.
- For *Mouris-ul-Bawl-al Dam* (Hematuria due to genetic cause) is *Tragacanth gum*.
- For Head and Lungs is *Pimpinella anisum L*.

Badal (Substitute) - *Saleekha (Cinnamomum cassia blume)*.

- For *Tanqiya* (Detoxification of liver and spleen) the substitute is *Saleekha (Cinnamomum cassia blume)* [25].
- As *Mudirr-i-Hayd (emmenagogue)*, the substitute is ½ times *Saleekha* and 1/3 of *MaweezSiyah (Vitis vinifera)* [25].
- Some Unani Physicians have recommended equal quantity of *Kababa (Piper cubeba)* [25].
- Other Unani Physicians have recommended *Sheetraj (Plumbago zeylanica)* as substitute [25].

Miqdar-i-Khuraq (Dosage):

- 3-5 gms [8] [26].
- 4.5gms as *Safy* [25].
- 4gm as *Safy* [24].
- 13.5gms as *Joshāda* [25].
- According to Gilani, upto 9gms with *Anisoon (Pimpinella anisum L)* has been recommended as Decoction [24].
- According to other Physicians, 7-8gms has been recommended [24].

Compound Formulations:**Table 1:** Name of compound formulations with dose and therapeutic uses:

Sr. No	Name of Compound Formulations	Dosage	Therapeutic Uses
1	<i>Agras-e-Mur</i> ^[11]	3-5g	' <i>Usr al-Wiṭāla</i> (difficult labour) ^[31] .
2	<i>Majoon e Hafiz ul Ajsad</i> ^[11]	5-10g	<i>Sūal-Qinya</i> (anemia) ^[32] , <i>Istisqād'</i> (ascites) ^[32] .
3	<i>Halwae Gheekwar</i> ^[11]	12-25g	<i>Du 'fal- 'A sab</i> (nerve weakness) ^[33] , <i>Du 'fal- Bḥ</i> (anaphrodisiac) ^[33] .
4	<i>Majoon Suparipak</i> ^[11]	10-20g	<i>Du 'fal- Bḥ</i> (anaphrodisiac) ^[31] <i>Sayalan al-Rahim</i> (Leucorrhoea) ^[31] .
5	<i>Majoon Dabeed ul ward</i> ^[11]	5g	<i>Waram al-Kabid</i> (hepatitis) ^[34] , <i>Waramal-Mi 'da</i> (gastritis) ^[34] , <i>Waram al-Rahim</i> (endometritis) ^[34] , <i>Du 'fal- Kabid</i> (hepatic insufficiency) ^[34] .
6	<i>Sadri</i> ^[11]	3g with luke warm water twice a day.	<i>Dīq al-Nafas</i> (asthama) ^[31] , <i>Su ḥ-o-Surfa</i> (cough) ^[31] .
7	<i>Roghan Ahmar Jadeed</i> ^[11]	Q.S for external use	<i>Du 'fal- 'A sab</i> (nerve weakness) ^[35] , <i>Dīq al-Atfal</i> (childhood tuberculosis) ^[35] .
8	<i>Dawaul Kurkum kabir</i> ^[11]	5-7g	<i>Istisqād'</i> (ascites) ^[36] . <i>Kāir-i-Riyḥ</i> (carminative) ^[36] .

Folk view on *Rubia cordifolia*

The world's tribal populations and rural communities strongly advocate the use of medicinal herbs. They consume and treat illnesses using herbs. They inherited from their ancestors medical plant knowledge that has been verbally transmitted from one generation to the other. One such plant that is well-known among rural and tribal groups around the world is *Majith* (*Rubia cordifolia*). For instance, the Kurumba tribe in Tamil Nadu administers honey-mixed dried stem powder of *Rubia cordifolia* orally to prevent snake bite. When combined with honey, it works well as a leucoderma treatment. It is used to treat eczema, psoriasis, herpes, and scabies irritation ^[37].

Modern View on *Rubia cordifolia*

The practice of adulterating these medications is the main problem the global herbal drug industry is dealing with right now. This is the reason why people nowadays no longer have faith in these herbal medicines ^[38]. Adulteration can occur intentionally or accidentally. Today, intentional adulteration is carried out in a variety of ways, including the substitution of regular commercial varieties, inferior but ostensibly identical drugs, artificially created drugs, outdated medications, and dangerous ingredients. The quality of the original medications inevitably suffers

as a result of these methods. The herbal plant dealers employ these adulteration procedures so cunningly that they go undetected unless and until a microscopic and chemical level investigation is required^[38]. Drug deterioration and degradation are two of the main drawbacks of adulteration. Additionally, adulteration raises the price of pharmaceuticals and has unfavourable consequences rather than real biological ones^[39]. The toxicity of traditional herbal medicines and their formulations is quite low, and they are not adulterated in any way. Modern contaminated medications typically come with health hazards. For instance, modern anti-inflammatory medications come with side effects, whereas *Rubia cordifolia* has been shown in numerous trials to have anti-inflammatory efficacy with little to no toxicity or harmful effects^[7].

Pharmacological actions

- **Anticarcinogenic activity**- To assess the anticancer properties of *Rubia cordifolia*, a study using the human carcinoma cell line HeLa was conducted. According to the results, this plant's ethanolic root extract is efficient against the cancer cell line^[40]. Another in-vitro study's findings demonstrated that human cervical cancer cell lines and human larynx carcinoma cell lines were inhibited by methanol extract of *Rubia cordifolia*^[41]. Pure *Rubia cordifolia* extract RC18 exhibited strong anti-cancer activity against the P388, L1210, L5178Y, and B16 melanoma cancer cell lines. In order to assess the anti-tumor potential of *Rubia cordifolia*, an in-vitro study using human leukaemia cell lines and human histolytic lymphoma cell lines was conducted. The results revealed that the plant's methanol fraction, pet-ether fraction, and dichloromethane fraction are linked to anti-tumor activity^[42].
- **Hepatoprotective** - According to data from a study on carbon tetrachloride (CCl₄)-induced liver injury in rats, rubiadin was discovered to be a powerful hepatoprotector. It decreased the enzymatic activity of serum glutamic oxaloacetic transaminase (SGOT), serum glutamate pyruvate transaminase (SGPT), serum alkaline phosphatase (SALP), and beta glutmyl transferase, which had increased due to the induction of carbon tetrachloride (CCl₄). This suggested that *Rubia cordifolia* is an effective hepatoprotective agent^[7].
- **Anti-inflammatory Effect** - In a model edoema that developed quickly, manjistin and purpurin both shown anti-proliferative activity. Inflammatory mediators, which are produced by the lipoxigenase enzyme pathway, are involved in illnesses like arthritis, asthma, and other inflammatory disorders. In a study, it was discovered that the rubia's aqueous extract effectively blocked the route. Rats with carrageenan-induced paw oedema were utilised to evaluate the anti-inflammatory effects of the extract from *Rubia cordifolia*, Linn. where ethanolic and alcoholic extract of the rubia was administered to animals. Chronic administration of ethanolic extract reduced phagocytosis, phagocytosis index, and humoral and cell-mediated immune response^[11].

- **Wound Healing Activity** - In experimental models, *R. Cordifolia* root extract has been shown to be an efficient wound healing ^[43]. When *R. Cordifolia* and a few other herbal medicines were examined for their ability to speed up the healing of wounds, it was discovered that they might compress the wound and encourage epithelization. In addition to showing histo-pathological changes, ethanolic extract and the hydrogel formulation of roots were discovered to be efficient in the functional recovery and healing of wounds ^[11].
- **Cardioprotective** - Nowadays, patients with heart dysfunction frequently receive combination therapy (hypolipidemic, diuretic, calcium channel blocker, vasodilator, antiplatelet). Combination therapy increases the possibility of drug interactions and negative effects. It is crucial to promote heart health using *Rubia cordifolia*, a single plant with numerous benefits. ^[44].
- **Diuretic activity** - To substantiate its folkloric claim, rats were given a hydroalcoholic extract of *Rubia cordifolia* roots. Two doses of extract (286 mg/kg and 667 mg/kg body weight) and the vehicle (normal saline: 25 ml/kg) were administered orally to four groups of rats. Up to 5 hours after the end of the treatment, discharged urine was collected and its creatinine, Na⁺, K⁺, and volume were measured. Urine volume and electrolyte excretion were significantly increased by the extract (p<0.01) in dependence. The effects of the extract were less pronounced at both dosages than those of furosemide on creatinine clearance. According to the findings, a hydroalcoholic extract of *Rubia cordifolia*'s roots has strong diuretic properties^[45].
- **Anti-proliferative activity** - Rubiadin was obtained during an investigation from *R. cordifolia* roots, where it has demonstrated anti-proliferative action in vitro. In molecular docking, rubiadin was tested for its ability to inhibit the EGFR tyrosine kinase enzyme, one of the targets for inhibiting cancer cells ^[46]. Radix Rubiae's ethyl acetate (EA) component, which limits cell proliferation and encourages terminal differentiation in cultured human keratinocytes, strongly suggests that it has anti-psoriatic effect ^[11].
- **Anti-bacterial**- The results of an in-vitro study on six species of gramme positive and six species of gramme negative bacteria revealed that all six species of gramme positive bacteria were inhibited by the chloroform and methanol extract of *R. cordifolia*. While *P. aeruginosa*, a kind of gram-negative bacterium, was inhibited by a methanol extract of *R. cordifolia* (at a specific dose) ^[9].
- **Anti-microbial activity** -Comparing the aqueous extract to streptomycin and pencillin G, Basuet al. found that it is more effective against *Bacillus subtilis* and *Staphylococcus aureus*. The

results were the same for the ethanolic whole plant extract. When used against Gram +ve bacteria including *Bacillus subtilis*, *Streptococcus faecalis*, and *Bacillus cereus*, rubiacordone A has been shown to have significant antibacterial efficacy ^[47].

- **Antidiabetic** - An investigation using rats treated with alloxan showed that *Rubia cordifolia* alcohol extract has antidiabetic properties. Alcoholic extract was found to dramatically lower blood glucose levels ^[7].
- **Anti-peroxidative activity** - Rat liver homogenate revealed antioxidative properties when *R. cordifolia* alcohol extract was used as a solvent free solvent. Even in the presence of the aforementioned toxin, the cumene hydroperoxide caused the development of malondialdehyde and a reduction in glutathione ^[44].
- **Nootropic and Anti-stress activity**: Alcoholic extract from the roots of *Rubia cordifolia* raises GABA levels in the brain while lowering dopamine and cortisol levels in the blood. The alcoholic extract prevented acidity and ulcers brought on by the cold restraint stress. Animals given alcoholic extract spent more time in open arms in the elevated plus maze model, which counteracted the damaging effects of scopolamine on learning and memory ^[48].
- **Gastroprotective** - Methanol and chloroform root extracts of *Rubia cordifolia* exhibit gastroprotective properties, according to the findings of a study on swimming stress-induced ulcer to assess the gastroprotective activity ^[7].
- **Anti-viral**- Furomollugin, mollugin, and rubilactone, which are naphthohydroquinones, were found to decrease the release of the hepatitis B surface antigen in human hepatoma Hep3B cells, according to a study on *Rubia cordifolia*'s antiviral activities ^[7].
- **Anti-allergic** - The extract of *Rubia cordifolia* has strong anti-allergic potential, according to the study. The outcome showed that it has inhibitory effects against immunoglobulin E (IgE) production both *in-vitro* and *in-vivo* ^[49].
- **Anti-urolithiasis** - This activity was studied using rat models in which ethylene glycol was used to artificially produce urolithiasis. The results of this investigation showed that variations in calcium, oxalate, and phosphate secretion in urine were suppressed by a hydro-alcoholic extract of *Rubia cordifolia* root. This *in-vivo* investigation demonstrated the effectiveness of *Rubia cordifolia* as an anti-urolithiasis treatment ^[50].

- **Anti Ulcer Effect** - By using an aspirin-plus-pylorus-ligated ulcer screening model in wistar rats, researchers were able to assess *Rubia cordifolia's* (*Rubiaceae*) protective effects against experimentally caused gastrointestinal ulcers and compare their activity to different fractions of the plant. The research verified that the chloroform fraction exhibited considerable activity at lower dosages than the parent extract. The mechanism is explained by a decrease in gastric acid secretory activity as well as a strengthening of the mucosal defence system through prostaglandin synthesis and antioxidant potential ^[18].

Conclusion

Majith, also known as *Rubia cordifolia* is a widely and traditionally used medicinal plant amongst all the thousands of medicinal herbs. It plays an important role as a potent blood purifier, anti-oxidant, anti-inflammatory, anti-stress, anti-microbial which helps to improve skin health. The pharmacological activities reported in the present review validate the great therapeutic value of *Majith* and have now proven as source of several clinically important drug resources. The present review is an attempt to provide detailed information about the most common medicinal plant species named *Majith* (*Rubia cordifolia*). For this purpose we have consulted various journals, review papers and books for the analysis which are referred at the end of paper. It is strongly believed that the data presented in this review on utilization of *Majith* (*Rubia cordifolia*) and folk cultures might draw the attention of researchers to use this plant in modern medicines. More studies are yet to be done on these active components to explore the new therapeutic potential of the plant. And this review might help to open more doors of research in future.

Conflict of Interest: None.

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