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PHARMACOLOGICAL POTENTIAL OF *IVY GUARD* PLANT

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ABSTRACT: *Coccinia grandis* (L.) Voigt, commonly known as *Ivy gourd*, little gourd, or 'Kundru' in vernacular Indian languages, is a tropical perennial vine belonging to the Cucurbitaceae family. It is widely distributed across India, tropical Africa, Australia, and other Oriental countries, and has a long history of use in traditional medicine systems, such as Ayurveda and Unani. This review provides a comprehensive overview of the anti-inflammatory potential of *C. grandis*, encompassing its history, botanical characteristics, phytochemistry, and pharmacological profile. The plant is a rich source of essential nutrients, including protein, calcium, fiber, and beta-carotene (a precursor of vitamin A). It contains a diverse array of secondary metabolites, such as alkaloids, flavonoids, saponins, sterols, and triterpenoids (cucurbitacins B and D). The various parts of the plant (leaves, stems, fruits, and roots) have been used as a household remedy for a range of ailments, including skin eruptions, fevers, ulcers, and inflammation. Numerous scientific studies have validated these traditional claims, demonstrating significant anti-inflammatory, analgesic, anti-pyretic, and antioxidant activities through in vitro and in vivo models. The anti-inflammatory effects are largely attributed to the presence of phenolic compounds and the modulation of key inflammatory mediators and signaling pathways, such as NF-κB and p38 MAPK. The accumulated data strongly suggest that *C. grandis* is a promising source of natural anti-inflammatory agents with potential for the development of modern therapeutics.

INTRODUCTION: The great majority of people, especially those who reside in rural areas, primarily rely on medicinal plants to manage their illnesses. Approximately 7000 plant species can be found in India. The WHO estimates that about 80% of the population living in developing countries rely almost entirely on traditional medicine for their primary health care needs. According to Tamilselvan *et al.* (2011) [16], plants have significantly contributed to preserving human health and enhancing human life quality.

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The gourd, melon, and pumpkin families are all members of the Cucurbitaceae family. There are 960 species in the Cucurbitaceous family, which includes *Coccinia grandis*. The family is mostly found in tropical regions. According to Reddy (2009), the majority of plants in the Cucurbitaceae family are annual vines. Coccinia includes 29 additional species, and they are found only in tropical Africa.

Coccinia grandis is used by humans mostly as a food crop in several countries in Australia, Asia, the Caribbean, the southern United States, and the Pacific Islands. *Coccinia grandis* hosts several insects such as *Leptoglossus australis*, *Aphis gossypii* Glover, *Diaphania indica*, *Bactrocera cucurbitae*, and *Liriomyza* spp. India is home to 2500 of these species.

In indigenous medicine, some 800 plants have been utilized. Herbal drugs have many advantages over the synthetic formulations in having a longer pharmacological effect and less metabolic toxicity [1, 2].

FIG. 1: *IVY GOURD COCCINIA GRANDIS*

India is home to 2500 of these species. In indigenous medicine, some 800 plants have been utilized. Herbal medications provide a longer pharmacological impact and less metabolic toxicity than synthetic preparations, among other benefits. According to estimates from the World Health Organization (WHO), around 80% of people in underdeveloped nations get their primary medical care from traditional medicine. A significant part of *Coccinia grandis's* therapeutic qualities is its medicinal properties. The phytochemistry and pharmacology of the *Coccinia grandis* plant, which is a member of the Cucurbitaceae family, are highlighted in this review [3].

Vernacular Names [7]:
Vernacular Names of *Coccinia grandis*:

Marathi: Tindora, Tondli

Hindi: Parval, Tindora, Tinda, Kundru, Danish, Skariagenagurk

English: Scarlet

Telagu: Dondakaya

Kannada: Tondekay

Malayalam: Tendli, Ghiloda, Kundri, Kowai

Chinese: Hong Qua

Japanese: Yasai, Karasuuri

Malay: Pepasan, Kovakka, Kovai

Spanish: Pepino, Cimaron

TABLE 1: DIFFERENT VARIETY OF *COCCINIA GRANDIS* [4]

Name of Variety	Synonyme
Coccinia abyssinica (Lam.) Cogn	*Bryonia abyssinica* Lam
Coccinia adoensis (A. Rich.) Cogn.	*Coccinia parvifolia* Cogn., *Coccinia pubescens* (Sond.) Eyles, *Momordica adoensis* A. Rich.
Coccinia grandis (L.) J. Voigt	*Coccinia cordifolia* Wight, *Coccinia indica, Coccinia cordifolia, Cephalandra indica, Bryonia cordifolia, Coccinia grandis* (L.) Voig
Coccinia palmata (Sond.) Cogn.	*Cephalandra palmata* E. Mey. ex Sond.

TABLE 2: ESSENTIAL NUTRIANTS [4]: 100 G OF THE FRUIT HAS SEVERAL ESSENTIAL NUTRIENTS

Nutrients	g/mg
Water	93.5g
Protein	1.2g
Energy	75kJ (18 kcal)
Fiber	1.6g
Carbohydrate	3.1g
Fat	0.1g
Fe	1.4mg
Thiamin	0.07mg
Ascorbic acid	1.4mg
Riboflavin	0.08mg
Ca	40mg
Niacin	0.7mg

Classifications and Characteristics [13]:

Plant Division: Angiosperms (Flowering Seed Plants) (Dicotyledon)

Plant Growth Form: Climber

Lifespan (in Singapore): Perennial

Mode of Nutrition: Autotrophic

Plant Shape: Irregular

Biogeography:

Native Distribution: Africa to Malesia Preferred

Climate Zone: Tropical, Sub-Tropical / Monsoonal

Description and Ethnobotany:

Growth Form: A perennial, dioecious vine that can grow up to a length of 20m

Roots: Plant has tuberous roots and climbs *via* simple tendrils.

Foliage: Leaves are green. Shape can be broadly ovate, subpentagonal to orbicular in shape and may be lightly or palmately lobed.

Landscaping Features:

Desirable Plant Features: Ornamental Flowers, Ornamental Fruits

Landscape Uses: Container Planting Fauna, Pollination and Dispersal Fauna Pollination Dispersal Associated Fauna: Bee-Attracting

Plant Care and Propagation:

Light Preference: Full Sun

Water Preference: Little Water

Plant Growth Rate: Fast Foliar

Foliage Retention: Evergreen

Mature Foliage Colour(s): Green

Foliar Type: Simple / Unifoliate

Non-Foliar and Storage:

Stem Type & Modification: Woody, Herbaceous

Root Type: Underground (Fibrous Root)

Specialised Storage Organ(s): Underground (Root Tuber) Floral (Angiosperm)

Flower & Plant Sexuality: Unisexual Flowers, Dioecious

Flower Colour(s): White

Fruit, Seed and Spore:

Mature Fruit Colour(s): Red

Fruit Classification: Simple Fruit

Fruit Type: Fleshy Fruit, Berry

TABLE 3: OTHERS

Master ID:	81 Species
Species ID:	1377 Flora
Disclaimer:	The information in this website has been compiled from reliable sources, such as reference works on medicinal plants. It is not a substitute for medical advice or treatment, and NParks does not purport to provide any medical advice. Readers should always consult his/her physician before using or consuming a plant for medicinal purposes

Plant Division: Angiosperms (Flowering Seed Plants) (Dicotyledon)

Plant Growth Form: Climber

Lifespan (in Singapore): Perennial

Mode of Nutrition: Autotrophic

Plant Shape: Irregular

Plant Profile:

Synonyms: *Coccinia indica* Wight and Arn, *Bryonia grandis* and *Coccinia cordifoliaauct* [7]

Taxonomical classification [10]:

TABLE 4:

Kingdom	Plantae
Super Division	Spermatophyta
Division	Magnoliophyte
Class	Magnoliopsida
Order	Cucurbitales
Family	Cucurbitaceae
Genus	Coccinia
Species	*Coccinia grandis*

TABLE 5: CHEMICAL CONSTITUENT [10, 11]

Plant part	Chemical constituent
Leaves and stem	ß- Sitosterol, Cephalandrol, Cephalandrine A & B, Heptacosane
Roots	Alkaloids, ß- Amyrin, ß- Sitosterol, Carbonic acid, saponin- Coccinoside, flavonoid- Ombuin 3-o-arabinofuranoside, Lupeol, Resins, Stigmast7- en- 3-one.
Fruit	ß- Amyrin acetate, ß- Sitosterol, ß- Carotene, Cucurbitacin B, Lycopene, Lupeol, Taraxerol, Taraxerone
Seeds	Seeds contain fat and fixed oil which are mainly ester of linoleic, oleic and palmitic acids

TABLE 6: MEDICINAL VALUE [10, 11]

Plant part	Medicinal value
LEAF	Antidiabetic, Oxidant, Larvicadal, GI disturbances, Cooling effect to the eye, Gonorrhea, Hypolipidemic, Skin diseases, Urinary tract infection
FRUIT	Hypoglycemic, Cure sores on tongue, Analgesic, Antipyretic, Hepatoprotective, Tuberculosis, Eczema. Anti-inflammatory
STEAM	Antispasmodic, Asthma, Bronchitis, GIT disturbances, Urinary tract infection, Skin diseases, Expectorant
ROOT	Hypoglycemic, Antidiabetic, Skin diseases, Removes pain in joint, Urinary tract infection.

Geographical [11]: Originating in East Africa, *Coccinia grandis* has expanded over tropical Asia, America, and the Pacific.

However, only in the Pacific's Hawaiian and Mariana Islands has it become invasive. Small populations can be found in the northern territories, Western Australia, and the northern coastal regions of Queensland. (Maurice *et al.*, 2012).

Plant Part Description

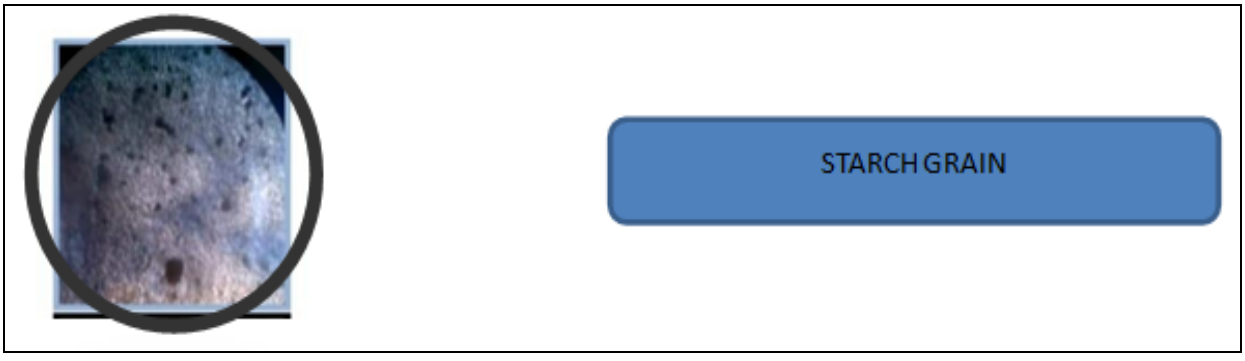
Leaves: The leaves are heart-shaped or pentagon-shaped, and they are placed alternately along the stems. (Up to 10 cm in length and width). The leaf's upper surface is hairless. The lower, however, is hairy. On the blade close to the leaf stalk are three to eight glands. Tendrils are easy to use. Dioecious is *Coccinia grandis*.

Flower: The flowers are big, white, and shaped like stars. The calyx has five subulate, recurved lobes, each 25 mm long on the hypanthium, peduncle 1–5 cm long. The white, campanulate corolla has three 4.5 cm long, deeply divided into five ovate lobes. Each flower has three stamens. The ovary of the *Coccinia grandis* flower is inferior. Staminate flowers are solitary, rarely in auxiliary clusters of 2-3, pedicels 15-50 mm long, lobes of calyx are subulate, recurved, 2-5 mm long, corolla lobes ovate, white, long about 15-20 mm; pistillate flowers solitary on stalks 10-30 mm long, hypanthium 10-15 mm long.

Fruit: The fruit is glabrous, hairless on the stalks, crimson, ovoid to elliptical, and 25–60 mm long by 15–35 mm in diameter.

Seed: The 6-7 mm long, tan seeds have thickened edge.

Microscopic Study:



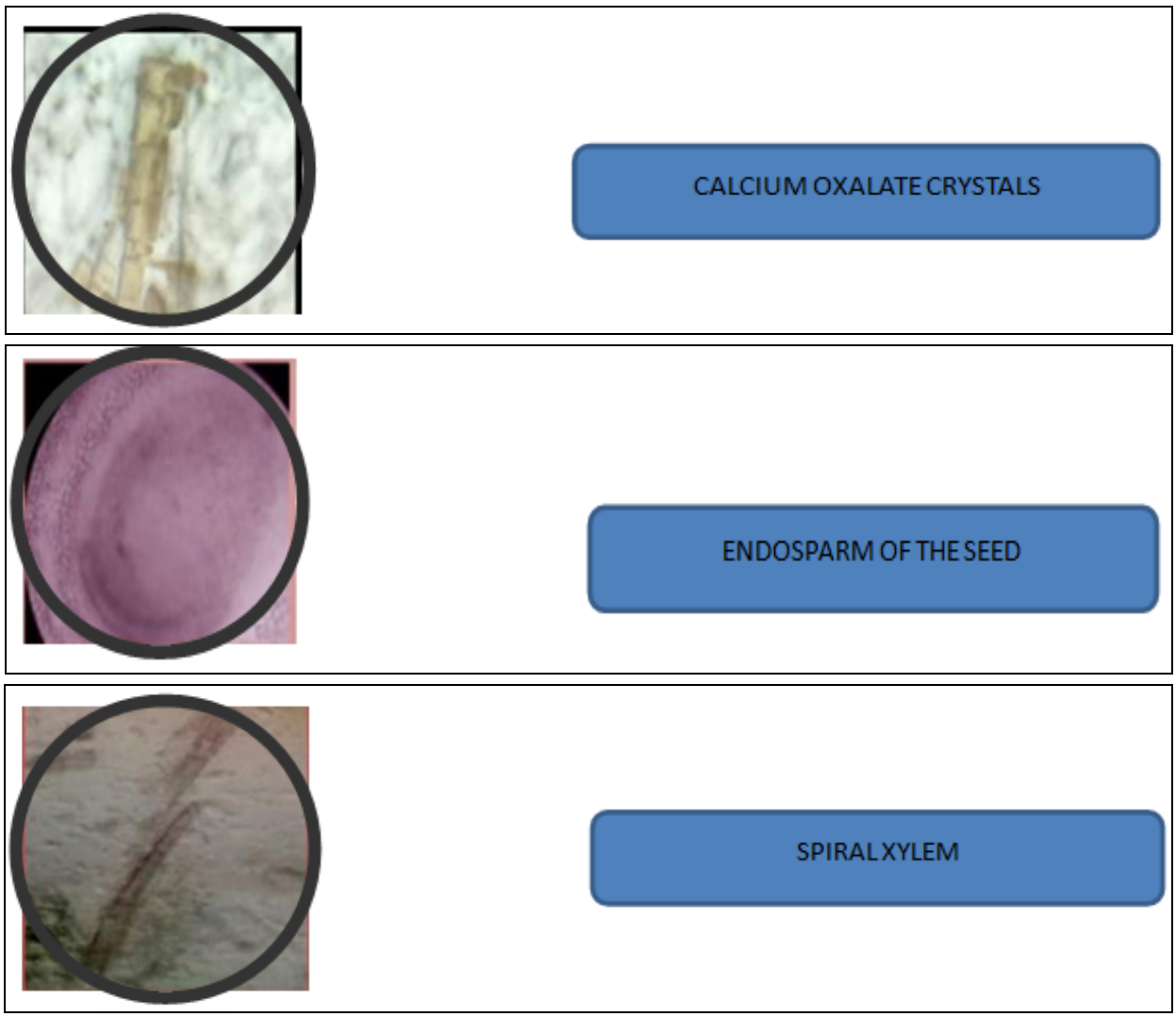


FIG. 2: MICROSCOPIC STUDY

Physical Parameter [12]:

Ash Values:

Determination of Total Ash Value: About three grams of air-dried powdered medication, precisely weighed, was placed in a crucible made of tarred silica and burned by progressively raising the temperature until it was dull red hot and carbon-free. Cooled, weighed, and then repeated until the value remained consistent. The percentage of total ash was then determined using the medication that had been air-dried.

Determination of Acid-Insoluble Ash Value: For five minutes, 25 milliliters of 2N HCL were used to boil the ash that was produced as instructed under the total ash value. After gathering the insoluble material on an ash-free filter paper, washing it with hot water, drying it, and weighing it, the percentage of acid insoluble ash was determined using the air-dried drug.

Determination of Water-Soluble Ash Value: For five minutes, the entire amount of ash was cooked with 25 milliliters of water. The insoluble matter was collected on an ash less filter paper, washed with hot water and ignited for 15 minutes at a temperature not exceeding 450 °C. The weight of total ash was deducted from the weight of insoluble materials. The difference in weight represents the water-soluble ash. The percentage of water-soluble ash was calculated with reference to the air-dried drug. Every ash value was computed and entered into **Table 6.**

Extractive Values: When the components of a medicine cannot be easily calculated by any other method, the extractive values of crude drugs help evaluate them. Furthermore, the type of components found in a crude medication is indicated by these numbers.

Determination of Alcohol Soluble Extractive Value: 10 grams of air-dried coarse *Coccinia grandis* macerated powder, and 100 milliliters of 90% ethanol were placed in a closed flask and left for 24 hours, shaking regularly for the first 6 hours and letting stand for 18 hours. After that, it was quickly filtered while being careful not to lose the solvent. Of that filtrate, 25 milliliters were dried by evaporation in a shallow dish with a tarred bottom, dried at 105 degrees Celsius, and weighed. The air-dried medications were taken into consideration while calculating the percentage of ethanol-soluble extractive value.

Determination of Water Soluble Extractive Value: Accurately weigh 10 grams of finely powdered medication, then macerate it with 100 milliliters of water in a closed flask for 24 hours. Shake the flask often during the first 6 hours and let it stand for 18 hours. After that, it was quickly filtered while being careful not to lose the solvent. The filtrate was then dried at 105°C and weighed after 25 milliliters were evaporated to dryness in a shallow dish with a tarred bottom. With reference to the air-dried medications, the percentage of water-soluble extractives was computed. The percentages of extractives that are soluble in water and alcohol were computed and entered into the tab.

Loss on Drying: A porcelain dish containing approximately 1.5 g of powdered medication was precisely weighed after it had been dried in a hot air oven at 105°C to a constant weight. **Table 7** shows the percentage loss of drying with respect to the air-dried substance, which was computed from the weight difference.

TABLE 7: STUDIED PARAMETER OF *IVY GROUNDS*

Studied Parameter	Observation
Loss on drying	6.9
Total ash value	5.2
Acid insoluble ash value	4.3
Water soluble ash value	3.1
Alcohol extractive value	16.7
Water extractive value	6.7

Phytochemical Screening [14, 15]: Qualitative examination of phytoconstituents:

Test for Alkaloids:

Dragendorff's Test: Mix 1 milliliter of the extract with 1 milliliter of the reagent (a solution of potassium bismuth iodide). Alkaloids are indicated by an orange-red precipitate. The orange-red precipitate is produced by ethanol extract, hexane fraction, chloroform fraction, and ethanol fraction.

Mayer's Test: To 1 gm of the extract, add 1 ml of Mayer's reagent (Potassium mercuric iodide solution). Whitish yellow or cream coloured precipitate indicates the presence of alkaloids. Ethanol extract, hexane fraction, chloroform fraction and ethanol fraction give the cream-coloured precipitate.

Wagner's Test: To 1 gm of the extract, add 2 ml of Wagner's reagent (Iodine in Potassium Iodide), Formation of reddish-brown precipitate indicates the presence of alkaloids. Ethanol extract, hexane fraction, chloroform fraction and ethanol fraction give the reddish brown precipitate

For the Carbohydrate Test:

Molisch's Test: Pour 1 milliliter of α-napthol solution into the extract, then pour strong sulfuric acid through the test tube's side. The presence of carbohydrates is indicated by a purple or reddish violet hue where the two liquids converge. The intersection of the two liquids is coloured purple by the ethanol extract and ethanol fraction.

Fehling's Exam: To 1gm of the extract, add equal quantities of Fehling solution A and B, upon heating formation of a brick red precipitate indicates the presence of sugars. Brick-red precipitate is produced by ethanol extract and ethanol fraction.

Test for Glycosides Legal Test: Make the extract alkaline by dissolving it in pyridine and adding sodium nitroprusside solution. When glycosides are present, a pink-red to crimson coloration forms. Ethanol extract and its three fractions do not give pink red to red colour.

Baljet Test: To 1gm of the test extract, add 1gm of sodium picrate solution and the yellow to orange colour reveals the presence of glycosides. Ethanol extract and its three fractions do not give yellow to orange colour.

Test for Phenolic Compounds and Tannins: Mix a small amount of the test solution with a basic lead acetate solution. When white precipitates start to

form, tannins are present. White precipitates are produced by ethanol extract, ethanol fraction, hexane fraction, and chloroform fraction.

When 1 gram of the extract is mixed with a ferric chloride solution, the resultant dark blue or greenish black product indicates the presence of tannins. Dark blue is produced by ethanol extract, ethanol fraction, hexane fraction, and chloroform fraction.

A solution of potassium ferric cyanide and ammonia is applied to the little amount of test extract. The presence of tannins is indicated by a deep red colour. Deep red coloration is produced *via* ethanol extract, ethanol fraction, hexane fraction, and chloroform fraction.

Test for Steroids:

Burchard-Libermann Test: After dissolving the test substance in a few drops of chloroform, adding three milliliters of acetic anhydride and glacial acetic acid, warming and cooling the mixture under the faucet, and adding drops of concentrated sulfuric acid along the test tube's sides, the test was completed. A bluish-green appearance indicates the presence of sterols.

Ethanol extract, ethanol fraction, hexane fraction, and chloroform fraction give bluish-green color

Test for Triterpenoid: To perform Noller's test, dissolve two or three tinmetal grains in two milliliters of thionyl chloride solution. The presence of triterpenoids is then indicated by the production of a pink colour after adding 1gm of the extract to a test tube and heating it. Pink coloration is produced by ethanol extract, ethanol fraction, and chloroform fraction.

Test for Flavonoid: Ferric chloride, sodium acetate, and amyl alcohol are used to treat a little amount of the extract. The presence of flavonoids is indicated by a yellow solution that forms and vanishes when an acid is added. When an ac is added, the yellow solution that forms from the ethanol extract, ethanol fraction, and hexane fraction goes away.

Test for Saponins: Add 20 milliliters of distilled water to a tiny amount of alcoholic and aqueous extract, and shake in a graduated cylinder for 15 minutes lengthwise. Saponin is indicated by a 1 cm layer of foam.

TABLE 8: STUDIED TEST FOR *IVY GROUND'S*

Test	Decoction	Alcohol maceration	Water maceration	Soxhlet extraction
Alcoloids				
Dragandraft test	+	+	+	+
Mayers test	+	+	+	+
Wagnars test	+	+	+	+
Hagars test	+	+	+	+
Carbohydrates				
Molisch test	+	+	+	+
Fehling test	+	+	+	+
Barfoets test	–	–	–	+
Benedicts test	–	–	–	–
Glycoside				
Balijet test	–	–	–	–
Phenol				
Lead acetate test	+	+	+	+
Tannins				
Ferric choride test	+	+	+	+

Pharmacological Profile [15, 16]:

Antimicrobial Activity: Bhattacharya *et al.* (2010) assessed the antibacterial activity of an aqueous extract of *Coccinia grandis* leaves against *Shigella flexneri* NICED, *Bacillus subtilis*, and *Escherichia coli*, *Shigella flexneri*, *Shigella dysenteries*, and *Salmonella choleraesuis.* Compared to the ethanol extract, the aqueous extract of *Coccinia grandis* exhibited more antibacterial activity. The extract's antibacterial qualities are mostly due to its polar moiety. *Coccinia cordifolia* chloroform extract has a moderate level of activity against *Bacillus subtilis* and *Sarcina lutea*. Extracts of ethyl acetate have anti-*Staphylococcus aureus* properties. It was discovered that hexane extract was effective against *Pseudomonas aeruginosa* and *Sarcina lutea*

(Bulbul *et al.*, 2011). Sivaraj *et al.* (2011) assessed *Coccinia grandis* leaf extract antibacterial efficacy using Solvents against five different bacterial species, including acetone, ethanol, methanol, aqueous, and hexane. *Coccinia grandis* leaf extract in ethanol had strong antibacterial action against *S. aureus, B. cereus, K. pneumoniae, E. coli,* and *S. pigeons.*

Anthelmintics Activity: *Coccinia grandis* methanolic extract has anthelmintic properties. The worm *Pheretima posthuma* was used for anti-helmintic activity. The extract's varying concentrations were utilized. Methanolic extract of *Coccinia grandis* acts by paralyzing the worm. The activity it is measured by the time taken to paralyze the worm and cause death.

Antioxidants Activity: In 2011, Moideen K. assessed that the flavonoids included in *Coccinia grandis* root ethanol extract are what give it its antioxidant properties. Methanolic extracts of Coccinia fruit Grandis has strong antioxidant properties. The *Coccinia grandis* methanol extract includes flavonoids and glycosides. *Coccinia grandis's* reducing power and hydrogen peroxide scavenging capacity are what give it its antioxidant action (Deshpande S. *et al.,* 2011; Mongolsilp S. *et al.,* 2004). The antioxidant activity of ethanol and methanol extracts is demonstrated. (M. Ashwini and others, 2012) Stem extract from *Coccinia grandis* that contains petroleum, chloroform, and ethyl acetate as solvents exhibits antioxidant properties. Compared to petroleum extract, ethyl acetate extract has stronger antioxidant properties. (S. Deshpande and others, 2011).

Anti-Ulcer Activity: In experimental rats, the anti-ulcer properties of an aqueous extract of *Coccinia grandis* leaves were examined using ethanol-induced ulcer models and pylorus ligation. The ulcer index was established in both models. Aqueous extract of *Coccinia grandis* at doses of 250 and 500 mg/kg produced significant inhibition of the gastric lesions induced by pylorus ligation-induced ulcer and ethanol-induced gastric ulcer. The extract showed a significant reduction in ulcer index, free acidity and gastric (Girish C. *et al.,* 2011; Manoharan P. *et al,* 2010) evaluated the Ethanol, aqueous and total aqueous extract for antiulcer activity in pylorus ligation-induced gastric ulcer. Ethanolic extract showed the antisecretory mechanism for its antiulcerogenic activity. At 400 mg/kg, an ethanolic plant extract had antiulcerogenic properties similar to those of omeprazole.

Antimalarial Activity: According to Sundaram R. *et al.* (2012), *Coccinia grandis* extract exhibits strong anti-plasmodial action against *Plasmodium falciparum*. *Coccinia grandis* leaf extract in water reduces the levels of blood urea nitrogen, total protein, SGPT, SGOT, and ALP. The antimalarial action of *Coccinia grandis* extract is attributed to its hydrophilic moiety. The extract significantly reduced the Plasmodium berghei parasite count in mice (Samanta A. *et al.,* 2011). The Methanolic extract of *Coccinia grandis* is used for larvicidal activity. (Rahumann A. 2008).

Anti-Inflammatory Activity: *Coccinia indica* Wight & Arn's methanolic fruit extract exhibits anti-inflammatory properties, which may be attributed to the phytoconstituents flavonoids, tannins, triterpenoids, reducing sugars, and saponins. Rat paw oedema caused by carrageenan is more inhibited by a 60% methanolic extract than by the common medication, diclofenac sodium, at a dosage of 10 mg/kg. A plethysmometer is used to measure the paw volume one, two, and three hours following the carrageenan injection. At a dose level of 200 mg/kg, the methanolic fruit extract exhibits 57.24% suppression in paw oedema, which is similar to the diclofenac-treated group's 51.97% inhibition after three hours. Additionally, the extract considerably lessens the granuloma that rats get from cotton pellets. The inhibition percentage is 59.05% at the 200 mg/kg dosage level. This suggests that it is highly effective in lowering the quantity of fibroblasts and the production of collagen and mucopolysaccharides, which are in charge of the development of granuloma tissue. Therefore, the anti-inflammatory model demonstrates that the plant's methanolic fruit extract has anti-arthritic and antiproliferative properties.

Antipyretic Activity: Aggarwal A. (2011) assessed the antipyretic properties of *Coccinia grandis* methanolic extract at 100 and 200 mg/kg in cases of fever caused by yeast. The extract exhibited antipyretic properties. Action through

affecting the production of prostaglandins. Prostaglandin is thought to control body temperature. Glycosides, alkaloids, flavonoids, terpenoids, phenols, and tannins are all present in *Coccinia grandis* extract.

Analgesic Activity: The analgesic activity was assessed using hot plate models, tail immersion, and acetic acid-induced writhing. A methanol extract of acetic acid is used to alleviate analgesia caused by *Coccinia grandis*. Glycosides, alkaloids, flavonoids, terpenoids, phenols, and tannins were detected in a methanolic extract of *Coccinia grandis* leaves. The active component or compounds in the *Coccinia grandis* methanol extract may have analgesic effects through peripheral rather than central mechanisms. *Coccinia grandis* lessens the issues that acetic acid causes [8].

Hypoglycemia Activity: In streptozotocin-induced diabetic rats, Mallick C. (2007) assessed the antidiabetic potential of a combination extract of *Musa paradisiaca* and *Coccinia indica* leaf aqueous extract. The ethanolic extract of the aerial part decreases blood glucose levels and lipid parameters in streptozotocin-induced diabetic rats at 100 or 200 mg/kg. In rats with alloxan-induced diabetes, chronic administration of fruit extract 200 mg/kg for 14 days lowers blood glucose levels (Gunjan M. *et al.,* 2010).

Antifungal Activity: The antifungal activity of the *Coccinia grandis* leaf extract against *Aspergillus nigger, Candida tropicalis*, and *Candida albicans*-II was assessed by Bhattacharya B. (2010). *Candida tropicalis* II, *Saccharomyces cerevisiae, Candida albicans* ATCC, and *Cryptococcus neoformans*. In terms of generating antifungal activity, the ethanol extract is more important. The extract's nonpolar portions have stronger antifungal effects. Ethanolic extract is more susceptible to *Aspergillus niger* and both strains of *Candida albicans*, while aqueous extract is more sensitive to both strains [9].

Hepatoprotective Activity: Vadivu R. (2008) assessed the hepatoprotective potential of an alcoholic extract o*f Coccinia grandis* fruit against hepatotoxicity caused by carbon tetrachloride in rats used in experiments. The SGPT, SGOT, and bilirubin levels were considerably lowered after treatment with 250 mg/kg of fruit ethanolic extract. The extract's hepatoprotective properties might result from the fruits' flavonoid antioxidant properties. Flavonoids, triterpens and tannin are antioxidant agents present in *Coccinia grandis* and may interfere with free radical formation confirmed that the Hepatoprotective activities of certain flavonoids are known.

Dyslipidemia Activity: By reducing the hamsters' levels of cholesterol and triglycerides, Singha G. (2007) assessed the anti-dyslipidemic effects of a chloroform extract of *Coccinia grandis* leaves. The polyprenol-containing chloroform extract of *Coccinia grandis* leaves decreases the plasma lipid profile before raising the ratio of high-density lipid cholesterol to total cholesterol. This plant yielded the first isolation of C60 polyprenol. When administered to dyslipidemic hamsters fed a high-fat diet at a dose of 50 mg/kg body weight, it significantly reduced blood triglycerides by 42%, total cholesterol by 25%, and glycerol by 12%. Aqueous and ethanolic extracts of leaves can be used for control of obesity (Mishra R *et al.,* 2012).

Anti-Cancer Activity: Numerous veggies have been shown to lower the risk of cancer. One of them is *Coccinia grandis.* The anticancer activity of the *Coccinia grandis* is due to its antioxidant nature. The antioxidant nature of *Coccinia grandis* reduces the ferric to ferrous. Hydrogen peroxide scavenged from *Coccinia grandis* neutralizes to water (Behera S. *et al.,* 2012). Bhattacharya B. (2011) evaluated the aqueous extract of leaves of *Coccinia grandis* for anticancer activity. Nitric oxide is a free radical that plays an important role in the pathogenesis of pain and inflammation. The antioxidant principle of *Coccinia grandis* decreases the nitrite generated by decomposition. The graded response produced by the cell is comparatively less. *Coccinia grandis* significantly reduced viable cell count and increased non-viable cell count suggesting comparable anticancer property with that of the reference drug (vinblastine) (Bhattacharya B. *et al.,* 2011).

Antitussive Activity: The analgesic potential of methanol extracts of *Coccinia grandis* fruit was assessed by Pattanayak S. (2009). *Coccinia grandis* has been widely used to treat coughing and asthma by India's native inhabitants. The methanol extracts

of the fruit of *Coccinia grandis* show the presence of alkaloids, tannins, steroids, triterpenoids, glycosides, carbohydrates and reducing sugar. The Antitussive activity of the methanol extract has been compared with that of codeine (an Antitussive drug). The methanol extract of *Coccinia grandis* fruit showed a significant decrease in cough induced by the chemical simulation, similar to codeine phosphate, in a dose-dependent manner. The methanol extract produces maximum inhibition of cough at 90 min. The extract of the 400 mg/kg dosing level at 90 minutes produced the greatest suppression of cough (56.71%). The central nervous system is how the methanol extract works. The mutagenic effect. By gradually slowing down mycelial growth, an aqueous extract of *Coccinia grandis* leaves inhibited growth and mutagenesis on *Neurospora crassa*. This outcome suggests that *Neurospora crassa* is mutagenic to the *Coccinia grandis* plant. (M. Bhuiyan and others, 2009).

Alpha-Amylase Inhibition Activity: Jaiboon V. (2011) evaluated the methanolic extract of *Coccinia grandis* for alpha amylase inhibitory activity. The dried plant material was extracted with 50% aqueous methanol (10 ml/g dry 118 114 119 wt.) and redissolved in 50% aqueous DMSO (10 ml/g dry wt.) and subjected to alpha-amylase inhibitory activity.

CONCLUSION: Our comprehensive review of scientific studies confirms that the *Ivy gourd* plant *(Coccinia grandis)*, known by common names like 'Kundru' or 'little gourd', is a powerful natural remedy for inflammation. This plant has been used for centuries in traditional medicine because it contains special natural chemicals (phytochemicals) like flavonoids and phenolic compounds that help reduce swelling and pain in the body. Modern research, mostly in labs and animal studies, has proven that different parts of the ivy gourd work effectively to calm inflammation. These natural compounds function similarly to common anti-inflammatory medications, but come from a natural source. In short, the *Ivy gourd* is a very promising plant for creating new, safe, and effective natural medicines. To move forward, scientists now need to conduct more detailed studies and human clinical trials to fully understand how these compounds work and turn this traditional wisdom into approved modern treatments.

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