A Scientific Update on Juglans Regia Linn.
Gunjan Verma *, Vandana Sharma
Arya College of Pharmacy, Jaipur, Rajasthan, India

ABSTRACT

Medicinal herbs having a great role in human health care and welfare services. These herbs widely used in Ayurveda, Homeopathic and Allopathic systems having various therapeutic properties. Walnut (Juglans regia L.) are the plants belonging to the family Juglandaceae commonly known as Akhrot. It is widely distributed in China, United State, Jammu & Kashmir, Himachal Pradesh, Arunachal Pradesh, Uttarakhand. It has different varieties such as Black walnut, English/Persian walnut, butternut/white walnut. J. regia L. have many marketed formulations such as Topical formulations like Walnut oil, Face wash, Exfoliating scrub, Soap, Shampoo, Hair color and Oral formulations like capsules, tinctures, dilutions, shell powder. Chemical study reveals that J. regia L. contains Juglone, Alkaloids, Flavonoids, Saponins, Polyphenols, Polyunsaturated fatty acids, Oleic acids, Linoleic acids, Proteins, Naphthaquinones, Ascorbic acid, Sitosterol, Tannins. Walnut contains different nutritional components like Carbohydrates, Proteins, Dietary fibres, Iron, Phosphorus, vitamin E & C. This plant possess beneficial effects include Antimicrobial, Antioxidant, Anticancer, Antidiabetic, Anthelmintic, Antiinflammatory, Antidepressant, Hepatoprotective. Antiulcer, Antiaging and Hypocholesteremic activity and other therapeutic activities. It is believed to be used in Dental plaque, Gingivitis, Oral hygiene, Eczema, Hemorrhoids, Burns, Blood Purifier, Dyeing or Colorant, Antiseptic and Astringent. In the present study, Pharmacognostic and Pharmacological properties of J. regia L. have been discussed. This review highlights the various Ethobotanical and traditional uses as well as Pharmacognostic and Pharmacological report on J. regia L.

Key words: Anti diabetic, Juglans regia, Juglone, Polyphenols, Nutritional value.

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*Address for Correspondence:
Gunjan Verma, Arya College of Pharmacy, Jaipur

INTRODUCTION

The system of medicine organized in India and absorbed in to the Indian culture. Indian medicinal practice includes AYUSH, Ayurveda, Unani, Siddha, Yoga, Naturopathy and Homeopathy. The word Ayurveda is made up of the two Sanskrit words “Ayu” means life and “Veda” means knowledge and “It is the science of life”. Ayurveda is the part of Adharvaveda, nature and science. Indian traditional medicine plays a great role in human health care and welfare services. In India, the history of traditional medicines have before 5000 years BCE. In ancient literature, there are different medicinal manuscripts like Atharveda (enlisted use of 290 medicinal plants), 1200 B.C), Rigveda (contains therapeutic uses of 67 plants, 1700-1100 B.C), Yajurveda (enlisted use of 81 plants, 1400-1000), Sushruta samhita (enlisted use of 395 plants, 660 B.C), Charakha samhita (describe use of 341 plants, 990 B.C), Dhanwantari nigantu (contains many medicinal plants). It is noticed that the method mentioned in Adharvaveda is more beneficial in humans than mentioned in different Vedas. Charakha and Sushruta samhita are the compendium of Ayurveda. Charakha samhita includes the knowledge of medicines and Sushruta samhita includes detail on surgery than medicines. In the Global Market, there are several medicinal plants which having therapeutic activity and it is the good source for the treatment of minor to major problems like Cold, Cough, Skin rashes, Bacterial and Fungal infections, Diabetes, Cancer, Arthritis, Tuberculosis etc. Different parts of plants like root, bark, fruit, flower, seed, leaves, stem etc and their secondary product like gum, resin show biological activity. This plant contains active constituents such as vitamins, minerals, enzymes and trace elements which having a great role in Pharmaceutical formulations.

In the present study we have gone through a comprehensive review of common walnut, Juglans regia Linn. (J. regia L.),
belonging to the family Juglandaceae. It is also known as English walnut, Persian walnut, common walnut Akhrot, Aksoda, Aksota. It is widely distributed in Southern Europe, Western Asia, Central Asia, Kashmir, Tajikistan, Kyrgyzstan, China, United State, Turkey, India, Australia, New Zealand. This plant can live over a duration of 100-200 years and some species for 1000 years\(^6\). All parts of *J. regia* L. such as leaves, bark, green husk, shell, seed, fruit have pharmacological activities\(^7\). *J. regia* L. is a source of vitamin E, monounsaturated fatty acids, omega 3 fatty acids and arachidonic acids\(^8\). *J. regia* L. is an ayurvedic traditional plant and it is used as an ingredient of many marketed formulations mentioned below in table no. 6. China is the largest and United State is the second largest producer of walnut in the world\(^9\). According to Indian scenario it is mainly cultivated in Jammu & Kashmir, Arunachal pradesh, Himachal pradesh and Uttarakhand\(^10\). In the world, there are different varieties of walnut such as black walnut (*Juglans nigra*), English or Persian walnut (*J. regia* L.), Butter or white walnut (*Juglans cinerea*). English walnut not too hard to crack than black or white walnut\(^11\).

*J. regia* L. contains various type of chemical constituents such as Juglone, polyphenols, Flavonoids, Terpenoids, Steroids, Ascorbic acid, Gallic acid, Sitoesterol, Quercetin and Omega 3 Fatty acid\(^12\)-\(^14\). *J. regia* L. is reported to use as Antiinflammatory, Diuretic, Anticancer, Laxatives, Antidiabetic, Antiatherogenic, Antimutagenic, Antifungal, Antioxidant, Anti-septic, Antibacterial, Antiallergic, Astringent, and Antiulcer. It is useful in traditional medicines for the treatment of Cardiac diseases, Dental plaque, reduces Cholesterol level, Blood purifier, regulate Immune system. The nut of *J. regia* L. is used in Cosmetic, Food and Pharmaceutical industry\(^15\).

### Table 1: A common name of *J. regia* L. in the various region of India

| S.no | Country   | Languages   | Common Names | References |
|------|-----------|-------------|--------------|------------|
| 1.   | India     | Hindi       | Akhrot       | [16]       |
| 2.   | India     | Kashmiri    | Doon         | *          |
| 3.   | India     | Unani       | Gardgani     | [16]       |
| 4.   | India     | Sanskrit    | Akschota     | [11]       |
| 5.   | India     | Tamil       | Akrhou       | [11]       |
| 6.   | India     | Telgu       | Akroot kaya  | [11]       |
| 7.   | India     | Gujarati    | Akrarot      | *          |
| 8.   | India     | Urdu        | Akhroof      | [11]       |
| 9.   | India     | Bengali     | Bosnian      | *          |
| 10.  | India     | Marathi     | Akroot       | [11]       |

### Table 2: A common name of *J. regia* in other countries

| S.no | Countries | Common names          | References |
|------|-----------|-----------------------|------------|
| 1.   | China     | Long zhu guo          | [11]       |
| 2.   | Japan     | Kusa-tokeiso          | *          |
| 3.   | Singapore | Timun hutan           | *          |
| 4.   | Sri Lanka | Kodimathulai          | *          |
| 5.   | Mexico    | Clavelin blanco       | *          |
| 6.   | Hawai     | Scarlet fruited passion flower | [11] |

**Taxonomical Classification**\(^11\)

- **Kingdom-** Plantae
- **Division-** Magnoliophyta
- **Class –** Magnoliopsida
- **Order –** Fagales
- **Family –** Juglandaceae
- **Genus –** Juglans L.
- **Species –** *Juglans regia* L.
Cultivation & Collection: 9,11,16,17

Walnut is grown in deep, fertile, loamy soil, free from alkali. Seed is sown about 4-10 cm deep in soil. Seed germinates in 1-2 weeks after planting. Nitrogen, Potassium, Phosphorus are the common elements must be available in the soil for germination of seed. The climate should be sunny because it is intolerant in wet or rainy climate. The main problem of this plant is that on heavy rainfall deterioration will start which reduces the number of flowers. The pH of soil should be 6-8. Plant should be protected from vermin by covering them from the net. The Plantation of J. regia L occurs in spring season. Flowering is done in the month of April and Pruning occurs between June and December. Harvesting of plant occurs in the month of September and it continued till November. Walnuts are ready to harvest when green husk is split and nut is falling from the tree. Harvesting occurs via shaking the tree by hands or using long poles. Delaying in harvesting reduce the quality of nuts and kernels. Dried nut stored at room temperature for 4-5 months and freeze for 1-2 years. For packaging, Green husk of fruit removes by wet scrubber and nut dried for 24 hrs to remove moisture. Proper drying of walnuts improves the quality and life of nuts.

Morphology: 6, 11, 18

J. regia L. is a large deciduous tree having height 25-35m and diameter 2 m. Bark is silver-grey in color having smooth and wide fissures. The color of the sap wood is creamy-white and heart wood is dark chocolate. Leaves are arranged in alternate and imparipinnate manner. It is Yellowish green in color having aromatic odour and Astringent taste. It is 20-35cm in length and 5-15cm in width. It has ovate and lanceolate shape.

Flowers are monoeccious, small yellowish green in colour. The male flowers are arranged in the manner of pendulous slender catkins and female flowers are in 1-3 flower terminal catkins which born in the form of clusters. The male and female reproductive organs exist on the same plant so for the pollination some trees grow near to each other. J. regia L. fruit is 5cm long with leathery, wrinkled exocarp and hard endocarp having 4 lobes. Fruits are born in the form of clusters. Seeds are edible. Nuts are round in shape, having size 1.5-2 inches.
Medicinal uses: J. regia L. is a traditional medicine, has been used in different Ayurvedic formulations since a long ago. Different parts of J. regia L. like bark, leaves, fruit, flower, seed, pericarp found various medicinal uses. Some of the medicinal uses of J. regia L. have been mentioned in table 3 given below:

| S.no. | Parts                  | Medicinal uses                                                                 | References |
|-------|------------------------|--------------------------------------------------------------------------------|------------|
| 1     | Bark                   | Oral cavity hygiene, Gingivitis, Dental plaque, Cleaning of teeth, Antiinflammatory, Diuretic, Laxative, Blood purifier, as colorant for dyeing or coloring the lips | [12]       |
| 2     | Leaves                 | Hyperglycemia, Eczema, Hemorrhoids, Diabetes, Hypercholesteremia, Urinary tract infection, Antibacterial, Antioxidant, Anti ulcer, Anthelmintic | [21-23]    |
| 3     | Fruit and green husk  | Goitre, Diabetes, Hepatic and Renal disease, Myocardial infraction, burns, Mental retardation, Galactagogue, oral contraceptives, Textile or Dyeing industry | [24,25]    |
| 4     | Flower                 | Skin inflammation, Antiucler, Antidiarrheol, Antiseptic, Astringent             | [26]       |
| 5     | Seed                   | Antiatherogenic, Antimutagenic, Breast and Colon cancer.                         | [27]       |
| 6     | Pellicle               | Antioxidant, Antiinflammatory, Antiatherogenic, Antimicrobial, Liver protective, Antidiabetic | [28]       |
| 7     | Walnut oil             | Inflammation, Diabetes, Diabetic neuropathy, Immunomodulatory, Cardiovascular disease | [14,29]    |

Nutritional Value: J. regia L. is the best source of Iron, Phosphorus, Carbohydrate and Protein. It has fat and dietary supplements which help in lowering the blood cholesterol level, lipids, LDL and HDL.
Table: 4 Nutritional values of various components of *J. regia* L.

| Substance              | Value   |
|------------------------|---------|
| Carbohydrate          | 13.7%   |
| Dietary fiber         | 31-52 gm/kg |
| Total proteins        | 15.7%   |
| Iron                  | 40 mg%  |
| Phosphorus            | 340 mg% |
| Unsaturated fatty acid| 63-90%  |
| Vitamin C             | 40%     |
| Vitamin E             | 24.5%   |

Chemical Constituents:

*J. regia* L. is a rich source of various types of chemical compounds. It plays a great role in the ayurvedic and homeopathic system of medicine. It contains different biologically active substances like Polyphenols, Flavonoids, Steroids, Phospholipids, Triterpenes, Quinines, Fatty acids, Tannins like Gallic Acid and Ellagic Acid. Ellagic acid is responsible for anticancer property and immunization. The active constituent of *J. regia* L. is Juglone (quinone). *J. regia* L. bark contain higher polyphenolic compounds which are responsible for antioxidant and antibacterial activities. The leaves of *J. regia* L. is highly rich in alkaloids, saponins, flavonoids which exhibits antidiabetic effect. Walnut oil contains omega 3 and omega 6 polyunsaturated fatty acid, mono, di, tri acylglycerol, free fatty acids, oleic and linoleic acid which is helpful in heart disease, lowering the blood cholesterol and sugar level.

The green husk shell contains juglone and polyphenols which are used in textile dyeing industries. *J. regia* L. plant contains monoterpenes, sesquiterpenes, juglone, sterols, tocopherols, proteins, dietary fibres, melatonin, folate. This study has found that *J. regia* L. contains varieties of chemical constituents containing different biological activities.

Table: 4 Chemical components present in different parts of *J. regia* L.:

| Part of plant | Chemical components                                                                 |
|---------------|-------------------------------------------------------------------------------------|
| Leaves        | Alkaloid, Saponin, Flavonoids, Napthaquinones                                      |
| Green walnut shell | Juglone, polyphenols, Naphthols, Tannins                                       |
| Walnut oil    | Poly Unsaturated Fatty Acids, Monoaclglycerol, Diacylglycerol, Triacylglycerol, Oleic and Linoleic Acid |
| Bark          | Polyphenols                                                                        |
| Seed          | Protein                                                                            |
| Stem          | Juglone, Sitosterol, Ascorbic Acid, Quercetin-3-Larabinoside, Phenols, Flavonoids, Napthaquinones |
| Flower        | Gallic acid, Coumarin, Quercetin, Polyphenols, Flavonoids, Sterols, Fat, Protein, Vitamin, Minerals |

Previous Findings:

Table: 5 Therapeutic activities of various parts of *J. regia* L.:

| Therapeutic activity                                  | Extract used               | Part used            | References |
|-------------------------------------------------------|----------------------------|----------------------|------------|
| Antimicrobial activity                                | Aqueous/Ethanol            | Bark                 | [12,20,22] |
| Antimycobacterial activity                           | Hexane/Methanol/Aqueous/Ethanol | Bark, Leaves        | [36]       |
| Antidiabetic effect                                  | Ethanol /Aqueous           | Leaves, Septum      | [14,21,35] |
| Antioxidant activity                                 | Methanol / Aqueous         | Pericarp (Green Husk), Bark | [30,34] |
| Antifungal activity                                  | Alcohol /Methanol          | Stem Bark, Leaves   | [23,37,38] |
| Antidepressant, antihypoxic, anti-inflammatory        | Methanol                   | Flower               | [26]       |
| Platelet aggregation, bleeding time, plasma coagulation | Aqueous                    | Root Bark           | [39]       |
| Thyroid hormone enhancing activity                  | Aqueous                    | Fruit                | [24]       |
Anticancer activity: 27,40

Anti cancer activity was performed on the alcoholic extract of J. regia L. stem bark. It was estimated by in vitro method against three isolates of fungi (Rhizoctonia solani) isolated from cauliflower, tomato and egg. The J. regia L. extract reduce the radial growth of fungus and the inhibition of radial growth was 3.5cm at 5% concentration of plant extract and decrease gradually 0.4cm at 20% concentration of plant extract. J. regia L. 20% concentration of extract show high inhibition of fungus Rhizoctonia solani and this method was studied by Mohammed Nadeem Kasim Hantoosh et al. (2018) and Emira noumi et al. (2011). Juglone, sitosterol, ascorbic acid, quercetin-3-larabinoside, polyphenols, flavonoids are the main constituents of J. regia L stem bark. Antifungal activity was also performed on the different extract of J. regia L. leaves effective against Candida albicans studied by Hubert sytykiewicz et al. (2015)

**Anti fungal activity:** 23,37,38

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**Anti inflammatory activity:** 29

Anti inflammatory and Anti nociceptive activity was studied on ethyl acetate extract of J. regia L. kernels and oil. Linoleic acid was responsible for the reduction of inflammation, pain and blood sugar level. It increased the level of serum insulin and normalise the glycated haemoglobin level. The ethyl acetate extract of kernels reduced the blood sugar level and increased the insulin level. This method was evaluated by Karim Rafat (2018) and Phytochemical analysis was done on the basis of GC-MS, GC-FID, RP-HPLC. J. regia L. oil and kernel show high anti nociceptive effect.
sanguis. The iranian bark of the juglone show antimicrobial effect against the oral bacteria. This activity studied by Faramarz zakavi et al.(2013). The aqueous and ethanolic extract were evaluated by using disk diffusion method. The result showed that sanguis and mutans species of streptococcus were most resistant to ethanol and aqueous extract respectively. The ethanol extract having significant anti bacterial activity against all tested bacteria. In vitro antimicrobial activity of green husk and leaves of J.regia L. was studied by Dilek keskin et al. (2012) and Bennacer amel et al. (2017). Anti microbial activity was also studied on the fruit extract of J.regia L. by Afaj H. Al- Nadaf et al. (2018) hence it is used as natural antimicrobial agent for oral hygiene.

**Hepato-Protective Activity:**

Hepato-protective activity was studied in J.regia L. leaves extract. Akram eidi et al. (2013) was studied the liver damage in animals which induced by using carbon tetra chloride(CCl₄). animals were divided in to seven groups. After 28 days of treatment animals were sacrificed and liver damage was examined by using various parameters such as serum biochemical parameters and histopathological observations. J.regia L. leaves extract exhibited the significant decrease in serum parameters and increase in antioxidant enzymes. Histopathological examination showed that leaves extract decrease fatty acid degeneration from carbon tetra chloride treated rats. It was concluded that J.regia L. leaves extract exhibits hepato-protective activity.

**Gastro-Protective Activity:**

Gastroprotective activity was monitored in the leaves extract of J.regia L. on albino rats. It was responsible for antiulcer activity against pylorus ligation method. The chemical agents like aspirin and ethanol induced gastric ulcers in animals at 500mg/kg body weight. This method was summarized by Kumarsaswamy dabburu et al. (2012). Animals were divided into 3 groups: control, standard and test. In pylorus ligation method J.regia L. extract showed the significant decrease in ulcer index. It was affected against ethanol and aspirin induced gastric ulcer. The gastro-protective effect was evaluated by histopathological examinations, hence J.regia L. leaves extract exhibited a potent gastro-protective activity.

**Hypcholestremic effect:**

This study monitored the activity of J.regia L. leaves in hypercholesterolemic rats. The antioxidant activity played an important role to overcome the hypercholesterolemic problems. Fifty albino rats were divided into 5 group of 8. J.regia L. leaves powder mixed with food at different concentrations 1%, 2% and 5%. After 40 days of treatment, the blood sample was collected and examined the various biochemical parameters such as triglycerides, cholesterol, LDL, HDL etc. The result showed that J.regia L. leaves powder reduced the cholesterol, LDL-C, triglycerides and increased the HDL-C level. This method was studied by Mahmoodi et al. (2011) and it was concluded that walnut leaves powder had a potent effect on cholesterol and lipid profile and helpful in reducing of cardiovascular disease.

**Anti Diabetic Activity:**

Anti diabetic activity was studied in ethanol extract of leaves in streptozotocin induced diabetic models. This antidiabetic activity was studied by Jamshid Mohammadi et al. (2010). Animals were divided in to four groups. Group 1 fed with normal diet and group 2,3,4 treated with streptozotocin. Then group 3 & 4 treated with J.regia L. leaves extract at different concentration e.g 200mg/kg and 400 mg/kg for 28 days. The alcholic extract of J.regia L. had a significant effect in lowering the triglyceride level. On increasing the concentration of leaves extract insulin level also increased but the HDL level was not change in any group study. The cholesterol, LDL, VLDL level reduced significantly when compared from diabetes inducing groups. The antidiabetic activity of the different parts of J.regia L. via alloxan induced diabetic animals were studied by Parivash Rahimi et al. (2011) and Susankhosroyar et al. (2017).

**Anthelmintic Activity:**

In vitro Anthelmintic activity was studied in different extracts of J.regia L. leaves by using an indian earthworm (Pheritima Posthuma). This in vitro activity was studied by Das et al. (2011). Leaves were extracted by using different solvents like petroleum ether, methanol and water (maceration method). On Phytochemical screening of different extracts of leaves revealed that it contains alkaloids, saponins, flavonoids, tannins. Earthworms were divided in to five groups. Each group contains six earthworms. Extract was administered at different concentration and piperazine citrate used as standard. Observation was done by calculating the time of paralysis and death of Earthworm. Water extract had significant activity than petroleum ether extract.

**Anti mycobacterial activity:**

Anti mycobacterial activity was studied on various extracts of bark and leaves of J.regia L. by Delia Elva Cruz-Vega et al. (2008). Leaves contain Monoterpenes, Sesquiterpenes and Bark contains Juglone, Regiolone, Sterol, Flavanoid. The minimal inhibitory concentration (MIC) was exhibited by hexane bark and methanol leaf extract. The aqueous and ethanol extract of bark and leaves had not show any anti mycobacterial activity.

**Antioxidant activity:**

Antioxidant activity on various extracts of bark and green husk of J.regia L. was performed by Kanchan Bhatia et al.(2006) and Ksenija kojicic et al.(2018) respectively. They analysed DPPH scavenging effect and Cyclophosphamide induced urotoxicity in mice. On increasing the concentration of extract radical scavenging activity also enhanced. It was analysed on research that all part of walnut like husk, leaf, seed, fruit, shell, pellicle, kernels show anti oxidant activity. All methanol extract show higher antioxidant activity than petroleum ether extract.

**Thyroid hormone enhancing activity:**

Thyroid hormone enhancing activity was studied on fruit extract of J.regia L. This activity was performed by Y.Ozturk et al. (1994) by preparing fresh juice from plant
material or extraction by boiling with distilled water. Aqueous extract was used as an oral contraceptive and show anti implantation activity. The extract of *J. regia* L. increases the thyroid hormone level in mice.

**Marketed Formulations Containing *J. regia* L. as main ingredient:**

| S.no. | Product name                     | Manufacturer                  | Indications                                                                 |
|-------|----------------------------------|-------------------------------|-----------------------------------------------------------------------------|
| 1.    | Walnut herbal extract Capsules   | Shudhanta Herbal Product      | Memory booster, Dietary Supplement, Improve brain function, makes bones stronger. |
| 2.    | Walnut oil                       | KS essentials, Park Daniel    | As hair oil, Paint thinner, wood oil, skin care, emollient.                  |
| 3.    | Exfoliating Walnut Face scrub    | Bipha Ayurveda, Bajaj Nomarks, Biocare, Himalaya, Biotique, Sri Sri tattva | Skin cleaner, Remove impurities and improve skin tone, remove dead skin cells. |
| 4.    | Herbal Hair Color walnut red brown | Logana Naturkosmetik           | Radiant color, shine and brown hair.                                         |
| 5.    | Body language face wash           | The Elite                     | Cleansing skin and remove impurities.                                        |
| 6.    | *J. regia* L. Gemmae bud          | Unda Gemmo                    | Dietary Supplement                                                           |
| 7.    | Gemmotherapy G75 *J. regia*       | Herbal Gem                    | Dietary supplement                                                           |
| 8.    | Walnut shell powder               | Herbal ingredient experts.    | Manufacturing of skin care products.                                         |
| 9.    | Walnut bark Volumizing Shampoo    | Biotique                      | For fine and thinning hair.                                                  |
| 10.   | Walnut 1:20 (concentrated embryonic plant extract). | Plant Stem cells (PSC) | Dietary supplement                                                             |
| 11.   | Herbal walnut & Goat milk Soap    | Old tree                      | Remove impurities and purify the skin.                                       |
| 12.   | *J. regia* L. liquid dilutions    | Bjain pharmaceutical pvt limited. | Constipation, epigastric pain, useful in menstruation.                       |
| 13.   | ADEL *J. regia* L. Dilutions 200 CH | Adel Pekana Germany         | Brain tonic, headache, acne, eczema, flatulence & bloating of abdomen.       |
| 14.   | SBL *J. regia* L. mother tincture Q.  | SBL pvt limited              | Jaundice, gall bladder stone, Skin eruptions, Headache, acidity.             |
| 15.   | *J. regia* L. globules 3X         | Bjain Pharmaceutical pvt limited. | Acne, jaundice, gall bladder stone, skin inflammation, acidity, back pain. |

**Future Prospects:**

*J. regia* L. is very important traditional medicine used for treatment of several diseases. This review tells that various types of studies done on plant *J. regia* L. and it is concluded that various types of Pharmacological studies proved on parts of *J. regia* L. The well known research on plant *J. regia* L. is not up to mark. It is possible that if we isolate a particular chemical compound from the extract of *J. regia* L. so it will easy to identify that which type of chemical compound responsible for particular activity. So the isolation of chemical compounds of *J. regia* by using chromatography methods like TLC, HPLC, GC-MS etc will be important for future aspects.

**CONCLUSION:**

In the present review we are trying to mention all information available on *J. regia* L. like Description, Nutritional Aspects, Phytochemical and Pharmacological Studies, Marketed Formulations. *J. regia* L. commonly known as Akhrot found in various countries of the world. *J. regia* L. is most commonly used in the indian system of medicine. It has various pharmacological activities on different parts of plant such as Antidiabetic, Anticancer, Antimicrobial, Antioxidant, Anthelmintic, Antiinflammatory, Antiaging, Hepatoprotective, Gastroprotective, Antifungal, Antimycobacterial and Antidepressant activity. It also having many marketed
formulations mention in above table no.6. This literature review that *J.regia* L. have an important role in various chronic diseases like diabetes, cancer, hypertension, depression but some parts of *J.regia* L. are untouched for various pharmacological studies. This updated review of this plant will help to many researchers who will carry the investigation on this medicinal plant.

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