2.1 Specific Plant Components

Plant medicinal packages, including as leaves., flowers., fruit., buds., seeds., and roots, can be inferred from the factory's vibrant hallways. various sections of the same manufacturing may have various active compounds. Consequently, a factory may have poisonous areas in some areas while having safe areas in others (Medicinal Botany Plant Parts Used, N. D.). The factory's most selective hallway used for medical purposes is seen below.

i. **Seed:** Seeds are utilized for their therapeutic possessions, which may be found in fruits or on their own.

ii. **The Root:** Woody and fleshy roots, which might be stringy or solid, are used medicinally.

iii. **Bark:** The majority of the active ingredients are located in the bark, which is a tree's outer layer of protection.

iv. **Flower:** Similar to saffron 20, it has extended remained used in traditional medicine.

v. **Leaf:** The leaves of trees, shrubs, and plants are employed for their therapeutic qualities. It can be utilized alone or in conjunction with other pieces, though.

vi. **Tuber:** A fleshy, swelling structure that originates from below the surface, tuber might have a partially source and partially stem origin.

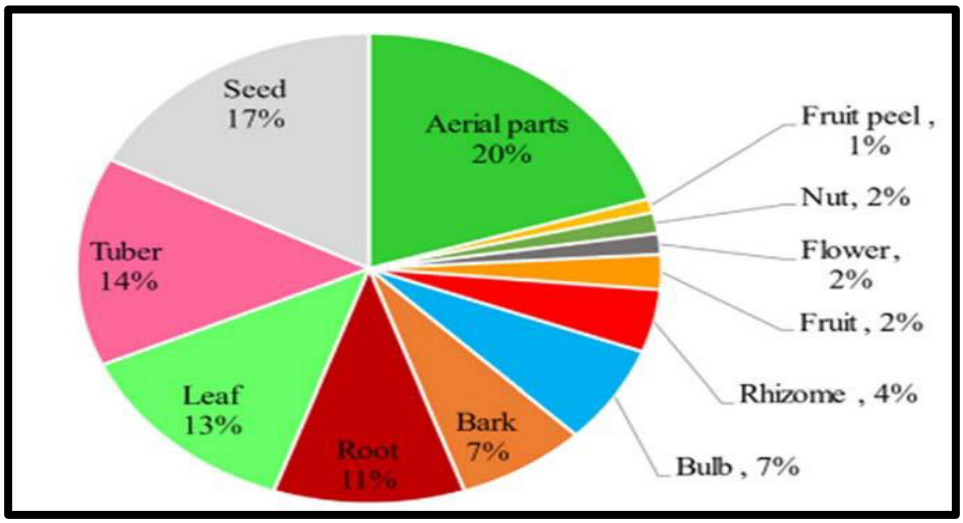

Figure No. 2.1 Parts of the Plants used in traditional Medicine.

Upstanding sections are the most frequently utilized manufacturing corridor, followed in usefulness by seeds, tubers, leaves, and roots. People also consume bulbs and dinghy, and rhizomes are also used. An ethnopharmacological study, however, indicates that the other areas that are emphasized are the ones that are used the least.[50]

2.2 Application & Dosage

The establishment of norms and criteria for use is problematic due to the significant variations in lozenge usage among individuals. In order to follow the prescribed norms, teaspoons, tablespoons, hand wins, little cutlet indicators, mugs, or glasses are typically employed. Decoction and infusion are done in a glass mug measure; a teaspoon of honey can be blended with it, but no sugar should be added. In addition to being typically ground and pulverized, sauces can also be combined with other ingredients like honey, milk, adulation, water, olive oil painting, or alcohol to create an oral or applied paste. Certain composites should be prepared an hour or two prior to intake. Conversely, other drugs must to be prepared and kept for a week before to usage. Typically, cases take one to three ladles one to three periods a day. Below is a pie chart that illustrates many modes of operation.[50]

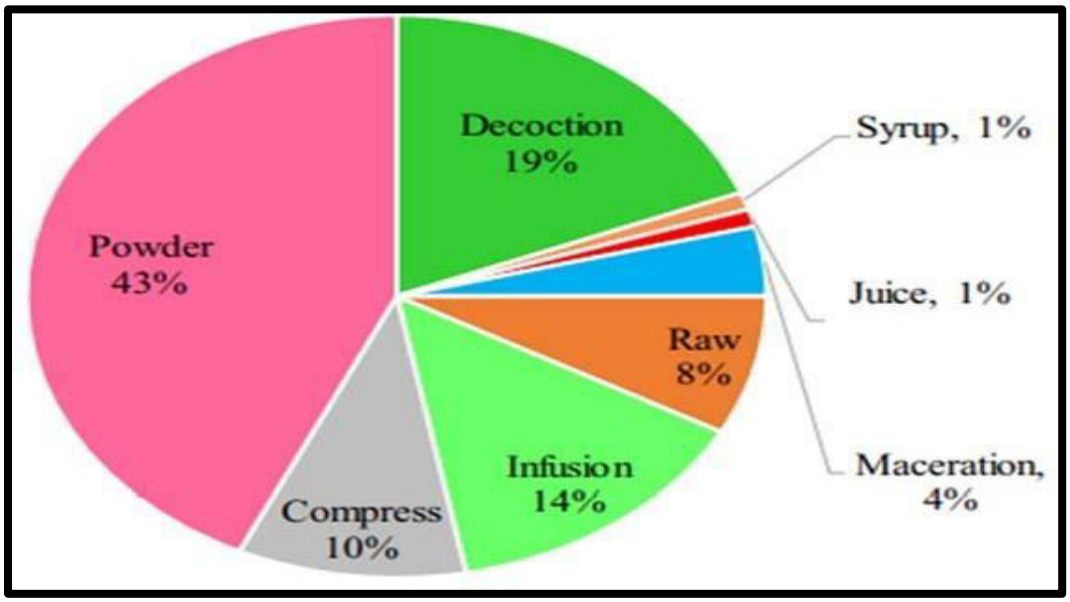

Figure No. 2.2 Various methods for using the parts of medicinal plants.

The aforementioned medicinal factory is often ground or crushed when used as a medication. However, many are created as decoctions, which include boiling the

mixture to reduce its volume by half and then giving the filterate orally. However, the medicinal sauces used for thyroid care were also made with herbal infusions and consumed orally. Similarly, a few of the stores serve as compressors for outside operations. Other applications, such as transformation into juice or saccharinity, have been demonstrated in numerous instances. Honey has also been brought up a lot. It was used as an additive in the therapy of composites made up of several different ingredients. Honey was administered either as a stand-alone remedy or as an infusion along with additional ingredients from other sources. Yogurt, olive oil painting, scapegoat's milk and praise, and other such practices are also citeable. These ingredients have the power to improve flavor, promote healing, and decrease the negative effects of retail drugs.[50]

2.3 Impact of Plant Ingredient

It is true that certain ingredients in factories can interfere with thyroid hormonogenesis enzymes, such as TPO, or decrease thyroid-specific gene expression. Insufficient thyroid hormonogenesis causes a decrease in T3 and T4 production, which in turn causes an increase in TSH stashing. In severe circumstances, hypothyroidism may develop. Numerous investigations have uncovered the primary manufacturing processes for Anti-thyroid products as well as their mechanisms of action through the course of the previous several decades. A few of the composites are explained hereunder. An alkaloid is among them. These are secondary factory metabolites with natural components and potential medical uses that have been thoroughly researched. The thyroid function is interfered with by the alkaloids mitragynine, arecoline, piperine, and harmine. Since that harmine can inhibit TPO, it is possible that it has anti-thyroid properties. Serum T3 and T4 conditions can be decreased using piperine. When exposed to arecoline, blood T3 and T4 levels rise while serum TSH levels decrease. Millet glycosyl flavones are a further component that exhibit TPO exertion inhibition. It also alleviates thyrotoxicosis and lowers serum T4 and T3 levels. The treatment of the well-known stilbenes resveratrol improved beast geste. and decreased stashing of TRH and TSH. It does not add thyroid hormone tube; instead, it acts on the hypothalamus-pituitary axis. In vitro experiments have shown that some hydroxyl cinnamon compounds can inhibit TPO or TSH binding to

the thyroid tube membrane. TSH and TPO activity are linked to thyroid tube membranes.[50]

2.4 Treatment objectives for disorders of hyperthyroidism and hypothyroidism

Numerous sauces have anti-thyroid effects on hypothyroidism and hyperthyroidism thyroid disorders. Numerous anti-thyroid herbs are listed below. Significantly distinct phytoconstituents, according to several authors who have researched under each medicinal store sauce, have diverse mechanisms of action and applications against both thyroid disorders. For hyperthyroidism, there are many herbal stores that provide remedies like bugleweed (Lycopus virginicus). Below is a list of some significant stores that treat thyroid issues.[50]

a. **Bugleweed (Lycopus virginicus):** Bugleweed is used as thyrosuppressive agent that suppress the thyroid function are the bone which are most effective sauces for thyroid complaint. The sauces are belonging to family of Lamiaceae. it contains hydrocinnamic acid deduced similar as lithospermic acid, rosimarinic acid, chlorogenic acid and caffeic. Bugleweed and its excerpt have numerous salutary goods similar as it has capability to inhibit the list of stimulating antibodies for Grave's conditions to the thyroid conditions, blockage product of thyroid stimulating hormones (TSH), drop deionization of supplemental T4 and also inhibit metabolism of iodine.

b. **Lemon balm (Melissa Officinalis):** Lemon balm is the condiment used as thyro suppressive agent in treatment of hyperthyroidism. It's effective in blockage of TSH list to the receptor by act on the hormones and receptor itself. It also acts on inhibiting the cyclic AMP product to stimulating by TSH receptor as antibodies. It contains large quantum of rosimarinic acid. substantially rosmarinic acid affects IgG antibodies. They've capability to rather of creating a receptor response on thyroid gland, the response in vulnerable system by reduce the lading of IgG, because of that IgG antibodies cannot be direct act on thyroid gland. Because of this result we conclude that bomb attar may also inhibit autoimmune exertion in vulnerable system. From traditionally, Lemon balm are used to treatment of symptoms associated with hyperthyroidism similar as wakefulness, tachycardia and hyperactivity also.

c. **Motherwort (Leonurus cardiac):** In aged studies, it studied that motherwort is condiment which substantially used in the combination with other sauces. utmost generally motherwort has an anti-inflammatory exertion, because it contains qurecetin, as a flavonoid. For treatment of autoimmune conditions, it's important to reduce inflammation or lump, because of that motherwort a good choice for treatment of hyperthyroidism. In this case, the enzyme 5 deiodanse is inhibit, when the addition to reducing inflammation. From traditionally motherwort uses include to treating symptoms of anxiety, pulsations and tachycardia.

d. **Gromwell (Lithospermum ruderale):** Gromwell has principally shown analogous exertion as bugleweeds. The gromwell sauces are belongingto family of Boraginaceae. It also contains rosmarinic acid The main function of sauces in hyperthyroidism is blocking the list of TSH to thyroid follicles, it also inhibits transport of iodine to thyroid follicles, and as analogous to bugleweeds it also drops the supplemental deionization of T4 and also drop the stashing of thyroid hormones.

e. **Rose marry (Rosmarinus officinalis):** Rose marry is a sauces which is a member of Lamiaceae factory. It contains a large quantum of Rosmarinic acid which is used in treatment of hyperthyroidism. Rosemary factory is also act as bomb attar, because in exploration it delved that rosmarinic acid act on the effect of TSH on receptor point, also inhibit immunoglobin goods on Thyroid stimulating hormone (TSH) receptor, and it also drop the supplemental conversion of T3. The rosmarinic acid may also salutary in the treatment of Grave's conditions.

f. **Sage (Salvia officinalis):** sage sauces are also belonging from the member of Lamiaceae shops. it also contains rosmarinic acid. Both rosemary and sage contains rosmarinic acid in a high percent. analogous it acts on act on the effect of TSH on receptor point, also inhibit immunoglobin goods on Thyroid stimulating hormone (TSH) receptor, and it also drop the supplemental conversion of T3. Because of that savant is also known as thyrosuppressive and sage sauces also have other exertion similar as antiviral, antioxidant, nervine and spasmolytic.

g. **Gotu Kola (Centella asiatica):** Gotu Kola splint is generally salutary for treatment of hypothyroidism. It contain asiatic acid, asiaticoside, brahmoside,, and

brahmic acid also called as madecassic acid. Morre sugguested that gotu kola has property to stimulate T4 conflation. It also used as nervous system controller to enhance the energy and vitality. Because of that it enerzging effect of this sauces it enhances or stimulate the conflation of T4. substantially tinge of gotu splint is used for treatment of hypothyroidism.

h. **Ashwagandha (Withania Somnifera):** Ashwagandha is a saponin glycoside which recognized as Indian ginseng or downtime cherry, it's an adaptive factory belonging to Solanaceae family. It also has antioxidant parcels. It contains alkaloids, steroidal and saponin chemicals which is essential for active in the hormonal pathways in system. These chemical ingredients involve in increase the product of T4 hormone with the help of conversion of T4 to T3. In 2011 study Ashwagandha excerpt has abilility to ameliorate thyroid exertion and also enhance the antiperoxidation exertion in towel.

i. **Guggul (Commiphora mukul):** The Guggul extract has oleo-resin derived from the Commiphora mukul tree. Z-guggulsterone, which has a high thyroid stimulating effect, is present in oleo-guggul resin. By mastering the conversion of T4 to T3 and hepatic lipid peroxidation, guggulsterone also increases the circumstances of T3. Increases in T3 levels have the potential to lower LDL cholesterol levels in hypothyroid patients. Loss of weight can be encouraged. Guggul is a traditional Ayurvedic medication used to stimulate the thyroid in India. Thus, it stimulates thyroid hormones by acting directly on the thyroid gland.

j. **Coleus or forskohlii (Plectranthus barbatus):** Forskohlii is an herbs substantially used for treatment of hypothyroidism, because it contains essential canvases and terpens. substantially generally product and conflation of thyroid hormones are enhanced by forskohlii or coleus. And it also activates product of cyclic AMP. It also used with thecombination of synthetic medicines to increase product of thyroid gland, if the case has not been to use drug remedy for long period of time.

k. **Bladder wrack (Fucus vesiculosus):** Bladder cream is a special type of algae, which one salutary advantage is that these algae used in remedy of both antithyroid complaint both hypothyroidism and hyperthyroidism. Bladder cream is attained from algae not from any factory source, because of that it belonging from

the family of Fucaceae. Traditionally use of bladder cream involve in thyroid function in different conditions if whether is hyperactive, or normal and or is in underactive. Bladder cream is order of seaweeds and all seaweeds contain variable quantum of iodine. Dried bladder cream contains approx. 50 mg of iodine. Iodine helps to stimulate thyroid gland. It contains substance that help to restore the normal function of thyroid gland and also reduce the size of goiter presence in thyroid. It's necessary to input iodine in case of low iodine situations, because it beget side effect and beget hyperthyroidism. It contains s Iodine and L- fucose emulsion, it has anti-obesity, anti-inflammatory, antioxidant and anti-carcinogenic parcels.

l. **Saussurea Costus :** synonymous with Saussurea lappa, aslo known a quest in Arabic or Costus root in English, belongs to family of Asteraceae, a types of thistle in the genus Saussurea found worldwide regularly in Western Himalayan region of Pakistan and India. natural therapies are not usually considered a part of standard care modern medicine which is evidence based. It has been envisaged to use natural therapies as a co treatment along with standard treatment speculating absence of side effects of natural treatments and in quest to do more to alleviate ones' symptoms and improve health. Available data has shown some role of S. costus in the management thyroid disorders in animal models but has not been proven for clinical use. The current available evidence is inconclusive regarding thyrotropic activities of S. costus and its potential role in the management of thyroid disorders in humans. More research is needed quantify the effectiveness of S. costus for its use in thyroid disorders.[52]

2.4 Medicinal Plants for Hypothyroidism Treatment

Due to their efficiency, safety, and lower risk of side effects, herbal medications for thyroid disorders have become more and more popular. Around the world, a number of factory species are consumed in an effort to lower thyroid function, support thyroid function as an iodine basis, or help balance thyroid hormones. The use of a range of medicinal sauces has also been proven to be useful in treating thyroid disorders when compared to prescription remedies. A study conducted on ethnopharmacology disclosed the utilization of drug stores in the management of hypothyroidism. The families Lamiaceae, Apiaceae, Fabaceae, Amaranthaceae, and Asteraceae were

among those that were notably represented. The following is a detailed list of the pharmacies that were established to effectively treat hypothyroidism.[53-54]

Table. No.2.1 Medicinal plants used for hypothyroidism

Family name	Species name	Common name	Availability (Country)	Active constituents	Uses
Apiaceae	Centella asiatica	Gotu Kola	Southeast Asian countries.	Madecassic acid	Improve synthesis of T4
Solanaceae	Withania Somnifera	Ashwagandha	South Asia, Central Asia, and Africa	Withaferin	Improve Thyroid Activity, Enhance Anti peroxidatio, production of T4. hormone with the help of alteration of T4 to T3
Ranunculaceae	Nigella sativa L.	black seed or black cumin	southwestern Asia and parts of the Mediterranean and African countries	Thymoquinone	it raises T3 and reduces the anti TPO synthesis & reductions VEGF level
Asteraceae	Saussurea Costus	Costus root	Western Himalayan region of Pakistan and India	Sesquiterpene terpenes (ST)	Alleviation of hypothyroidism induced hepatic enzyme derangement.

Burseraceae	Commiphora mukul	Guggul	Areas of India, Bangladesh, and Pakistan	Guggulsterone	increases T3. synthesis by boosting T4 to T3 change & hepatic lipid peroxidation
Lamiaceae	Plectranthus barbatus	Coleus or forskohlii	Brazil, tropical Africa and China	forskolin	Thyroid hormone production & synthesis are typically boosted

A. The healing properties of walnut partitions[55]

The healing properties of the partitions are due to the rich content of elements that have a positive effect on individual organs and systems of a person. It is worth considering the main components that make up the chemical composition of the product.

i. **Potassium.** Helps regulate water content in the body, increases the metabolic rate of carbohydrates and proteins. Decreases heart rate. Maintains the acid-base balance at the required level. Maintains the total content of substances in the blood. Promotes weight loss.

ii. **Iodine.** Participates in the processes of energy exchange, biological and chemical reactions, assimilation of many vitamins. Helps the body to develop properly, both physically and mentally. Like the previous element, it promotes the effective metabolism of nutrients in the body. Regulates body temperature. Increases the absorption of oxygen by various tissues. Iodine increases brain activity, gives the body more energy, helps burn excess fat, and keeps hair, skin, nails and even teeth healthy.

iii. **Magnesium.** It is an integral part of all body tissues. Participates in cell formation, digestion, and brain function. Regulates energy metabolism, kidney

function, digestion. Increases the efficiency of the heart and blood vessels, affects the tone and strength of the muscles. Stabilizes the nervous system.

iv. **Carotene.** Strengthens the immune system, significantly decreases the risk of infectious diseases. Assistances remove substances from the body that are not involved in biological processes.

v. **A nicotinic acid.** Serves for the regulation of cholesterol in the blood and tissues, maintains glucose levels, and resists free radical attacks. Participates in the production of hormones and tissue respiration.

2.5 The following positive properties of nut membranes are distinguished:

a) Increase the body's immunity;

b) Saturate the body with iodine;

c) Soothe in case of nervous disorders, stress, irritability, insomnia;

d) Improve heart function;

e) Create antiviral and antimicrobial protection;

f) Reduce blood sugar;

g) Improve the work of the digestive system;

h) Promote the resorption of tumors and cysts;

i) Have an antiseptic effect;

j) Reduce the presence of cholesterol in the blood, thereby improving the state of blood vessels and preventing the risk of atherosclerosis;

k) Reduce painc and relieve inflammation in various joint pains.

The produt is effective for bowel disorders. A decoction from the membranes not only helps to stop diarrhea, but also removes toxins from the body, protects against dehydration. Walnut partitions are used in the treatment of numerous female diseases (hormonal disruptions, reproductive system disorders). With regular intake of infusion and decoctions, it relieves painful menstruation, mastitis, mastopathy, various neoplasms, and reduces the symptoms of menopause.

A. What walnut partitions help with

Walnut partitions are used in folk medicine for the following diseases:

i. Hormonal disorders of various kinds;

ii. Male diseases (prostate adenoma, prostatitis, weak potency);

iii. Respiratory tract diseases (bronchitis, pneumonia, in some cases asthma);

iv. Bowel diseases (diarrhea, colitis, helminths);

v. Female diseases (fibroma, myoma, mastopathy);

vi. Colds (colds, flu, runny nose);

vii. Diseases of bones and joints;

viii. Disorders of the nervous system and mental disorders;

ix. Endocrine system diseases;

x. Oncological diseases.

I. Walnut Septa for Thyroid Gland

It is a known fact that walnut shells are rich in iodine. Iodine deficiency in the body leads to various endocrine disorders. With a lack of iodine, the thyroid gland is disrupted, a person becomes more irritable, weak, and puberty slows down.

II. Walnut partitions for joints

a) Tincture of walnut shells has been shown to be effective for joint pain, radiculitis.

b) Fill a half-litter container by a third with membranes and fill it 2/3 with vodka (double-distilled moonshine or alcohol diluted to 40%.). Put in a place protected from light for 15-20 days, filter.

c) Applied externally for rubbing into painful areas, as well as to increase efficiency, take 1 teaspoon orally half an hour before meals or on an empty stomach.

III. Cleaning of vessels with walnut partitions

a) For the normal functioning of the body, it is necessary to periodically clean the blood vessels. For these purposes, you can make a tincture of walnut partitions.

b) To do this, take a glass of ground partitions and pour half a liter of vodka. Insist for 2 weeks, filter. Take 15-20 drops, dissolved in a small amount of water three times a day for 14 days.

c) There is also a good recipe for relieving vascular spasms, as well as for normalizing blood pressure.

d) A glass of ground partitions is mixed with hawthorn tincture (diluted with water in a 4: 1 ratio, that is, 100 ml of cold purified water is needed for 400 ml of hawthorn). Insist for 7 days, then filter.

e) Take 3 times a day 30 - 40 minutes before meals (on an empty stomach) a single dose of 5 ml. The course of treatment is one and a half months.

IV. Walnut partitions for men

i. Walnut membranes contain zinc and magnesium, minerals important for potency. They are part of the hormone (testosterone), increase sperm motility.

ii. Due to the content of fatty acids, the permeability of the vessels is restored, and, as a result, the blood supply to the organs is improved.

iii. For the treatment of prostatitis and adenoma, you can effectively use tinctures that contain useful substances from the partitions of walnuts.

iv. Half a glass of partitions is poured with 250 ml of water. The partitions of walnuts are brewed and left for 20 minutes to infuse. Then it is filtered. The broth is taken 15 ml 3 times a day before meals. The required course of treatment is from 2 to 4 weeks.

V. Walnut partitions with menopause

a) The essence of the treatment of menopause with folk remedies is reduced to the normalization of hormonal balance. Symptoms are mitigated (irritability,

depression, poor sleep). Partitions are considered an effective folk remedy for improving well-being.

b) To prepare the broth, take membranes from 5 walnuts, pour a glass of cold water. In the morning, boil for several minutes, filter well, add 1 tablespoon of honey (not desirable last year). They must drink on an empty stomach or not earlier than 30 - 40 minutes before meals.

VI. Walnut membranes in diabetes mellitus

a) Medicinal tinctures and decoctions from walnut partitions, with regular use, reduce blood sugar levels, remove unpleasant symptoms of the disease (thirst, weakness, itching) and improve well-being.

b) The effectiveness of tinctures and decoctions is observed only with complex treatment together with traditional methods of treatment.

c) To prepare the broth, a glass of membranes is poured with a glass of boiling water and cooked over low heat for 1 hour. The resulting broth is cooled, filtered. Take 1 teaspoon half an hour before meals. The course of treatment should be 4 weeks.

d) To prepare the tincture, take 2 tablespoons of partitions and fill them with half a litter of vodka, insist for 2 weeks, filter. Take 8-10 drops, diluted in a small amount of water 20 minutes before meals. The course of treatment is from two weeks to a month, the duration depends on the severity of the disease.

B. Contraindications to the use of walnut membranes

Taking any medicine, you must read the contraindications for use. If they are, then you must refuse to take this drug.

a) For example, you cannot use a decoction and tincture of walnut partitions for eczema or psoriasis, neuro dermatitis, urticaria, since even larger rashes on the body are possible.

b) If you suffer from allergies, then you should refuse treatment with a tincture of walnut partitions, as there is a possibility of itching and rashes on the skin, coughing fits (in some cases, even Quincke's edema is possible).

c) Since walnut partitions have a strong effect, it is impossible to use for pregnant women and it is undesirable to take women who are breastfeeding, children under 5 years of age (after 5 years, only a decoction can be given).

d) You cannot use the tincture for diseases of the gastrointestinal tract. Ulcers and gastritis are contraindications to treatment with walnuts, especially on an empty stomach.

e) You should not immediately consume the full portion indicated in the recipe, even if there are no contraindications, as allergic reactions are possible. In this case, you should take the drug and refuse this treatment.

REVIEW OF PREVIOUS WORK DONE

1. **Neslihan Sirin et al., 2024**. In this study author said, Cholesterol is pivotal emulsion that plays vital part in cellular function in living organisms. Its redundant or insufficiency in tube can lead to destruction and decomposition of cell membrane structure. Maintaining balanced input of cholesterol in diet and seeking medical treatment, if necessary, can help these negative goods. likewise, people frequently resort to natural and herbal remedies, similar as walnut septum. Due to dearth of scientific data regarding goods of walnut septum on cholesterol metabolism, this exploration was accepted to explore its implicit goods. Analysis was begun by rooting septum using colorful detergents. Performing excerpts were also anatomized using GC- MS, and composites were linked by using an intertwined library database. To descry goods of excerpts on cholesterol esterase and HMG- CoA reductase, a colorimetric system was employed. Monophenol, 2,4- Di- tert- butylphenol, 2,6- Di- tert- butylphenol, ethyl linoleate, and butyl linoleate were some of composites detected by GC- MS scanning. The loftiest inhibitions were observed in the enzymatic analysis, with a rate of 3.2 (acetone) in the HMG- CoA reductase analysis and13.6 (water) in the cholesterol esterase analysis. Although the walnut septum excerpt contains colorful chemical composites, in vitro analysis data suggest that there's no inhibitory effect at remedial position on enzyme pathways that regulate tube cholesterol situations, videlicet HMG- CoA reductase and cholesterol esterase. We believe that farther exploration is necessary to exhaustively estimate its goods on other pathways.[56]

2. **Letit,ia Mates et al., 2023**. The author finding shows, In the last many decades, scientific substantiation has stressed the significance of shops in the forestallment and/ or probative treatment of a plethora of conditions, numerous of them habitual, age associated diseases. Juglans regiaL. is a traditional factory that has been integrated into traditional drug since ancient times. Due to the presence of biologically active composites, walnut was used in the treatment of colorful dis temperatures. lately, examinations have concentrated on the walnut by- products and waste products, with exploration on their precious ingredients and active parcels. Among these secondary products, walnut septum was anatomized in several studies, its phytochemical profile described, and some of the natural conditioning examined. still, compared to other walnut by- products, no comprehensive review to gather all the material scientific knowledge was set up in the literature. thus, the end of this study was to critically assess the information furnished by peer- reviewed papers regarding the walnut septum chemical composition and the affiliated natural conditioning, including antioxidant conditioning, anti-inflammatory goods, antimicrobial parcels, antidiabetic conditioning, anti-tumor parcels, and anti-aging eventuality. In conclusion, as these preclinical studies showed that walnut septum metabolites were responsible for a wide range of preventative and remedial uses, farther exploration should confirm the salutary issues in clinical trials. [57]

3. **Elif Azize Ozşahin Deliba et al., 2023**. In view of author work, Walnut (Juglans regia L.) kernel septum (or septa) (WKS), a traditional nutraceutical material in China, has not been explored in detail. In this study, antimicrobial exertion, total phenolic content (TPC) and antioxidant- oxidant status of WKS was delved in case it may be clinically important in the operation of colorful complications. The WKS was uprooted with ethanol in a Soxhlet device. TPC of WKS was analysed by using Folin- Ciocalteu's system. Antioxidant exertion was attained by using Rel Assay Diagnostics accoutrements. The antimicrobial exertion of WKS was estimated against two Gram-positive (Staphylococcus aureus, Bacillus subtilis), one Gram-negative bacteria (Escherichia coli) and one fungus (Candida albicans) strains using the agar prolixity system. The TPC of WKS was set up to be119.42 ±2.39 mg GAE/ gDW. It was determined that total antioxidant status (TAS), total

oxidant status (TOS) and oxidative stress indicator (OSI) values were7.542 ±0.389 mmol/ L,3.718 ±0.287 µmol/ L and0.049 ±0.001, independently. WKS widely inhibited the growth of Gram-positive bacteria and fungus, while. aureus was the most susceptible bone with 16 mm of inhibition zone. Gram-negative bacteria were resistant to the excerpt. As far as we know, this paper is the first work that demonstrates the antioxidant- oxidant status of WKS by using the system described over, and also there are no scientific reports which have examined WKS in such a multidisciplinary experimental design. This study explosively supports the reported traditional use of WKS. Results indicated that WKS can be used as a pharmacological natural agent due to its high antioxidant and antimicrobial conditioning. [58]

4. **Marius Emil Rusu et al. 2020.** As author reported that, Walnut (Juglans regia L.) septum represents an intriguing bioactive emulsion source by- product. In our study, a rich phenolic walnut septum excerpt, preliminarily named, was further examined. The tocopherol content determined by liquid chromatography- tandem mass spectrometry (LC- MS/ MS) revealed advanced quantities of α- tocopherol compared to γ- and δ- tocopherols. also, several natural conditioning were delved. The in vitro inhibiting assessment against acetylcholinesterase, α- glucosidase, or lipase attested a real operation eventuality in diabetes or rotundity. The excerpt demonstrated veritably strong antimicrobial eventuality against Staphylococcus aureus, Pseudomonas aeruginosa and Salmonella enteritidis. It also revealed moderate (36.08) and strong (43.27) antimutagenic inhibitory goods against TA 98 and TA 100 strains. The cytotoxicity of the excerpt was assessed on cancerous (A549, T47D- KBluc, MCF- 7) and normal (mortal gingival fibroblasts (HGF)) cell lines. Flow cytometry measures verified the cytotoxicity of the excerpt in the cancerous cell lines. also, the excerpt demonstrated antioxidant exertion on all four cell types, as well asanti-inflammatory exertion by lowering the seditious cytokines (interleukin- 6 (IL- 6), interleukin- 8 (IL- 8), interleukin- 1 β (IL- 1β)) estimated in HGF cells. To the stylish of our knowledge, utmost of the cellular model analyses was performed for the first time in this matrix. The results prove that walnut septum may be an implicit phytochemical source for medicinal and food assiduity.[59]

5. **CARLO GENOVESE et al., 2020.** In this publication, Walnut (Juglans regia L.) is considered to be a 'superfood' for its multiple defensive conduct on mortal health. Walnut excerpts have proven antitumor exertion in different cancer cell lines. still, the efficacity of septum excerpt against glioblastoma has still not been delved. Glioblastoma is the most delicate type of brain cancer to treat. The standard remedy, grounded on temozolomide, causes several side goods, including neutropenia and lymphocytopenia, which frequently favor the onset of opportunistic infections. In the present study, the chemical profile of the Sicilian walnut septum ethanolic excerpt was anatomized using high performance liquid chromatography (HPLC)- diode array discovery and HPLC- electrospray ionization tandem mass spectrometry. The implicit cytostatic exertion of the excerpt against the mortal A172 glioblastoma cell line was delved and the results showed that the excerpt could drop cancer cell proliferation and migration. Using cytofluorimetric analyses and caspase 3 assays, the pro-apoptotic action of walnut excerpt was demonstrated. likewise, the evaluation of the antibacterial exertion stressed the efficacity of the excerpt in reducing Gram positive and Gram negative bacterial growth, utmost of which were resistant to the antibiotic, ciprofloxacin. Eventually, vaticination of exertion Spectra for Substances analysis showed the prognosticated antitumor and antibacterial exertion of HPLC detected composites. The promising results could give new perspective in the field of chemotherapeutic-adjuvants.[60]

6. **Zahra Ghiravani et al., 2020**. In this journal, Walnut (Juglans regiaL.) is a well-known member of the Juglandaceae family and its kernel is extensively consumed around the world for both unique nutritive characteristics and health- related benefits. Indeed though several studies delved the composition and natural conditioning of different corridor of the walnut tree, the internal septum of the walnut kernel is less estimated. In the last two decades, some studies delved phytochemical and pharmacological aspects of the walnut septum. Their results showed a wide range of natural parcels along with safety of walnut septum ingredients persuading us to shift our view to walnut septum as a useless by-product to a natural herbal material with precious parcels. The purpose of this review was to epitomize the presently available examinations on chemical composition and natural conditioning of the walnut septum. Several

phytochemical studies showed that the walnut septum is a rich source of secondary metabolites like polyphenols are which estimated to be responsible for its high antioxidant property. farther experimental studies verified numerous natural conditioning of this by- product similar as radical scavenging, food preservative, antibacterial, antitumor, hypoglycemic, hypolipidemic, and hepatorenal defensive parcels. [61]

7. **Tooraj Mehdizadeh et al., 2019.** The outcome acquired reveal that, Objectification of natural constituents' antioxidants in comestible fats can profitably affect their oxidative stability during product and storehouse. The purposes of the current work were to assess the antioxidant and antimicrobial effect of walnut kernel septum membranes hydroalcohol excerpt (WHE) in traditional adulation (TB). Antioxidant characterization of the excerpt was screened through styles of DPPH, reducing power and total phenolic assays. After medication of traditional adulation from yogurt, WHE was incorporated into TB at three different attention;0.05,0.1 and0.5 and compared with a control, BHT and tocopherol treated samples (200 mg of BHT and tocopherol/ kg). Microbiological studies (Staphylococcus aureus, Coliforms, Psychrotrophic bacteria, provocations and molds) were done during 90 days of storehouse time. Changes in Anisidine value AV), acid value, peroxide value (PV) free adipose acids (FFA), Schaal and Totox value were covered at 45- day intervals. sensitive evaluation was done using 10 semi-trained panelists grounded on the 5- point hedonic scale.[62]

8. **Tejas Godase and Bugubaeva Mahabat Mitalipovna (2024).** The author finding shows, hyperthyroidism is rare but potentially life- hanging. It develops in fetuses of women with current or previous Graves complaint. In Graves complaint, motherly autoantibodies against the thyroid receptor for thyroid stimulating hormone (TSH) overstimulate thyroid hormone product by binding to TSH receptors in the thyroid gland. These antibodies cross the placenta and beget thyroid hyper function in the fetus (intrauterine Graves complaint), which can affect in fetal death or preterm birth due to fetal hyperactivity or tachycardia. Because babies clear the antibodies after birth, neonatal Graves complaint is generally flash. still, because the concurrence rate varies, duration of neonatal Graves complaint varies.[63]

9. **Dr. Vijay Kumar Sah (2023).** The author reported that, Vish Parikshan is one of the important part of the discovery of bane According to Ayurveda whole world has taken place from the panchamahabhutas. each matter is constituted of five mahabhutas. All the gross and fine rudiments in the macrocosm, differ in their rate of panchamahabhautic compositions and are named after the pre dominant bhuta. also vish dravyas are also made up of panchmahabhutas. The specific composition and pre dominance of each bhuta for vish dravyas wasn't described Samhitas. Their bhautic composition is guessesed and assessed grounding on the symptoms. They produce in the body. Panchbhautic Pareeksha Dalhana in his commentary on Sushruta Samhita has explained the teristic features of vish grounding on the bhautic charecters in the environment of vishaanna pareeksha (EXAMINATION OF toxic FOOD), also logical procedure is also important for discovery of bane and clinical symptoms of poisoning also indicates features of bane and help to discriminational opinion. Shabdha Pareeksha When the poisoned food is placed on fire it burns with cracking sound. Roop pareeksha; when the toxic food is placed on fire it emanates as dears in the colours of peacock neck Ras Pareeksha The canvases die after flying over the toxic food Gandha pareeksha; when toxic food is placed on fire it emits prickly, pungent and strong smothers which cannot be extinguished fluently. Sparsha pareeksha; toxic food comes in contact with skin and causes burning sensation, severe itching.[64]

10. **Megha Raghavan and Ajmal KK et al., (2023).** In view of author works, Walnut (Juglans regiaL.) a temperate nut crop coming under the family Juglandaceae have wide most significance in the diet of people in the history, present and unborn. Wide variety of study was conducted in walnut till now ranging from phonological to phylogenetic molecular position. Walnuts are rich in protein, fat, carbohydrate and minerals. The storehouse life of these nuts is longer than that of the other temperate fruits because their fruits are dry and light. Growth habit reflecting with tree box, volume and circumference are wide variety among the available genotypes and cultivars. The factory being Monoecious in nature starts flowering in the months of April to May. The setting of fruits starts from the last week of May to June and growing of fruits is over by September to October. Walnuts are dried to remove redundant humidity from the shell and kernel. These nuts are of high import value. This review paper gives some primary information about characters of walnut that can be useful for breeding work.[65]

11. **Aiman Farooq et al., (2023).** The author finding shows, The goods of three different hulling styles wiz natural heaping/ traditional (T1), steeping (T2), and scattering (T3), on humidity, colour, fat, free amino acids, adipose acids, antioxidant conditioning, flavonoids, tannins, total phenolic content, and organoleptic rates of walnut kernels were examined in this study. The kernels uprooted from walnuts subordinated to T3 system recorded significantly ($p \leq 0.05$) loftiest DPPH inhibition (68.61), ABTS (54.56 inhibition) and FRAP 0.106 μM trolox/ 100g); flavonoids (1993.08 mg QE/ 100g), tannin content (0.312) and phenols (0.736 mg GAE/ g) compared to T1 and T2. Walnut kernels of T3 treatment group were rated more in terms of taste (3.8), odour (3.6) and overall adequacy (3.78) likewise, walnut kernels attained from T3 treatment group displayed the loftiest chance of unsaturated adipose acids (UFAs) and sweet free amino acids. The outgrowth of the present study offers a fresh standpoint regarding the hulling processes of green walnuts to meet the quality conditions of walnut kernels.[66]

12. **Summaia Fordos et al., (2023).** The consequences of this study, Walnut is among the four most consumed dry fruits around the globe. piecemeal from the comestible walnut kernel, walnut fruit consists of a walnut shell (WS) and walnut cocoon / housing (WH), generally discarded in walnut processing and consumption. These walnut by- products are filled with beneficial composites that find their use in different fields. This review summarizes recent developments and exploration on functional aspects of walnut waste (shell and cocoon / housing) in colorful fields. WS has numerous important bioactive composites, including lignin, cellulose, oleic, and palmitic acids. The creation of WS and carbon-grounded accoutrements, similar as actuated imitations and unmodified / modified WS, as adsorbents have been explored. Possible uses for WS deduced by-products include each-natural but important adsorbents for barring dangerous substances, similar as heavy essence, dangerous composites, and synthetic artificial colors. also, WH also has numerous benefcial composites like juglone. WH has antioxidant parcels and can be used as cloth and protein strainers. These wastes are used in husbandry, laboratory, medical, and food diligence, which can be employed as sustainable and terrain-friendly druthers.[67]

13. **Aeyaz Ahmad Bhat (2023)** The present investigation, Juglans regia Linn. is a precious medicinal factory that possesses the remedial eventuality to treat a wide range of conditions in humans. It has been known to have significant nutritive and restorative parcels since ancient times, and nearly all corridor of this factory have been employed to cure multitudinous fungal and bacterial diseases. The separation and identification of the active constituents in J. regia as well as the testing of those active composites for pharmacological parcels are presently of great interest. lately, the naphthoquinones uprooted from walnut have been observed to inhibit the enzymes essential for viral protein conflation in the SARS- CoV- 2. Anticancer characteristics have been observed in the synthetic triazole analogue derivations of juglone, and the unique variations in the parent outgrowth of juglone have paved the way for farther synthetic exploration in this area. Though there are some exploration papers available on the pharmacological significance of J. regia, a comprehensive review composition to epitomize these findings is still needed. The current review, thus, abridges the most recent scientific findings about antimicrobial, antioxidant, anti-fungal, and anticancer parcels of colorful discovered and separated chemical composites from different detergents and different corridor of J. regia.[68]

14. **Yajun Zeng et al., (2022).** The outcome acquired reveal that, Walnuts (including those covered with a pellicle) are loved for their rich nutritive value. And the popular kinds of walnut civilization are Juglans sigillata L. The pellicle (seed fleece) of these walnut cultivars has different colors and has a necessary influence on the walnut quality conformation. still, there are many reports on the pellicle color and quality conformation in different experimental stages of walnut (Juglans sigillataL.). thus, in this study, three walnut cultivars (F, Q, and T) with different pellicle colors were named for transcriptome sequencing and physiological indicator analysis of the color and quality conformation mechanisms at different development stages. The results showed that with the development of walnut fruit, the bounce sucrose metabolism pathway in the pellicle was actuated and promoted bounce hydrolysis. Meanwhile, the expression situations of genes related to the nascence- linolenic acid metabolism pathway were significantly increased during walnut development, especially in F2. Some physiological pointers affiliated to lipid oxidation were also detected and anatomized in this study, similar as MDA,

CAT, cover and DPPH. These results were analogous to the expression patterns of corresponding nonsupervisory genes in the RNA- Seq profile. In addition, lignin conflation genes were over- regulated in the phenylpropanoid metabolic pathway, while crucial genes amended in the flavonoid and anthocyanin conflation pathways were down- regulated. The results were harmonious with the results of total anthocyanins and flavonoid content discovery during walnut development. thus, this trial suggested that with the development of walnut pellicle, the gene expression in the phenyl propanoid metabolic pathway flowed to the branch of lignin conflation, especially in the Q variety, performing in lower flavonoid and anthocyanin content at the maturity stage than immature. This is also the main reason for the pale pellicle of the three walnut kinds after mature. The findings of this study showed that changes in the expression situations of regulating genes for lipid, bounce, sugar, and flavonoid conflation during walnut development told the accumulation of the affiliated metabolite for walnut quality conformation and pellicle color. The results of this trial handed the molecular base and reference for the parentage of high nutritive quality walnut kinds. [69]

15. **Pan Gao et al., (2022).** In this publication, We totally estimated adipose acids and triacylglycerol composition, as well as tocopherol, phytosterol, and phenolics, in walnut oil painting and compared the cholesterol- lowering goods of oil painting reused with different styles (cold pressing, repast- pressing, hexane birth, subcritical butane birth, and supercritical CO birth). The different styles didn't affect the lipid composition of walnut oil painting. The tocopherol (41.11 mg/ 100g) and total phenolic content (TPC,4.26 mg/ 100g) of repast- pressed walnut oil painting and the phytosterol contents of subcritical butane- uprooted walnut oil painting (106.51 mg/ 100g) were advanced than those of other tested canvases. Walnut oil painting significantly dropped cholesterol conflation by downregulating the expression of HMGCR, SREBP- 2, and CYP51 genes, and increased cholesterol efflux by upregulating the expression of ABCG1, therefore significantly reducing total cholesterol and triacylglycerol. Phytosterols and TPC in walnut oil painting were responsible for lowering cholesterol; the optimal attention of phytosterols was 10μg/ mL, and that of TPC was12.5 × 10 μg/ mL. Through process optimization, a new processing system for walnut oil painting grounded on natural evaluation was previously established.[70]

16. **Mohammed Junaidh K et al., (2022).** The author finding shows, Walnuts have high nutritive and pharmacological parcels. They're considered to be a type of natural functional food. Its consumption at recommended quantities has a number of health advantages, including a lower threat of coronary heart complaint, rotundity, cardiovascular complaint, forestallment of some cancers, and type 2 diabetes, and also it acts as an antioxidant. The number of bioactive rudiments in walnuts, similar as polyphenols, factory sterols, salutary fiber, proteins, sterols, and essential adipose acids, contribute significantly. This review summarizes the bioactive factors present in walnut and how they affect the gut microbiota and also their studies and pharmacological parcels.[71]

17. **Munish Sharma et al., (2022).** In this study, Juglans regiaL. generally recognized as walnut is cast-off as the greatest expansive and provident sapling in the world. This evaluation goals to study the ethno-medicinal, phytochemical and pharmacological eventuality of walnut. The literature has been collected from diferent online sources like wisdom Direct, Scopus, Research Gate, Google Scholar, PubMed, etc. grounded on addition and rejection criteria. An ethnomedicinal check has also been conducted to document the traditional knowledge and uses of walnut among the original peoples of the Union Territory of Jammu and Kashmir. On surveying the original peoples in the different major walnut- producing areas, it has been followed that the walnut is locally used as a medicinal, nutritive, and marketable factory to treat common conditions and diseases in the position. The check has been conducted first time in the area and no study has been reported till now in the Jammu Division while some work has been reported in the Kashmir Division. Among the numerous bioactive composites present in colorful factory corridor, Juglone has been reported a significant anti-cancer emulsion in treating deadly cancer. This methodical review describes the signifcant knowledge and traditional information collected on ethnomedicinal uses, phytochemistry, niche, macro-morphology, area of distribution, and pharmacological significance.[72]

18. **Munish Sharma et al., (2022).** In view of author work, Juglans regiaL. is one of the high yielding dry fruit crops grown in Union Territory of Jammu & Kashmir in India. Jammu and Kashmir UT is the largest walnut product and force in India’s

share of total product. But in recent times, there has been a decline in India's import of walnuts, largely as a result of the importing of walnuts from China and California. Consumer acceptance of walnuts from California and China is advanced than that of J&K walnuts, which negatively impacts the Indian walnut trade. Besides this, colorful other factors like lower mindfulness to original fruit farmers, trace connectivity, slice of perm for timber, preface of mongrel kinds, and other mortal interferences also contributed to lower import and product of J&K Walnut. There are great challenges in J&K fruit assiduity to manage up with these problems and increase the quality fruit product in J&K. This current study is a special case report on walnut grounded on present trends and secondary data, exploring the walnut assiduity sector and marketing in J&K.[73]

19. **Nael Abu Taha and Mohammed A. Al-wadaan (2021).** The author finding shows Juglans regia Linn is a medicinal factory that has been extensively used in traditional drug for a wide array of affections that include helminthiasis, diarrhea, sinusitis, bellyache, arthritis, asthma, eczema, scrofula, skin diseases, and colorful endocrine conditions similar as diabetes mellitus, anorexia, thyroid dysfunctions, cancer and contagious conditions. The present review, attempts to give comprehensive information on the ethnobotanical use, pharmacology, nutritive value, preclinical and clinical studies, toxin, other uses and current exploration prospects of the Juglans regiaL. presently, there's a renewed interest in walnut, and several examinations aimed at scientific confirmation of its traditional uses and a humble scientific disquisition aimed at insulation and identification of active ingredients of crude excerpts.[74]

20. **Sumbul Qadar et al., (2021).** The present study explains antimicrobial exertion and acute toxin of walnut (Juglans regiaL.) endocarp from Azad Jammu Kashmir (AJK). The walnut endocarp excerpt tested against fungal species i.e. Aspergillus niger and Penicillium notatum and bacterial species i.e. Staphylococcus aureus and Escherichia coli. Aspergillus niger and Penicillium notatum. at 10, 100 and 1000 µg/ ml attention showed Diameter Inhibition Zone (DIZ). Periphery Inhibition Zone (DIZ) was maximum against Aspergillus niger in all attention as compared to Penicillium notatum. also, Staphylococcus aureus showed advanced Diameter Inhibition Zone (DIZ) at 10, and 1000 µg/ ml attention independently as

compared to Escherichia coli Diameter Inhibition Zone (DIZ) at the same attention. Acute toxin of walnut endocarp excerpt showed the significant result at 100 mg/ kg, 200 mg/ kg and 400 mg/ kg attention with 0 mortality. It was concluded that walnut endocarp may be important source of antimicrobial exertion and may be used in pharmacognosy.[75]

21. **Abhishek Chaudhary et al., (2021).** The author concluded that, As we know, dire need for new medicines are demanded for colorful conditions and the demand for herbal drugs is adding day by day. The reason may be due to smaller side goods and good remedial value. One similar medicinal factory is Walnut or scientifically named Juglans regia. It's an implicit traditional drug with multitudinous remedial values ranging from diabetes, rheumatic pains, fever, diabetes, skin conditions, malaria, and rheumatic pain. Also, they show good exertion as an analgesic, antidiarrheal, antiparasitic, and antimicrobial. This review focuses on agitating the details of walnut or Juglans regia and its pharmacological uses.[76]

22. **Ali Jahanban-Esfahlan et al., (2020).** the effective use of agrarian by- products is surely a major challenge in waste operation. In the walnut fruit processing assiduity, large quantities of shells are produced as agrarian by- products and discarded or burned produced as energy. Walnut (Juglans regiaL.) is a precious tree nut in the Juglandaceae family. The fruit is composed of four main corridors the kernel, the skin, the shell, and the cocoon. The significance of walnuts is substantially related to theirs precious kernels. still, their shells are presently passing as important interest as their kernels due to the salutary goods of the shells. In the past several times, walnut shell (WS) has been extensively explored as a naturally inert factory- grounded biosorbent. In this review, we first punctuate recent scientific literature regarding the development of adsorbents from WS in the form of carbon- grounded accoutrements including unmodified/ modified WS, and actuated imitations (ACs). Next, we bandy the implicit operations of WS- deduced by- products as natural yet effective adsorbents for the junking of colorful dangerous accoutrements including heavy essence (HMs), synthetic artificial colorings, and dangerous chemicals.[77]

23. Jyldyz Shigaeva et al., (2020). The consequences of this study, totally reviews 146 publications on the socio- profitable significance of natural and planted walnut timbers in the 15 countries of the Silk Road in order to exhaustively assess the current state of knowledge, identify knowledge gaps and define precedences for farther exploration. Despite extensively spreading natural and cultivated walnut timbers along the Silk Road, which are intensely employed and make significant donation to original livelihoods, we set up that being socio- profitable exploration was still fairly limited and inversely distributed among the Silk Road countries, especially for Central Asia and Iran. As substantiated by the significant decline of walnut timbers and their continued declination, once timber conservation programs and programs were frequently not effective and, thus, new strategies and perpetration models are urgently demanded to achieve sustainable timber operation objects. Our review has shown that conducive profitable programs, well- funded public walnut breeding programs and profitable incitement schemes could effectively promote the establishment of walnut colonies, which both vastly contribute to the recovery and recuperation of demoralized lands and the diversification of tilling systems. At the same time, farther sweats are demanded in walnut exploration and practice to ameliorate being value chain arrangements, develop new products from J. regia and other underutilized timber species, and to more effectively examiner coffers and apply being legal fabrics. While country- position exploration gaps feel frequently to be driven by public dockets and patron interests, we also linked more general motifs that didn't have entered applicable attention in the literature across all the delved countries. This includes exploration on the impact and effectiveness of walnut colonies in reducing pressure on natural walnut timbers under land sparing strategies; examinations on the part volition forms of tourism can play in walnut timber conservation and development; and consumer studies that can give useful guidance to enterprises in the food processing, cosmetics, handcraft and other diligence to ameliorate the quality, value- added and profitability of products deduced from the walnut timbers. These points illustrate the need for further methodical studies in the walnut timbers of the Silk Road countries.[78]

24. **Nageena Nazir et al., (2020).** The author reported that, Walnut (Juglans regiaL.) occupies an important position in the horticulture assiduity of Jammu and Kashmir. It has the monopoly of producing excellent quality of walnuts contributing further than 90 per cent of Indian walnut product. The temperate climatic conditions favor its civilization and offer Jammu and Kashmir an exceptional edge to super pass the other countries in terms of walnuts. Being organic in nature (which is its USP), as no diseases or sprays are used on walnut shops and its yield, and high in nutrients with immense health benefits, Kashmiri walnut has seen growing demand and adequacy in the domestic and transnational request. The present study is an attempt to find once trends of walnut in Jammu and Kashmir using parametric, non-parametric andsemi-parametric retrogression styles. The performance of each system is compared using high value of R and low value of residual criteria. It's set up that non parametric/ semi parametric retrogression comes out to be a good fit for trend in walnut product in comparison to parametric retrogression. Indeed semi parametric spline is named as the stylish fit model for trend analysis. It's inferred that the area under walnut civilization in J&K is adding from 1998- 2017 and the productivity has also shown an adding trend except for some times where the trend is set up declining.[79]

25. **Bakhtaver Hassana et al., (2020).** This paper intends to study the Spatio-temporal growth of the walnut crop in Jammu & Kashmir, which holds a monopoly in walnut product in India. It also aims to assess the effectiveness of the being marketing channels of the walnut- crop in the region. Amulti-stage arbitrary selection fashion was used to collect primary data from three major walnut producing sections to identify the being marketing channels and estimate their separate edge. emulsion-Periodic Growth- rate and Cuddy- Della- Valle indicator was used to estimate the growth of the walnut crop. Shepherd's Marketing Efficiency Index was used to estimate the marketing edge of the channels involved in the marketing of the crop. This paper set up out veritably-high variability and slow growth in realty, veritably-high variability, and high growth in product as well as in yield- per- hectare of the walnut crop.[80]

26. **Gunjan Verma et al., (2020).** The consequences of this study, Medicinal sauces having a great part in mortal health care and weal services. These sauces extensively used in Ayurveda, Homeopathic and Allopathic system having colorful remedial parcels. Walnut (Juglans regiaL.) are the shops belonging to the family Juglandaceae generally known as Akhrot. It's extensively distributed in China, United State, Jammu & Kashmir, Himachal Pradesh, Arunachal Pradesh, Uttarakhand. It has different kinds similar as Black walnut, English/ Persian walnut, butternut/ white walnut. J.regiaL. have numerous retailed phrasings similar as Topical phrasings like Walnut oil painting, Face marshland, slipping mite, Soap, Shampoo, Hair color and Oral phrasings like capsules, tinctures, dilutions, shell greasepaint. Chemical study reveals that J.regiaL. contains Juglone, Alkaloids, Flavonoids, Saponins, Polyphenols, Polyunsaturated adipose acids, Oleic acids, Linoleic acids, Proteins, Napthaquinones, Ascorbic acid, Sitosterol, Tannins. Walnut contains different nutritive factors like Carbohydrates, Proteins, Dietary fibres, Iron, Phosphorus, vitamin E & C. This factory retain salutary goods include Antimicrobial, Antioxidant, Anticancer, Antidiabetic, Anthelmintic, Antiinflammatory, Antidepressant, Hepatoprotective, Antiulcer, Antiageing and Hypocholestermic exertion and other remedial conditioning. It's believed to be used in Dental shrine, Gingivitis, Oral hygiene, Eczema, Hemorrhoids, Burns, Blood Purifier, Dyeing or Colorant, Antiseptic and Astringent. In the present study, Pharmacognostic and Pharmacological parcels ofJ.regiaL. have been bandied. This review highlights the colorful Ethanobotanical and traditional uses as well as Pharmacognostic and Pharmacological report on J.regiaL.[81]

27. **Pan Gao et al., (2019).** This study compared the lipid compositions, minor factors contents, oxidative stability indicator, and free radical scavenging capacities of walnut canvases from two species in China Juglans regia (common walnut) and Juglans sigillata (iron walnut). The results showed that iron walnut oil painting contained lower C160(4.97 –5.25) and special adipose acid (erucic acid C221). Common walnut oil painting handed advanced tocopherols (441.03 –490.32 mg/ kg), phytosterols(1014.49 –1211.40 mg/ kg), squalene(4.41 –5.21 mg/ kg), and polyphenols(44.78 –64.61 mgGAE/ kg) and better antioxidant capacities. The

walnut oil painting of the different walnut species could be distinguished by top element analysis and hierarchical cluster analysis. In addition, multiple direct retrogression was employed to estimate the benefactions of minor factors to the free revolutionary scavenging capacity of the walnut canvases and develop a prophetic model for the antioxidant capacity of the oil painting. This information has important counteraccusations for the nutritive value and artificial product of walnut oil painting in China.[82]

28. **Ali Jahanban-Esfahlan et al., (2019).** The author finding shows, The walnut (Juglanssp.) is an appreciated nut that belongs to the Juglandaceae family. The fruit includes four main corridor the kernel, the skin, the shell, and the green cocoon. It's extensively cultivated due to its comestible kernel. In walnut product centers, high quantities of the cocoon as anagro-forest waste product are produced and discarded down. lately, it has been demonstrated that the walnut green cocoon could be valued as a source of different natural bioactive composites with excellent antioxidant and antimicrobial parcels. Regarding this respect, in this donation, the current scientific knowledge on the antioxidant and antiradical conditioning, colorful linked and insulated individual chemical ingredients, as well as the functional operations of the walnut cocoon with further emphasis on the Persian walnut (Juglans regiaL.) are reviewed.[83]

29. **Ali Jahanban-Esfahlan et al., (2018).** In view of author works, Upon the processing of different agrarian products, considerable quantities of by- products and memoir wastes are produced and discarded or burnt as energy, which are an implicit source of precious composites. Over the once several decades, factory by-products have been honored as a source of nutraceutical factors, including salutary filaments, phenolics, and numerous other useful composites. The walnut is known as an important tree nut. The shell of a walnut is the middle part of the fruit and it's a waste product of walnut processing diligence. lately, pyroligneous acids from the walnut shell have been entering much- adding interest because of their excellent antimicrobial and antioxidant conditioning. Hence, this review deals with the recent scientific literature on walnut shell pyroligneous acids and their chemical composition as well as their functional operations.[84]

30. **Tabasum Fatima et al., (2018).** The author reported that, Walnuts are generally set up in our diet and have been honored for their nutritional parcels over a long period of time. Traditionally, walnuts have been known for their lipid profile which has been linked to a wide array of natural parcels and health- promoting goods. In addition to essential adipose acids, walnuts contain a variety of other bioactive composites similar as, vitamin E and polyphenols. Among common foods and potables, walnuts represent one of the most important sources of polyphenols, hence, their effect over mortal health heists attention. Walnuts retain well known antioxidant and anti-seditious bioactivity and several studies have assessed the implicit part of walnuts against complaint inauguration and progression, including cancer, cardiovascular and neurodegenerative conditions.[85]

31. **Hamdollah Delaviz et al., (2017).** The author finding shows, in recent times, the use of medicinal shops increased vastly; so that moment, the use of traditional drug, as well as medicinal shops is necessary for the end of producing further effective medicines with smaller side goods and determining the effective boluses. With the scientific name of Juglans regia, walnut factory is a medicinal factory with different parcels that's considered less, despite having great remedial eventuality in the traditional drug. The end of this study was to review the disbandment of walnut shops, the chemical composites, and remedial goods of walnuts on antioxidant exertion, antidiabetic, hypolipidemic, antimicrobial, and antihypertensive conditioning, as well as liver protection. Data of this review study have been collected from the books and scientific papers published in databases similar as Science Direct, Web of Science, Scopus, PubMed, and Scientific Information Database. While this factory having high antioxidant capabilities, walnuts are composed of numerous chemical composites similar as ascorbic acid, flavonoids, quercetin, and caffeic acid. Experimental studies have shown that walnuts reduced blood glucose and lipids and also dropped blood pressure. They've antioxidant, antidiabetic, antimicrobial, and liver - defensive parcels. The use of walnuts in traditional drug and review of experimental studies demonstrated the presence of multiple, effective, and useful composites which may give the occasion for the product of lipid - lowering, antidiabetes, and liver defensive medicines. Due to the goods of walnuts on perfecting the complications of colorful conditions, the need for doing comprehensive clinical trials for the use of walnuts in the treatment of conditions is necessary.[86]

32. **Parastoo Zarghami Moghaddam et al., (2017).** In this publication, Juglans regia seed has been used in traditional drugs as antimicrobial, antihelmintic andanti-diarrhoeal. In the present study, the antibacterial capabilities dichloromethane, ethyl acetate, methanol and waterless excerpts of endocarp and exocarp of walnut were determined against two Gram-positive bacteria and one Gram-negative bacteria. The antioxidant exertion was screened by 2, 2- diphenyl-1-picrylhydrazyl (DPPH) radical scavenging and ferric reducing antioxidant power (FRAP) assays. The loftiest antioxidant exertion was observed for methanol excerpt of endocarp in both styles and it was stronger than positive control butylated hydroxy toluene (BHT). The total phenolic contents were ranging between34.59 to68.34 mg GAE/ g DW. The results revealed that all excerpts had antibacterial exertion against named bacteria except waterless excerpt. The methanol excerpt of endocarp presented the loftiest zone of inhibition against tested pathogens (9- 21 mm). From the results it's conclude that the methanol excerpt from endocarp of walnut could be used as a natural preservative component in food and medicinal diligence.[87]

33. **Hamdollah Delaviz et al., (2017).** The author concluded that, In recent times, the use of medicinal shops increased vastly; so that moment, the use of traditional drug, as well as medicinal shops is necessary for the end of producing further effective medicines with smaller side goods and determining the effective boluses. With the scientific name of Juglans regia, walnut factory is a medicinal factory with different parcels that's considered less, despite having great remedial eventuality in the traditional drug. The end of this study was to review the disbandment of walnut shops, the chemical composites, and remedial goods of walnuts on antioxidant exertion, antidiabetic, hypolipidemic, antimicrobial, and antihypertensive conditioning, as well as liver protection. Data of this review study have been collected from the books and scientific papers published in databases similar as Science Direct, Web of Science, Scopus, PubMed, and Scientific Information Database. While this factory having high antioxidant capabilities, walnuts are composed of numerous chemical composites similar as ascorbic acid, flavonoids, quercetin, and caffeic acid. Experimental studies have shown that walnuts reduced blood glucose and lipids and also dropped blood

pressure. They've antioxidant, antidiabetic, antimicrobial, and liver - defensive parcels. The use of walnuts in traditional drug and review of experimental studies demonstrated the presence of multiple, effective, and useful composites which may give the occasion for the product of lipid - lowering, antidiabetes, and liver defensive medicines. Due to the goods of walnuts on perfecting the complications of colorful conditions, the need for doing comprehensive clinical trials for the use of walnuts in the treatment of conditions is necessary.[88]

34. **Zahra Ghiravani et al., (2016).** As the author reported that, Todays, the fashionability of herbal drug is adding worldwide. Due to significance the evaluation of medicinal sauces efficacity and safety, the present study was conducted to probe the antidiabetic and hypolipidemic goods of internal septum of walnut fruit (ISWF) ethanolic excerpt in diabetic rats. Alloxan diabetic rats treated orally with ethanolic excerpt of ISWF (0- 400mg/ kg) for 28 days. To estimate itsanti-diabetic exertion, the creatures dieting blood glucose were determined on the first, 14th and 29th days. also, oral glucose forbearance test (OGTT) was performed in diabetic rats at the last day of the study. After 24h of last administration, the blood samples were collected, and the Tube lipids and liver enzymes situations were measured in fasting overnight rats.[89]

35. **Thais Regina Mezzomo and Juliana Nadal (2016).** The present Investigation, this composition aims to develop a literature review of food nutrients and substances that can impact on thyroid function. A literature review using “hypothyroidism” associated with the descriptors iodine, selenium, zinc, soy, gluten and flavonoids was conducted. It was set up 172 papers and 42 were named, as well as other material demanded to achieve the ideal of this study. It was observed that iodide participates in the organification response and latterly engages with tyrosyl remainders to form the thyroid hormones. inordinate or deficient quantities of iodine contribute to thyroid dysfunction, including hypothyroidism. Selenium and zinc areco-factors for deiodination responses, which convert thyroxine (T4) into triiodothyronine (T3) peripherally. Deficiency of these minerals can be developed on restrictive diets or unstable diet at any stage of life, uniting with a dropped product of thyroid hormones. likewise, ingested substances, similar as thiocyanate and isothiocyanate can contend with iodide for

the entry in thyroid follicles and concession hormones conflation, as well as soy, which can inhibit thyroid peroxidase, enzyme responsible for the oxidation of iodide and conformation of thyroid hormones, when there's iodine insufficiency. In vivo studies that show the type and quantum of flavonoids that may intrude with the conversion of T4 to T3 should be performed, as well as studies to interpret the part of the impunity of gluten in the reversal of subclinical hypothyroidism.[90]

36. **GIRISH SHARMA et al., (2016).** In view of author works, Twelve walnut genotypes were estimated and characterized for factory height, factory spread, splint area, bearing habit, chronicity in bearing, nut weight, kernel chance and yield. On the base of growth characters' maximum factory height (5.45 m) was set up in Kainthal Selection whereas, factory spread was loftiest in 'Partap'. Shimla selection had loftiest nut weight (16.37 g) and splint area (705.33 cm2) among all the selections. Kernel chance was maximum in Kullu Selection (49.00) and minimum in Montignac (34.07). The nut yield varied from to87.50 kg/ tree, loftiest being in Kainthal Selection. On the whole, out of twelve genotypes estimated Kainthal Selection and Shimla Selection appeared to be promising for utmost features like yield, nut weight, splint area etc. All the genotypes were regular and terminal in bearing habit.[91]

37. **Naseem A et.al., (2015).** The author finding shows, Export performance of Indian walnut has been exhaustively anatomized in this study employing chronological data. The import of walnut from India has significantly increased over the times, but still constituted only 3 per cent of total world import. Between 1979 and 2012, the import of shelled walnut has significantly increased, at an periodic growth rate of about 3 per cent, while walnut with shell has shown a declining trend over the times, inferring widening of requests for value- added products of walnut. The import insecurity in volume and value of both shelled and walnut with shell has declined over the times; still, the insecurity in unit price of shelled walnut has increased over the times. The corruption analysis has revealed loftiest donation of change in mean import volume among the other factors of change in the average import value of walnut. The unit value of Indian walnut import has been set up lower compared to numerous other nations, indicating the possibility of an

advanced price by icing quality parameters as per global norms. The estimates of graveness model have revealed that per capita GDP, agrarian GDP, and consumption of importing mates, and also the Indian GDP are the significant factors determining Indian walnut import. The study has also unveiled unexploited eventuality of Indian walnut import to some trading mates. The study has emphasized on the enhancement in quality of walnut, integration of product and value addition, import creation and strengthening of bilateral ties with regular trade mates for enhancing import of Indian walnut.[92]

38. **Sevinç Aydın et al., (2015).** The purpose of this study is to demonstrate defensive goods of walnut samples on CCl4- convinced towel damage in vivo. Walnut fruits were uprooted and also subordinated to vitamin and flavonoid analyses. The excerpts attained were fitted intra peritoneally every other day to Wistar manly rats given carbon tetrachloride (CCl4) and the creatures were guillotined at the end of the study period. The brain, order, and liver apkins were removed and lipid peroxidation (LPO) measures were done in the lipid bit generated. The adipose acids in the lipid excerpt were anatomized by gas chromatography after converting them into methyl esters. In addition, the quantities of glutathione, protein, and vitamins were anatomized. Results Given the results achieved, it was set up that the situations of adipose acids increased in the brain and order apkins after CCl4 administration (perceiving fresh walnut in comparison with the controls (p Our data indicates that walnut excerpt has defensive goods against LPO conformation in the brain, order and liver apkins.[93]

39. **S. Angmo et al., (2015).** The author concluded that, Ladakh region includes Leh and Kargil sections of Jammu and Kashmir in India. The region is cold and thirsty limiting the growing of fruit crops. The study aims to characterize walnut diversity in the region which would be resourceful in the near future for colorful purposes and boost up walnut civilization. Four genotypes are named from colorful walnut growing areas of Ladakhviz. G1 from Skara, G2 from Nurla, G3 from Temisgam and G4 from Dhomkhar. It was apparent that maturity of the genotypes displayed intermediate tree vigour with spreading nature of growth habit, rough shoot pubescence and splint and rachis pubescence, strong shell seal and shell strength with good nut periphery and nut length, satisfactory kernel

flavor, well filled kernel and easy junking of kernel halves. pamphlet shape observed was elliptic, pamphlet periphery was entire, green splint and rachis colour, brown shoot colour, complete shell integrity and kernel plumpness was moderate in all the four genotypes. The branching habit was thick in genotypes G3 and G4, intermediate in G1 and intermediate to thick in G2 In general, the loftiest value of splint length and kernel chance was recorded in G2. G3 displayed the maximum range of splint, number of circulars, inshell nut weight and kernel weight. The nut shape was broad to ovate in G2 and G3 while G1 was broad ovate and G4 was broad elliptic in shape. The shell texture of G2 and G4 was medium while G3 was medium to rough and G1 was rough. The shell colour of G1 was light, medium in G2, light to medium in G3 and medium to dark in G4. The shell consistence recorded the outside in G4. The kernel colour was light in G2 and G4, while redundant light and light to amber was observed in G1 and G3 independently.[94]

40. **Neerja Rana et al., (2015).** In this publication, Walnuts (Juglans regia L) are nutritionally rich finest nut crop of temperate regions having salutary effect on the mortal health. Five different walnut cultivars grown in the temperate region of Himachal Pradesh videlicet; Kotkhai Selection, Govind, Lara, Partap and Maylannise were named and estimated for their physical characteristics, nutritive parcels and biochemical composition. Among the fruit physical characteristics, the nut length was set up in the range of29.59 –38.74 mm, nut periphery (26.72 mm-32.82 mm), nut consistence (28.81mm-34.70 mm), nut weight (7.07 g-12.98 g), kernel weight (3.04g-6.70 g), kernel rate (43.26-51.62) and shell weight (4.03-6.84 mm). Arnongst the nutritive parcels and biochemical composition of walnut cultivars, high protein content was observed in Kotkhai Selection (20), followed by Partap (19) cultivar. varied from ranged The fat content was set up to range between32.25-56.40, total carbohydrates8.09-14.0, humidity content2.71-3.01, Total phenol content renged32.61-80.00 mg/ g and Scavenging Anti oxidantactivity veried between 40- 85. On the base of forenamed characteristics, Kotkhai Selection and Partap suitable for cultivation was set up to be a superior walnut cultivar in temperate region of Himachal Pradesh, India.[95]

41. **Radha Mohan Sharma et al., (2014)** The author concluded that, Western Himalayan region of India provides agroclimatic conditions suitable for producing high quality walnuts. Jammu and Kashmir State of India produces major share of import quality walnut. The nuts brought to vend are generally a admixture of variable size and shape as they're gathered from different seedling perm. This study aimed to identify a clone, which has high import quality. We linked 63 walnut seedling trees and set up GL0109 tree as stylish meeting all the import norms like nut weight (20.10 g), nut size (45.45 mm x42.07 mm), nut grade (Jambo), shell consistence (1.24 mm), kernel recovery (61.40), proportion of light coloured kenel (83.40), protein content (15.66) and oil painting content (68.42). It was also set up largely resistant to anthracnose complaint as it showed 5- 10 prevalence and 0- 5 inflexibility against 60 prevalence and 75 inflexibilities in other 63 seedling trees. Overall, it scored numerical standing on 10-point scale grounded on the parameters specified by Jammu and Kashmir Walnut Exporters Association. therefore, GL0109 was linked and recommended for civilization in different walnut growing areas of the state.[96]

42. **Y.L. SATAV et al., (2013).** In present disquisition Burfi was prepared from buffalo milk with constant position of sugar (30 by weight of Khoa) and different situations of walnut greasepaint (2, 4, 6 and 8 by weight of Khoa). It was observed that the overall adequacy score for treatment T1, T2, T3, T4 and T5 were8.76, ,8.16,7.80 and7.50, independently. The results revealed that as the position of walnut greasepaint in Burfi increases the overall adequacy score decreases. On the base of results, it could be concluded that 2 per cent walnut greasepaint could be successfully incorporated in Burfi which increases nutritive value without majorly affected the sensational and textural quality profile of Burfi.[97]

43. **MONIKA THAKUR AND KARUNA SINGH (2013).** In this publication, Nuts are nutrient thick foods and have been a regular element of humanity's diet since neolithic times. In recent times there's a growing interest in nuts which give health benefits and are indispensable to medicine. Walnut (Juglan regiaL.) belong to family Juglandaceae have amazing health benefits. They aren't only succulent but also a complete functional food because they not only give nutritive but also medicinal health benefits. They're unique among nuts because they're loaded with omega-3 adipose acids, and colorful other bioactive composites, antioxidants, fibre, vitamins, minerals, and phytosterols.[98]

44. Ram S. Verma et al., (2013). The author concluded that, the walnut tree (Juglans regia L.), generally known as 'Akhrot' in India, is a precious tree has a long history of medicinal use to treat a wide range of health complaints. To explore the diversity in essential oil painting yield and composition of J. regia, leaves were collected during spring season from 28 populations growing in western Himalaya. relative results showed considerable variations in the essential oil painting yield and composition ofJ. regia leaves. The essential oil painting yield varied from0.02 to0.12 in fresh leaves of the different populations of J. regia. Analysis of the essential canvases by GC/ FID and GC/ MS and the posterior bracket by statistical analysis redounded in three clusters with significant variations in their terpenoid composition. Altogether, 70 ingredients, representing83.2 –98.0 of the total oil painting composition, were linked and quantified. Major factors of the essential canvases were (E)- caryophyllene (1.4 –47.9), β- pinene(4.5 –39.5), germacrene D(5.0 –23.3), α- pinene(1.5 –18.1), α- humulene(1.1 –11.8), α- zingiberene(0.1 –11.3), α- copaene(0.0 –10.1), limonene(0.8 –8.6), caryophyllene oxide(0.1 –8.6), ar- curcumene(0.0 –7.2), δ cadinene(0.3 –6.7),(E)- β- farnesene(0.0 –5.9), 1,8-cineole (<0.0–5.4%) γ- curcumene (0.0 –4.2), and methyl salicylate (0.1 –4.0). This is the first report on splint unpredictable oil painting composition ofJ. regia populations from western Himalaya. Out of the 70 linked ingredients, over 25 were described for the first time forJ. regia.[99]

45. Saeid Mousav (2013). This study employed product functions to examine the factors effective on walnut product in Kohgiloyeh VA Boyer- Ahmad fiefdom. Thecross-sectional data collected from 100 Walnut farmers by questionnaire with interview schedule. The variables of this study were Zulonfloo bane, labour, ministry, Iron fertilization, water and realty. The Cob- Douglas product function named as the most applicable model to dissect the walnut product function. The result of this paper showed that Walnut farmers have used the factors of product in the alternate area of product. The Findings also showed that the pliantness of factors product similar as Zulonfloo bane, labour, ministry, Iron fertilization, water and realty were 0.810,0.169,0.097,0.212,0.158 and0.093 independently. The result of Wald test showed that there's increase of Returns to gauge (IRS) in walnut vineyards of Kohgiloyeh VA Boyer- Ahmad fiefdom.[100]

46. **Naseer Ahmad Rather et al., (2013).** The consequences of this study, Under the changing agrarian script, it has been realized that the horticulture sector plays a vital part in furnishing livelihood security to the growers encyclopedically. Area, product, productivity and import of horticultural produces are vital for adding ranch income and overall employment in the agrarian sector. In this paper an attempt has been made to explore implicit and strength of Jammu and Kashmir with regard to its product and import of fresh and dry fruits. Jammu and Kashmir is the major patron of apple and walnuts in India, 77 percent of apple and 90 percent of walnut product in India belongs to Jammu and Kashmir and chance share of state in India's total product is showing an adding trend and the state has been declared as the "Agri. Export zone for Apples and Walnuts". Given the declining share of traditional agrarian goods in product, consumption and trade horticulture represent an important assiduity to ameliorate income growth and employment in pastoral areas of Jammu and Kashmir. Agribusiness including import of fresh and dry fruits is the foundation of frugality. The assiduity contributes nearly 60 percent of the countries profit and 22 percent of gross state domestic product (GSDP). It's also estimated that 80 percent of population is engaged in husbandry and its confederated sectors including horticulture sector in the state.[101]

47. **Nael Abu Taha and Mohammed A (2011).** The author reported that, Juglans regia Linn is a medicinal factory that has been extensively used in traditional drug for a wide array of affections that include helminthiasis, diarrhea, sinusitis, bellyache, arthritis, asthma, eczema, scrofula, skin diseases, and colorful endocrine conditions similar as diabetes mellitus, anorexia, thyroid dysfunctions, cancer and contagious conditions. The present review, attempts to give comprehensive information on the ethnobotanical use, pharmacology, nutritive value, preclinical and clinical studies, toxin, other uses and current exploration prospects of the Juglans regiaL. presently, there's a renewed interest in walnut, and several examinations aimed at scientific confirmation of its traditional uses and a humble scientific disquisition aimed at insulation and identification of active ingredients of crude excerpts.[102]

48. **Sina COSMULESCU et al., (2011).** The consequences of this study, Juglone (5-hydroxy -1,4-napthoquinone) is a chemical emulsion released by walnut trees that can be poisonous for girding factory species. In the present study, juglone was linked in leaves and green cocoon in five walnut cultivars 'Germisara', 'Jupanesti, 'Franquette', 'Vina', 'Valcor' by using high performance liquid chromatography (HPLC- RP). Juglone was set up predominant in green cocoon (average value of cultivars is about31.308 mg/ 100 g). Significant differences in contents of linked juglone were observed among cultivars that ranged from20.56 to42.78 mg/ 100g for green cocoon, and5.42 to22.82 mg/ 100 g for leaves. It was also set up that walnut green cocoon and leaves represent the most important source of walnut phenolics.[103]

49. **Zijia Zhang et al., (2009).** In this investigation, an exertion- directed separation and sanctification process was used to insulate 1,1- diphenyl-2-picrylhydrazyl radical (DPPH) scavenging factors from Juglans regia kernels. Ethyl acetate and n- butanol fragments showed lesser DPPH scavenging conditioning compared to those of water and petroleum ether fragments. The ethyl acetate bit was subordinated to sanctification using column chromatography. Seven phenolic composites, pyrogallol (1), p- hydroxybenzoic acid (2), vanillic acid (3), ethyl gallate (4), protocatechuic acid (5), gallic acid (6) and- pentahydroxydibenzo (b, d) pyran-6-one (7), containing significant antioxidant conditioning were insulated and linked in J. regia by spectroscopic styles for the first time in this study. The relative order of DPPH scavenging capacity for these composites was 7> 6 ⩾ 4 ⩾ 1> Trolox ⩾ 5> 3> 2. The results of this study suggested that the antioxidant conditioning of these phenolic composites may be told by the number of hydroxyls in their sweet rings.[104]

50. **Ivo Oliveira et al., (2008).** The present investigation, the total phenols content and antioxidant and antimicrobial conditioning were studied in walnut (Juglans regiaL.) green cocoons waterless excerpts of five different cultivars (Franquette, Mayette, Marbot, Mellanaise and Parisienne). Total phenols content was determined by colorimetric assay and their quantum ranged from32.61 mg/ g of GAE (cv. Mellanaise) to74.08 mg/ g of GAE t (cv. Franquette). The antioxidant

capacity of waterless excerpts was assessed through reducing power assay, scavenging goods on DPPH (2,2- diphenyl-1-picrylhydrazyl) revolutionaries and β- carotene linoleate model system. A attention-dependent antioxidative capacity was vindicated in reducing power and DPPH assays, with EC values lower than 1mg/ mL for all the tested excerpts. The antimicrobial capacity was screened against Gram positive and Gram negative bacteria, and fungi. All the excerpts inhibited the growth of Gram positive bacteria, being Staphylococcus aureus the most susceptible bone with MIC of0.1 mg/ mL for all the excerpts. The results attained indicate that walnut green cocoons may come important in the accession of a conspicuous source of composites with health defensive eventuality and antimicrobial exertion. [105]

51. **Diana O et al., (2008)** Walnut (Juglans regiaL.) In this publication, kernels have important quantities of phenolic composites. The objects of the work were twofold (a) to prize the phenolic bit from shells and walnut flour, and to examine its antioxidant capacity and (b) to estimate the effect of housing junking on solubility of protein fragments from walnut flour. In agreement with their advanced total phenolic content, housing excerpts had stronger antioxidant exertion than had flour excerpts. The presence of phenolic composites dropped protein solubility in walnut flour attained from whole kernels. Dehulling of kernels significantly bettered protein recovery but this result was explosively affected by the solvent system employed. Proteins from whole kernels, especially those uprooted with water and NaCl result, had a reduced solubility, indicating that phenolics bind to proteins when they're dispersed in waterless media at neutral pH. The results are bandied in the light of the different complex- forming mechanisms that bind phenolics to proteins.[106]

52. **José Alberto Pereira et al., (2008).** The author concluded that, the chemical composition, antioxidant eventuality and antimicrobial exertion were studied in six walnuts (Juglans regia L.) cultivars (cv. Franquette, Lara, Marbot, Mayette, Mellanaise and Parisienne) produced in Portugal. Concerning their chemical composition, the main element of fruits was fat ranging from78.83 to82.14, being the nutritive value around 720kcal per 100g of fruits. Linoleic acid was the major

adipose acid reaching the maximum value of60.30 (cv. Lara) followed by oleic, linolenic and palmitic acids. The waterless excerpts of walnut cultivars were delved by the reducing power assay, the scavenging effect on DPPH (2,2-diphenyl-1-picrylhydrazyl) revolutionaries and β- carotene linoleate model system. All the walnut excerpts displayed antioxidant capacity in an attention-dependent manner being the smallest EC values attained with excerpts of cv. Parisienne. Their antimicrobial capacity was also checked against gram positive (Bacillus cereus, Bacillus subtilis, Staphylococcus aureus) and gram negative bacteria (Pseudomonas aeruginosa, Escherichia coli, Klebsiella pneumoniae) and fungi (Candida albicans, Cryptococcus neoformans), revealing exertion against the different tested microorganisms.[107]

53. **José Alberto Pereira et al., (2007).** The outcome acquired reveal that, Different cultivars of walnut (Juglans regiaL.) leaves (Cv. Lara, Franquette, Mayette, Marbot, Mellanaise and Parisienne) grown in Portugal, were delved in what concerns phenolic composites and antimicrobial and antioxidant parcels. Phenolics analysis was performed by reversed- phase HPLC/ pater and 10 composites were linked and quantified 3- and 5- caffeoylquinic acids, 3- and 4- p-coumaroylquinic acids, p- coumaric acid, quercetin 3- galactoside, quercetin 3-pentoside outgrowth, quercetin 3- arabinoside, quercetin 3- xyloside and quercetin 3- rhamnoside. The antimicrobial capacity was screened against Gram positive (Bacillus cereus,B. subtilis, Staphylococcus aureus) and Gram negative bacteria(Pseudomonas aeruginosa, Escherichia coli, Klebsiella pneumoniae) and fungi(Candida albicans, Cryptococcus neoformans). Walnut leaves widely inhibited the growth of Gram positive bacteria, beingB. cereus the most susceptible one (MIC0.1 mg/ mL). Gram negative bacteria and fungi were resistant to the excerpts at 100mg/ mL. Lara walnut leaves were also submitted to antibacterial assays using 18 clinical isolates of Staphylococcussp. Antioxidant exertion was penetrated by the reducing power assay, the scavenging effect on DPPH (2,2-diphenyl- 1- picrylhydrazyl) revolutionaries and β- carotene linoleate model system. In a general way, all of the studied walnut leaves cultivars presented high antioxidant exertion (EC values lower than 1mg/ mL), being Cv. Lara the most effective bone.[108]

54. **G. Pandey S. K. Shukla, (2006).** This paper provides a review of the current status of the walnut assiduity in India. The artistic practices, growing regions and mar keting trends of the walnut assiduity in India are anatomized in detail. The paper also addresses the issues related to product constraints and unborn expansion in India's marketable walnut product. With the bettered living norms and increased interest in walnut growing, India is still getting a major walnut producing country.[109]

55. **Toshiyuki Fukuda et al., (2003).** In this study, three hydrolyzable tannins, glansrins A – C, together with adenosine, adenine, and 13 known tannins were insulated from the n- BuOH excerpt of walnuts (the seeds of Juglans regia L.). Glansrins A – C were characterized as ellagitannins with a tergalloyl group, or related polyphenolic acyl group, grounded on spectral and chemical substantiation. The 14 walnut polyphenols had superoxide dismutase (SOD)-suchlike exertion with EC21.4- 190 μM and a remarkable radical scavenging effect against 1,1- diphenyl-2-picrylhydrazyl (DPPH) (EC0.34 –4.72 μM). From walnuts (the seeds of Juglans regia), three ellagitannins, glansrins A – C, have been insulated together with 13 known hydrolysable tannins and their structures illustrated by means of 1D and 2D NMR analyses. Their antioxidative goods were also estimated.[110]

56. **Y. Ozturk et al., (1994).** The author finding shows, In Turkish folk drug, the fruits and leaves of Juglans regiaL. have been extensively used as an herbal remedy for the treatment of colorful endocrine conditions similar as diabetes mellitus, anorexia, thyroid dysfunctions, etc. The effect of fruits of J. regia on the thyroid hormone situations of mice was delved using two excerpts prepared from the fruits by different styles. The acute venom of these two excerpts in mice were assessed as well. On the base of our findings attained, the excerpts prepared from the fruits of J. regia enhanced thyroid hormone situations, while they wielded minimum acute toxin in mice.[111]