

ETHNOBOTANICAL AND PHARMACEUTICAL PROPERTIES OF MEDICINAL HERB *CICER ARIETINUM* - A REVIEW

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Abstract: This purpose of the present study is to study the medicinal and dietary properties of *Cicer arietinum*. *Cicer arietinum* is found to have many pharmacological properties such as antioxidant, cardiovascular, anticancer, antimicrobial activities. Carbohydrates, Proteins, Amino acid, phytosterols, phenolic compounds, tannins, amino acids and flavonoids. The present review also focuses on the active ingredients of *Cicer arietinum* which impart the plant with its medicinal and dietary properties.

Keywords: Chickpea, *Cicer*, ethnobotanical, medicinal, pharmaceutical, phytochemical.

1. INTRODUCTION

During the last few decades medicinal herbs are gaining importance due to their immense health related benefits and thus now days these medicinal plants are under research by various researchers. Medicinal plants are the plants that have certain medicinal properties that can be exploited for the development of various drugs and medicines. These medicinal properties of the plant can be attributed to the various phytochemical constituents present in it. Research in medicinal plants is gaining much significance as many plants are a rich source of such constituents which can be of great help in curing various ailments. Moreover, about half million plants are present in the world, out of which most of them have not been explored as yet for their medicinal potential, and can be exploited for their medicinal as well as therapeutic uses in the near future²².

Chickpea is one among these beneficial herbs which had spread their medicinal and dietary influence across the world. It is an old-world pulse and one of seven Neolithic founder crop a fertile crescent of the Near East⁸. It was first originated in southern Carcasus, northern Persia, Turkey and Syria. Currently it is grown across 50 countries of Indian subcontinent⁴⁷. It is a good source of carbohydrates, proteins, minerals, trace elements^{3,4,5,6} vitamins and dietary fiber^{13,15,16,102,105,106}. Lack of essential oils in seeds of chickpea is an advantage in research work for searching less toxic drug like molecules. It is third important legume in production, next to dry beans and field peas⁴⁰. It is cultivated from about 7000 years old in the Mediterranean and Middle East and is first found in Western Asia^{21,84}. In India, it was first cultivated in UP from about 4000 BC and it originally occurs in wild forms too and nowadays it is domesticated all across the world. India leads all the countries in the production of Chickpea. The other countries producing chickpea are Pakistan, Turkey, Australia,

Myanmar, Ethiopia, Iran, Mexico, Canada and USA⁹⁶. Chickpea is grown in tropical, subtropical and temperate regions. Chickpea is found in two varieties- Microsperma called Desi Channa and other variety is Macrosperma called Kabuli Channa^{10,20,85}. Desi type consists of thick coated and colored chickpea found in various shades and combinations of green, yellow, brown and black. These are small-sized⁸⁹ and angular with rough surface and about 80-85% of chickpea cultivated area is of this type¹². The Kabuli type seeds are white or beige-colored with thin seed coat having ram's head shape and smooth surface with large size¹⁰⁵ and also have high market value. The seed weight ranges from 0.1-0.3g and 0.2-0.6g in desi and Kabuli type respectively¹¹. Chickpea has high nutritional value and it contains hundreds of significant drugs and other biologically active compounds and thus the plant shows a wide range of pharmacological, therapeutic and ethnobotanical activities/uses.

2. STARCH, CARBOHYDRATE, FIBRE, PROTEIN CONTENT^{18,90}

Common name	Scientific name	Total carbohydrate percentage	Starch percentage	Amylose content of starch	Dietary fiber (per 100g of whole mature seed)	Protein content g/100g DM range
Chickpea	Cicer arietinum	60.1-61.2	37-50	31.8-45.8	25.6	19.1-31.2

3. PLANT PROFILE

Synonyms:

Cicer album hort, *Cicer arietinum L.*, *Cicer arietinum subsp.*, *Cicer edessinum Bornm.*, *Cicer grossum Salisb*, *Cicer nigrum hort.*, *Cicerophysodes Rchb.*, *Cicer rotundum Alef*, *Cicer sativum Sckuhr* and *Cicer sintenissi Bornm.*^{20,109}.

Taxonomic Classification:

Kingdom: Plantae; **Division:** Magnoliophyte; **Class:** Magnoliopsida; **Order:** Fabales; **Family:** Fabaceae; **Subfamily:** Faboideae; **Genus:** Cicer, **Species:** arietinum^{20,110,111}.

Common Name:

Arabic: hummus, hommos, lablabi; **Chinese:** yingzuidou; **English:** Bengal gram, chickpea, garbanzo; **French:** pois chiche; **German:** kichererbse; **India:** Kala Chana, Bengal gram; **Italian:** cece; **Portuguese:** grao-de-bico; **Spanish:** garbanzo; **Swedish:** Kikart; **Turkish:** nohut; **Sindhi:** chola; **Ethiopia:** shimbra^{1,111}.

Description– It is annual herb with height of 20-100 cm tall. It is a small bush having spreading and diffused branches and it is covered by glandular and non-glandular hairs. Leaves are compound, having 3-8 pairs of ovals, toothed leaflets. Flowers are purple, pink²¹ or white in colour and solitary in leaf axils. The fruit is pod having 2-3 cm length and comprises of 1-2 seeds^{87,88}.

Part use: Leaves, seeds and seedpod^{106,112,113}.

4. ETHNOBOTANICAL USES

1. Brown Spots: Flour of *Cicer arietinum* (Chickpea) is mixed with *Cocos nucifera* L. (Coconut) oil and applied to the affected area in District Khairpur (Sindh) for curing brown spots and acne in Districts Thatta, Nawabshah, Kamber Shadad Kot, and Tando Muhammad Khan Khan (Sindh). It is also used to cure hand burn and abscess in District Khairpur and Thatta (Sindh)⁴⁴.

2. Acne: *C. arietinum* flour is mixed in jaggery and applied to affected part for the treatment of acne in District Nawabshah (Sindh)⁴⁴.

3. Boils: *Dalbergia sissoo* Roxb (North Indian Rosewood), leaves of *Ziziphus nummularia* L. (Chinese apple), and *C. arietinum* flour are mixed and used for curing boils in District Naushahroferoz (Sindh)⁴⁴.

4. Dandruff: Paste of *Brassica campestris* L. (Mustard) leaves, *Curcuma Longa* L. (Turmeric), and *C. arietinum* is made and applied on the scalp for treating dandruff in District Nawabshah (Sindh)⁴⁴.

5. Remove of Face Hair: The paste of chickpea flour, almond flour and orange juice is applied on the face to remove face hairs and continued for one month in the District Nawabshah (Sindh) to get proper results⁴⁴.

6. Other Medicinal Application: Glandular secretion of leaves, stems and pods consists of oxalic acids, giving a sour taste are effective for bronchitis, catarrh, catamenia, cholera, constipation, diarrhea, dyspepsia, flatulence, snake bite, sunstroke and warts. In India, these acids are extracted by spreading thin muslin over crop during night and in the morning that same cloth is wrung out and acids are collected in bottles and taken whenever required. Seed are also considered as anti-bilious^{96,112,113}.

7. Animal Feed: It is also used as food for livestock. Grain husks and green or dried stem and leaves are mainly used as stock feed¹⁷.

8. Insufficient Milk or Sperm: It is used traditional for curing insufficient milk and sperm⁹⁶.

9. Kidney Stones and Urinary Problems: The Spanish people even believed that kidney stones and urinary problems can be treated with chickpea after the work of Spanish physician and botanist Andres Laguna^{96,105}.

10. Induce Menstruation: Earlier Menstruation is also induced by eating boiled chickpea and the people of Kerala roast the seeds of Cicer arietinum powder them and mixed with jaggery and take it during first menstrual cycle^{17,100}.

11. Diuretic: Dioscorides (1st Century Physician) traditionally used chickpea as diuretic. He also said that chickpea would help women in labors stimulate breastmilk and facilitate menstruation¹⁷.

12. Lessen Menstrual Pain: In India they are used as "sitz" bath- bath of warm water where a few handfuls of dried chickpea plant are added to lessen menstrual pain¹⁷.

13. Traditional Snack Food: Chickpea are consumed as traditional snack food in almost all countries from pre-historic times. In turkey people eat chickpeas by roasting or puffing of legumes by subjecting them to high temperature. The Processing stages include cleaning and grading, soaking, tempering (preheating and testing), boiling, resting, roasting and dehulling. At the end, the chickpea swells, soften and after roasting become crisp^{17,107}.

Most of the Americans traditionally eat hummus (nutrient dense dip or spread made from cooked) mashed chickpeas, blended with tahini, olive oil, lemon juice and spices.

Seeds are ground and flour is used as soup, dhal and to make bread prepared with pepper, salty and lemon. It is served as side dish.

Dhal is split chickpea without its seedcoat, dried and cooked into thick soup or ground into flour for snacks and sweetmeats. Sprouted seeds are eaten as vegetables or added to salads. Young plants and green pods are eaten as spinach. A small proportion of canned chickpea also used in Turkey and Latin America to produce fermented food¹⁷.

14. Diarrhoea: Chile, a cooked chickpea milk (4:1) mixture was good for feeding infants, effectively controlling diarrhea¹⁷.

15. Diabetes: Uygur people of China used chickpeas in herbal medicines for treating hypertension and diabetes for over 2500 years^{79,80,81,113}.

In early fourth century BC, the people of Greek mentioned it as laxative, diuretic, nutritious and included in category of cathartic substances. Drinking chickpea decoction cures gastric problems. For treating malfunctioning of urinary system people drink water which is used for soaking chickpea beans mixed with wine. Roots and leaves in the form of cataplasms are applied both externally and internally to treat many health related disorders¹⁷.

5. PHARMACOLOGICAL USES

Pulses have been consumed from thousand of years ago due to their potential health benefits and nutritional qualities out of which Chickpea consumption have some physiologic benefits and thus considered as 'functional food'⁷. (i). "One encompassing healthful product including, modified food or ingredient that may provide health benefits beyond traditional ingredients"⁴⁸. (ii). "foods that, the virtue of the presence of physiologically-active components, provide a health benefit beyond basic nutrition"⁴⁹.

1. Anti-Cancer effect: Chickpea contain certain minerals, phytochemicals, vitamins, fibers, isoflavone and other compound which prevent our body from various types of cancer¹²⁶. For e.g A principal SCFA called butyrate present in chickpea help to suppress cell proliferation⁶⁴ and also induce apoptosis⁶⁵, thus reduce the risk of colorectal cancer⁸⁶. Protease inhibitors also suppress carcinogenesis by different mechanisms but their target are still unknown. Chickpea seeds contain an oxygenated carotenoid called lycopene, which prevent prostate cancer⁶⁶. According to studies, there is a correlation between carotenoid rich diet and decreased incidence of lung and other types of cancer due to presence of antioxidant properties in carotenoids which protect cells against free radical damage¹⁰⁵. Biochanin A, a chickpea isoflavone inhibit the division of stomach cancer cells and also reduced tumor growth in mice. Saponins, phytochemicals present in chickpea prevent the multiplication of cancer cells and spreading throughout the body⁸⁶. Folate present in chickpea play important role in synthesis of DNA and its repair and thus prevent the formation of cancer cells and mutations in DNA. High fiber intakes also reported to lower the risk of colorectal cancer⁸⁹. A mineral selenium present in chickpea help the enzymes of liver to function properly and detoxify some cancer-causing compounds in body and also decreases tumor growth rates^{44,45,77,83-88,90,144}. C-25 is the protein extracted from chickpea whose cytotoxic activity was studied on normal cells and cancer cells. It reduced cell proliferation of oral cancer cells and have no toxic effect on normal cells^{1,27,43,91}.

2. Heart Health- Cardiovascular Disease and Coronary Heart Disease: The high fiber, K, Vitamins C and Vitamins B-16 content of chickpea all support good health of heart⁸⁶. The high fiber content lowers the amount of cholesterol in blood and thus prevent from various heart diseases^{90,101}. Various bioactive compounds (e.g. phytosterols, saponins and disaccharides) coupled with dietary fiber and low glycemic index lower the risk of Cardiovascular Disease^{7,23,95,99,106,143,144}. Isoflavones are diphenolic secondary metabolites that lowers the heart disease due to inhibition of LDL-C oxidation^{56,57} and proliferation of aortic smooth muscle cells⁵⁸ along with the maintenance of physical properties of arterial walls^{59,77}. B-Carotene along with other vitamins and nutrients present in Chickpea is also helpful in reducing the incidence of Cardiovascular Disease^{103,105}. Intake of saponins and folic acid reduce plasma cholesterol by 16-24% and homocysteine levels by 13.4-51.7% resp^{32,33,85}.

3. Anti-Diabetic : Chickpea contains higher amount of resistant starch and amylose. Polymerization of amylose renders the starch in chickpea more resistant to digestion in small intestine resulting in lower availability of glucose⁶¹ due to which glucose enters slowly into the blood and reduce the demand of insulin and thus lowers glycemic index (GI)^{89,92} and insulinemic Postprandial response this results in severity of type II diabetes by improving glucose tolerance and insulin sensitivity^{22,23,46,47,89}. Studies have shown that people with type 1 diabetes who consume chickpea have high fiber diets lower blood glucose levels and the people with type 2 diabetes, chickpea intake may improve blood sugar, lipid and insulin levels. Intake of seeds also reduce postprandial plasma glucose were useful in treatment of diabetes which is proved by the experiment conducted on mice showing antihyperglycemic activity of petroleum ether extract of *Cicer arietinum* (PEECA) seeds at three different doses^{1,13,85,86,90,99,106,136,137,138,144}.

4. Anti-Inflammatory: The methanolic and ethanolic extracts of Chickpea seeds at different doses (250 mg/kg and 500 mg/kg body weight) show anti-inflammatory action against carrageenan and histamine, induced paw edema in rats. Among these extracts, the methanolic 500 mg/kg and ethanolic 500mg/kg extracts shows maximum anti-inflammatory activity¹. The choline found in chickpeas help to maintain the structure of cellular membranes, aids in transmission of nerve impulses, assist in absorption of fat and reduces chronic inflammation^{28,78,85,90,94,139}.

5. Cholesterol Control: Studies shows that chickpea lowers the amount of low-density lipoprotein or cholesterol in blood and increased consumption of soluble fiber from foods results in reduced serum total cholesterol. All hydrolysates tested exhibit better hypocholesterolemia activity when compared with protein isolated from chickpea^{14,50-55}. Saponin and folic acid rich food including chickpea are reported to reduce plasma cholesterol by binding to dietary cholesterol or bile acids and thus increasing their excretion through faeces^{34,35}. B-sitosterol (dominant phytosterol in chickpea) is helpful in decreasing serum cholesterol levels and thus preventing Coronary heart disease^{36-38,95,96,97}.

6. Anti-Diarrheal effect: Intestinal disorder like diarrheal diseases are one of the leading causes of morbidity and mortality of millions of people each year and thus WHO had started Diarrheal Disease control program which deals with the use of medicinal plants including *Cicer arietinum* to cure such deadly disease. The anti-diarrheal activity of the hydroalcoholic extract of *Cicer arietinum* roots and its acetone and methanol fraction were studied based on their effect on castor oil induced diarrhea in mice. The results show that Loperamide (5mg/Kg) inhibit diarrhoea by 75.37% which is

induced by castor oil while highest reduction was noticed in hydroalcoholic extract (24.63%). It takes place by increasing the rate of intestinal absorption, decrease intestinal secretion or by reducing intestinal motility^{1,29,93,141}.

7. Weight Loss/ Obesity: Chickpea have high fiber content and thus have high volume along with high nutrient density, yet they are low in calories and our body can't digest carbs from fiber. Intake of foods rich in dietary fiber often lead to lower body mass index (BMI)^{67,68} as dietary fibers function as bulking agents in digestive system. These compounds increase satiety (a feeling of fullness)^{69,89} and reduce appetites making people feel fuller for longer and thereby reducing overall calorie intake. Additionally, chickpea is considered as low GI food which increase cholecystokinin (hunger suppressant) thus help in obesity reduction and weight loss^{2,20,21,23,46,47,70-73,85,86,95,99,144}.

8. Digestion and Regularity Maintenance: Because of their high fiber content, chickpeas help to prevent constipation and promote regularity for a healthful digestive tract because dietary fibers require long time to chew and digest in intestine^{90,95}. Chickpea flour has zero wheat, barley, rye or cross-contaminated oats thus It's totally free from gluten and all other grains and presence of gluten have negative effects on the gut, digestion immune responses and bowel syndrome^{60,85,86,106,144}.

9. Blood Pressure: Linoleic acid, a PUFA is important as it is involved in production of prostaglandins which is involved in lowering of blood pressure and smooth muscle constriction⁶². Phytosterols like beta- sitosterol is also helpful in reducing blood pressure. Linoleic acid and beta- sitosterol are the major PUFA and phytosterol in chickpea seeds resp. therefore chickpea seeds could be incorporated as a part of regular diet that may help to reduce blood pressure^{63,90}.

10. Gut Health and Laxation: Studies have shown that intake of chickpea results increase in dietary fiber which results in improvement in bowel health accompanied by increased frequency of defecation. Thus, promote laxation or bowel function by aiding in movement of material through digestive system^{7,47}.

11. Bone Health: Chickpea are rich in iron, phosphate, calcium, Mg, Mn, Zinc and vitamin K which contribute to building and maintain bone structure and strength. Minerals present in chickpea also help to prevent age related disorders like osteoporosis. Bonematrix formation requires the minerals Mn, Fe and Zn which play crucial roles in production and maturation of collagen. The phosphate present in chickpea along with calcium help in proper bone mineralisation. Vitamin K improves Ca absorption is improved by Vitamin K.. Low intake of vitamin K is associated with high risk of bone fracture^{26,45,90}.

12. Diuretic and Anti-nephrolithiasis Effects: The Diuretic and anti-nephrolithiasis activities of Cicer arietinumethanolic seed extract were evaluated in albino rats. The activity was studied by using ethylene glycol induced nephrolithiasis model. Cystone was used as standard drug. Urine volume, urine, urine analysis serum analysis was used to assess the efficiency of test drug. The results revealed that the extract decreased urinary stones in the kidney with good diuretic property^{28,31,92,94,127}.

13. Pharmacological effects of Allantoin: Allantoin is a major metabolic intermediate which is produced from uric acid. It acts as moisturizer and treat skin irritations (e.g. diaper rash, skin burns from radiation therapy.)

The allantoin, 5-ureide-hydantoin acts as a pharmacological active compound which is present in chickpea and its pharmacological effects included wound healing, regulation of inflammatory response, stimulation of fibroblastic proliferation, enhancement extracellular matrices synthesis, anti-irritating, hydrating and remover of necrotic tissues, stimulating the cell mitosis, promoter of epithelial stimulation, analgesic action and keratolytic activity^{1,128-135}.

14. Astringent Properties: An acid erudition from the seedpods is effective in treating stomach disorders like dyspepsia, vomiting, indigestion, costiveness, diarrhea and dysentery thus acts as astringent^{97,143}.

15. Cleansing and moisturizing agent: The herb cicer arietinum is valuable as it cleans skin and scalp thus used in gently baby shampoo, protein shampoo gentle daily care, protein conditioner softness and shine, anti-hair fall hair oil, himfartin²¹.

16. Neural tube defects: Chickpea contain vitamin folate or folic acid which is essential for fetal neural tube formation and thus prevent from neural tube defects such as spina bifida and anencephaly⁹⁵.

17. Prevention of Anemia: Iron is also one important constituent in chickpeas which help in formation of RBC's in the body thus no more feeling of exhaustion or nausea^{17,83}.

18. Nervous System Disorders: The mineral Mo present in chickpea aids in production of cell energy and development of nervous system. Chickpea also provide necessary Amine acids, vitamins and minerals to brain including vitamin B9 or folate which plays important role in the regulation of Amino acids which are required for proper functioning of Nervous System⁹⁵.

19. Detoxification of Sulfites: Certain vegetables, dried fruits and wines contain sulfites which are acidic compounds and causes side effects like headaches and disorientation. Chickpea are extremely high in Mo which counteract these side effects caused due to sulfides⁸⁴.

20. Boost Memory: Chickpeas are excellent source of choline, which help to improve sleep, muscle movement, learning and also boost energy¹⁷.

21. Brain Development: Chickpea comprise of choline (a micronutrient) that aids in brain and spinal cord development and also building healthy nerves¹⁷.

22. Aphrodisiac effects: Intake of chickpea leads to arouse sexual behaviour as it increases production of semen (due to nutritional values, carminative and warming properties), and also increase the cholesterol of serum and testosterone levels. It was studied by methanolic extract of chickpeas (MECA) in sexually sluggish male albino rats as the oral administration of MECA at 200 and 400 mg/ kg increased body weight, mount frequency, intromission frequency, ejaculation frequency, ejaculation latency while intromission latency and mount latency were decreased. These all results are might be due to presence of alkaloids, saponins and flavonoids in MECA^{1,42,76,114}.

23. Improves eyesight: Chickpea is highly rich in carotenoids than golden rice also thus used as a good source of dietary carotenoids which boost many developmental processes in our body like cell division / differentiation, bone growth and the most important vision. Vitamins C and E present in chickpea protect vision and zinc present in chickpea help in transport of vitamin A from liver to retina along with prevention of progression of macular degeneration^{2,75,84}.

24. Estrogenic effects: Chickpeas are good source of phytoestrogen as it is reported to have 993micrograms of estrogen per 100 gram which help to increase in uterine weight, epithelial height, gland number and hormone secretion. The menopausal and postmenopausal symptoms like hot flashes , night sweats and mood swings, etc are countered by consuming chickpeas. It is studied when aqueous, alcoholic and chloroform extract of chickpea was given to female albino rat from 11 to 15 day of pregnancy at dose level of 100, 200 and 400 mg/kg body weight. The dose of 400 mg/kg body weight of aqueous extract acts as abortifacient and also help to increase the weight of reproductive organ^{27,39,41,42,82,84,115,116}.

25. Antioxidant effects : All of the phytosterols , avenasterol and phytonutrients present in chickpea function as antioxidants which inhibit oxidation and prevent or slow damage to cells caused by free radicals. The antioxidant value of raw chickpea in ORAC units is 847 micromole TE/100g. hydrolysates of chickpea show better antioxidant activities especially reducing power and DDPH scavenging effects. Three methods – beta carotene bleaching method, reducing power and 2,2 – diphenyl-1- picrylhydrazyl [DDPH] radical scavenging effect are used to test antioxidant activity. The presence of antioxidants reduce oxidative stress in body and prevent chronic diseases^{23,25,27,30,47,79,84,140}.

26. ACE- inhibition: Chickpea acts as an angiotensin-converting-enzyme inhibitor which is pharmaceutical drug for treatment of hypertension, congestive heart failure, high blood pressure, scleroderma, migraines and other medical problems. It was observed by treatment of chickpea with alcalase which yield hydrolysates which are good source of peptides with angiotensinI converting enzyme inhibitory activity¹¹⁸.

27. Anticonvulsant effect: A dichloromethane extract was prepared from fruits of chickpea by percolation acts as anticonvulsant which is used for treatment of epileptic seizures or ongoing series of seizures, prevent migraines, treat brain disorders, neuropathic pain, etc^{19,119,120}.

28. Hepatoprotective effect : The hepatoprotective activity of petroleum ether , methanol , aqueous extracts of aerial parts (except fruits) of chickpeas was studied against CCl4 induced hepatotoxicity in rats and a dose of 200 and 400mg/kg/day for 20 days is given to experimental rats which results in preventing damage to liver by reducing values of SGOT, SGPT, SALP, LPO, total bilirubin and by increasing SOD,CAT, GSH, similar to silymarin^{108,117,142}.

29. Antimicrobial Effects: Chickpea extracts along with phenolic compounds contain the compounds which have antimicrobial properties against Gram-negative, (E. coli, P. aeruginosa and K. Pneumoniae), Gram-Positive Bacteria (B.

subtilis and *E. faecalis*) and the fungus *Candida albicans*^{9,27,98,104,121-125}. The hydroalcoholic extract along with acetone and methanol fraction of root of Chickpea showed significant activity against *E. coli*, *B. subtilis*, *S. aureus*. Chickpea seed extracts also possess antiviral activity both DNA and RNA containing viruses. E.g. Herpes simplex type 1 (HSV-1) and Parainfluenza-3 (PI-3) and many more. The tocotrienols, tocopherols and sterols present in chickpea oil exhibit anti-ulcerative, anti-bacterial, anti-fungal, anti-tumoric properties⁷⁴.

30. Skin care : The manganese and vitamin B present in Chickpea give energy to cells to fight with free radicals which cause wrinkles. It also prevents the formation of fine lines at bay. The other vital nutrients like folate, zinc and vitamin repair toxin overload and UV damage, thus keeps the skin glowing and supple².

31. Prevent hair loss : Chickpea is rich in proteins and iron which help to make our hairs healthy and thus prevent their damage. Zinc and vitamin A present in chickpea aids in removing dandruff and the presence of manganese in chickpea help to strengthen the hairs while cobalt helps in regrowth of hairs which have lost due to medical treatments like chemotherapy. Presence of vitamin A, B, E along with omega - 6 fatty acids help to improve scalp health and blood circulation².

32. Support pregnancy : Calcium, iron, protein, fiber and other nutrients present in chickpea are essential during pregnancy. Folate is the most important which is required during pregnancy as it is indispensable for the health of foetus and mother also help to overcome health problems like neural tube defects and low birth weight. Folate also provides immunity to foetus and protect from various types of infections².

6. CONCLUSION

Chickpea is a medicinal plant used as a medicine to treat traditionally a wide range of health complications. The analysis of phytochemistry, proteins, amino acids and other minerals present in chickpea are proved beneficial for treating many health disorders and thus have high significant value in therapeutical and pharmacological uses, thus serve the humanity.

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