

INTERNATIONAL JOURNAL OF UNIVERSAL PHARMACY AND BIO SCIENCES

IMPACT FACTOR 2.093***

ICV 5.13***

Pharmaceutical Sciences

REVIEW ARTICLE.....!!!

A REVIEW ON *PAPAVER SOMNIFERUM* (OPIUM POPPY)

Shafiqua Asiya Madani*¹, Shekshavali. T¹, Kuppast .I.J¹, Ravi M.C.²Department of Pharmacology ¹, Department of Pharmacognosy ², National College of Pharmacy, Shimoga-577201 Karnataka, India.

KEYWORDS:

Morphine, Papavarine,
Stomach spasms,
Atropine.

For Correspondence:

Anusha M*

Address: Department of
Pharmacology, National
College of Pharmacy,
Shimoga-577201

Karnataka, India.

Email:

Sariya2691@gmail.com

ABSTRACT

The *opium poppy* has been termed a boon to humanity and a curse at the same time, because of the fact that although the herb can bring relief for a great number of maladies. *Opium poppy* (*Papaver somniferum*) produces a large number of benzyloquinoline alkaloids, including the narcotic analgesics. The *Papaver somniferum*, is the type of poppy from which opium and all refined opiates such as morphine, thebaine, codeine, papaverine, and narcotine are naturally present and extracted from the poppy. The seeds of the poppy are widely used as the popular "poppy-seed" found in and on many food items such as bagels, muffins and cakes. The seeds can be pressed to form poppy seed oil. has emerged as one of the most versatile model systems to study alkaloid metabolism in plants. As summarized in this review, we have included the history, introduction, important medicinal uses and also the pharmacological activities of *poppy* seeds derived from *opium poppy*.

INTRODUCTION:

Opium derived from the Greek word “opos” for juice, refers to the liquid collected from the unripe seed capsule of *Papaver somniferum L.*, also known as *opium poppy*. Opium has been used for medicinal purposes for centuries. It is generally agreed that the first written reference to *opium poppy* is found on Sumerian clay tablets inscribed in Cuneiform script about 3000 B.C. Opium was probably used as an euphoriant in religious rituals by the Sumerians. It wasn't until 1805, that a young German apothecary named Friedrich Wilhelm Sertürner, founded out many pharmacologically active ingredients from the *poppy* seeds, He named this alkaloid as morphine, after Morpheus, the god of dreams in Greek mythology. Shortly after, other alkaloids codeine and papaverine were discovered.⁽³⁾ The term opiate is used today to describe drugs derived from opium. Poppy seeds are less than a millimeter in length⁴ and minute it takes 3300 poppy seeds to make up a gram, and a pound contains between 1 and 2 million seeds⁵. The primary flavor compound is 2-pentylfuran,⁶

Opium poppy is a very powerful plant, and its superior powers so its also called as the joy plant by the Commonly called as joy plant by the Sumerians who apparently used it quite frequently¹ and also commonly called as Opium, it is the source of many narcotics like morphine and heroin. The meaning of its botanical name is “sleep inducing Opium”. By the year 300 BC, opium had become popular with Arabs, Romans, and Greeks as a sedative and soporific, and widely used in countries as diverse as Persia, India, Europe, China, and the Americas. The *opium poppy* has been termed a boon to humanity, and a curse at the same time, because of the fact that although the herb can bring relief for a great number of maladies that a human being suffers from, it can also be a terrible curse to those people who happen to fall under its spell, since it is extremely addictive.⁸



FIGURE NO.1 *POPPY SEEDS*

Poppy seeds(Fig.No.1) are kidney-shaped, and have a blue-gray colour and are used in various baked goods, salad dressings and West Asian cuisine. *Poppy seeds* have a crunchy texture and are a good source of protein, fibre, calcium, fat and minerals. These tiny seeds are very nutritious.

BOTONY OF PAPAVER SOMNIFERUM

The botanical name of Opium seed is *Papaver somniferum* and belongs to the family Papaveraceae. Common names of Opium or Poppy seeds include Opium, Khaskhas, Apheem, Aaphim postadaanaa, Aphini, Aalan, Avil, Oriental poppy etc.⁷

Indian Names	
Hindi	: Kashash
Bengali	: Kashash
Gujarati	: Khuskhush
Kannada	: Khasksi
Malayalam	: Kashakasha
Marathi	: Khus khus
Punjabi	: Khush khush, Khas
Sanskrit	: Khasa, Khakasa
Tamil	: Gaehagesha kasakasa
Telugu	: Kasakasa, Gasagasla, Gasalu
Urdu	: Kashkash sufaid

Cultivation: The centre of origin of *Poppy* is the Western Mediterranean region of Europe and is cultivated in India, Russia, Egypt, Yugoslavia, Poland, Germany, the Netherlands, China, Japan, Argentina, Spain, Bulgaria, Hungary, and Portugal for its legal pharmaceutical use. It is also grown illegally for the narcotic trade. in Burma, Thailand and Laos (Golden Triangle) and Afghanistan, Pakistan and Iran (Golden Crescent).

Poppy is cultivated in temperate and sub-tropical region and requires well drained, highly fertile, light black cotton soil having good percentage of fine sand. In India it is a licensed crop since the latex of the mature fruit are collected for the production of *opium*, a narcotic substance⁹

History: The earliest accounts of the use of poppy preparations date to the ancient Sumerians in Mesopotamia, where the plant was used medicinally and was known as hul gil (the plant of joy).

The medicinal uses of poppy were described by the ancient Greeks and opium, as an addictive agent, was identified by Arabic physicians more than 900 years ago. Because of the wide distribution of the opium poppy, its use has been recognized by most major cultures. Opium was widely used in the United States during the Civil War to treat wounded soldiers, who often developed dependence. The alkaloid morphine was purified from crude opium in 1803. In 1874, morphine was reacted with acetic anhydride to yield heroin. This compound was developed by the Bayer pharmaceutical company in Germany for cough, chest pain, and pneumonia and was later recognized to have a high addiction potential. Derivatives of opium alkaloids continue to play a major role as antitussives, antidiarrhoeal and analgesics. Their abuse potential remains high, and efforts to curtail the illicit cultivation of the opium poppy have had limited success. Poppy seeds are used in the preparation of confections and breads.^{10,2} While growing poppies is legal, it is illegal to process what is grown into the drug form.

Constituents: The most important constituents of *opium* are the alkaloids, which constitute in good opium about one-fifth of the weight of the seed. The principal alkaloid, both as regards its medicinal importance, and the quantity in which it exists, is Morphine. Next to this, Narcotine and Codeine are of secondary importance. Among the numerous remaining alkaloids, amounting in all to about 1% of the seeds, are Thebaine, Narceine, Papaverine, Codamine and Rhoeadine. Meconic acid exists to the extent of about 5 per cent combined with morphine. This acid is easily identified, and is important in toxicological investigation, as corroborative of the presence of opium. Meconin and meconiasin exist in small quantity only. Mucilage, sugar, wax, caoutchouc and salts of calcium, and magnesium are also contained in opium, and sulphuric acid is found in the ash. The presence of starch, tannin, oxalic acid and fat, common constituents of most plants, indicates adulteration, as these substances do not occur normally in the seed. Powdered poppy capsules stones, small shot, pieces of lead, gum, grape must, sugary fruits, and other mechanical impurities, have also been used as adulterants of opium.¹¹

Chemistry: The chemistry of the genus *Papaver* is well known. When the unripened seed capsule is scored, a milky latex exudes.^{2,12} The dried latex is known as opium, which contains more than 30 alkaloids.⁵ The most important of these alkaloids are morphine (20%), noscapine (5%), codeine (2%), papaverine (2%), and thebaine (1%). Codeine is the most widely used opium alkaloid and is obtained from natural sources or through the methylation of morphine or synthetic transformation of thebaine.^{2,13} Because of the medicinal importance of morphine

derivatives, efforts have been made to identify a species of *Papaver* that contains high levels of a suitable starting compound for the commercial synthesis of codeine. In some varieties of thebaine constitutes 98% of the total alkaloid content.¹⁴ Commercially, thebaine may be readily converted to codeine, oxycodone, hydrocodone, or dihydrocodeine. *P. bracteatum* may become the species of choice as a legal source of alkaloid precursors.¹⁵ Poppy seed oil, used as a vehicle for pharmacological substances as well as oil-based paints, varnishes, soaps and liniments contains saturated palmitic and stearic acids and oleic, linoleic, alpha-linolenic, and other unsaturated fatty acids.^{16,17} *Poppy seeds* and their oil contain only minuscule amounts of *opium* alkaloids.

Essential Nutrition Facts about Poppy Seeds:¹⁸

Health Benefits of Poppy Seeds :

1. Poppy seeds are effective in quenching thirst, fever, inflammation, constipation and irritation of the abdomen and also are one of the necessary ingredients in many cooling medicines. The oil from poppy seeds plant is useful in treating carcinoma as it contains monounsaturated fatty acids and mainly they add flavour and texture to breads, cookies, muffins, cakes and other foods. As an Ayurvedic medicine, these seeds are sometimes grounded into a paste with milk to form a skin-renewing moisturizer. As Poppy seeds contain Linoleic acid that is beneficial in preventing heart disorders and abdomen conditions and have a decent supply of fatty acids that are needed for the body's physiological state. They are found to be rich in omega-3 fatty acids, even they are used as narcotics to treat pain-related conditions, and utilized in treating respiratory disorders, infectious diseases, diarrhoea and sleep disorders. As they contain relatively lower quantity of alkaloids and are used in the treatment of various nerve disorders.¹⁸

Selection and storage

Fresh whole or ground *poppy seeds* are readily available in stores. However, the seeds are high in polyunsaturated fats, which make them vulnerable to oxidation and turn rancid. Therefore, buy good quality whole seeds from authentic store wherever they are fresh. Store seeds poppy in cool, dry, dark place, in airtight containers where they will stay fresh for up to six months.¹⁹

PHARMACOLOGICAL ACTIVITIES

Morphine, (PAIN RELIEVER/ ANALGESIC)

Morphine is having a very powerful analgesic properties. It is the most abundant component of *opium*, ranging from 4-21% by weight. Morphine is still unsurpassed in its ability to deaden pain.

It is considered the most powerful naturally-occurring analgesic. Originally, it was taken orally, but its full potential was not realized until after the development of the hypodermic syringe in the middle of the 19th century. Taken orally, morphine is rapidly inactivated and excreted. Morphine depresses the areas of the brain involved in the perception of pain, and reduces the anxiety that accompanies pain. Severe burns and visceral pain during post-operative period, Also used for radiation sickness, allegedly stockpiled for that contingency during the Cold War.² It is one of the best painkillers known to medicine and to man. It acts mainly on the sensory nerve cells of the cerebrum, and this effectively blocks the pain from other part of the body. It also acts as a stimulant. Opium induces euphoria and helps to eliminate anxiety, tensions, and fears, all of these being the effect sought by addicts wanting to escape the realities of life. However, morphine does decrease respiration, at times even to the point of death, and furthermore, it can be very addictive. In the case of heroin, a further refinement of morphine is very addictive that its use has been banned even as a medicine.

Papaverine (Skeletal Muscle Relaxant): It is a muscle relaxant and this blocks the nerve impulses that are held responsible for contractions. It can be used to treat intestinal and stomach spasms too and also the asthmatic attacks that can be triggered by respiratory spasms²⁰

Properties:

Painkiller properties: The bio-chemicals in *poppy seeds* have been found to possess painkiller properties, especially in cases of muscular and neuralgic pains. It is also effective in treating syphilis, colic, as well as various cancers and ulcers. Research into plant based painkillers has been giving positive results which are consistent with those of synthesized chemical painkillers, without any major side effects.²¹

Anti-oxidant properties: Studies on *poppy seeds* have shown that they possess considerable amount of anti-oxidants present in them. Anti-oxidants protect various organs and tissues from free radical attacks which damage DNA and cause cancer in severe instances.²¹

Anti diarrheal effects: It slows peristalsis in the digestive tract. Diarrhea can be controlled by taking a teaspoonful of dry roasted poppy seeds.²¹

Prevents formation of kidney stones: *Poppy seeds* are good for kidneys as they prevent the formation of stones in the kidney. Excess calcium in the body can crystallize gradually and form stones in the kidney. The oxalates found in *poppy seeds* prevent excess absorption of calcium in

the body than needed.²¹

Hypnotic Properties: *Opium poppy* containing morphine is a strong hypnotic and sedative which works by modulating endorphine receptors and as a strong stimulant induces euphoria and eliminates anxieties and inhibitions. The use of which often leads to addiction.²¹

Treating Respiratory disorders: Property of *poppy seed* as expectorant and demulcent is good for treating respiratory disorders. It helps in reducing cough and along with sedative effect provides long lasting relief. It finds therapeutic use in various cough syrups. Though it is mildly inflammatory in nature, it helps in treatment of asthma and cough.²² *Poppy seeds* show Direct effects on respiratory centers in the medulla. Dose-related depression of ventilatory response to hypercarbia and hypoxia. This shifts CO₂ response curve to the right May involve a distinct subset of μ_2 receptors.¹²

Anti-cough: It suppresses the cough reflex in CNS and used in cough syrups, Codeine suppresses the cough reflex and has antitussive activity¹⁹. Opioids present causes Depression of cough centers in the medulla. Different molecular mechanism than analgesia or respiratory depression cough suppressed by dextro-isomers of opioids (e.g. dextromethorphan), compounds which have no analgesic activity.¹²

CNS Effects

Analgesia and Mood

Processing of pain information is inhibited by a direct spinal effect at the dorsal horn. Probably involves presynaptic inhibition of the release of tachykinins like substance P, Rostral transmission of pain signals decreased by activation of descending inhibitory pathways in the brainstem. Emotional response to pain altered by opioid actions on the limbic cortex, Opioids may act at receptors located peripherally on sensory neurons. Possibly important in painful conditions accompanied by tissue inflammation.¹²

Sedation-Hypnosis

Drowsiness, feelings of heaviness, and difficulty concentrating are common, Sleep may occur with relief of pain, although these drugs are not hypnotics. Most likely to occur in elderly or debilitated patients and in those taking other CNS depressants.¹²

Pupillary Constriction •

Stimulation of Edinger-Westphal (parasympathetic) nucleus of the oculomotor nerve to produce miosis, Pinpoint pupil is a pathognomonic sign of opioid overdose and Antagonized by naloxone, atropine or ganglionic blockers.¹²

Cardiovascular Effects

Decrease in central sympathetic tone causes vasodilation and orthostatic hypotension. Effects on both capacitance and resistance vessels. Bradycardia by stimulating central vagal nuclei, Little or no myocardial depression.¹²

Histamine Release

Morphine, codeine, meperidine cause non-immunologic displacement of histamine from tissue mast cells. Occasionally redness, hives, itching near injection site. Rarely, hypotension, Generalized flushing. Not an allergy—true allergic responses to opioids are very rare. Facial itching and warmth are common after opioids—probably a dysesthesia which has nothing to do with histamine.¹²

On Gastrointestinal Tract

Intestine and Stomach

Spasm of smooth muscle all along the GI tract. Both small and large bowel become hypertonic, but rhythmic propulsive activity is diminished. Delay in intestinal transit time and spasm of the anal sphincter cause constipation, Delayed gastric emptying, is important because it may slow

absorption of oral medications. Mechanism involves both CNS effects and peripheral actions on opioid receptors in the enteric plexus. Smooth muscle effects of morphine > meperidine > agonist-antagonist opioids. Chronic administration of opioids frequently necessitates the administration of laxatives and stool softeners to treat constipation. Recent evidence that poorly-absorbed quaternary opioid antagonists are also effective in reversing this local effect. Constipating effect is used therapeutically for treatment of diarrhea. Diphenoxylate (in Lomotil) and loperamide (Imodium) are poorly-absorbed opioids that do not produce central effects.¹²

Biliary System

Contraction of smooth muscle along the biliary tree and spasm of the sphincter of Oddi. Can precipitate biliary colic on rare occasions. Effect antagonized by naloxone and partially reversed by glucagon, nitroglycerin, or atropine.¹²

Urinary Tract

Increase contractions of the ureter and tone of the urinary sphincter, but decrease force of detrusor muscle contraction. Decreased attention to full bladder. Can cause urinary retention. Probably both central and peripheral mechanisms involved.¹²

Effects on Pregnancy and the Neonate •

All cross the placenta, No teratogenic effects, but chronic use may cause physical dependence in utero. Neonatal withdrawal after delivery can be life-threatening, Opioids given during labor can cause respiratory depression in baby¹²

General Depression;-

It is a general CNS (central nervous system) depressant and, in overdose, can lead to death by completely suppressing the respiratory center in the brain. *Papaver somniferum* belongs to family Papaveraceae, in minute doses it first stimulates brain, heart and respiration. Later, this effect is soon followed by general depression (Khan, 1997).²³

Free Radical Scavenging Capacity Of *PAPAVER SOMNIFERUM*

The free radical generation is related to the oxidation process in biological systems as well as in foods. It was found that oxidation is affected by antioxidants that can act as radical scavengers. The free radical scavenging capacity of opium poppy (*Papaver somniferum L.*) extract by using the DPPH(2,2-diphenyl-1-picrylhydrazyl) test and to verify the suitability of the micellar electrokinetic capillary chromatography (MEKC) technique for analytical assessment and determination of three major poppy alkaloids (thebaine, morphine and papaverine). Because of its generally high separation efficiency, the MEKC is successfully used for analytical evaluation of biologically active substances usually without special claims for sample preparation. The results of DPPH test have shown that *poppy* contains components capable of terminating free radicals.²⁴

Antibacterial Activity

Antibacterial activity of aqueous infusions and aqueous decoctions of *poppy* seed (*Papaver somniferum L.*, Papaveraceae) were investigated against 188 bacterial isolates belonging to 11 different genera of Gram +ve and Gram -ve microorganisms isolated from oral cavity of apparently healthy individuals. Disc diffusion method was performed to test antibacterial activity. The highest antibacterial potential was observed from the aqueous decoction of *poppy* seed (14.4%). Hence concluded that *Poppy* seeds showed inhibitory Potential against tested microorganism.²⁵

Anti Cancer property

Omega -3 and Omega-6 fatty acids in Poppy seeds are considered having anti cancer properties. Plants used against cancer, Hartwell mentions o mentions *opium poppy* as a remedy for conditions in cancer of the skin, stomach, tongue, uterus, breast, liver, spleen. Research shows that Oleic acid, present in poppy seed reduces risk of cancers and tumors. A research shows that

lipidol in *poppy* seed binds itself to hepatocellular cancer cells and prevent the spread of cancer. Similar Anticancer properties of *poppy* seed are being researched.²²

Anti spasmodic

Poppy seed has properties as anti-spasmodic and useful in case of muscle spasm and stomach spasm.²²

Cardio-protective property

Omega -6 fatty acids in Poppy seed mainly Linolenic acid helps reduce bad cholesterol levels in body. Around 30-40% of *poppy* seed by weight contains such fatty acids. Research studies suggest that diet rich in Omega 3 and omega 6 fatty acids can reduce heart risk. Additionally, dietary fiber in *poppy* seed binds to bile salts and cholesterol in intestine and prevents their absorption in colon. There by reducing risk from cholesterol. Sedative impact of *Poppy* seed also helps in reducing blood pressure.²²

Enhancing Immunity

Poppy seeds are considered good for increasing body immunity and preventing various diseases.²²

MEDICINAL USES:-



FIGURE NO.2(Fruits and seeds of Opium Poppy)

Chinese have used *poppy* to treat cases of diarrhea, headaches and asthma and they have also found a use for the unripe seeds of the *poppy* by using the *opium* latex from the unripe capsules as both anti tussive and sedative, since it has been proven that *opium poppies* contain over 20

alkaloids, including morphine, papaverine, noscapine, and codeine. Today, scientists have realized that *poppy's* alkaloids can be used as an effective painkiller: while codeine can be used to treat minor pains, noscapine can be used to treat coughing, and papaverine can be used to increase blood flow. In herbal tradition, *opium* is considered to be an excellent 'cold' remedy, because of its ability to reduce physical function, and to sedate and suppress coughs, nervous activity, including pain. *Opium* also brings great relief to patients suffering from diarrhea and persistent coughs. It has been used since ancient times for its sedative properties. *Opium* acts on the nerves and relieves pain. Excess quantity produces sedative effects on the brain and nerves.

PRIMARY MEDICINAL USES :-

Nerve Disorders

Opium is very effective in treating nerve disorders in the body. When taken over time the medicine increase the strength of the body nerves.²⁶

Diarrhoea

Poppy seeds (Fig No:-2) are very effective in treating diarrhoea. The seeds are powdered and mixed with milk and consumed. They also cure the stomach pain caused due to excessive heat and dehydration. *Opium* is rich in fiber which helps in absorbing the water and thereby easing digestion.²⁶

Sleeplessness

Opium is very effective in treating insomnia. They work on the nerves and bring peaceful sleep.²⁶

Cures insomnia: *Poppy* seeds have been used traditionally for inducing sleep in people who were suffering from insomnia.²¹

Effective Coolant

Opium is an effective coolant for the body. They are ground and consumed. They reduce the body heat and keep the body cool.²⁶

Good cholesterol levels

Opium increases the HDL in the body. It increases the blood lipid profile thereby prevents strokes and artery diseases. It helps keep the cholesterol under control and reduces the blood pressure in the body.²⁶

Body Resistance

Poppy seeds increase body resistance. They increase the disease resistant properties of the body.²⁶

Rich Source of Nutrients

Besides being rich in fiber, the seeds are good source of Vitamin B. They also contain thiamine, folic acid niacin, pyridoxine, riboflavin, etc. They are also rich in minerals like zinc, copper, calcium, iron, magnesium, potassium, etc²⁶

Pain Relievers:

Poppy seeds are used as painkiller and muscle relaxant. They have been used to relieve toothaches and cures spasms.²³ and *Opium* alkaloids in *Poppy* seeds also act as pain killer. *Poppy* seed is beneficial relieving muscular and neuralgic pain. *Poppy* seeds can be used to cure Ear and Tooth aches. *Poppy* seeds have helped ancient man fight pain. *Opium poppy* was one of the first plants man found for relieving pain²²

Reduces bone loss

According to some studies conducted on *Poppy* seeds, Linoleic acid, reduces calcium loss from bone associated with Osteoporosis, porosis. Further it also contains considerable amount of dietary calcium.²²

Colovesicle Fistule

A few studies have evaluated the *poppy* seed test for the diagnosis of fistulae. Newer diagnostic methods have a varying success rate (70% to 80% for computerized tomography scans and 80% for radio-labeled chromium),^{13, 14} while the *poppy* seed test and the charcoal test have been demonstrated to detect fistula in 100% of instances.^{26, 27, 28} Costs and acceptability of the *poppy* seed test are more favorable.²⁷

Hepatocellular cancer

Iodized *poppy* seed oil (Lipiodol) is used in imaging techniques in vascular hepatocellular cancer, because of the preferential accumulation of *poppy* seed oil in hepatocellular cancer cells. For this reason, iodized *poppy* seed oil is used as an adjuvant or vehicle to deliver chemotherapeutic agents (eg, cyclosporine A, cisplatin) to tumor sites.^{29, 30, 31.}

Skin Treatment properties

Linoleic acid in *poppy* seed (Fig.No;2) helps treat eczema. In Ayurveda, *poppy* seed are considered good for skin; it acts as moisturizer and provides smooth and soft skin, and used in

treating burning sensation, itchs. With pain killer effect, it is also helpful in relieving pain in case of some inflammation. *Opium* seeds are effective reducing dark patches under eyes.²²

Additional uses of poppy seeds

Poppy Seed Oil

Poppy seeds are mainly used for extracting poppy seed oil which has many medicinal uses.²⁶

Cooking

Poppy seeds are widely used in cooking as a flavoring agent.²³ They are customary in flavored bread, cakes, rolls and cookies. *Poppy* seeds are often sprinkled on top of dishes, used as garnish or as a spice with farm cheese, cheese, eggs, pie crust, salad, cookies, cakes, bread, pastries, salads, sauce, curries, sauces for meat and fish, vegetables and noodles.

Asthama

Opium seeds are very effective in treating asthma. A spoon of the opium seeds are ground and consumed regularly for curing asthma.²⁶

Black circles

Opium seeds are very effective in removing dark spots.²⁶

Itching

Poppy seeds cures itching.²⁶

Ornamental Plant

Poppy plants are widely used for ornamental purposes.. It is also called as garden *Poppy*.²⁶

Drug

Poppy seeds are used as main ingredients in preparing cough syrups and decoctions.³²

Adverse Reactions :-

Immunoglobulin E-mediated allergy to *poppy* seeds is rare,²⁴ although case reports of anaphylactic reactions exist.^{24, 25, 26, 27} The poppy seed commonly used in confectionary is thermostable. In some patients, it may need to be ground in order to be allergenic.²⁴ Cross-sensitization with sesame seed, hazel nut, rye grain, kiwi fruit, and buckwheat has been reported.^{27, 31}

Side effects of poppy seeds

Precaution need to be taken while use of *poppy* seed, as many people can be intolerant to its consumption. Intake in excess should be avoided. *Poppy* seeds are less allergic among seeds and nuts. They can be used safely even in pregnant women and children. Though it doesn't

contain any banned opiate like morphine or codeine, it reacts to drug tests. If *poppy* seed pastry are consumed and are travelling to countries where above drug test can be done at airport. Some countries like Saudi Arabia have banned *poppy* seed and so should be avoided.²²

Safety profile

Poppy seeds are less allergic among seeds and nuts. They can be used safely even in pregnant women and children. Sports personnel, however, need to keep in mind that they may test false positive when consume food items containing *poppy* seeds for banned opiate substances like morphine, codeine etc. However, these compounds may not be high enough to produce narcotic drug side effects.¹⁹

CONCLUSION

An extensive survey of literature revealed that sporadic information is available, a close scrutiny of literature on *poppy* seeds have been investigated pharmacologically. Pharmacological studies infer that *poppy* seeds exhibits Sedation, Hypnosis, Antitussive, Antidiarrhoeal, Cardioprotective, anticancer, pain relieving, Anti spasmodic, Skeletal Muscle Relaxant ,and in treating , Colovesicle fistule, Hepatocellular Cancer, keeping in view the traditional, alternative and complementary uses, sporadic phytochemical and pharmacological reports, low toxicity and frequency of use in herbal formulations seems to hold great potential investigation for various biological activities. The pharmacological reports support medicinal potential of *opium poppy*, Scientifically explored extensive reports of plants, their medicinal properties and active chemical constituents have role in the management of various ailments, this review attempt to encompass the available literature on *opium poppy* with respect to its traditional uses, chemical constituents and summary of various pharmacological activities.

Acknowledgement

Authors are thankful to VGST (vision group of science and technology), Government of Karnataka for providing the facilities to carry out this work.

References:

1. Benyhe S. Morphine: new aspects in the study of an ancient compound. Life Sci, 1994; 55: 969-969.
2. Calixto JB, Beirith A, Ferreira J, et al. Naturally occurring anti nociceptive substances from plants. Phytother Re, 2000;14(6):401-418.

3. Brownstein MJ. A brief history of opiates, opioid peptides, and opioid receptors. Proc Natl Acad Sci USA, 1993;90:5391-5393.
4. United States Government Printing Office. *Year book of Agriculture* .1896. P 203.
5. Harold Mc Gee, Simon and Schuster. *On Food and Cooking: The Science and Lore of Kitchen*. ISBN 978-0-684-80001-1.P 513. (2004)
6. Yiu H.Hui, CRC Press: *Handbook of Food Sciences, Technology and Engineering*. ISBN 0-8493-9848-7, (2006).
7. K R Kirtikar and B D Basu, “Indian medicinal plants”, Periodical experts book agency, Delhi-10095;1st edition :120-130.
8. OPIUM POPPY (*papaver somniferum*) HERBS2000.COM.
9. SPICES BOARD INDIA Ministry of Commerce And Industry, Govt of India.
10. Hoffmann JP. The historical shift in the perception of opiates: from medicine to social menace. J Psychoactive Drugs . 1990;22(1):53-62.
11. POPPY.WHITE POISON, *Steadman Shorter’s Medical dictionary*, Poisons and antidotes: opium.
12. Simon JE, Chadwick AF, Cracker LE. Herbs: An Indexed Bibliography, 1971-1980: The Scientific Literature on Select Herbs, and Aromatic and Medicinal Plants of the Temperate Zone . Amsterdam, New York: Elsevier; Hamden, CT: Shoestring Press; 1984.
13. Duke JA. CRC Handbook of Medicinal Herbs . Boca Raton, FL: CRC Press; 1985.
14. Nyman U, Bruhn JG. *Papaver bracteatum* –a summary of current knowledge.PlantaMed.1979;35(2):97-771.
15. Theuns HG, Theuns HL, Lousberg RJ. Search for natural sources of morphians. Econ Bot . 1986;40(4):485-497.
16. Untoro J, Schultink W, West CE, Gross R, Hautvast JG. Efficacy of oral iodized peanut oil is greater than that of iodized poppy seed oil among Indonesian schoolchildren. Am J Clin Nutr. 2006;84(5):1208-1214.
17. Krist S, Stuebiger G, Unterweger H, Bandion F, Buchbauer G. Analysis of volatile compounds and triglycerides of seed oils extracted from different poppy varieties (*Papaver somniferum L.*). J Agric Food Chem. 2005;53(21):8310-8316.
18. 15 Amazing Benefits Of Poppy Seeds Apsara on July 8, 2013.
19. Poppy seeds nutrition facts, power your diet www.nutrition-and-you.com

20. Psychoactive Plants.
21. PHYTOCHEMICALS (Quick Facts about Poppy seeds or *Papaver somniferum*)
22. JENNIFER B Health benefits of Poppy seeds 05 JAN '11.
23. AISHA AZMAT, MOHAMMAD ABDUL AZEEM, NAVAJD-UL-ZAFAR AND S.I. AHMAD Physiological And Pharmacological Effects Of Somnia (HERBAL PREPARATION) On Cardiac Parameters Pakistan Journal of Pharmacology Vol.22, No.2, July 2005, pp.35-40.
24. STANISLAV BAROS, et al Free radical scavenging capacity of *Papaver somniferum l* and determination of pharmacologically active alkaloids using capillary electrophoresis Journal of Microbiology, Biotechnology and Food Sciences 2012 : 1 (February Special issue) 725-732
25. Nazia Masood, Ahmed Chaudhry, Praveen Tariq. Invitro Antibacterial activities of Kalonji, Cumin and *Poppy seeds*. Pak. J.Bot, 2008; 40(1):461-467.
26. Wensky H. Jongen J. Diagnosis of enterovesical fistula using poppy seeds. Colorectal Dis . 2006;8(1):71-72.
27. Kwon EO, Armenakas NA, Scharf SC, Panagopoulos G, Fracchia JA. The poppy seed test for colovesical fistula: big bang, little bucks! J Urol. 2008;179(4):1425-1427.
28. Schwaibold H, Popiel C, Geist E, Hartung R. Oral intake of poppy seed: a reliable and simple method for diagnosing vesico-enteric fistula. J Urol . 2001;166(2)530-531.
29. Buscombe JR. Interventional nuclear medicine in hepatocellular carcinoma and other tumours. Nucl Med Commum . 2002;23(9):837-841.
30. Fujiyama S, Shibata J, Maeda S, et al. Phase I clinical study of a novel lipophilic platinum complex (SM-11355) in patients with hepatocellular carcinoma refractory to cisplatin/lipiodol. Br J Cancer . 2003;89(9):1614-1619.
31. Abe S, Otsuki M. Styrene maleic acid neocarzinostatin treatment for hepatocellular carcinoma. Curr Med Chem Anticancer Agents . 2002;2(6):715-726
32. Medicinal uses of opium (poppy seeds) posted on may 12 2013
33. Harvard-MIT Division of Health Sciences and Technology HST.151: Principles of Pharmacology Instructor: Dr. Carl Rosow.
34. Botonical.com A MODERN HERBAL BY Mrs. M GRIEVE.