

# Future perspectives of Therapeutic Claims of an Ethnopharmacological Drug *Ipomoea carnea* Jacq. - A Critical Review

## Review Article

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## Abstract

*Ipomoea carnea* Jacq is an ethnopharmacological drug used for various indications by healers. As the herbal medicines are becoming endangered, ethnopharmacological drug can be used efficiently as they are available abundantly. The aim of this article is to highlight the therapeutic uses of *Ipomoea carnea* and to stress the use of ethnopharmacological drug vividly in the treatment. Materials and Methods: The data was located from books including ethnopharmacological drugs, Indian flora, traditional medicine and articles in various journals out of which only the data related to Identification of the species, pharmacological researches, therapeutic and other uses of *Ipomoea carnea* Jacq was selected. The data was segregated, edited, consolidated and reviewed critically to explore the therapeutic potential of the drug. Result: Phytochemical, in vivo and in vitro pharmacological studies indicate the therapeutic potential of *Ipomoea carnea* but there is scarcity of clinical evidences to prove their efficacy and safety in human beings. Discussion and Conclusion: *Ipomoea carnea* has significant pharmacological and therapeutical value. Though it is used as folk medicine, no clinical study has been conducted to evaluate the efficacy or to evaluate the toxic potential of *Ipomoea carnea* leaves, seeds or any other part.

**Key Words:** *Ipomoea carnea*, Ethnopharmacology, Ethnomedicine, Swainsonine.

## Introduction

In India, traditional medicines have been used since long ago. Ethnomedicine is the study or comparison of the traditional medicine based on bioactive compounds in plants and animals and practiced by various ethnic groups. Ethnopharmacology is a study of ethnic groups and their use of plants compounds. It is linked to medicinal plants and ethnobotany.

*Ipomoea* is a large and complex genus comprising over 600 species of vines and shrubs widely distributed throughout the tropics. (1) In India, over 60 species of *Ipomoea* are reported. (2) *Ipomoea carnea* Jacq commonly known as *Beshrama* in Maharashtra is a folklore medicine and belongs to convolvulaceae family. It is also called as pink morning glory and bush morning glory. It grows in India as weed or wild plant naturally in waste lands, wet land, roadside, canals and drain banks abundantly. Its flowers are used in *bathukamma* which is a state festival of Telangana state. (3)

The plant is harvested from the wild for local use as a food and a medicine. It has escaped from

cultivation and become naturalized in many areas, often being classified as invasive. The plant is grown as a hedge and green manure. It is traditionally grown in living fences in the northwestern Himalayas, where it helps to exclude livestock and other animals; mark out land boundaries. It is well distributed in India and found particularly in Maharashtra, Chhattisgarh and Madhya Pradesh, Kota and Ghuntaghat in Rajasthan. (4) This plant is spread all over the world including American tropics, Argentina, Brazil and Bolivia, (5) Pakistan, Srilanka etc. (6)

Many claims have been made by traditional healers for ethnomedicine. But there is lack of evidences; hence there is need of validation and to generate the evidences regarding claims. Due to the deforestation and changing climatic conditions, a wide number of species of medicinal plants are getting endangered whereas in India, ethnomedicine is available abundantly and used as folklore medicine. The ethnomedicines can reduce the burden of pharmacopoeal herbal medicines if they are studied and proved scientifically with evidences. Hence, this article aims to highlight the therapeutic claims of ethnopharmacological drug, *Ipomoea carnea* Jacq. It gives thorough knowledge about the use of *Ipomoea carnea* as a medicine. It provokes the significance of ecofriendly drug which can fulfill the demand of herbal medicine. The article emphasizes upon the use of ethnopharmacological drug vividly in the treatment so that the burden of endangered herbal medicine can be reduced.

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**Aim**

The aim of this article is to identify the therapeutic potential of ethnopharmacological drug, *Ipomoea carnea* Jacq.

**Objectives**

To highlight the therapeutic utility of *Ipomoea carnea* Jacq from different literature sources.

**Material and methods**

The data was located from books including ethnopharmacological drugs, Indian flora and traditional medicine as well as from articles in various journals of botany, taxonomy, agriculture, ethnopharmacology etc. Search engines like pubmed, google search, science direct etc were used for searching the data. The data portal like AYUSH, DHARA and TKDL were also used for search process. Studies published on *Ipomoea carnea* within the duration from 1981 to March 2021 were searched in the form of review articles, analytical and experimental studies, clinical studies and ethnomedicinal surveys from the various peer reviewed journals which are available online on free access. The key word like “Researches on *Ipomoea carnea*”, “Folk uses of *Ipomoea carnea*”, “Toxicity of *Ipomoea carnea*”, “Pharmacological properties of *Ipomoea carnea*” “Ethnomedicinal survey on *Ipomoea carnea*” were used for searching. Publications available in English language were included in the study.

From the available data, only the data related to identification of the species, pharmacological and clinical researches, therapeutic and other uses of *Ipomoea carnea* Jacq was selected. The data was segregated into morphology of the plant, phytochemical, invivo and invitro pharmacological studies, therapeutic and other utilities of *Ipomoea carnea* Jacq. The data was edited to explore the therapeutic significance of *Ipomoea carnea* Jacq. All the pharmacological evidences and therapeutic uses of *Ipomoea carnea* were consolidated to stress on its therapeutic potential.

**Observations and results**

Total 73 articles were searched out of which 7 articles (5 articles and 2 ethno botanical surveys) were rejected as they were not directly related with the criteria. Out of 66 articles, review articles were 21, experimental studies were 28, 2 ethno medicinal surveys, chapters from 4 books and one experimental research protocol were included in the study. In over all search, no clinical study or randomized control trial was found regarding the therapeutic efficacy of *Ipomoea carnea*. The experimental studies are conducted in different parts of the world including India. Out of these articles, 11 articles were published in Pubmed journals, 9 in Scopus journals and rest of the articles in different peer reviewed indexed journals. From year 1981 to 2000, 5 review articles and 4 experimental studies were published. From year 2001 to 2021, 16 review articles, 34 experimental studies 2 ethno medicinal surveys,

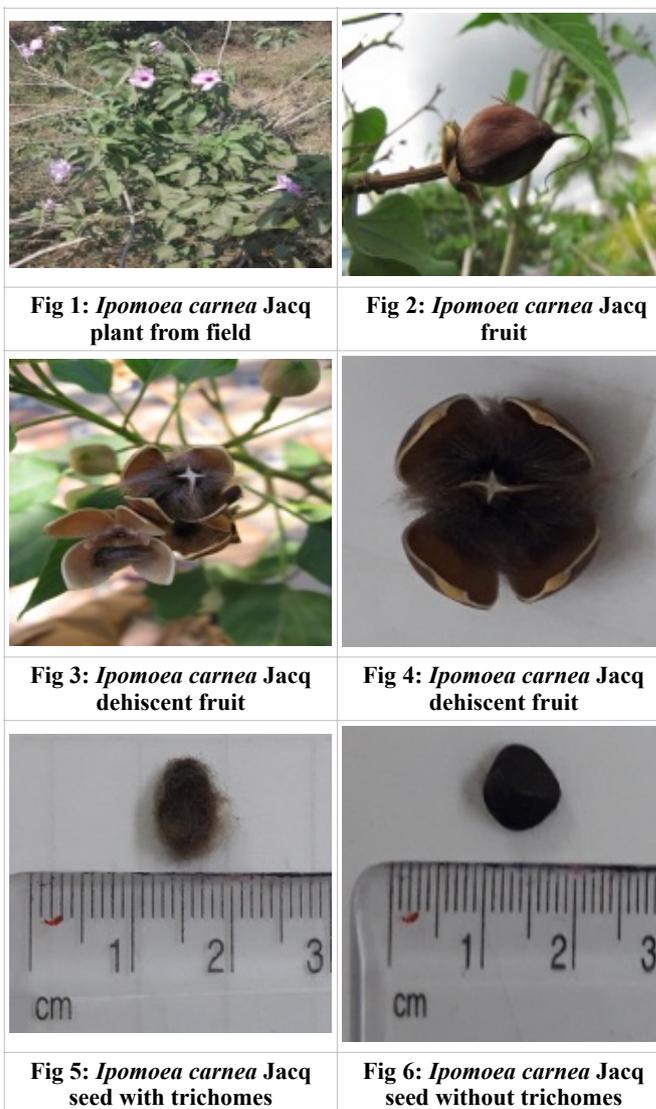
chapters from 4 books and one experimental research protocol were published. But since last four decades, no clinical study was published to provide the evidences for therapeutic claims of *Ipomoea carnea*.

**Contribution of the review articles**

Most of the review articles have contributed in emphasizing the geographical distribution, morphological features, cultivation method, phyto constituents and their pharmacological activities along with traditional, folk uses as well as other ecological utilities of *Ipomoea carnea* plant.

**Contribution of the experimental studies**

Various preclinical experimental studies have established different pharmacological properties of *Ipomoea carnea* plant providing validated evidences for the clinical or medicinal use of the plant along with toxicity profile the drug which is a very important step in drug development.



**Phytochemical significance**

*Ipomoea carnea* is a rich source of chemical compounds, pigments, steroid etc. Chloroform extract of *Ipomoea carnea* showed the presence of steroids, carbohydrates alkaloids, phenolic compounds, saponins,

xanthoproteins and flavonoids.(7) It was studied that when *Ipomoea carnea* flowers were analyzed with Petroleum ether and Hydro alcoholic treatment then Flavonoids, Tannins, Glycosides, Alkaloids, Carbohydrates, and Phenolic compound were observed. Along with glycosides and alkaloids, it also contains reducing sugars, flavonoids, fatty acid, esters, alcohol and tannins. (8)

Swainsonine is found in all parts of *Ipomoea carnea*. It is lysosomotropic compound which produces neurological disorders. The nortropane alkaloids calystegines B2 and C1, together with swainsonine have been detected in the leaves collected in Mozambique where goats were intoxicated. (9)

The roots are reported to contain 2-Ethyl-1,3-dimethylbenzene, 2-(12-Pentadecyloxy) tetrahydro-2H-pyran, 3-Furanyl[2-hydroxy-4-methyl-2-(2-methylpropyl) cyclopentyl]- methanone, 2,2-Dideuterooctadecanal, Hexadecanoic acid, Linoleic acid. The stem of the plant contains 2-(12-Pentadecyloxy) tetrahydro- 2H-pyran, 1-Octadecanol, Hexadecanoic acid, Epiglobulol, Squalene, 1-Octadecanol.(10)

The leaves of the plant showed the presence of thirteen compounds which include hexa decanoic acid, stearic acid, 1, 2 diethyl phthalate, n-octadecanol, octacosane, hexatriacontane, tetracontane, 3-diethylamino-1- propanol.(11) Also the presence of swainsonine and calystegines B1, B2, B3, and C1 were detected in the aqueous ethanolic extract of leaf.(9) Quercetin was present in *Ipomoea carnea* leaves. (12) Polysaccharide Ipomose and saponins and significant amount of phenols, terpenoid and steroid. (13)

The flowers of the plant are reported to contain flavonoids, tannins, glycosides, alkaloids, carbohydrates and phenolic compound.(7) Flowers contain maximum amount of phenolic compounds while stem contain their minimum amount. Phenolic values lies between 45 to 73 mg catechol equivalent/gm.(14) The presence of swainsonine and calystegines B1, B2, B3, and C1 was confirmed in the aqueous ethanolic extract of flowers. (9) Polysaccharide Ipomose and saponins and significant amount of phenols, terpenoid and steroid were also present.(13)

Swainsonine and calystegines B1, B2, B3, and C1 were found in seeds of the plant *Ipomoea carnea*.(9)

Its seed oil was found to contain linoleic acid (VII) and oleic acid (VIII).(15)

### Folk and pharmacological practices

*Ipomoea carnea* is used as folk medicine.(16) It has a very high medicinal value.(17) Leaves, flower, seed and root are the useful parts of *Ipomoea carnea*. Leaves are used as purgative. Paste of leaves is applied on a sore known as 'Haja' which occurs in between toes and fingers due to fungal infection. Leaves are cooked and eaten as a vegetable even though they are slightly purgative. Roots have laxative effects and are boiled and used to provoke menstruation, and are traditionally a treatment for skin diseases.

Latex or Milky sap of plant has been traditionally used to treat Leucoderma (13) in Chhattisgarh, India and other related skin diseases. The latex of plant applied locally to relief boils and pimples in the body skin, used locally to alleviate the stomachache, nodules in breast, muscular pain and swelling. Latex is also used as an antiseptic in skin diseases. Stem juice is used as an antiseptic in cuts and injuries.(18) Leafy latex of *Ipomoea carnea* are already reported the presence of flavonoid and evaluated for wound healing activity.(19) The Cyclophosphamide (20) present in *Ipomoea carnea* is used as aphrodisiac, purgative and cathartic.

It contains a component identical to marsilin which is used as a sedative and anticonvulsant.(21) It also contains a glycosidic saponin which has anti-carcinogenic and oxytoxic properties.(22) Ash of *Ipomoea carnea* leaves was used in a skin disease in some rural areas of Chhattisgarh, India.(16) Extract of the whole plant prepared in hot water was widely used as anti-rheumatic remedy in Bolivia.(23) The plant is also believed to reduce the teratogenic effect of cyclophosphamide.(20) In many folk medicines, it is used as aphrodisiac, purgative as well as cathartic.(24) Plant sap,(25) leaves and flowers are used in scorpion sting. (26) Leaves are used to reduce high blood pressure, on swelling, on boils and in snake bite. The plant is used against dermatoses without referring to any sources.(27) From the field survey in Wardha district of Maharashtra state in India, it came to know that its leaves are used for scorpion bite. The fresh leaves are crushed and its juice is poured on bite site. The paste of leaves is applied and kept over bite site till the pain subsides.

**Table 1: Summarizing pharmacological and therapeutic properties of different parts of *Ipomoea carnea* Jacq.**

Parts of <i>Ipomoea carnea</i> Jacq	Pharmacological activity	Therapeutic uses
Leaves	Purgative, Aphrodisiac, Cathartic, Anti-diabetic, Anti-microbial, Antifungal, Anticancer, Cardiovascular Activity, Anti-inflammatory, Hepatoprotective, Anxiolytic, Wound healing, Phytotoxic, Embryo toxic, Neurotoxic	Fungal infection, skin disease, Purgative, scorpion sting, high blood pressure, swelling, Sore, boils, snake bite, Sprain (28)
Flowers	-	Scorpion sting
Buds	-	Scorpion sting (29)
Root	Laxative	Purgative, Menstruation, skin diseases.
Latex	Antiseptic, Wound healing activity	Leucoderma, boils and pimples stomach ache, nodules in breast, muscular pain and swelling, cuts and injuries, scorpion sting
Seed	Analgesic and antiseptic	-
Whole plan		Rheumatic disease, Dermatoses

**Table 2: Summarizing outcome of pharmacological activities of *Ipomoea carnea* Jacq.**

Pharmacological Activity	Results
Anti-bacterial (30,31)	Anti-bacterial activity of silver nanoparticles was found against selected human pathogens viz. <i>Bacillus cereus</i> , <i>Bacillus subtilis</i> , <i>Proteus vulgaris</i> , <i>Staphylococcus aureus</i> , <i>Pseudomonas aeruginosa</i> , <i>Aeromonas hydrophila</i> , <i>Klebsiella pneumonia</i> and <i>Salmonella typhi</i> .
Anti-fungal (32,33)	Chloroform and Methanol extract of <i>Ipomoea carnea</i> show antifungal activity against <i>Alternaria alternate</i> and <i>curvularia lunata</i> as well as against eleven pathogenic and nonpathogenic fungi.
Anti-oxidant (13,34)	Dose dependant free radical scavenging property in all the models was observed in in vitro antioxidant activity using different models of screening viz. DPPH radical scavenging, ABTS radical scavenging, iron chelating activity, nitric oxide scavenging assay, and alkaline DMSO assay.
Antimicrobial activity (35)	Crude acetone extracts of <i>Ipomoea carnea</i> leaves showed Antimicrobial activity against <i>Proteus vulgaris</i> and <i>Salmonella typhimurium</i> . Crude ethanol extract of <i>Ipomoea carnea</i> leaves showed Antimicrobial activity against <i>pseudomonas aeruginosa</i> .
Anti-cancer (36)	Hydroalcoholic extract of <i>Ipomoea carnea</i> leaves possess significant anticancer property with the dose dependent effect.
Anti-convulsant (37)	Polar extract of <i>Ipomoea carnea</i> reduces the MES-induced convulsion n extension phase and stupor phase at a dose ranging from 200mg/kg to 400mg/kg.
Sedative (37)	Aqueous and alcoholic extracts showed the CNS depressant activity in dose dependent manner.
Anti-inflammatory (38)	Aqueous extracts of mature green leaves found to possess a strong anti-inflammatory activity at dose of 500 mg/kg in comparison to Etorikoxib 6 mg/kg.
Anxiolytic activity (37,39)	<i>Ipomoea carnea</i> methanolic extract showed greater anxiolytic effect as compared to <i>Ipomoea carnea</i> leaf aqueous extract (doses of 32.5 mg/kg and 16.2 mg/kg) and diazepam.
Immunomodulatory Activity (40, 41)	Consumption of <i>Ipomoea carnea</i> in a dose of 7 gm/kg, causes less food intake, reduction in body weight, increase in spleen/body weight ratio, decrease in the thymus/body weight ratio, and histological changes. Swainsonine has immune effect due to glycoprotein metabolism. Due to this rheumatoid arthritis (RA) was developed to both adult (70 days old) and juvenile rats (21 days old).
Peroxide production activity (40)	Administration of low dosage of <i>Ipomoea carnea</i> increases body process activity and peroxide production by macrophages.
Anti-diabetic activity (12,42)	Aqueous extract of <i>Ipomoea carnea</i> leaves reduces the blood glucose level in streptozotocin induced diabetic rats and increased the glucose tolerance in normal rats.
Anti- Malarial activity (43)	Synergistic effect of insecticides with plant extracts of <i>Ipomoea carnea</i> is reported against malarial vector, <i>Anopheles stephens</i> .
Hepatoprotective activity (44)	Hepatoprotective activity of <i>Ipomoea carnea</i> was found in CCl4 induced hepatotoxicity in rat.
Cardiovascular Inhibition (45)	<i>Ipomoea carnea</i> may produce a positive inotropic effect on isolated frog heart by sodium extrusion or release of the intracellular calcium.
Wound healing Activity (46)	Ethanolic extract of <i>Ipomoea carnea</i> effectively stimulates wound contraction and significantly increased tensile strength of skin wound tissues. (54)
Wormicidal activity (3)	Ethanol:water extract of <i>Ipomoea carnea</i> showed potent anthelmintic activity against Indian earthworm <i>spheritima posthuma</i> and was equipotent to standard anthelmintic drug.
Insecticidal Property (47)	Benzene and chloroform extracts of <i>Ipomoea carnea</i> showed presence of Cholestan-3-one which is a steroidal compound and it has a high insecticidal property.
Embryotoxic effect (48)	Prenatal ingestion of the <i>Ipomoea carnea</i> aqueous extract in rats induces embryotoxicity. These effects are associated to an active principle from <i>Ipomoea carnea</i> acting on maternal homeostasis, or directly in the conception.

### Effect on Nervous System

When goats were fed with fresh leaves, flowers and stems of *Ipomoea carnea* for 45 to 60 days then Hirsute coat, depression, difficulty to stand up, ataxia, hypermetria, wide-based stance, incoordination of muscular movements, intense tremors, spastic paresis, abnormal postural reactions, nystagmus, hyperreflexia, hypersensitivity to sound, head tilting and loss of equilibrium were observed in all treated animals. The cerebellum which processes information from other nervous areas, mainly spinal cord and sensory receptors, with the purpose to coordinate skeletal muscle movements was affected due to *Ipomoea carnea* intoxication. (49) The functional units of the cerebellum cortex are the Purkinje cells; these cells send inhibitory projections to the deep cerebellar nuclei. These neurons were severely affected in this intoxication, including

necrosis in some of them. (50) Leaves can lead to antidepressant activity of CNS. (51)

### Toxicity profile

Seeds and leaves are toxic and it can be hazardous to cattle, the toxicity is related to the bioaccumulation of selenium species in leaves but mostly in seeds. (52) Leaves are toxic to livestock. It is reported to have phytotoxic and stimulatory allelopathic effects. Leaves have toxic effects on nervous system and maternal reproductive system. It is embryo toxic and causes skeletal and visceral abnormalities and malformations. Feeding of fresh green leaves to goat caused signs of toxicity viz. dullness, ataxia, paralysis, lacrimation, diarrhea and nasal discharge. Two goats died on 22<sup>nd</sup> and 55<sup>th</sup> day with chronic neurotoxic symptoms such as ataxia, weakness of lumber region, paralysis of hind and fore limbs with progressive

emaciation.(53) Consumption of the seeds may cause negative side effects, including vomiting, nausea and indisposition; probably as a result of non-water-soluble alkaloids. Visions of “small people” are very common, as well as LSD-like sensations, although the effects are not exactly like LSD. The seeds also seem to stimulate the uterus, probably due to the alkaloid ergonovine. (54)

When ethanolic extract of *Ipomoea carnea* leaves was tested for its toxicity against fish Guppy (*Poecilia reticulata*) with 0.025, 0.050, 0.07 and 0.1 mg/ml concentrations, it showed toxic effect and caused mortality in guppy fishes. It showed change in behaviour like surfacing, gulping, mucous secretion from skin, omitting, increase in rate of gill opercular movement, loss of body balance and change in body colour to white. (55)

The Swainsonine is the main toxic principle present in *Ipomoea carnea*. It is an indolizidine alkaloid with significant physiological activity. It is an alpha mannosidase and mannosidase II inhibitor that alters glycoprotein processing and causes lysosomal storage disease. It is water soluble and hence it distributes rapidly in many parts of the body. It is excreted rapidly through urine. Some portion is also excreted in milk in lactating animals. It is present in number of plant species worldwide and causes severe toxicosis in livestock grazing these plants. Swainsonine from locoweed causes acute intoxication in horses, goats, and sheep, in addition to chronic poisoning in rabbits, rats, and mice. Consumption of these plants leads to a chronic wasting disease characterized by weight loss, depression, altered behavior, decreased libido, infertility and death. (48)

The fast excretion rate indicates that occasional consumption of the locoweed for short duration will not produce serious toxic effects but continuous consumption even at low dose causes severe toxicity. The Swainsonine, Calystegines B1, B2, B3 and C1 are present in leaves, flowers and seeds. (7) The toxicity is due to bioaccumulation of selenium species more in seeds in comparison with leaves. Hence, seeds are more toxic. Swainsonine has immune effect due to glycoprotein metabolism. Due to this rheumatoid arthritis (RA) was developed to both adult and juvenile rats. Hence, Swainsonine modulates the immune function.(41) Severe reproductive and developmental toxicities are associated with swainsonine poisoning. (56)

However, the plant extracts has not produced death up to dose level 2000 mg/kg and did not cause any toxic effect up to dose of 3000 mg/kg in mice in acute toxicity study. (37)

### Ecological significance of *Ipomoea carnea*

*Ipomoea carnea* is extremely hardy and is resilient to several forms of chemical and biological control. The stem is used as a raw material for paper making. (57) Stem is also used as fire wood. It is a good raw material which is replacement of wood. Soda lignin and Soda Anthraquinone lignin obtained from wood and *Ipomoea carnea* is almost same. The leaves are used as fertilizer. The plants are also used for

fencing. Colourful flowers are often grown as ornamentals, and a number of cultivars have been developed.

It has been observed that *Ipomoea carnea* is a suitable raw material for the production of activated carbon. It is effective in the removal of copper from aqueous solution. It was concluded that the activated carbon produced from *Ipomoea carnea* by zinc chloride activation has better adsorbing capacity of copper than the raw adsorbent. (58) *Ipomoea carnea* is used as a potential source of textile and energy. It has pest management activity. The plant is grown as a hedge and green manure.

The farmers of Chhattisgarh used *Ipomoea carnea* with other herbs and cow urine to repel away the insects and pathogens in crop field. (2) This type of uses of the plant shows the presence of bioactive molecules which are responsible for entomological activities. There are reports on synergistic effect of insecticides with plant extracts of *Ipomoea carnea* against malarial vector, *Anopheles stephensi*. (43) Aqueous and petroleum ether extracts of *Ipomoea carnea* leaves have the potential to be used as an ideal eco-friendly approach for the control of the major lymphatic filariasis vector, *Culex quinquefasciatus* (59) Aqueous extract of leaves showed nematocidal activity and acetone extract of leaves showed insecticidal effect. (60) The changes in leaf surface traits can be used as air pollution marker. (61) Leaf surface can also be used as dust scavengers. The leaves are palatable for various fish species. Entire *Ipomoea carnea* subspecies *fistulosa* is used as a raw material for paper-bag production in the surroundings of Tiruchirapalli and along the Eastern Ghats in India. Dried stem material is also used as fire-wood in Rajasthan, because of its yellow flame. (62)

### Discussion

The curiosity has given birth to some researches on *Ipomoea carnea*. Phytochemical researches are conducted to find out various phytoconstituents which are responsible for pharmacological actions of *Ipomoea carnea*. The pharmacological activities are also proved successfully in invitro and in vivo experiments. All the studies mainly include leaves of *Ipomoea carnea*. (11-14, 35-39, 42, 45-47) No clinical studies are conducted to evaluate the efficacy of *Ipomoea carnea* leaves, seeds and other useful parts. It may due to its toxic potential, Swainsonine which is maximum in seeds (0.0332%) in comparison with leaves (0.0029%) and flower (0.0028%). (63) Molyneux et al. detected swainsonine in the seeds and estimated the level as 0.058% by gas chromatography-mass spectrometry (GC-MS). (64) But a conservative approach suggests that levels of Swainsonine in excess of 0.001% should be of concern. (65) Phytoconstituents of this plant viz-a-viz tannin have antibacterial, antifungal and antiviral activities. However, Cholestan-3-one is a steroidal compound and it has a high insecticidal property. That may be the reason it shows antimicrobial activity against various microorganisms. So it is a good option for infectious or communicable diseases. (47)

Polyphenols and alkaloids present in *Ipomoea carnea* can be used as reducing agents in the synthesis of nanoparticles. It was suggested that these nanoparticles can be used in the fabrication of hospital clothes, gloves and masks to avoid the spread of infection among healthcare workers. (30) This will have a wider scope to prevent various infections in hospital as it is needed in current situation. The leaves of *Ipomoea carnea* are effectively used in muscle sprains. (66) Hence, it may be better muscle relaxant for external applications. Ethnomedicines have this kind of wide use in therapeutics. (67, 68, 69)

Since Vedic period, plants are used for medicinal purposes. Later on Charaka and Sushruta has used different herbal plant parts for different ailments of the human being. Then, it is reported that traditional healers use near about 2500 plant species and 100 species of plants which serve as regular sources of medicine. Traditional herbalists, Hakims and Vaidyas were collecting plant materials from the forest on the basis of the knowledge of plants they have received traditionally from their mentors and experiences. (70)

*Ipomoea carnea* Jacq is also one of the ethnic plants used by traditional healers for various pathological conditions. As it is available abundantly and used for treatment can be thought about to use as an alternative of endangered or rare species. Though the drug is toxic and has high therapeutic value, there should be some measure to reduce the toxicity or to combat its toxic effects with the help of some procedure or antidote. In the proposed research, the author may be able to find out any measure to reduce the toxicity of the *Ipomoea carnea* seeds. (71) Evidence based medicine demands scientific data related to efficacy and safety to save the mankind. Dose and duration of administration of the drug plays an important role in the treatment. To study the safety and efficacy of *Ipomoea carnea*, dose and duration of administration is a challenge. If these challenges are overcome, the ethnopharmacological drugs can be used vividly in the treatment so that the burden of endangered herbal medicine can be reduced.

## Conclusion

From the review of literature and researches conducted on *Ipomoea carnea*, it can be concluded that it has significant pharmacological value and it is therapeutically important. Though *Ipomoea carnea* is used as folk medicine in traditional medicinal systems, no clinical study has been conducted to evaluate the efficacy or to evaluate the toxic potential of *Ipomoea carnea* leaves, seeds or any other part. The drug is toxic but no antidote is available for its toxicity. Hence, further scientific research is recommended to evaluate the efficacy and toxic potential of *Ipomoea carnea* leaves as well as seeds so that it can be used as a substitute of pharmacopoeal drugs for various indications.

**Conflict of Interest:** NIL

**Acknowledgements:** I acknowledge Shri Shyamraoji Timande, Gardner, Mahatma Gandhi Ayurved College, Hospital & Research Centre, Salod (Hirapur) and resident of Salod (Hirapur), Wardha, Maharashtra, India for his help to locate the plants and to provide information during field survey.

I acknowledge Datta Meghe Institute of Medical Sciences (Deemed to be University), Wardha, Maharashtra, India for their financial support.

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