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A Review On Properties Of Indian Wild Medicinal Weed: *Ipomea Carnea Jarq.*

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Abstract :

The aim of this review is to expose the therapeutic and potential of ethnopharmocological drug, *Ipomoea carnea* Jacq. and to ellustrate the therapeutic utility of *I. carnea Jacq* from different literature sources. Phytomedicines are progressively being established in modern therapeutic science. The shrub *I. carnea* has been used traditionally for thousands of years. However, there are many scientific studies on this medicinal plant which reveals the presence of many phytocompounds (alkaloid, flavonoid, tannin and saponin) in this plant. In this review, we have summarized the biochemical efficiency of phytocompounds of *I. carnea*. Anti-bacterial, anti-fungal, anti-oxidant, anti-cancer, anti-convulsant, immunomodulatory, anti-diabetic, hepatoprotective, anti-inflammatory, anxiolytic, sedative and wound healing activities are shows by different phtyoextracts of plant and their different parts. However, some toxic effects have been also reported. Some of the major phytocompounds associated with the bioactivity of *I. carnea* have been reported. This review article might be valuable for phytotherapy researchers, as *I. carnea* can be a good source for drug development for pharmaceuticals and ayurvedic practitioners.

Keywords: Phytocompounds ,therapeutic ,flavonoids , hepatoprotective

Introduction:

In India, many traditional remedial bioactive phytocompounds derives from plants have been used since many years. Ethnomedication is the study of the traditional drug based on phytocompounds present in plants and practiced by various medicinal practitioners. It is a study of ethnic assemblies of people and their use of plants due to presence of their bioactive compounds. It is linked to therapeutic floras of local areas and their relation to their ethanobotany. Several species belonging to the genus *Ipomea* may be found rising by road and highways , landfields and beside watercanals.

Ipomea carnea, a plant belonging to the Convolvulaceae family, is straight, hairy, woody and has greenish in colour. It may nurture up to 5-6 metres tall. It also named as bush morning glory and beshram.. *I. Carnea* is used as a ornamental and healing herb due to the anti-inflammatory latex and its antiseptic efficacy to treat injuries. The hot aqous extract from plant reduces the teratogenic properties of cyclophosphamide and possesses antirheumatic potentials, purgative, cathartic and aphrodisiac properties. Many research studies proved the antibacterial and antifungal efficacy of the plant. It has also been demonstrated that leaves of *I.Carnea* goes well for treating rheumatic pain and piles, sedative and anticonvulsant efficiency. Paper can be

made from the pulp of stem of the plant.(1) .Some species of *Ipomoea* are such as *I. pes-caprae*, *I. aquatic*, *I. obscura*, *I. asarifolia*, *I. setifera*, *I. batatas*, *I. indica*, *I. amnicola*, *I. tiliacea*, and *I. batatas*.

Therefore, the present review pointed out to determine the chemical constituents and bioactive component of the parts of *I. carnea*.(2,3) which can further be used to develop non-toxic herbal formulations with multiple pharmaceuticals options in various industries .

Objective: Aim is to highlight the ethnomedicinal and therapeutic efficacy of *Ipomea carnea jarq*

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

Plant part of Ipomea carnia jarq	**Pharmacological activity**	**Therapeutic uses**	**References**
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 s plant. Leaf Leaf hot water extract reduces the teratogenic effects of cyclophosphamide and possesses antirheumatic qualities	(4)
flowers		It is well known that tannins found in flowers have antiinflammatory, antifungal, antibacterial, and antioxidant properties	(5)
roots	laxative	Scorpion sting , Laxative, Menstruation, skin diseases. Boiled roots are used as a menstrual stimulant and laxative	(6)
bark	Antiseptic, Wound healing activity	Leucoderma, boils and pimples stomach ache, nodules in breast, muscular pain and swelling, cuts and injuries, scorpion sting, Leucoderma and other associated skin conditions have long been treated using latex, or milky sap, which is extracted from the bark of	(7)
Seed	Analgesic and antiseptic	Rheumatic disease, Dermatoses	(7)

Discription of plant:

Distribution

This plant is found all over the world including American tropics, Argentina, Brazil and Bal via, Pakistan, and Sri Lanka, India in Chhattisgarh and Madya Pradesh.(4)

Morphology of plant:

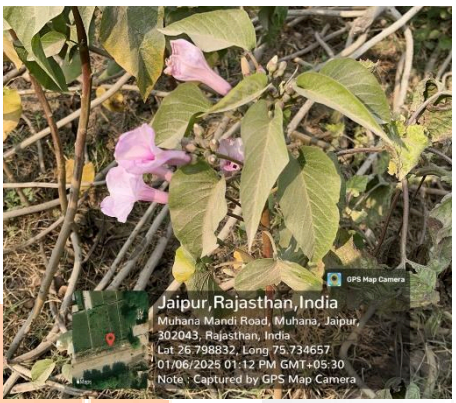

Fig 1: Picture of whole plant *Ipomea carnea jark*

Ipomoea carnea may grows up to 6-7 metres tall in height, while it grows shorter in aquatic environments. The stem grows to become a big trunk with several thick branches growing out of the base. Leaf arrangement is like Petiolate and simple leaf. The petiole is cylindrical, measuring 2.5–3.0 mm in diameter and 4.0–7.5 cm in length. *Ipomoea carnea* has a tall, bushy, woody stem having greenish in colour and cylindrical in arrangement. On the plant, there leaves are alternate arrange. Its leaves may reach a maximum length of 2.78 metres and a maximum diameter of 0.5 to 0.9 cm. The leaves are 10 to 20 cm long, green in appereance and have a heart shaped. The bushes have bunches of 5 inch pink flowers in the spring and summer. Its tubular structure and green pedicel are special characters of its axial . The length and diameter of flowers varies from 1.6 to 2.4 cm and 0.18 to 0.27 cm, respectively. Fruits have a globous capsule,seed is silky, flowers with terminal, pedunculate cymes are pale rose, pink, or light violet in colour. The corolla of flower is 1.6–1.8 centimetres wide and 5.2–6.0 centimetres, 7-8 cm long with noticeable hollows where the petals are united with each other. The seed of this plant has three surfacesides: a convex ventral surface, two flat ventral surfaces with a central depression. (5)

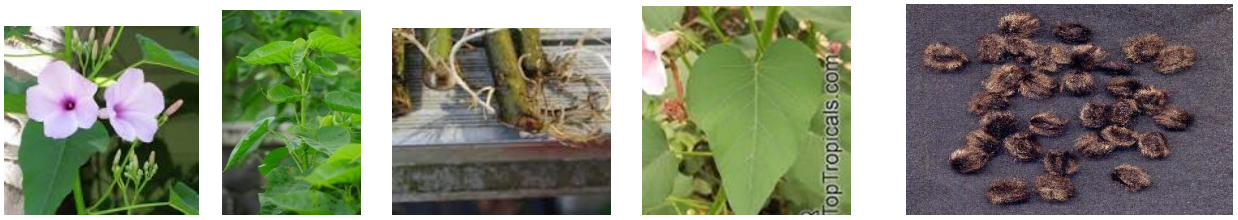

Fig:2 Pictures of plant parts of *Ipomea carnea jark*

Synonyms:

Marathi- Besharm
English- Bush Morning glory
Oriya- Bahay
Bengali- Besharm
Hindi- Besharm, Bahay
Others- Pink Morning Glory, Borrachero, Bush Morning Glory, Badoh Negro, Matacabra, Morning Glory Tree

Taxonomical Classification of plant:

Kingdom: Plantae
Subkingdom: Tracheobionta
Phylum: Spermatophyta
Subphylum: Magnoliophyta
Class: Magnoliopsida– Dicotyledons
Subclass: Asteridae
Order: Solanales
Family: Convolvulaceae
Genus: *Ipomoea*
Species: *Ipomoea carnea*

Harmonious phytochemical constituents of plant:

Ipomoea carnea is a native plant of American tropical regions. While grown as an decorative plant having various bioactive compounds that have posses their potential effects. These compounds and their potential effects are listed here below(6):

- **Cardiac glycosides**: *Ipomoea carnea* holds cardiac glycosides such as digitoxigenin and gitoxigenin. These compounds have their potential on cardiovascular effects. Cardiac glycosides have been efficient in medicine to treat heart conditions like congestive heart failure and arrhythmias. They used to increasing the strength of heart contractions and regulating heart beats.
- **Alkaloids**: Alkaloids, the nitrogenous compounds found in this plants include lysergic acid and its derivatives. These compounds are psychoactive effects and have been studied for their potential in treating neurological disorders as recreational drugs.
- **Flavonoids**: Flavonoids are assorted groups of plant metabolites with various biological and pharmacological properties like antioxidant properties, potential health benefits, anti-inflammatory and anti-cancer effects.
- **Tannins**: Tannins are polyphenolic compounds found in *I. carnea*. They have astringent properties which binds precipitate proteins. Tannins may have antimicrobial and anti-inflammatory effects which posses plant's medicinal properties.
- **Saponins**: Saponins are other glycosides with foaming properties. They have potential to lower cholesterol effects and have ability to boost the immune system. Saponins credit medicinal properties of *I. Carnea*.

It is to specify that *I. carnea* contains these bioactive phytocompounds, their concentrations , and effects can vary on factors such as age of plant, growing conditions (temperature, atmospheric pressure etc), preparation methods, *invivo* and *invitro* conditions. This review research is needful to understand the potential benefits and harmfull effect of *I. carnea* associated with the ingesting or use of *I. carnea* and its bioactive compounds. Furthermore, some bioactive compounds found in *I. carnea* may be toxic in high doses, so caution should be taken when using it for medicinal purposes.

Toxic phytocompounds of *Ipomea carnea jark:*

Several poisonous substances like swainsonine , calystegines , convolvulaceae resin glycosides ,lysergic acid derivatives found in *I. carnea* have the potential to noxious to both people and animals.

1. **Swainsonine**: An indolizidine alkaloid responsible for inhibiting the alpha-mannosidase enzyme. This syndrome affects the central nervous system, related to neurological syntoms in animals that cause depression, incoordination and abnormal behaviour.
2.Calystegines: These are nor tropane alkaloids that restrict the action of glycosidases which are enzymes that breaks down carbohydrates. These enzymes inhibition can damage regular cellular processes and increase the toxicity of the plant.
3.Convolvulaceae Resin Glycosides: laxative qualities, these substances can troubled the gastric system and result in signs including vomiting, diarrhoea, and headaches.
4.Lysergic Acid Derivatives: Ergot alkaloids, which are linked to lysergic acid, are present in certain *Ipomoea s*pecies. Psychoactive effects such as delusion and abnormal behaviour can be caused by these toxic substances.

Pharmacological activities of *Ipomea Carnea jark*:

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

Pharmacological activities	**Results**
Antibacterial	silver nanoparticles of *I. carnea* exihibit antibacterial activity against pathogens *Bacillus cereus, Bacillus subtilis, Proteus vulgaris, Stapyhlococcus aureus, Pseudomonas aeruginosa, Aeromonas hydrophila, Klebsiella pneumoni*a and *Salmonella typhi*
Antifungal	Methanolic and chloroformic extracts of *I. carnea* show antifungal activity against *Alternaria alternate* and *Curvularia lunata* as well as against eleven pathogenic and nonpathogenic fungi.
Antioxidant	In vitro antioxidant activity viz. DPPH radical scavenging, ABTS radical scavenging, iron chelating activity, nitric oxide scavenging assay and alkaline DMSO assay shows by extracts.
Antimicrobial	Crude acetone extracts and ethanol extracts of *I. carnea* leaves showed Antimicrobial activity against *Proteus vulgaris and Salmonella typhimurium and* pseudomonas aeruginosa.
Anticancer	Hydroalcoholic extract of *I. carnea* leaves possess significant anticancer property
Anticonvulsant	Polar extract of *I. carnea* reduces the MES-induced convulsion
Sedative Activity	Aqueous and alcoholic extracts showed the CNS depressant activity in dose dependent protocol.
Anti inflammatory	Aqueous extracts of mature green leaves possess strong anti-inflammatory activity.
Anxiolytic activity	*I.carnea* methanolic extract posses anxiolytic effect.
Antidiabetic activity and Antimalarial activity	Aqueous extract of *I. carnea* leaves lowers the blood glucose level in streptozotocin induced diabetic rats and increased the glucose tolerance in normal rats.

Hepatoprotective activity	Hepatoprotective activity of *I. carnea* was found in CCl4 induced hepatotoxicity in rat.
Cardiovascular Inhibition	*I. carnea* shows a positive inotropic effect on isolated frog heart by sodium extrusion or release of the intracellular calcium.
Wound healing Activity	Ethanolic extract of *I. carnea* effectively stimulates wound contraction and significantly increased tensile strength of skin wound tissues.
Wormicidal activity	Ethanol: water extract of *I. carnea* showed potent anthelmintic activity against Indian earthworm spheritima posthuma and was equal potent to standard anthelmintic drug.
Insecticidal Property	Benzene and chloroform extracts of *I. carnea* showed presence of Cholestan-3-one which is a steroidal compound and it has a high insecticidal property.
Immune-modulatory effect	In female rats, the nor tropane alkaloids calystegines B1, B2, B3, and C1 and t indolizidine alkaloid swainsonine of *I. carnea* demonstrate an effect on spleen/body weight ratio

Significance of *Ipomea carnea jark:*

1.As a Raw Material for Paper Making

This plant is a very decent natural resource for replacement of wood.Functional groups of the components Soda lignin and Soda Anthraquinone derived from wood and *I. carnea* are almost very much similar. Vanillin and syringaldehyde are present in both the lignin samples. Adding of anthraquinone to the pulping process does not affect the quality of lignin precipitated from soda black liquor; it doubles the amount of lignin precipitated from black liquor. Delignification rate was significantly greater with 0.1% addition of anthraquinone.(8)(9)

2.Raw material for Activated Carbon

Ipomoea carnea is potent raw material in the illaminate of copper from aqueous solution. It was proven that the activated carbon derived from morning glory by zinc chloride activation process has shown better adsorbing capacity of copper as compared to the raw adsorbent. The adsorption of copper was found to be higher at its natural pH.(10.) (11)

3.As a potential source of Energy

Ipomoea carnea is a wonderful source of biogas. It was seen that cellulose content of *I. carnea* is over 55% and lignin content is about 17% which indicates it is a fibrous material and can be used as filler for making light weight polymer composite which provides an effective means of utilization of this wild shrub. *I. carnea* biomass and distillery waste admixture proved to be the best substrate. The plant puses suitable methane content which makes *I. carnea* suitable for energy product.(12)(13)

4.As a Biocompost

Experiments proven that the *Ipomoea carnea* is useful to up the microbial activity of bio compost. The organic content of biocompost also increases after treatment of *I. carnea.* The thermophilic bacteria are in highest number in *I. compost* . It is also useful in germination of numerous seeds.(14)**(**15)

5.As a Pesticide

I .carnea extracts were studied for their antifeedant efficacy. It was revealed that the mortality percentage on exposure (hr) in 100% EtOH extract of I. carnea was 100% mortality detected in 12 hr in all the three test concentrations. In 50% EtOH extract of I. Carnea was 100% (1000ppm), 5% (500ppm) and 18% (100ppm) on 12 hr. 95% (500ppm) on 24 hr. In water extract of I. Carnea the mortality was observed on 24. Mortality observed after pupa formation (48 hr) in control (16). Earlier experiments revealed that *I.th carnea* benzene and chloroform extracts yielded the compounds such as neophyadiene, 1-decanol, tetradecanoic acid,

pentadecane, 1-iodo-2-methylundecane, transcaryophyllene, eicosane, 2-butenoic acid and cholestan-3-one. Cholestan-3-one is a steroidal compound and it has a high pesticide property.

6.As a Potential Source of Textile

Cellulose content of this shrub is over 55% and lignin content is about 17% which indicates it is a fibrous material and can be used as filler for making light weight polymer composite which provides an effective means of utilization of a large quantity of this diffuse shrub. experiments can be used as an effective support in polymeric composite beyond its old-style uses. It can also be used as a alternate for wood based compound. Reinforcement of *I. carnea* particulate into the epoxy matrix shows improvement in both the ductile and flexural characters compared to pure epoxy (17)

I. carnea is hazardous if consumed because of the presence harmful chemicals. Confirming that animals cannot get in touch with this plant and handling it carefully is necessary .*I. carnea's* poisonous biochemicals have several negative effects on cattle and human health.
The following are each's effects:(18)(19)

Effects on human and animal life:

1. Neurological Symptoms: Consuming *Ipomea carnea* can cause symptoms like trembling, disorientation, lethargy, and, in extreme situations, seizures. Swainsonine, an alkaloid, is mostly to blame for these effects. Animals fed I. carnea may have locomotion symptoms, such as depression, tremors, and alterations in behaviour. Swainsonine interferes with normal nervous system function, which is why this is happening
2. Gastrointestinal Disturbances: The plant can cause diarrhoea, vomiting, nausea, and abdominal pain when consumed. If these symptoms are not treated right once, they may lead to dehydration and other problems. Just like people, animals can have diarrhoea, vomiting, and nausea, which can dehydrate them and negatively impact their general health
3. Respiratory Problems: The smoke from burning the plant can irritate the respiratory system, leading to breathing difficulties, wheezing, and coughing.
4. Dermatological Reactions: Sensitive people may experience rashes, allergic reactions, and skin irritation after coming into contact with the plant's sap.
5. Liver Damage: Extended consumption can result in liver toxicity, which can cause weariness, jaundice, and other symptoms associated with the liver.
6. Reproductive Problems: Animals that graze on this plant for extended periods have been reported to experience reproductive problems and congenital malformations.
7. Fatalities: Consuming significant amounts of the plant can be lethal in extreme circumstances, especially if it is not recognized and treated promptly.

Similar symptoms are seen in animals and pets that consume the plant, putting them at risk as well. To avoid unintentional poisoning, keep Ipomoea carnea away from children and grazing animals.

Prevention and Management in cultivation of *I. Carnea Jark*: (20)(21)

Effective steps to safeguard the health of people and animals can be taken by being aware of the threats posed by *I. carnea*

1. For Humans: It's vital to inform people about the risks associated with *I. carnea* and to steer clear of utilizing it in herbal treatments or cooking. When working with the plant, gloves and protective clothes should be worn to avoid coming into touch with the skin.
2. For Livestock: It is the responsibility of farmers and livestock owners to periodically monitor grazing areas and make sure that pastures are free of *I. carnea*. Animals must be removed from the contaminated location and given quick veterinary care if ingestion is suspected.

Effective steps to safeguard the health of people and animals can be taken by being aware of the threats posed by *I. carnea*.

Conclusion:

The plant is a promising source of safe and effective treatment for a variety of chronic diseases. This means that there is still space for anumerous research projects those explore highly active biomolecules of *Ipomea carnea jark* would be extremely beneficial to phytochemistry and pharmacology. *I. carnea* is a plant has its therapeutic significance. The plant's taxonomy, morphology, chemical constituents, ecological roles, therapeutic properties, toxicological features explores in this review. *I. carnea's* grows in tropical and subtropical regions contains harmful substances. These chemicals are twin in nature, which emphasizes the need for toxicological and pharmacological researches to reveal its therapeutic potential. *I. carnea* is a reasonably straightforward plant to cultivate and conserve it .This plant has has a lot of potential for use in the domains of ecology and medication. Connecting the benefits of *I. carnea* while reducing its potential harmful effects will require more focus on research, conservation plans and careful assessment of its medical uses.

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