Morphology and Medicinal values of *Cardiospermum halicacabum***Durgesh Dixena and D. K. Patel***

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Received : 18.09.2019; **Accepted :** 04.11.2019**ABSTRACT**

The plant *Cardiospermum halicacabum* is also known as balloon plant, love in a puff plant. Traditionally useful for treatment of many disorders. It is widely distributed near cropping fields. The plant is belonging to the family Sapindaceae. The current paper deals with the study of morphological variations as well as medicinal value of the plant.

The study on its growth and treatment potential of varied disorders was done using field monitoring and medicinal values of the plant were recorded as per available literature. The study area was tribal village adopted by GGV-Bilaspur (C.G.) under Unnat Bharat Abhiyan programme. The present review describes the morphological and medicinal potential of *Cardiospermum halicacabum*. It produces small milky white flowers. The plant includes remarkable medicinal value and utilized for several purpose to treat varied disorders. Outcomes like their morphological variations and medicinal uses etc. are discussed.

Figures : 05

References : 32

Table : 00

KEY WORDS : *Cardiospermum halicacabum*, Climber, Herb, Medicinal value, Sapindaceae.**Introduction**

Plants are valuable natural resources for providing numerous useful plant products. These are widely used for several purposes like food, fodder, fuel and medicine etc. Plants are showing rich diversity as well as adaption capacity in their natural habitat in different ecological areas. Rich diversity of plants is leading by their wide range of regeneration capability in variable climatic conditions. As per environmental situation, plants are adjusting themselves to grow and for propagating using several modes. A plant includes two major modes of regeneration/propagation like sexual and asexual mode of regeneration. Sexual mode of plant propagation includes development of flower, pollination, fertilization and seed development. Seeds propagation of the plants are under this mode of plant propagation. Asexual propagation also known as vegetative plant propagation including development of new individuals similar to their parental plants. It is done by the plants using their vegetative plant parts such as root, stem, leaf or their modified plant structures like bulb, tuber, rhizome and corn etc.

In nature the plant species which are not capable to produce seeds are efficiently reproducing their new plantlets using vegetative plant parts. But some plants also showing their capability to reproduce their own copies like their parental plants following both sexual and asexual modes like *Nerium indicum*, *Plumbago zeylanica* etc.

The basic targets of both the above methods are targeted for same purpose as to form new individuals like their mother plant. The process leading for multiplication and continuous appearing of plant species in nature. It is also supporting the process of maintaining existence of plant species in changeable environmental condition. The category of the plants which includes certain chemicals found to be useful in treating specific disorders are referred as Medicinal and Aromatic plants. These plants also showing variation in their presence, diversity as well as treatment potential depending on several factors like plant variety, age, plant health etc. India is one of the centers of having rich vegetation over the world. *Cardiospermum* made by Latin words cardio, meaning heart and sperma, meaning seed meant for white heart-shaped pattern on the seed. *Halicacabum* is derived from the Latin word halicacabus, a plant with inflated fruits.

The Plant includes various phytochemicals which making it potent for treatment of several disorders. Continuous field visits for observation of Medicinal and Aromatic plants required for their utility among the society following pharmaceutical Standards. Traditional knowledge of Medicinal and Aromatic plants are leading the utilization of such plants as purpose of medicine among the society. Herbal medicines are playing remarkable role in primary health care system in the society. Ancient Indian literature focusing significant valuation of Medicinal

Fig. 1 : *Cardiospermum halicacabum* : Developed mature Plant

Fig. 2 : *Cardiospermum halicacabum* : Leaf, Tendril, Flower

Fig. 3 : *Cardiospermum halicacabum* : Fruiting

and Aromatic plants in relation to their potential application for treating specific disorders. India is rich in biodiversity including vegetation as well as Medicinal and Aromatic plants. About 75-80% of the whole population over the world utilizing herbal medicines for their primary health problems.

Plant diversity plays significant role in formation of biodiversity in certain ecological areas. Biological diversity useful for better regulation of the ecological system. Plants are important component in nature and are utilized for various purposes. To maintain the existence in nature plants are regenerating in all possible manners. For this purpose these are following different modes of plant propagation. The seed dispersal process is also variable among the different varieties. All the plants are not equally potential in term of their multiplication in nature. Some are well adopted for sexual propagation using their seeds for rapid propagation whereas other plants which are not producing seeds are potentially propagating their vegetative mode of plant propagation or their modified plant structure like bulb, tuber, rhizome and corn are also found suitable for the same targets. Plants are major source of valuable products like food, fodder, fuel etc. The plants are also source of medicine. There is a great variation of bio species in natural habitat which are responsible for sustainability of ecosystem. Natural products are registered for their major valuation in term of producing several beneficial products. Chemical constituents present in Medicinal and Aromatic plants are greatly responsible for treating particular disorders in society.

On preliminary phytochemical screening and antibacterial of *Cardiospermum halicacabum* on effect of Drying Treatment on the contents of Antioxidants in *Cardiospermum halicacabum* there was noticed antipyretic activity of *Cardiospermum halicacabum*^{1,2,4}. Some workers^{6,7} studied on biology and management of *Cardiospermum halicacabum* and recorded fatty acids of the seed oil of *Cardiospermum halicacabum*. Some investigators studied pharmacognostical, phytochemical and biological evaluation of *Cardiospermum halicacabum* and focused on developmental study on tendrils of *Cardiospermum halicacabum*^{8,9}

Triterpenoids were estimated from *Cardiospermum halicacabum*^{11,12} and studies on the pharmacological actions of *Cardiospermum halicacabum* were done. Germination and hard seed studies with *Cardiospermum halicacabum* were made¹³. There was observation on essential oil from the seeds of *Cardiospermum halicacabum*¹⁴ Studies on germination and emergence of balloonvine (*Cardiospermum halicacabum*) recorded on chemical examination of *Cardiospermum halicacabum*^{15,16} Examination of antioxidant activities of the methanol extract of *Cardiospermum halicacabum*

was done¹⁷.

Phytochemical analysis and antibacterial activity of medicinal plant *Cardiospermum halicacabum* was done¹⁸ and study of phyto chemical, analgesic and anti ulcer activity of extracts of area parts of *Cardiospermum halicacabum* was done²⁰. There was studies on morphology and embryology of *Cardiospermum halicacabum*²¹ Exploring ethnobiological classifications for novel alternative medicine: A case study of *Cardiospermum halicacabum* was made²². Antibacterial activity of *Cardiospermum halicacabum* and focus on pharmacological investigation of *Cardiospermum halicacabum* were made^{23,24}.

There was review on beneficial and remedial aspects of *Cardiospermum halicacabum*²⁵ and studies on *in vitro* Antimicrobial and Phytochemical analysis of *Cardiospermum halicacabum*²⁶. There was studies on phytochemical investigation of *Cardiospermum halicacabum*²⁷. Exploring ethnobiological classifications for novel alternative medicine: a case study of *Cardiospermum halicacabum* was made²⁸. A worker³⁰ evaluated on Antimicrobial Potentials of *Cardiospermum halicacabum* and another recorded *in vitro* and *in vivo* antimalarial activity of *Cardiospermum halicacabum*³¹. There were studies on pharmacognostical evaluation of *Cardiospermum halicacabum*³².

These were studies on Pharmacological and Phytochemical Study of *Cardiospermum halicacabum* and on characterization of Wound Healing Potential and Antioxidant activity of *Cardiospermum halicacabum* in Wistar albino rats⁵. Phytochemical analysis and antibacterial potential of *Cardiospermum halicacabum* and pharmacological properties of *Cardiospermum halicacabum*-a review were made^{19, 29}. Phytochemical and Anti-Microbial studies on the leaves extracts of *Cardiospermum halicacabum* were done¹⁰.

Material and Methods

Cardiospermum halicacabum Linn was monitored for their changes/variations. Proper images were taken and arranged according to their different plant parts. This process supported to record morphological variation of the *Cardiospermum halicacabum* Linn. The study was done in adopted tribal village by GGV-Bilaspur (C.G.) under Unnat Bharat Abhiyan.

Medicinal values of the plant *Cardiospermum halicacabum* were monitored for their changes/variations. Proper images were taken and arranged according to their different plant parts. This process supporting to record morphological variation of the *Cardiospermum halicacabum* was recorded with the support of the available literatures.

Fig. 4 : *Cardiospermum halicacabum* : Developed fruit

Fig. 5 : *Cardiospermum halicacabum* : Matured and ripened fruit

Result and Discussion

Profile of *Cardiospermum halicacabum* Linn.

Botanical Name: *Cardiospermum halicacabum* Linn.

Common Names: Balloon vine, Blister creeper, Heart seed, Heart pea, Love in a puff, Winter cherry.

Family : Sapindaceae

The plant is Herbaceous, climber in nature of 1-3 meter height with presence of tendrils.

Hindi - Kanphuti

Sanskrit - Jyotishmati

Parts used: Whole plant

Distribution: Commonly found as a weed throughout India,

Description: An annual or sometimes perennial climber, Around 3.5m in height.

Leaf—Alternate, compound with pinnate venation, Leaflets beared lobed margins, lanceolate in shape, acute, rachis 5 to 7 cm long, upper surface dark green, lower pale,

Stem - slender, cylindrical, glabrous, internodes 6 to 7 cm in length and 2-4 mm in diameter, Weak.

Inflorescence- umbellate cyme.

Flowering Time: *C. halicacabum* flowers from July to August.

Pollinator: Pollinated by bees, wasps, flies, and butterflies.

Flower— White-yellow in colour, 2-3 mm long in clusters, irregular, complete, bisexual, green, gamosepalous, outer two small, flower beared four sepals, two large and two small, four whitish petals 4mm long, Stamens 8, creamy white, free, filaments up to 2mm long, Ovary superior, trilobular, style very short, stigma trifid.

Fruit— Membranous, inflated, green capsules, around 25 mm long. Green converting into brown after maturation, fruits were green, balloon like papery capsules with three chambers, 3-4 cm in diameters.

Seed - Round, Black, Kidney shaped. Seeds were black, opaque smooth with a white heart shaped spot at the micropyle, seeds ripen from August to October.

Phytochemistry

The whole plant contains Alkaloid, flavanoids, apigenins and phytosterols etc. Whole plant contains alkaloids, β -sitosterol, L-triacontanol, n-pentacosane and ntriacontane. Leaves of the plant contain tannins, saponins, flavonoids, glycosides and cardiac glycosides. Plant also contains oxalic acid, amino acids. Plant also contains oxalic acid, amino acids.

MEDICINAL PROFILE/ PHARMACEUTICAL ACTIVITIES

The plant is main source of many active chemical compounds with important traditional medicinal uses among human society. The plant is utilized singly as well as by mixing with different plant parts of varied plant species. It has multifold ethnomedicinal uses such as –

Ethnobotanical Uses: *C. halicacabum* has been used in the treatment of many disorders. It is useful as diaphoretic, diuretic, emetic, laxative, refrigerant, stomachic, antibacterial, antioxidant, Wound healing, anti inflammatory , antidiarrhoeal, antidiarrhoeal, antiulcer, nervous diseases, itching, fruits are used for boils etc.

Conclusion

Cardiospermum halicacabum possess certain significant properties that support its role in treatment of varied disorders. It also plays important role in its utilization for preparing many fuseful combinations which further support their uses in treating many diseases. Due to presence of certain chemical compounds the plant is effectively using in its different plant parts. Present chemical compounds are major source for the wide activity of the plant against different disorders. It is registered for multiple benefits among the human society.

Due to potentially applicability of the plant *Cardiospermum halicacabum* it becomes need for detailed study on this plant as well as to protect the plant in nature following all possible manners. Further it is concluded that the plant *Cardiospermum halicacabum* has wide range of potential for certain disorders in the society. It is supported by many researchers based on their study on ethnomedicinal uses of *Cardiospermum halicacabum* Based on the above facts this plant should not be overexploited and is needed for proper protection for long term utility for the same.

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