

**AMPELOCISSUS LATIFOLIA (ROXB) PLANCH.–A TRADITIONAL PLANT  
WITH ENORMOUS MEDICINAL AND ECONOMIC IMPORTANCE.****DEEP CHHAVI ANAND\*<sup>1</sup> AND VIDYA PATNI<sup>2</sup>**<sup>\*1</sup>*Department of Botany, University of Rajasthan, Jaipur 302004, India.*<sup>2</sup>*Associate Professor, Department of Botany, University of Rajasthan, Jaipur 302004, India.***ABSTRACT**

The plant *Ampelocissus latifolia* (Roxb.) Planch. belonging to the family vitaceae, is an example of ethnomedicinal plant species which is the source of dye and a range of traditional medicines that cure various diseases. The plant has high medicinal value and is used for indigenous treatment of numerous diseases including bone fractures, dysentery, leucorrhoea, dental problems, stomach pain, gout, tuberculosis, dyspepsia indigestion, body weakness and for bone strengthening. The plant contains some pharmacologically active constituents that have anti-microbial and anti-inflammatory activities. The plant is identified in trade for its dye. Plant is also sold as wild species of medicinal plant and is direct or indirect source of income for the tribal people. The plant needs phytochemical and pharmacological investigations on a wider range which may have great scope in near future. Thus, efforts are needed to conserve, and cultivate the plant. This paper reviews the plant's medicinal and economic aspects.

**KEYWORDS:** *Ampelocissus latifolia*, ethnomedicinal plant, traditional medicine, phytochemical, anti-microbial, anti-inflammatory.

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## INTRODUCTION

The medicinal plants played a very important role and have been used by man from the ancient times. The ancient Ayurvedic, Homeopathic, Unani & Siddha system of medicines which are still prevailing predominantly use plant based raw materials in most of their preparations and formulations. Over 8000 plant species are used in traditional and modern medicine in India<sup>1</sup>, and 90-95% collection of medicinal plants is from the wild, of which more than 70% collection involves destructive and unscientific extraction. Over-exploitation of trade species, destructive way of collection, and vulnerability due to anthropogenic pressure are some of the major threats to medicinal plants<sup>2</sup>. Due to accelerated local, national and international interest in recent years the demand for medicinal plants has increased manifolds and pharmaceutical industry views plant wealth as a source of income. Semi-arid regions of Rajasthan especially the tribal and rural areas are a major reservoir of medicinal plants. Different agro-climatic zones are there and varied forms of microhabitats are available here resulting in availability of good number of medicinal plants species useful in traditional as well as in codified medicines. Members of

vitaceae family are known for their bone healing properties and among them *Ampelocissus latifolia*, *Cayratia trifolia*, *Cissus quadrangularis*, *Cissus repanda* are well known. Bone fracture is most often caused by some type of trauma to a bone. This trauma might occur as a result of a fall, physical abuse, motor vehicle accident or disease and can be cured by plants and plant derived compounds. Fracture is defined as a complete or incomplete separation in the continuity of the bone<sup>3</sup>. Fracture healing is a complex physiological process that involves the coordinated participation of hematopoietic and immune cells within the bonemarrow. In conjunction with vascular and skeletal cell precursors, it also includes mesenchymal stem cells (MSCs), which are recruited from the circulation and the surrounding tissues<sup>4, 5</sup>. The present paper is focused on an important use of *Ampelocissus* species, *A. latifolia* (Roxb.) Planch. family Vitaceae of semi-arid region. The plant is commonly known as Wild Grape. A preliminary survey revealed that the above mentioned plant have the property of bone bonding. Along with great medicinal importance of *Ampelocissus latifolia*, it is also employed throughout India for dyeing, because of the production of a black dye from its roots and green dye from its leaves in large amounts<sup>6,7</sup>.

### PLANT PROFILE

Common name : Wild Grape  
 Hindi : Golinda, Katti-bel, Pani-bel  
 Synonym : *Vitis latifolia* (Roxb.)  
 Sanskrit : Amlavetasah  
 Ecology : Common among hedges and as forest undergrowth.

### CLASSIFICATION OF PLANT

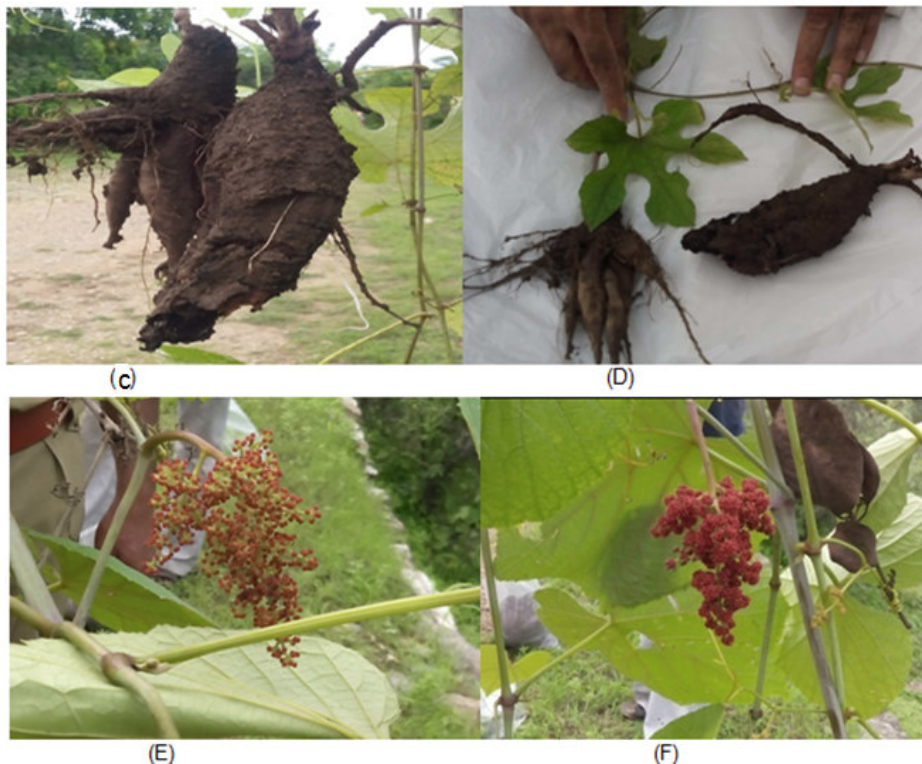
Division : Dicotyledons  
 Class : Polypetalae  
 Series : Disciflorae  
 Order : Celastrales  
 Family : Vitaceae  
 Genus : *Ampelocissus*  
 Species : *latifolia*

### PHYTOGRAPHY

Wild Grape is a large herbaceous climber, with a tuberous root stock. Stem and branches are hollow, more or less smooth. Leaves are circular or broadly heart-shaped 7-15x8-15cm, 3-7 lobed and lobes acute,

toothed. Leaf stalk is 3-5cm long. Inflorescence is a compact cyme with a stalk 6-7cm long, ending in a long bifurcate tendril. Flowers are numerous, deep reddish. Petals are 5, oblong. Fruit is spherical, black, 6-7mm, 2 seeded, rarely 3 seeded.





**Figure A & B Plant in natural habitat.  
Figure C & D Tuberous roots of plant.  
Figure E & F Early fruiting stage.**

## FLOWERING & FRUITING

The flowering and fruiting of the plant takes place during June-September.

## GEOGRAPHICAL DISTRIBUTION

*Ampelocissus latifolia* is a plant in the Vitoideae subfamily of the Grape family and is adapted to tropical climate, native to the Indian subcontinent (Bangladesh, India, Nepal, and Pakistan).

## ECONOMIC IMPORTANCE

With the increasing side-effects and allergies related to synthetic dyes, natural dyes obtained from plants are in great demand in view of their nontoxic, biodegradable and ecofriendly properties. These natural dyes can therefore be used to color clothes, textiles, foodstuffs, etc. Among various traditional medicinal plants, *Ampelocissus latifolia* is used widely for dyeing as natural dye is obtained from its roots and leaves. Roots- A black color dye is obtained from the tuberous roots of the plant<sup>6</sup>. Leaves- A green color dye is obtained from the leaves of the plant<sup>7</sup>.

## MEDICINAL IMPORTANCE

*Ampelocissus latifolia* is used widely in herbal and traditional medicines due to its enormous medicinal importance. Various plant parts like tuber, stem, leaves

are used by local communities to cure a wide range of health problems<sup>8, 9, 10</sup>. The Sandals of Bihar use this plant for muscular pains, sores and fractured bones<sup>11</sup>. Infusion of whole plant is used as tonic by aged persons<sup>8</sup>.

### Tuber

- Decoction of the tuber is taken orally for the treatment of fractured bone.
- Fresh crushed tuber is boiled in *Ricinus communis* oil and then applied externally for the treatment of gout.
- Crushed tuber with water is given to animal with the help of drenching tube to cure fractured bone.
- The extract of tuber is given orally to cure dyspepsia, indigestion and tuberculosis and also used by tribal as blood purifier and diuretic.
- Root paste is applied to wounds to heal.

### Stem

- Ash formulation of stem is applied abdominally for a week for easy delivery.
- Decoction of the stem bark is given in stomach pain.

### Leaves

- Juice of tender leaves is used in dental problems and as a detergent for indolent ulcers.
- Leaves are also used in cough and skin disease.

## PHARMACOLOGY

Elemental concentrations of methanolic soxhlet leaf extracts of *Ampelocissus latifolia* was measured by the

Inductively coupled plasma atomic emission spectroscopy technique. 41 elements Na, Mg, Si, Cl, K, Ca, Cr, Mn, Fe, Ni, Cu, Zn, Co, Cd, Se, Al, S, Pb, Ba, Hg, As, B, P, Sr, Br, Ti, Bi, Ge, In, La, Li, Mo, Pd, Sb, Sc, Sn, Te, V, W, I, Th, were screened in their role in treating various diseases<sup>12</sup>. The antimicrobial activity of the methanolic leaf extract of *Ampelocissus latifolia* was evaluated against medicinally important bacteria *Staphylococcus epidermidis* (ATCC12228), *Micrococcus luteus* (MTCC9207), Methicillin-resistant *Staphylococcus aureus* (ATCC43300), *Propionibacterium acnes* (MTCC1951) and yeast, *Malaassezia furfur* (MTCC1374) using the MIC and MBC/MFC analysis. The same methanolic leaf extracts were also tested for antioxidant activity by DPPH free radical scavenging method and Nitric oxide radical scavenging method. The functional groups present in the crude powder and methanolic extract of *Ampelocissus latifolia* leaves were identified through Fourier Transform Infrared (FT-IR) spectrometry<sup>13</sup>. The roots of *Ampelocissus spp.* have been studied for cancer cell growth inhibitory components and a new acetogenin have been isolated which is characterized as 22-epicalamistrin<sup>14</sup>. Various extracts of *Ampelocissus latifolia* exhibit significant anti-inflammatory activity that may be due to its inhibitory effect of histamine kinin and prostaglandins release<sup>11</sup>. Hydro alcoholic extract of *Ampelocissus latifolia* (Roxb.) Planch. root extract was found effective in inhibition of inflammation in carrageenan induced paw edema in rat by oral and tropical application<sup>15</sup>. The current report showed that *Ampelocissus latifolia* (Roxb.) Planch. is a multipurpose ethnomedicinally important plant of vitaceae family, which is used by the tribal people in many parts of not only India but all over the world. The plant has high medicinal value and is used for indigenous treatment of numerous diseases including bone fractures, dysentery, leucorrhoea, dental problems, stomach pain, gout, tuberculosis, dyspepsia indigestion, body weakness and for bone strengthening. The plant extract is given to animals also for treatment of fractured bone and to alleviate flatulence<sup>16</sup>. The plant is also a source of natural black and green dye that could be obtained from its roots and leaves. Despite its well-recognized medicinal and economic potential, there are no commercial plantations worldwide. Wild plants have continuously been used to meet the growing commercial demand in terms of their socio-economic value, many other species of vitaceae family also have similar importance and are well known medicinally and economically. *Ampelocissus latifolia* is the plant which may not be freely available in future due to overexploitation, habitat destruction or lack of

domestication and cultivation. The plant also needs phytochemical, pharmacological and morphogenic investigations on a wider range which may have great scope in the near future. So, efforts must be taken to conserve this species and also for the conservation of traditional knowledge for sustainable management of biodiversity. Medicinal properties of plant can be significantly attributed to a variety of phytochemical constituents synthesized in the different plant tissues<sup>17</sup>. The preliminary chemical analyses indicate the presence of relatively higher quantities of tannins, saponins, terpenoids, flavonoids, carbohydrates and anthraquinones and a trace amount of alkaloids and glycosides in aerial parts aqueous extract of *Ampelocissus latifolia* (Roxb.) Planch<sup>18</sup>. The FT-IR analysis of leaf powder of *Ampelocissus latifolia* showed the presence of alkanes, alkenes, alkynes, alcohols, carboxylic acids, ethers, esters, nitro compounds, phenols, polysulfides and Aliphatic iodo compounds. The FT-IR of methanolic leaf soxhlet extract of *Ampelocissus latifolia* revealed the presence of alkanes, alkenes, alkynes, amines, amides, carboxylic acids, ethers, transitional metal carbonyl and Aliphatic fluoro compounds. The FT-IR of stem powder of *Ampelocissus latifolia* revealed the presence of alkanes, alkenes, alcohols, amines, amides, carboxylic acids, ethers, esters, aldehydes, ketones, phenols and nitro compounds<sup>13</sup>. Also the FT-IR spectra of 14 different polar & non polar solvent extracts revealed the presence of characteristic functional groups which are important for their medicinal usage<sup>19</sup>. Since this plant species is an important ingredient of several medicines used in bone healing and is being over-exploited due to its usefulness, phytochemical investigation for isolation of important active ingredients through cell culture will be helpful.

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## CONFLICT OF INTEREST

Conflict of interest declare as none.

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