

Curative Climbers in the Adi-Badri Region of Bilaspur Block, District YamunaNagar, Haryana (India)

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ABSTRACT

Climbers are considered the most neglected group of angiosperms. According to the Botanical Survey of India, of India's approximately 18,000 species of angiosperms, 8,000 are medicinal climbers. Numerous climbers have medicinal value and are utilised as herbal treatments in traditional Indian medical systems, including Ayurveda, Siddha and Unani. Several active phytochemicals are extracted from various plant sections and utilised as medication alone or in combination with other components. Unfortunately, many of these plants are threatened with extinction owing to habitat loss and overexploitation, necessitating conservation measures to preserve their long-term survival. The present study focuses on the documentation of medicinal properties of some of the angiospermic climbers collected from the Adi-Badri region, block Bilaspur of district Yamuna Nagar, Haryana.

Introduction

Climbers are characterised as plants with specific structures that allow them to cling to supports. Climbing species can be found in around half of the vascular plant families. Nearly all plants in families like Hippocrateaceae and Vitaceae are climbers, and their axes contain less supporting tissue.

The climbers are present in all forest environments, with tropical and subtropical forests having the largest concentrations (Quigley & Plat 2003; Bongers et al. 2005). Gentry projected that there will be approximately 8,000 climbing species in 130 groups (1991). The majority of researchers worldwide have concentrated their

investigations on climbing species primarily on lianas found in tropical forest communities (Schnitzer et al. 2000; Ibarra-Manriquez&Martnez-Ramos 2002; Reddy &Parthasarathy 2003; Yuan et al. 2009; Muthumperumal 2011; Naidu et al. 2014). Despite their importance to ecology and the economy, only a small number of researchers have studied herbaceous vines (Gallagher et al. 2011, Kumar et al. 2013, Suthari et al. 2014, Singh et al. 2015). In India, there hasn't been nearly as much research on climbing plants' diversity and their utilization as there has been elsewhere.

Despite possessing extensive tropical and subtropical forest covers, as well as a rich variety and density of climbers, India has not given this group much attention. There have only been a few studies done in the nation, specifically in the Eastern and Western Ghats, coastal and inland tropical dry evergreen forest, and eastern Himalaya (Muthuramkumar&Parthasarathy 2000; Chitbabu&Parthasarathy 2001; Reddy &Parthasarathy 2003; Muthumperumal&Parthasarathy 2009; Chetri et al. 2010; Barik et al. 2015;), as well as some specific areas of southern states like Tamil Nadu, Pondicherry, Andhra Pradesh, and Andaman, have been the site of the majority of climbing plant research in India.

A few studies are also available from Allahabad, Jharkhand, Uttar Pradesh, Arunachal Pradesh, Meghalaya, Sikkim, and Tripura from the Himalayan region and its surrounding areas. (Barik et al. 2015; Singh et al. 2015; Dvivedi et al. 2016; Chetri et al. 2010; Kumar et al. 2013; Darlong&Bhattacharyya 2014). Bor and Raizada(1954) published a treatise 'Some beautiful Indian climbers and shrubs'. Ghosh and Mukherjee (2006) had enumerated 149 herbaceous climbers and 79 lianas from Andaman Islands covering 55 families.

Study Area

The Adi-Badri region is located in the Bilaspur block of Yamunanagar district. The area of Bilaspur is 301.22 sq. km. It receives the greatest average annual rainfall in the state of Haryana, at 1,130 millimetres. There are extensive areas of silt, sand, and pebbles in the beds of seasonal streams and the terrain is steep. River Somb traverses the region and eventually unites with the Yamuna. Block Bilaspur is flanked to the north by the Siwalik foothills of Sirmaur District in Himachal Pradesh, to the east by Block Chhachhrauli, and to the south by Block Jagadhri. Block Sadhaura encompasses the western edge of the study region. AdiBadri (300 27' N: 770 27' E) is located in the Siwalik Range foothills.

Materials and Methods

Extensive field surveys were carried out during the years 2019-2022 in the above-

mentioned region. The climbing plants were collected, photographed and studied in detail. The collected specimens were carefully pressed, dried and preserved using standard herbarium techniques (Jain & Rao, 1977). The plant specimens were identified using regional floras. In the present work, the medicinal properties of climbers distributed throughout the above mentioned research site which harbours one of the richest dry deciduous forest areas in the state of Haryana are selected and their botanical names with nomenclature, chemical constituents and their general and traditional medicinal uses including therapeutic properties have been explained.

Results and Discussion

Cuscutareflexa Roxb. [Dodder] belongs to the family-Convulvaceae. Its seeds and stem contain significant chemical constituents. Amarbelin and kaempferol have been reported to be contained in seeds, while stem has been shown to possess cuscutin, cuscutatin, beta-sitosterol, luteolin, bergenin and kaempferol. Since it is a parasitic plant, therefore, it acquires alkaloids from the host plant. It has been frequently reported to contain the alkaloids originally present in the host plants; for example, it contains mangiferin when it climbs on *Mangifera indica* (Khare 2007). In Pharmacological Studies The *Cuscutareflexa* is investigated for antitumour (Chatterjee et al. 2011), antimicrobial (Inamdar et al. 2011), hepatoprotective (Balakrishnam et al. 2010), anticonvulsant (Borole et al. 2011), antioxidant (Sharma et al. 2012a).

The Indian sarsaparilla, also known as *Hemidesmus indicus* (L.) R. Br. ex Schult. belonging to family Apocynaceae is a medicinal climber which is found all over India (Hassler 2019). *H. indicus* roots are used in healthcare drinks and as a tool to help people quit smoking (Padhy et al. 1973). According to Murshed et al. (2005) and Khandelwal et al. (2010), this plant also exhibits hypoglycemic, hypolipidemic, and anti-ischemic properties.

Gloriosa superba L., Family- Colchicaceae (common name: Malabar Glory Lily) is a significant perennial medicinal climbing herb, distributed over India's tropical and subtropical areas (Jana and Shekhawat 2011). *G. superba* is one of the seven 'Upavishas', which are medications that can cure a variety of illnesses but in certain circumstances are hazardous (Joshi 1993). Colchicine and colchicoside are two important components extracted from its seeds and tubers. Colchicine possesses anti-abortive, antibacterial, and anticancer properties (Nikhila et al. 2014a; Mahajan et al. 2016). Colchicine contributes to its antitumor effect by reducing the polymerization of tubulin, hence preventing the development of spindle fibres. Traditional Indian medicine uses *G. superba* tubers as antihelminthic and antiperiodic compounds, as a

natural remedy against snakebite, to treat sprains, chronic ulcers, and snakebites.

Abrus precatorius L. (common name: Crab's eye) belonging to family Fabaceae is a medicinal, woody climber native to India (Roskov et al. 2019). *A. precatorius* contains the alkaloids arbol, abrasin, precol, and glycyrrhizin, which are responsible for its medicinal properties (Joshi 2000; Ghani 2003). Several traditional healers utilise the plant to induce abortion, relieve pain, and treat skin ailments (Winkel 2004). Important poisonous glycoproteins Arbin A and B have been found in the seeds of *A. precatorius* (Zhang 2003).

Asparagus racemosus Willd. (popular name: Shatavari) belonging to family Asparagaceae is a significant medicinal shrub native to both tropical and subtropical India (Govaerts 2019). *A. racemosus* possesses phytoestrogens, which can replace the requirement for synthetic oestrogen (Bopana and Saxena, 2007), it is used for enhancing lactation and reducing menopausal symptoms (Mitra et al. 1999). It is also an essential Rasayana ingredient utilised in the manufacture of Chyawanprash (Gautam et al., 2009). It has immunomodulant, antidepressant, adaptogenic, anticarcinogenic, anti-HIV, antioxidant, and antibacterial properties (Rao 1952; Rege et al. 1999; Singh et al. 2009; Bhutani et al. 2010; Sabde et al. 2011; Sharma et al. 2011b).

Caesalpinia bonduca (L.) Roxb. (common name: fever nut) belongs to the family Fabaceae. It is a scrambling woody climber native to India's tropical and subtropical regions (Ved et al. 2001). Ayush-64, an Ayurvedic treatment for malaria, is derived from *C. bonduca* seeds (Vaidyaratnam 1994). It is hepatoprotective, antioxidant, antibacterial, antifungal, hypoglycemic, and anti-asthmatic (Gayaraja et al. 1978; Rao et al. 1994; Simin et al. 2000; Gupta et al. 2003; Arif et al. 2009; Ata and Gale 2009). Roasted, crushed, and boiled seeds are used as a diuretic and malaria treatment (Chakrabarti et al. 2005).

Convolvulus arvensis L. (Common name: Common bindweed) belongs to the family Convolvulaceae. The entire plant is used to treat a variety of inflammatory illnesses, including diabetes, spermatorrhoea, itching, dysentery, leprosy, and several types of dysentery. It is also said to be a blood purifier, hypoglycemic, anti-dysenteric, seminogenic, and astringent (Ghani, 2010e).

Tinospora cordifolia (Willd.) Miers ex Hook. f. (Common name: Giloy) belongs to family Menispermaceae. The climber is widely used as an immunity booster, blood purifier and liver tonic. As a cure for snakebite and scorpion sting, *T. cordifolia* root and stem are used (Nadkarni 1976, Kirtikar 1976, Zhao 1991). The stem treats jaundice and is bitter, diuretic, stomachic, increases bile secretions, reduces thirst, and

enriches blood (Nayampalli et al. 1988). Diabetes, dyspepsia, vaginal discharges, and urethral discharges can all benefit from plant stem juice (Singla et al. 2010).

Conclusion

Research into medicinal climbers has drawn more attention during the past 20 years. Although climbers are mainly found throughout Asia, particularly in India, The greatest variety of climbers, from tiny twiners to huge lianas, can be found in tropical forests. Due to their endemic distribution and increased risk of extinction, several climbers fall under the categories of endangered, critically endangered, and vulnerable. The native species are on the edge of extinction as a result of climate change, habitat degradation, and alien species invasion. There is an urgent need to promote field surveys to understand the variation and distribution of climbers. Along with their taxonomic studies, the steps for conservation and propagation of climbers should also be undertaken. Focused research into medicinal climbers will produce more findings and help to overcome these challenges.

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