

Floristic Assessment and Ecological Distribution of Climbing Angiosperms in Bor Tiger Reserve, Maharashtra State, Central India

Research Article

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Abstract

The present study conducted in the Bor Tiger Reserve (BTR), Wardha, documented a total of 131 climber plant species, providing insights into their taxonomic diversity, habitat preferences, and climbing mechanisms. The taxonomic analysis revealed that climbing angiosperms in BTR belong to 40 families and 91 genera, with dicotyledons dominating the flora (123 species, 93.89%) compared to monocotyledons (8 species, 6.11%). Among these, 35 families and 86 genera were dicots, while only 5 families and 5 genera were monocots, highlighting the predominance of dicot climbers in the region. Habitat classification showed that herbaceous vines were the most abundant (74 species, 56.49%), followed by woody vines (55 species, 41.98%), while parasitic vines were rare (2 species, 1.53%). This distribution suggests that herbaceous climbers thrive better in the ecological conditions of BTR, possibly due to their adaptability to varying environmental factors. The study also categorized climbing mechanisms into four primary types. Stem twiners were the most prevalent (79 species, 60.30%), utilizing stem twining as their primary mode of ascent. Tendril climbers constituted the second-largest group (35 species, 26.72%), employing leaf or stem tendrils for support. Stragglers, both armed (4 species, 3.05%) and unarmed (10 species, 7.64%), relied on scrambling growth, whereas hook climbers (3 species, 2.29%) were the least common, using thorns or hooks for anchorage. The findings underscore the ecological adaptability and structural diversity of climbers in BTR, with stem twiners and herbaceous vines being the dominant forms. This study contributes to the understanding of climbing plant ecology in tropical dry deciduous forests and highlights the need for further research on their role in forest dynamics and conservation. The data can serve as a baseline for future biodiversity assessments, climbers' conservation and habitat management strategies in protected areas like Bor Tiger Reserve..

Keywords: Angiosperm Climbers; Bor Tiger Reserve; Floristic Diversity; Ecological Distribution; Maharashtra

Introduction

Bor Tiger Reserve is one of the smallest tiger reserves by area in the country. It became the 47th tiger reserve in India and the sixth tiger reserve in Maharashtra State. Bor sanctuary established by vide notification No. WLP.1670/431126(a)-Y Dated 27/11/1970 and Bor Tiger Reserve was notified on 16 August 2014, with an area of

138.12 km² as the core comprising Bor Sanctuary (61.10 km²), New Bor Sanctuary (60.70 km²) and the extended New Bor Sanctuary (16.32 km²). A total adjoining area of 678.15 km² (355.83 km² of forest area and 322.32 km² of non-forest area) was declared the buffer area of Bor Tiger Reserve on 4 December 2015. Bor Tiger Reserve is situated along the southern boundary of Nagpur district and northern boundary of Wardha District of Maharashtra, and extends

over on area 61.10 sq.kms including the reservoir. It represents the floral and faunal wealth of Satpuda-Maikal the landscape. Satpuda runs along the northern boundary of Maharashtra from West to East and meets the Maikal hill range which comes from Kanha. It was a game reserve in past which was subsequently declared as wildlife sanctuary in 1970 to conserve its rich biodiversity. The tiger reserve represents a typical assemblage of the Central Indian flora and fauna. It comprises of good teak bearing forests with natural associates and extremely valuable mixed deciduous forests from the point of view of wildlife. The main herbs found in the sanctuary are *Cassia tora*, *Cassia auriculata*, *Tribulus terrestris*, *Urena labata*, *Dichrostachys cinerea*, *Capparis horrida*, *Ziziphus mauritiana*, *Madhuca longifolia*. The Bor Wildlife Sanctuary is home to many species including the endemic and endangered species such as Tiger, Panther, Small Indian Civet Cat, Wild Boar, Sloth Bear, Blue Bull, Wild Dog, Pangolin, etc. The avi-faunal diversity of the sanctuary is its most attractive and remarkable feature. The sanctuary is an abode of reptiles' species of endangered status namely, Indian Cobra, Indian Rock Python, Rat Snake, Russell's Viper, Checkered Keelback and Common Monitor Lizard.

Climbing plants (lianas and vines) play a crucial role in tropical and subtropical forest ecosystems by contributing to structural complexity, nutrient cycling, and providing resources for fauna (Schnitzer & Bongers, 2002). [1] Despite their ecological importance, climbing plants are often understudied compared to trees and shrubs, particularly in Central Indian forests. BTR harbors diverse vegetation types, including dry deciduous forests, moist patches, and grassland-scrub ecosystems, providing an ideal habitat for climbing plants. However, comprehensive studies on climbing angiosperms in this region are lacking. Some work appears to have been done on climbers angiosperms in Protected Areas. A total of 175 climbing plant species that belong to 100 genera and 40 families found in tropical forests of southern Eastern Ghats, Tamil Nadu, India (Chellam M. et al, 2009). [2] 746 species of climbers reported in Upper Guinean forests (Jongkind and Hawthorne, 2005) [3] and the total number of climbing plants species that are found in Puerto Rico and the Virgin Islands amounts to 386 (Acevedo-Rodriguez 2005) [4].

This study aims to

1. Document the floristic diversity of climbing angiosperms in BTR.
2. Analyze their taxonomic distribution (families, genera).
3. Assess their ecological distribution across different habitats.
4. Identify dominant climbing mechanisms (twiners, tendrils, etc.).

The findings will contribute to the conservation and management of climbers in Central Indian forests.

Materials and Methods

Study Area

Location: The Geographic Coordinates of Bor Tiger Reserve are as

Latitude: N 20° 55' 40" to N 21° 3' 15"

Longitude: E 78° 34' 40" to E 78° 47' 30"

Bio-geographical Zone: The Bor Tiger Reserve falls under '6B-Central Highlands', as per the Bio-geographical classification done by the Wildlife Institute of India (WII), Dehradun. The details are as below:

- i. Bio-geographic Kingdom - Paleotropical
- ii. Sub kingdom – Indo-Malaysian
- iii. Bio-geographic zone - 6 - Deccan peninsula
- iv. Biotic Province – 6B- Central Highlands
- v. Sub Division Region – Satpuda-Maikal Division

Forest Types: The major forest types of the reserve are as below (Champion and Seth classification)-

- a) 5A/C- i-a: Dry Teak Bearing Forests.
- b) 5A/C- 3: Southern Tropical Dry Deciduous Mixed Forests.

Vegetation: Dominated by dry deciduous forests (*Tectona grandis*, *Dendrocalamus strictus*), with patches of riparian and scrub vegetation.

Climate: Tropical monsoon, with 750–1000 mm annual rainfall and temperatures ranging from 10°C (winter) to 45°C (summer).

Soil and Minerals: The soil type is black, often mixed with red murrum and boulders, with variation in depth and other physical properties. The alluvial soil along the water courses of main tributaries of Bor River is eminently suited to tree growth. The basaltic rocks can be distinguished into two types, namely, those that are extremely compact, hard and homogeneous and the other type is the softer basalt exfoliating in softer flakes. The former types of rocks wither very slowly and the small quantity of soil that is formed in such areas supports low quality tree growth. In the areas having softer basalt rapid decomposition takes place and a fine yellowish brown loam is obtained. It supports valuable tree growth.

Water Bodies and River Pools: Due to undulating, hilly topographic features the area has a good drainage. There is a reservoir at Bordharan, spread over an area of about 1500 hectares, apart from several natural water-points. The reservoir is a perennial source of water to wild animals, in addition to several perennial nalas, such as Dhanoli, Sima, Khadaknala, Bhulaidoh and Khorikhapa.

Data Collection

The scheduled study visits to different locations for the collecting of climbers in the study area are part of the exploration of the area under investigation. It took place from July 2024 to June 2025. A number of field trips were conducted on a daily and seasonal basis to cover the entire Bor Tiger Reserve using grid method. Photographs of close-ups of flowering and fruiting specimens were gathered, and field notes on habitat, habit, flower color, local name, etc. were made. A picture album of the necessary climber specimens was created following the completion of the gathering of plant specimen

photographs from the study region (Jain & Rao 1978; Diane & Leonard, 1998) [5,6]. Particular care was taken to take pictures of the plants in various locations, and every location was photographed in every season.

The laboratory work was mainly in the form of comprised the correct identification of collected photographs (close up) of specimens. The photographs of specimens were identified with the help of published flora like Flora of British India, Hooker (1898) [7], The Flora of the Maharashtra state; Monocotyledons, Sharma et al. (1996) [8], Flora of Maharashtra Vol-I to IV, Almeida and Almeida (2001, 2003) [9-11]. Flora of Maharashtra State; Dicotyledons Vol-I, Singh and Karthikeyan (2001) [12], Flora of Maharashtra state Dicotyledons Vol-II, Singh et al. (2001) [13,14]. Flora of Nagpur District (Ugemuge, 1986) [15] etc.

Data Analysis

The study involved a comprehensive analysis of various ecological and morphological aspects of climbing plants, focusing on species richness, family dominance, and genera distribution. These parameters provided insights into the biodiversity and evolutionary adaptations of climbers in different habitats. Additionally, the habitat preferences of these plants were examined based on forest type and microhabitat conditions, revealing distinct ecological patterns.

One of the key aspects of the study was the classification of climbing mechanisms, which play a crucial role in how these plants anchor and ascend their supports. The climbing strategies were categorized into four main types. The first type, twiners, consists of plants that climb by twining their stems around a support, allowing them to grow vertically. The second type, tendril climbers, utilize specialized structures such as leaf or stem tendrils to grasp onto nearby surfaces. The third group, hook climbers, rely on thorns or hooks to anchor themselves as they grow. Lastly, stragglers, which may be armed or unarmed, lack specialized climbing structures and instead scramble over other vegetation for support.

Furthermore, the study classified climbing plants based on their habitat types. Woody vines, characterized by their hard, lignified stems, were found predominantly in forested areas where they could climb tall trees. Herbaceous vines, with softer and more flexible stems, were commonly observed in open or disturbed habitats. Parasitic vines, which derive nutrients from host plants, exhibited unique adaptations to thrive in specific ecological niches.

Results

Floristic Diversity

The present study conducted in Bor Tiger Reserve (BTR), Wardha, Maharashtra, documented a rich diversity of climbing angiosperms, comprising 131 species belonging to 91 genera and 40 families. The taxonomic analysis revealed that dicotyledons dominated the climber flora, representing 123 species (93.89%) under 86 genera and 35 families, while monocotyledons contributed only 8 species (6.11%) under 5 genera and 5 families (Table 1). The predominance of dicots aligns with global patterns where dicot climbers exhibit higher species richness due to their adaptive morphological traits.

Habitat Distribution of Climbing Angiosperms

Climbing plants in BTR were classified into three major habitat categories: herbaceous vines, woody vines, and parasitic vines. Herbaceous vines were the most abundant, accounting for 74 species (56.49%), followed by woody vines with 55 species (41.98%). Parasitic vines were the least represented, with only 2 species (1.53%) (Table 2). The high prevalence of herbaceous climbers suggests their adaptability to the reserve’s semi-deciduous forest ecosystem, where rapid growth and flexibility provide a competitive advantage in light-limited understories.

Climbing Mechanisms and Adaptations:

The climbing mechanisms of the recorded species were categorized into five groups: stem twiners, tendril climbers, stragglers (armed and unarmed), and hook climbers. Stem twiners were the most common, comprising 79 species (60.30%), followed by tendril climbers with 35 species (26.72%). Stragglers (armed and unarmed) accounted for 14 species (10.69%), while hook climbers were the least frequent, with only 3 species (2.29%) (Table 3). The dominance of stem twiners indicates their evolutionary success in utilizing surrounding vegetation for support, whereas tendril climbers demonstrate specialized morphological adaptations for anchorage.

Discussion

Taxonomic Richness and Floristic Composition:

The floristic assessment revealed that Bor Tiger Reserve harbors a significant diversity of climbing angiosperms, with dicotyledons overwhelmingly dominating the climber community. This trend is consistent with studies from other tropical and subtropical forests, where dicots exhibit greater species richness due to their diverse growth forms and reproductive strategies (Gentry, 1991) [16-

Table 1: Taxonomic Summary of Climbing Angiosperms in BTR

Category	Dicotyledons		Monocotyledons		Total	
	No. of species	Percent-ages	No. of Species	Percent-ages	No. of species	Percentages
Families	35	87.5 %	5	12.5 %	40	100
Genera	86	94.50 %	5	5.50 %	91	100
Species	123	93.89 %	8	6.11 %	131	100

Table 2: Summary of climbing Angiosperms in BTR

Sr. No.	Habitat Classification	No. of species	Percentages
1	Herbaceous Vine	74	56.49 %
2	Woody Vine	55	41.98 %
3	Parasitic Vine	2	1.53 %
	Total	131	100

Table 3: Climbing mechanisms of Climbing Angiosperms in BTR

Sr. No.	Climbing Mode/ Mechanism	No. of Species	Percentages
1	Stem Twiner	79	60.30 %
2	Tendrill Climber	35	26.72 %
3	Stragglers Armed	4	3.05 %
	Stragglers Unarmed	10	7.64 %
4	Hook Climber	3	2.29 %
	Total	131	100

Table 4: List of Climbers species in BTR, Wardha, India.

Sr. No.	Name of Families	Name of Climber Species	Vernacular Name	Habit	Climbing Mode	Flowering and Fruiting
1	Acanthaceae	<i>Asystasia gangetica</i> (L.) T. Ander.	Lavan vel	HV	Stem Twiner	Oct-Dec
2	Annonaceae	<i>Artabotrys hexapetalus</i> (L.f.) Bhandari.	Chafvel	WA	Stem Twiner	Apr-Oct
3	Asteraceae	<i>Mikania micrantha</i> Kunth.	Jarman-lota	HV	Stem Twiner	Annual
4	Apocynaceae	<i>Allamanda cathartica</i> L.	Trumpet Vine	WV	Stem Twiner	Annual
5		<i>Cryptolepis dubia</i> (Burm.f) M.R. Almeida	Dudhi	WV	Stem Twiner	Sept-Dec
6		<i>Quirivelia frutescens</i> (L) M.R. & S.M. Almeida.	Shamlata	WV	Stem Twiner	Oct-Feb
7	Asclepiadaceae	<i>Leptadenia reticulata</i> (Retz.) Wt. & Arn.	Hirandodi	HV	Stem Twiner	Aug-Oct
8		<i>Pergularia daemia</i> (Forsk.) Chiov.	Utaranvel	HV	Stem Twiner	Aug-Dec
9		<i>Telosma pallida</i> (Roxb.) Craib.	Sensan vel	WV	Stem Twiner	July-Oct
10		<i>Tylophora indica</i> (Burm.f.) Merr.	Banbaka	HV	Stem Twiner	Sept-Dec
11		<i>Wattakaka volubilis</i> (L.f.) Stapf.	Haranvel	WV	Stem Twiner	April-Sept
12	Asparagaceae	<i>Asparagus racemosus</i> Willd. var. <i>javanica</i> Baker	Shatawari	HV	Stem Twiner	Oct-Jan
13	Aristolochiaceae	<i>Aristolochia indica</i> L.	Badakvel	HV	Stem Twiner	Nov-Jan
14	Araceae	<i>Pothos scandens</i> L.	Money plant	HV	Tendrill Twiner	Not found
15		<i>Lasia sinosa</i> (L.) Thw.	Kanta	HV	Stem Twiner	Oct-Jan
16	Bignoniaceae	<i>Bignonia unguis-cati</i> L.	Manjar vel	HV	Tendrill Climber	Jan-June
17	Basellaceae	<i>Basella rubra</i> L.	Poi-Vel	HV	Stem Twiner	Oct-March
18		<i>Basella alba</i> L.	Palak-vel	HV	Stem Twiner	Oct-March
19	Celastraceae	<i>Celastrus paniculata</i> Willd.	Malkangoni	WV	Stem Twiner	Nov-April
20	Capparaceae:	<i>Capparis zeylanica</i> L.	Sabi	WV	Straggler Armed	Oct-March
21		<i>Maerua arenaria</i> (DC.) Hook. f. & Thoms.	Kalwari	WV	Straggler unarmed	Nov-April
22	Caesalpiniaceae	<i>Bauhinia vahlii</i> Wight & Arn.	veliaapta	WV	Straggler unarmed	Dec-March
23		<i>Caesalpinia bonduc</i> (L.) Roxb.	Sagargota	WV	Straggler Armed	Sept-Jan
24	Combretaceae	<i>Calycopteris floribunda</i> (Roxb.) Poir.	Kukudranzi	WV	Straggler Armed	Dec-May
25		<i>Combretum indicum</i> (L) DeFillips.	Madhumalati	WV	Stem Twiner	Dec-May
26		<i>Combretum ovalifolium</i> Roxb.	Piwarbel	WV	Stem Twiner	Feb-April
27		<i>Quisqualis indica</i> L.	Lalchameli	HV	Stem Twiner	March-June
28	Cucurbitaceae	<i>Bryonia laciniosa</i> Linn.	Shivlingi	HV	Tendrill Climber	July-Oct
29		<i>Citrullus colocynthis</i> (L.) Schrad.	Indrayan	HV	Tendrill Climber	July-Oct
30		<i>Citrullus fistulosus</i> Stock	Dhemse	HV	Tendrill Climber	April-July
31		<i>Citrullus lantus</i> Matsumura et Nakai.	Tarbooz	HV	Tendrill Climber	Feb-May
32		<i>Coccinia grandis</i> (L.) Voigt.	Tondli	HV	Tendrill Climber	July-Dec
33		<i>Cucumis callosus</i> (Rottl.) Cogn.	Pangogrikadu.	HV	Tendrill Climber	July-Jan
34		<i>Cucumis melo</i> , var. <i>agrestis</i> Naud.	Shendada.	HV	Tendrill Climber	July-Feb
35		<i>Cucumis sativus</i> L.	Kakadi	HV	Tendrill Climber	Aug-Nov
36		<i>Cucurbita maxima</i> Duch.	Bhopala	HV	Tendrill Climber	Sept-Jan
37		<i>Cucurbita moschata</i> (Duch.) Poir.	Kala bhopala	HV	Tendrill Climber	Sept-March
38		<i>Cucurbita pepo</i> L.	Kashibhopala	HV	Tendrill Climber	Aug-Nov
39		<i>Diplocyclos palmatus</i> (L.) Jeffrey	Shankarvel	WV	Tendrill Climber	Aug-Oct
40		<i>Lagenaria siceraria</i> (Molina) Standley	Dudhi bhopala	HV	Tendrill Climber	Aug-Feb
41		<i>Luffa acutangula</i> (L.) Roxb.	Dodka	HV	Tendrill Climber	Jun-Oct
42		<i>Luffa cylindrica</i> (L.) Roem.	ChopdaDodka	HV	Tendrill Climber	Aug-Dec
43		<i>Momordica charantia</i> L.	Karale	HV	Tendrill Climber	Aug-Dec
44		<i>Momordica dioica</i> Roxb.	Kartoli	HV	Tendrill Climber	June-Oct
45		<i>Trichosanthes anguina</i> L.	Padval	HV	Tendrill Climber	Sept-Dec
46		<i>Trichosanthes cucumerina</i> L.	Jangli Padval	HV	Tendrill Climber	Aug-Oct

47	Convolvulaceae	<i>Argyreia nervosa</i> (Burm.f.) Boj.	Samudraashok	HV	Stem Twiner	Aug-Jan	
48		<i>Convolvulus arvensis</i> L.	Chandvel	HV	Stem Twiner	Aug-Feb	
49		<i>Ipomoea cairica</i> (L.) Sweet.	Garwel	WA	Stem Twiner	Annual	
50		<i>Ipomoea coccinea</i>	Ganesh-Pushp	HV	Stem Twiner	Sept-Dec	
51		<i>Ipomoea hederifolia</i> L.	Tara-vel	HV	Stem Twiner	Sept-Dec	
52		<i>Ipomoea muricata</i> (L.) Jacq.	Chandra-vel	WA	Stem Twiner	Aug-Nov	
53		<i>Ipomoea nil</i> (L.) Roth.	Kaladana	HV	Stem Twiner	Aug-Jan	
54		<i>Ipomoea obscura</i> (L.) Ker-Gawl.	Pungali	HV	Stem Twiner	Oct-Jan	
55		<i>Ipomoea pes-tigridis</i> L.	Belukeja	HV	Stem Twiner	Aug-Nov	
56		<i>Ipomoea quamoclit</i> L.	Ganeshpushpa	HV	Stem Twiner	Aug-Dec	
57		<i>Ipomoea sinensis</i> (Desv.) Choisy.	Pandhari vel	HV	Stem Twiner	Oct-Nov	
58		<i>Jacquemontia paniculata</i> (Burm.f.) Hallier	Baniya vel	HV	Stem Twiner	Sept-Jan	
59		<i>Operculina turpethum</i> (L.) S. Manso.	Dudhloma	WV	Stem Twiner	Sept-Jan	
60		<i>Rivea hypocrateriformis</i> (Desr.) Choisy.	Phasvel.	HV	Stem Twiner	June-Sept	
61		<i>Rivea ornata</i> Choisy.	Phand	HV	Stem Twiner	Aug-Nov	
62		Colchicaceae	<i>Gloriosa superba</i>	Agniphul	HV	Tendrill Climber	Aug-Oct
63		Cuscutaceae	<i>Cuscuta reflexa</i> Roxb.	Amarwel	PV	Stem Twiner	Nov-Feb
64	Cassythaceae	<i>Cassytha filiformis</i> L.	Adharvel	PV	Stem Twiner	Aug-Dec	
65	Dioscoreaceae	<i>Dioscorea bulbifera</i> L.	Mataru	HV	Stem Twiner	Oct-Jan	
66		<i>Dioscorea hamiltonii</i> Hook.f.	Sut mataru	HV	Stem Twiner	Oct-Jan	
67		<i>Dioscorea pentaphylla</i> L.	Mundi Mataru	HV	Stem Twiner	Oct-Jan	
68	Euphorbiaceae	<i>Tragia plukenetii</i> L.	Khajvel	HV	Stem Twiner	Aug-Sept	
69	Fabaceae	<i>Abrus precatorius</i> L.	Gunj	HV	Stem Twiner	Sept-Dec	
70		<i>Butea superba</i> Roxb.	Palasvel	WV	Straggler unarmed	Feb-April	
71		<i>Cajanus scarabaeoides</i> (L.) du-Petit-Th	Rantur.	HV	Stem Twiner	June-Dec	
72		<i>Cajanus platycarpus</i> (Bth.) van der Maes	Gophanvel	HV	Stem Twiner	Sept-Dec	
73		<i>Canavalia gladiata</i> (Jacq.) DC.	Bara sem	WV	Stem Twiner	Aug-March	
74		<i>Clitoria ternatea</i> L.	Gokarni	WV	Stem Twiner	July-Oct	
75		<i>Clitoria ternatea</i> var. <i>Pilosula</i> L.	Gokarni	WV	Stem Twiner	July-Oct	
76		<i>Derris indica</i> (Lam.) Bennet	Karanjo	WV	Stem Twiner	Sept-Dec	
77		<i>Derris scandens</i> Benth.	Tupbel	WV	Stem Twiner	Aug-Oct	
78		<i>Entada rheedii</i> Spreng	Hanuman vel	WV	Stem Twiner	Oct-March	
79		<i>Grona trifolia</i>	Tipani vel	HV	Stem Twiner	Aug-Oct	
80		<i>Lablab purpureus</i> (L.) Sweet.	Popat.	WV	Stem Twiner	Oct-Feb	
81		<i>Lablab purpureus</i> var. <i>lignosus</i> (L.), King.	Waal	WV	Stem Twiner	Nov-Jan	
82		<i>Lathyrus aphaca</i> L.	Ran watana	HV	Stem Twiner	Jan-March	
83		<i>Mimosa pudica</i> L.	Lajvanti	HV	Stem Twiner	Sept-Dec	
84		<i>Mucuna pruriens</i> (L.) DC.	Khajkui	WV	Stem Twiner	Sept-Dec	
85		<i>Phaseolus radiatus</i>	Jangli moong	HV	Stem Twiner	Aug-Oct	
86		<i>Phaseolus vulgaris</i> L.	Vilayatsem	HV	Stem Twiner	Dec-March	
87		<i>Pisum sativum</i> L.	Vatana.	HV	Stem Twiner	Jan-March	
88		<i>Mucuna gigantea</i> (Willd) DC.	Kakavali	WV	Stem Twiner	Sept-Dec	
89	<i>Rhynchosia bracteata</i> Benth.	Turvel	HV	Stem Twiner	Oct-Nov		
90	<i>Rhynchosia minima</i> (L.) DC.	Turvel	HV	Stem Twiner	July-Dec		
91	<i>Teramnus labialis</i> (L.f.) Spreng.	Ran-udid,Tipani	HV	Stem Twiner	Aug-Dec		
92	<i>Vigna unguiculata</i> (L.) Walp.	Barbati	HV	Stem Twiner	June-Oct		
93	Malvaceae	<i>Abutilon indicum</i>	Kupi vel	HV	Stem Twiner	Aug-Feb	
94	Menispermaceae	<i>Cocculus hirsutus</i> (L.) Diels.	Vasanvel	HV	Stem Twiner	Aug- Feb.	
95		<i>Tinospora cordifolia</i> (Willd.) Miers.	Gulvel	WV	Stem Twiner	Jan-Aug	
96	Malpighiaceae:	<i>Aspidopterys cordata</i> (HnaxWall) A. Juss.	Bokadvel	WV	Stem Twiner	Sept-Dec	
97		<i>Hiptage benghalensis</i> (L.) Kurz.	Madhumalati	WV	Strgglers unarmed	Feb-April	
98	Nyctaginaceae	<i>Bougainvillea glabra</i> Choisy.	Boganvel	WV	Hook Climber	Annual	
99		<i>Bougainvillea spectabilis</i> Willd.	Kagajiphul	WV	Hook Climber	Feb-June	
100		<i>Boerhavia diffusa</i> L.	Punarnava	HV	Hook Climber	Sept-Jan	
101	Oleaceae	<i>Jasminum officinale</i> L var. <i>grandiflorum</i>	Chameli	WV	Stem Twiner	June-Oct	
102		<i>Jasminum sambac</i> Ait.	Batmogra	WV	Stem Twiner	March-May	
103		<i>Olex scandens</i> Roxb.	Dheniyani	WV	Straggler unarmed	March-July	

104	Primulaceae	<i>Embelia ribes</i> Burm. f.	Vidhang	WV	Straggler unarmed	Oct-March
105	Passifloraceae	<i>Passiflora foetida</i> L.	Gangurli	HV	Tendrill Climber	July-Nov
106		<i>Passiflora incarnata</i> L.	Krishnkamal	HV	Tendrill Climber	April-Sept
107	Periplocaceae	<i>Cryptolepis buchananii</i> Roem. & Sch.	Dudhivel	WV	Stem Twiner	April-Nov
108		<i>Cryptostegia madagascariensis</i> Bojer	Rubbar-vel	HV	Stem Twiner	June-Sept
109		<i>Hemidesmus indicus</i> var. <i>indicus</i> (L.)	Anantmul,	HV	Tendrill Climber	Aug-Dec
110		<i>Hemidesmus indicus</i> var. <i>pubescens</i> (Wight & Arn.) Hook.f.	Nannari	HV	Tendrill Climber	Aug-Dec
111	Polygonaceae	<i>Antigonon leptopus</i> Hook, & Arn.	Icecream vel	WV	Tendrill Climber	Aug-May
112	Piperaceae	<i>Piper betle</i> L. Pan.	Nagwel	WV	Stem Twiner	Not found
113	Rhamnaceae	<i>Ventilago denticulata</i> Willd.	Lokhandi	WV	Stem Twiner	Nov-March
114		<i>Ventilago madraspatana</i> Gaertner.	Zumaka	WV	Stem Twiner	Nov-March
115		<i>Ziziphus oenoplia</i> (L.) Mill	Yeroni	WV	Straggler Armed	Jan-April
116	Ranunculaceae	<i>Clematis gouriana</i> Roxb. Ex DC	Barivel	WV	Straggler unarmed	Sept-March
117		<i>Clematis terniflora</i> DC	Bari-vel	WV	Straggler unarmed	Sept-March
118	Rubiaceae	<i>Paederia foetida</i> L.	Prasanel	WV	Stem Twiner	Sept-Dec
119	Sapindaceae	<i>Cardiospermum helicacabum</i> L.	Kanphodi	HV	Tendrill Climber	July-Dec
120	Smilacaceae	<i>Smilax perfoliate</i> Lour.	Mothuri	HV	Tendrill Climber	Aug-Oct
121		<i>Smilax zylanica</i>	Sherdire	HV	Tendrill Climber	Jan-March
122	Thunbergiaceae	<i>Thunbergia fragrans</i> Roxb.	Indra-pushp	HV	Stem Twiner	July-Oct
123		<i>Thunbergia erecta</i> (Benth) T. Anderson	Akash-vel	HV	Stem Twiner	July-Nov
124		<i>Thunbergia grandiflora</i> (RoxRottl.) Roxb.	Akash-vel	WV	Stragglerunarmed	Aug-Nov
125	Vitaceae	<i>Ampelocissus latifolia</i> (Roxb.) Planch.	Dokela	WV	Tendrill Climber	July-Oct
126		<i>Cissus quadrangularis</i> L.	Kandvel	WV	Tendrill Climber	July-Aug
127		<i>Cissus repanda</i> Vahl.	Gendal	WV	Tendrill Climber	July-Aug
128		<i>Cissus vitiginea</i> L.	Jangliangur	WV	Tendrill Climber	Aug-Dec
129		<i>Vitis vinifera</i> L.	Draksha, Angur	WV	Tendrill Climber	Nov-May
130	Verbenaceae	<i>Clerodendrum splendens</i> G. Don	Pagoda pushp	WV	Stem Twiner	Sept-Dec
131		<i>Petrea volubilis</i> L.	Rani-har vel	WV	Straggler unarmed	March-May

(WV-Woody vines; HV-Herbaceous vines; PV-Parasitic vines)

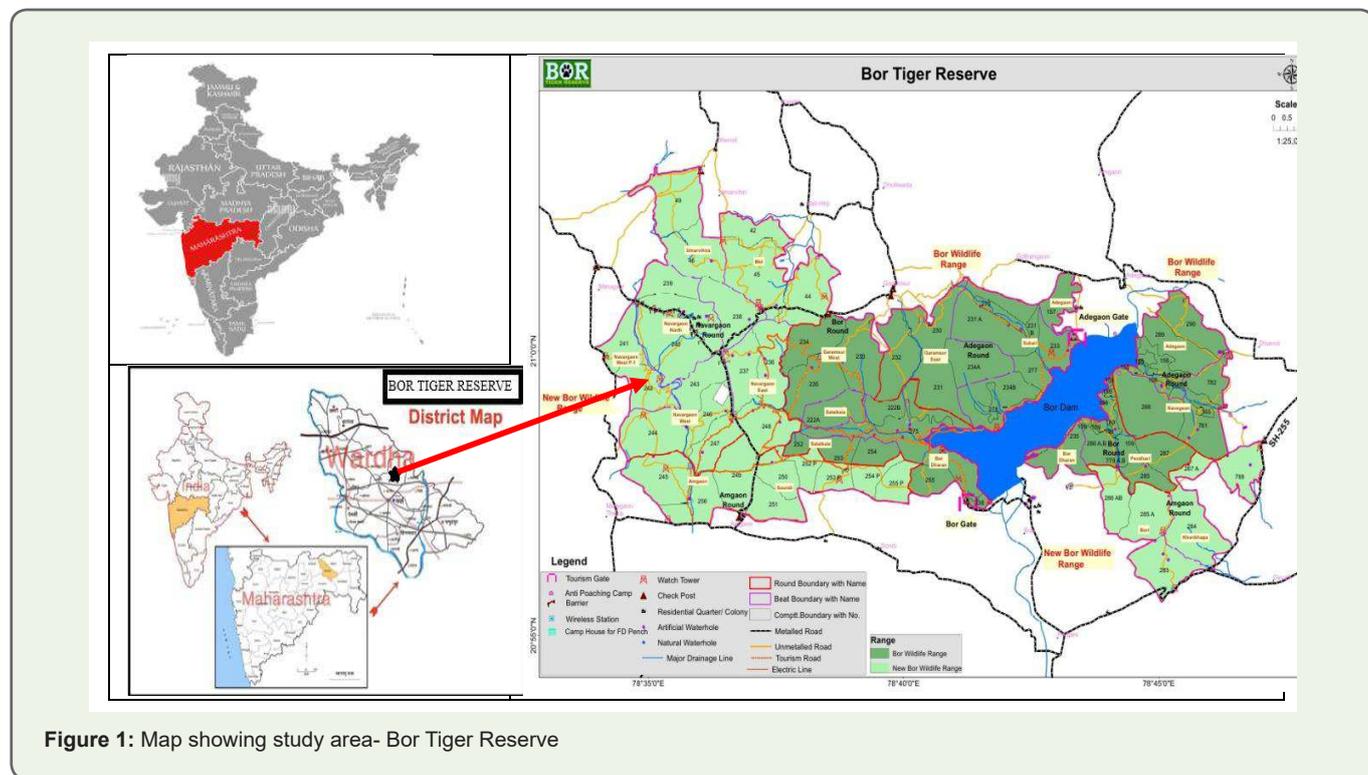


Figure 1: Map showing study area- Bor Tiger Reserve

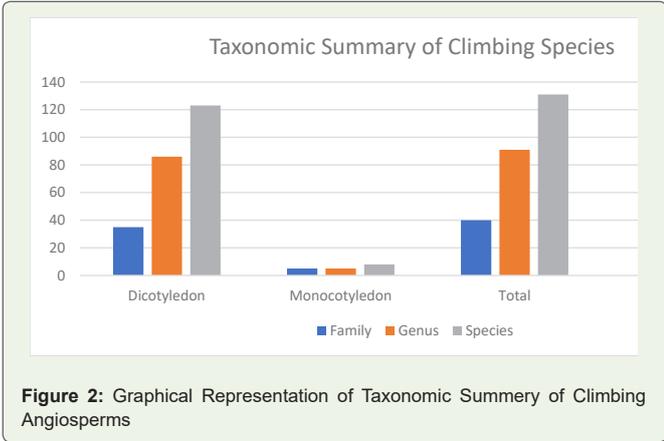


Figure 2: Graphical Representation of Taxonomic Summary of Climbing Angiosperms

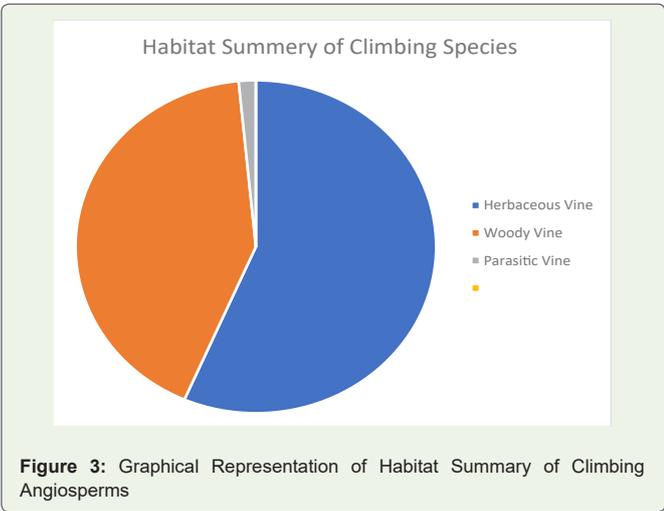


Figure 3: Graphical Representation of Habitat Summary of Climbing Angiosperms

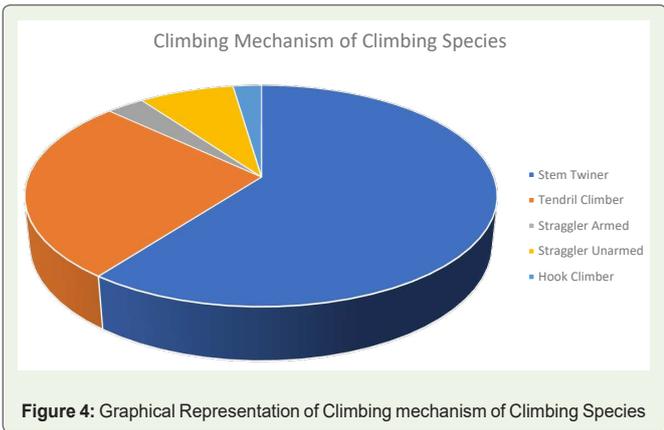


Figure 4: Graphical Representation of Climbing mechanism of Climbing Species



32]. Families such as Fabaceae (24 spp.), Cucurbitaceae (19 spp.) and Convolvulaceae (15 spp.) were particularly well-represented, likely due to their tendril-bearing and twining adaptations. In contrast, monocot climbers, primarily represented by species from Asparagaceae, Bigniniaceae, Colchicaceae and Dioscoreaceae, were scarce, possibly due to their reliance on specific host plants and limited dispersal mechanisms.

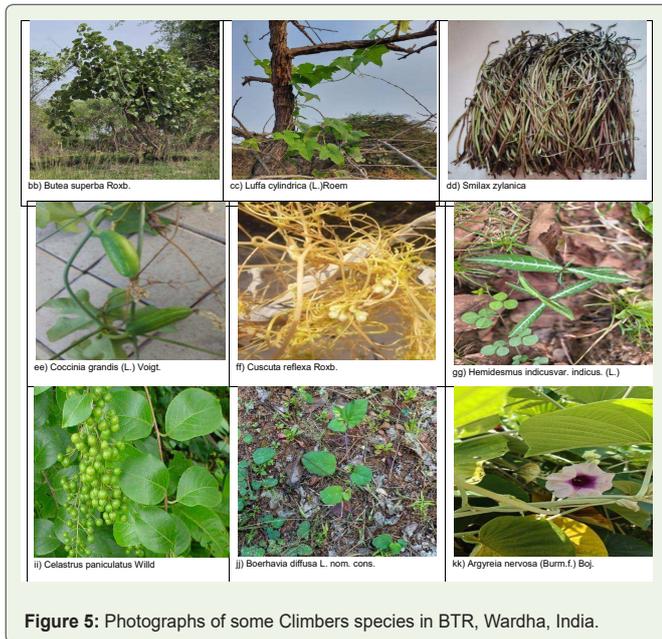


Figure 5: Photographs of some Climbers species in BTR, Wardha, India.

Ecological Preferences and Habitat Specialization:

The high abundance of herbaceous vines (56.49%) suggests their ecological success in disturbed and edge habitats, where rapid growth and vegetative reproduction facilitate colonization. Woody vines (41.98%), though less numerous, play a crucial role in forest dynamics by competing with trees for light and nutrients (Schnitzer & Bongers, 2002) [1]. The scarcity of parasitic vines (1.53%) indicates limited host specificity and potential constraints imposed by the reserve’s vegetation structure.

Climbing Mechanisms and Evolutionary Adaptations:

The prevalence of stem twiners (60.30%) underscores their efficiency in utilizing surrounding vegetation for mechanical support. Tendril climbers (26.72%) demonstrate specialized adaptations, with modified leaves or stems enhancing their climbing efficiency. Stragglers (10.69%), both armed and unarmed, rely on thorns or sprawling growth to scramble over vegetation, while hook climbers (2.29%) employ specialized structures for anchorage. These mechanisms reflect evolutionary trade-offs between energy allocation and climbing efficiency (Isnard & Silk, 2009).

Conservation Implications:

Given the ecological roles of climbers—such as providing food resources for fauna, facilitating forest regeneration, and contributing to carbon sequestration—their conservation within BTR is vital. However, habitat fragmentation and anthropogenic disturbances may threaten certain climber species, particularly those with specialized habitat requirements. Long-term monitoring and habitat restoration initiatives are recommended to sustain climber diversity.

Conclusion

The present study provides the first comprehensive assessment of climbing angiosperms in Bor Tiger Reserve, documenting 131 species

with distinct taxonomic, ecological, and adaptive characteristics. The dominance of dicotyledons, herbaceous vines, and stem twiners highlights the evolutionary and ecological success of these groups in the reserve’s semi-deciduous forests. The findings contribute to the broader understanding of climber ecology in Central India and underscore the need for targeted conservation strategies. Future research should focus on climber-host interactions, phenological patterns, and the impacts of climate change on climber diversity. By integrating climber conservation into forest management plans, Bor Tiger Reserve can enhance biodiversity conservation and ecosystem resilience.

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