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A study on common climbers found in Chirawa, Jhunjhunu (Raj.)

Rajbala
Associate Professor, Department of Botany SRRM Govt. PG College, Jhunjhunu, Rajasthan, India

Abstract
This study explores the morphological characteristics of climber plants found in Chirawa tehsil of Jhunjhunu Rajasthan, a region located between Jhunjhunu, Khetri, and Pilani. This tehsil experiences hot, dry summers. Sandstorms are a defining feature of this tehsil in the summer. The temperature ranges from 0°C to 48°C, with a mean of 26°C. Through systematic field survey and morphological analysis this research identifies various 49 climber plants belonging to 36 genera and 11 different families. This observation is helpful in future research and also helpful in knowing the plant vegetation of the study area. To identify the vegetation growing in the study area and classify the plants in their respective families. The study contributes to understanding the local biodiversity fostering an appreciation for traditional knowledge. Plants have the ability to grow and continuously adapt their body to the surroundings, high plasticity and adaptability to changing environments, so they have adaptibility to all habitats on earth.

Keywords: Morphological characteristics, temperature, Chirawa, climber, sandstorms

Introduction

Climbing plants are important group of plants whose structural support does not come entirely from its own tissue with original rooting position in the soil or a sur-face close to the soil and whose climbing efforts could take its foliage and reproductive organs into tree canopies (Burnham 2009) [3]. Plants having distinct structures to climb on hosts are termed as climbers. Climbers are mostly fixed in the soil but need support for their weak stem. They compete strongly with large trees and shrubs for light, space as well as nutrients (Richards, 1952) [9]. Climbers play diverse roles in the biology of forests. Climber species due to its fragile nature are susceptible to any change in the forests. climbing plants among all show many interesting and peculiar features (Darwin C,1865) [4]. They need to grow vertically and rapidly at the apical level of shoots to find a suitable support and to enhance light acquisition (or they perish), for which they minimize their energy consumption (Gianoli E, 2015) [6]. Secondly, vines and lianas develop flexibility and tough-ness in their stem because they need to survive extreme mechanical stresses in their habitat (e.g. movement or falls of trees and branch) (Rowe N and Speck T, 2005) [10]. Thirdly, many climbing plants have a sophisticated fibres arrangement which can affect the mechanical properties of the plant stem, leaf or attachment organ (Wang J-S *et a*l, 2013) [13]. climbing plants can perform several kinds of movements (e.g. circumnutation is particularly evident in twining stems and used to find a support) (Smyth D R, 2016) [16]. some climbing plants have the capacity to morphologically change their leaf form and shape, for example for camouflage in possible hostile environments (Gianoli E and Carrasco-Urra F 2014) [5]. These plants grow at least for part of their life by winding around, leaning, or anchoring/adhering to other plants. Climbers show great variety in their mechanism of climbing (Bongers *et al*., 2005; Jongkind & Hawthorne, 2005) [7]. Their growth pattern has little structural support with more resources allocated to canopy development, reproduction, and stem and root elongation compared to self-support-ing plants. The climbers show unique morphological climbing mechanism innovation, stem anatomy, and vegetative regeneration; stem tissues often possess a large proportion of parenchymatous cells, with the vascular cambium showing anomalous growth through continuous cambial activity. Various climbing mechanisms include indeterminate apical stem twining; determinate tendrils produced by a variety of modified organs; scrambling with hooks, spines, scabrous leaves, or stems; and adventitious adhesion of roots. About 5000–10,000 climber species are recorded within angiosperms (Caballe 1993). The climbers exist among ancestral angiosperm groups and monocotyledonous families and are commonly represented in major groups of Cucurbits and Convuvols. Plants' phylogenetic breadth strongly supports multiple origins of the distribution and abundance of climbers (lianas) are also apparently determined by biotic elements such as the architecture of hosts than by climate or soil factor (Balfour & Bond, 1993) [1], climbing habit among angiosperms. Significant advantage to climbing habit confers on plants able to transit from self-supporting to additional support. Their geographic distribution is also wide and not uniform around the globe. Climatic conditions play an important role in the determination of their occurrence.

Study Area

A well-known tehsil in Jhunjhunu district in Shekhawati Rajasthan is Chirawa town (The study area), which is located between Jhunjhunu, Khetri, and Pilani. This tehsil is situated in the Jhunjhunu district's northeastern region. This tehsil has 1923.27 square kilometers area. This tehsil experiences hot, dry summers. Sandstorms are a defining feature of this tehsil in the summer. The temperature ranges from 0°C to 48°C, with a mean of 26°C. Due to the plain and sandy terrain of Chirawa tehsil, irrigation and agriculture are dependent on rain. To identify the vegetation growing in the study area and classify the plants in their respective families.

Methodology

Plant collection was done to identify the taxonomic and medicinal properties of plants. So, intensive exploration trips were also conducted to document plants and to know prevailing biodiversity of the selected area. The portion of specimens were collected in a clear phyllotaxy and branching system. All the specimens collected will be serially numbered and will be identified with the help of floras. (Singh and Shetty, 1987-1993; Bhandari, 1990) [11, 2], Herbarium of Universities, BSI, Jodhpur, IBS, New Delhi and also by local dwellers like hakims, priest, homeopath, farmers and herdsmen by interviews periodically. Final confirmation of identified plants will be identified with the help of floras. (Singh and Shetty, 1987-1993; Bhandari, 1990) [11], Herbarium of Universities, BSI, Jodhpur, IBS, New Delhi and also by local dwellers and herdsmen by interviews periodically.

Results

Table shows data pertaining to 49 different climbers growing in site showing Scientific names, common names and families of these plants. They belong to total 11 different families which includes Aristolochiaceae, Combretaceae, Nyctaginaceae, Sapindaceae and Scrophulariaceae (1 each), Cuscutaceae (2), Menispermaceae (4), Fabaceae (6), Asclepiadaceae (9), Convolvulaceae (9) while maximum number of climbers belong to Cucurbitaceae (13). The climbing plants are of various types of them the most dominant are twiners (55.39%), followed distantly by tendril climbers (19.12%), scramblers (15.68%) and branch climbers (4.90%). (2-1%) are root climbers (1.47%), leaf climbers, hook climbers (0.98%), and petiole climbers (0.50%). Of the climbers enumerated, 80% are wild and the rest either cultivated or naturalized.

Table 1

S. No.	Scientific Name	Common Name	Family
1	Aristolochia bracteolate Lam.	Batakh bel	Aristolochiaceae
2	Ceropegia bulbosa Roxb.	Khadulo	Asclepiadaceae
3	Cryptostegia grandiflora (Roxb.) R. Br	Rubber bel	Asclepiadaceae
4	Leptadenia reticulata (Retz.)	Jeewanti	Asclepiadaceae
5	Marsdonia tenacissima (Roxb.) Wight et Arn.	Murwa bel	Asclepiadaceae
6	Pentatropis spiralis (Forssk.) Decne.	Aakar bel	Asclepiadaceae
7	Pergularia daemia (Forssk.)	Gadaria bel	Asclepiadaceae
8	Sarcostemma viminale L.	Khir khimp	Asclepiadaceae
9	Telosma pallida Roxb.	Sulkila	Asclepiadaceae
10	Tylophora indica Burm. f.	Dama bel	Asclepiadaceae
11	Quisqualis indica L.	Jhumka bel	Combretaceae
12	Argyreia nervosa (Burm.f.)	Ghav bel	Convolvulaceae
13	Ipomoea cairica L.	Panchpatti	Convolvulaceae
14	Ipomoea indica L.	Morning glory	Convolvulaceae
15	Ipomoea indica L.	Rota bel	Convolvulaceae
16.	Ipomoea nil L.	kaladana	Convolvulaceae
17	Ipomoea pestigridis L.	Modi ladu	Convolvulaceae
18	Ipomoea roderifolia Carey ex Voight.	Lal pungi	Convolvulaceae
19	Merremia disecta (Jacq.) Hallier f.	Cutleaf bel	Convolvulaceae
20	Ipomoea percaprae L.	Do patti bel	Convolvulaceae
21	Merremia aegyptia (L.) Urb.	Ghala bel	Convolvulaceae
22	Coccinia grandis L	Parwal	Cucurbitaceae
23	Corallocarpus epigaeus (Rottler) C.B. Clarke	Kadwibel	Cucurbitaceae
24	Ctenolepis cerasiformis Stocks) Hook.f.	Aakh phutni bel	Cucurbitaceae
25	Cucumis callosus Rottb.	kachri	Cucurbitaceae
26	Cucumis melo L.	Kharbuza	Cucurbitaceae
27	Cucumis prophetarum L.	Khad kachro	Cucurbitaceae
28	Dactyliandra welwitschii Hook. f	Aakh futni bel	Cucurbitaceae
29	Luffa echinata (Roxb.)	Kukadbel	Cucurbitaceae
30	Momordica balsamina L.	Baad karelio	Cucurbitaceae
31	Momordica charantia L.	karelo	Cucurbitaceae
32	Momordica dioca Roxb	Kakoda	Cucurbitaceae
33	Mukia maderaspatana (Linn.) M. Roemer:	Ankh fodi bel	Cucurbitaceae
34	Trichosanthes anguina L.	Chachinda	Cucurbitaceae
35	Cuscuta chinensis Lam.	Amar bel	Cuscutaceae
36	Cuscuta reflexa Roxb.	Amar bel	Cuscutaceae
37	Abrus precatorius L.	Chirmi	Fabaceae
38	Clitoria ternatea L.	Butterfly pea	Fabaceae
39	Mucuna pruriens	kirmich	Fabaceae
40	Phaseolus trilobus Linn.	Mungi	Fabaceae
41	Rhyncosia minima L.	Chiri moth	Fabaceae
42	Vigna trilobata Linn.	Jangli moth	Fabaceae
43	Cissampelos pareira L.	Patha	Menispermaceae
44	Cocculus hirsutus L.	Pilwani	Menispermaceae
45	Cocculus pendulus (J.R. Forst. & G. Forst.) Diels	Pilwani	Menispermaceae

46	Tinospora cordifolia Willd.	Giloy	Menispermaceae
47	Bougainvillea glabra	Bogan bel	Nyctaginaceae
48	Cardiospermum helicocabum L.	Kapel phori	Sapindaceae
49	Kickxia ramosissima (Wall.) Janchen	Bhichatti	Scrophulariaceae

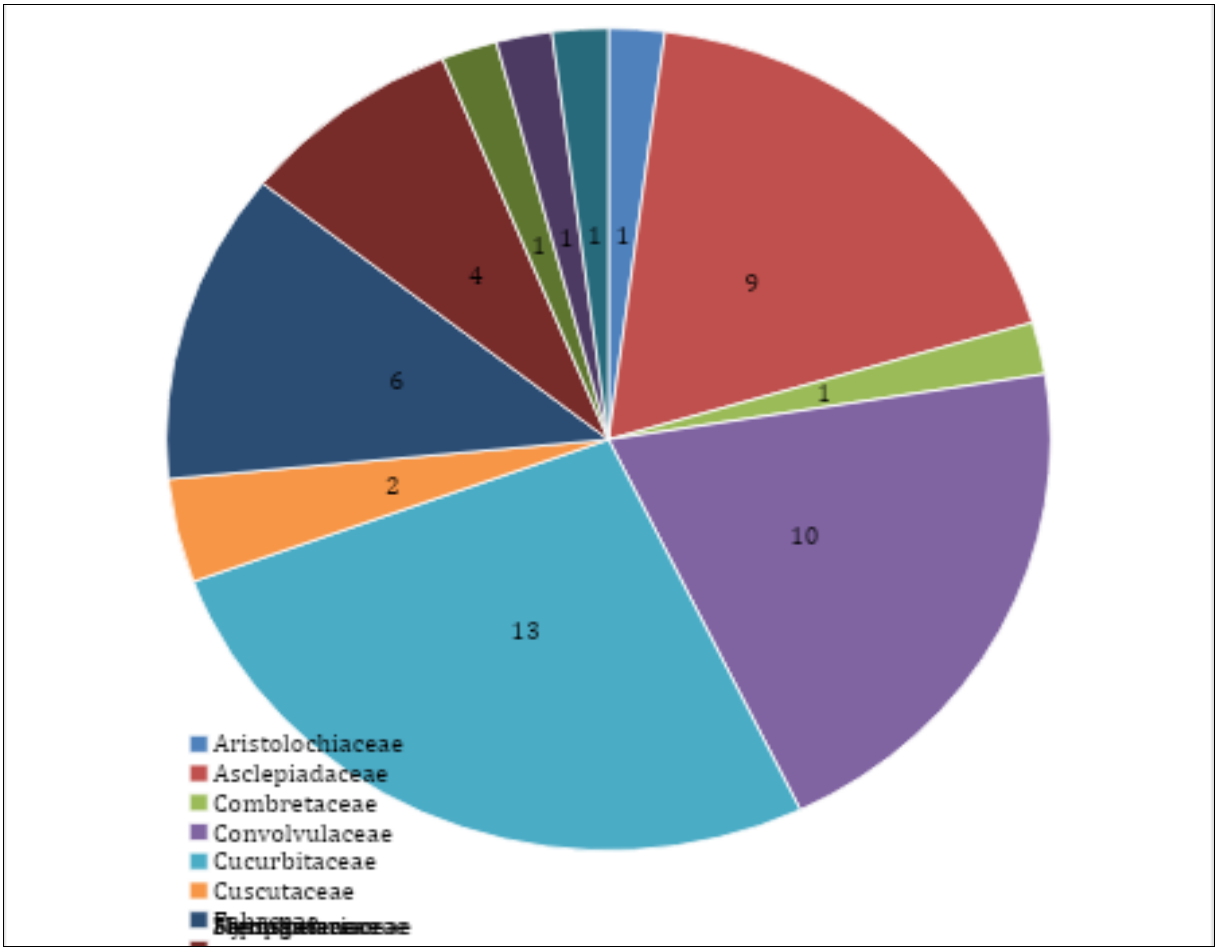
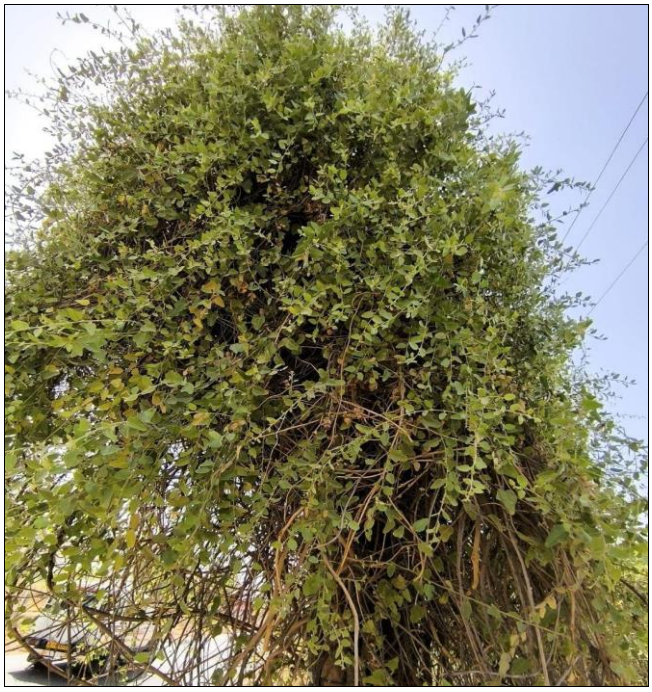
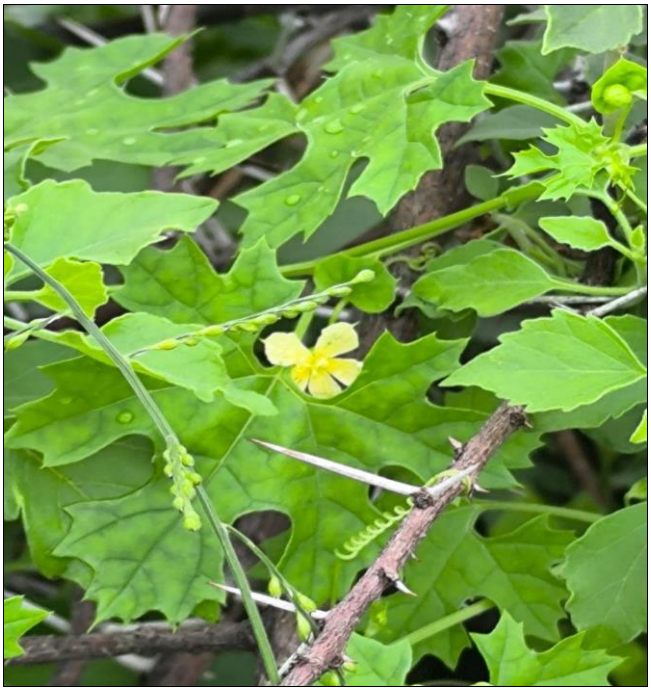


Fig 1: Family-wise distribution of climbers



Cocculus pendulus



Momordica balsamina

Bougainvillea glabra Tinospora cordifolia Ipomoea pesti-gridis

Discussion

The present paper is highlighted on morphological study on climbers' plants found in chirawa tehsil of Rajasthan. This study presents a s comprehensive documentation of 49 different climbers from 11 different families which includes Aristolochiaceae, Combretaceae, Nyctaginaceae, Sapindaceae and Scrophulariaceae (1 each), Cuscutaceae (2), Menispermaceae (4), Fabaceae (6), Asclepiadaceae (9), Convolvulaceae (10) while maximum number of climbers belongs to Cucurbitaceae (13 plant species). The most common climber plants found in study site are *Cocculus pendulus*, *Cuscuta chinensis*, *Pentatropis spiralis*, *Leptadenia reticulata*, *Momordica balsamina* L., *Ipomoea pestigridis* L., *Tinospora cordifolia* Willd., *Coccinia grandis* L, *Merremia aegyptia* (L.) Urb.*Pergularia daemia* (Forssk.), *Cryptostegia grandiflora* (Roxb.) R. Br. Cucurbitaceae family having maximum number of plants denotes its higher adaptability to environment. The Ipomoea emerges as the most diversified genus with 7 species followed by 3 species of *Cucumis* and *Momordica* both.

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