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Research Article

Biodiversity of angiospermic climbers of *daund tahsil* from pune district (M.S.), India

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Abstract

The regional floristic studies are very important and it can be achieved by exploration of smaller areas. This is useful in the revision of existing flora. In present paper an account of Biodiversity of Angiospermic climbers of Daund Tahsil from Pune district of Maharashtra state, India is highlighted. Plant exploration was conducted to determine Angiosperm climber species in Daund tahsil. The present paper gives an account of total 73 species of climbers belonging to 53 genera and 23 families of Angiosperms. Out of 73 species, 71 species are belonging to Dicotyledons while only 2 species are of Monocotyledons. The family Cucurbitaceae (16 Species), Convolvulaceae (13 Species) and Fabaceae (7 Species) are dominant families of climbing Angiosperms in Daund tahsil. The genus *Ipomea* (7 species) is largest genera. Each plant is studied with respect to its botanical name, local name, family name, flowering and fruiting period etc.

Keywords: Angiosperm, biodiversity, climbers, *Daund Tahsil*.

INTRODUCTION

Climbing plants i.e. climbers, twiners and lianas are important components of vegetation. Climbers are plants rooted in the ground but need support for their weak stems (Richards, 1952). A plant species which cannot withstand on itself due to weak stem and takes support of other plants or objects to continue its growth and ascending up to trap the solar energy is considered as a climber. A liana is a woody climber that generally has roots in woodland or forest floor but its leaves often in full sun, blanketing canopies of trees, often many meters from the ground. All these climbing elements having various morphological forms including climbers, twiners and lianas are components of vegetation and play a crucial role to maintain the diversity of the particular area. The climbers in the wild generally utilize the neighboring plants as external supporting structures to ascend (Den & Oosterbeek, 1995). The early and somewhat sound classification of climbers is that of Schimper (1903), who categorized them into scrambles, root climbers, twiners and tendril climbers.

India is having richest biodiversity in the world. The Flora of India is consists of 47513 plant species of all groups and 18117 flowering plant species. (Arisdason & Lakshminarasimhan, 2019). India is also known as a mega-diversity center among 12 in the world .Vegetation

may be described as the plant life of a region. India, one of the 12 megacentres of origin of cultivated plants is also one of the richest centers of biodiversity (Kohli et al., 2004). Environmental condition supports the diversity of different plant species. The current study focuses on documentation of Biodiversity of plants especially climbers of Angiosperms in Daund Tahsil from Pune District (Maharashtra State), India.

Daund Tahsil lies in Pune district situated on the margins of '*Bhima*' river. Geographically this region extends from 18°18' to 18°41' North Latitude and 74°07' to 74°51' East Longitude Figure 1. The geographical area of the study region is 1289.86 Sq. Km. (128986 hectore) according to 2011 census. The average height of study area is 554 meters from mean sea level. The river '*Bhima*' and its tributary rivers '*Mula*', '*Mutha*' are dominating drainage pattern in study region. Agriculture is predominant in Daund tahsil and it provides livelihood to 66.93 % population.

In different part of India studies on diversity of climbers were undertaken by a number of workers. The earlier studies on the climbers of the different regions of the country have been made by different workers, Baro and Borthakur, Climbing Angiosperms of Manas National Park, Assam: Diversity and Ethno botany (2017); (Gakhare Pankaj et al., 2016). Diversity and distribution of Angiospermic climbing plants of Nagpur City, Maharashtra (2016), (Padaki

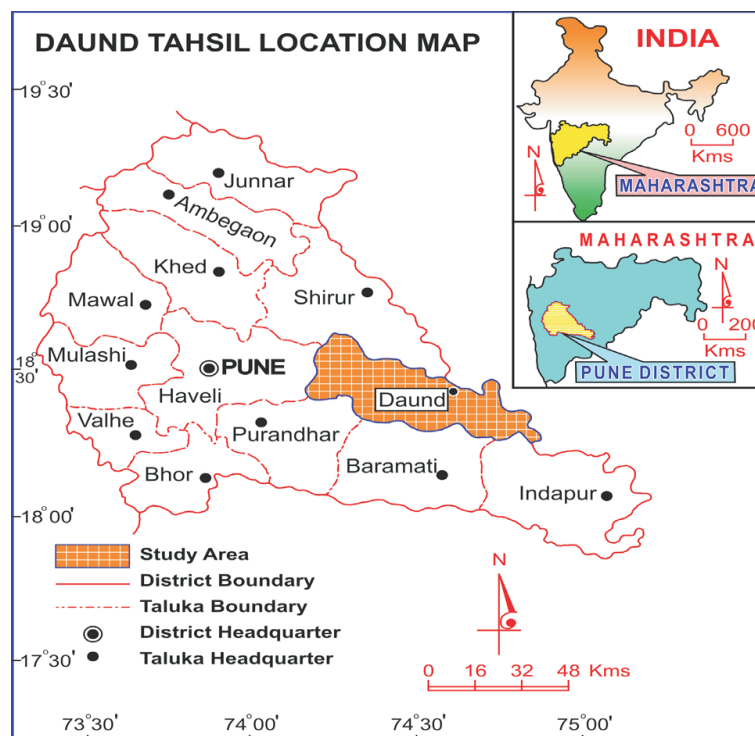


Figure 1: Geographical location of Pune District in Maharashtra State (India) and Daund Tahsil in Pune district.

& Parthasarathy, 2000); Abundance and distribution of lianas in tropical lowland evergreen forest of Agumbe, central Western Ghats, India (2000), (Sateesh et al., 2014). The Climbing Plants of Northern Telangana in India and their ethno medicinal and economic uses (2014) etc.

MATERIALS AND METHODS

The exploration of the area under study includes the planned study tours to various places for collection of climbers in study area. It was carried out during 2017-2020. Several daily and seasonal field tours were made to cover the entire Daund Tahsil. Flowering and fruiting specimens were collected and field observations on habit, habitat, color of flower, local name etc. were noted. After completing the plant specimen collection from study area, herbariums of collected specimens were prepared (Jain & Rao 1978; Diane & Leonard, 1998). Close up of flowering/fruiting material and habit along with associated plants were photographed. Special attention was paid to collect the plants from different areas and as far as possible all localities have been covered during all seasons. Extensive field work, exploration and collection of plants were carried out in different seasons. Identification of collected specimens was made with the help of relevant literature.

The laboratory work was mainly in the form of comprised the correct identification of collected specimens. The specimens were identified with the help of published flora like Flora of British India, Hooker (1898), Flora of presidency of Bombay, Cooke (1958), The Flora of the Maharashtra state; Monocotyledons, Sharma et al. (1996), Flora of Maharashtra Vol-I to IV, Almeida and Almeida (2001,

2003). Flora of Maharashtra State; Dicotyledons Vol-I, Singh and Karthikeyan (2001), Flora of Maharashtra state Dicotyledons Vol-II, Singh et al. (2001). Flora of Kolhapur District, Yadav, and Sardesai (2002), 'Flora of Baramati', Bhagat et al. (2008), Flora of Khandala on the Western Ghats of India, Santapau (1953), Flora of Purandar, Santapau (1958), Botanical collectors' manual, Santapau (1958) etc.

Names of the plants specimens were searched concerning with the different herbaria especially Herbarium of Botanical Survey of India (B.S.I.), Western Circle, Pune, Herbarium, Department of Botany, Savitribai Phule Pune University, Pune, Agharkar Herbarium of Maharashtra Association (AHMA), Agharkar Research Institute (A.R.I.) Pune. The herbarium specimens of the collections have been deposited at the Herbarium, Department of Botany, E.S. Divekar College, Varvand, Tal- Daund, Dist- Pune (M.S.) India.

RESULTS

The work embodied in this communication is the result of three years collection of Angiospermic climbers from different localities in Daund Tahsil from Pune District, Maharashtra, India. The present investigation revealed that total climbers include 73 species, 53 genera belonging to 23 families of Angiosperms. Out of 73 species, 71 species, 51 genera and 21 families are belonging to Dicotyledons (97.26 %), while only 2 species, 2 genera and 2 families are of Monocotyledons (2.74%) Table 1. The family Cucurbitaceae (16 Species), Convolvulaceae (13 Species) and Fabaceae (7 Species) are dominant families of climbers in Daund tahsil. Genus *Ipomea* is the largest genera with seven species Table 2.

Table 1. Plant Groups.

Plant Group	Families	Genera	Species
I)Dicotyledons	21	51	71
A)Polypetalae	10	28	36
B)Gamopetalae	8	20	31
C)Monochlamydae	3	3	4
II)Monocotyledons	2	2	2
Total	23	53	73

Table 2. Records of 73 Climbers of Angiosperms.

Family	Botanical Name	Local Name	Fl. & Fr. Period	Ref. No.
I)Dicotyledons				
A)Polypetalae				
Ranunculaceae	<i>Clematis heynei</i> M. A. Rau.	Morvel, Ranjai	Sept.-Dec.	JGB-75
Annonaceae	<i>Artabotrys hexapetalous</i> (L.f.) Bhandari	Hirva Chapha	Mar.-Aug.	JGB-525
Menispermaceae	<i>Tinospora cordifolia</i> (Willd.) Miers	Gulvel	Aug-Jan.	JGB-104
Vitaceae	<i>Cayratia trifolia</i> (L.) Domin	AmbatVel'	Aug.-Mar.	JGB-281
Vitaceae	<i>Cissus quadrangularis</i> L.	Kandvel	Jan.-June	JGB-245
Vitaceae	<i>Cyphostemma auriculatum</i> (Roxb.) Singh & Shetty	Jangali Kajorni, Kali Vel'	June-Nov.	JGB-334
Vitaceae	<i>Vitis vinifera</i> L.	Drakshe	Nov.-May	JGB-413
Sapindaceae	<i>Cardiospermum helicacabum</i> L.	Kanphuti	July-Dec	JGB-56
Papilionaceae	<i>Abrus precatorius</i> L.	Gunj	Oct. Dec.	JGB-227
Papilionaceae	<i>Canavalia gladiata</i> (Jacq.) DC.	Abai, Ghevada	Aug.-Dec.	JGB-246
Papilionaceae	<i>Clitoria ternatea</i> L.	Nili Gokarna	Sept. -Dec	JGB-11
Papilionaceae	<i>Lablab purpureus</i> (L.) Sweet.	Pavata, Vaal	Sept.-Mar.	JGB-169
Papilionaceae	<i>Phaseolus vulgaris</i> L.	Shravan Ghevada	Sept-Mar.	JGB-239
Papilionaceae	<i>Psophocarpus tetragonolobus</i> (L.) DC.	Chaudhari	Dec.-Feb.	JGB-253
Papilionaceae	<i>Rhynchosia minima</i> (L.) DC.	--	Sept.-Feb.	JGB-83
Caesalpinaceae	<i>Caesalpinia crista</i> L.	--	Oct.-Feb.	JGB-276
Combretaceae	<i>Quisqualis indica</i> L.	Madhumalati	Almost throughout year. Frts.: Not seen	JGB-329
Passifloraceae	<i>Passiflora caerulea</i> L.	Krishna-Kamal	Throughout year Frts. not seen.	JGB-767
Passifloraceae	<i>Passiflora edulis</i> Sims.	Krishna-Phal	Aug.-Feb.	JGB-423
Passifloraceae	<i>Passiflora foetida</i> L.	Veli-Ghani	:July-Dec.	JGB-13
Cucurbitaceae	<i>Benincasa hispida</i> (Thunb.) Cogn.	Kohla	June-Oct	JGB-416
Cucurbitaceae	<i>Citrullus colocynthis</i> (L.) Schrad.	Kadu Indrayan	July-Sept.	JGB-115
Cucurbitaceae	<i>Corallocarpus epigaeus</i> (Rottl.) Hook.	Mirchikand'	Aug. -Nov.	JGB-237
Cucurbitaceae	<i>Cucumis melo</i> L.	Shendad, Kharbooz'	Aug.-Nov.	JGB-415
Cucurbitaceae	<i>Cucumis prophetarum</i> L.	Kadu Indrayan	Apr.-Aug.	JGB-207
Cucurbitaceae	<i>Cucumis sativus</i> L.	Kakadi	Apr.-Nov.	JGB-417
Cucurbitaceae	<i>Cucurbita maxima</i> Duch.	Tambda Bhopala	Aug.-Feb.	JGB-652
Cucurbitaceae	<i>Cucurbita pepo</i> L.	Kashifal Bhopala	Dec-Apr.	JGB-653
Cucurbitaceae	<i>Diplocyclos palmatus</i> (L.) Jeffrey	Shivalingi, Shanker-vel	Aug.-Feb.	JGB-34
Cucurbitaceae	<i>Lagenaria siceraria</i> (Molina) Standl.	Dudhi Bhopala	Sept.-Jan.	JGB-637
Cucurbitaceae	<i>Luffa acutangula</i> (L.) Roxb.	Dodaka	Aug.-Feb.	JGB-633
Cucurbitaceae	<i>Luffa cylindrica</i> (L.) Roem.	Ghosale	Aug.-Dec.	JGB-614
Cucurbitaceae	<i>Momordica charantia</i> L.	Karle	June-Nov.	JGB-601
Cucurbitaceae	<i>Momordica dioica</i> Roxb.	Kartoli	June-Dec.	JGB-23
Cucurbitaceae	<i>Mukia maderaspatana</i> (L.) Roem	Tuntani	Sept.-Dec.	JGB-170
Cucurbitaceae	<i>Trichosanthes dioica</i> Roxb.	Padval	July-Sept.	JGB-537
B) Gamopetalae				
Oleaceae	<i>Jasminum auriculatum</i> Vahl.	Jai	Mar.-Oct.	JGB-424
Oleaceae	<i>Jasminum officinale</i> L.	Chameli	Mar.-Oct.	JGB-524
Oleaceae	<i>Jasminum sambac</i> (L.) Ait.	Mogra	Jan.-Mar.	JGB-468
Apocynaceae	<i>Vallisneria spiralis</i> (L.) O. Ktze.	--	Dec.-Sept.	JGB-753
Periplocaceae	<i>Cryptolepis buehneri</i> R. Br.	Kavali	Throughout year	JGB-58
Periplocaceae	<i>Cryptostegia grandiflora</i> R. Br.	Kavali	Mar.-Dec.	JGB-369

Periplocaceae	<i>Hemidesmus indicus</i> (L.) R. & S.	Anantmul, Upalsari	July- May	JGB-279
Asclepiadaceae	<i>Gymnema sylvestre</i> (Retz.) R. Br.	Bedkicha pala, Madhunashini, Gudmari	Apr.-Oct	JGB-823
Asclepiadaceae	<i>Pentatropis nivalis</i> (L.f.) Bullock	Amarvel	Sept.-Mar.	JGB-308
Asclepiadaceae	<i>Pergularia daemia</i> (Forssk.) Chiov.	Utarni	July-Feb.	JGB-366
Asclepiadaceae	<i>Tylophora indica</i> (Burm.f.) Merr.	Potmari	July-Dec.	JGB-824
Convolvulaceae	<i>Argyreia nervosa</i> (Burm.f.) Boj.	--	Sept.-Mar.	JGB-46
Convolvulaceae	<i>Convolvulus arvensis</i> L.	Chandvel	July-Mar.	JGB-117
Convolvulaceae	<i>Ipomoea cairica</i> (L.) Sweet.	Garvel	Oct-Apr	JGB-71
Convolvulaceae	<i>Ipomoea eriocarpa</i> R. Br.	--	July-Aug.	JGB-309
Convolvulaceae	<i>Ipomoea nil</i> (L.) Roth.	--	Sept-Dec	JGB-28
Convolvulaceae	<i>Ipomoea pes-tigridis</i> L.	--	Sept.-Dec.	JGB-159
Convolvulaceae	<i>Ipomoea quamoclit</i> L.	Ganesh Pushp, Ganeshvel	Sept.-Dec.	JGB-552
Convolvulaceae	<i>Ipomoea sinensis</i> (Desv.) Choisy	--	Oct.-Nov.	JGB-909
Convolvulaceae	<i>Ipomoea turbinata</i> Lag.	--	Jan.-March.	JGB-37
Convolvulaceae	<i>Jacquemontia coerulea</i> Choisy	Blue bel	Sept.-Dec.	JGB-830
Convolvulaceae	<i>Merremia hederacea</i> (Burm.f.) Hall.	--	Oct.-Dec.	JGB-831
Convolvulaceae	<i>Merremia quinquefolia</i> (L.) Hall.	--	Sept.-Feb.	JGB-586
Convolvulaceae	<i>Rivea hypocrateriformis</i> (Desr.) Choisy	--	Jan.-Mar.	JGB-832
Cuscutaceae	<i>Cuscuta reflexa</i> Roxb.	Amarvel	Jan.-Mar.	JGB-38
Bignoniaceae	<i>Macfadyena unguis-cati</i> (L.) A Gentry	--	Dec.-May	JGB-834
Bignoniaceae	<i>Pachyptera hymenaea</i> (DC.) Gentry	--	Throughout yr.	JGB-606
Bignoniaceae	<i>Pyrostegia venusta</i> (Ker.-Gawl.) Miers.	Golden shower	Oct.-Jan.	JGB-494
Thunbergiaceae	<i>Thunbergia alata</i> Boj.	--	Sept.-Dec.	JGB-642
Thunbergiaceae	<i>Thunbergia grandiflora</i> (Roxb. ex Rottl.)Roxb.	--	Sept.-Oct.	JGB-746
Thunbergiaceae	<i>Thunbergia laevis</i> Nees.	--	Aug.-Dec.	JGB-645
C)Apetalae				
Basellaceae	<i>Basella alba</i> L.	Bhajyacha vel	Oct.-Dec.	JGB-678
Polygonaceae	<i>Antigonon leptopus</i> Hook. & Arn.	Ice cream creeper	Oct.-May	JGB-660
Piperaceae	<i>Piper betle</i> L.	Nagwel, Paan	Mar.-May	JGB-712
Piperaceae	<i>Piper longum</i> L.	Pimpli	Oct.-Dec.	JGB-479
II)Monocotyledons				
Liliaceae	<i>Gloriosa superba</i> L.	Kal-Lawi	July-Nov.	JGB-710
Araceae	<i>Pothos scandens</i> L.	Money plant	May-Dec.	JGB-851

DISCUSSION

Biodiversity is the capital asset of a nation and form the foundation upon which the human civilization are built. Biodiversity offers several direct and indirect economic benefits to human kind. Among different groups of plants, flowering plants play an important role and will continue to play major role in shaping the word's civilization (Yadav, 1997). Cultural, economic and overall development of a particular region is largely depends on the careful exploration, utilization as well as conservation of its natural resources.

The present investigation enumerates plants of Angiospermic climbers in Daund Tahsil provides detailed information about 73 climber taxa belonging to 53 genera and 23 families. From the data it is concluded that, out of total 730 species of flowering plants in the study area (Bagal et al., 2012), the number of Angiospermic climbers is 73 species and it is of 10 %. This data generate baseline information for further research work. The survey of Biodiversity of Angiospermic climbers of Daund Tahsil from Pune district of Maharashtra state, India at regional level

would be a good source of importance on technical and taxonomic data. The findings of the survey will be helpful to identify threats to biodiversity.

Therefore assessment and documentation of biodiversity have become an urgent need of the day. There is an urgent need of repeated floristic studies to access biodiversity to know the changes in the floristic composition of region in time and space.

Plant wealth of a region is regarded as an important & valuable natural resource. However, this diversity is under great pressure due to anthropogenic activity such as deforestation, habitat destruction, various developmental activities etc. Therefore we should know the status of biodiversity in a particular area in general and incorporate the actual status. Documentation of diversity of plants especially climbers of Angiosperms in Daund Tahsil from Pune Disrtict (Maharashtra), India will be great significance to recognize present status of floristic diversity in the area. The findings of the survey will be helpful to identify threats to biodiversity.

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