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Cover: A mesmerising Indian Luna moth *Actias selene* is dancing through the starry night (by Vincent van Gogh) moonlit sky, displaying its ballistic display of feather tail.
Digital artwork by Vyshnavee Sneha Jaijar.



An annotated checklist of lianas in Manipur, India

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Abstract: The taxonomic inventorization of lianas growing in the state of Manipur (India) has been attempted since 2013. A checklist prepared from different published literature enumerates the occurrence of 98 lianas in the state. Of these, 11 species could not be traced in the field; however, 17 are represented by herbarium specimens housed at the herbarium CAL. All the taxa enumerated are presented here with their phenology, voucher number, accession number, and place of occurrence in the study area. Photographs of some selected less known species are provided to enable quick identification. Conservation and maintenance of germplasm of these unique growth forms are critically important for ensuring their long-term survival and potential future use.

Keywords: Angiosperms, conservation, diversity, enumeration, gymnosperm, Indo-Myanmar, northeastern India, phenology, taxonomy, woody climbers.

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Author contributions: First author (LMC) collected the specimens from the field, worked out, identified, prepared the specimens for the herbarium and drafted the manuscript. Corresponding author (DB) supervised the work, checked the manuscript and communicated it to the journal.

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INTRODUCTION

Lianas, the woody climbing plants, are one of the most interesting growth forms (Image 1) in the plant world owing to their curious habit (Schnitzer & Bongers 2002). They are dominantly found in the tropical regions of the globe. Using support from trees and other vertical objects, they reach the forest canopy to access maximum sunlight for their food assimilation. They own varied climbing mechanisms and have several modified adaptive features to fasten themselves with the other plants, viz., hooks, stem twiners, tendrils, and thorns (Bongers et al. 2002; Gerwing et al. 2006).

Lianas are important structural and functional components of plant communities in most tropical and temperate forests. They are important contributors to the species diversity of the forests and perform significant role in regeneration of the forest and carbon sequestration (Schnitzer & Bongers 2002). Lianas constitute around 25% of woody species diversity in lowland tropical moist and wet forests. Despite their contribution to the diversity of forests, they are also used as foods and arboreal pathways for many forest animals particularly, primates (Gentry 1991; Schnitzer & Bongers 2002). In addition to this, they are also widely used by the local people for medicine, house construction, and artisan work (Bongers et al. 2002). Considering the importance of this growth-form, it was felt to prepare a comprehensive checklist of lianas in the state of Manipur.

In this study, a checklist of the lianas growing in Manipur state was prepared obtaining data from different literature (Hooker 1875–1894; Deb 1957, 1961a,b; Chaudhuri & Naithani 1985; Singh et al. 2000; Chanu & Bhattacharyya 2017, 2020, 2023), all known collections housed in Eastern Regional Centre, Botanical Survey of India (ASSAM), Shillong and Central National Herbarium, Botanical Survey of India (CAL), Howrah, and extensive field visits in the study area from 2013–2020. This study reveals the occurrence of 98 species of lianas in the state out of which 11 are in doubt.

MATERIALS AND METHODS

Study area

Manipur, the northeastern state of India, is situated at the confluence of two important biodiversity hotspots of the world — the Himalayas and the Indo-Burma. The state is bordered by Nagaland on the northern side, Mizoram in the southwestern, Assam on the

western side, and shares an international border with Myanmar in the eastern side (Figure 1). The state lies between 24.664° N and 93.906° E. Total geographical area covered by the state is about 22,327 km² with an elevation ranging from 40–2994 m. The state comprises lush green valleys to towering peaks and is the tapestry of biodiverse elements. According to the Forest Survey of India report (Anonymous 2019), the recorded forest area of the state is 17,418 km², which constitutes about 78% of the total geographical area of the state. The state's major area is covered by various types of forests, viz., subtropical deciduous forests, subtropical semi-evergreen forests, montane wet temperate forests, subtropical dry temperate forests, and subtropical pine forests (Singh 2014). The state is famous for Loktak Lake, a Ramsar site wetland, which is exclusively unique for Phumdi/Phumthi/Phum—the floating islands. In addition to this, the state is also famed for Siroi Lily *Lilium mackliniae* Sealy, the state flower, and the Sangai or Dancing Deer *Rucervus eldii eldii* (McClelland, 1842)—both endemic to the state.

Data collection and analysis

Several random field explorations have been conducted since 2013 in different natural habitats of Manipur. Surveys were also done in some areas covered under wildlife sanctuaries and reserved forests of the state, viz., Yangoupokpi-Lokchao Wildlife Sanctuary, and Nongmaiching Reserved Forest. Explorations were conducted in almost all the seasons in forest-dominated and species-rich areas of the state. Collections were mainly made during their flowering and fruiting periods to facilitate easy identification of the species. The specimens were tagged with voucher numbers during the collection and all the relevant field data — such as the elevation, habitat, phenology, their occurrence in the field, and the mode of their climbing mechanism were noted. A total of 44 localities were visited for the collection purposes (Figure 1, Table 1).

Identification of species

The collected specimens were assigned collection numbers, pressed, dried, poisoned, and mounted on the herbarium sheets following the routine herbarium practices (Jain & Rao 1977; Singh & Subramaniam 2008). Identifications of the specimens were done based on their vegetative and reproductive characters with the aid of different existing literature (Hooker 1875–1894; Deb 1957, 1961a,b; Chaudhuri & Naithani 1985; Singh et al. 2000; EFloras of India 2017).

The reproductive parts of the specimens were

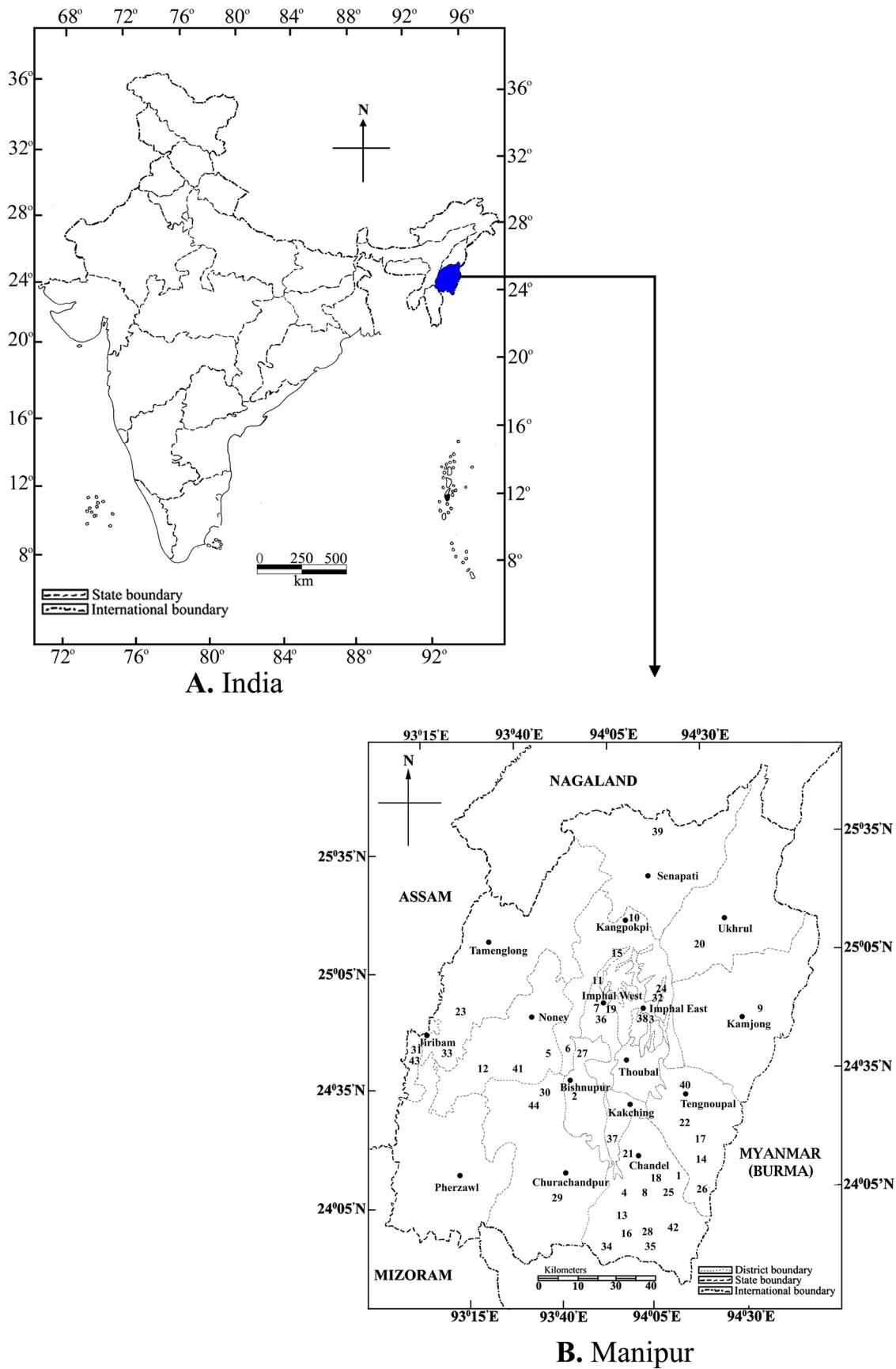


Figure 1. Map showing collection sites in the study area Manipur [number in the map (B) corresponds to number in Table 1].

Table 1. Collection sites with their elevation (the locality number corresponds to number in Figure 1B).

	Place of occurrence	Altitude (in m)
1	Beru Anthi	880
2	Bishempur	820
3	Canchipur	777
4	Chakpi karong	1000
5	Charoi Chakotloi	1126
6	Chiru village	1097
7	Hiyangthang	800
8	Gohok village	1000
9	Kamjong	913
10	Kangpokpi	1097
11	Khonghampat	793
12	Khoubum	1260
13	Khubung khunau	1000
14	Khudengthabi	1450
15	Khurkhul	901
16	Khuyam khulen	1000
17	Kwatha Lamgai	1450
18	Lamkang Khunthak	1293
19	Lilong Chajing	786
20	Litan	1318
21	Litantampak khul	790
22	Lokchao	1293
23	Makru	1260
24	Moirang purel	740
25	Mongsang Pantha	1293
26	Moreh	800
27	Nambol ching	780
28	Nepali kuthi	783
29	Ngaloi	1082
30	Ngarian hill	1340
31	Ningsingkhul	80
32	Nongmaijing hill	795
33	Pangkhotpai village	64
34	Sajik Tampak	1000
35	Salluk	1232
36	Samurau	768
37	Serou	898
38	Singjamei	786
39	Tadubi	1700
40	Tengnaupal	1450
41	Thangal	1340
42	Thorham	1340
43	Uchathol	80
44	Vanok	832

dissected under an Olympus SZ61 Stereo Zoom Dissecting Microscope and studied critically comparing with the existing relevant standard taxonomic literature. After preliminary identification, the same was again confirmed by comparing and checking against the authentic specimens housed in Central National Herbarium, Botanical Survey of India (CAL) and Eastern Regional Centre, Botanical Survey of India, Shillong (ASSAM). Images of type specimens available at different authentic e-platforms were also browsed. Correct names and synonymy were checked and updated from the authentic online resources, including IPNI (2025), POWO (2025), Tropicos (2025), and WFO (2025). In the present study, all the species are enumerated with their respective families, phenology, place of occurrence, voucher number, and accession number and arranged alphabetically in a tabular form (Table 2) following APG IV Classification (2016). The voucher specimens were deposited in the herbarium of Eastern Regional Centre, Botanical Survey of India (ASSAM), Shillong. Duplicate copies were kept in the Central Herbarium of Assam University, Silchar (AUSCH).

RESULTS

In this present study, a total of 87 liana species are documented from Manipur State (Table 2). Out of 98 lianas enumerated from the state on the basis of literature review (Hooker 1875–1894; Deb 1957, 1961a,b; Chaudhuri & Naithani 1985; Singh et al. 2000; Chanu & Bhattacharyya 2017, 2020, 2023), 11 species could not be located in the field or found as herbarium specimens (Table 3). Hence, the occurrence of these 11 species are treated here as doubtful in the state.

Among the rest of the 87 species, 70 species (including three varieties and one subspecies) were located across different habitats within the study area, under 25 families and 53 genera while, other 17 species are only reported on the basis of the herbarium specimens. Of these, 86 species belong to angiosperms, while a single species represents gymnosperm. The most dominant family recorded (Figure 2) was Fabaceae (22 species under 16 genera), followed by Vitaceae (10 species under 3 genera), Apocynaceae (7 species under 7 genera), and Combretaceae (6 species under a single genus). The most abundant genera recorded were *Combretum* Loefl. and *Tetrastigma* K. Schum. (6 species each), followed by *Clematis* L. and *Mucuna* Adans. (4 species each).

Photographs of some selected lesser-known species are provided in Image 2.



Image 1. A—*Mucuna macrocarpa* | B—*Uncaria sessilifructus* | C—*Phanera scandens* | D—*Tetrastigma leucostaphylum* | E—*Entada rheedii*.
© Longjam Malemnganbee Chanu.

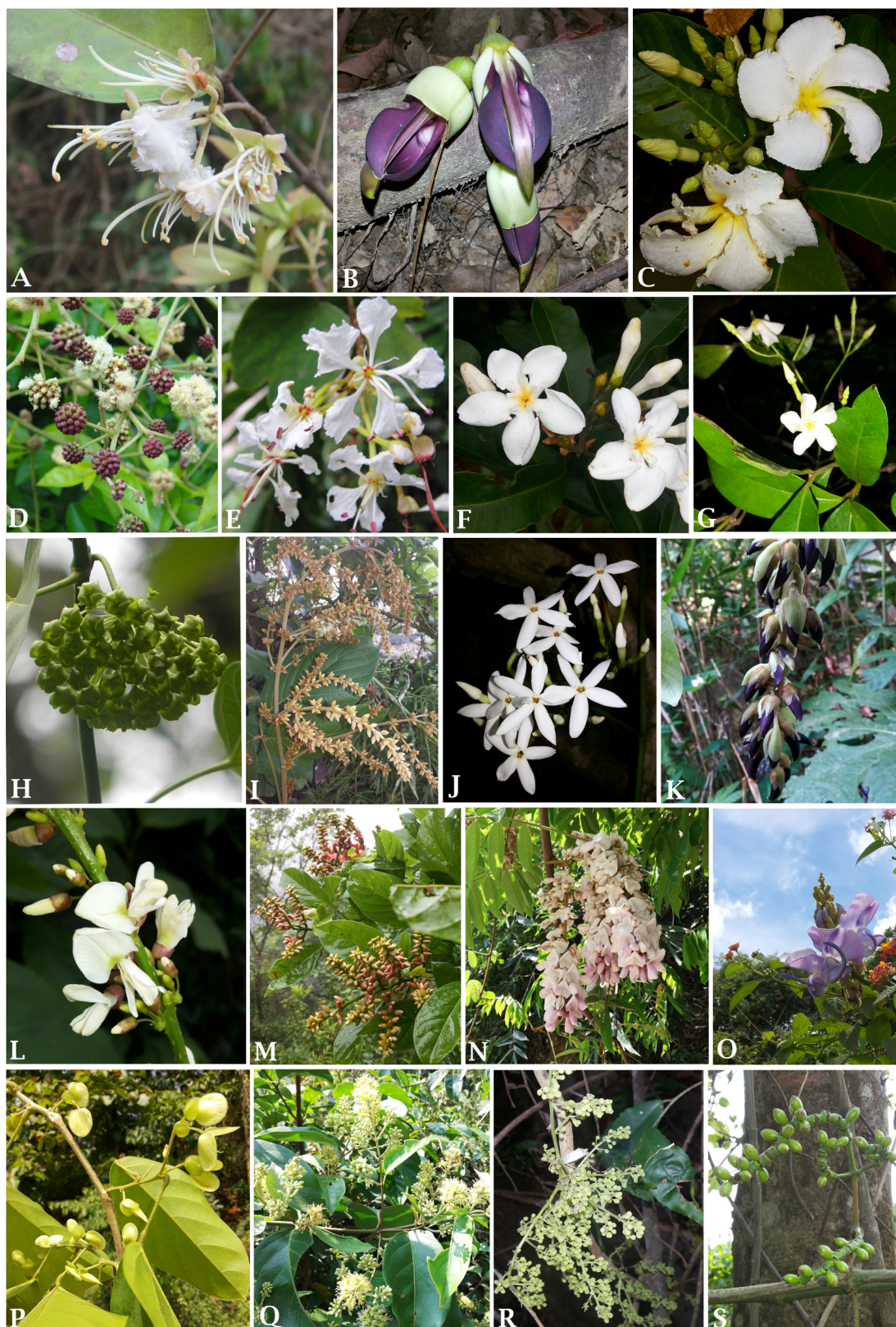


Image 2. A—*Hiptage benghalensis* | B—*Mucuna macrocarpa* | C—*Chonemorpha fragrans* | D—*Senegalia pennata* (Syn. *Acacia pennata*) | E—*Cheniella tenuiflora* (Syn. *Phanera tenuiflora*) | F—*Melodinus cochinchinensis* | G—*Trachelospermum asiaticum* | H—*Stephanotis volubilis* (Syn. *Dregea volubilis*) | I—*Spatholobus parviflorus* | J—*Jasminum lanceolaria* | K—*Mucuna bracteata* | L—*Brachypterum scandens* (Syn. *Derris scandens*) | M—*Callerya cinerea* | N—*Derris taiwaniana* (Syn. *Millettia pachycarpa*) | O—*Dysolobium grande* | P—*Dalhousiea bracteata* | Q—*Combretum punctatum* var. *squamosum* | R—*Cyclea bicristata* | S—*Gnetum montanum*. © Longjam Malemnganbee Chanu.

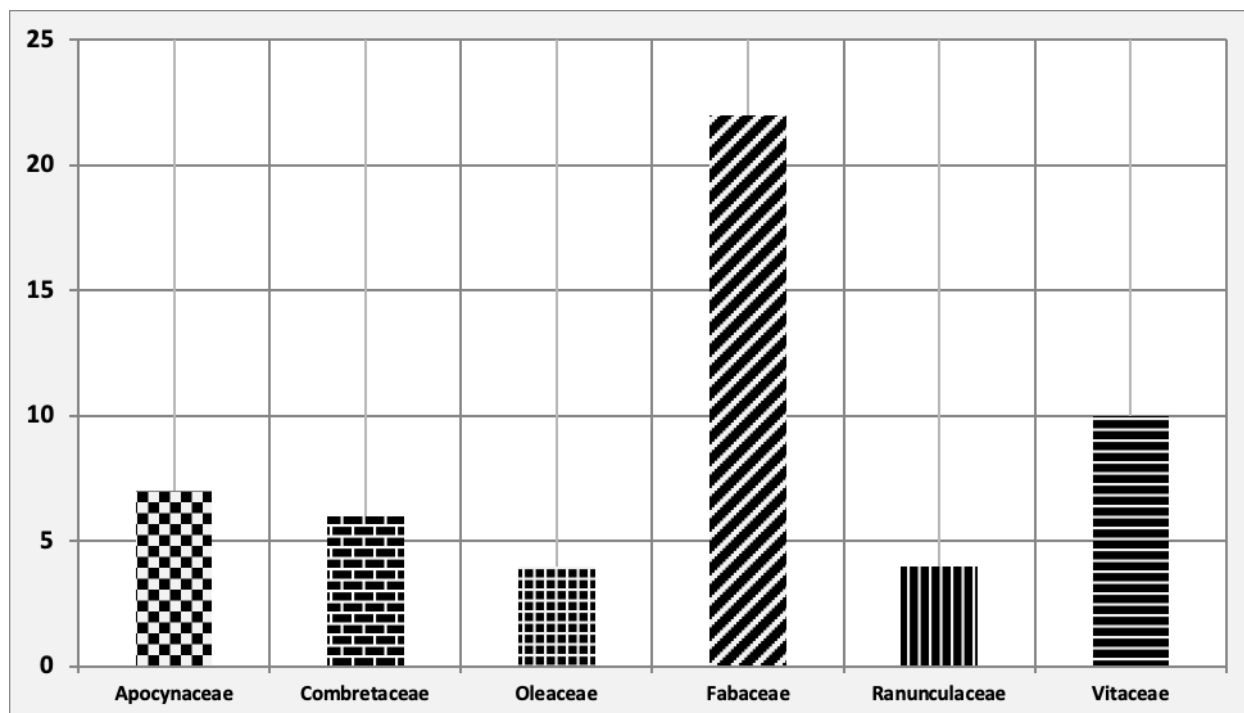


Figure 2. Dominant families occurring in the state of Manipur (family with four or more spp.).

DISCUSSION

This field-based enumerative study, the first of its kind in the state, provides essential baseline data on the diversity, distribution, and phenology of liana species. The study site falling along the Indo-Myanmar border shows high floristic diversity and abundance of lianas. Various biotic and abiotic factors have placed many previously recorded species at risk, with several no longer traceable in the field. The decline in liana diversity and forest regeneration is primarily attributed to human activities such as deforestation, *jhum* cultivation, forest floor burning, and timber extraction. The data presented here not only bridges the gaps in knowledge regarding liana diversity in the region but also serves as a foundation for conservation efforts aimed at monitoring and managing forest resources.

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Table 2. Enumeration of lianas species in Manipur State with their respective phenology, place of occurrence, voucher number and accession number.

	Family	Scientific name	Phenology	Place(s) of occurrence	Voucher number	Accession number (ASSAM)
1	Acanthaceae	<i>Thunbergia coccinea</i> Wall. ex D. Don	Fl.: May–Jun Fr.: Jul–Sep	30	L. M. Chanu 25459	94673
2		<i>Thunbergia grandiflora</i> Roxb.	Fl.: Jun–Sep Fr.: Oct–Mar	40	L. M. Chanu 25381	94674
3	Apocynaceae	<i>Aganosma cymosa</i> (Roxb.) G. Don	Fl.: May–Aug Fr.: Sep–Dec	2	L. M. Chanu 25367	98208
4		<i>Chonemorpha fragrans</i> (Moon) Alston	Fl.: May–Jul Fr.: Jul–Dec	35, 22	L. M. Chanu 25352 & 25368	94676
5		<i>Decalepis khasiana</i> (Kurz) Ionta ex Kambale	Fl.: May–Jun Fr.: Jun–Oct	1	L. M. Chanu 25443	94679
6		<i>Melodinus cochinchinensis</i> (Lour.) Merr.	Fl.: Jun–Jul Fr.: Jul–Dec	44	L. M. Chanu 25458	94677
7		<i>Periploca calophylla</i> (Wight) Falc.	Fl.: Jun – Jul Fr.: Aug–Nov	30	L. M. Chanu 25403	94678
8		<i>Stephanotis volubilis</i> (L.f.) S. Reuss, Liede & Meve [Syn. <i>Dregea volubilis</i> (L.f.) Benth. ex Hook.f.]	Fl.: Apr–Jun Fr.: Jun–Jan	26	L. M. Chanu 25497	94675
9		<i>Trachelospermum asiaticum</i> (Siebold & Zucc.) Nakai	Fl.: Apr–Jun Fr.: Jul–Dec	35	L. M. Chanu 25351	93458
10	Bignoniaceae	<i>Campsis grandiflora</i> (Thunb.) K. Schum.	Fl.: Jun–Aug Fr.: Sep–Feb	19	L. M. Chanu 25462	94680
11		<i>Pyrostegia venusta</i> (Ker Gawl.) Miers	Fl.: Feb–Apr Fr.: Apr – Jul	27	L. M. Chanu 25432	94681
12	Capparaceae	<i>Stixis suaveolens</i> (Roxb.) Pierre	Fl.: Apr – May Fr.: May – Oct	3	L. M. Chanu 25465	94686
13	Celastraceae	<i>*Celastrus monospermus</i> Roxb.	Fl.: Jan– Feb Fr.: Feb – Mar	Hill near Kohima	G. Watt 618 (CALI)	86322
14		<i>Celastrus paniculatus</i> Willd. subsp. <i>paniculatus</i>	Fl.: May–Jul Fr.: Aug – Dec	28, 21	L. M. Chanu 25356 & 25374	94687
15		<i>Celastrus stylosus</i> Wall.	Fl.: Mar–May Fr.: Jun–Nov	30	L. M. Chanu 25460	98205
16	Combretaceae	<i>*Combretum griffithii</i> Van Heurck & Mull. Arg.	Fl.: Dec–Jan Fr.: Jan – Feb	Jirighat	A. Meebold 5366 (CALI)	NA
17		<i>Combretum indicum</i> (L.) DeFilipps	Fl.: Mar–May Fr.: Jun–Dec	38, 40	L. M. Chanu 25344 & 25528	94689
18		<i>Combretum latifolium</i> Blume	Fl.: Apr–Jun Fr.: Jul–Oct	4	L. M. Chanu 25302	98204
19		<i>Combretum punctatum</i> var. <i>squamosum</i> (Roxb. ex G. Don) M. Gangop. & Chakrab.	Fl.: Apr–Jun Fr.: Jul–Dec	31, 16	L. M. Chanu 25382 & 25413	94688
20		<i>Combretum sundaicum</i> Miq.	Fl.: Apr–Jun Fr.: Jul–Dec	5	L. M. Chanu 25359	94641
21		<i>Combretum wallichii</i> DC. var. <i>flagrocarpum</i> (C.B. Clarke) M.G. Gangop. & Chakrab.	Fl.: Apr–Jun Fr.: Jul–Dec	24	L. M. Chanu 25477	94690
22	*Connaraceae	<i>*Rourea minor</i> (Gaertn.) Merr.	Fl.: Oct–Nov Fr.: Nov–Dec	Laimatak	A. Meebold 6252 (CALI)	NA
23	Convolvulaceae	<i>Argyreia nervosa</i> (Burm. f.) Bojer	Fl.: Apr–May Fr.: May–Oct	36, 2	L. M. Chanu 25492 & 25434	94691
24		<i>Argyreia wallichii</i> Choisy	Fl.: Sep–Nov Fr.: Dec–Jun	8	L. M. Chanu 25324	94637
25		<i>Camonea umbellata</i> (L.) A.R. Simões & Staples [Syn. <i>Merremia umbellata</i> (L.) Hallier f.]	Fl.: Oct–Nov Fr.: Dec–Jun	14	L. M. Chanu 25488	94692
26	Cucurbitaceae	<i>Hodgsonia macrocarpa</i> (Blume) Cogn.	Fl.: Mar–Apr Fr.: Apr–May	Koubu	Deb 2271 (CALI)	NA
27		<i>Trichosanthes tricuspidata</i> Lour.	Fl.: Jun–Aug Fr.: Sep–Nov	14, 35	L. M. Chanu 25487 & 25508	94693

	Family	Scientific name	Phenology	Place(s) of occurrence	Voucher number	Accession number (ASSAM)
28	Fabaceae	<i>Aganope thyrsoflora</i> (Benth.) Polhill	Fl.: May–Jul Fr.: Jul–Aug	25	L. M. Chanu 25415	98207
29		<i>Brachypterum scandens</i> (Roxb.) Wight & Arn. ex Miq. [Syn. <i>Derris scandens</i> (Roxb.) Benth.]	Fl.: Mar–Jul Fr.: Aug–Oct	11	L. M. Chanu 25347	94670
30		<i>Callerya cinerea</i> (Benth.) Schot	Fl.: May–Jul Fr.: Aug–Dec	25, 40	L. M. Chanu 25315 & 25321	94666
31		<i>Cheniella tenuiflora</i> (G.Watt ex C.B.Clarke) R.Clark & Mackinder [Syn. <i>Phanera tenuiflora</i> (C.B. Clarke) de Wit]	Fl.: Sep–Oct Fr.: Oct–Mar	4, 6	L. M. Chanu 25303 & 25316	94684
32		<i>Dalbergia pinnata</i> (Lour.) Prain	Fl.: Mar–Apr Fr.: May–Oct	13	L. M. Chanu 25339	94668
33		<i>Dalbergia stipulacea</i> Roxb.	Fl.: Mar–Apr Fr.: May–Oct	33, 15	L. M. Chanu 25390 & 25425	94669
34		<i>Dalhausia bracteata</i> (Roxb.) Graham ex Benth.	Fl.: Apr–Jun Fr.: Jul–Sep	33	L. M. Chanu 25385	94667
35		* <i>Derris cuneifolia</i> Benth.	Fl.: Apr–May Fr.: May–Jul	Makru	G. Watt. 6929 (CALI)	132433
36		<i>Derris taiwaniana</i> (Hayata) Z.Q.Song (Syn. <i>Millettia pachycarpa</i> Benth.)	Fl.: Mar–May Fr.: Jun–Nov	6, 42, 29	L. M. Chanu 25312, 25326 & 25334	94643
37		<i>Dysolobium grande</i> (Wall. ex Benth.) Prain	Fl.: Jun–Jul Fr.: Jul–Apr	37, 40	L. M. Chanu 25440, 25446 & 25498	94671
38		<i>Entada rheedii</i> Spreng.	Fl.: May–Jun Fr.: Jul–Dec	36, 20	L. M. Chanu 25346 & 25342	94702
39		<i>Millettia extensa</i> (Benth.) Benth. ex Baker	Fl.: Mar–Apr Fr.: Apr–Aug	37, 1	L. M. Chanu 25439 & 25445	94672
40		<i>Mucuna bracteata</i> DC. ex Kurz	Fl.: Nov–Jan Fr.: Feb – May	12	L. M. Chanu 25491	94644
41		<i>Mucuna imbricata</i> (Roxb. ex Lindl.) DC. ex Baker	Fl.: Mar–Apr Fr.: May–Nov	34, 12	L. M. Chanu 25309 & 25514	94645
42		<i>Mucuna macrocarpa</i> Wall.	Fl.: Mar–Apr Fr.: May–Nov	8, 13, 14	L. M. Chanu 25323, 25341 & 25503	94646
43		* <i>Mucuna pruriens</i> (L.) DC.	Fl.: Oct–Nov Fr.: Nov–Feb	Sugnu	Deb 2596 (CALI)	NA
44		<i>Phanera scandens</i> (L.) Lour. ex Raf.	Fl.: Sep–Oct Fr.: Oct–Dec	34, 5	L. M. Chanu 25307, & 25313	94683
45		<i>Phanera vahlii</i> (Wight & Arn.) Benth.	Fl.: Apr–May Fr.: May–Jul	33	L. M. Chanu 25388	94685
46		<i>Pueraria montana</i> var. <i>lobata</i> (Willd.) Maesen & S.M. Almeida ex Sanjappa & Predeep	Fl.: Jul–Aug Fr.: Sep–Dec	8, 9, 43	L. M. Chanu 25327, 25345 & 25383	94649
47		<i>Senegalia pennata</i> (L.) Maslin [Syn. <i>Acacia pennata</i> (L.) Willd.]	Fl.: Jun–Jul Fr.: Jul–Dec	35, 17	L. M. Chanu 25354 & 25494	94701
48		<i>Spatholobus parviflorus</i> (Roxb. ex G.Don) Kuntze	Fl.: Jun–Jul Fr.: Aug–Jan	8, 41	L. M. Chanu 25446 & 25457	94650
49		<i>Toxicopueraria peduncularis</i> (Benth.) A.N.Egan & B.Pan [Syn. <i>Pueraria peduncularis</i> (Graham ex Benth.) Benth.]	Fl.: Oct–Nov Fr.: Nov–Apr	8	L. M. Chanu 25322	94648
50	Gnetaceae	<i>Gnetum montanum</i> Markgr.	Fl.: Feb–Mar Fr.: Apr–Oct	33, 32, 17	L. M. Chanu 25386, 25399 & 25484	94694
51	Hernandiaceae	<i>Illigera trifoliata</i> (Griff.) Dunn	Fl.: Mar–May Fr.: Jun–Nov	8, 6	L. M. Chanu 25321 & 25314	94695
52	Malpighiaceae	<i>Aspidopterys elliptica</i> (Blume) A.Juss.	Fl.: Jun–Jul Fr.: Aug–Oct	30	L. M. Chanu 25451	98209
53		<i>Aspidopterys nutans</i> (Roxb. ex DC.) A.Juss.	Fl.: May–Jun Fr.: Jul–Dec	21, 19	L. M. Chanu 25375 & 25464	94696
54		<i>Hiptage benghalensis</i> (L.) Kurz	Fl.: Mar–Apr Fr.: Apr–Jun	29, 13	L. M. Chanu 25333 & 25338	94697
55	Malvaceae	<i>Ayenia elegans</i> (Ridl.) Govaerts	Fl.: Sep–Oct Fr.: Nov–Feb	31	L. M. Chanu 25384	94661
56		<i>Ayenia grandifolia</i> (DC.) Christenh. & Byng [Syn. <i>Byttneria aspera</i> Colebr. ex Wall.]	Fl.: Oct–Nov Fr.: Dec–Feb	16	L. M. Chanu 25414	98206
57	Menispermaceae	<i>Cyclea bicristata</i> (Griff.) Diels	Fl.: Mar–Apr Fr.: Apr–Jun	39, 25	L. M. Chanu 25330 & 25418	94698

	Family	Scientific name	Phenology	Place(s) of occurrence	Voucher number	Accession number (ASSAM)
58	Oleaceae	<i>Jasminum caudatum</i> Wall. ex Lindl.	Fl.: Oct–Nov Fr.: Nov–Apr	6	L. M. Chanu 25320	94663
59		* <i>Jasminum coarctatum</i> Roxb.	Fl.: Jan–Mar Fr.: Mar–Jun	s.l.	Deb 914 (CAL!)	NA
60		<i>Jasminum dispernum</i> Wall.	Fl.: Mar–Apr Fr.: May–Oct	39	L. M. Chanu 25331	94664
61		<i>Jasminum lanceolaria</i> Roxb.	Fr.: May–Oct Fr.: May–Oct	4	L. M. Chanu 25337	94638
62	Passifloraceae	<i>Adenia cardiophylla</i> (Mast.) Engl.	Fl.: May–Jun Fr.: Jul–Aug	28, 5	L. M. Chanu 25353 & 25362	94703
63		* <i>Adenia trilobata</i> (Roxb.) Engl.	Fl.: Oct–Nov Fr.: Nov–Dec	Khoumum	A. Meebold 1907 (CAL!)	NA
64	Ranunculaceae	* <i>Clematis buchananiana</i> DC.	Fl.: Dec–Jan Fr.: Jan–Mar	Lingli	G. Watt 6672 (CAL!)	579
65		<i>Clematis gouriana</i> Roxb. ex DC.	Fl.: Oct–Nov Fr.: Dec–May	7, 32, 10	L. M. Chanu 25399 & 25509	94704
66		* <i>Clematis montana</i> Buch.Ham. ex DC.	Fl.: Mar–Apr Fr.: Apr–Jun	Siroh	G. Watt 6439 (CAL!)	59
67		<i>Clematis zeylanica</i> (L.) Poir.	Fl.: Oct–Nov Fr.: Nov–Dec	Bishempur	A. Meebold 6142 (CAL!)	NA
68	Rhamnaceae	<i>Gouania leptostachya</i> DC.	Fl.: Jun–Jul Fr.: Aug–Jan	30, 32	L. M. Chanu 25361 & 25393	94662
69	Rubiaceae	<i>Paederia foetida</i> L.	Fl.: Jun–Jul Fr.: Aug–Oct	25	L. M. Chanu 25417	94651
70		* <i>Uncaria macrophylla</i> Wall.	Fl.: Oct–Nov Fr.: Nov–Dec	Jirighat	A. Meebold, 5686 (CAL!)	NA
71		<i>Uncaria sessilifructus</i> Roxb.	Fl.: Sep–Nov Fr.: Dec–May	34	L. M. Chanu 25305	94652
72	Rutaceae	<i>Toddalia asiatica</i> (L.) Lam.	Fl.: Apr–May Fr.: Jun–Nov	18	L. M. Chanu 25422	94660
73	*Sabiaceae	* <i>Sabia campanulata</i> Wall.	Fl.: Mar–Apr Fr.: May–Jun	Siroy hill	G. Watt 6463 (CAL!)	97401
74	Smilacaceae	<i>Smilax ovalifolia</i> Roxb. ex D.Don	Fl.: Apr–May Fr.: Jun–Nov	4	L. M. Chanu 25369	94657
75		<i>Smilax perfoliata</i> Lour.	Fl.: Mar–Apr Fr.: May–Oct	21, 23	L. M. Chanu 25377 & 25311	94658
76		<i>Smilax zeylanica</i> L.	Fl.: Apr–May Fr.: Jun–Nov	29	L. M. Chanu 25335	94659
77	Urticaceae	<i>Poikilospermum suaveolens</i> (Blume) Merr.	Fl.: Mar–Apr Fr.: May–Jul	6	L. M. Chanu 25329	94703
78	Vitaceae	* <i>Cissus adnata</i> Roxb.	Fl.: Jan–Feb Fr.: Feb–Mar	Irang	A. Meebold 5573 (CAL!)	NA
79		* <i>Cissus assamica</i> (M. A. Lawson) Craib	Fl.: Jun–Sept Fr.: Aug–Nov	Imphal	Deb 1085 (CAL!)	NA
80		<i>Cissus repanda</i> (Wight & Arn.) Vahl	Fl.: Apr–May Fr.: May–Aug	28, 14	L. M. Chanu 25350 & 25500	94653
81		<i>Nekemias rubifolia</i> (Wall.) J.Wen & Z.L.Nie [Syn. <i>Ampelopsis rubifolia</i> (Wall.) Planch.]	Fl.: Apr–May Fr.: May–Sep	1	L. M. Chanu 25441	94639
82		* <i>Tetragium bracteolatum</i> (Wall.) Planch.	Fl.: Feb–Mar Fr.: Apr–Aug	Bishempur	A. Meebold 6089 (CAL!)	NA
83		* <i>Tetragium dubium</i> (M.A.Lawson) Planch.	Fl.: Feb–Apr Fr.: Apr–Aug	Siroh	G. Watt 6355 (CAL!)	NA
84		<i>Tetragium leucostaphylum</i> (Dennst.) Alston [Syn. <i>Tetragium lanceolarium</i> (Roxb.) Planch.]	Fl.: Apr–May Fr.: May–Aug	6, 5	L. M. Chanu 25315 & 25520	94654
85		<i>Tetragium leucostaphylum</i> (Dennst.) Alston	Fl.: Apr–May Fr.: Jun–Nov	21, 40	L. M. Chanu 25373 & 25529	94655
86		<i>Tetragium obovatum</i> Gagnep.	Fl.: Apr–May Fr.: May–Aug	11	L. M. Chanu 25348	94640
87		<i>Tetragium rumicispermum</i> (M.A.Lawson) Planch.	Fl.: Apr–May Fr.: May–Jul	4, 5	L. M. Chanu 25371 & 25542	94656

*—taxa represented only by herbarium specimens | NA—No accession number and number(s) given under the column 'Place(s) of occurrence' corresponds to number at Table 1 and Figure 1B.

Table 3. List of doubtful species in terms of their occurrence in the Manipur State.

	Scientific name	Family	Locality, Collector and Collection number	Reference of the report
1	<i>Abrus precatorius</i> L.	Fabaceae	Leimkhong (Deb 490); Lamboi (Mukerjee 3347)	Singh et al. (2020); Deb (1961a)
2	<i>Aspidopterys indica</i> (Willd.) W.Theob.	Malpighiaceae	Sakok (Meebold 7143); Chatrik (Mukerjee 3692) & s. l. (Deb 1270)	Singh et al. (2020); Deb (1961a)
3	<i>Beaumontia grandiflora</i> Wall.	Apocynaceae	Kouburu, Manipur (Deb 2262)	Deb (1961a)
4	<i>Beaumontia longituba</i> Craib	Apocynaceae	Saithong (Mukerjee 6615)	Deb (1961a)
5	<i>Combretum albidum</i> G.Don (Syn. <i>Combretum ovalifolium</i> Roxb.)	Combretaceae	Jirighat (Meebold 5699)	Singh et al. (2020)
6	<i>Epigynum auritum</i> (C.K.Schneid.) Tsiang & P.T.Li (Syn. <i>Trachelospermum auritum</i> C.K.Schneid.)	Apocynaceae	Kangpokpi, Maopang (s.coll. s.n.)	Deb (1961a)
7	<i>Millettia fruticosa</i> (DC.) Benth. ex Baker	Fabaceae	s.l. (C.B. Clarke s.n.)	Deb (1961a)
8	<i>Mucuna interrupta</i> Gagnep. [Syn. <i>Mucuna nigricans</i> (Lour.) Steud.]	Fabaceae	Sugnu (Deb 2596); Ukhru (Mukerjee 2515)	Singh et al. (2020); Deb (1961a)
9	<i>Mucuna monosperma</i> DC. ex Wight	Fabaceae	Chingmeirong (Deb 1176)	Deb (1961a)
10	<i>Senegalia pruinescens</i> (Kurz) Maslin, Seigler & Ebinger (Syn. <i>Acacia pruinescens</i> Kurz.)	Fabaceae	Chingmeirong (Deb 767)	Deb (1961a)
11	<i>Thunbergia fragrans</i> Roxb.	Acanthaceae	s.l. Manipur valley (Deb 310, 775)	Deb (1961a)

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