



УДК 582.594.2:581.95/.961(540.41)

Updated checklist of orchid flora of Manipur

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Keywords: Conservation, Manipur, new record, Orchidaceae, orchid checklist, threats.

Summary. Manipur is one of the eight states of North-East India placed inside square area 23°83'–25°68'N and 93°03'–94°78'E. The natural vegetation of the state falls under the Indo-Myanmar Biodiversity Hotspot area with rich flora and fauna. In the present paper, 389 taxa of orchids (including 7 new records to Manipur) belonging to 90 genera, are listed and analysed. Various threats for the depletion of orchid species in the natural habitats of Manipur have been discussed and necessary conservation measures for their conservation are suggested.

Дополненный список флоры орхидных Манипура

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Ключевые слова: лимитирующие факторы, Манипур, новая находка, сохранение, список орхидных, Orchidaceae.

Аннотация. Манипур – один из восьми штатов Северо-Восточной Индии, расположенный на площади между 23°83'–25°68' с.ш. и 93°03'–94°78' в.д. Естественная растительность штата попадает в область “Indo-Myanmar Biodiversity Hotspot” с богатой флорой и фауной. В настоящей статье перечислены и проанализированы 389 таксонов орхидных (включая 7 новых находок для Манипура) из 90 родов. Обсуждаются различные лимитирующие факторы, приводящие к сокращению видов орхидных в естественных местообитаниях Манипура, и предлагаются необходимые меры по сохранению орхидных.

Introduction

Manipur is one of the eight states of North-East India placed at the eastern end of the region between the latitude of 23°83'–25°68'N and longitude of 93°03'–94°78'E and bordered by Nagaland on the north, Assam on the west and Myanmar on South and east (Fig. 1). The state is spreaded over an area of about 22347 sq. km of which about 14365

sq. km (nearly 64 % of the total geographical area of the state) is covered by natural vegetation which may be classified into four types: “Tropical Semi-evergreen”, “Dry Temperate”, “Sub-Tropical Pine” and “Tropical Moist Deciduous”. There are forests of teak, pine, oak, bamboo and cane. The natural vegetation of Manipur falls under the **Indo-Myanmar Biodiversity Hotspot area** (Singh et al., 2010) with rich flora and fauna.

Materials and methods

A critical review of literature (Hooker, 1888–1890; Pradhan, 1976, 1979; Shukla, Baishya, 1979; Ramakandtha, 1995; Phukan, 1996; Mao, 1999; Chauhan, 2001; Meitei et al., 2014; Laiphrakpam et al., 2014, 2015; Rao, Kumar, 2015; Sharma et al., 2015; Khuraijam, Roy, 2016) reveals that the state Manipur has been explored by several plant collectors and botanists since British period. Some

of the important persons who made botanical collections from the state are George Watt in 1881–1882, C. B. Clarke in 1889, A. K. Meebold in 1906–1907, N. L. Bor in 1938–1945, K. Ward in 1952 (Kumar, Kumar, 2005) and subsequently during post independence period S. K. Mukerjee (1953), D. B. Deb (1956, 1957, 1961), Devi and Ghatak (1984), Ghatak and Devi (1986) and several botany scientists from Botanical Survey of India and other Research Institutions, Universities and

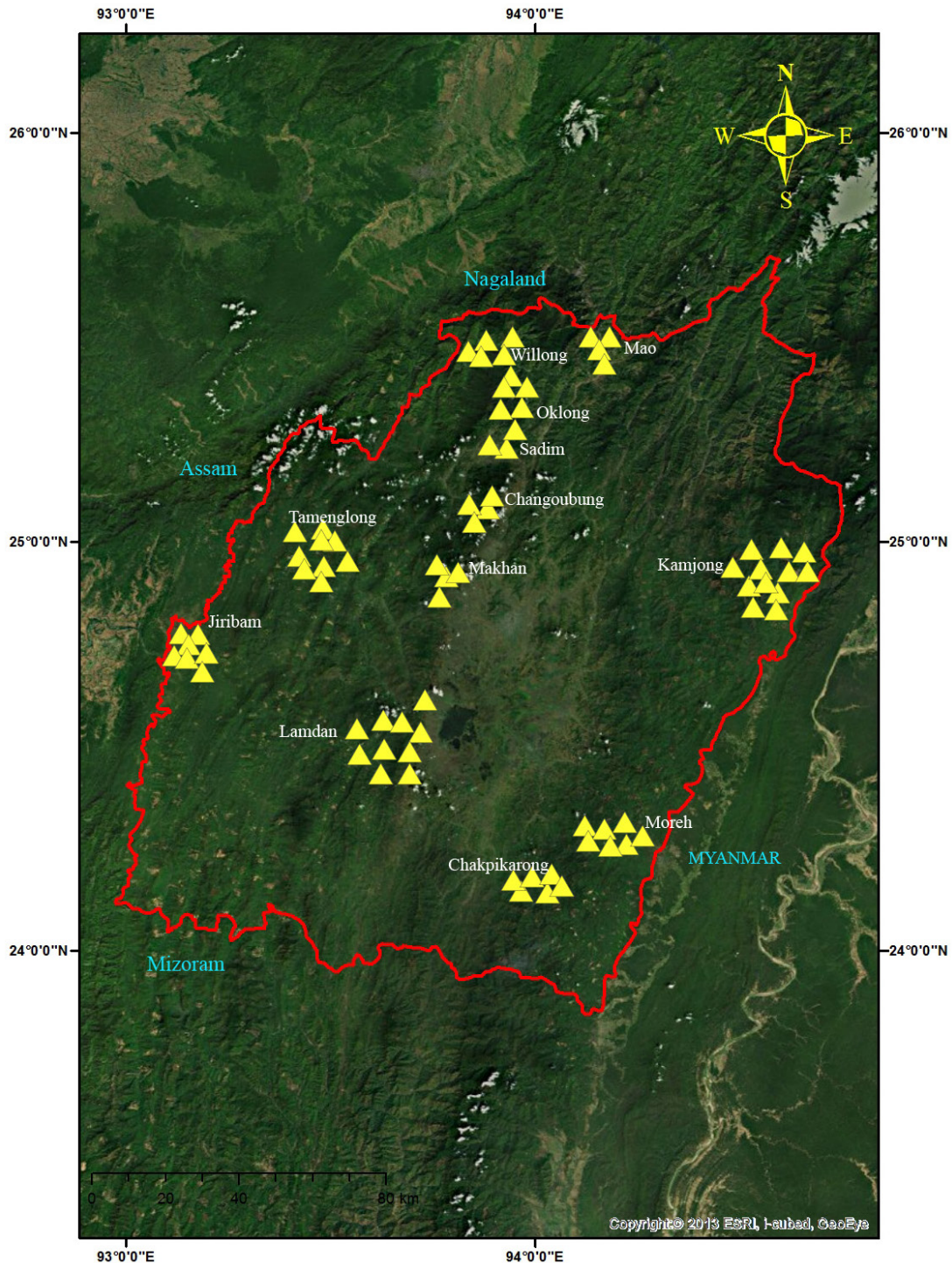


Fig. 1. Map of Manipur state showing the orchid survey areas in yellow triangle (Arc Map 10.5).

plant collectors from various orchid nurseries of N. E. Indian states.

During the last five years i. e. since 2012, a critical study has been conducted by the authors, based on the living collections which are made from different parts of Manipur and brought under cultivation at Orchid Research and Development Centre (ORDC), Hengbung, Manipur; herbarium collections deposited at Central National Herbarium (CAL), Howrah, West Bengal; BSI, Shillong (ASSAM), Meghalaya and COGCEHR Herbarium, Hengbung, Manipur; and consultation of many research papers

(Phukan, Mao, 2002a-b, 2004; Kumar, Kumar, 2005; Rao, 2007, 2015; Choltco, 2009; Chowdhery, 2009; Nanda et al., 2012a-b, 2013a-c, 2014a-d; Chowlu et al., 2012a-b, 2013a-e, 2014a-c, 2015a-c; Kishor et al., 2012, 2014; Yumkham et al., 2013; Chowlu, 2014, 2016; Chowlu, Rao, 2015a-b; Kumar, Rao, 2015; Kumar et al., 2015, 2016a-b, 2017; Rao et al., 2016; Kumar, 2017) on orchids of Manipur. The list of orchids reported so far from Manipur are listed in Table, nomenclature of each species is followed as per the World Checklist of Orchidaceae (Govaerts et al., 2018) and the analysis has been discussed below.

Table

List of Orchid species reported from Manipur

S. No.	Species/ variety	Habit	Voucher specimens record	Reference of first report for the state
1.	<i>Acampe carinata</i> (Griff.) Panigrahi	E	Nanda et al. 00294, 00482, 00051(all at COGCEHR)	Devi, Ghatak, 1984
2.	<i>Acampe ochracea</i> (Lindl.) Hochr.	E	Nanda 00174 (COGCEHR)	Chauhan, 2001
3.	<i>Acampe praemorsa</i> (Roxb.) Blatter et McCann var. <i>rigida</i> (Smith) Barbhuiya et al.	E	Herbarium not available. Live plants under cultivation.	Devi, Ghatak, 1984
4.	<i>Acanthophippium sylhetense</i> Lindl.	T	Herbarium not available.	Chauhan, 2001
5.	<i>Aerides multiflora</i> Roxb.	E	Nanda et al. 40 (COGCEHR)	Devi, Ghatak, 1984
6.	<i>Aerides odorata</i> Lour.	E	Nanda et al. 00323 (COGCEHR)	Devi, Ghatak, 1984
7.	<i>Aerides rosea</i> Lindl. et Paxt.	E	Nanda et al. 00004 (COGCEHR)	Nanda et al., 2013c
8.	<i>Agrostophyllum callosum</i> Rehb. f.	E	Kishor et al. 00258, 00460 (all at COGCEHR). D. B. Deb 1528; A. Meebold 6904 (all at CAL)	Mukerjee, 1953
9.	<i>Agrostophyllum planicaulum</i> J. J. Sm.	E	Herbarium not available.	Clarke, 1889
10.	<i>Ania angustifolia</i> Lindl.	T	Nanda 00011; V. Kumar 1658 (all at COGCEHR)	Nanda et al., 2013c
11.	<i>Aniaviridifusca</i> (Hook.) Tang et Summerh	T	George Watt 6293 (K)	Kumar, Kumar, 2005
12.	<i>Anoectochilus roxburghii</i> (Wall.) Lindl.	T	Herbarium not available.	Clarke, 1889
13.	<i>Anthogonium gracile</i> Lindl.	T	V. Kumar 1656; Nanda 00054 (all at COGCEHR)	Mukerjee, 1953
14.	<i>Aphyllorchis montana</i> Rehb. f.	M	V. Kumar 1660, 1161 (COGCEHR)	Rao, Kumar, 2015
15.	<i>Arachnis clarkei</i> (Rehb. f.) J. J. Sm.	E	Kishor et al. 00045 (COGCEHR)	Rao, 2007
16.	<i>Arachnis labrosa</i> (Lindl. et Paxt.) Rehb. f.	E	C. Sathish Kumar 28747 (TBGT).	Kumar, Kumar, 2005
17.	<i>Arachnis senapatianum</i> (S. Phukan et A. A. Mao) Kocyan et Schuit.	E	A. A. Mao 60271 (CAL)	Phukan, Mao, 2002b
18.	<i>Arundina graminifolia</i> (D. Don) Hochr.	T	Nanda et al. 00157 (COGCEHR). D. B. Deb 306, 806, 1234, 2668; S. K. Mukerjee 3121(all at CAL)	Mukerjee, 1953

Continuation of table

S. No.	Species/ variety	Habit	Voucher specimens record	Reference of first report for the state
19.	<i>Brachycorythis galeandra</i> (Rchb. f.) Summerh.	T	S. K. Mukherjee 3118 (CAL)	Mukerjee, 1953
20.	<i>Brachycorythis obcordata</i> (Lindl.) M. R. Almeida	T	Herbarium not available	Laiphrakpam et al., 2015
21.	<i>Bryobium pudicum</i> (Ridl.) Y. P. Ng et Cribb	E	Nanda et al. 0006, 506, 000197 (all at COGCEHR)	Nanda et al., 2013c
22.	<i>Bulbophyllum affine</i> Lindl.	E	Chowlu 00021 (COGCEHR)	Chowlu et al., 2013e
23.	<i>Bulbophyllum appendiculatum</i> (Rolfe) J. J. Sm.	E	Kipgen 00569 (COGCEHR)	Chowlu et al., 2015c
24.	<i>Bulbophyllum bifurcatoflorens</i> (Fukuy.) J. J. Verm. et al.	E	COGCEHR 00093; K. Chowlu s. n. (acc. no. 399) [all at COGCEHR]	Chowlu et al., 2012a
25.	<i>Bulbophyllum candidum</i> (Lindl.) Hook. f.	E	Kishor 00175 (COGCEHR)	Chowlu et al., 2013c
26.	<i>Bulbophyllum careyanum</i> (Hook.) Spreng.	E	K. Chowlu 00050, 00138, 00332 (all at COGCEHR)	Chauhan, 2001
27.	<i>Bulbophyllum cariniflorum</i> Rchb. f.	E	K. Chowlu 00381 (COGCEHR)	Chowlu et al., 2013e
28.	<i>Bulbophyllum cornutum</i> (Blume) Rchb. f.	E	Chowlu s. n. (acc. no. 394) (COGCEHR)	First time report in present paper
29.	<i>Bulbophyllum cylindraceum</i> Lindl.	E	Chowlu 00411 (COGCEHR)	Chowlu, Rao, 2015a
30.	<i>Bulbophyllum dickasonii</i> Seidenf.	E	Chowlu 00333(CAL). Chowlu 000325 (COGCEHR)	Chowlu et al., 2014a
31.	<i>Bulbophyllum dissitiflorum</i> Seidenf.	E	Chowlu 00568, 00571 (all at COGCEHR)	Chowlu et al., 2015c
32.	<i>Bulbophyllum elatum</i> (Hook. f.) J. J. Sm.	E	Herbarium not available.	Chauhan, 2001
33.	<i>Bulbophyllum forrestii</i> Seidenf.	E	Chowlu 00478, 00536 (all at COGCEHR)	Chowlu, Rao, 2015a
34.	<i>Bulbophyllum gamblei</i> (Hook. f.) Hook. f.	E	Kipgen 00547, 00548, 00549 (all at COGCEHR)	Chowlu et al., 2015c
35.	<i>Bulbophyllum guttulatum</i> (Hook. f.) Balakr.	E	Shukla 63655 (ASSAM)	Shukla, Baishya, 1979
36.	<i>Bulbophyllum gymnopus</i> Hook. f.	E	Herbarium not available.	Kumar, Kumar, 2005
37.	<i>Bulbophyllum helenae</i> (Kuntze) J. J. Sm.	E	Nanda 00386; Chowlu 00387 (all at COGCEHR)	Chowlu, Rao, 2015a
38.	<i>Bulbophyllum hirtum</i> (Sm.) Lindl.	E	Chowlu 00020 (COGCEHR)	Chowlu et al., 2013e
39.	<i>Bulbophyllum khasyanum</i> Griff.	E	Herbarium not available.	Kumar, Kumar, 2005
40.	<i>Bulbophyllum kipgenii</i> (Kishor et al.) J. J. Verm. et al.	E	COGCEHR/Herb/00001; Kishor 00144 (all at COGCEHR)	Kishor et al., 2012
41.	<i>Bulbophyllum leopardinum</i> (Wall.) Lindl.	E	Herbarium not available.	Chauhan, 2001
42.	<i>Bulbophyllum lobbii</i> Lindl.	E	Herbarium not available.	Chauhan, 2001
43.	<i>Bulbophyllum moniliforme</i> Parish et Rchb. f.	E	Herbarium not available.	Chauhan, 2001
44.	<i>Bulbophyllum odoratissimum</i> (Sm.) Lindl.	E	Chowlu 00221 (COGCEHR)	Chauhan, 2001
45.	<i>Bulbophyllum penicillium</i> C. S. P. Parish et Rchb. f.	E	Chowlu 00361 (COGCEHR)	Chowlu, Rao, 2015a

Continuation of table

S. No.	Species/ variety	Habit	Voucher specimens record	Reference of first report for the state
46.	<i>Bulbophyllum polyrrhizum</i> Lindl.	E	Chowlu 00019 (COGCEHR)	Chowlu et al., 2013e
47.	<i>Bulbophyllum proboscideum</i> (Gagnep.) Seidenf. et Smitinand.	E	Herbarium not available. Live plants under cultivation.	Rao et al., 2016
48.	<i>Bulbophyllum propinquum</i> Krzl.	E	Sathish Kumar 28755 (TBGT).	Kumar, Kumar, 2005
49.	<i>Bulbophyllum reichenbachianum</i> Krzl.	E	Under cultivation at Lyoyd Botanic Garden, Darjeeling	Mukerjee, 1953
50.	<i>Bulbophyllum reptans</i> (Lindl.) Lindl.	E	K. Chowlu 00212, 00213 (all at COGCEHR)	Chauhan, 2001
51.	<i>Bulbophyllum retusiusculum</i> Rchb. f.	E	Chowlu et al. 00018 (COGCEHR)	Chowlu et al., 2013e
52.	<i>Bulbophyllum roseopictum</i> J. J. Verm., Schuit. et de Vogel	E	S. K. Mukerjee 3572 (CAL)	Mukerjee, 1953
53.	<i>Bulbophyllum rothschildianum</i> (O'Brien) J. J. Sm.	E	Chowlu 1651, 00550 (all at COGCEHR)	Mao, 1999
54.	<i>Bulbophyllum rufinum</i> Rchb. f.	E	Chowlu 00014 (COGCEHR)	Chowlu et al., 2013e
55.	<i>Bulbophyllum scabratum</i> Rchb. f.	E	Chowlu 00145; Nanda s. n. (acc. n. 360) [all at COGCEHR]	Chowlu et al., 2013e
56.	<i>Bulbophyllum secundum</i> Hook. f.	E	Chowlu 00107 (COGCEHR)	Chowlu et al., 2013e
57.	<i>Bulbophyllum sunipia</i> J. J. Verm., Schuit. et de Vogel	E	B. Sharma 00349; K. Chowlu 591 (all at COGCEHR)	Chowlu et al., 2013c
58.	<i>Bulbophyllum triste</i> Rchb. f.	E	Chowlu 00052 (COGCEHR)	Chauhan, 2001
59.	<i>Bulbophyllum umbellatum</i> Lindl.	E	Chowlu 00124 (COGCEHR)	Chauhan, 2001
60.	<i>Bulbophyllum xylophyllum</i> C. S. P. Parish et Rchb. f.	E	Chowlu 00016 (COGCEHR)	Chowlu et al., 2013e
61.	<i>Calanthe biloba</i> Lindl.	T	S. K. Mukerjee 3733 (CAL)	Mukerjee, 1953
62.	<i>Calanthe brevicornu</i> Lindl.	T	D. B. Deb 2230, 1446 (CAL)	Mukerjee, 1953
63.	<i>Calanthe densiflora</i> Lindl.	T	Herbarium not available.	Chauhan, 2001
64.	<i>Calanthe mannii</i> Hook. f.	T	Herbarium not available. Live plants under cultivation.	Chauhan, 2001
65.	<i>Calanthe masuca</i> (D. Don) Lindl.	T	Mao 106311 (ASSAM)	Chauhan, 2001
66.	<i>Calanthe odora</i> Griff.	T	G. Watt 6803 (CAL)	Mukerjee, 1953
67.	<i>Calanthe tricarinata</i> Lindl.	T	Herbarium not available.	Chauhan, 2001
68.	<i>Callostylis bambusifolia</i> (Lindl.) S. C. Chen et J. J. Wood	E	Nanda 00072, 00073 (all at COGCEHR)	Mao, 1999
69.	<i>Callostylis rigida</i> Blume	E	Herbarium not available.	Kumar, Kumar, 2005
70.	<i>Cephalanthera longifolia</i> (L.) Fritch	T	Herbarium not available.	Chauhan, 2001
71.	<i>Cephalantheropsis longipes</i> (Hook. f.) Ormerod	T	Herbarium not available.	Deb, 1961
72.	<i>Cephalantheropsis obcordata</i> (Lindl.) Ormerod	T	A. Mao 106408 (ASSAM)	Mukerjee, 1953
73.	<i>Ceratostylis himalaica</i> Hook. f.	E	Chowlu s. n. (COGCEHR)	Chauhan, 2001
74.	<i>Chiloschistaparishii</i> Seidenf.	E	Herbarium not available.	Chauhan, 2001

Continuation of table

S. No.	Species/ variety	Habit	Voucher specimens record	Reference of first report for the state
75.	<i>Chrysoglossum ornatum</i> Blume	T	Poornima, Bishwajit and Jennifer 00437 (COGCEHR)	Nanda et al., 2014c
76.	<i>Cleisocentron pallens</i> (Lindl.) Pears. et Cribb	E	Nanda et al. 00289 (COGCEHR)	Laiphrakpam et al., 2015
77.	<i>Cleisomeria pilosulum</i> (Gagnep.) Seidenf. et Garay	E	Thokchom 00572 (COGCEHR); N.N. Rabha and L.R. Meitei 131143 (ASSAM)	Meitei et al., 2014
78.	<i>Cleisostoma appendiculatum</i> (Lindl.) Jacks.	E	A. Mao 101944 (ASSAM)	Chauhan, 2001
79.	<i>Cleisostoma discolor</i> Lindl.	E	Nanda et al. 00417 (COGCEHR)	Kumar, Kumar, 2005
80.	<i>Cleisostoma filiforme</i> (Lindl.) Garay	E	Nanda et al. 596 (COGCEHR)	Shukla, Baishya, 1979
81.	<i>Cleisostoma linearilobatum</i> (Seidenf. et Smit.) Garay	E	Herbarium not available.	Live plants under cultivation at ORDC orchidarium
82.	<i>Cleisostoma racemiferum</i> (Lindl.) Garay	E	Kishor et al. 00300 (COGCEHR)	Chauhan, 2001
83.	<i>Cleisostoma rolfeanum</i> (King et Pantl.) Garay	E	C. Sathish Kumar 28742 (TBGT). A. A. Mao 68282; A. K. Baisya 72200 (all at ASSAM)	Phukan, Mao, 2004
84.	<i>Cleisostoma simondii</i> (Gagnep.) Seidenf.	E	Herbarium not available. Live plants under cultivation.	Rao, 2015
85.	<i>Cleisostoma striatum</i> (Rchb. f.) N. E. Br.	E	Herbarium not available.	Laiphrakpam et al., 2015
86.	<i>Cleisostomawilliamsonii</i> (Rchb. f.) Garay	E	Nanda et al. s. n. (acc. no. 588) [COGCEHR]	Kumar, Kumar, 2005
87.	<i>Coelogyne barbata</i> Griff.	E	George Watt 7452; Meebold 6926; S. K. Mukerjee 3482; CAL)	Mukerjee, 1953
88.	<i>Coelogyne corymbosa</i> Lindl.	E	Chowlu et al. 18; Nanda s. n. (acc. n. 11104) [all at COGCEHR]. S. K. Mukerjee2812 (CAL)	Mukerjee, 1953
89.	<i>Coelogyne cristata</i> Lindl.	E	J. Devi 2320 (Manipur University Herbarium)	Devi, Ghatak, 1984
90.	<i>Coelogyne fimbriata</i> Lindl.	E	Chowlu et al. s. n. (acc. no. 115) [COGCEHR]. S. K. Mukerjee 3721 (CAL)	Mukerjee, 1953
91.	<i>Coelogyne flaccida</i> Lindl.	E	J. Devi 2446 (Manipur University Herbarium)	Das, Jain, 1980
92.	<i>Coelogyne fuscescens</i> Lindl.	E	Chowlu et al. s. n. (acc. no. 440) [COGCEHR]	Rao, 2015
93.	<i>Coelogyne ghatakii</i> T. K. Paul et al.	E	Ghatak 2213a (CAL). Ghatak 2213b, c, d (Manipur Univ. Herbarium)	Paul et al., 1988; Kumar, Kumar 2005
94.	<i>Coelogyne griffithii</i> Hook. f.	E	Watt's collection 6780 (CAL)	Hooker, 1890
95.	<i>Coelogyne holochila</i> Hunt et Summerh.	E	Herbarium not available.	Kumar, Kumar, 2005
96.	<i>Coelogyne longipes</i> Lindl.	E	S. K. Mukerjee 3439; S. C. Sinha 1893 (all at CAL)	Mukerjee, 1953
97.	<i>Coelogyne micrantha</i> Lindl.	E	Chowlu et al. 00329, 00141 (all at COGCEHR)	Das, Jain, 1980
98.	<i>Coelogyne nitida</i> (D. Don) Lindl.	E	Nanda et al. 00028; Chowlu 00032 (all at COGCEHR)	Devi, Ghatak, 1984

Continuation of table

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99.	<i>Coelogyne ovalis</i> Lindl.	E	Chowlu et al. s. n. (acc. no. 97); K. Chowlu 00180 [all at COGCEHR]	Mukerjee, 1953
100.	<i>Coelogyne ovalis</i> Lindl. var. <i>latifolia</i> Hook. f.	E	Herbarium not available.	Hooker, 1890
101.	<i>Coelogyne prolifera</i> Lindl.	E	Nanda et al. 00025, 00033; Chowlu 00026; Kishor et al. 00027 (all at COGCEHR). A. Meebold 4766 (CAL)	Devi, Ghatak, 1984
102.	<i>Coelogyne pulverula</i> Teijm. et Binnend.	E	Herbarium not available	Ghatak, Devi, 1986
103.	<i>Coelogyne punctulata</i> Lindl.	E	Chowlu 00030, 00038 (all at COGCEHR)	Das, Jain, 1980
104.	<i>Coelogyne schultesii</i> Jain et Das	E	Meebold 4766 (CAL)	Das, Jain, 1980
105.	<i>Coelogyne stricta</i> (D. Don) Schltr.	E	Imbeng and Atan s. n. (acc. no. 226) [COGCEHR]	Das, Jain, 1980
106.	<i>Coelogyne suaveolens</i> (Lindl.) Hook. f.	E	Nanda et al. 00035; Chowlu et al. 1196 (all at COGCEHR)	Shukla, Baishya, 1979
107.	<i>Coelogyne trinervis</i> Lindl.	E	Herbarium not available.	Chauhan, 2001
108.	<i>Coelogyne viscosa</i> Rchb. f.	E	Kishor et al. 00022; Chowlu 00173, 00023 (all at COGCEHR)	Shukla, Baishya, 1979
109.	<i>Conchidium muscicola</i> (Lindl.) Rauscht.	E	D. B. Deb 935 CAL)	Deb, 1961
110.	<i>Corymborkis veratrifolia</i> (Reinw.) Blume	T	Herbarium not available	Chauhan, 2001
111.	<i>Crepidium acuminatum</i> (D. Don) Szlach.	T	V. Kumar 1665, 1666 (all at COGCEHR);	Mukerjee, 1953
112.	<i>Crepidium calophyllum</i> (Rchb. f.) Szlach.	T	Herbarium not available. Live plants under cultivation.	Rao, 2015
113.	<i>Crepidium josephianum</i> (Rchb. f.) Marg.	T	Not seen by authors.	Chauhan, 2001
114.	<i>Crepidium khasianum</i> (Hook. f.) Szlach.	T	Herbarium not available. Live plants under cultivation.	Rao, 2015
115.	<i>Crepidium purpureum</i> (Lindl.) Szlach.	T	K. Chowlu s. n. (acc. no. 365) [COGCEHR]	Rao, 2015
116.	<i>Cryptochilus lutea</i> Lindl.	E	Herbarium not available.	Chauhan, 2001
117.	<i>Cryptochilus sanguinea</i> Lindl.	E	S. K. Mukerjee 3042 (CAL)	Mukerjee, 1953
118.	<i>Cymbidium aloifolium</i> (L.) Sw.	E	Chowlu 00012 (COGCEHR)	Devi, Ghatak, 1984
119.	<i>Cymbidium cochleare</i> Lindl.	E	Chowlu-00439 (COGCEHR)	Chowlu et al., 2013d
120.	<i>Cymbidium concinnum</i> Liu et Chen	E	Chowlu 1562 (COGCEHR)	Chowlu et al., 2015b
121.	<i>Cymbidium crassifolium</i> Herb.	E	Nanda et al. 00036; Chowlu 00170 (all at COGCEHR)	Kumar, Kumar, 2005
122.	<i>Cymbidium cyperifolium</i> Lindl.	T	Herbarium not available.	Devi, Ghatak, 1984
123.	<i>Cymbidium dayanum</i> Rchb. f.	E	OBDD-IBSD-K-C-01 to OBDD-IBSD-K-C-06	Kumar et al., 2018
124.	<i>Cymbidium devonianum</i> Paxt.	E	Herbarium not available. Live plants under cultivation.	Chauhan, 2001

Continuation of table

S. No.	Species/ variety	Habit	Voucher specimens record	Reference of first report for the state
125.	<i>Cymbidium eburneum</i> Lindl.	E	J. Devi 2389 (Manipur University Herbarium)	Devi, Ghatak, 1984
126.	<i>Cymbidium elegans</i> Lindl.	E	A. Mao 106309 (ASSAM)	Mukerjee, 1953; A. A. Mao, 1999
127.	<i>Cymbidium ensifolium</i> Sw.	T	Chowlu 971 (COGCEHR)	Ghatak, Devi, 1986
128.	<i>Cymbidium erythraeum</i> Lindl.	E	Herbarium not available. Live plants under cultivation.	Rao, 2007
129.	<i>Cymbidium hengbungense</i> A. N. Rao et al.	M	A. N. Rao 00409 (COGCEHR)	Rao et al., 2016
130.	<i>Cymbidium hookerianum</i> Rchb. f.	E	S. K. Mukherjee 3068, 3640 (all at CAL)	Mukerjee, 1953
131.	<i>Cymbidium insigne</i> Rolfe	E	Herbarium not available.	Kumar, Kumar, 2005
132.	<i>Cymbidium iridioides</i> D. Don	E	Chowlu 00435 (COGCEHR)	Devi, Ghatak, 1984
133.	<i>Cymbidium lancifolium</i> Hook. f.	T	Nanda et al. 00029 (COGCEHR)	Chauhan, 2001
134.	<i>Cymbidium macrorhizon</i> Lindl.	M	Herbarium not available	Rao, 2007
135.	<i>Cymbidium mastersii</i> Lindl.	E	Herbarium not available.	Pradhan, 1979
136.	<i>Cymbidium munronianum</i> Kingh et Pantl.	T	Herbarium not available.	Ghatak, Devi, 1986
137.	<i>Cymbidium nanulum</i> Wu et S. C. Chen	T	V. Kumar 74200 (CAL)	Kumar, 2017
138.	<i>Cymbidium sinense</i> (Jacks.) Willd.	T	Hengbung (under cultivation at ORDC Orchidarium).	Chowlu et al., 2014; Rao, 2015
139.	<i>Cymbidium tigrinum</i> Hook. f.	L	Kishor 00223 (COGCEHR)	Kumar, Kumar, 2005
140.	<i>Cyrtosia nana</i> (Downie) Garay	M	P. K. Singh 000816 (Man. Univ. Mus. Plants)	Sanatombi et al., 2013
141.	<i>Dendrobium abhaycharanii</i> (Phukan et A. A. Mao) Schuit. et P. B. Adams	E	V. Kumar 1681 (COGCEHR); Nanda et al. s. n. (acc. no. 578) [all at COGCEHR]	Phukan, Mao, 2005
142.	<i>Dendrobium aduncum</i> Lindl.	E	Herbarium not available. Live plants under cultivation.	Laiphrakpam et al., 2015
143.	<i>Dendrobium alboburpureum</i> (Seidenf.) Schuit. et P. B. Adams	E	Y. Nanda, Krishna, Bishwajit and Jennifer 00438; Kishor et al. 00066 (all at COGCEHR)	Nanda et al., 2014c
144.	<i>Dendrobium amoenum</i> Lindl.	E	Y. Nanda 00372 (COGCEHR)	Nanda et al., 2013b
145.	<i>Dendrobium amplum</i> Lindl.	E	Chowlu 00102 (COGCEHR)	Mao, 1999
146.	<i>Dendrobium anceps</i> Sw.	E	Herbarium not available	Kumar, Kumar, 2005
147.	<i>Dendrobium aphyllum</i> (Roxb.) Fischer	E	Herbarium not available. Live plants under cultivation.	Devi, Ghatak, 1984
148.	<i>Dendrobium bellatulum</i> Rolfe	E	Kishor et al. 144 (COGCEHR)	Pradhan, 1979
149.	<i>Dendrobium bensonae</i> Rchb. f.	E	Herbarium not available. Live plants under cultivation.	Pradhan, 1979
150.	<i>Dendrobium bicameratum</i> Lindl.	E	Nanda 00024; Kishor 00263 (all at COGCEHR)	Nanda et al., 2012b
151.	<i>Dendrobium brymerianum</i> Rchb. f.	E	Kishor et al. 00434, 00463, 00464 (all at COGCEHR)	Mao, 1999

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S. No.	Species/ variety	Habit	Voucher specimens record	Reference of first report for the state
152.	<i>Dendrobium capillipes</i> Rchb. f.	E	Y. Nanda 00371, 00032 (all at COGCEHR)	Nanda et al., 2013b
153.	<i>Dendrobium cariniferum</i> Rchb. f.	E	G. Watt 6500 (CAL)	Mukerjee, 1953
154.	<i>Dendrobium chapaense</i> Aver.	E	COGCEHR/Herb/00003 (ASSAM, CAL)	Kishor et al., 2013
155.	<i>Dendrobium chrysanthum</i> Lindl.	E	Nanda 000483 (COGCEHR); Nanda et al. 00062 (COGCEHR)	Mao, 1999
156.	<i>Dendrobium chryseum</i> Rolfe	E	Herbarium not available. Live plants under cultivation.	Deori, 2007
157.	<i>Dendrobium chrysotoxum</i> Lindl.	E	Kishor et al. 324 (COGCEHR)	Mukerjee, 1953
158.	<i>Dendrobium crepidatum</i> Lindl. et Paxt.	E	Herbarium not available. Live plants under cultivation.	Devi, Ghatak, 1984
159.	<i>Dendrobium crystallinum</i> Rchb. f.	E	Nanda 00370 (COGCEHR)	Nanda et al., 2013b
160.	<i>Dendrobium cumulatum</i> Lindl.	E	Nanda et al. 1151 (COGCEHR)	Nanda et al., 2014c
161.	<i>Dendrobium dantaniense</i> Guill.	E	Deori 101148 (ASSAM)	Deori, 2007
162.	<i>Dendrobium delacourii</i> Guill.	E	N. N. Rabha and L. R. Meitei 131115 (ASSAM)	Meitei et al., 2014
163.	<i>Dendrobium densiflorum</i> Lindl.	E	Kishor et al. s. n. (acc. no. 311); Nanda et al. 00068 (all at COGCEHR)	Mao, 1999
164.	<i>Dendrobium denudans</i> D. Don	E	Nanda et al. 00065; Kishor et al. 317, 321 (all at COGCEHR)	Mukerjee, 1953
165.	<i>Dendrobium devonianum</i> Paxt.	E	Nanda et al. 00050 (COGCEHR)	Devi, Ghatak, 1984
166.	<i>Dendrobium dickasonii</i> L. O. Williams.	E	Pradhan 6 (K-sprit collection)	Pradhan, 1976
167.	<i>Dendrobium draconis</i> Rchb. f.	E	J. Devi 2451 (Manipur Univ. Herbarium)	Pradhan, 1976
168.	<i>Dendrobium eriiflorum</i> Griff.	E	Nanda 00060 (COGCEHR)	Mukerjee, 1953
169.	<i>Dendrobium falconeri</i> Hook.	E	Nanda et al. 00061; Kishor et al. 301 (all at COGCEHR)	Hooker, 1890
170.	<i>Dendrobium farmerii</i> Paxt.	E	J. Devi 2303 (Manipur Univ. Herbarium)	Devi, Ghatak, 1984
171.	<i>Dendrobium fimbriatum</i> Hook.	E	Y. Nanda 00310, 00284 (at COGCEHR)	Deori, 2007
172.	<i>Dendrobium fimbriatum</i> Hook. var. <i>oculatum</i> Hook.	E	J. Devi 2461 (Manipur Univ. Herbarium)	Devi, Ghatak, 1984
173.	<i>Dendrobium formosum</i> Lindl.	E	Supt. G. Gardner s. n. (CAL)	Devi, Ghatak, 1984
174.	<i>Dendrobium fugax</i> Rchb. f.	E	Herbarium not available. Live plants under cultivation.	Chauhan, 2001
175.	<i>Dendrobium fuscescens</i> Griff.	E	Herbarium not available. Live plants under cultivation.	Rao, 2007
176.	<i>Dendrobium gibsonii</i> Lindl.	E	Nanda et al. 904 (COGCEHR)	Devi, Ghatak, 1984
177.	<i>Dendrobium gratiotissimum</i> Rchb. f.	E	J. Devi 2362 Minipur Univ. Herbarium)	Pradhan, 1979
178.	<i>Dendrobium hesperis</i> (Seidenf.) Schuit. et P. B. Adams	E	Nanda et al. 00480 (COGCEHR)	Nanda et al., 2014b
179.	<i>Dendrobium heterocarpum</i> Lindl.	E	Nanda et al. 39 (COGCEHR)	Devi, Ghatak, 1984

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S. No.	Species/ variety	Habit	Voucher specimens record	Reference of first report for the state
180.	<i>Dendrobium hookerianum</i> Lindl.	E	Herbarium not available. Live plants under cultivation.	Chauhan, 2001
181.	<i>Dendrobium infundibulum</i> Lindl.	E	C. Sathish Kumar 28726 (TBGT).	Pradhan, 1979
182.	<i>Dendrobium jenkinsii</i> Lindl.	E	Nanda 00415 (COGCEHR)	Chauhan, 2001
183.	<i>Dendrobium lindleyii</i> Steud.	E	Nanda et al. s. n. (COGCEHR)	Devi, Ghatak, 1984
184.	<i>Dendrobium linguella</i> Rchb. f.	E	Herbarium not available	Ghatak, Devi, 1986
185.	<i>Dendrobium lituiflorum</i> Lindl.	E	Kishor et al. s. n. (acc. no. 574) [COGCEHR]	Mukerjee, 1953
186.	<i>Dendrobium longicornu</i> Lindl.	E	Y. Nanda 00414; Kishor et al. 00273, 00315 (all at COGCEHR)	Mukerjee, 1953
187.	<i>Dendrobium mannii</i> Ridl.	E	J. S. Khurajam 101968 (LWG)	Khurajam, Roy, 2016
188.	<i>Dendrobium moniliforme</i> (L.) Sw.	E	S. K. Mukerjee 2855 (CAL)	Mukerjee, 1953
189.	<i>Dendrobium moschatum</i> (Buch.-Ham.) Sw.	E	S. K. Mukerjee 2849 (CAL)	Mukerjee, 1953
190.	<i>Dendrobium nobile</i> Lindl.	E	Nanda et al. s. n. (COGCEHR)	Mukerjee, 1953
191.	<i>Dendrobium ochreatum</i> Lindl.	E	Nanda et al. 00182 (COGCEHR)	Mukerjee, 1953
192.	<i>Dendrobium parcum</i> Rchb. f.	E	Nanda et al. 00275, 00064, 00481 (all at COGCEHR)	Kumar, Kumar, 2005
193.	<i>Dendrobium parishii</i> Rchb. f.	E	J. Devi 2369 (Manipur Univ. Herbarium)	Devi, Ghatak, 1984
194.	<i>Dendrobium pendulum</i> Roxb.	E	Herbarium not available	Pradhan, 1979
195.	<i>Dendrobium polyanthum</i> Lindl.	E	Nanda et al. s. n. (acc. no. 536) [COGCEHR]	Devi, Ghatak, 1984
196.	<i>Dendrobium porphyrochilum</i> Lindl.	E	V. Kumar 1662 (COGCEHR)	Mukerjee, 1953
197.	<i>Dendrobium pulchellum</i> Lindl.	E	Nanda et al. s. n. (COGCEHR)	Mukerjee, 1953
198.	<i>Dendrobium salaccense</i> (Blume) Lindl.	E	Y. Nanda 197 (COGCEHR)	Nanda et al., 2013b
199.	<i>Dendrobium sinominutiflorum</i> S. C. Chen et al.	E	Nanda 00405, Akhimpau s. n. (acc. no. 584) [all at COGCEHR]	Nanda et al., 2014; Rao et al. 2016
200.	<i>Dendrobium spatella</i> Rchb. f.	E	Nanda et al. 00059, 1065 (all at COGCEHR).	Chauhan, 2001
201.	<i>Dendrobium stuposum</i> Lindl.	E	Kishor et al. 00259 (COGCEHR)	Chauhan, 2001
202.	<i>Dendrobium sulcatum</i> Lindl.	E	A. Mao 101934 (ASSAM)	Chauhan, 2001
203.	<i>Dendrobium thyrsoiflorum</i> B. S. Williams	E	J. Devi 2370 Manipur University Herbarium)	Mukerjee, 1953
204.	<i>Dendrobium transparens</i> Lindl.	E	Nanda et al. 00453 (COGCEHR)	Mao, 1999
205.	<i>Dendrobium wardianum</i> Warner	E	Kishor 00048 (COGCEHR)	Pradhan, 1979
206.	<i>Dendrobium wattii</i> (Hook. f.) Rchb. f.	E	G. Watt 5944 (CAL)	Hooker, 1890
207.	<i>Dendrobium williamsonii</i> Day et Rchb. f.	E	Kishor et al. 508, 509 (all at COGCEHR)	Shukla, Baishya, 1979
208.	<i>Dickasonia vernicosa</i> L. O. Williams	E	Herbarium not available	Pradhan, 1979

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S. No.	Species/ variety	Habit	Voucher specimens record	Reference of first report for the state
209.	<i>Dienia ophrydis</i> (Koen.) Seidenf.	T	Chowlu s. n. (acc. no. 479)	Mukerjee, 1953
210.	<i>Eria biflora</i> Griff.	E	Nanda et al. 00005 (COGCEHR)	Nanda et al., 2013c
211.	<i>Eria clavicaulis</i> Lindl.	E	Nanda 00333, 00365, 00395 (all at COGCEHR)	Nanda et al., 2013a
212.	<i>Eria coronaria</i> (Lindl.) Rchb. f.	E	Nanda et al. 00068; Kishor et al. 00278 (all at COGCEHR)	Mukerjee, 1953
213.	<i>Eria javanica</i> (Sw.) Blume	E	Herbarium not available. Live plants under cultivation.	Shukla, Baishya, 1979
214.	<i>Eria lasiopetala</i> (Willd.) Ormerod	E	Herbarium not available. Live plants under cultivation.	Rao, 2007
215.	<i>Eria scabrilinguis</i> Lindl.	E	Nanda 396, 833 (all at COGCEHR)	Nanda et al., 2013a
216.	<i>Eria sutepensis</i> Downie	E	Nanda 00316; Nanda et al. 0075 (all at COGCEHR)	Phukan, Mao, 2002a
217.	<i>Eria tomentosa</i> (J. Koenig) Hook. f.	E	Nanda et al. 00262 (COGCEHR)	First time report in present paper
218.	<i>Eria vittata</i> Lindl.	E	Herbarium not available. Live plants under cultivation.	Hooker, 1890
219.	<i>Eriodes barbata</i> (Lindl.) Rolfe	E	Kishor et al. 00008, Nanda et al. 00088 (all at COGCEHR)	Nanda et al., 2013c
220.	<i>Erythrodes blumei</i> (Lindl.) Schltr.	T	Inbeng s. n. (acc. no. 590) (COGCEHR)	Nanda et al., 2014c
221.	<i>Erythrodes hirsuta</i> (Griff.) Ormerod	T	V. Kumar 1673 (COGCEHR)	Kumar et al., 2016b
222.	<i>Eulophia bicallosa</i> (D. Don) Summerh.	T	G. Watt 6243; S. K. Mukerjee 3023 (all at CAL)	Hooker, 1890
223.	<i>Eulophia dabia</i> (D. Don) Hochr.	T	S. K. Mukerjee 2717 (CAL)	Mukerjee, 1953
224.	<i>Eulophia mannii</i> (Rchb. f.) Hook. f.	T	Prazer 155 (CAL)	A. S. Rao, P. K. Hajra 1974
225.	<i>Eulophia nuda</i> Lindl.	T	N. L. Bor 17986 (ASSAM)	Chauhan, 2001
226.	<i>Eulophia zollingeri</i> (Rchb. f.) J. J. Sm.	M	Akimpou 00531; V. Kumar s. n. (all at COGCEHR);	Nanda et al., 2014a
227.	<i>Galeola falconeri</i> Hook. f.	M	Herbarium not available	Ramakantha, 1995
228.	<i>Galeola lindleyana</i> (Hook. f. et Thomson) Rchb. f.	M	S. K. Mukerjee 2917 (CAL)	Chauhan, 2001
229.	<i>Gastrochilus acutifolius</i> (Lindl.) Kuntze	E	V. Kumar s. n. (COGCEHR)	Ghatak, Devi, 1986
230.	<i>Gastrochilus bellinus</i> (Rchb. f.) Kuntze	E	Herbarium not available	Devi, Ghatak, 1984
231.	<i>Gastrochilus calceolaris</i> (Sm.) D. Don	E	Nanda et al. s. n. (acc. no. 586) [COGCEHR]	Devi, Ghatak, 1984
232.	<i>Gastrochilus distichus</i> (Lindl.) Kuntze	E	G. Watt 6236, 6338 (all at CAL)	Chauhan, 2001
233.	<i>Gastrochilus inconspicuous</i> (Hook. f.) Kuntze	E	C. Sathish Kumar 28740 (TBGT)	Kumar, Kumar, 2005
234.	<i>Geodorum densiflorum</i> (Lamk.) Schltr.	T	S. K. Mukerjee 2949 (CAL)	Shukla, Baishya, 1979
235.	<i>Geodorum recurvum</i> (Roxb.) Alston	T	Herbarium not available	Mukerjee, 1953

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S. No.	Species/ variety	Habit	Voucher specimens record	Reference of first report for the state
236.	<i>Goodyera foliosa</i> (Lindl.) Clarke	T	G. Watt 0923 (CAL)	Mukerjee, 1953
237.	<i>Goodyera procera</i> (Ket-Gawl.) Hook.	T	Herbarium not available	Clarke, 1889
238.	<i>Goodyera schlechtendaliana</i> Rchb. f.	T	Herbarium not available	Hooker, 1890
239.	<i>Goodyera viridiflora</i> (Blume) Dietrich	T	V. Kumar 1654, 1655 (COGCEHR)	Kumar, Rao, 2015a
240.	<i>Habenaria acuifera</i> Lindl.	T	S. K. Mukerjee 3461 (CAL)	Mukerjee, 1953
241.	<i>Habenaria arietina</i> Hook. f.	T	S. K. Mukerjee 3268 (CAL)	Mukerjee, 1953
242.	<i>Habenaria dentata</i> (Sw.) Schltr.	T	Akimpou s. n. (acc. no. 408); K. Chowlu, s. n. (acc. n. 401, 412) [all at COGCEHR]. S. K. Mukerjee 3555; A. Meebold 6404 (all at CAL)	Mukerjee, 1953
243.	<i>Habenaria malintana</i> (Blanco) Merl.	T	S. K. Mukerjee 3523(CAL)	Mukerjee, 1953
244.	<i>Habenaria mandersii</i> Collet. et Hemsl.	T	Herbarium not available	Chauhan, 2001
245.	<i>Habenaria pelorioides</i> C. S. P. Parish et Rchb. f.	T	S. K. Mukerjee 3523 (CAL)	Mukerjee, 1953
246.	<i>Habenaria reniformis</i> (D. Don) Hook. f.	T	S. K. Mukerjee 3529 (CAL)	Mukerjee, 1953
247.	<i>Habenaria trichosantha</i> Lindl.	T	D. B. Deb 787 (CAL)	Deb, 1961
248.	<i>Herminium lanceum</i> (Sw.) Vujik	T	A. A. Mao 106330 (ASSAM).	Mukerjee, 1953
249.	<i>Holcoglossum amesianum</i> (Rchb. f.) Christ.	E	Herbarium not available. Live plants under cultivation.	Devi, Ghatak, 1984
250.	<i>Holcoglossum himalaicum</i> (Deb et al.) Aver.	E	Kishor et al. 00458, 00256 (all at COGCEHR)	Chauhan, 2001
251.	<i>Liparis bistriata</i> C. S. P. Parish et Rchb. f.	E	S. K. Mukerjee 2881(CAL)	Mukerjee, 1953
252.	<i>Liparis bootanensis</i> Griff.	E	Herbarium not available. Live plants under cultivation.	Chauhan, 2001
253.	<i>Liparis caespitosa</i> (Lam.) Lindl.	E	Chowlu 528; Kishor et al. s. n. (acc.no. 497) [all at COGCEHR]	Kumar, Kumar, 2005
254.	<i>Liparis distans</i> Clarke	E	S. K. Mukerjee 3540 (CAL).	Mukerjee, 1953
255.	<i>Liparis duthiei</i> Hook. f.	E	Chowlu s. n. (acc.no. 236) [COGCEHR]	First time report in present paper
256.	<i>Liparis elliptica</i> Wight	E	Chowlu 00428 (COGCEHR).	Chowlu et al., 2014; Rao, 2015
257.	<i>Liparis odorata</i> (Willd.) Lindl.	T	V. Kumar 1664 (COGCEHR). S. K. Mukerjee 2286, 3258 (CAL)	Mukerjee, 1953
258.	<i>Liparis plantaginea</i> Lindl.	E	Chowlu 722 (COGCEHR)	Chauhan, 2001
259.	<i>Liparis resupinata</i> Ridl.	E	Herbarium not available	Chauhan, 2001
260.	<i>Liparis spathulata</i> Lindl.	E	Herbarium not available. Live plants under cultivation.	Clarke, 1889
261.	<i>Liparis viridiflora</i> (Blume) Lindl.	E	Imbeng s. n. (acc. no. 421); Nanda s. n. (acc. no. 98) [all at COGCEHR]. A. Meebold 6482 (CAL)	Clarke, 1889

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S. No.	Species/ variety	Habit	Voucher specimens record	Reference of first report for the state
262.	<i>Luisia antennifera</i> Blume	E	Herbarium not available	Ghatak, Devi, 1986
263.	<i>Luisia filiformis</i> Hook. f.	E	Nanda et al. 00010, 00087 (all at COGCEHR)	Nanda et al., 2013c
264.	<i>Luisia jonesii</i> J. J. Sm.	E	Herbarium not available	Ghatak, Devi, 1986
265.	<i>Luisia trichorhiza</i> (Hook.) Blume	E	Nanda (acc. No. 988), [COGCEHR]	First time report in present paper
266.	<i>Mycaranthes floribunda</i> (D. Don) Chen et Wood	E	Nanda et al. s. n. (acc. no. 593) [COGCEHR]	Mao, 1999
267.	<i>Mycaranthes pannea</i> (Lindl.) Chen et Wood	E	Kishor et al. s. n. (acc. no. 322) [COGCEHR]	Ghatak, Devi, 1986
268.	<i>Myrmechis pumila</i> (Hook. f.) Tang et Wang	T	Capt. K. Ward 3267 (CAL)	Mukerjee, 1953
269.	<i>Neogyna gardneriana</i> (Lindl.) Rchb. f.	T	G. Watt 5871 (CAL)	Chauhan, 2001
270.	<i>Nephelaphyllum pulchrum</i> Blume	T	Herbarium not available	Kumar, Kumar, 2005
271.	<i>Nervilia concolor</i> (Blume) Schltr.	T	Herbarium not available	Chauhan, 2001
272.	<i>Nervilia crocififormis</i> (Zoll. et Mor.) Seidenf.	T	D. B. Deb 2497, 2527 (CAL)	Mukerjee, 1953
273.	<i>Nervilia falcata</i> (King et Pantl.) Schltr.	T	Herbarium not available	Chauhan, 2001
274.	<i>Nervilia plicata</i> (Andr.) Schltr.	T	Herbarium not available. Live plants under cultivation.	Chauhan, 2001
275.	<i>Oberonia acaulis</i> Griff.	E	Meehold 6642 (MH), Mao 106405 (ASSAM); V. Kumar 1684 (COGCEHR)	Mao, 1999
276.	<i>Oberonia acaulis</i> Griff. var. <i>latipetala</i> Chowlu et al.	E	Chowlu 00368 (COGCEHR)	Chowlu et al., 2014b
277.	<i>Oberonia bicornis</i> Lindl.	E	A. Mao 101966 (ASSAM)	Mao, 1999
278.	<i>Oberonia clarkeii</i> Hook. f.	E	Herbarium not available	Chauhan, 2001
279.	<i>Oberonia ensiformis</i> (Sm.) Lindl.	E	Chowlu s. n. (acc. n. 423) [COGCEHR]	Chauhan, 2001
280.	<i>Oberonia integerrima</i> Guill.	E	Kipgen 00334 (COGCEHR)	Chowlu et al., 2013b
281.	<i>Oberonia jenkinsiana</i> Lindl.	E	V. Kumar 1659; Inbeng and Atan 00012; Chowlu 00486 (all at COGCEHR)	Chowlu et al., 2012b
282.	<i>Oberonia longibracteata</i> Lindl.	E	A. Mao 101940 (ASSAM)	Mao, 1999
283.	<i>Oberonia manipurensis</i> Chowlu et al.	E	K. Chowlu 00362 (CAL). K. Chowlu 00441 (COGCEHR)	Chowlu et al., 2015a
284.	<i>Oberonia maxima</i> Hook. f.	E	Chowlu 00123, 00388 (all at COGCEHR)	Deb, 1961
285.	<i>Oberonia mucronata</i> (D. Don) Ormerod et Seidenf.	E	Chowlu 00425 (COGCEHR)	Chauhan, 2001
286.	<i>Oberonia myosurus</i> Lindl.	E	A. Mao 101971 (ASSAM)	Mao, 1999
287.	<i>Oberonia pachyrachis</i> Rchb. f.	E	Chowlu s. n. (acc. no. 91) [COGCEHR]	Devi et al., 2018
288.	<i>Oberonia pyrulifera</i> King et Pantl.	E	G. Watt 6438; S. K. Mukerjee 2880 (all at CAL)	Hooker, 1890

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S. No.	Species/ variety	Habit	Voucher specimens record	Reference of first report for the state
289.	<i>Oberonia teres</i> Kerr	E	Chowlu 00358 (COGCEHR).	Phukan, Mao, 2002a
290.	<i>Odontochilus grandiflorus</i> (Lindl.) Hook. f.	T	Herbarium not available	Chauhan, 2001
291.	<i>Odontochilus tetrapterus</i> (Hook. f.) Bhatta. et Chowdh.	T	C. B. Clarke 42191 (K)	Hooker, 1890
292.	<i>Otochilus albus</i> Lindl.	E	D. B. Deb 1435, 1892; S. K. Mukerjee 3039 (all at CAL)	Mukerjee, 1953
293.	<i>Otochilus fuscus</i> Lindl.	E	K. Chowlu s. n. (acc. no. 344, 345); Kishor 11190, 00194, 00197 (all at COGCEHR); G. Watt 6482; A. Meebold 7105 (CAL)	Hooker, 1890
294.	<i>Otochilus porrectus</i> Lindl.	E	Herbarium not available	Hooker, 1890
295.	<i>Pachystoma pubescens</i> Blume	T	Biswajit et al. s. n. (acc. no. 343) [COGCEHR]	Hooker, 1890
296.	<i>Panisea apiculata</i> Lindl.	E	Biswajeet WL 194 (COGCEHR)	First time report in present paper
297.	<i>Panisea demissa</i> (D. Don) Pfitz.	E	Biswajit s. n. 235 (COGCEHR)	Kumar, Kumar, 2005
298.	<i>Panisea tricallosa</i> Rolfe	E	J. Devi 2351 (Manipur Univ. Herbarium)	Chauhan, 2001
299.	<i>Panisea uniflora</i> (Lindl.) Lindl.	E	COGCEHR 00105, Chowlu 00172 (all at COGCEHR)	Chowlu et al., 2012a
300.	<i>Paphiopedilum hirsutissimum</i> (Hook.) Stein	T	S. coll. 340 (COGCEHR); J. Devi 2322 (Manipur University Herbarium)	Devi, Ghatak, 1984
301.	<i>Paphiopedilum insigne</i> (Lindl.) Pfitz.	T	J. Devi 2356 (Manipur Univ. Herbarium)	Devi, Ghatak, 1984
302.	<i>Paphiopedilum spicerianum</i> (Rchb. f.) Pfitz.	T	J. Devi 2457 (Manipur Univ. Herbarium)	Devi, Ghatak, 1984
303.	<i>Paphiopedilum venustum</i> (Wall.) Stein	T	J. Devi 2339 (Manipur Univ. Herbarium)	Devi, Ghatak, 1984
304.	<i>Paphiopedilum villosum</i> (Lindl.) Stein	T	J. Devi 2358 (Manipur Univ. Herbarium)	Devi, Ghatak, 1984
305.	<i>Papilionanthe teres</i> (Roxb.) Schltr.	E	C. Sathish Kumar s. n. (TBGT)	Chauhan, 2001
306.	<i>Papilionanthe uniflora</i> (Lindl.) Garay	E	Nanda et al. 00380 (COGCEHR)	Nanda et al., 2014c
307.	<i>Papilionanthe vandarum</i> (Rchb. f.) Garay	E	S. K. Mukerjee 6290 (CAL).	Clarke, 1889
308.	<i>Pecteilis henryii</i> Schltr.	T	N. L. Bor 18495 (DD).	Mukerjee, 1953
309.	<i>Pecteilis susannae</i> (L.) Rafin.	T	S. K. Mukerjee 3463 (CAL)	Chauhan, 2001
310.	<i>Pelatantheria insectifera</i> (Rchb. f.) Ridl.	T	Akimpou 00529 (COGCEHR)	Nanda et al., 2014d
311.	<i>Peristylus affinis</i> (D. Don) Seidenf.	T	Herbarium not available	Chauhan, 2001
312.	<i>Peristylus densus</i> (Lindl.) Sant. et Kapad.	T	S. K. Mukerjee 3202 (CAL)	Mukerjee, 1953
313.	<i>Peristylus goodyeroides</i> (D. Don) Lindl.	T	Deb. 1005 (CAL)	Deb, 1961
314.	<i>Peristylus lacertiferus</i> (Lindl.) J. J. Sm.	T	V. Kumar 1663 (COGCEHR)	Deb, 1961

Continuation of table

S. No.	Species/ variety	Habit	Voucher specimens record	Reference of first report for the state
315.	<i>Peristylus mannii</i> (Rehb. f.) Mukerj.	T	S. K. Mukerjee 3731 (CAL)	Mukerjee, 1953
316.	<i>Peristylus parishii</i> Rehb. f.	T	V. Kumar 1667; Chowlu 00957 (all at COGCEHR)	Chowlu et al., 2014c
317.	<i>Peristylus richardianus</i> Wight	T	Chowlu 00954 (COGCEHR)	Chowlu et al., 2014c
318.	<i>Peristylus tipuliferus</i> (C. S. P. Parish et Rehb. f.) Mukerj.	T	S. K. Mukerjee 3364, 3417 (CAL)	Mukerjee, 1953
319.	<i>Phaius flavus</i> (Blume) Lindl.	T	S. K. Mukerjee 2937 (CAL)	Mukerjee, 1953
320.	<i>Phaius mishmensis</i> (Lindl. et Paxt.) Rehb. f.	T	Herbarium not available	Devi, Ghatak, 1984
321.	<i>Phaius tankervilleae</i> (Banks) Blume	T	Nanda et al. 274 (COGCEHR)	Mukerjee, 1953
322.	<i>Phaius wallichii</i> Lindl.	T	S. K. Mukerjee 2457 (CAL); Herbarium not available. Live plants under cultivation.	Laiphrakpam et al., 2015
323.	<i>Phalaenopsis cornu-cervi</i> (Breda) Blume et Rehb. f.	E	J. Devi 2378 (Manipur Univ. Herbarium)	Devi, Ghatak, 1984
324.	<i>Phalaenopsis difformis</i> (Lindl.) Kocyan et Schuit.	E	Herbarium not available. Live plants under cultivation.	Chauhan, 2001
325.	<i>Phalaenopsis fasciata</i> Rehb. f.	E	C. Sathish Kumar 28259, 28764 (all at TBGT).	Kumar, Kumar, 2005
326.	<i>Phalaenopsis hygrophila</i> J. M. H. Shaw	E	Nanda et al. 540 (COGCEHR). S. K. Mukerjee 2946 (CAL)	Mukerjee, 1953
327.	<i>Phalaenopsis pulcherrima</i> (Lindl.) J. J. Sm.	E	Mao 101970 (ASSAM)	Chauhan et al., 2001
328.	<i>Phalaenopsis taenialis</i> (Lindl.) Christen.	E	Kishor et al. 00009 (COGCEHR)	Kumar, Kumar, 2005
329.	<i>Phalaenopsis yingjiangensis</i> (Z. H. Tsi) Kocyan et Schuit.	E	V. Kumar 1677 (COGCEHR)	Kumar et al., 2016b
330.	<i>Pholidota articulata</i> Lindl.	E	Kishor 00070B; Chowlu 00029, 00080 (all at COGCEHR); S. K. Mukerjee 3212; A. Meebold 5525, 7080 (all at CAL)	Mukerjee, 1953
331.	<i>Pholidota convallariae</i> (C. S. P. Parish et Rehb. f.) Hook. f.	E	Chowlu 502, 503 (COGCEHR)	Chowlu, Rao, 2015b
332.	<i>Pholidota imbricata</i> Hook.	E/L	Chowlu 0028, 0074, 0079 (all at COGCEHR); S. C. Sinha 1890; S. K. Mukerjee 2942; A. Meebold 6856 (CAL)	Clarke, 1889
333.	<i>Pholidota pallida</i> Lindl.	E	Chowlu s. n. (acc. no. 404); Chowlu 00085 [all at COGCEHR]	Chowlu, Rao, 2015b
334.	<i>Pholidota protracta</i> Hook. f.	E/L	S. K. Mukerjee 3722 (CAL)	Mukerjee, 1953
335.	<i>Pholidota pygmaea</i> H. J. Chowdhery et G. D. Pal	E	Chowlu 00392 (COGCEHR)	Chowlu et al., 2013d
336.	<i>Pholidota rubra</i> Lindl.	E	Chowlu 00179, 00178 (COGCEHR). A. Meebold 7073 (CAL)	First time report in present paper
337.	<i>Phreatia elegans</i> Lindl.	E	Nanda et al. 00055 (COGCEHR)	Mao, 1999
338.	<i>Pinalia acervata</i> (Lindl.) Kuntze	E	Kishor et al. 00279; Nanda et al. 303 (all at COGCEHR)	Mao, 1999

Continuation of table

S. No.	Species/ variety	Habit	Voucher specimens record	Reference of first report for the state
339.	<i>Pinalia amica</i> (Rchb. f.) Kuntze	E	Nanda et al. 00455 (COGCEHR)	Mao, 1999
340.	<i>Pinalia excavata</i> (Lindl.) Kuntze	E	S. K. Mukerjee 3237(CAL)	Mukerjee, 1953
341.	<i>Pinaliaglobulifera</i> (Seidenf.) A. N. Rao	E	C. Sathish Kumar 28748, 27362 (all at TBGT)	Kumar, Kumar, 2005
342.	<i>Pinalia spicata</i> (D. Don) Chen et Wood	E	V. Kumar 1685; Nanda et al. 00461, 00462 (all at COGCEHR)	Chauhan, 2001
343.	<i>Pinalia stricta</i> (Lindl.) Kuntze	E	Nanda et al. 00053 (COGCEHR)	Nanda et al., 2013c
344.	<i>Pleione hookeriana</i> (Lindl.) Rollisson	E	S. K. Mukerjee 3238 (CAL)	Mukerjee, 1953
345.	<i>Pleione humilis</i> (Sm.) D. Don	E	Chowlu 1569, 1570 (all at COGCEHR)	Chauhan, 2001
346.	<i>Pleione maculata</i> (Lindl.) Lindl. et Paxton	E	Chowlu 534 (COGCEHR); A. Meebold 6562 (CAL)	Chauhan, 2001
347.	<i>Pleione praecox</i> (Sm.) D. Don	E	Chowlu 00535, 00543 (all at COGCEHR); S. K. Mukerjee 3655 (CAL)	Mukerjee, 1953
348.	<i>Polystachya concreta</i> (Jacq.) Garay et H. R. Sweet	E	Kishor s. n. (acc. no. 377), Chowlu s. n. (acc. no. 385) [all at COGCEHR]	Kumar, Kumar, 2005
349.	<i>Ponerorchis secundiflora</i> (Kraenzl.) X. H. Jin et al.	T	Herbarium not available	Chauhan, 2001
350.	<i>Porpax gigantea</i> Deori	E	Herbarium not available	Deori, 1978
351.	<i>Pteroceras teres</i> (Blume) Holtt.	E	D. B. Deb 1896 (CAL)	First time report in present paper
352.	<i>Renanthera imschootiana</i> Rolfe	E	Nanda et al. 00385, 00281 (all at COGCEHR)	Shukla, Baishya, 1979
353.	<i>Rhynchostylis gigantea</i> (Lindl.) Ridl.	E	J. Devi 2383 (Manipur Univ. Herbarium)	Devi, Ghatak, 1984
354.	<i>Rhynchostylis retusa</i> (L.) Blume	E	C. Sathish Kumar 28737 (TBGT)	Devi, Ghatak, 1984
355.	<i>Sarcoglyphis manipurensis</i> Rao et al.	E	H.B. Sharma 596; Nanda and Akimpou 530 (all at COGCEHR). H.B. Sharma 596 (CAL)	Kumar et al., 2016a
356.	<i>Satyrium nepalense</i> D. Don	T	S. K. Mukerjee 3392 (CAL)	Mukerjee, 1953
357.	<i>Schoenorchis fragrans</i> (C. S. P. Parish et Rchb. f.) Seidenf.	E	Chowlu s. n. (acc. no. 367) (COGCEHR)	Devi, Ghatak, 1984
358.	<i>Schoenorchis gemmata</i> (Lindl.) J. J. Sm.	E	Nanda et al. 00118 (COGCEHR)	Chauhan, 2001
359.	<i>Smitinandia micrantha</i> (Lindl.) Holtt.	E	Nanda et al. 642 (COGCEHR)	Nanda et al., 2014c
360.	<i>Spathoglottis pubescens</i> Lindl. var. <i>parvifolia</i> Hook. f.	T	V. Kumar 1657; Nanda et al. s. n. (acc. no. 575) [all at COGCEHR]	Mukerjee, 1953
361.	<i>Spiranthes himalayensis</i> Survesw. et al.	T	S. Surveswaran 1 (HJCB 1001) (JCB)	Surveswaran et al., 2017
362.	<i>Spiranthes sinensis</i> (Pers.) Ames	T	S. K. Mukerjee 3732, 2742 (all at CAL)	Mukerjee, 1953
363.	<i>Taeniophyllum glandulosum</i> Blume	E	Kishor 00002 (COGCEHR)	Nanda et al., 2012a
364.	<i>Tainia latifolia</i> (Lindl.) Rchb. f.	T	D. B. Deb 2583(CAL).	Kumar, Kumar, 2005

End of table

S. No.	Species/ variety	Habit	Voucher specimens record	Reference of first report for the state
365.	<i>Thelasis longifolia</i> Hook. f.	E	Kipgen 00540, Chowlu et al. 1108 (all at COGCEHR)	Chowlu et al., 2014; Rao, 2015
366.	<i>Thelasis pygmaea</i> Lindl.	E	Chowlu et al. s. n. (acc. no. 534) [COGCEHR]	Mao, 1999
367.	<i>Thrixspermum centipeda</i> Lour.	E	Herbarium not available	Chauhan, 2001
368.	<i>Thrixspermum indicum</i> Vik. Kumar et al.	E	Nanda et al. 00015 (COGCEHR)	Kumar et al., 2017
369.	<i>Thunia alba</i> (Lindl.) Rchb. f.	E	Chowlu 00359, 1201; Kishor 00177 (all at COGCEHR)	Mukerjee, 1953
370.	<i>Tropidia curculigoides</i> Lindl.	T	S. K. Mukerjee 3702 (CAL)	Mukerjee, 1953
371.	<i>Tropidia namasiae</i> Liao et al.	T	V. Kumar 1653 (COGCEHR)	Kumar et al., 2015
372.	<i>Uncifera acuminata</i> Lindl.	E	Herbarium not available	Chauhan, 2001
373.	<i>Uncifera obtusifolia</i> Lindl.	E	Nanda et al. 318 (COGCEHR)	Nanda et al., 2013c
374.	<i>Vanda alpina</i> Lindl.	E	A. Mao 101953 (ASSAM)	Mao, 1999
375.	<i>Vanda ampullacea</i> (Roxb.) L. M. Gardiner	E	C. Sathish Kumar 28732 (TBGT)	Clarke, 1889
376.	<i>Vanda bicolor</i> Griff.	E	Nanda 242, 272 (all at COGCEHR)	Nanda et al., 2014c
377.	<i>Vanda coerulea</i> Lindl.	E	Nanda 00070, 00071 (all at COGCEHR). S. K. Mukerjee 3480 (CAL)	Mukerjee, 1953
378.	<i>Vanda coerulescens</i> Griff.	E	N. L. Bor 18456 (K). C. Sathish Kumar 28706 (TBGT).	Devi, Ghatak, 1984
379.	<i>Vanda cristata</i> Lindl.	E	V. Kumar 1678 (COGCEHR)	Chauhan, 2001
380.	<i>Vanda miniata</i> (Lindl.) L. M. Gardiner	E	A. Mao 101990 (ASSAM)	Phukan, Mao, 2002a
381.	<i>Vanda motesiana</i> Choltco (sensu <i>V. stangeana</i>)	E	Nanda et al. 00067 (COGCEHR); Limasena 17006 (NEHU)	Choltco, 2009; Phukan, 1996
382.	<i>Vanda pumila</i> Hook. f.	E	Herbarium not available	Kumar, Kumar, 2005
383.	<i>Vanda testacea</i> (Lindl.) Rchb. f.	E	Kishor et al. 240 (COGCEHR)	Devi, Ghatak, 1984
384.	<i>Vandopsis undulata</i> (Lindl.) J. J. Sm.	E	S. K. Mukerjee 2726 (CAL)	Mukerjee, 1953
385.	<i>Vanilla aphylla</i> Blume	E	C. Sathish Kumar 28270 (TBGT)	Chauhan, 2001, Kumar, Kumar, 2005
386.	<i>Yuania japonica</i> Maxim.	M	Herbarium not available	Hooker, 1890
387.	<i>Zeuxine affinis</i> (Lindl.) Hook. f.	T	V. Kumar 1169, 1170; A. N. Rao 316; Y. Nanda 430 (all at COGCEHR)	Nanda et al., 2014c
388.	<i>Zeuxine nervosa</i> (Lindl.) Trimen	T	Herbarium not available	Clarke, 1889
389.	<i>Zeuxine strateumatica</i> (L.) Schltr.	T	Herbarium not available	Rao, 2007

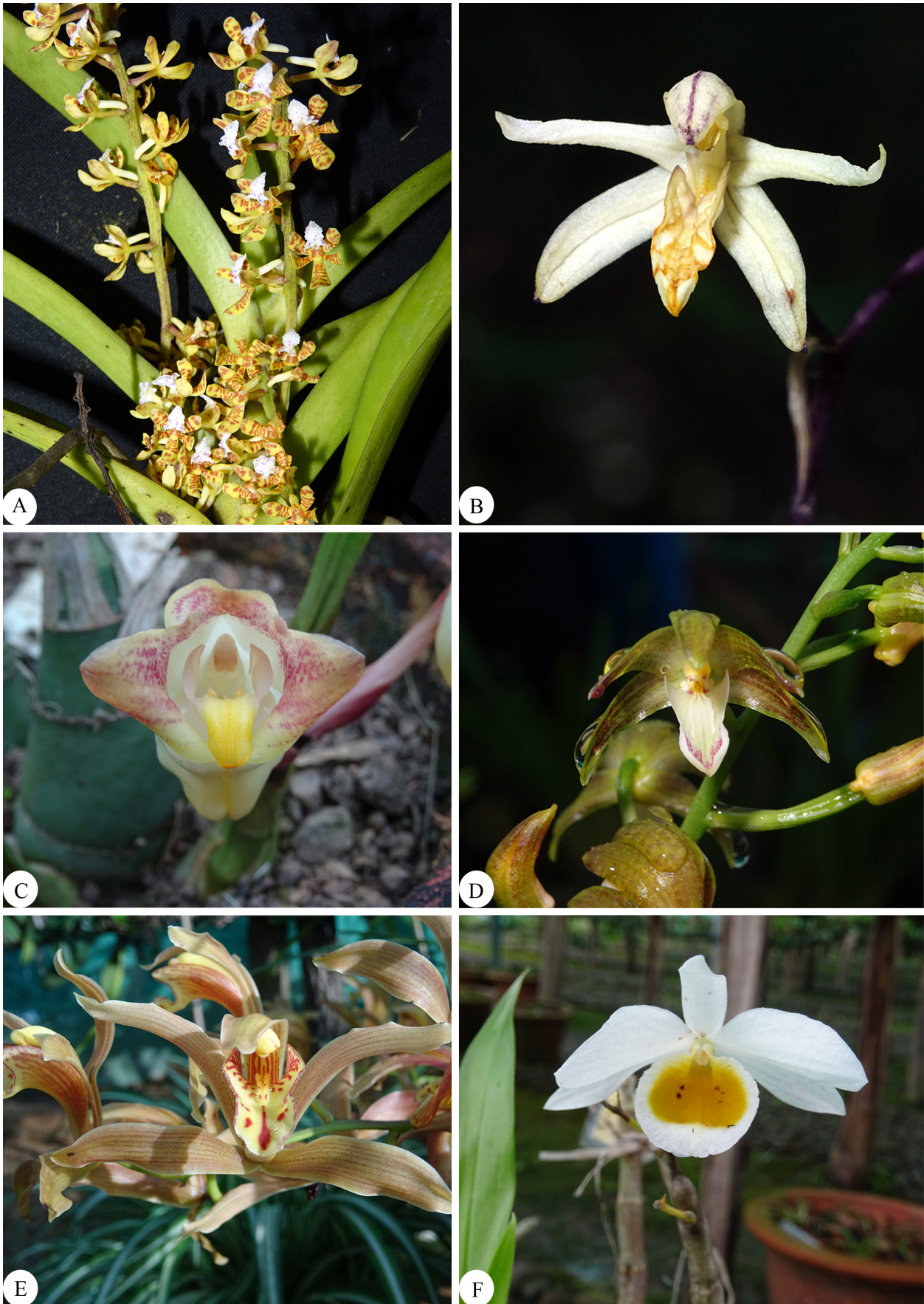


Fig. 2. A – *Acampe ochracea* (Lindl.) Hochr.; B – *Aphyllorchis montana* Rehb. f.; C – *Acanthophippium sylhetense* Lindl.; D – *Chrysoglossum ornatum* Blume; E – *Cymbidium concinnum* Liu et Chen; F – *Dendrobium gratiotissimum* Rehb. f.

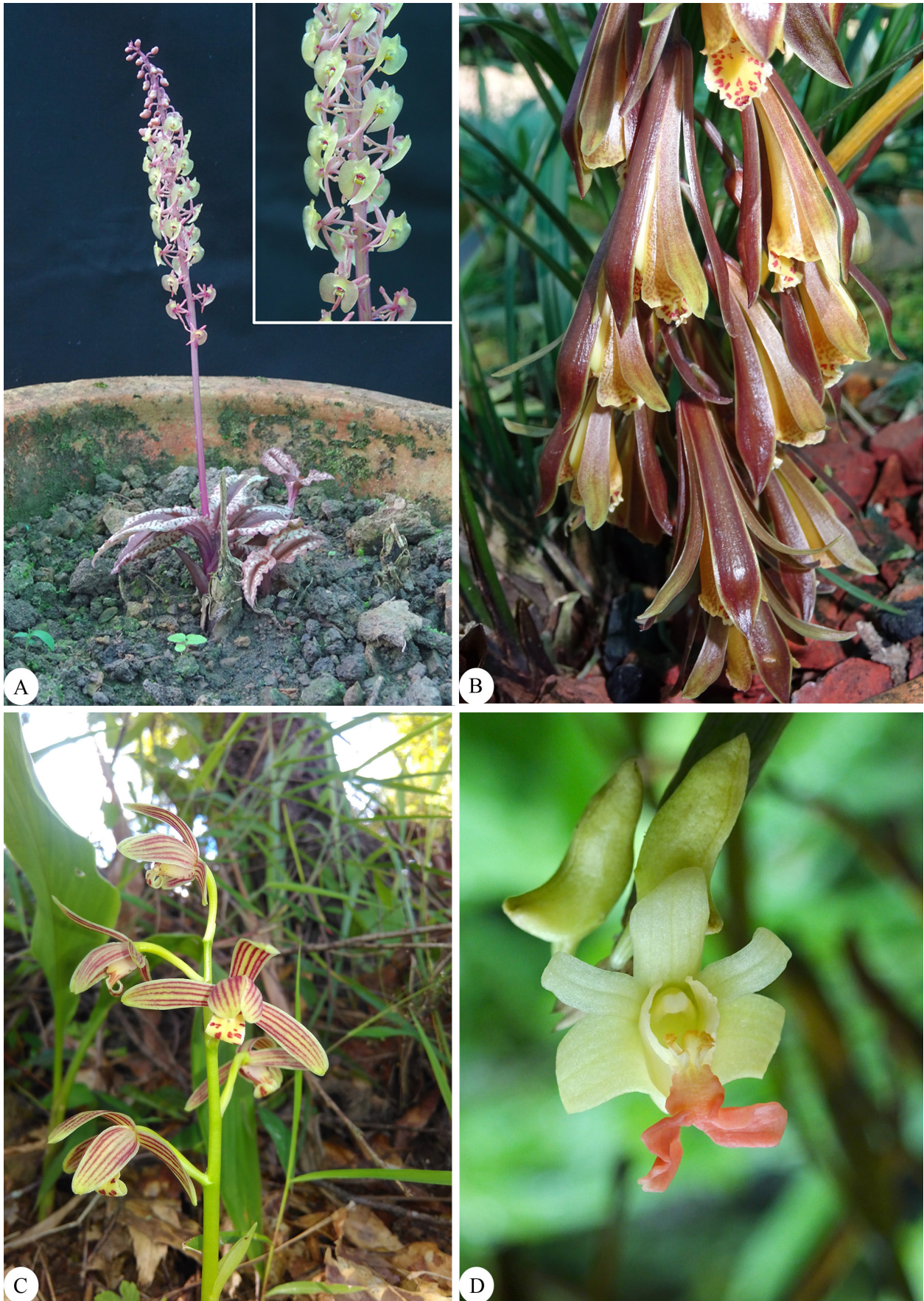


Fig. 3. A – *Crepidium calophyllum* (Rchb. f.) Szlach.; B – *Cymbidium cochleare* Lindl.; C – *Cymbidium nanulum* Wu et S. C. Chen; D – *Dendrobium abhaycharanii* (Phukan et A. A. Mao) Schuit. et P. B. Adams.

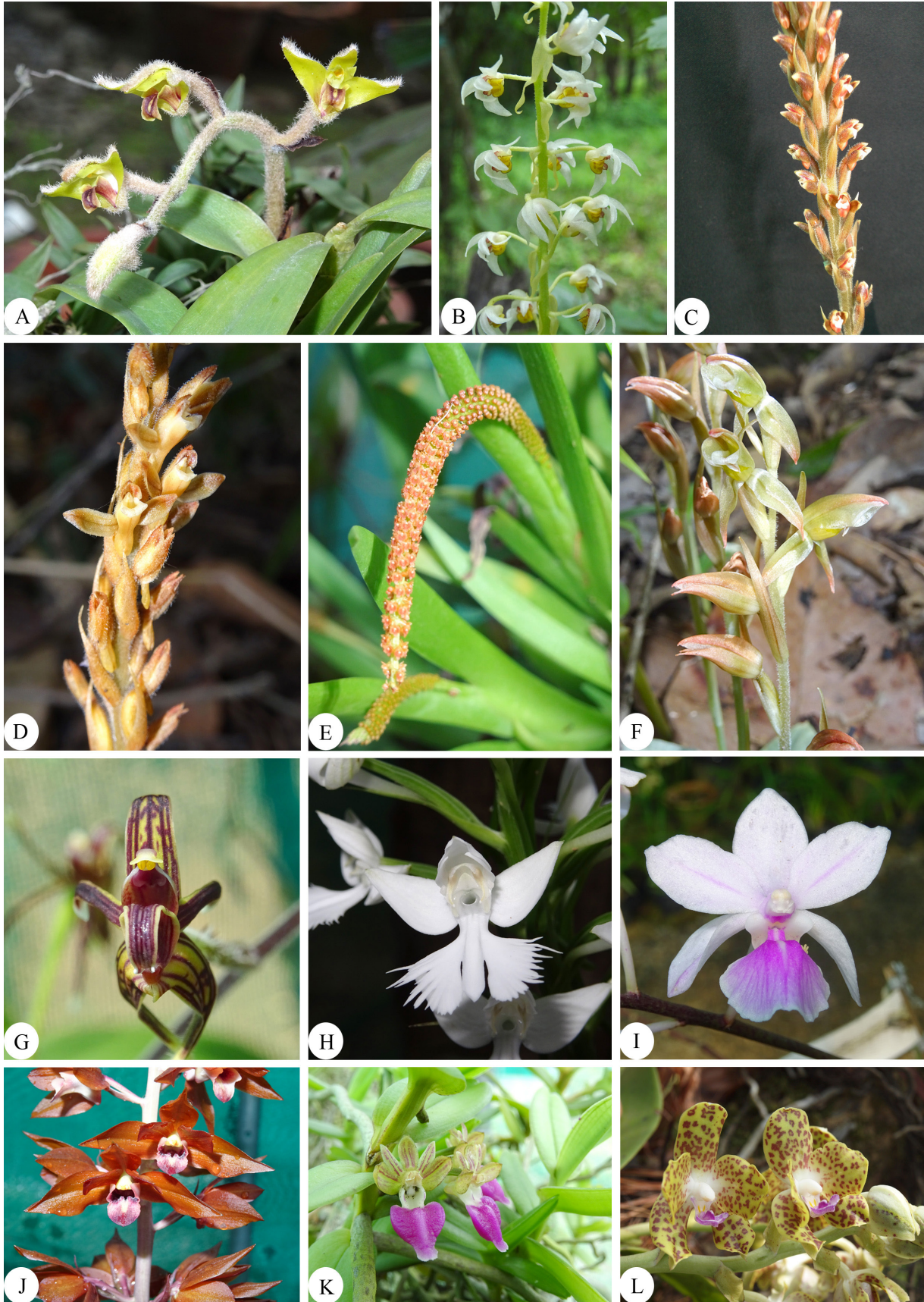


Fig. 4. A – *Eria lasiopetala* (Willd.) Ormerod; B – *Eria sutepensis* Downie; C – *Erythrodes blumei* (Lindl.) Schltr.; D – *Erythrodes hirsuta* (Griff.) Ormerod; E – *Oberonia jenkinsiana* Lindl.; F – *Goodyera viridiflora* (Blume) Dietrich; G – *Eriodes barbata* (Lindl.) Rolfe; H – *Habenaria dentata* (Sw.) Schltr.; I – *Holcoglossum amesianum* (Rchb. f.) Christ.; J – *Eulophia zollingeri* (Rchb.f.) J. J. Sm.; K – *Pelatantheria insectifera* (Rchb. f.) Ridl.; L – *Phalaenopsis hygrochila* J. M. H. Shaw.

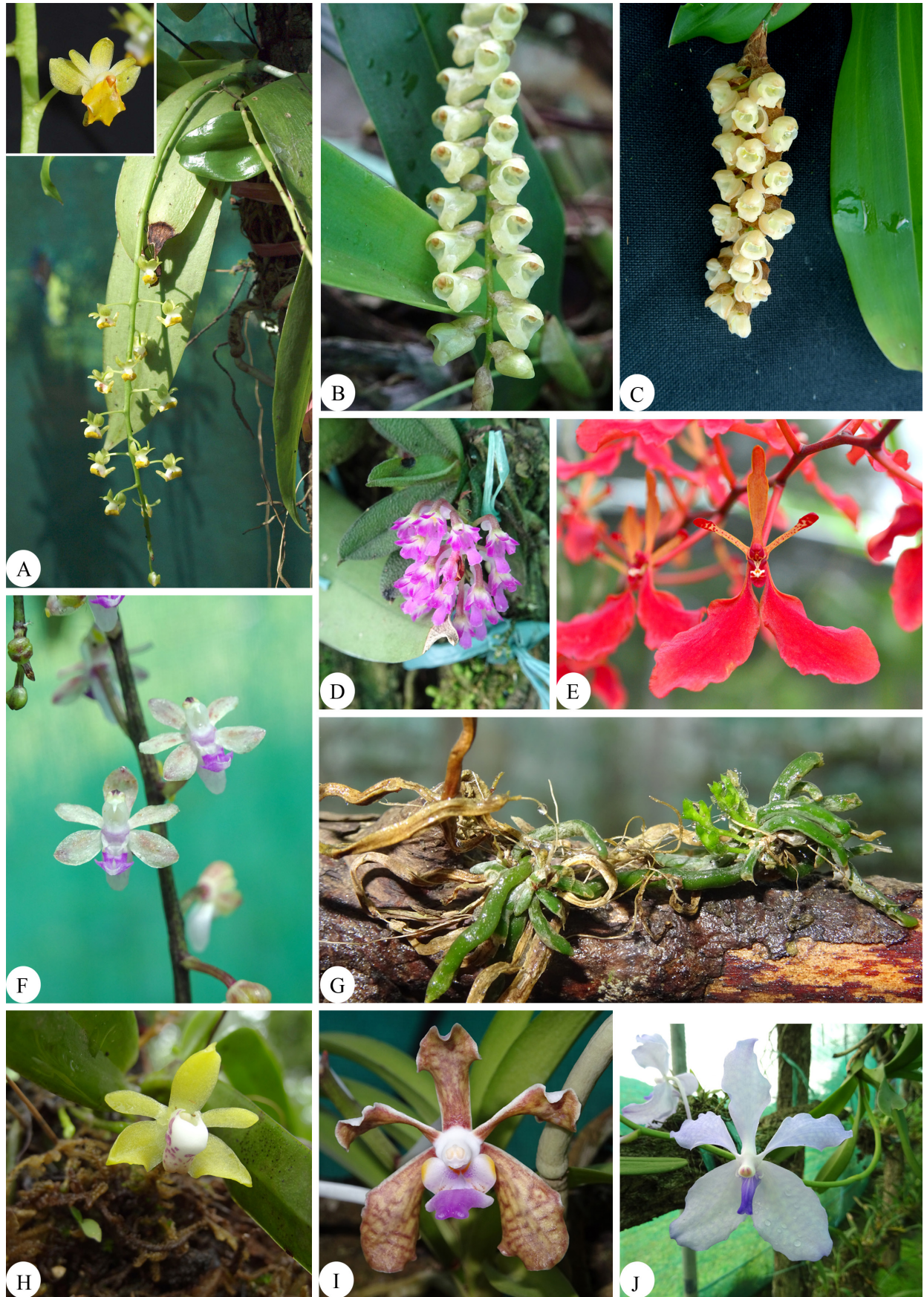


Fig. 5. A – *Phalaenopsis yingjiangensis* (Z. H. Tsi) Kocyan et Schuit; B – *Pholidota pallida* Lindl.; C – *Pholidota pygmaea* H. J. Chowdhery et G. D. Pal; D – *Schoenorchis fragrans* (C. S. P. Parish et Rchb. f.) Seidenf.; E – *Renanthera imschootiana* Rolfe; F – *Sarcoglyphis manipurensis* A. N. Rao et al.; G – *Taeniophyllum glandulosum* Blume; H – *Thrixspermum indicum* Vik. Kumar et al.; I – *Vanda bicolor* Griff.; J – *Vanda coerulea* Lindl.

Results and discussion

Orchid Genera so far reported from Manipur are arranged in the phylogenetic classification (Chase et al., 2015). According to this classification, the 90 genera represent 4 Subfamilies, 13 Tribes and 14 Subtribes as shown below. The number of species known from Manipur and the total number of species in the genus are indicated in parentheses.

Systematic overview

Subfamily: Vanilloideae Szlach.

Tribe: Vanilleae Blume

Genera: *Cyrtosia* Blume (1/5), *Galeola* Lour. (2/6), *Vanilla* Mill. (1/105).

Subfamily: Cyrtopedioideae Kostel.

Genus: *Paphiopedilum* Pfitzer (5/86)

Subfamily: Orchidoideae A. A. Eaton

Tribe: Cranichideae Pfeiff.

Subtribe: Goodyerinae Klotzsch

Genera: *Anoectochilus* Blume (1/43), *Erythrodes* Blume (2/26), *Goodyera* R. Br. (4/98), *Myrmechis* Blume (1/17), *Odontochilus* Blume (2/25), *Zeuxine* Lindl. (3/74).

Subtribe: Spiranthinae Lindl. ex Meisn.

Genus: *Spiranthes* Rich. (2/34)

Tribe: Orchideae Verm.

Subtribe: Orchidinae Verm.

Genera: *Habenaria* Willd. (8/835), *Herminium* L. (1/19), *Pecteilis* Raf. (2/8), *Peristylus* Blume (8/103), *Ponerorchis* Rchb.f. (1/55), *Satyrium* Sw. (1/86),

Subfamily: Epidendroideae Kostel.

Tribe: Neottieae Lindl.

Genera: *Aphyllorchis* Blume (1/22), *Cephalanthera* Rich. (1/19)

Tribe: Tropicidae Dressler

Genera: *Corymborkis* Thouars (1/6), *Tropidia* Lindl. (2/31)

Tribe: Nervilieae Dressler

Subtribe: Nerviliinae Schltr.

Genus: *Nervilia* Gaudich. (4/67).

Tribe: Arethuseae Lindl.

Subtribe: Arethusinae Benth.

Genera: *Anthogonium* Lindl. (1/1), *Arundina* Blume (1/2)

Subtribe: Coelogyninae Benth.

Genera: *Coelogyne* Lindl. (21+1var./200), *Dickasonia* L. O. Williams (1/1), *Neogyna* Rchb. f. (1/1), *Otochilus* Lindl. (3/5), *Panisea* (Lindl.) Lindl. (4/11), *Pholidota* Hook. (7/39), *Pleione* D. Don (4/21), *Thunia* Rchb. f. (1/5).

Tribe: Malaxideae Lindl.

Subtribe: Dendrobiinae Endl.

Genera: *Bulbophyllum* Thouars (39/1867), *Dendrobium* Sw. (66+1var./1509).

Subtribe: Malaxidinae Benth. et Hook. f.

Genera: *Crepidium* Tausch (5/260), *Dienia* Lindl. (1/6), *Liparis* Rich. (11/426), *Oberonia* Lindl. (14+1var./323)

Tribe: Cymbidieae Pfitzer

Subtribe: Cymbidiinae Benth.

Genera: *Cymbidium* Sw. (22/71)

Subtribe: Eulophiinae Benth.

Genera: *Eulophia* R. Br. (5/200), *Geodorum* Andrews (2/12)

Tribe: Epidendreae Lindl.

Subtribe: Calypsoinae Chase et al.

Genus: *Yoania* Maxim. (1/4).

Subtribe: Agrostophyllinae Szlach.

Genus: *Agrostophyllum* Blume (2/100)

Tribe: Collabieae Pfitzer.

Genera: *Acanthephippium* Endl. (1/13), *Ania* Lindl. (2/11), *Calanthe* R. Br. (7/216), *Cephalantheropsis* Guillaumin (2/4), *Chrysoglossum* Blume (1/4), *Eriodes* Rolfe (1/1), *Nephelaphyllum* Blume (1/11), *Pachystoma* Blume (1/3), *Phaius* Lour. (4/45), *Spathoglottis* Blume (1/48), *Tainia* Blume (1/23).

Tribe: Podochileae Pfitzer.

Genera: *Bryobium* Lindl. (1/8), *Callostylis* Blume (2/5), *Ceratostylis* Blume (1/147), *Conchidium* Griff. (1/10), *Cryptochilus* Wall. (2/5), *Eria* Lindl. (9/237), *Mycaranthes* Blume (2/36), *Phreatia* Lindl. (1/211), *Pinalia* Lindl. (6/105), *Porpax* Lindl. (1/13), *Thelasis* Blume (2/26).

Tribe: Vandae Lindl.

Subtribe: Polystachyinae Schltr.

Genus: *Polystachya* Hook. (1/234).

Subtribe: Aeridinae Pfitzer.

Genera: *Acampe* Lindl. (2+1var./8), *Aerides* Lour. (3/25), *Arachnis* Blume (3/14), *Chiloschista* Lindl. (1/20), *Cleisocentron* Brühl (1/6), *Cleisomeria* G. Don (1/2), *Cleisostoma* Blume (9/88), *Gastrochilus* D. Don (5/56), *Holcoglossum* Schltr. (2/14), *Luisia* Gaudich. (4/39), *Papilionanthe* Schltr. (3/11), *Pelatantheria* Ridl. (1/8), *Phalaenopsis* Blume (7/70), *Pteroceras* Hassk. (1/27), *Renanthera* Lour. (1/20), *Rhynchostylis* Blume (2/3), *Sarcoglyphis* Garay. (1/12), *Schoenorchis* Reinw. (2/25), *Smitinandia* Holttum (1/3), *Taeniophyllum* Blume (1/185), *Thrixspermum* Lour. (2/161), *Uncifera* Lindl. (2/6), *Vanda* R. Br. (10/73), *Vandopsis* Pfitzer (1/4).

It may be noticed that the orchid flora of Manipur comprises of 389 taxa (including 5 varieties) belonging to 90 genera. Out of 389 taxa, there are 286 (including 3 var.) epiphytes of 49 genera, 95 (including 2 varieties) terrestrials of 38 genera, 8 mycoheterotrophs of 6 genera. It may be mentioned that some of the epiphytes like *Cymbidium tigrinum*, *Pholidota imbricate*, *P. rubra* etc. are found as lithophytic on moss covered rocks. There are 3 genera with species of mixed habits i. e. *Cymbidium* with 14 epiphytes, 6 terrestrials and 2 mycoheterotrophs; *Liparis* with 11 epiphytes and 1 terrestrial and *Eulophia* with 4 terrestrials and 1 mycotrophic species (Table).

Among larger epiphytic genera, *Dendrobium* tops the list with 67 species and 1 variety followed by *Bulbophyllum* (39), *Coelogyne* (21+1var.), *Oberonia* (14+1var.), *Eria* (9) etc. Among the terrestrials, *Peristylus* (8 species) is the largest followed by *Calanthe* (8), *Habenaria* (8), *Paphiopedilum* (5) etc. Among the 6 mycotrophic genera, *Galeola* and *Cymbidium* are with 2 species each followed by *Aphyllorchis*, *Cyrtosia*, *Eulophia* and *Yoania* with one species each. There are 4 monotypic genera viz. *Anthogonium*, *Dickasonia*, *Eriodes* and *Neogyne* reported so far from the state.

New records for the state

Out of 389 orchids reported so far from Manipur, seven species viz. *Bulbophyllum cornutum* (Blume) Rchb. f.; *Eria tomentosa* (J. Koenig) Hook. f.; *Liparis duthiei* Hook. f.; *Luisia trichorhiza* (Hook.) Blume, *Panisea apiculata* Lindl., *Pholidota rubra* Lindl. and *Pteroceras teres* (Blume) Holtt. have been reported from Manipur for the first time as new records to the state.

Threats and conservation measures

Majority of the orchid species of Manipur are facing a serious threat of extinction in the state mainly due to their natural habitat loss caused by forest clearance for 'Jhum' cultivation or 'shifting cultivation' which is still prevalent among indigenous tribes of N. E. India. It involves slash and burning of certain area of forest to grow required agriculture crop and after harvesting the

crop, that area will be abandoned for certain period of cycle. Thus, they keep on moving to different forest places for this type of cultivation and return to the first place after 5–10 years of cycle depending upon their population. Clearance of forest area for developing new townships, construction of roads and dams for generation of hydro-electricity are also playing considerable role in depletion of wild orchid populations in the state. Further, it has been noticed that ornamental orchids like *Dendrobium densiflorum*, *D. chrysathum*, *Renanthera imschootiana*, *Vanda coerulea* etc. and the species of medicinal importance like *Dendrobium aphyllum*, *D. denudans*, *D. devonianum*, *D. nobile*, *D. fugax* etc. are collected indiscriminately by the local people from the wild on large scale for commercial purpose in the domestic as well as international market. The stems of medicinal orchids are cut into pieces and made into small bundles and smuggled illegally to China via Myanmar at the cost of Rs. 500–1000 (USD 6.99 to 13.99) per kilogram.

It is suggested to bring more amount of orchid rich-forest area of the state under protected area by the state forest department with stringent rules and regulations to preserve the flora *in situ* on one hand, and on the other to check illegal collections from the wild. Wherever, the forest area is owned by the local tribes, those people are to be made aware of the importance of the plants occur in their forest area and their sustainable utilization. Establishment of tissue-culture laboratories in the state should be encouraged by the government to propagate many rare ornamental and medicinal plants on large scale and make available to local farmers and business people which would surely reduce the pressure on wild populations.

Acknowledgements

Sincere thanks are due to Mr. H. Kipgen, President, FEEDS, Hengbung for support and facilities; and to the SEED & KIRAN Division, Department of Science and Technology, Government of India, N. Delhi for financial assistance. Second author extends sincere thanks also to the Director, Botanical Survey of India, Kolkata for encouragement and to Santanu Dey for providing relevant literature.

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