

A check list of angiospermic flora of Chirang Reserve Forest under Manas Biosphere Reserve in Assam, India

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[Received 13.11.2015; Revised 14.12.2015; Accepted 21.12.2015; Published 31.12.2015]

Abstract

Systematic survey carried out in Chirang Reserve Forest of Manas Biosphere Reserve during 2008 to 2010, showed a wide diversity in macrophytic flora. The forest is mainly semi evergreen and moist deciduous type. Accounting the floral macrophytic diversity, occurrence of 427 species of both monocot (81 genera) and dicot (219 genera) plants covering 93 families were recorded. From the point of view of medicinal and economic importance of the plant families, Chirang Reserve forest is under constant threat and conservation measures need to be designed and implemented.

Key words: Chirang Reserve Forest, Manas Biosphere Reserve, Angiospermic diversity.

INTRODUCTION

Assam, the gateway to the North Eastern part of India lies in Himalaya Biodiversity Hotspot zone. In Assam is located the Manas Biosphere Reserve (MBR), one of the eighteen Biosphere Reserves of India, created on 14th March, 1989. Prior to the creation of Biosphere Reserve, it was Manas National Park. Manas got the recognition as a World Heritage site by UNESCO in 1985. In 1992, UNESCO declared it as a world heritage site in danger due to heavy poaching and terrorist activities. On 21st June 2011, it was removed from the List of World Heritage in Danger and was commended for its efforts in preservation (http://en.wikipedia.org/wiki/Manas_National_Park, <http://cpreec.org/pubbook-biosphere>).

MBR, known for its unique and highly rich biodiversity is surrounded by Bhutan and Arunachal Pradesh in the north and in the south there are 201 fringe villages of mostly ethnic communities falling under Kokhrajar, Bongaigaon, Barpeta, Nalbari and Darrang districts of Assam. The river Sankosh demarcate western boundary while the eastern boundary is marked by the Dhansiri river of Darrang district. Geographical location is between 90°48'003 E to 91°15'003 E and 26°36'003 N to 26°49'003 N with altitude ranges from 57 – 280 meters from above the mean sea level. The average annual rainfall in this area is 330 cm and the temperature ranges between 6°C and 36°C (Baruah *et al.* 2003).

The Biosphere Reserve is a combination of number of reserve forests. Some of the reserve forests included under this are Ripu, Chirang, Kachugaon, Kuklung, Manas, Garumara,

Koklabari, Daranga, Khaligduar etc. along with other forest areas. Out of this the angiospermic floral diversity of Chirang Reserve Forest is very rich and is the home for many threatened plant species of Assam (Bhattacharjee *et al* 2014).

The development of database, an essential step in the formulation of conservation strategies for a given area. Thus the present study aims at to investigate the macrophytic flora of Chirang Reserve forest and to prepare a check list of the recorded flora.

STUDY AREA

The Chirang RF of Manas Biosphere Reserve is the oldest reserve forest in Assam constituted by the notification No. 46 of 20th November, 1875. This RF has 593 sq km area, 26° 0.06' 56.05" N to 26° 0.54' 21.95" N Latitude and 90° 0.12' 03.76" E to 90° 0' 29' 07.02" E Longitude and falls under the Haultugaon Forest division of Assam forestry. The division is bounded on the north by an international boundary with Bhutan; on the south it is bounded by the river Brahmaputra; east by the river Bhur, which is also, known as Champamati in the plains and on the west by the Saralbhangra River.

Three seasonal variation can be recognized in the reserve forest as winter (middle of October to February), summer (March to middle of May) and monsoon (At the end of May to September).

MATERIALS AND METHODS

A number of field trips have been conducted in Chirang Reserve Forest under Manas Biosphere Reserve from 2008 – 2010 covering all seasons. Based on the visual survey, each section of the spectacular Reserve Forest was carefully combed to assure all species in the list including those that were scattered or infrequent.

The specimens were collected in flowering and fruiting stage and were preserved as dried herbarium specimen using standard herbarium technique (Jain & Rao 1977). The plants were identified with the help of *Flora of Assam* (Kanjilal *et al.* 1934–1940; Bor 1940), *Flora of British India* (Hooker 1872–1897), other available literatures (Rajkhowa 1961) and by comparing at GUBH. For the up-to-date nomenclature www.theplantlist.org has been largely consulted. The voucher specimens have been deposited in the GUBH.

RESULTS AND DISCUSSION

Systematic survey carried out in Chirang Reserve Forest of MBR during 2008 to 2010, showed a wide diversity in macrophytic flora. The forest is mainly semi evergreen and moist deciduous type (Bhattacharjee *et al* 2014). Accounting the floral macrophytic diversity, occurrence of 427 species of both monocot and dicot under 301 genera of 93 families were recorded. Of these dicot consists of 309 species of 219 genera belonging to 77 families and monocot consists of 119 species 81 genus and 16 families. A good number of plant species have a noted medicinal importance, economic importance, ornamental use etc.

Based on this field survey a check list of the macrophytic flora of the Chirang Reserve Forest under Haultugaon Division of Manas Biosphere Reserve was prepared. Plants recorded from CRF are presented in Tables 1 & 2, alphabetically to their genera and species. And, for each of the species scientific name, family, voucher specimen number and habit are provided for easy understanding.

Table 1. Dicotyledonous plants recorded from Chirang Reserve Forest under Manas Biosphere Reserve

Scientific Name	Family	Voucher specimen	Habit
<i>Abelmoschus manihot</i> var. <i>pungens</i> (Roxburgh) Hochreutiner	Malvaceae	Bhatt.404	Shrub
<i>Acacia caesia</i> var. <i>subnuda</i> (Craib) I.C. Nielson	Leguminosae	Bhatt.689	Tree
<i>Acacia catechu</i> (Linnaeus f.) Willdenow	Leguminosae	Bhatt.668	Tree
<i>Achyranthes aspera</i> Linnaeus	Amaranthaceae	Bhatt.576	Herb
<i>Acilepis saligna</i> (DC.) H. Robinson	Asteraceae	Bhatt.716	Herb
<i>Ageratum conyzoides</i> (Linnaeus) Linnaeus	Asteraceae	Bhatt.819	Herb
<i>Alangium chinense</i> (Loureiro) Harms	Alangiaceae	Bhatt.664	Shrub
<i>Albizia odoratissima</i> (Linnaeus f.) Bentham	Leguminosae	Bhatt.411	Tree
<i>Albizia procera</i> (Roxburgh) Bentham	Leguminosae	Bhatt.620	Tree
<i>Alstonia scholaris</i> (Linnaeus) R. Brown	Apocynaceae	Bhatt. 635	Tree
<i>Alternanthera philoxeroides</i> (Martius) Grisebach	Amaranthaceae	Bhatt.573	Aq.Herb
<i>Alternanthera sessilis</i> (Linnaeus) R. Brown ex DC.	Amaranthaceae	Bhatt.734	Herb
<i>Amaranthus spinosus</i> Linnaeus	Amaranthaceae	Bhatt.464	Herb
<i>Amaranthus tricolor</i> Linnaeus	Amaranthaceae	Bhatt.700	Herb
<i>Amaranthus viridis</i> Linnaeus	Amaranthaceae	Bhatt.825	Herb
<i>Amoora hiernii</i> Viswanathan & Ramachandran	Meliaceae	Bhatt.775	Tree
<i>Ampelocissus barbata</i> (Wallich) Planchon	Vitaceae	Bhatt.725	Climber
<i>Andrographis paniculata</i> (Burman f.) Nees	Acanthaceae	Bhatt.562	Herb
<i>Anisomeles indica</i> (Linnaeus) Kuntze	Lamiaceae	Bhatt.575	Herb
<i>Antidesma acidum</i> Retzius	Phyllanthaceae	Bhatt.800	Tree
<i>Aporosa octandra</i> (Buchanan-Hamilton ex D. Don) Vickery	Phyllanthaceae	Bhatt.583	Tree
<i>Ardisia thomsonii</i> C.C. Mez	Myrsinaceae	Bhatt.540	Shrub
<i>Argemone mexicana</i> Linnaeus	Papaveraceae	Bhatt.751	Herb
<i>Argyreia argentea</i> (Roxburgh) Sweet	Convolvulaceae	Bhatt.718	Climber
<i>Argyreia nervosa</i> (Burman f) Bojer	Convolvulaceae	Bhatt.731	Climber
<i>Argyreia roxburghii</i> (Wallich) Arnott ex Choisy	Convolvulaceae	Bhatt.642	Climber
<i>Artemisia nilagirica</i> (C.B. Clarke) Pampanini	Asteraceae	Bhatt.533	Herb
<i>Artocarpus chama</i> Buchanan-Hamilton	Moraceae	Bhatt.588	Tree
<i>Artocarpus gomezianus</i> Wallich ex Trecul	Moraceae	Bhatt.701	Tree
<i>Azadirachta indica</i> A. Jussieu	Meliaceae	Bhatt.756	Tree
<i>B. stipularis</i> (Linnaeus) Blume	Phyllanthaceae	Bhatt.794	Tree
<i>Baliospermum solanifolium</i> (Burman) Suresh	Euphorbiaceae	Bhatt.584	Shrub
<i>Barleria cristata</i> Linnaeus	Acanthaceae	Bhatt.519	Shrub
<i>Bauhinia purpurea</i> Linnaeus	Leguminosae	Bhatt.669	Tree
<i>Bauhinia scandens</i> Linnaeus	Leguminosae	Bhatt.607	Climber
<i>Bauhinia vahlii</i> Wight & Arnott	Leguminosae	Bhatt.665	Climber

Scientific Name	Family	Voucher specimen	Habit
<i>Bauhinia variegata</i> Linnaeus	Leguminosae	Bhatt.706	Tree
<i>Biden biternata</i> (Loureiro) Merrill & Sherff	Asteraceae	Bhatt.742	Herb
<i>Biophytum reinwardtii</i> (Zuccarini) Klotzsch	Geraniaceae	Bhatt.406	Herb
<i>Bischofia javanica</i> Blume	Phyllanthaceae	Bhatt.795	Tree
<i>Blumea fistulosa</i> (Roxburgh) Kurz	Asteraceae	Bhatt.820	Herb
<i>Blumea laciniata</i> (Wallich ex Roxburgh) DC.	Asteraceae	Bhatt.694	Herb
<i>Boerhaavia diffusa</i> Linnaeus	Nyctaginaceae	Bhatt.514	Herb
<i>Bombax ceiba</i> Linnaeus	Bombacaceae	Bhatt.723	Tree
<i>Breonia chinensis</i> (Lamarck) Capuron	Rubiaceae	Bhatta.763	Tree
<i>Breynia vitis-idaea</i> (Burman f.) C.E.C. Fischer	Phyllanthaceae	Bhatt.793	Tree
<i>Bridelia retusa</i> (Linnaeus) A. Jussieu	Phyllanthaceae	Bhatt.478	Tree
<i>Buddleja asiatica</i> Loureiro	Loganiaceae	Bhatt.788	Herb
<i>Butea monosperma</i> (Lamarck) P. Taubert	Leguminosae	Bhatt.673	Tree
<i>Byttneria grandifolia</i> A. DC.	Byttneriaceae	Bhatt.589	Climber
<i>C. viscosa</i> Linnaeus	Capparaceae	Bhatt.403	Herb
<i>Cajanus scarabaeoides</i> (Linnaeus) Thouars	Leguminosae	Bhatt.712	Climber
<i>Callicarpa arborea</i> Roxburgh	Lamiaceae	Bhatt.568	Tree
<i>Callicarpa longifolia</i> Lamarck	Lamiaceae	Bhatt.733	Tree
<i>Callicarpa macrophylla</i> Vahl	Lamiaceae	Bhatt.651	Shrub
<i>Calotropis acia</i> Buchanan-Hamilton	Asclepiadaceae	Bhatt.641	Shrub
<i>Calotropis gigantea</i> (Linnaeus) Dryander	Asclepiadaceae	Bhatt.442	Shrub
<i>Cannabis sativa</i> Linnaeus	Cannabaceae	Bhatt.778	Shrub
<i>Capparis spinosa</i> Linnaeus	Capparaceae	Bhatt.598	Shrub
<i>Cardiospermum halicacabum</i> Linnaeus	Sapindaceae	Bhatt.757	Herb
<i>Careya arborea</i> Roxburgh	Lecythidaceae	Bhatt.690	Tree
<i>Cassia fistula</i> Linnaeus	Leguminosae	Bhatt.608	Tree
<i>Catunaregam spinosa</i> (Thunberg) Tirvengadam	Rubiaceae	Bhatt.532	Herb
<i>Celosia argentea</i> Linnaeus	Amaranthaceae	Bhatt.578	Herb
<i>Chamaecrista mimosoides</i> (Linnaeus) Greene	Leguminosae	Bhatt.727	Climber
<i>Chromolaena odorata</i> (Linnaeus) R.M. King & H. Robinson	Asteraceae	Bhatt.695	Herb
<i>Cinnamomum glaucescens</i> (Nees) Handel-Mazzetti	Lauraceae	Bhatt.801	Tree
<i>Cinnamomum verum</i> J. Presl	Lauraceae	Bhatt.582	Tree
<i>Cissampelos pareira</i> Linnaeus	Menispermaceae	Bhatt.597	Climber
<i>Cissus adnata</i> Roxburgh	Vitaceae	Bhatt.812	Climber
<i>Cissus assamica</i> (M.A.Lawson) Craib	Vitaceae	Bhatt.767	Climber
<i>Cissus paniculata</i> (Balfour) Planchon	Vitaceae	Bhatt.780	Climber
<i>Cissus quadrangularis</i> Linnaeus	Vitaceae	Bhatt.811	Climber
<i>Clematis gouriana</i> Roxburgh ex DC.	Ranunculaceae	Bhatt.441	Climber
<i>Cleome scaposa</i> DC.	Capparaceae	Bhatt.683	Herb
<i>Clerodendrum indicum</i> (Linnaeus) Kuntze	Lamiaceae	Bhatt.457	Shrub

Scientific Name	Family	Voucher specimen	Habit
<i>Clodendrum infortunatum</i> Linnaeus	Lamiaceae	Bhatt.822	Shrub
<i>Coffea benghalensis</i> B. Heyne ex Schultes	Rubiaceae	Bhatt.784	Shrub
<i>Cotula hemispherica</i> (Roxburgh) Babu	Asteraceae	Bhatt.430	Herb
<i>Crassocephalum crepidioides</i> (Bentham) S. Moore	Asteraceae	Bhatt.535	Herb
<i>Crotalaria aessiliflora</i> Linnaeus	Leguminosae	Bhatt.672	Shrub
<i>Crotalaria albida</i> Roth	Leguminosae	Bhatt.817	Shrub
<i>Crotalaria juncea</i> Linnaeus	Leguminosae	Bhatt.748	Shrub
<i>Crotalaria micans</i> Link	Leguminosae	Bhatt.686	Shrub
<i>Croton caudatus</i> Geiseler	Euphorbiaceae	Bhatt.766	Tree
<i>Cryptolepis dubia</i> (Burman f.)M.R. Almeida	Asclepiadaceae	Bhatt.545	Climber
<i>Cuphea carthagenensis</i> (Jacquin) J.F. Macbride	Lythraceae	Bhatt.412	Herb
<i>Cuscuta reflexa</i> Roxburgh	Convolvulaceae	Bhatt.643	Climber
<i>Cyanthillium cinereum</i> (Linnaeus) H. Robinson	Asteraceae	Bhatt.696	Herb
<i>Cyathula prostrata</i> (Linnaeus) Blume	Amaranthaceae	Bhatt.802	Herb
<i>Cynoglossum zeylanicum</i> (Vahl) Brand	Boraginaceae	Bhatt.445	Herb
<i>Dalbergia sissoo</i> DC.	Leguminosae	Bhatt.614	Tree
<i>Datura metel</i> Linnaeus	Solanaceae	Bhatt.644	Shrub
<i>Deeringia amaranthoides</i> (Lamarck) Merrill	Amaranthaceae	Bhatt.805	Herb
<i>Dentella repens</i> (Linnaeus) J.R. Forster & G. Forster	Rubiaceae	Bhatt.744	Herb
<i>Derris indica</i> (Lamarck) Bennett	Leguminosae	Bhatt.783	Tree
<i>Derris robusta</i> (DC.) Bentham	Leguminosae	Bhatt.726	Herb
<i>Desmodium gangeticum</i> (Linnaeus) DC.	Leguminosae	Bhatt.818	Herb
<i>Desmodium griffithianum</i> Bentham	Leguminosae	Bhatt.612	Shrub
<i>Desmodium heterocarpon</i> (Linnaeus) DC.	Leguminosae	Bhatt.409	Herb
<i>Desmodium heterophyllum</i> (Willdenow) DC.	Leguminosae	Bhatt.615	Herb
<i>Desmodium laxiflorum</i> DC.	Leguminosae	Bhatt.671	Herb
<i>Desmodium triangulare</i> (Retzius) A. Schindler	Leguminosae	Bhatt.616	Herb
<i>Desmodium triflorum</i> (Linnaeus) DC.	Leguminosae	Bhatt.610	Herb
<i>Dichrocephala integrifolia</i> (Linnaeus f.) Kuntz	Asteraceae	Bhatt.661	Herb
<i>Dicliptera chinensis</i> (Linnaeus) A. Jussieu	Acanthaceae	Bhatt.454	Herb
<i>Dillenia indica</i> Linnaeus	Dilleniaceae	Bhatt.402	Tree
<i>Dillenia pentagyna</i> Roxburgh	Dilleniaceae	Bhatt.500	Tree
<i>Dioscorea alata</i> Linnaeus	Dioscoreaceae	Bhatt.520	Climber
<i>Dioscorea bulbifera</i> Linnaeus	Dioscoreaceae	Bhatt.654	Herb
<i>Dipterocarpus retusus</i> Blume	Dipterocarpaceae	Bhatt.782	Tree
<i>Drymaria cordata</i> (Linnaeus) Willdenow ex Schultes	Capparaceae	Bhatt.752	Herb
<i>Drypetes eglandulosa</i> (Roxburgh) Pax & K. Hoffmann	Euphorbiaceae	Bhatt.703	Tree
<i>Duabanga grandiflora</i> (DC.) Walpers	Lythraceae	Bhatt.704	Tree
<i>Duchesnea indica</i> Wallich (Andrew) Focke	Rosaceae	Bhatt.667	Herb
<i>Dysoxylum gotadhora</i> (Buchanan-Hamilton) Mabbarley	Meliaceae	Bhatt.768	Tree

Scientific Name	Family	Voucher specimen	Habit
<i>Eclipta prostrata</i> (Linnaeus) Linnaeus	Asteraceae	Bhatt.786	Herb
<i>Elaeocarpus floribundus</i> Blume	Elaeocarpaceae	Bhatt.505	Tree
<i>Elephantopus scaber</i> Linnaeus	Asteraceae	Bhatt.639	Herb
<i>Emilia sonchifolia</i> (Linnaeus) DC. ex DC.	Asteraceae	Bhatt.764	Herb
<i>Erigeron bonariensis</i> Linnaeus	Asteraceae	Bhatt.741	Herb
<i>Euphorbia heyneana</i> Sprengel	Euphorbiaceae	Bhatt.510	Herb
<i>Euphorbia hirta</i> Linnaeus	Euphorbiaceae	Bhatt.792	Herb
<i>Evolvulus nummularius</i> (Linnaeus) Linnaeus	Convolvulaceae	Bhatt.548	Herb
<i>Flemingia macrophylla</i> (Willdenow) Merrill	Leguminosae	Bhatt.713	Shrub
<i>Flemingia strobilifera</i> (Linnaeus) W.T. Aiton	Leguminosae	Bhatt.747	Shrub
<i>Glochidion ellipticum</i> Wight	Phyllanthaceae	Bhatt.585	Tree
<i>Glochidion multiloculare</i> (Rottler ex Willdenow) Voigt	Phyllanthaceae	Bhatt.790	Tree
<i>Glycosmis pentaphylla</i> (Retzius) DC.	Rutaceae	Bhatt.755	Shrub
<i>Gmelina arborea</i> Roxburgh	Lamiaceae	Bhatt.823	Tree
<i>Grewia eriocarpa</i> Jussieu	Tiliaceae	Bhatt.680	Shrub
<i>Grewia sapida</i> Roxburgh ex DC.	Tiliaceae	Bhatt.750	Herb
<i>Hedyotis coronaria</i> (Kurz) Craib	Rubiaceae	Bhatt.729	Herb
<i>Hedyotis costata</i> R. Brown ex G. Don	Rubiaceae	Bhatt.531	Herb
<i>Heliotropium indicum</i> Linnaeus	Boraginaceae	Bhatt.546	Herb
<i>Hiptage bengalensis</i> (Linnaeus) Kurz	Malpighiaceae	Bhatt.776	Herb
<i>Hodgsonia macrocarpa</i> (Blume) Cogniaux	Cucurbitaceae	Bhatt.705	Climber
<i>Holarrhena pubescens</i> Wallich ex G. Don	Apocynaceae	Bhatt.638	Medium size tree
<i>Holmskioldia sanguinea</i> Retzius	Lamiaceae	Bhatt.570	Shrub
<i>Hyptis suaveolens</i> (Linnaeus) Poiteau	Lamiaceae	Bhatt.572	Herb
<i>Ichnocarpus frutescens</i> (Linnaeus) W.T. Aiton	Apocynaceae	Bhatt.543	Climber
<i>Impatiens tripetala</i> Roxburgh ex DC.	Balsaminaceae	Bhatt.711	Herb
<i>Ipomoea aquatica</i> Forsskal	Convolvulaceae	Bhatt.658	Aq. Herb
<i>Ipomoea carnea</i> Jacquine	Convolvulaceae	Bhatt.447	Aq. Herb
<i>Ipomoea quamoclit</i> Linnaeus	Convolvulaceae	Bhatt.521	Climber
<i>Isodon ternifolius</i> (D. Don) Kudo	Lamiaceae	Bhatt.739	Herb
<i>Ixora acuminata</i> Roxburgh	Rubiaceae	Bhatt.420	Shrub
<i>Justicia adhatoda</i> Linnaeus	Acanthaceae	Bhatt.649	Shrub
<i>Knoxia sumatrensis</i> (Retzius) DC.	Rubiaceae	Bhatt.693	Shrub
<i>Kydia calycina</i> Roxburgh	Malvaceae	Bhatt.682	Tree
<i>Lactuca indica</i> Linnaeus	Asteraceae	Bhatt.537	Herb
<i>Lagerstroemia parviflora</i> Roxburgh	Lythraceae	Bhatt.624	Tree
<i>Lagerstroemia speciosa</i> (Linnaeus) Persoon	Lythraceae	Bhatt.691	Tree
<i>Lantana camara</i> Linnaeus	Verbenaceae	Bhatt.652	Herb
<i>Laphangium luteoalbum</i> (Linnaeus) Tzvelev	Asteraceae	Bhatt.432	Herb

Scientific Name	Family	Voucher specimen	Habit
<i>Leea acuminata</i> Wallich ex Clarke	Leeaceae	Bhatt. 749	Shrub
<i>Leea aequata</i> Linnaeus	Leeaceae	Bhatt.675	Herb
<i>Leea alata</i> Edgeworth	Leeaceae	Bhatt.813	Shrub
<i>Leea asiatica</i> (Linnaeus) Ridsdale	Leeaceae	Bhatt.707	Shrub
<i>Leea macrophylla</i> Roxburgh ex Horneman	Leeaceae	Bhatt.815	Shrub
<i>Leptopus cordifolius</i> J. Decaisne	Phyllanthaceae	Bhatt.765	Tree
<i>Leucas aspara</i> (Roth) Sprengel	Lamiaceae	Bhatt.738	Herb
<i>Leucas lavandulifolia</i> J.E. Smith	Lamiaceae	Bhatt.577	Herb
<i>Limnophila sessiliflora</i> (Vahl) Blume	Plantaginaceae	Bhatt.719	Herb
<i>Lindernia crustacea</i> (Linnaeus).F. Mueller	Linderniaceae	Bhatt.740	Herb
<i>Lindernia ruellioides</i> (Colsman) Pennell	Linderniaceae	Bhatt.698	Herb
<i>Lindernia viscosa</i> (Horneman) Merrill	Linderniaceae	Bhatt.555	Herb
<i>Linnea grandis</i> A. Rishdale	Anacardiaceae	Bhatt.781	Tree
<i>Lippia javanica</i> (Burman f.) Sprengel	Verbenaceae	Bhatt.459	Shrub
<i>Litsea glutinosa</i> (Loureiro) C.B. Robson	Lauraceae	Bhatt.797	Tree
<i>Litsea monopetala</i> (Roxburgh) Persoon	Lauraceae	Bhatt.798	Tree
<i>Litsea salicifolia</i> (Roxburgh ex Nees) Hooker f.	Lauraceae	Bhatt.799	Tree
<i>Ludwigia adscendens</i> (Linnaeus) H. Hara	Onagraceae	Bhatt.529	Aq. Herb
<i>Ludwigia hyssopifolia</i> (G. Don) A.W. Exell	Onagraceae	Bhatt.745	Shrub
<i>Ludwigia octovalvis</i> subsp. <i>sessiliflora</i> (Michali) P.H. Raven	Onagraceae	Bhatt.626	Aq. Herb
<i>Macaranga denticulate</i> (Blume) Müeller Argoviensis	Euphorbiaceae	Bhatt.480	Shrub
<i>Macrosolen cochinchinensis</i> (Loureiro) van Tieghem	Loranthaceae	Bhatt.475	Tree
<i>Maesa indica</i> (Roxburgh) A.DC.	Myrsinaceae	Bhatt.633	Shrub
<i>Magnolia champaca</i> (Linnaeus) Baillon ex Pierre	Magnoliaceae	Bhatt.592	Tree
<i>Magnolia griffithii</i> Hooker f. & Thomson	Magnoliaceae	Bhatt.595	Tree
<i>Magnolia hookeri</i> (Cubitt & W.W. Smith) D.C.S. Raju & M.P. Nayar	Magnoliaceae	Bhatt.600	Tree
<i>Magnolia pterocarpa</i> Roxburgh	Magnoliaceae	Bhatt.502	Tree
<i>Mallotus pallidus</i> (Airy Shaw) Airy Shaw	Euphorbiaceae	Bhatt.587	Tree
<i>Mallotus repandus</i> (Willdenow) Müeller Argoviensis	Euphorbiaceae	Bhatt.481	Tree
<i>Mallotus roxburghianus</i> Müeller Argoviensis	Euphorbiaceae	Bhatt.702	Tree
<i>Mangifera indica</i> Linnaeus	Anacardiaceae	Bhatt.760	Tree
<i>Mangifera sylvatica</i> Roxburgh	Anacardiaceae	Bhatt.408	Tree
<i>Mazus pumilus</i> (Burman f.) Steenis	Phrymaceae	Bhatt.450	Herb
<i>Melastoma malabathricum</i> Linnaeus	Melastomataceae	Bhatt.666	Shrub
<i>Merremia mammosa</i> (Loureiro) Hallier f.	Convolvulaceae	Bhatt.552	Climber
<i>Merremia umbellata</i> (Linnaeus) Hallier f.	Convolvulaceae	Bhatt.550	Climber
<i>Mesua ferrea</i> Linnaeus	Clusiaceae	Bhatt.769	Tree
<i>Meyna laxiflora</i> Robyns	Rubiaceae	Bhatt.426	Shrub

Scientific Name	Family	Voucher specimen	Habit
<i>Meyna spinosa</i> Roxburgh ex Link	Rubiaceae	Bhatt.631	Shrub
<i>Micromelum mintum</i> Merrill	Rutaceae	Bhatt.678	Small Tree
<i>Mikania micrantha</i> Kunth	Asteraceae	Bhatt.787	Climber
<i>Mikania scandens</i> (Linnaeus) Willd.	Asteraceae	Bhatt.730	Climber
<i>Millettia pachycarpa</i> Benth	Leguminosae	Bhatt.605	Shrub
<i>Mimosa himalayana</i> Gamble	Leguminosae	Bhatt.603	Shrub
<i>Mimosa pudica</i> Linnaeus	Leguminosae	Bhatt.714	Herb
<i>Mimosa rubicaulis</i> Lamarck	Leguminosae	Bhatt.762	Stragling Shrub
<i>Momordica dioica</i> Roxburgh ex Willdenow	Cucurbitaceae	Bhatt.530	Climber
<i>Moringa oleifera</i> Lamarck	Moringaceae	Bhatt.685	Tree
<i>Mosla dianthera</i> (Buchanan-Hamilton ex Roxburgh) Maximowicz	Lamiaceae	Bhatt.699	Herb
<i>Mucuna pruriens</i> (Linnaeus) DC.	Leguminosae	Bhatt.670	Shrub
<i>Mucuna pruriens</i> (Linnaeus) DC.	Leguminosae	Bhatt.482	Climber
<i>Mukia maderaspatana</i> (Linnaeus) M. Roemer	Cucurbitaceae	Bhatt.627	Climber
<i>Murraya koenigii</i> (Linnaeus) Sprengel	Rutaceae	Bhatt.708	Shrub
<i>Mussaenda roxburghii</i> Hooker f.	Rubiaceae	Bhatt.785	Shrub
<i>Nymphaea nouchali</i> Burman f.	Nymphaeaceae	Bhatt.722	Herb
<i>Nymphoides cristata</i> (Roxburgh) Kuntze	Menyanthaceae	Bhatt.659	Aq. Herb
<i>Ocimum tenuiflorum</i> Linnaeus	Lamiaceae	Bhatt.806	Herb
<i>Oenanthe javanica</i> (Blume) DC.	Apiaceae	Bhatt.692	Herb
<i>Olax nana</i> Wallich ex Benth.	Olacaceae	Bhatt.677	Herb
<i>Oldenlandia corymbosa</i> Linnaeus	Rubiaceae	Bhatt.629	Herb
<i>Oroxylum indicum</i> (Linnaeus) Kurz	Bignoniaceae	Bhatt.558	Tree
<i>Osbeckia nepalensis</i> Hooker f.	Melastomataceae	Bhatt.527	Shrub
<i>Osbeckia nutans</i> Wallich ex C.B. Clarke	Melastomataceae	Bhatt.715	Herb
<i>Osbeckia stellata</i> Buchanan-Hamilton ex Ker Gawler	Melastomataceae	Bhatt.623	Herb
<i>Oxalis corniculata</i> Linnaeus	Oxalidaceae	Bhatt.724	Herb
<i>Oxalis debilis</i> var. <i>corymbosa</i> (DC.) Lourteig	Oxalidaceae	Bhatt.774	Herb
<i>Paederia foetida</i> Linnaeus	Rubiaceae	Bhatt.743	Climber
<i>Peperomia pellucida</i> (Linnaeus) Kunth	Piperaceae	Bhatt.826	Herb
<i>Persicaria barbata</i> (Linnaeus) H. Hara	Polygonaceae	Bhatt.467	Herb
<i>Persicaria capitata</i> Buchanan-Hamilton	Polygonaceae	Bhatt.512	Herb
<i>Persicaria chinense</i> Linnaeus	Polygonaceae	Bhatt.470	Herb
<i>Persicaria hydropiper</i> (Linnaeus) Delarbre	Polygonaceae	Bhatt.580	Aq. Herb
<i>Phaulopsis dorsiflora</i> (Retzius) Santapau	Acanthaceae	Bhatt.653	Herb
<i>Phyla nodiflora</i> (Linnaeus) Greene	Verbenaceae	Bhatt.827	Herb
<i>Phyllanthus debilis</i> Klein ex Willdenow	Phyllanthaceae	Bhatt.791	Herb
<i>Phyllanthus emblica</i> Linnaeus	Phyllanthaceae	Bhatt.736	Tree
<i>Phyllanthus fraternus</i> G.L. Webster	Phyllanthaceae	Bhatt.507	Herb

Scientific Name	Family	Voucher specimen	Habit
<i>Phyllanthus virgatus</i> G. Forster	Phyllanthaceae	Bhatt.735	Herb
<i>Phyllodium pulchellum</i> (Linnaeus) Desvaux	Leguminosae	Bhatt.687	Herb
<i>Physalis minima</i> Linnaeus	Solanaceae	Bhatt.717	Herb
<i>Piper longum</i> Linnaeus	Piperaceae	Bhatt.803	Climber
<i>Piper mullesua</i> Buchanan-Hamilton ex D. Don	Piperaceae	Bhatt.472	Climber
<i>Piper nigrum</i> Linnaeus	Piperaceae	Bhatt.804	Climber
<i>Pogostemon auricularius</i> (Linnaeus) Hasskarl	Lamiaceae	Bhatt.462	Herb
<i>Polyalthia simiarum</i> (Buchanan-Hamilton ex Hooker f. & Thomson) Bentham ex Hooker f. & Thomson	Annonaceae	Bhatt.401	Medium Tree
<i>Polygonum posumbu</i> Buchanan-Hamilton ex D. Don	Polygonaceae	Bhatt.737	Herb
<i>Portulaca oleracea</i> Linnaeus	Portulacaceae	Bhatt.599	Herb
<i>Premna bengalensis</i> C.B. Clarke	Lamiaceae	Bhatt.807	Herb
<i>Premna cordifolia</i> Roxburgh	Lamiaceae	Bhatt.517	Herb
<i>Premna herbacea</i> Roxburgh	Lamiaceae	Bhatt.579	Herb
<i>Pterospermum acerifolium</i> (Linnaeus) Willdenow	Sterculiaceae	Bhatt.771	Herb
<i>Rauwolfia serpentina</i> (Linnaeus) Bentham ex Kurz	Apocynaceae	Bhatt.440	Herb
<i>Rhamnus napalensis</i> (Wallich) M.A. Lowson	Rhamnaceae	Bhatt.814	Tree
<i>Ricinus communis</i> Linnaeus	Euphorbiaceae	Bhatt.789	Shrub
<i>Rorippa indica</i> (Linnaeus) Hiern	Brassicaceae	Bhatt.773	Herb
<i>Rothea serrata</i> (Linnaeus) Steane & Mabbarley	Lamiaceae	Bhatt.569	Shrub
<i>Rungia pectinata</i> (Linnaeus) Nees	Acanthaceae	Bhatt.720	Herb
<i>Scoparia dulcis</i> Linnaeus	Plantaginaceae	Bhatt.809	Herb
<i>Semecarpus anacardium</i> Linnaeus f.	Anacardiaceae	Bhatt.816	Tree
<i>Senecio analogus</i> DC.	Asteraceae	Bhatt.632	Herb
<i>Senecio diversifolius</i> Wall.	Asteraceae	Bhatt.637	Herb
<i>Senna occidentalis</i> (Linnaeus) Link	Leguminosae	Bhatt.746	Herb
<i>Senna siamea</i> Lamarck	Leguminosae	Bhatt.619	Tree
<i>Senna sophera</i> Linnaeus	Leguminosae	Bhatt.604	Herb
<i>Senna tora</i> Linnaeus	Leguminosae	Bhatt.609	Herb
<i>Shorea robusta</i> Gaertner	Dipterocarpaceae	Bhatt.679	Tree
<i>Sida acuta</i> Burman f.	Malvaceae	Bhatt.681	Herb
<i>Sida cordata</i> (Burman f.) Borssum Waalkes	Malvaceae	Bhatt.753	Herb
<i>Sida cordata</i> (Burman f.) Borssum-Waalkes	Malvaceae	Bhatt.759	Herb
<i>Solanum americanum</i> Miller	Solanaceae	Bhatt.810	Herb
<i>Solanum myriacanthum</i> Dunal	Solanaceae	Bhatt.554	Shrub
<i>Solanum torvum</i> Swartz	Solanaceae	Bhatt.657	Shrub
<i>Solena heterophylla</i> Loureiro	Cucurbitaceae	Bhatt.663	Climber
<i>Sonchus oleraceus</i> (Linnaeus) Linnaeus	Asteraceae	Bhatt.640	Herb
<i>Spatholobus parviflorus</i> (DC.) Kuntze	Leguminosae	Bhatt. 613	Tree
<i>Spermaceoce neohispida</i> Govaerts	Rubiaceae	Bhatt.628	Herb

Scientific Name	Family	Voucher specimen	Habit
<i>Spilanthes acmella</i> (Linnaeus) Linnaeus	Asteraceae	Bhatt.437	Herb
<i>Spondias pinnata</i> (Linnaeus f.) Kurz	Anacardiaceae	Bhatt.674	Tree
<i>Stellaria media</i> (Linnaeus) Villars	Capparaceae	Bhatt.770	Herb
<i>Stephania hernandiifolia</i> (Willdenow) Walpers	Menispermaceae	Bhatt.594	Climber
<i>Stephania japonica</i> (Thunberg) Miers	Menispermaceae	Bhatt.709	Climber
<i>Sterculia villosa</i> Roxburgh	Sterculiaceae	Bhatt.405	Tree
<i>Synedrella nodiflora</i> (Linnaeus) Gaertner	Asteraceae	Bhatt.660	Herb
<i>Syzygium cumini</i> (Linnaeus) Skeels	Myrtaceae	Bhatt.621	Tree
<i>Tabernaemontana divaricata</i> (Linnaeus) R. Brown ex Roemer & Schultes	Apocynaceae	Bhatt.634	Shrub
<i>Tamarix dioica</i> Roxburgh ex Roth	Tamaricaceae	Bhatt.772	Shrub
<i>Tectona grandis</i> Linnaeus f.	Lamiaceae	Bhatt.824	Tree
<i>Tephrosia candida</i> (Roxburgh) DC.	Leguminosae	Bhatt.617	Shrub
<i>Tephrosia purpurea</i> (Linnaeus) Persoon	Leguminosae	Bhatt.410	Shrub
<i>Terminalia bellerica</i> (Gaertner) Roxburgh	Combretaceae	Bhatt.525	Tree
<i>Terminalia chebula</i> Retzius	Combretaceae	Bhatt.601	Tree
<i>Tetragium leucostaphylum</i> (Dennstedt) Alston	Vitaceae	Bhatt.407	Climber
<i>Thunbergia fragrans</i> Roxburgh	Acanthaceae	Bhatt.451	Climber
<i>Thunbergia grandiflora</i> (Roxburgh ex Rottler) Roxburgh	Acanthaceae	Bhatt.452	Climber
<i>Toona ciliata</i> M. Roemer	Meliaceae	Bhatt.758	Tree
<i>Torenia vagans</i> Roxburgh	Linderniaceae	Bhatt.650	Herb
<i>Torenia violacea</i> (Azaola ex Blanco) Pennell	Linderniaceae	Bhatt.732	Herb
<i>Trema tomentosa</i> (Roxburgh) H. Hara	Cannabaceae	Bhatt.754	Shrub
<i>Tridax procumbens</i> (Linnaeus) Linnaeus	Asteraceae	Bhatt.538	Herb
<i>Triumfetta rhomboidea</i> Jacquin	Tiliaceae	Bhatt.779	Herb
<i>Uraria arborea</i> G. Don	Leguminosae	Bhatt.618	Shrub
<i>Uraria picta</i> (Jacquin) DC.	Leguminosae	Bhatt.688	Shrub
<i>Uraria rufescens</i> (DC.) A. Schindler	Leguminosae	Bhatt.761	Shrub
<i>Urnea lobata</i> Linnaeus	Malvaceae	Bhatt.710	Herb
<i>Utricularia stellaris</i> Linnaeus f.	Lentibulariaceae	Bhatt.556	Aq. Herb
<i>Vernonia cineria</i> Lessing	Asteraceae	Bhatt.636	Herb
<i>Vitex peduncularis</i> Wallich ex Schauer	Lamiaceae	Bhatt.460	Shrub
<i>Vitex negundo</i> Linnaeus	Lamiaceae	Bhatt.721	Shrub
<i>Wedelia urticifolia</i> (Blume) DC.	Asteraceae	Bhatt.438	Herb
<i>Woodfordia fruticosa</i> (Linnaeus) Kurz	Lythraceae	Bhatt.728	Shrub
<i>Wrightia arborea</i> (Dennstedt) Mabbarley	Apocynaceae	Bhatt.523	Tree
<i>Zanthoxylum rhetsa</i> DC.	Rutaceae	Bhatt.590	Tree
<i>Ziziphus jujuba</i> Miller	Rhamnaceae	Bhatt.777	Tree
<i>Ziziphus rugosus</i> Lamarck	Rhamnaceae	Bhatt.676	Tree

Table 2. Monocotyledonous flora of Chirang Reserve Forest under Manas Biosphere Reserve

Scientific Name	Family	Voucher specimen	Habit
<i>Acorus calamus</i> Linnaeus	Araceae	Bhatt.958	Rhizomatous Herb
<i>Aerides odoratum</i> Reinwardt ex Blume	Orchidaceae	Bhatt.901	Epiphytic Herb
<i>Alpinia nigra</i> (Gaertner) Burt	Zingiberaceae	Bhatt.912	Erect Herb
<i>Amomum aromaticum</i> Roxburgh	Zingiberaceae	Bhatt.853	Rhizomatous Herb
<i>Apluda mutica</i> Linnaeus	Poaceae	Bhatt.867	Small grass
<i>Arundinella decempedalis</i> (Kuntze) Janowski	Poaceae	Bhatt.922	Small grass
<i>Arundinella pumila</i> (Hochstetter) Steudel	Poaceae	Bhatt.892	Small grass
<i>Arundo donax</i> Linnaeus	Poaceae	Bhatt.894	Tall grass
<i>Brachiaria distachya</i> (Linnaeus) Stapf	Poaceae	Bhatt.900	Small grass
<i>Bulbophyllum farreri</i> (W.W. Smith) Seidenfaden	Orchidaceae	Bhatt.931	Epiphytic Herb
<i>Bulbophyllum schillerianum</i> Reichenbach f.	Orchidaceae	Bhatt.877	Epiphytic Herb
<i>Calamus floribundus</i> Griffith	Araceae	Bhatt.884	Climber
<i>Calanthe odora</i> Griffith	Orchidaceae	Bhatt.937	Terrestrial Herb
<i>Capillipedium assimile</i> (Steudel) A. Camus	Poaceae	Bhatt.923	Perennial grass
<i>Carex breviculmis</i> R. Brown	Cyperaceae	Bhatt.870	Sedge
<i>Carex composita</i> Boott	Cyperaceae	Bhatt.885	Sedge
<i>Cheilocostus speciosus</i> (J. Koenig) C.D. Specht	Costaceae	Bhatt.940	Rhizomatous Herb
<i>Chrysopogon zizanioides</i> (Linnaeus) Roberty	Poaceae	Bhatt.859	Tall grass
<i>Chrysopogon aciculatus</i> (Retzius) Trinius	Poaceae	Bhatt.866	Small grass
<i>Commelina appendiculata</i> C.B. Clarke	Commelinaceae	Bhatt.959	Herb
<i>Commelina benghalensis</i> Linnaeus	Commelinaceae	Bhatt.855	Small Herb
<i>Commelina paludosa</i> Blume	Commelinaceae	Bhatt.980	Small Herb
<i>Commelina suffruticosa</i> Blume	Commelinaceae	Bhatt.926	Small Herb
<i>Curculigo orchioides</i> GaertnER	Hypoxidaceae	Bhatt.854	Small Herb
<i>Cyanotis axillaris</i> (Linnaeus) D. Don ex Sweet	Commelinaceae	Bhatt.979	Small Herb
<i>Cymbidium aloifolium</i> (Linnaeus) Swartz	Orchidaceae	Bhatt.902	Epiphytic Herb
<i>Cymbidium bicolor</i> Lindley	Orchidaceae	Bhatt.935	Epiphytic Herb
<i>Cynodon dactylon</i> (Linnaeus) Persoon	Poaceae	Bhatt.888	Small grass
<i>Cyperus compactus</i> Retzius	Cyperaceae	Bhatt.857	Annual sedge
<i>Cyperus compressus</i> Linnaeus	Cyperaceae	Bhatt.954	Annual sedge
<i>Cyperus cyperoides</i> (Linnaeus) Kuntze	Cyperaceae	Bhatt.963	Annual sedge
<i>Cyperus diffusus</i> Vahl	Cyperaceae	Bhatt.991	Annual sedge
<i>Cyperus digitatus</i> Roxburgh	Cyperaceae	Bhatt.869	Annual sedge
<i>Cyperus distans</i> Linnaeus f.	Cyperaceae	Bhatt.964	Annual sedge

Scientific Name	Family	Voucher specimen	Habit
<i>Cyperus haspan</i> Linnaeus	Cyperaceae	Bhatt.886	Annual sedge
<i>Cyperus iria</i> Linnaeus	Cyperaceae	Bhatt.858	Annual sedge
<i>Cyperus nutans</i> var. <i>eleusinoides</i> (Kunth) Haines	Cyperaceae	Bhatt.983	Annual sedge
<i>Cyperus pilosus</i> Vahl	Cyperaceae	Bhatt.925	Annual sedge
<i>Cyperus rotundus</i> Linnaeus	Cyperaceae	Bhatt.914	Annual sedge
<i>Cyperus tenuispica</i> Steudel	Cyperaceae	Bhatt.868	Annual sedge
<i>Cyrtococcum oxyphyllum</i> (Steudel) Stapf	Poaceae	Bhatt.915	Grass
<i>Dendrobium aphyllum</i> (Roxburgh) C.E.C. Fischer	Orchidaceae	Bhatt.851	Epiphytic Herb
<i>Dendrobium macraei</i> Lindley	Orchidaceae	Bhatt.910	Epiphytic Herb
<i>Dendrobium moschatum</i> (Buchanan-Hamilton) Swartz	Orchidaceae	Bhatt.930	Epiphytic Herb
<i>Dendrobium nobile</i> Lindley	Orchidaceae	Bhatt.879	Epiphytic Herb
<i>Dendrobium salaccense</i> (Blume) Lindley	Orchidaceae	Bhatt.933	Epiphytic Herb
<i>Dendrobium sulcatum</i> Lindley	Orchidaceae	Bhatt.876	Epiphytic Herb
<i>Digitaria abludens</i> (Roemer & Schultes) Veldkamp	Poaceae	Bhatt.864	Small grass
<i>Digitaria ciliaris</i> (Retzius) Koeler	Poaceae	Bhatt.965	Small grass
<i>Digitaria violascens</i> Link	Poaceae	Bhatt.952	Small grass
<i>Echinochloa colona</i> (Linnaeus) Link	Poaceae	Bhatt.865	Small grass
<i>Eichhornia crassipes</i> (Martius) Solms	Pontederiaceae	Bhatt.928	Floating Herb
<i>Eleusine indica</i> (Linnaeus) Gaertner	Poaceae	Bhatt.899	Small grass
<i>Eulophia mannii</i> (Reichenbach f.) Hook. f.	Orchidaceae	Bhatt.904	Epiphytic Herb
<i>Fimbristylis aestivalis</i> Vahl	Cyperaceae	Bhatt.953	Annual sedge
<i>Fimbristylis dichotoma</i> (Linnaeus) Vahl	Cyperaceae	Bhatt.973	Annual sedge
<i>Gastrochilus inconspicuus</i> (Hooker f.) Kuntze	Orchidaceae	Bhatt.852	Terrestrial Herb
<i>Geodorum densiflorum</i> (Lamarck) Schlechter	Orchidaceae	Bhatt.932	Terrestrial Herb
<i>Globba racemosa</i> J.E. Smith	Zingiberaceae	Bhatt.962	Rhizomatous Herb
<i>Gloriosa superba</i> Linnaeus	Colchicaceae	Bhatt.961	Rhizomatous climber
<i>Habenaria digitata</i> Lindley	Orchidaceae	Bhatt.875	Terrestrial Herb
<i>Imperata cylindrica</i> (Linnaeus) Raeuschel	Poaceae	Bhatt.889	Tall grass
<i>Kyllinga brevifolia</i> Rottboell	Cyperaceae	Bhatt.913	Annual sedge
<i>Lasia spinosa</i> (Linnaeus) Thwaites	Araceae	Bhatt.984	Rhizomatous Herb
<i>Lemna minor</i> Linnaeus	Araceae	Bhatt.957	Floating Herb
<i>Monochoria hastata</i> (Linnaeus) Solms	Pontederiaceae	Bhatt.960	Aquatic annual
<i>Monochoria vaginalis</i> (Burman f.) C. Presl	Pontederiaceae	Bhatt.883	Aquatic annual
<i>Murdannia japonica</i> (Thunberg) Faden	Commelinaceae	Bhatt.871	Small Herb
<i>Musa ornata</i> Roxburgh	Musaceae	Bhatt.882	Tall erect herb

Scientific Name	Family	Voucher specimen	Habit
<i>Mycaranthes floribunda</i> (D. Don) S.C. Chen & J.J. Wood	Orchidaceae	Bhatt.929	Epiphytic Herb
<i>Neyraudia reynaudiana</i> (Kunth) Keng ex Hitchcock	Poaceae	Bhatt.863	Tall grass
<i>Ophiopogon intermedius</i> D. Don	Asparagaceae	Bhatt.909	Perennial Herb
<i>Ophiuros exaltatus</i> (Linnaeus) Kuntze	Poaceae	Bhatt.893	Small grass
<i>Oplismenus compositus</i> (Linnaeus) P. Beauvois	Poaceae	Bhatt.890	Small grass
<i>Ottelia alismoides</i> (Linnaeus) Persoon	Hydrocharitaceae	Bhatt.850	Aquatic annual herb
<i>Ottochloa nodosa</i> (Kunth) Dandy	Poaceae	Bhatt.917	Small grass
<i>Panicum auritum</i> J. Presl ex Nees	Poaceae	Bhatt.921	Small grass
<i>Panicum brevifolium</i> Linnaeus	Poaceae	Bhatt.898	Small grass
<i>Panicum incomptum</i> Figler & De Notaris	Poaceae	Bhatt.971	Small grass
<i>Panicum paludosum</i> Roxburgh	Poaceae	Bhatt.891	Small grass
<i>Papilionanthe teres</i> (Roxburgh) Schlechter	Orchidaceae	Bhatt.942	Epiphytic Herb
<i>Paspalidium flavidum</i> (Retzius) A. Camus	Poaceae	Bhatt.951	Small grass
<i>Paspalum conjugatum</i> P.J. Bergius	Poaceae	Bhatt.916	Small grass
<i>Paspalum longifolium</i> Roxburgh	Poaceae	Bhatt.862	Small grass
<i>Paspalum scrobiculatum</i> Linnaeus	Poaceae	Bhatt.949	Small grass
<i>Peristylus goodyeroides</i> (D. Don) Lindley	Orchidaceae	Bhatt.881	Terrestrial Herb
<i>Pholidota pallida</i> Lindley	Orchidaceae	Bhatt.903	Epiphytic Herb
<i>Phragmites karka</i> (Retz.) Trinius ex Steudel	Poaceae	Bhatt.968	Tall grass
<i>Phrynium pubinerve</i> Blume	Marantaceae	Bhatt.873	Rhizomatous Herb
<i>Pinalia mysorensis</i> (Lindley) Kuntze	Orchidaceae	Bhatt.880	Epiphytic Herb
<i>Pistia stratiotes</i> Linnaeus	Araceae	Bhatt.982	Floating herb
<i>Pogonatherum crinitum</i> (Thunberg) Kunth	Poaceae	Bhatt.986	Small grass
<i>Pogonatherum paniceum</i> (Lamarck) Hack	Poaceae	Bhatt.897	Small grass
<i>Pollia subumbellata</i> C.B. Clarke	Commelinaceae	Bhatt.974	Small Herb
<i>Polytoa digitata</i> (Linnaeus f.) Druce	Poaceae	Bhatt.967	Small grass
<i>Rhynchospora colorata</i> (Linnaeus) H. Pfeiffer	Cyperaceae	Bhatt.924	Annual sedge
<i>Rhynchostylis retusa</i> (Linnaeus) Blume	Orchidaceae	Bhatt.911	Epiphytic Herb
<i>Saccharum arundinaceum</i> Retzius	Poaceae	Bhatt.861	Tall grass
<i>Saccharum procerum</i> Roxburgh	Poaceae	Bhatt.970	Tall grass
<i>Saccharum ravennae</i> (Linnaeus) Linnaeus	Poaceae	Bhatt.972	Tall grass
<i>Saccharum spontaneum</i> Linnaeus	Poaceae	Bhatt.948	Tall grass
<i>Scleria biflora</i> Roxb	Cyperaceae	Bhatt.987	Tall sedge
<i>Scleria levis</i> Retzius	Cyperaceae	Bhatt.990	Tall sedge
<i>Scleria terrestris</i> (Linnaeus) Fassett	Cyperaceae	Bhatt.887	Tall sedge

Scientific Name	Family	Voucher specimen	Habit
<i>Setaria pallide-fusca</i> (Schumach) Stapf & C.E. Hubbard	Poaceae	Bhatt.943	Tall sedge
<i>Setaria palmifolia</i> (J. Koenig) Stapf	Poaceae	Bhatt.860	Small grass
<i>Smilax perfoliata</i> Loureiro	Smilacaceae	Bhatt. 978	Shrubby climber
<i>Smilax purhampuy</i> Ruiz	Smilacaceae	Bhatt.872	Undershrub
<i>Smitinandia micrantha</i> (Lindley) Holttum	Orchidaceae	Bhatt.874	Epiphytic Herb
<i>Spiranthes sinensis</i> (Persoon) O. Ames	Orchidaceae	Bhatt.906	Terrestrial Herb
<i>Sporobolus diandrus</i> (Retzius) P. Beauvois	Poaceae	Bhatt.945	Small grass
<i>Themeda arundinacea</i> (Roxburgh) A. Camus	Poaceae	Bhatt.895	Tall grass
<i>Thysia zea</i> (C.B. Clarke) Stapf	Poaceae	Bhatt.920	Erect grass
<i>Thysanolaena latifolia</i> (Roxburgh ex Hornemann) Honda	Poaceae	Bhatt.896	Tall grass
<i>Typha elephantina</i> Roxburgh	Typhaceae	Bhatt.856	Tall aquatic herb
<i>Zeuxine nervosa</i> (Wallich ex Lindley) Bentham ex Trimen	Orchidaceae	Bhatt.908	Terrestrial Herb
<i>Zingiber zerumbet</i> (Linnaeus) Roscoe ex J.E. Smith	Zingiberaceae	Bhatt.977	Rhizomatous Herb
<i>Zingiber capitatum</i> Roxburgh	Zingiberaceae	Bhatt.975	Rhizomatous Herb
<i>Zingiber montanum</i> (J. Koenig) Link ex A. Dietrich	Zingiberaceae	Bhatt.907	Rhizomatous Herb

Summarizing Table 1 & 2, the different habit groups in the flora of Chirang Reserve Forest can be presented numerically in Table 3. It shows that herbs dominate the Dicotyledonous plants where as grasses dominate the Monocots.

Table 3. Habit groups of angiospermic plants of Chirang Reserve Forest

Plant Type	Herb	Shrub	Trees	Climber	Grasses & sedges	TOTAL
Dicots	132	60	80	37	0	309
Monocots	54	0	0	2	63	119

The forest type of Chirang Reserve Forest can be divided into Sal forest, Evergreen & Semi-evergreen forest, Deciduous forest, Savannah/Grassland and Riverine forest.

In **Sal forest** *Shorea robusta* is the most dominated species and its associated trees are *Dysoxylum gotadhora*, *Dipterocarpus retusus*, *Sterculia villosa*, *Phyllanthus emblica*, *Macaranga denticulata*, *Mallotus philippensis*, *Butea monosperma*, *Wrightia arborea* etc. In this type of vegetation, under-storey is poorly developed but some shed loving species like *Callicarpa macrophylla*, *Rotheca serrata*, *Leea guineensis*, *Tephrosia candida*, *Premna bengalensis*, *Holmskioldia sanguinea* etc. are quite common.

In **Evergreen and semi evergreen forest** the top canopy are composed of *Dipterocarpus retusus*, *Artocarpus chama*, *Canarium bengalense* etc. The middle storey is generally dominated by *Artocarpus gomezianus*, *Magnolia griffithii*, *M. hookeri*, *M. hodgsonii* etc. The ground cover is represented by scattered growth of *Piper mullesua*, *Dendrolobium triangulare*, *Globba racemosa*, *Glycosmis pentaphylla*, *Dracaena angustifolia*, *Chromolaena odorata*, *Mikania scandens* etc.

In **Deciduous forest** part the top canopy is mainly comprised of *Dillenia pentagyna*, *D. indica*, *Shorea robusta*, *Careya arborea*, *Terminalia bellirica* etc. The middle stratum of 10 – 15 metres height is dominated by *Holarrhena pubescens*, *Oroxylum indicum*, *Albizia lebbek*, *Gmelina arborea*, *Holmskioldia sanguine* etc. The ground vegetation is formed by *Rauvolfia serpentina*, *Hedychium spicatum*, *Tacca integrifolia*, *Musa velutina* etc.

In **Savannah/ Grassland** very scattered and stunted *Careya arborea*, *Bombax ceiba*, *Sterculia villosa*, *Dillenia pentagyna*, *Lagerstroemia parviflora* and occasionally *Gmelina arborea*, *Premna bengalensis* are the main tree species found in such areas. Among the grasses *Arundo donax*, *Apluda mutica*, *Arundinella pumila*, *Phragmites karka*, *Imperata cylindrica*, *Paspalidium flavidum*, *Paspalum conjugatum*, *Saccharum spontaneum*, *S. arundinaceum*, *Eleusine indica*, *Carex breviculmis* are dominant.

In **Riverine Forest** mixed vegetation of *Typha elephantina* and *Lasia spinosa* occurring together are rather rare and in such patches *Dalbergia sisso* invariably predominates. *Acacia catechu* stands persist as isolated groups or as individuals in all stages of the succeeding moist mixed deciduous formation with the grasses (Lahkar *et al.* 2007; Talukdar *et al.* 2007). The dominant species are *Alpinia nigra*, *Amomum aromaticum*, *Lasia spinosa*, *Typha elephantina*, *Carex breviculmis*, *Zingiber capitatum*, *Z. zerumbet* etc.

Some important **medicinal plants** are also observed in the study area. These are as follows *Stephania hernandiifolia*, *S. japonica*, *Cissampelos pareira*, *Abelmoschus manihot* var. *pungens*, *Sterculia villosa*, *Murraya koenigii*, *Azadirachta indica*, *Toona ciliate*, *Cissus quadrangularis*, *Cissus paniculata*, *Leea asiatica*, *Cardiospermum halicacabum*, *Spondias pinnata*, *Semecarpus anacardium*, *Moringa oleifera*, *Butea monosperma*, *Desmodium gangeticum*, *D. heterophyllum*, *Flemingia strobilifera*, *Senna sophera*, *Albizia odoratissima*, *Terminalia bellerica*, *T. chebula*, *Syzygium cumini*, *Lagerstroemia parviflora*, *Woodfordia fruticosa*, *Coffea benghalensis*, *Catunaregam spinosa*, *Lippia javanica*, *Gmelina arborea*, *Tectona grandis*, *Premna bengalensis*, *Premna herbacea*, *Vitex negundo*, *Hyptis suaveolens*, *Boerhaavia diffusa*, *Cinnamomum glaucescens*, *C. verum*, *Litsea glutinosa*, *L. monopetala*, *L. salicifolia*, *Bridelia stipularis*, *Zanthoxylum rhetsa*, *Mucuna pruriens*, *Zingiber zerumbet*, *Chrysopogon zizanioides* etc.

The following species found in Chirang Reserve Forest are included as **RET plants** in Red data book. These are *Magnolia griffithii*, *M. hookeri*, *M. pterocarpa*, *Polyalthia simiarum*, *Polyalthia simiarum*, *Hodgsonia macrocarpa*, *Hodgsonia macrocarpa*, *Dioscorea bulbifera*, *Calanthe odora*, *Dendrobium moschatum*, *Eulophia mannii*, *Zeuxine nervosa*, *Zingiber zerumbet* etc.

Some important timber yielding plants as well as some important medicinal plants from core area of CRF are over exploited which is a serious threat directly towards Manas National Park viz Tiger Reserve Forest. So conservation and management strategy of Central and State Govt have a dim chance to become fruitful. And it is at the verge of deforestation and occupied by some unwanted elements.

CONCLUSION

Thus the above study has shown that a good number of macrophytic angiosperms are there in Chirang Reserve Forest. The Reserve is home for many medicinal and threatened species of plant. But rapid deforestation from various sources and encroachment in the last decade is a major threat to the very existence of the Reserve Forest. So, elaborate *in situ* and *ex situ* conservation strategies are suggested to save the valuable species of Chirang Reserve Forest.

Acknowledgements

The authors are thankful to the Ministry of Environment & Forest, Govt. of India, for providing financial assistance for the field study. Also, the authors express sincere thanks to the Head, Department of Botany, Gauhati University for providing laboratory facilities.

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