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Status of Floristic study in Barak Valley in Assam, India: need for future research

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Abstract

Barak Valley of Southern Assam covers an area of 6922 sq km and encompassing the districts of Cachar, Karimganj and Hailakandi. Geographically, the valley is located within 24º 82 and 25 º 82 N latitude and 92º 152 and 93º 152 East longitude with an altitude of 26 – 27 m above MSL only. A review on the status of floristic study in Barak Valley could not reveal the exact number of species occurring in the region due to incomplete exploration. Taxonomic and ethnobotanical studies conducted by universities and research organizations have some contribution to such knowledge. The *Flora of Assam* (1930 – '40) is the most important such contribution, which paid special attention to woody or arborescent plants. It is now realized that the floristic works on Barak Valley region are still fragmentary and need of comprehensive floristic survey of the entire region has been emphasized.

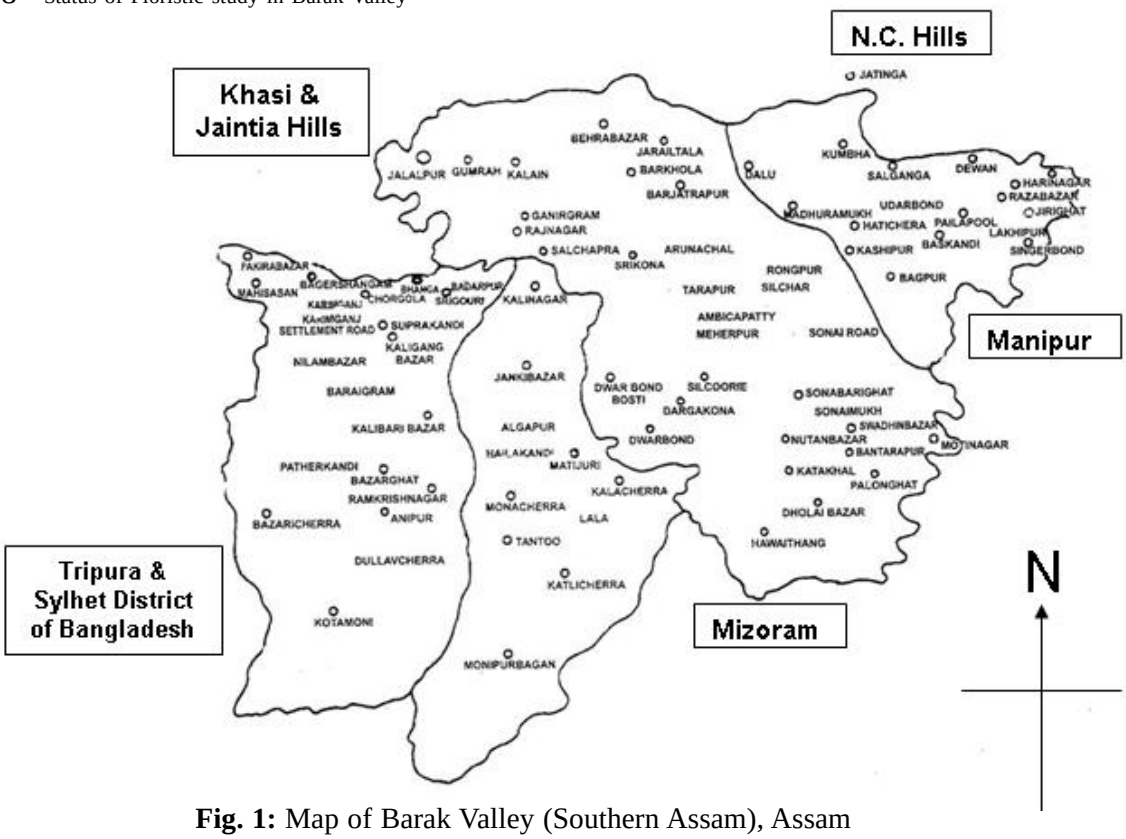
***Key words*:** Floristic diversity, Survey status, Barak Valley

INTRODUCTION

Our country is endowed with a rich floral diversity and it is largely attributable to the country's vast array of environmental, physical, and climatic diversities. IUCN has recognized India recognized India as one of the world's 17 megadiversity countries and within this country the North East India deserves special mention for being one of the richest areas in plant-endemism. The North East India, the seven sister states associating Assam is regarded as the Biogeographical gateway for its varied kinds of biological resources. On the basis availability of a number of primitive terrestrial angiosperms, Takhtajan (1969) considered this region as the "Cradle of flowering plants". Utility of a vast majority of plant species still remain unexplored, because most parts of the area are still without communication and inhabited mostly by back-ward ethnic communities.

Barak Valley region, situated in the Southern part of Assam, covers an area of 6922 sq km and comprises of three districts, viz. Cachar, Karimganj and Hailakandi. The Barak valley region is surrounded by N.C. Hill district of Assam and the Jaintia Hills of the state of Meghalaya on the north, Manipur state in the east, Mizoram state in the South and Tripura state and the Sylhet district of Bangladesh on west. The area is located within 24º 82 and 25º 82 N Latitude and 92º 152 and 93º 152 East longitude with an altitude of 26 – 27 m above MSL. Barak valley is a heterogeneous land composed of high hills, low lands and plains. On the north, east and south it is girdled by ranges of forested hills. The peaks of the Bhuban range on the eastern frontier covers a considerable area having peaks over 900 m above MSL. While the high lands are with tea plantations, the lower level lands are used for paddy cultivation. The river Barak flows from east to west through the central plain land of the valley. A number of its tributaries like Jiri, Chiri, Madhura and Jatinga flow towards the North and Sonai, Dholeswari and Katakhal towards South (Anonymous 2002).

Geologically, the Barak Valley region as a whole is younger than the Brahmaputra Valley. It is entirely alluvial zone and is composed of pebbles, sand, silt, clay and sometimes a mixture of sand and clay containing decomposed vegetable matter. Formation of laterite and stony profile at places are common. The rocks in this area are predominantly sand and clay shell. The soil in general has dark brown to yellowish brown and mainly redder sub-surface. Variability does exist depending on the level of degradation, type of vegetation etc. In general the colour pattern of soils indicates the



Valley

Fig. 1: Map of Barak Valley (Southern Assam), Assam

dominance of iron oxides in pedogenic environment. Soil pH is ranging between 5.0 and 5.6. The soil characteristics, however, is extremely variable with change in vegetation and anthropogenic influences. (Anonymous 2002; Meteorological research centre, Tocklai, Jorhat).

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Our knowledge on the flora of Assam started with the observations and writings of F. Buchanan Hamilton (1920): *An account of Assam with some notices concerning neighboring territories*, London. But the systematic collection of plants and floristic studies were mainly focused through the *Flora of British India* (Hooker 1872 – 1897), and *Flora of Assam* (Kanjilal *et al* 1934 – 1940; Bor 1940). Kanjilal *et al* have recorded mostly arborescent or woody dicotyledonous and gymnospermic plants; and casually made references to herbaceous plants and described 3431 species including a few varieties. Over the years a good number of district level explorations and collections have been made in this valley especially by Botanical Survey of India, Assam University, Silchar; Gauhati University and North Eastern Hill University, Shillong. These works have considerable contribution to the floristic knowledge on this state. Towards the end of last century, Rao & Verma (1970, 1972, 1973, 1974, 1976) unsuccessfully attempted to complete the record of monocotyledonous

families. Despite all these efforts, the floristic data-base of Assam and North Eastern Regions still remains incomplete. As such, there is a need to undertake a thorough floristic study.

The forest type of the area is represented by Tropical Semi- evergreen type consists of such plants which can be broadly classified into two major groups on the basis of their leafing pattern i.e. Periodic Growth Deciduous Type and Periodic Growth Evergreen Type. The main species of trees and shrubs found in the region includes *Alstonia scholaris, Neolamarckia cadamba, Artocarpus heterophylla, Albizia* spp, *Bombax ceiba, Cassia fistula, Clerodendrum viscosum, Dendrocalamus hamiltonii, Dillenia indica, Dipterocarpus macrocarpus, Elaeocarpus floribunda, Ficus religiosa, Gmelina arborea, Melastoma malabathricum, Mesua ferrea, Terminalia chebula,* etc. along with numerous herbaceous plants like *Cyperus* spp., *Paspalum* spp., *Saccharum* spp., *Achyranthes aspera, Ageratum conyzoides, Amaranthus spinosus., Cleome viscosa, Costus speciosus, Eclipta prostata, Leucas aspera, Mikania micrantha, Persicaria hydropiper, Sida rhombifolia, Spilanthes paniculata, Vernonia cineria* etc.

Different species of *Melocanna* are the main bamboos found in the area. In the higher altitude of Barail, both in N.C. Hills and Cachar districts, a sub-tropical broad-leaf hill forest with short stature trees occurs which has been has greatly affected by shifting or jhum cultivation.

Floristic works in Assam and Barak Valley: an overview

Out of 26 districts in Assam the Barak Velley is sharing only three, namely Cachar, Karimganj and Hailakandi. So far the floristic study of all the Assam districts is quite fragmentary. This includes a good number of published articles and some unpublished Ph.D. theses on district level floras (Table 1). However, some resourceful districts as well as forests are yet to be explored thoroughly.

Table 1. Enumeration of the district level and other floristic works done in Assam

Year of Publication	Name of Author(s)	Title of the work
1934-1940	Kanjilal U.N. *et al*.	*Flora of Assam*, Volumes I-IV. Govt. of Assam, Shillong. (Allied Book Centre, Dehradun)
1963	Panigrahi G.K.	Family Compositae in Assam and NEFA. *Bull. Bot Surv. India.* 8(3-4): 228 – 236.
1964	Kataki, S.K. & Panigrahi, G.	Ranunculaceae in Assam and NEFA in *Bull. Bot. Surv. India* 5: 394 – 400.
1965	Panigrahi, G.	Studies in the Monocot Flora of Assam and NEFA, *Proc. Nac. Acad. Sci. Ind.* 35: 357 – 366
1966 (1967)	Rao, A.S. & Rabha L. C.	Contribution to the Botany of Kamrup district (Southern Part), Assam, *Bull. Bot. Surv. India*. 8: 296 – 303
1970	Rao, A.S. & Verma, D.M.	Materials towards Monocot Flora of Assam-I (Hydrocharitaceae and burmaniaceae) *Ibid* 12: 139-143
1972	Rao, A.S. & Verma, D.M.	Materials towards Monocot Flora of Assam-II(Zingiberaceae and Marantaceae) *Ibid* 11: 245-248
1973	Rao, A.S & Verma, D.M.	Materials towards Monocot Flora of Assam –III (Taccaceae, Dioscoreaceae and Stemonaceae) *Ibid* 15: 189-209.
1974	Rao, A.S & Verma, D.M.	Materials towards Monocot Flora of Assam –IV- (Pontedariaceae, Xyridaceae, and Commelinaceae) *Ibid* 16: 1-20
1976	Rao, A.S. & Verma, D.M.	Materials towards Monocot Flora of Assam –V(Flagellariaceae, Juncaceae and Erioculaceae) *Ibid* 18: 1-48
1980	Hajra P.K.	*Flora of Kaziranga and Manas Wildlife Sanctury of Assam*. Ph. D. Thesis, GU

Year of Publication	Name of Author(s)	Title of the work
1980	Baruah, I.C., Choudhury, S. & Neogi, B.	Primitive Land Plants (Angiosperms) and their distribution pattern in Assam. *J. Econ. Taxon. Bot* 12(1): 81-92.
1981	Gogoi, P.	*Flora of Golaghat and Neighbouring area*. Ph. D. Thesis, GU
1982	Choudhury, S.	*Cleistostome spicatum* Lindl. in Cachar district of Assam. Indian For. 108(8): 589-592.
1985	Gammie, G.A.	Report on a Botanical Tour in the Lakhimpur District, Assam. *Rec. of Bot. Surv., India* 1(5): 61-88
1989	Sarmah, J.N.	*A detailed Study of the Flora of Sibsagar district*. Ph.D. Thesis, GU
1992	Baruah, I.C.	*A systematic studies of the Angiosperms of Kamrup district, Assam*. Ph.D. Thesis, GU
1992	Singh, R.	*Systematic study on the Dicotyledonous plants of Lakhimpur district (undivided) of Assam*. Ph.D. Thesis, GU
1992	Sarkar, S.	*Studies on Herbaceous plants of Karbi Anglong district of Assam with reference to their taxonomy and Economic utilization*. Ph.D. Thesis, GU
1995	Malakar, N.C.	*Aquatic Angiosperm of Cachar district*. Ph.D. Thesis, GU
1997	Gogoi, A.B	*Floristic composition of Tinsukia district of Assam: A systematic Study*. Ph.D. Thesis, GU
1999	Bora, P.J.	*Flora and Biodiversity of Pabitora Wild life Sanctuary,Assam in North East India*. Ph.D. Thesis, GU
1999	Nath, S.M.	*Floristic composition of Orang Wildlife Sanctury of Assam, A comprehensive study*. Ph.D. Thesis, GU
2005	Choudhury *et al*	*Assam Flora (present studies of Vascular Plants).* Assam Science Technology and Environment Council. Guwahati.
2007	Das, B.	*Fern Flora and Fern allies of Southern Assam with reference to Ethno-Medicobotanical studies and certain conservation aspects*. Ph.D. Thesis, AUS
2008	Nath, S.K.	*Floristic diversity of Laokhowa Wildlife Sanctury, Assam, India.* Ph.D. Thesis, GU
2009	Das, P.S.	*Herbaceous Flora of Karimganj district, Assam with reference to economic utility*. Ph.D. Thesis, AUS
2010	Begum, S.	*Floristic biodiversity of Nameri reserve forest, Assam*. Ph.D. Thesis, GU

The exact number of species occurring in the Barak Valley region is uncertain due to inadequate exploration. Some of the district level floristic studies in Barak valley include N.C. Malakar (1990), B. Das (2007), P.S. Das (2009) and Sharma *et al* (2002) (Table 1; Fig. 2)

B. Das (2007) recorded a total of 108 species of Ferns and fern allies belonging to 57 genera and 36 families. She has also recognized ethno-medicinal utility of 70 of these species.

P.S. Das (2009) in his thesis on herbaceous plants of Karimganj district of Assam analyzed and reviewed the *Flora of Assam* and has revealed that 394 species in this flora were reported from this district. Out of these only 78 species were herbs while 190 species are trees and 126 species are shrubs (Fig.-4).

Sharma *et al* (2002) has recorded 10 genera of Bryophytes, as many as 34 species of pteridophytes and 165 species of angiosperms from the Cachar district.

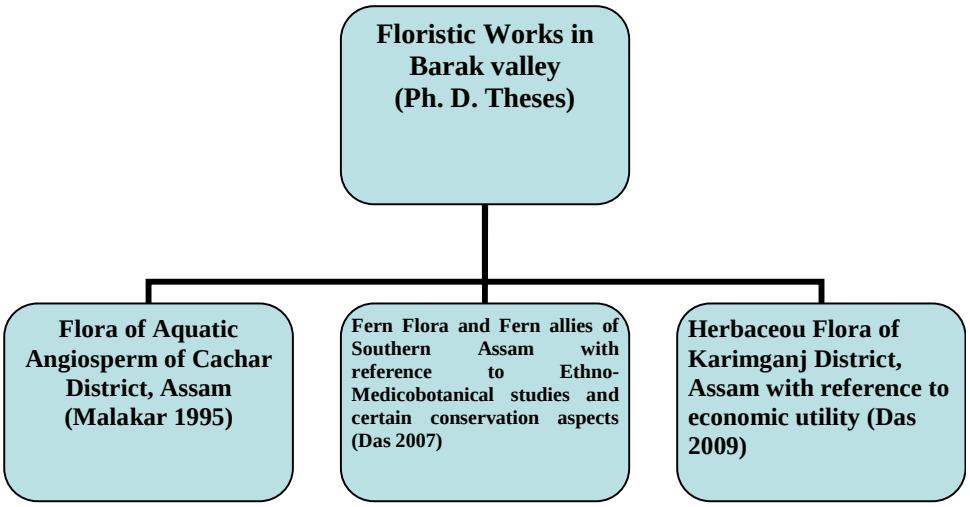

Fig. 2: Ph. D. theses related to floristic studies in Barak Valley, Assam

Analyzing the trends of work carried out so far:

Flora of British India: Sir J.D. Hooker (1872 – 1897) in his seven volume work "*The Flora of British India*" described about 15,900 species of flowering plants. This monumental work formed the basis for the principal regional floras those were published subsequently. This classical work also used a good number of plants from the Assam region.

Flora of Assam: The systematic collection of plants made by U. N. Kanjilal, P.C. Kanjilal, A. Das and N. L. Bor, resulted into the publication of "*Flora of Assam* "(1934 – 1940) is said to be the most important and pioneering venture in the history of Botanical exploration of Assam. The contents covering plants from Barak valley have been enumerated in the following:

Volume-I: Part-I. (Ranunculaceae to Elaeocarpaceae):

Thalamiflorae: A total of 37 species belonging to 15 families were reported from Cachar district of Assam, out of which 23 are trees, 6 shrubs, and 4 climbers, while only 4 species are herbs (Table 2).

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Table 2. Names of species, families and their habits as recorded from the then Cachar district in Part-I of the Volume–I of *Flora of Assam*.

Family	Name of species	Habit
Dilleniaceae	*Dillenia indica* Linn.	Evergreen tree
Magnoliaceae	*Talauma phelocarpa* King	Evergreen tree
	Michelia montana Bl.	Evergreen tree
Annonaceae	*Unona longiflora* Roxb.	Shrubs
	Goniothalamus sesquipedalis Hk. f.& Th.	Shrubs
	Alphonsea ventricosa Hk. f. & Th.	Tall tree
	A. lutea Hk. f.	Small tree
	Anona squamosa Linn.	Small tree
	Melodorum wallichii Hk. f .& Th.	Woody climber
	M. rufinerve Hk. f & Th.	Woody climber
Menispermaceae	*Pericampylus incanus* Miers	Climber
	Cissampelos pareira Linn.	Climber
Nymphaeaceae	*Euryale ferox* Salisb	Aquatic herb
Fumariaceae	*Fumaria parviflora* Lam.	Herb
Bixaceae	*Bixa orellana* Linn.	Evergreen tree
Polygalaceae	*Polygala arillata* Hamilt.	Shrubs
	P. laptalea DC.	Herb
	P. glomerata Lour.	Herb
	Xanthophylum flavescens Roxb.	Tree
Guttiferae (Clusiaceae)	*Garcinia cowa* Roxb.	Tree
	G. lanceaefolia Roxb.	Shrubs
	G. morella Desr.	Small tree
	G. paniculata Roxb.	Evergreen tree
	Kayea floribunda Wall.	Tree
	Calophyllum polyanthum Wall.	Tree
Ternstroemiaceae	*Camellia drupifera* Lour.	Shrub
	Eurya acuminata DC.	Evergreen tree
	Actinidia callosa Lindl.	Shrubs
Dipterocarpaceae	*Dipterocarpus turbinatus* Gaertn.	Tree
Ancistrocladaceae	*Ancistrocladus wallichii* Planchon	Tree
Malvaceae	*Hibiscus macrophyla* Roxb.	Deciduous tree
	Bombax insigne Wall.	Tree
Sterculiaceae	*Heritiera macrophyla* Wall.	Evergreen tree
	H. acuminata Wall.	Tree
	Grewia microcos Linn.	Tree
Elaeocarpaceae	*Elaeocarpus integer* Wall.	Tree
	E. assamicum Benth.	Tree

Volume-I: Part-II. (**Linaceae to Moringaceae**):

Disciflorae: In the part-II of Volume-I, out of the 24 species incorporated from the Cachar district, 13 are trees, 8 shrubs and 3 climbers covering 15 families of angiosperms (Table 3).

Table 3. Names of species, families and their habits as recorded from the then Cachar district in Part-II of the Volume –I of *Flora of Assam*.

Family	Name of species	Habit
Linaceae	*Ixonanthes khasiana* Hk.f.	Tree
Malpighiaceae	*Aspidopteris glabriuscula* (Wall.) A. Juss.	Woody Climber
Rutaceae	*Zanthoxylum budrunga* Wall.	Evergreen tree
	Z. hamiltonianum Wall.	Evergreen tree
	Toddalia aculeata Pers.	Evergreen shrub
	Clausena heptaphyla Wt. & Arn.	Shrub

Family	Name of species	Habit
	Atlantia monophyla Correa	Shrub
	A. caudata Hk. f.	Shrub
Simaroubaceae	*Ailanthus grandis* Prain	Tree
Ochnaceae	*Ochna wallichii* Planch.	Tree
Burseraceae	*Garuga pinnata* Roxb.	Tree
	Bursa serrata Colebr.	Tree
Meliaceae	*Dysoxylum hamiltonii* Hiern.	Evergreen tree
	Aglaia perviridis Hiern.	Small tree
Olacaceae	*Olax acuminata* Wall.	Shrub
Celastraceae	*Microtropis discolour* Wall.	Evergreen tree
Hippocrataceae	*Hippocratus indica* Roxb.	Shrub
Rhamnaceae	*Zizyphus funiculosa* Ham.	Shrub
	Hovenia dulcis Thunb.	Tree
Ampelidae (Vitaceae)	*Vitis quadrangularis* Wall.	Climber
	Vitis assamica Laws.	Climber
Aceraceae	*Acer niveum* Bl.	Tree
Sapindaceae	*Allophylus zeylenica* Linn.	Shrub
Anacardiaceae	*Holigarna longifolia* Roxb.	Tree

Volume- II. (Connaraceae to Cornaceae):

Calyciflorae: In Vol. II, a good number of 54 plants belonging to 11 families were reported from Cachar district. Out of these 29 were trees, 11 were shrubs, 11 were climbers and only 3 plants were herbs (Table 4)**.**

Table 4. Names of species, families and their habits as recorded from the then Cachar district in the Volume -II of *Flora of Assam.*

Family	Name of species	Habit
Leguminosae	*Abrus precatorius* Linn.	Shrub
	Dunbaria conspersa Benth.	Shrub
	Dalbergia reniformis Roxb.	Tree
	Derris robusta Benth.	Tree
	D. cuncifolia Benth.	Climber
	Ormosia robusta Wight	Tree
	Caesalpinia crista Linn.	Shrub
	C. digyna Rottler	Shrub
	Mezoneurum ennerphyllum Wt. & Arn.	Shrub
	Acrocarpus fraxinifolius Wight	Tree
	Cassia nodosa Ham.	Tree
	C. tora Linn.	Herb
	C. alata Linn.	Shrub
	Cynometra polyandra Roxb.	Evergreen tree
	Tamarindus indica Linn.	Tree
	Saraca indica Linn.	Tree
	Bauhinia macrostachya Wall.	Climber
	B. nervosa Wall.	Climber
	Parkia roxburghii G. Don	Tree
	Mimosa himalayana Gamble	Shrub
	Acacia pennata Willd.	Climber
	Pithecolobium bigeminum Benth.	Tree
	Calliandra umbrosa Benth.	Tree
Rosaceae	*Pygeum acuminatum* Coleb.	Tree
	P. montanum Hk.	Tree
	Eriobotrya benghalensis Hk.f.	Tree

Family	Name of species	Habit
Combretaceae	*Terminalia beleria* Roxb.	Tree
	Combretum decandrum Roxb.	Climber
	C. flagrocarpum Roxb.	Shrub
	C. chinense Roxb.	Climber
	C. extensum Roxb.	Climber
Myrtaceae	*Eugenia macrocarpa* Roxb.	Tree
	E. aquea Burm.	Tree
	E. kurzii Duthie	Tree
	E. grandis Wight	Tree
	E. anisopetala Parker	Tree
	E. tetragona Wight	Tree
	E. balsamea Wight	Tree
	E. bracteata Roxb.	Tree
Lecythidaceae	*Careya arborea* Roxb.	Tree
Melastomataceae	*Osbeckia nepalensis* Hk.f.	Shrub
	Memecylon plebejum Kurz	Tree
	M. edule Roxb.	Tree
Lythraceae	*Crypteronia paniculata* Bl.	Tree
Cucurbitaceae	*Hodgsonia heteroclita* Hk.f..	Climber
	Trichosanthes palmata Roxb.	Climber
	T. cordata Roxb.	Climber
	Momrdica charantia Linn.	Climber
Cactaceae	*Mollugo oppositifolia* Linn.	Herb
Araliaceae	*Aralia thomsonii* Seem	Shrub
	A. armata Seem	Shrub
	Heptapleurum venulosum Seem	Climbing Herb
	Brassaiopsis speciosa Don	Tree
Cornaceae	*Alangium barbata* R. Br.	Tree

Volume- III. (Caprifoliaceae to Plantaginaceae):

Gamopetalae: In volume-III, a total of 121 species has been recorded from this region and these are belonging to 19 families. Out of these 34 species are trees, 54 shrubs, 20 woody climbers and only 13 species are Herbs (Table 5).

Table 5. Names of species, families and their habits as recorded from the then Cachar district in the Volume-III of *Flora of Assam*.

Family	Name of species	Habit
Rubiaceae	*Mitragyna diversifolia* Haviland	Tree
	Sarcocephalus cordatus Miq.	Tree
	Cephalanthus occidentalis Linn.	Shrub
	Nauclea sessilifolia Roxb.	Tree
	Adina polycephala Benth.	Tree
	Hymenodictyon excelsum Wall	Tree
	Wendlandia scraba Kurs	Tree
	Hedyotis scandens Roxb.	Herb
	H. vestita Br.	Herb
	H. hispida Retz.	Herb
	Spiradielis bifida Blume	Herb
	Ophiorrhiza ochroleuca Hk.f.	Undershrub
	Silvianthus bracteatus Hk.f.	Shrub
	Mussaenda glabra Vahl.	Shrub

Family	Name of species	Habit
	M. keenani Hk. f.	Shrub
	Acranthera tomentosa Br.	Shrub
	Myrioneuron nutans Wall.	Shrub
	Keenania modesta Hk.f.	Herb
	Webera campaniflora Hk. f.	Shrub
	Gardenia campanulata Roxb.	Shrub
	Randia longiflora Lamk.	Shrub
	R. fasciculata Dc	Tree
	R. densiflora Benth.	Tree
	R. wallichii Hk. f.	Tree
	Tricalysia singularis K. Schum.	Tree
	Canthium glabrum Bl.	Tree
	Vangueira spinosa Roxb.	Tree
	Ixora subsessilis Wall	Shrub
	I. villosa Roxb.	Shrub
	Pavetta indica Linn.	Shrub
	Paederia foetida Linn.	Climber
	Morinda villosa Hk.f.	Climber
	Psychotria calocarpa kurz.	Herb
	P. fulva Ham	Shrub
	Saprosma ternatum Hk.f.	Shrub
	Lasianthus cyanocarpus Jack.	Shrub
Compositae	*Vernonia arborea* Ham.	Tree
(Asteraceae)	*Enhydra fluctuans* Lour.	Herb
Myrsinaceae	*Maesa indica* Wall.	Tree
	M. chisia Don	Shrub
	M. ramentacea A. DC.	Shrub
	Embelia parviflora Wall.	Shrub
	Ardisia humilis Vahl	Shrub
	A. khasiana Clarke	Shrub
	A. grandiflora A. DC.	Shrub
	A. floribunda Wall.	Shrub
	A. colorata Roxb.	Shrub
	A. odontophylla Wall	Shrub
	Hymenandra wallichii A. DC.	Shrub
	Amblyanthopsis membranacea Mez	Shrub
Sapotaceae	*Chrysophyllum roxburghii* G. Don	Tree
	Sideroxylon grandifolium Wall.	Tree
	Palaquium polyanthum Benth.	Tree
	Mimusops elengi Roxb.	Tree
Ebenaceae	*Diospyros toposia* Ham.	Tree
	D. nigricans Wall.	Tree
	D. pilosula Wall.	Tree
	Maba cacharensis Das *et al*	Tree
Styraceae	*Symplocos pealii* King ex Das	Tree
	S.ferruginea Roxb.	Small Tree
	S. oxyphylla Wall.	Tree
	Styrax serrulatum Roxb.	Tree
Oleaceae	*Jasminum subtriplinerve* Bl	Climber
	Myxopyrum smilacifolium Bl	Shrub
Apocynaceae	*Alyxia fascicularis* Benth.	Woody Climber
	Vinca rosea Linn.	Shrub
	Holarrhena antidysenterica Wall.	Tree
	Tabernaemontana coronaria Br.	Bushy Shrub
	Wrightia coccinia Sims	Tree
	Strophantum wallichii A.DC.	Climber
	Choneomorpha macrophyla G. Don	Large Climber
	Ichnocarpus frutescens Br.	Climber
Asclepiadaceae	*Cryptolepsis elegans* Wall.	Climber

Family	Name of species	Habit
	Cynanchum corymbosum Wight	Climber
	Tylophora hirsuta Wall.	Shrub
	T. asthmatica Wt. & Arn.	Climber
	Hoya globulosa Hk.f.	Climber
	Ceropegia lucida Wall.	Climber
Loganiaceae	*Buddleia asiatica* Lour.	Shrub
	Strychnos aenea A.W. Hill	Shrub
	S. laurina Wall.	Climber
	S. wallichiana Benth.	Shrub
	Fagraea obovata Wall.	Small tree
Boraginaceae	*Cordia fragrantissima* Kurz	Tree
	Ehretia acuminata Br.	Large tree
	Tournefortia viridiflora Wall.	Woody shrub
Convolvulaceae	*Argyreia argentea* Chois	Large climber
	Lettsomia strigosa Roxb.	Climber
	Ipomoea batatus Lamk.	Climber
	I. reptans Poir.	Aquatic herb
	Quamoclit penneta Boj.	Climbing herb
	Lepistemon wallichii Chois	Shrub
	Merremia chryseides Hallier	Climber
	Erycibe glaucescens Wall.	Shrub
	E. albiflora Hallifer.f.	Shrub
	Cuscuta reflexa Roxb.	Twinning parasite
Solanaceae	*Solanum torvum* Swartz	Shrub
Scrophulariaceae	*Curanga amara* Juss.	Herb
	Scoparia dulcis Linn.	Herb
Gesneriaceae	*Aeschynanthus gracili* Parish	Shrub
	Boeica filiformis Clarke	Undershrub
	Rhynchotechum ellipticum A.DC.	Undershrub
Bignoniaceae	*Pajanelia rheedii* DC.	Tree, not branched
Acanthaceae	*Thunbergia grandiflora* Roxb.	Climber
	Strobilanthes glabratus Nees	Shrub
	S. panichanga T. Anders.	Shrub
	Eranthemum suffruticosum Roxb.	Undershrub
	E. pulchellum Andrew	Undershrub
	Phlgacanthus carniflorus Nees	Shrub
	Mackaya neesiana Nees	Shrub
	Rhinacanthus calcaratus Nees	Shrub
Verbenaceae	*Callicarpa arborea* Roxb.	Evergreen tree
	Premna cordifolia Roxb.	Shrub
	P. scandens Roxb.	Shrub
	Vitex pubescens Vahl	Tree
	Clerodendron infortunatum Gaertn.	Under shrub
	C. colebrookianum Walp.	Shrub
	C. bracteatum Wall.	Shrub
	Sphenodesma pentandra Jack.	Woody climber
Labiatae (Lamiaceae)	*Ocimum sanctum* Linn.	Undershrub
	Leucas zeylanica Br.	Herb

Volume-IV. (Nyctaginaceae to Cycadaceae):

Apetalae: In the Volume-IV, a total of 62 species were recorded from the region. Those are belonging to 12 families, out of which only one species is Herb, while 41 species are Trees, 17 are shrubs and 3 species are Climbers (Table 6).

Table 6: Names of species, families and their habits as recorded from the then Cachar district in the Volume-IV of *Flora of Assam*.

Family	Name of species	Habit
Polygonaceae	*Polygonum chinense* Linn.	Herbs
	Myristica amygdalina Wall.	Tree

Family	Name of species	Habit
	M. linifolia Roxb.	Tree
	M. angustifolia Roxb.	Tree
	M. gibbosa Hk.f. &T.	Tree
Lauraceae	*Endiandra firma* Nees	Tree
	Cinnamomum pauciflorum Nees	Shrub
	C. cacharensis R. N. Parker	Tree
	Alseodafne peliolaris Hk. f.	Large Tree
	A. owdenii Parker	Large tree
	A. keenani Gamble	Large tree
	Litsaea angustifolia Wall.	Evergreen shrub
	L. laeta Benth & Hk.f.	Tree
Thymelaeaceae	*Linostoma decandrum* Wall.	Climbing shrub
	Aquilaria agallocha Roxb.	Evergreen tree
Elaeagnaceae	*Elaeagnus latifolia* Linn.	Evergreen shrub
Loranthaceae	*Hyphear odoratum* (Wall)Danser	Bushy shrub
	Scurrula pulverulenta (Wall)G. Don	Stout stem parasite
	S. umbellifer(Schult)G.Don	Stout stem parasite
Euphorbiaceae	*Bridelia tomentosa* Bl.	Tree
	Prosorus indicus (Muell) Dalz	Tree
	Aporosa oblonga (Muell) Arg.	Tree
	Antidesma ghesaembilla Gaertn.	Deciduous tree
	Sauropus androgynus (Linn)Merr.	Small shrub
	S. trinervius Muell.-Arg.	Under shrub
	Breynia patens Benth.	Shrub
	Drypetes eglandulosa(Kurz)Pax. et Hoffin.	Tree
	Glochidion multiloculare (Willd.) Muell.-Arg.	Shrub
	G. hirsutum Muell.-Arg.	Shrub
	G. thomsonii Hk.f.	Tree
	G. sphaerogynum Kurz	Tree
	Croton oblongifolius Roxb.	Tree
	Manihot utilissima Pohl.	Shrub
	Chaetocarpus castanocarpus (Roxb.)Thwaites	Evergreen tree
	Claoxylon khasianum Hk.f..	Shrub
	Mallotus roxburghianus Muell. Arg.	Shrub
Ulmaceae	*Gironniere reticulata* Thw.	Evergreen tree
Moraceae	*Ficus gibbosa* Bl.	Large tree
	F. benghalensis Linn.	Evergreen tree
	F. glaberrima Bl.	Large tree
	F. rhododendrifolia Miq.	Tree
	F. retusa Linn.	Evergreen tree
	F. nervosa Roth	Large tree
	F. rumphii Bl.	Large tree
	F. prostrata Wall.	Small tree
	F. fistulosa Reint	Shrub
	F. hirta Vahl	Small tree
	F. pyriformis Hk. & Arn.	Small tree
	F. silhetensis Miq.	Tree
	F. lepidosa Wall.	Shrub
	F. laevis Bl.	Epiphytic climber
	F. ramentacea Roxb.	Epiphytic climber
	Pseudostreblus indica Bureau	Tree
Urticaceae	*Debregeasia dentata* Hk. f.	Bushy shrub
Juglandaceae	*Engelhandtia spicata* Blume	Deciduous tree
	E. polystachya Radlk.	Tree
Fagaceae	*Quercus semiserrata* Roxb.	Evergreen tree
	Pasania lappacea (Roxb.) Schottky	Tree
	P. fenestrata Roxb.	Tree
	Castanopsis hystrix A. DC.	Evergreen tree

Family	Name of species	Habit
	C. tribuloides A. DC.	Tree
Betulaceae	*Betula alnoides* Ham.	Tree

Volume –V. (Gramineae or Poaceae):

In the Volume-V Bor (1940) had recorded following 23 species from the concerned region. Out of these only 4 species are trees and 19 species are herbs or tall grasses. Viz. (1) *Dendrocalamus hamiltonii* Nees *et* Arn. ex Munro, (2) *Dinochloa maclellandii* (Munro) Kurz, (3) *D. compactiflora* (Kurz) Mc Clure, (4) *Melocanna bambusoides* Trin. (5) *Bambusa pallida* Munro, (6) *Phragmites karka* Trin. ex Steud., (7) *Arundo donax* Linn. (8) *Eragrostrs riparia* Nees, (9) *E. diarrhena* Steud. (10) *E. uniloides* Nees *ex* Steud, (11) *E. zeylanica* Nees *et* Mey, (12) *E. nutans* Nees et Steud. (13) *Eleusine indica* Gaertn., (14) *E. verticillata* Roxb., (15) *Dactyloctenium aegyptium* Beauv., (16) *Leptochloa filiformis* Roem. & Schult., (17) *Sporobolus diandra* Beauv., (18) *S. indica* R. Br., (19) *S. poirettii* (Roem. *et* Schult.) Hitch. (20) *S. piliferus* Kunth, (21) *Oryza sativa* Linn. (22) *Isachne albens* Trin., and (23) *Panicum cruciabile* Chase.

Thus, the analysis of "*Flora of Assam*" revealed that a total of 321 species were recorded from the then Cachar district of Assam, out of which 162 are trees, 96 shrubs, 41 climbers and only 22 species are herbs. As regards the record of plants from the then Karimganj district, the *Flora of Assam* recorded a total of 394 species were recorded, of which only 78 are herbs, 190 are trees and 126 are shrubs (Table 7; Figs. 3 & 4). In addition, Table 8 shows the top five families represented by the Cachar flora in the *Flora of Assam*.

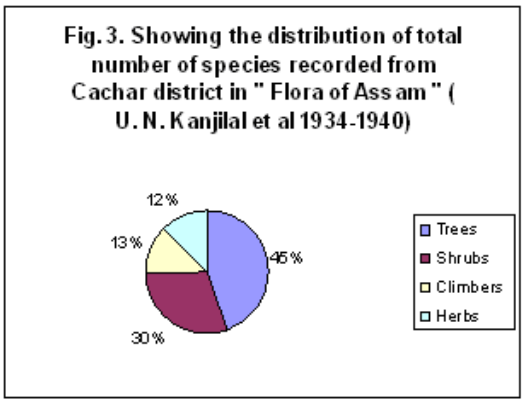

Fig. 3. Showing the distribution of total number of species recorded from Cachar district in " Flora of Assam " (U. N. Kanjilal et al 1934-1940)

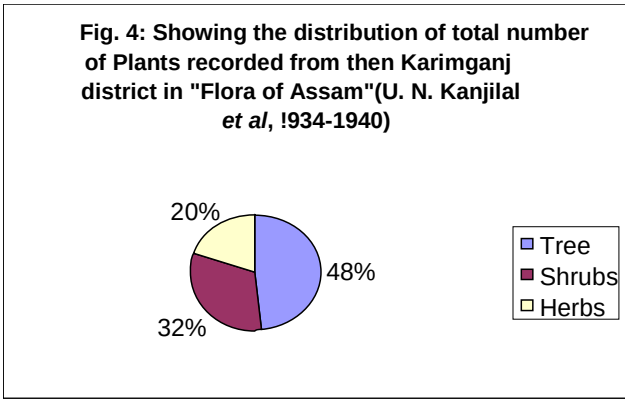

Fig. 4: Showing the distribution of total number of Plants recorded from then Karimganj district in "Flora of Assam"(U. N. Kanjilal *et al*, !934-1940)

Table 7. Habit analysis of species recorded from Cachar district in "*Flora of Assam*" (Kanjilal *et al* 1934 – 1940)

Volumes of *Flora of Assam*	Number of species				Grand Total
	Trees	Shrubs	Climbers	Herbs	
Vol. I	36	14	7	4	61
Vol. II	29	11	11	3	54
Vol. III	34	54	20	13	121
Vol. IV	41	17	3	1	62
Vol. V	4	-	-	19	23
	144	**96**	**41**	**40**	**321**

Table 8: Names of five dominant families of angiosperms recorded from Cachar district in "*Flora of Assam*" (Kanjilal *et al* 1934-1940)

Based on Number of Genera	Based on number of species
1. Rubiaceae (27)	1. Rubiaceae (36)
2. Leguminosae (18)	2. Leguminosae (23)
3. Gramineae (14)	3. Gramineae (23)
4. Euphorbiaceae (13)	4. Euphorbiaceae (17)
5. Convolvulaceae & Apocynaceae (8)	5. Moraceae (16)

Quite a good number of research work related to flora and ethno-botany have been carried out by several workers in Barak valley, a precise account of these are given below (Table-9-A, B, C).

Table-9: Some of the important research publications based on floristic studies in Barak valley:

A. Pteridophytes

Year of publication	Author(s)	Title of the work
1994	Bhattacharya, M. K.	Certain Fern Flora of Karimganj district, Assam. *New Botanist* 22: 125-127
1996	Dutta Choudhury, M. Bhattacharya, M. K	*Dryopteris wallichi*- a new report from Hailakandi district, & Assam, India. *Indian Fern J*. 13: 18-20
1997	Dutta Choudhury, M.	Fern flora of Duhalia Hill and Karimganj District. *Geobios* 16: 91-96.
1998	Bhattacharya, M.K.; Astapati, A.D.; Banik, G. & Dutta Choudhury, M.	A survey of the Pteridophytic flora of Cachar district, Assam, N. E. India. *Indian Fern J*. 15: 80-88
2002	Bhattacharya, B. & Sharma, G.D.	Contribution to the Pteridophytic Flora of Assam University Campus. In *Biodiversity of Assam and its conservation*. Eds. M.K. Bhattacharya, M. Dutta Choudhury & P. B. Mazumder. Pp. 233-240.
2002	Bhattacharya, M. K.; Dutta Choudhury, M. & Mazumder, P. B	Pteridophytic flora of Karimganj district of Assam. In *Biodiversity of Assam and its conservation*. Eds. M.K. Bhattacharya, M. Dutta Choudhury and P.B. Mazumder, pp. 217-224

B. Angiosperms:

Year of publication	Author(s)	Title of the work
1982	Choudhury, S.	*Cleistostome spicatum* Lindl in Cachar district of Assam. Indian For.. 108(8): 589-592
2002	Das, P.S. & Bhattacharya, M.K.	Notes on the causes of threats and conservation of some threatened Pteridophytes and angiosperms of Barak valley, Assam, India. *ECOBIOS*, Vol.-1(1): 16 – 23.
2002	Mazumder, P.B.; Dutta Choudhury, M. & Bhattacharya, M.K	A contribution to the Orchid flora of Southern Assam, India. In *Biodiversity of Assam and its conservation*. Eds. M.K. Bhattacharya, M. Dutta Choudhury & P.B. Mazumder, Pp. 135 – 150
2002	Sharma, G.D., Bhattacharjee S., Sinha M. & Das A.K.	Status of Plant Bio-diversity of Cachar district and its Conservations. *J. Econ. Taxon. Bot*. 25(1): 94-101

Year of publication	Author(s)	Title of the work
2002	Astapati, A.D.; M.K.; Sinha, K. & Mazumder, P.B.	Study of the vascular plants of some wetlands and aquatic habitat Bhattacharya, of Karimganj district of Assam. In *Biodiversity of Assam and its conservation*. Eds. M.K. Bhattacharya, M. Dutta Choudhury & P.B. Mazumder, pp- 80-92
2002	Mazumder, P.B. & Mazumder, B.	*Ex citu* conservation of some orchids of Barak valley, Assam. In *Biodiversity of Assam and its conservation*. Eds. M.K. Bhattacharya, M. Dutta Choudhury & P.B. Mazumder, pp- 48-61
2002	Mazumder, P.B. & Paul, S.	A contribution to the Orchid Flora of Southern Assam (Barak Valley) India. *J. Orchids Soc. India* !6(1-2): 41-45
2002	Bhattcharjee, P.	Study of Bamboos of Karimganj district, Assam, India. In *Biodiversity of Assam and its conservation*. Eds. M.K. Bhattacharya, M. Dutta Choudhury & P.B. Mazumder, pp- 117-123
2004	Das, A.K.; Sharma, G D. & Dutta, B. K.	Study of Plant Diversity and its conservation in Hailakandi district, Assam, India. *J. Econ. Taxon. Bot.* 28 (1): 213-228
2007	Dutta, B.K. & Bhattacharya, B.	A Study on the Orchid Flora of Karimganj District Southern Assam,(Barak Valley), India. In *Biodiversity Conservation- the post Rio Scenario in India*. Eds. B.K. Dutta, A.K. Das & P. Choudhury. Pp176-186
2009	Pal, H., Bhttacharya, D. & Dutta Choudhury, M.	Cyperaceae of Southern Assam: An Inventory. In Abstract for *National Conference on Recent trends in Biodiversity* Research organized, Dept of Life Science, Assam University, Silchar, Pp. 82
2009	Borah, N.; Devi, F.A. & Garcoti, S.C.	Floristic diversity assessment and vegetation analysis of the Bhuban hillsd of Cachar District, Assam. In *National Conference on Recent trends in Biodiversity Research* organized by the Dept. of Life Sciense, Assam University, Silchar, in Abstract pp 42-43
2009	Borah, N.; Devi, F. A. & Garcoti, S. C.	Diversity and structure of Bamboo mixed tropical forest of South Assam, NE India. In *National Conference on Recent trends in Biodiversity Research* organized by Dept of Life Science, Assam University, Silchar, in Abstract pp 83
2010	Bhattacharjee. B. & Dutta, B. K.	Orchids of Barak valley (Southern Assam), Assam, India- An overview. In *National Seminar on Biodiversity Conservation* and Forest and Land Resource Management Organized by the dept of Ecology and Environmental science , Assam University, Silchar, in Abstract pp-19-20
2010	Pal, H. & Dutta Choudhury, M.	Some new records of Cyperaceae from Southern Assam. In press (*Pleione*)

C. Ethnobotany:

Year of publication	Author(s)	Title of the work
2002	Dutta Choudhury, M. & Choudhury, S.	Ethno-medicobotanical aspects of Reang tribes of Assam, India: Part II: New Ethnomedicinal Claims. In *Proceedings of UGC seminar*. Karimganj College, pp-151-161.
2003	Das, P.S. & Dutta Choudhury, M.	A survey on non-conventional Food Plants of Southern Assam. *J. Econ. Taxon. Bot.* 27 (2): 416-420
2005	Choudhury, B.I.; Nath, A.; Barbhuiya, A. R. ; Choudhury, S. & Dutta Choudhury, M.	Ethno-medicobotanical Aspects of Rongmai naga of Cachar District of Assam, India: A study. *Ecobios*. 3 (1-2): 26-34.

Year of publication	Author(s)	Title of the work
2007	Dutta Choudhury, P. & Baruah, M.K.	Ethno-medicinal plants used by Jaintia tribe of Cachar District, Assam. In *Biodiversity Conservation- the post Rio Scenario in India*. Eds. B. K. Dutta, A. K. Das & P. Choudhury. pp-187-192
2007	Das, A.K.; Dutta, B.K. & Sarma, G.D.	Study of Home Garden Plants and their uses in Karimganj district, Assam. In *Biodiversity Conservation- the post Rio Scenario in India*. Eds. B. K. Dutta, A. K. Das & P. Choudhury. pp.176-186
2010	Baruah, M. K.; Chakraborty G. & Dutta Choudhury M.	Ethno-medicinal plants used by Kuki tribe of Cachar district, Assam. In *National Seminar on Biodiversity Conservation* organized by the Dept. of Ecology and Environmental Science, Assam University, Silchar on March, 4-5, In abstract pp- 74-75

DISCUSSION AND CONCLUSION

Botanically Barak valley region is one of such resourceful areas of Assam, the flora of which has not yet been fully studied. A number of areas of the region with their vast natural resources have not been covered by the available publications.

During the last three decades some ethnobotanical survey have been undertaken in the Barak valley region of North East India with a view to prepare resource inventories of plants used by the tribal and ethnic people. However, the publications based on Ethnobotanical works, till date, are also quite insufficient.

Due to various anthropogenic activities such as construction of roads, urbanization, construction of dams, mining, jhoom cultivation etc. the species-rich forests are experiencing threat of extinction – both known and unknown. It is therefore, important that conservation strategy be directed more strongly to those areas those deserve protection and preservation. Emphasis should be given on study of the biodiversity especially the ethno-medicinal plants of the entire area. Conservation of RET species and their documentation through collection, identification, description and preservation from such unexplored areas need to be undertaken immediately.

The phytochemical and pharmacological studies of the recognized ethnomedicinal plants from the Barak valley have not been comprehensive and exhaustive yet. Field surveys on various tribal and rural groups should be carried out giving special attention to the species of ethnomedicinal importance and their documentation, validation and conservation. As diverse kinds of medicinal properties are displayed by many of the plant species of this region researches need to be directed towards novel drug development for human welfare.

Comprehensive work may be undertaken to publish total flora of the region. While doing so emphasis may be given Aquatic Flora, Epiphytic Flora and Herbaceous Flora. Special emphasis may be given on the Monocots Flora of region as there is serious lack of data so far monocot plants of the state are concerned.

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