Angiospermic flora of Borail Wildlife Sanctuary (BWS) in Assam, India: First report

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Abstract

The present investigation deals with the composition of angiosperm plants in the Borail Wildlife Sanctuary, Assam. A total of 281 angiosperm plant species under 199 genera and 64 families were recorded from the sanctuary during the survey period. Angiosperm included herbs (84), trees (83), shrubs (45), climber (38), creeper (01), lianas (6), palm (3), grass (10), sedge (6) and bamboo (5) species.

Key words: Angiosperm flora, Borail Wildlife Sanctuary, Assam

INTRODUCTION

Protected areas help to reduce forest fragmentation and degradation through protection laws and best management practices for biodiversity conservation. Wildlife sanctuary is endowed with ecological, floral, faunal and geomorphologic significance (Shukla 2016). Protected areas helps in recharging ground water, offer scope for pollination of commercially valuable crops, act as carbon sink, helps in soil stabilization etc. (Noss 1992). In Wildlife sanctuary, animals are brought to life and protected for the rest of their life until their natural death (Seikh 2018).

Assam has an geographical area of 78,433 sq. km, lying in between 24°44´ N to 27°45´N latitude and 89°41´ and 96°02´ E longitudes. The state is surrounded by hills and mountains on the north, east and the south side. To the west, it merges with the West Bengal and Bangladesh plains. The state has the Brahmaputra valley in the northern part bordering to Arunachal Pradesh and the Barak valley in the southern part bordering to Mizoram, Tripura and Meghalaya. The state is enriching with 3832 (dicotyledons 2752 and monocotyledon 1080) species of angiosperm plants comprising of 1370 (dicotyledons 1012 and monocotyledon 368) genera distributed in 229 (dicotyledons 189 and monocotyledon 40) families (Chowdhury 2005).

Barail Wildlife Sanctuary (BWS) is situated in the northern part of Cachar district of Assam and lies along the foothills of the North Cachar and Barail hills (Plate:1). The sanctuary is located between latitude 24°58´- 25°50´ N and longitude 92°50´-92°52´E. The total area covered by this wildlife sanctuary is 326.24 sq km. Barail Wildlife Sanctuary is a combination Barail Reserve Forest and North Cachar Reserve Forest, which were together upgraded to Barail Wildlife Sanctuary in June 2004. The BWS is under the administrative control of the Southern Assam Forest Circle, Silchar, and consists of Barail Reserve Forest, which is part of the Cachar Forest Division (East Block) and North Cachar Reserve Forest, part of the Karimgunj Forest Division (West Block). The BWS is governed under two forest range
offices namely, Udharbond and Kalain range offices (Hussain 2015; Bora & Bhattacharyya 2017; Bora et al. 2017).

The climate is humid tropical to sub-tropical; annual rainfall varies from 200 cm/year to 600 cm/year and the average humidity is 72 – 90%. Temperatures range minimum 8°C and maximum temperatures 38°C. Major rivers draining the sanctuary are the Jatinga (Photo-1), Daloo (Photo-24), Kayong, Gumra, and Boleswar. The sanctuary is characterized by undulating hills having altitudinal range of less than 30 m to more than 1867 m. Geologically, the soils are sandy stony to clayey. The area is one of the richest treasure houses of flora as well as fauna due to its unique geographical position, diverse landscapes, wide range of physiographic conditions and high precipitation. As per classification of Champion and Seth (1968), the sanctuary has 2 broad groups of forests, tropical wet evergreen (Photo - 27) and tropical semi-evergreen forests. Tree, shrub and lianas species forming a thick vegetation of the sanctuary, Forest floor is enriched by many herbaceous species. The main secondary landscape elements are cultivated flatland, extensive bamboo brakes (Photo-26), tree plantations (Teak and Sal), secondary and disturbed forest (betel-vine plantation), and village gardens including Areca nut plantations (Barbhuiya & Singh 2012; Hussain 2015; Bora & Bhattacharyya 2017; Bora et al. 2017).

Several publications came out on assessment of plant diversity in protected areas of Assam. Some of them are Sarkar & Devi (2015) on Assessment of plant diversity in Hollongapar Gibbon Wildlife Sanctuary; Jain & Hajra (1975) on the plant diversity of Manas Wildlife Sanctuary; Dutta et al. (1974) on forest flora of North Cachar Hills and Borail Range; Buragohain & Swargiari (2016) on Diversity and conservation of Ficus Linnaeus (Moraceae) in Chakrashila Wildlife Sanctuary; Baruah & Baruah (2000) on hydrophytes of Kaziranga National Park; Baruah & Baruah (2007) on vegetation characteristics of grassland of Kaziranga National Park; Baruah et al. (2003) on biodiversity status in Manas Biosphere reserve; Bharali & Borua (2003) on diversity of orchid flora of Dibru-Saikhowa National Park and Biosphere Reserve; Gogoi et al. (2009) on orchid flora of Joypur Reserve Forest of Dibrugarh district; Gogoi et al. (2009) on orchid flora of Dibru-Saikhowa National Park and Biosphere Reserve; Gogoi (2005) on Dendrobium genus of Dibru-Saikhowa National park and Biosphere Reserve; Dey et al. (2007) on Orchid diversity in Manas National Park, Assam; Bujarbarua & Sarma (2006) on the diversity of family Poaceae in Gibbon Wildlife Sanctuary, Assam; Konwar et al. (2009) on abundance of food plant species and food habits of Rhinoceros unicornis L. in Pobitora Wildlife Sanctuary; Talukdar & Deori (2017) on Floristic Diversity of Laokhowa Wildlife Sanctuary; Nath (2012) on Aquatic macrophytes of Laokhowa Wildlife Sanctuary; Deori & Talukdar (2015) Floristic Diversity of Barnadi Wildlife Sanctuary; Kar et al. (2015) on vascular plant diversity in Amchang Wildlife Sanctuary.

As far as plant diversity study of the Borail Wildlife Sanctuary is concerned, only few report on angiosperm plants (Dutta et al. 1974); on observations of trees and lianas of Borail Wildlife Sanctuary (Bora & Bhattacharyya 2017); on Grasses and bamboos of Barail Wildlife Sanctuary (Bora et al. 2017) is available. There is no report of herbaceous plant is available, thus this work is attempt to provide information all the herb, shrub, tree, lianas and epiphytes, cane & bamboo. Therefore, present investigations were carried out with the objective-study of angiosperm plant diversity of Borail wildlife Sanctuary.

MATERIALS AND METHODS

Detailed surveys of the angiosperm plants of Borail Wildlife Sanctuary were conducted from April 2018 to December 2018 covering wild species. Surveys were conducted from nine sites of the sanctuary mostly from East block viz., Madhura, Indranagar, Khasia Punji,
PLATE - I. Plants of Borail Wildlife Sanctuary: 1. Jatinga River; 2. Pandanus odorifer; 3. Dioscorea pentaphylla; 4. Remusatia pumila; 5. Piper acutistigma; 6. Indigofera zoolingeriana; 7. Bauhinia scandens (stem); 8. Arundina graminifolia; 9. Phrynium pubinerve; 10. Saurauia roxburghii; 11. Medinilla assamica; 12. Trichosanthes tricuspidata; 13. Boehmeria macrophylla; 14. Bauhinia vahlii; 15. Abroma augusta; 16. Homalomena aromatic; 17. Jasminum multiflorum
Kapocherra, Balacherra, Marwa cherra, Durbin tilla, and dense forest areas of the East Block and in West block Damcherra and Bandarkhal area. External mor-phological characteristics including hairs, stipules and floral parts, of collected specimens was observed using Foldscope microscope. Characteristics of each species were observed and noted. The collected specimens were processed into mounted herbarium specimen following standard herbarium techniques (Jain & Rao 1977). Identification of the specimens was done by comparing the field descriptions and observations with the descriptions available in authentic literature (Kanjilal et al. 1934 – 1940; Chowdhury, 2005) and confirmed with ASSAM Herbarium, Shillong. Herbarium specimens were deposited at the TERI herbarium as a voucher specimen for future reference. The International Plant Name Index (IPNI 2012), The Plant List (2013) and Tropicos (2017) were consulted for current nomenclature of all taxa. The Angiosperm Phylogeny Group III Classification (APG III 2009) was followed for the classification of families. The families were arranged in alphabetical order.

RESULTS AND DISCUSSION

A total number of 281 species from 199 genera representing 64 families (Appendix I) were recorded from the study area. Angiosperm comprises of 64 families (dicots 50 and monocots 14), 199 genera (dicots 160 and monocots 39) and 281 species (dicots 224 and monocots 57). Out of the total recorded 281 angiosperm species the composition were herbs (84), trees (83), shrubs (45), climber (38), creeper (01), lianas (6), palm (3), grass (10), sedge (6) and bamboo (5) species.

Among dicotyledons, Asteraceae is the most dominant family in the study area in respect to number of species with (19 species), followed by Fabaceae with (18 species), Lamiaceae, Euphorbiaceae, Moraceae and Mimosaceae each with (11 species), Rubiaceae and Caesalpiniaaceae each with (10 species) etc. In Monocot Poaceae is the dominant family with (15 species) followed by Araceae with (7 species), Cyperaceae and Dioscoreaceae each with (6 species), Zingiberaceae and Orchidaceae each with (4 species), Arecaceae and Smilacaceae each with (3 species). Among the dicotyledons Ficus is the dominant genera representing with 9 species followed by Clerodendrum and Albizia each with 6 species, Desmodium and Ipomoea each with 5 species. Among the monocotyledons most

![Map](image-url) 

*Figure 1. Map (not to scale) of the study area*
PLATE - II. Plants of Borail Wildlife Sanctuary: 18. Rhynchotechum ellipticum; 19. Sarcochlamys pulcherrima; 20. Cheilocostus speciosus; 21. Momordica charantia; 22. Licuala spinosa; 23. Bamboo orchid population; 24. Dalu river; 25. Arenga pinnata; 26. Bamboo and banana thickets; 27. Tropical wet evergreen forest
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CONCLUSION

It is interesting to note that Bauhinia scandens and Heterophragma adenophyllum each with only 2-3 plant recorded from the whole study area. Among tree, Callicarpa tomentosa, Tectona grandis, Sterculia villosa and among shrub, Clerodendrum infortunatum, Senna tora, Cayratia trifolia, Leea indica, Rhynchotechum ellipticum etc. Common herb species are Musa balbisiana, Stellaria media, Cynodon dactylon, Persicaria strigosa and among climber Thunbergia grandiflora, Ipomoea cheiropylla, Argyreia nervosa, Ipomoea purpurea etc. are very common in the study area.

It was observed that, there is severe pressure on the sanctuary due to human activities which is an alarming cause for decline in species diversity. Main problem of the sanctuary is deforestation due to construction of East-West Corridor which is passing through East block of the sanctuary. There is also the problem of stone quarrying, earth cutting which are highly detrimental to the flora and fauna of the sanctuary. Monoculture activities like Areca nut plantation, Tea plantation, and Teak plantation in fringe areas are also threat for the sanctuary. Thus, a multidimensional approach is required with regard to development of a conservation management plan for the safety of the sanctuary. Further research is required on ecology and population dynamics of the species of the sanctuary.

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Dioscorea is the most dominant genera representing with 6 species followed by Smilax, Bambusa, Cyperus and Globba each with 3 species.
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APPENDIX - I

Angiospermic Flora of Borail Wildlife Sanctuary

[Abbreviations used: Habit: H= Herb; S= Shrub; Cl= Climber; Cr = Creeper; L = Lianas; T= Tree; PA = Palm; G= Grass; SE= Sedge; B= Bamboo; EP = Epiphytic. Habitat: RS= Road sides; SS: Stream side; HS= hill slopes; RB = River bank; F = Forest]

| Sl. no. | Name of the plants | Habit | Habitat | Distribution |
|--------|--------------------|-------|---------|--------------|
| **DICOTYLEDONS** | | | |
| 1 | *Andrographis paniculata* (Burm.f.) Wall. ex Nees | H | F | Common |
| 2 | *Thunbergia grandiflora* (Roxb. ex Rotl.) Roxb. | L | F | Very common |
| **ACTINIDIACEAE** | | | |
| 3 | *Saurauia armata* Kurz | T | F | Rare |
| 4 | *Saurauia roxburghii* Wall. [Photo: 10] | T | F | Rare |
| **AMARANTHACEAE** | | | |
| 5 | *Achyranthes aspera* L. | H | RS | Common |
| 6 | *Alternanthera sessilis* (L.) R Br. ex DC. | H | RS | Common |
| 7 | *Amaranthus spinosus* L. | H | RS | Common |
| 8 | *Amaranthus viridis* L. | H | RS | Common |
| 9 | *Deeringia amaranthoides* (Lam.) Merr. | S | HS | Rare |
| **ANACARDIACEAE** | | | |
| 10 | *Mangifera indica* L. | T | F | Common |
| 11 | *Spondias pinnata* (L.f.) Kurz | T | F | Rare |
| 12 | *Rhus chinensis* Mill. | T | F | Rare |
| **APOCYNACEAE** | | | |
| 13 | *Alstonia scholaris* (L.) R.Br. | T | F | Common |
| 14 | *Hoya verticillata* (Vahl) G.Don | Cr | F | Common |
| Sl. no. | Name of the plants | Habit | Habitat | Distribution |
|--------|--------------------|-------|---------|--------------|
| 15     | Taberna montana divaricata (L.) R.Br. ex Roem. & Schult. | S     | F       | Common       |
| 16     | Wrightia arborae (Dennst.) Mabb. | T     | F       | Rare         |
| 17     | Wrightia antidysenterica (L.) R.Br. | T     | F       | Rare         |
| 18     | Aralia armata (Wall. ex G.Don) Seem. | S     | F       | Rare         |
| 19     | Trevesia palmata (Roxb. ex Lindl.) Vis. | T     | F       | Rare         |
| 20     | Schefflera venulosa (Wight & Arn.) Harms | Cl    | F       | Common       |
| 21     | Acmella oleracea (L.) R.K Jansen | H     | RS      | Common       |
| 22     | Ageratum conyzoides (L.) L. | H     | RS      | Common       |
| 23     | Blumea lacera (Burm.f.) DC. | H     | RS      | Common       |
| 24     | Bidens bipinnata L. | H     | RS      | Common       |
| 25     | Centipeda minima (L.) A.Braun & Asch. | S     | RS      | Common       |
| 26     | Chromolaena odorata (L.) R.M. King & H. Rob. | S     | RS      | Common       |
| 27     | Crossocephalum crepidioides (Benth.) S.Moore | H     | F       | Common       |
| 28     | Cyanthillium cinereum (L.) H.Rob. | H     | RS      | Common       |
| 29     | Dichrocephala integrifolia (L.f.) Kuntze | H     | RS      | Rare         |
| 30     | Erigeron canadensis L. | H     | RS      | Rare         |
| 31     | Eclipta prostrata (L.) L. | H     | RS      | Common       |
| 32     | Elephantopus scaber L. | H     | F       | Common       |
| 33     | Helichrysum luteoalbum (L.) Rchb. | H     | RS      | Common       |
| 34     | Mikania micrantha Kunth. | Cl    | RS      | Common       |
| 35     | Sonchus wightianus DC. | H     | RS      | Common       |
| 36     | Sigesbeckia orientalis L. | H     | F       | Common       |
| 37     | Tithonia diversifolia (Hems.) A.Gray | S     | F       | Common       |
| 38     | Trinidad procumbens (L.) L. | H     | RS      | Common       |
| 39     | Xanthium strumarium L. | H     | RS      | Common       |
| 40     | Impatiens balsamina L. | H     | RS      | Rare         |
| 41     | Begonia palmata D. Don | H     | F       | Rare         |
| 42     | Begonia picta Sm. | H     | F       | Rare         |
| 43     | Begonia roxburghii A.DC. | H     | F       | Rare         |
| 44     | Paujania longifolia (Willd.) K. Schum | T     | F       | Rare         |
| 45     | Oxytpermum indicum (L.) Benth. ex Kurz | T     | F       | Rare         |
| 46     | Heterophragma adenophyllum (Wall ex G. Don) Seem ex Benth. & Hook.f. | T     | F       | Very rare    |
| 47     | Protium serratum (Wall. ex Colebr.) Engl. | T     | F       | Rare         |
| 48     | Canarium strictum Roxb. | T     | F       | Rare         |
| 49     | Bauhinia vahlii Wight & Arn. [Photo -14] | L     | HS      | Common       |
| 50     | Bauhinia purpurea L. | T     | HS      | Common       |
| 51     | Bauhinia variegata L. | T     | F       | Very Rare    |
| Sl. no. | Name of the plants                        | Habit | Habitat | Distribution     |
|--------|------------------------------------------|-------|---------|------------------|
| 52     | Bauhinia scandens [Photo -7] L. [Photo -7] | L     | F       | Very Rare        |
| 53     | Senna alata (L.) Roxb.                   | S     | RS      | Common           |
| 54     | Senna occidentalis (L.) Link              | H     | RS      | Common           |
| 55     | Senna tora (L.) Roxb.                    | H     | RS      | Very Common      |
| 56     | Senna sophora (L.) Roxb.                  | H     | RS      | Common           |
| 57     | Cassia fistula L.                         | T     | RS      | Rare             |
| 58     | Cassia javanica L.                        | T     | RS      | Rare             |
| CALOPHYLLACEAE |                                |       |         |                  |
| 59     | Mesua ferrea L.                           | T     | F       | Common           |
| CARYOPHYLLACEAE |                        |       |         |                  |
| 60     | Stellaria media (L.) Vill.                | H     | F       | Very Common      |
| CLEOMACEAE |                                |       |         |                  |
| 61     | Cleome gynandra L.                        | H     | RS      | Very Common      |
| 62     | Cleome viscosa L.                         | H     | RS      | Common           |
| CONVOLVULACEAE |                        |       |         |                  |
| 63     | Poranopsis paniculata (Roxb.) Roberty     | Cl   | F       | Very Common      |
| CUCURBITACEAE |                                |       |         |                  |
| 64     | Argyreia nervosa (Burn.f.) Bojer          | Cl   | F       | Very Common      |
| 65     | Cuscuta reflexa Roxb.                     | Cl   | F       | Very Common      |
| 66     | Ipomoea cheirophylia O'Donell             | Cl   | F       | Very Common      |
| 67     | Ipomoea hederifolia L.                    | Cl   | F       | Very Common      |
| 68     | Ipomoea caerica (L.) Sweet                | Cl   | F       | Very Common      |
| 69     | Ipomoea purpurea (L.) Roth                | Cl   | F       | Very Common      |
| 70     | Ipomoea nil (L.) Roth                     | Cl   | F       | Very Common      |
| 71     | Poranopsis paniculata (Roxb.) Roberty     | Cl   | F       | Very Common      |
| DIPTEROCARPACEAE |                                |       |         |                  |
| 72     | Dipterocarpus turbinatus C.F. Gaertn      | T     | F       | Rare             |
| EUPHORBIACEAE |                                |       |         |                  |
| 73     | Macaranga denticulata (Blume) Müll.Arg.   | T     | F       | Common           |
| 74     | Macaranga peltata (Roxb.) Müll.Arg.       | T     | F       | Common           |
| 75     | Mallotus philippensis Lam. Müll.Arg.      | T     | F       | Common           |
| 76     | Mallotus tetracoccus (Roxb.) Kurz         | T     | F       | Rare             |
| 77     | Mallotus nepalensis Müll.Arg.             | T     | F       | Rare             |
| 78     | Mallotus philippensis Lam. Müll.Arg.      | T     | F       | Common           |
| 79     | Mallotus peltata (Roxb.) Müll.Arg.        | T     | F       | Common           |
| 80     | Mallotus nontiflorus (L.) Kulju & Welzen  | T     | F       | Common           |
| LEGUMINOSAE : FABOIDEAE |                                |       |         |                  |
| 81     | Aeschynomene aspera L.                    | S     | RB      | Rare             |
| 82     | Aeschynomene indica L.                    | H     | SS      | Rare             |
| 83     | Alysicarpus vaginalis (L.) DC.             | H     | RS      | Common           |
| 84     | Butea monosperma (Lam.) Taub.             | T     | F       | Common           |
| Sl. no. | Name of the plants | Habit | Habitat | Distribution |
|--------|------------------|-------|---------|--------------|
| 92     | Centrosema pubescens Benth. | Cl    | RS      | Rare         |
| 93     | Crotonia pallida Aiton | S     | RS      | Common       |
| 94     | Desmodium gangeticum (L.) DC. | S     | RS      | Common       |
| 95     | Desmodium heterocarpon (L.) DC. | S     | RS      | Common       |
| 96     | Desmodium heterophyllum (Willd.) DC. | H     | RS      | Common       |
| 97     | Hylocomium podocarpum subsp. oxyphyllum (DC.) H.Ohashi & R.R.Mill | S     | HS      | Common       |
| 98     | Desmodium triflorum (L.) DC. | H     | HS      | Common       |
| 99     | Derris pachycarpa Merr. | S     | HS      | Rare         |
| 100    | Erythrina stricata Roxb. | T     | RS      | Common       |
| 101    | Mucuna pruriens (L.) DC. | L     | F       | Common       |
| 102    | Indigofera tinctoria L. | S     | HS      | Rare         |
| 103    | Indigofera zollingeriana Miq. [Photo – 6] | T     | F       | Rare         |
| 104    | Mucuna monosperma Roxb. ex Wight | Cl   | F       | Rare         |
| 105    | Caesalpinia bonduc (L.) Roxb. | S     | HS      | Common       |
|        | FAGACEAE          |       |         |              |
| 106    | Castanopsis indica (Roxb. ex Lindl.) A.DC. | T     | F       | Rare         |
| 107    | Castanopsis lanceifolia (Oerst.) Hickel & A.Camus | T     | F       | Rare         |
| 108    | Quercus semiserrata Roxb. | T     | F       | Rare         |
|        | GESNERIACEAE      |       |         |              |
| 109    | Rhyynchotetnum ellipticum (Wall. ex D. Dietr.) A.DC. [Photo – 18] | S     | F       | Very Common  |
|        | LAMIACEAE         |       |         |              |
| 110    | Anisomeles indica (L.) Kuntze | H     | F       | Common       |
| 111    | Callicarpa tomentosa (L.) L. | T     | F       | Common       |
| 112    | Clerodendrum glandulosum Lindl. | S     | F       | Common       |
| 113    | Clerodendrum hastatum (Roxb.) Lindl. | S     | F       | Rare         |
| 114    | Clerodendrum indicum (L.) Kuntze | S     | F       | Common       |
| 115    | Clerodendrum infortunatum L. | H     | RS      | Very Common  |
| 116    | Gmelina arborea Roxb. | T     | F       | Rare         |
| 117    | Holmskiodia sanguinea Retz. | S     | F       | Common       |
| 118    | Rotheca farinosa (Roxb.) Govaerts | T     | F       | Rare         |
| 119    | Rotheca serrata (L.) Steane & Mabb. | S     | HS      | Common       |
| 120    | Tectona grandis L.f. | T     | F       | Common       |
|        | LAURACEAE         |       |         |              |
| 121    | Actinodaphne obovata (Nees) Blume | T     | F       | Rare         |
| 122    | Cinnamomum bejolghota (Buch.-Ham.) Sweet | T     | F       | Rare         |
| 123    | Litsea glutinosa (Lour.) C.B. Rob. | T     | F       | Rare         |
|        | LECYTHIDACEAE     |       |         |              |
| 124    | Careya arborea Roxb. | T     | F       | Rare         |
|        | LORANTHACEAE      |       |         |              |
| 125    | Dendrophthoe falcata (L.f.) Ettingsh. | H     | P       | Rare         |
|        | LYTHRACEAE        |       |         |              |
| 126    | Duabanga grandiflora (Roxb. ex DC.) Walp. | T     | F       | Common       |
| 127    | Lagerstroemia parviflora Roxb. | T     | F       | Rare         |
| 128    | Lagerstroemia speciosa (L.) Pers. | T     | F       | Rare         |
|        | MALVACEAE         |       |         |              |
| 129    | Abelmoschus moschatus Medik. | H     | F       | Common       |
| Sl. no. | Name of the plants                  | Habit | Habitat | Distribution |
|--------|-------------------------------------|-------|---------|-------------|
| 130    | *Abroma augusta* (L.) L.f. [Photo – 15] | S     | F       | Rare        |
| 131    | *Abutilon indicum* (Link) Sweet     | H     | RS      | Common      |
| 132    | *Firmiana simplex* (L.) W. Wight    | T     | F       | Common      |
| 133    | *Sida acuta* Burm.f.                | H     | RS      | Common      |
| 134    | *Sida cordifolia* L.                | H     | RS      | Rare        |
| 135    | *Sida rhombifolia* L.               | H     | RS      | Rare        |
| 136    | *Sterculia villosa* Roxb.           | T     | F       | Common      |
| 137    | *Urena lobata* L.                   | H     | RS      | Common      |
| 138    | *Medinilla assamica* (C.B. Clarke) C. Chen [Photo – 11] | S     | F       | Rare        |
| 139    | *Melastoma malabathricum* L.        | S     | RS      | Common      |
| 140    | *Osbeckia nepalensis* Hook.         | S     | HS      | Rare        |
| 141    | *Osbeckia stellata* Buch.-Ham. ex D.Don |       |         |             |
|        | **MELASTOMATAEAE**                  |       |         |             |
| 142    | *Aphanamixis polystachya* (Wall.) R. Parker | T     | HS      | Rare        |
| 143    | *Dysoxylum gotadhora* (Buch.-Ham.) Mabb. | T     | HS      | Rare        |
| 144    | *Melia azedarach* L.                | T     | HS      | Common      |
| 145    | *Toona ciliata* M Roem.             | T     | F       | Common      |
|        | **MELIACEAE**                       |       |         |             |
| 146    | *Tinospora crispa* (L.) Hook.f. & Thomson | L     | F       | Common      |
| 147    | *Acacia concinna* DC.               | T     | F       | Common      |
| 148    | *Vachellia farnesiana* (L.) Wight & Arn. | T     | F       | Common      |
| 149    | *Senegalia pennata* (L.) Maslin     | T     | F       | Common      |
| 150    | *Albizia amara* (Roxb.) Boivin     | T     | F       | Common      |
| 151    | *Albizia lebbek* (L.) Benth.        | T     | F       | Common      |
| 152    | *Albizia lucidor* (Steud.) I.C. Nielsen | T     | F       | Common      |
| 153    | *Albizia odoratissima* (L.f.)Benth. | T     | F       | Common      |
| 154    | *Albizia procera* (Roxb.) Benth.    | T     | F       | Common      |
| 155    | *Albizia saman* (Jacq.) Merr.       | T     | F       | Common      |
| 156    | *Mimosa diplotricha* Sauvalle       | S     | RS      | Common      |
| 157    | *Mimosa pudica* L.                  | H     | RS      | Common      |
|        | **MORACEAE**                        |       |         |             |
| 158    | *Artocarpus chama* Buch.-Ham.       | T     | F       | Rare        |
| 159    | *Artocarpus lacucha* Roxb. ex Buch.-Ham. | T     | F       | Rare        |
| 160    | *Ficus auriculata* Lour.            | T     | F       | Common      |
| 161    | *Ficus benjamina* L.                | T     | F       | Rare        |
| 162    | *Ficus hispida* L.f.                | T     | F       | Common      |
| 163    | *Ficus hirta* Vahl.                 | T     | F       | Rare        |
| 164    | *Ficus racemosa* L.                 | T     | F       | Common      |
| 165    | *Ficus religiosa* L.                | T     | F       | Common      |
| 166    | *Ficus benghalensis* L.             | T     | F       | Common      |
| 167    | *Ficus elastica* Roxb. ex Hornem.   | T     | F       | Common      |
| 168    | *Ficus semicordata* Buch.-Ham. ex Sm. | T     | F       | Common      |
|        | **MYRTACEAE**                       |       |         |             |
| 169    | *Syzygium cumini* (L.) Skeels       | T     | F       | Common      |
| 170    | *Olax acuminata* Wall. ex Benth.    | S     | F       | Rare        |
| Sl. no. | Name of the plants | Habit | Habitat | Distribution |
|--------|--------------------|-------|---------|--------------|
| 171    | Jasminum multiflorum (Burm.f.) Andrews [Photo -17] | Cl    | F       | Rare         |
| 172    | Ludwigia hyssopifolia (G.Don) Exell | H     | SS      | Common       |
| 173    | Ludwigia octovalvis (Jacq.) P.H.Raven | H     | SS      | Rare         |
| 174    | Ludwigia prostrata Roxb. | H     | SS      | Common       |
| 175    | Eurya acuminata DC. | S     | F       | Rare         |
| 176    | Antidesma acidum Retz. | S     | F       | Rare         |
| 177    | Bridelia retusa (L.) A. Juss. | T     | HS      | Rare         |
| 178    | Phyllanthus amarus Schumach. & Thonn. | H     | RS      | Common       |
| 179    | Phyllanthus emblica L. | T     | F       | Rare         |
| 180    | Peperomia pellucida (L.) Kunth | H     | RS      | Common       |
| 181    | Piper acutistigmum C.DC. [Photo -5] | Cl    | F       | Common       |
| 182    | Piper thomsonii (C.DC.) Hook.f. | Cl    | F       | Rare         |
| 183    | Persicaria barbata (L.) H.Hara | H     | F       | Common       |
| 184    | Persicariachinensis (L.) H.Gross | Cl    | F       | Common       |
| 185    | Persicaria hydropiper (L.) Dilarbre | H     | SS      | Common       |
| 186    | Persicariastrigosa (R.Br.) Nakai | H     | F       | Common       |
| 187    | Polygonumperfoliatum L. | Cl    | F       | Rare         |
| 188    | Polygonumplebeium R.Br. | H     | F       | Common       |
| 189    | Rumexmaritimus L. | H     | RS      | Common       |
| 190    | Ziziphus jujuba Mill. | T     | F       | Common       |
| 191    | Cephalanthus occidentalis L. | T     | F       | Rare         |
| 192    | Dentelia repens (L.) J.R.Forst. & G.Forst. | H     | RS      | Common       |
| 193    | Haldinia cordifolia (Roxb.) Ridsdale | T     | F       | Rare         |
| 194    | Mussaenda glabra Vahl | S     | F       | Common       |
| 195    | Oldenlandia diffusa (Wild.) Roxb. | H     | RS      | Common       |
| 196    | Mussaenda macrophylla Wall. | S     | F       | Rare         |
| 197    | Mussaenda roxburghii Hook.f. | S     | F       | Common       |
| 198    | Paederia foetida L. | Cl    | F       | Common       |
| 199    | Paederia scandens (Lour.) Merr. | Cl    | F       | Common       |
| 200    | Spermacoce hispida L. | H     | RS      | Common       |
| 201    | Zanthoxylum acanthopodium DC. | T     | F       | Rare         |
| 202    | Zanthoxylum oxyphyllum Edgew. | T     | F       | Rare         |
| 203    | Zanthoxylum rhetsa (Roxb.) DC. | T     | F       | Rare         |
| 204    | Xerospermumnoronhianum Blume | T     | F       | Common       |
| 205    | Nicotiana plumaginifolia Viv. | H     | RS      | Rare         |
| 206    | Physalisminima L. | H     | RS      | Rare         |
| 207    | Solanum aculeatissimum Jacq. | H     | RS      | Common       |
| Sl. no. | Name of the plants | Habit | Habitat | Distribution |
|--------|-------------------|-------|---------|--------------|
| 208    | Solanum americanum Mill. | H     | RS      | Common       |
| 209    | Solanum indicum L. | H     | HS      | Common       |
| 210    | Solanum torvum Sw. | S     | HS      | Common       |
|        | **THEACEAE**      |       |         |              |
| 211    | Camellia kissi Wall. | S     | F       | Rare         |
| 212    | Schima wallichii Choisy | T   | HS      | Rare         |
|        | **VERBENACEAE**   |       |         |              |
| 213    | Lantana camara L. | S     | RS      | Common       |
| 214    | Lippia alba (Mill.) N.E.Br. ex Britton & P.Wilson | S | RS | Rare |
| 215    | Phyla nodiflora (L.) Greene | H   | RS      | Rare         |
| 216    | Stachytarpheta jamaicensis (L.) Vahl | H   | RS      | Common       |
|        | **VITACEAE**      |       |         |              |
| 217    | Cissus adnata Roxb. | Cl   | F       | Common       |
| 218    | Cayratia trifolia (L.) Domin | Cl   | F       | Very common  |
| 219    | Leea asiatica (L.) Ridsdale | S   | F       | Common       |
| 220    | Leea indica (Burm.f.) Merr. | S   | F       | Very common  |
| 221    | Tetrastigma pedunculare (Wall. ex Lowson) Planch. | Cl   | F       | Rare         |
|        | **URTICACEAE**    |       |         |              |
| 222    | Boehmeria macrophylla Hornem. [Photo -13] | S     | HS      | Rare         |
| 223    | Dehegeasia longifolia (Burm.f) Wedd. | S   | HS      | Rare         |
| 224    | Elastonema sessile J.R. Forst. & G. Frost. | H   | SS      | Rare         |
| 225    | Pouzolzia hirta Blume ex Hassk. | H   | RS      | Common       |
| 226    | Sarcochlamys pulcherrima Gaudich. [Photo -19] | S   | HS      | Common       |
| 227    | Girardinia diversifolia (Link) Friis | S   | F       | Common       |
|        | **MONOCOTYLEDONS** |       |         |              |
| 228    | Alocasia cucullata (Lour.) G.Don | H   | HS      | Rare         |
| 229    | Colocasia fallax Schott | H   | F       | Rare         |
| 230    | Homalomena aromatica (Spreng.) Schott [Photo -16] | H   | HS      | Rare         |
| 231    | Pothos scandens L. | Cl   | F       | Common       |
| 232    | Remusatia pumila (D.Don) H.Li & A.Hay [Photo -4] | H   | HS      | Common       |
| 233    | Remusatia hookeriana Schott | H   | HS      | Rare         |
| 234    | Rhaphidophora decursiva (Roxb.) Schott | Cl   | F       | Common       |
|        | **ARECACEAE**     |       |         |              |
| 235    | Arenga pinnata (Wurmb) Merr. [Photo -25] | PA   | F       | Rare         |
| 236    | Caryota urens L. | PA   | F       | Common       |
| 237    | Licuala spinosa Wurmb [Photo -22] | PA   | F       | Common       |
|        | **COSTACEAE**     |       |         |              |
| 238    | Chelocostus speciosus (J.Koenig) C.D. Specht. [Photo -20] | H   | F       | Rare         |
|        | **CYPERACEAE**    |       |         |              |
| 239    | Carex dimorpholepis Steud. | SE   | RS      | Common       |
| 240    | Cyperus compressus Retz. | SE   | RS      | Common       |
| 241    | Cyperus compressus L. | SE   | RS      | Common       |
| 242    | Cyperus cypérinus (Retz.) Suringar | SE | RS | Common |
| 243    | Fimbristylis eragrostis (Nees) Hance | SE | RS | Common |
| 244    | Kyllinga brevifolia Rottb. | SE   | RS      | Common       |
|        | **DIOSCOREACEAE** |       |         |              |
| Sl. no. | Name of the plants                     | Habit | Habitat | Distribution |
|--------|---------------------------------------|-------|---------|--------------|
| 245    | Dioscorea alata L.                     | Cl    | F       | Common       |
| 246    | Dioscorea bulbifera L.                 | Cl    | F       | Common       |
| 247    | Dioscorea deltoidea Wall. ex Griseb.   | Cl    | F       | Common       |
| 248    | Dioscorea esculenta (Lour.) Burkill    | Cl    | F       | Common       |
| 249    | Dioscorea hamiltonii Hook.f.           | Cl    | F       | Common       |
| 250    | Dioscorea pentaphylla L. [Photo -3]    | Cl    | F       | Rare         |
|        | **LILIACEAE**                          |       |         |              |
| 251    | Asparagus racemosus Wild.              | Cl    | F       | Rare         |
|        | **MARANTACEAE**                        |       |         |              |
| 252    | Phrynium pubinerve Blume [Photo -9]    | H     | F       | Rare         |
|        | **MUSACEAE**                           |       |         |              |
| 253    | Musa balbisiana Colla                  | H     | F       | Very common  |
|        | **ORCHIDACEAE**                        |       |         |              |
| 254    | Arundina graminifolia (D.Don) Hochr. [Photo -8, 23] | S     | HS      | Common       |
| 255    | Dendrobium densiflorum Lindl.          | H     | EP      | Rare         |
| 256    | Papilionanthe teres (Roxb.) Schltr.    | H     | EP      | Common       |
| 257    | Rhynchostylis retusa (L.) Blume        | H     | EP      | Common       |
|        | **PANDANACEAE**                        |       |         |              |
| 258    | Pandanus odorifer (Forssk.) Kuntze [Photo -2] | T     | F       | Rare         |
|        | **POACEAE**                            |       |         |              |
| 259    | Arundo donax L.                        | G     | SS      | Common       |
| 260    | Bambusa balcooa Roxb.                 | B     | F       | Common       |
| 261    | Bambusa cachearensis R.B. Majumdar     | B     | F       | Rare         |
| 262    | Bambusa tulda Roxb.                   | B     | F       | Common       |
| 263    | Cynodon dactylon (L.) Pers.            | G     | RS      | Common       |
| 264    | Eleusine indica (L.) Gaertn.           | G     | RS      | Common       |
| 265    | Eragrostis pilosa (L.) P. Beauv.       | G     | SS      | Common       |
| 266    | Imperata cylindrica (L.) Raeusch.      | G     | SS      | Common       |
| 267    | Melocanna baccifera (Roxb.) Kurz       | B     | F       | Common       |
| 268    | Opismenus compositus (L.) P. Beauv.    | G     | RS      | Common       |
| 269    | Panicum brevifolium L.                 | G     | RS      | Common       |
| 270    | Phragmites karka (Retz.) Trin. ex Steud | G     | RS      | Common       |
| 271    | Schizostachyum dullooa (Gamble) R.B.Majumdar | B     | F       | Common       |
| 272    | Setaria palmifolia (J.Koenig) Stapf    | G     | RS      | Common       |
| 273    | Thysanolaena latifolia (Roxb. ex Hornem.) Honda | G     | RS      | Common       |
|        | **SMILACACEAE**                        |       |         |              |
| 274    | Smilax china L.                        | Cl    | F       | Rare         |
| 275    | Smilax perfoliata Lour.                | Cl    | F       | Rare         |
| 276    | Smilax zeylanica L.                    | Cl    | F       | Rare         |
|        | **STEMONACEAE**                        |       |         |              |
| 277    | Stemona tuberosa Lour.                 | Cl    | F       | Rare         |
|        | **ZINGIBERACEAE**                      |       |         |              |
| 278    | Hedychium coccineum Buch-Ham ex Sm.    | H     | F       | Rare         |
| 279    | Globba clarkii Baker                   | H     | F       | Rare         |
| 280    | Globba multiflora Wall. ex Baker       | H     | F       | Rare         |
| 281    | Globba racemosa Sm.                    | H     | F       | Rare         |