

Flora of Umananda Island of Brahmaputra River in Assam, India

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Abstract

The flora of Umananda Island on Brahmaputra River near Guwahati is represented with 146 species of plants belonging to Macro-Fungi, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms. It includes 3 spp. of macro-fungi, 3 spp. of bryophytes, 11 spp. of pteridophytes, 2 spp. of gymnosperms, 100 spp. of dicots (42 families) and 25 spp. of monocots (11 families).

Keywords: Phytodiversity, Umananda Island, Guwahati, Brahmaputra River

INTRODUCTION

Umananda is the smallest inhabited Island in the world and one of the three islands, off the Guwahati Shore (Anonymous 2006), which lies between 91° 45' to 91° 50' E Longitude and 26° 07' to 26° 10' N Latitude with an area of 4.7 hectare. The Island was named as *Peacock Island* by an unknown British Administrator. The temple of Umananda is located on the Island, which was built in 1694 A.D. by the order of King Gadadhar Singh (1681 – 1696), one of the ablest and strongest rulers of the Ahom Dynasty. The construction was accomplished by the King's administrator stationed at Guwahati Bar Phukan Garhganya Handique. The original temple was however immensely damaged by a devastating earthquake in 1897. The present structure was reconstructed subsequently (Anonymous 2006). It has tropical climate, while the mean temperature varies from 10° C to 38° C. The soil is mostly brown-sandy (Guha 2007).

The Legend: *Lord Siva* is said to have resided here in the form of Bhayananda. According to the Kalika Purana, at the beginning of the creation, *Siva* sprinkled ashes (*bhasma*) at this place and imparted knowledge to Parvati (his consort). It is said that, when *Siva* was in meditation on this hillock, Kamadeva interrupted his yoga and was therefore burnt to ashes with the fire of *Siva's* anger and hence the hillock also got the name *Bhasmacala* (Anonymous 2007).

The Importance: Beside its historical importance, the island is also come into focus as the Golden Langur (*Trachypithecus geei*) habitat. It is a highly endangered species found in the North-Eastern part of India and is one of the most beautiful monkeys. A group of four individuals was introduced to Umananda Island (when?) and now their population has increases to nine (Biswas *et al.* 1996).

The vegetation of the Umananda Island comprises of tropical dry deciduous forests. Some of the common plants growing there include: *Litsea glutinosa* (Lour.) C.B. Robinson, *Sterculia villosa* Roxb., *Wrightia tomentosa* (Roxb.)Roem. & Schult., *Vitex peduncularis* Wall., *Aegle marmelos* (L.) Correa, *Melia azedarach* L., *Azadirachta indica* A. Juss., *Tamarindus indica* L., *Bridelia tomentosa* Bl., *Streblus asper* Lour. *Barringtonia acutangula* (L.) Gaertn. etc., are **Trees**; *Phoenix sylvestris* (L.) Roxb., *Areca catechu* L., *Cocos nucifera* L. etc. are **Palms**; *Stephania hernandifolia* (Willd.) Walp., *Cayratia trifolia* (L.) Gangnep., *Pueraria tuberosa* DC., *Coccinia indica* Wight &

Arn., *Cryptolepis sinensis* (Lour.) Merr., *Ipomoea hederifolia* L., *Dioscorea bulbifera* L., *Dioscorea deltoidea* (Lour.) Burkil etc. are **Climbers**; *Hibiscus rosa-sinensis* L., *Malvaviscus arboreus* Cav., *Murraya koenigii* (L.) Sprengel, *Murraya paniculata* (L.) Jac., *Leea guineensis* G. Don, *Meyna laxiflora* Robyns. etc. are **Shrubs**; *Biophytum sensitivum* (L.) DC., *Oxalis corniculata* L., *Oxalis corymbosa* DC., *Cardamine hirsuta* L., *Cleome viscosa* L. etc. are represented as **Herbs**; and *Rhynchosyilis retusa* (L.) Blume, *Vanda tessellata* Hook. ex G. Don and *Papilionanthe teres* Schlechter etc. are **Epiphytes**.

Previous work: Although a number of workers like Sharma *et al* (1993) and Biswas *et al.* (2000) have worked on Brahmaputra River Island Majuli but no effort has been made so far to work out the floristic account of Umananda Island separately.

The present study was undertaken during 2007 – 2008 to bring out an account of the Phytodiversity of this island. Present communication includes Fungi, Bryophytes, Pteridophytes, Gymnosperms and Angiospermic plants presently growing in the Island.

METHODOLOGY

Frequent visits during last one year were made at regular intervals to different spots of the Island for observation and collection of specimens at flowering and fruiting stages. Herbarium specimens were made as per standard methodology (Jain & Rao, 1977) and identified with the help of different literature including *Flora of Assam* (Kanjalil *et al*, 1934 – 1940) and were matched at the ASSAM Herbarium. Voucher specimens have been deposited in the Herbarium of the Botany Department, Gauhati University.

RESULTS AND DISCUSSION

Exploration of the Umananda Island has resulted in the documentation of 146 plant species representing 127 genera under 67 families those are presented in Table-1 for Macro-Fungi; Table-2 for Bryophytes, Table-3 for Pteridophytes, Table-4 for Gymnosperms; Table-5 for Dicotyledonous Angiosperms and Table-6 for Monocotyledonous Angiosperms. Numerical representation of different plant groups are presented in Table-7.

Table 1: Macro-Fungi of Umananda Island.

Name of the plants	Habit	Distribution	Regeneration
Lycoperdiaceae			
<i>Lycoperdon pyriforme</i> Leyss.	Fleshy fruit body	Common	Spore
Agaricaceae			
<i>Agaricus campestris</i> L.	Fleshy fruit body	Common	Spore
Polyporaceae			
<i>Pycnoporus sanguinea</i> L.	Hard fruit body	Rare	Spore
<i>Polyporus gilvus</i> Fries	Hard fruit body	Common	Spore

Table 2: Bryophytes of Umananda Island.

Name of the plants	Habit	Distribution	Regeneration
Ricciaceae			
<i>Riccia crystallina</i> Nees	Thallus body	Rare	Spore
Marchantiaceae			
<i>Marchantia palmata</i> Nees	Thallus body	Common	Gemma, Spore
<i>Marchantia Polymorpha</i> L.	Thallus body	Rare	Gemma, Spore
Funriaceae			
<i>Funria hygrometrica</i> Swartz	Erect moss	Common	Spore

Table 3: Pteridophytes of Umananda Island. [Abbreviations: H= herb; S= shrub; Cl= climber; T= tree; EP= epiphytes]

Name of the plants	Habit	Distribution	Regeneration
Adiantaceae			
<i>Adiantum philippense</i> L.	H	Common	Rhizome, Spore
<i>Adiantum caudatum</i> L.	H	Common	Rhizome, Spore
Polypodiaceae			
<i>Pteris vittata</i> L.	H	Common	Rhizome, Spore
<i>Pyrrosia adnascens</i> (Swartz) Ching	H	Common	Rhizome, Spore
<i>Microsorium punctatum</i> (L.) Copel.	H	Rare	Rhizome, Spore
<i>Pteris semipinnata</i> L.	H	Rare	Rhizome, Spore
Dipteridaceae			
<i>Drymoglossum heterophyllum</i> (L.) Trimen	H	Rare	Rhizome, Spore
Drynariaceae			
<i>Drynaria quercifolia</i> (L.) J. Sm.	H	Rare	Rhizome, Spore
Lygodiaceae			
<i>Lygodium japonicum</i> (Thunb.) Swartz	H	Common	Rhizome, Spore
<i>Lygodium microphyllum</i> (Cav.) R.Br.	H	Common	Rhizome, Spore
Thelypteridaceae			
<i>Chrystella parasitica</i> (L.) Lev.	H	Rare	Rhizome, Spore

Table 4: Gymnosperms of Umananda Island.

Name of the plants	Habit	Distribution	Regeneration
Cycadaceae			
<i>Cycas pectinata</i> Griff.	Stout palm like	Rare	Rhizome, Spore
Cupressaceae			
<i>Thuja orientalis</i> Roxb.	Bushy small tree	Rare	Cone

Table 5: Angiospermic Dicotyledonous plants of Umananda Island. [Abbreviations: H= herb; S= shrub; Cl= climber; T= tree; EP= epiphytes]

Name of the plants	Habit	Distribution	Regeneration
Annonaceae			
<i>Annona reticulata</i> L.	T	Rare	Seed
Menispermaceae			
<i>Stephania hernandifolia</i> (Willd.) Walp.	Cl	Common	Tuber

Papaveraceae			
<i>Argemone mexicana</i> L.	H	Common	Seed
Brassicaceae			
<i>Cardamine hirsuta</i> L.	H	Rare	Seed
Capparaceae			
<i>Capparis spinosa</i> L.	S	Rare	Seed
<i>Cleome viscosa</i> L.	H	Common	Seed
Malvaceae			
<i>Abutilon indicum</i> (L.) Sweet	H	Common	Seed
<i>Urena lobata</i> L.	H	Common	Seed
<i>Hibiscus rosa - sinensis</i> L.	S	Common	Stem cutting
<i>Malvaviscus arboreus</i> Cavanilles	S	Rare	Stem cutting
Sterculiaceae			
<i>Sterculia villosa</i> Roxb.	T	Rare	Seed
Oxalidaceae			
<i>Biophytum sensitivum</i> (L.) DC.	H	Rare	Seed
<i>Oxalis corniculata</i> L.	H	Common	Seed
<i>Oxalis corymbosa</i> DC.	H	Common	Seed
Rutaceae			
<i>Aegle marmelos</i> (L.) Correa	T	Common	Seed
<i>Glycosmis pentaphylla</i> (Retz.) DC.	H	Common	Seed
<i>Murraya koenigii</i> (L.) Sprengel	S	Common	Seed
<i>Murraya paniculata</i> (L.) Jac.	S	Rare	Seed
Meliaceae			
<i>Melia azedarach</i> L.	T	Common	Seed
<i>Azadirachta indica</i> A. Juss.	T	Common	Seed
Vitaceae			
<i>Cayratia trifolia</i> (L.) Gangnep	Cl	Common	Seed
Leeaceae			
<i>Lea guineensis</i> G.Don	S	Common	Seed
Anacardiaceae			
<i>Mangifera indica</i> L.	T	Common	Seed
Fabaceae			
<i>Desmodium cephalotes</i> Wall.	H	Common	Seed
<i>Erythrina stricta</i> Roxb.	T	Common	Seed
<i>Pueraria tuberosa</i> DC.	Cl	Common	Seed
<i>Tephrosia candida</i> (Roxb.) DC.	H	Rare	Seed
<i>Tamarindus indica</i> L.	T	Common	Seed
Caesalpiniaceae			
<i>Bauhinia racemosa</i> Lam.	S	Rare	Seed
<i>Cassia tora</i> L.	H	Common	Seed
<i>Cassia sophera</i> L.	H	Common	Seed
<i>Delonix regia</i> (Boj.)Raf.	T	Rare	Seed
Mimosaceae			
<i>Albizia lebbek</i> Benth.	T	Common	Seed

Rosaceae			
<i>Rosa alba</i> L.	S	Rare	Stem cutting
Melastomataceae			
<i>Melastoma malabathricum</i> L.	S	Common	Seed
<i>Osbeckia nepalensis</i> Hooker	S	Rare	Seed
Lythraceae			
<i>Lagerstroemia speciosa</i> (L.) Pers.	T	Common	Seed
Cucurbitaceae			
<i>Coccinia indica</i> Wight & Arn.	Cl	Common	Seed
Molluginaceae			
<i>Mollugo pentaphylla</i> L.	H	Common	Seed
Apiaceae			
<i>Centella asiatica</i> (L.) Urban	H	Common	Runner
<i>Hydrocotyle sibthorpioides</i> Lamarck	H	Common	Seed
Rubiaceae			
<i>Meyna laxiflora</i> Robyns.	S	Rare	Seed
<i>Neolamarckia cadamba</i> (Roxb.) Bosser	T	Common	Seed
Asteraceae			
<i>Ageratum conyzoides</i> L.	H	Common	Seed
<i>Elephantopus scaber</i> L.	H	Common	Seed
<i>Eupatorium odoratum</i> L.	S	Common	Seed
<i>Mikania micrantha</i> Kunth.	Cl	Common	Seed
<i>Crassocephallum crepidioides</i> (Benth.) Moor.	H	Common	Seed
<i>Tagetes erecta</i> L.	H	Common	Seed
Apocynaceae			
<i>Wrightia tomentosa</i> (Roxb.) Roem. & Schult.	T	Common	Seed
<i>Plumeria alba</i> L.	T	Rare	Stem cutting
<i>Nerium indicum</i> Mill.	T	Rare	Seed
<i>Thevetia peruviana</i> (Pers.) K.Schum.	T	Rare	Seed
Asclepiadiaceae			
<i>Cryptolepis sinensis</i> (Lour.) Merr.	Cl	Common	Seed
Convolvulaceae			
<i>Ipomoea hederifolia</i> L.	Cl	Rare	Seed
Solanaceae			
<i>Datura metel</i> L.	H	Common	Seed
<i>Solanum nigrum</i> L.	H	Common	Seed
<i>Solanum spirale</i> Roxb.	S	Common	Seed
Scrophulariaceae			
<i>Lindernia crustacea</i> (L.) Fl.	H	Common	Stem
<i>Mazus pumilus</i> (Burm.f.) van Steenis	H	Common	Seed
<i>Scoparia dulcis</i> L.	H	Common	Seed
Acanthaceae			
<i>Justicia adhatoda</i> L.	S	Rare	Root
<i>Phaulopsis imbricata</i> (Forssk) Sweet.	H	Common	Seed

<i>Rungia pectinata</i> (L.) Nees	H	Common	Seed
<i>Justicia gendarussa</i> (L.f.) Burm.	S	Rare	Seed
Verbenaceae			
<i>Tectona grandis</i> L.f.	T	Common	Seed
<i>Clerodendrum viscosum</i> Vent.	H	Common	Seed
<i>Vitex peduncularis</i> Wall.	T	Rare	Seed
<i>Lantana camara</i> L.	S	Common	Seed
Lamiaceae			
<i>Anisomeles ovata</i> R.Br.	H	Common	Seed
<i>Ocimum sanctum</i> L.	H	Rare	Seed
Nyctaginaceae			
<i>Nyctanthes arbor-tristis</i> L.	T	Rare	Seed
Amaranthaceae			
<i>Achyranthes aspera</i> L.	H	Common	Seed
<i>Alternanthera sessilis</i> (L.) Roxb. ex. DC.	H	Common	Seed
<i>Amaranthus spinosus</i> L.	H	Common	Seed
<i>Amaranthus viridis</i> L.	H	Common	Seed
<i>Deeringia amaranthoides</i> Merrill	S	Rare	Seed
Piperaceae			
<i>Peperomia pellucida</i> (L.) H.B.K.	H	Common	Seed
Lauraceae			
<i>Litsea glutinosa</i> (Lour.) C.B. Robinson	T	Rare	Seed
Euphorbiaceae			
<i>Phyllanthus emblica</i> L.	T	Rare	Seed
<i>Bridelia tomentosa</i> Blume	T	Rare	Seed
<i>Mallotus philippensis</i> (Lamk) Muell.-Arg.	T	Common	Seed
<i>Ricinus communis</i> L.	S	Common	Seed
<i>Euphorbia antiquorum</i> L.	S	Common	Stem cutting
<i>Phyllanthus niruri</i> L.	H	Common	Seed
<i>Breynia retusa</i> (Dennst.) Alston	S	Rare	Seed
<i>Euphorbia hirta</i> L.	H	Common	Seed
<i>Trewia nudiflora</i> L.	T	Rare	Seed
Urticaceae			
<i>Pouzolzia hirta</i> (Bl.) Hassk.	H	Common	Seed
Moraceae			
<i>Ficus elastica</i> Roxb.	T	Rare	Seed
<i>Ficus hispida</i> L.f.	Sh	Common	Seed
<i>Ficus infectoria</i> Roxb.	T	Rare	Seed
<i>Ficus religiosa</i> L.	T	Common	Seed
<i>Ficus bengalensis</i> L.	T	Common	Seed
<i>Streblus asper</i> Lour.	T	Common	Seed
<i>Artocarpus heterophyllus</i> Lam.	T	Common	Seed
<i>Artocarpus chaplasi</i> Roxb.	T	Rare	Seed
Caricaceae			
<i>Carica papaya</i> L.	H	Common	Seed

Burseraceae

<i>Garuga pinnata</i> Roxb.	H	Rare	Seed
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Lacynthidaceae

<i>Barringtonia acutangula</i> (L) Gaertn.	T	Common	Seed
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Table 6: Angiospermic Monocotyledonous plants of Umananda Island. [Abbreviations: H= herb; S= shrub; Cl= climber; T= tree; EP= epiphytes]

Name of the plants	Habit	Distribution	Regeneration
Orchidaceae			
<i>Papilionanthe teres</i> Schlechter	H/EP	Rare	Seed
<i>Rhynchosyilis retusa</i> (L.) Blume	H/EP	Rare	Seed
<i>Vanda tessellata</i> Hook. ex G. Don	H/EP	Rare	Seed
Hypoxidaceae			
<i>Curculigo orchiioides</i> Gaertn.	H	Rare	Rhizome
Dioscoreaceae			
<i>Dioscorea bulbifera</i> L.	Cl	Common	Tuber
<i>Dioscorea deltoidea</i> (Lour.)Burkil	Cl	Rare	Tuber
Liliaceae			
<i>Sansevieria roxburghiana</i> Schult.	H	Common	Rhizome
Commelinaceae			
<i>Commelina benghalensis</i> L.	H	Common	Seed
<i>Commelina appendiculata</i> C.B.Clarke	H	Rare	Seed
Araceae			
<i>Amorphophalus bulbifer</i> (Roxb.) Blume	H	Common	Rhizome
<i>Colocasia esculenta</i> (L.) Schott	H	Common	Corn
<i>Alocasia macrorrhiza</i> Schott	H	Common	Corn
<i>Pothos cathcartii</i> Schott	Cl	Common	Seed
Musaceae			
<i>Musa paradisiaca</i> L.	H	Common	Rhizome
Costaceae			
<i>Costus speciosus</i> (Koen. ex Retz.) Smith	H	Rare	Rhizome
Arecaceae			
<i>Areca catechu</i> L.	Palm	Common	Seed
<i>Cocos nucifera</i> L.	Palm	Common	Seed
<i>Phoenix sylvestris</i> (L) Roxb.	Palm	Common	Seed
Cyperaceae			
<i>Kyllinga brevifolia</i> Rottb.	H	Rare	Seed
Poaceae			
<i>Axonopus compressus</i> (Sw.) P.Beauv.	H	Common	Seed
<i>Cynodon dactylon</i> (L.) Pers.	H	Common	Seed
<i>Imperata cylindrica</i> (L)P.Beauv.	H	Common	Seed
<i>Paspalum conjugatum</i> Berg.	H	Rare	Seed
<i>Saccharum arundinaceum</i> Retz.	H	Common	Seed
<i>Sacchrum spontaneum</i> L.	H	Common	Seed

PLATE I



Fig 1 View of the Umananda Island.



Fig 2 Golden Langur (*Trachypithecus geei*) highly endangered species.



Fig 3 *Cycas pectinata* Griff.



Fig.4 *Capparis spinosa* Roxb.
(a medicinal plant)



Fig.5. *Bambusa spinosa* (thorny bamboo)



Fig.6 *Abutilon indicum* (fiber plant)

Macro-fungi are represented by 4 species belong to 4 genera and 3 families; Bryophytes are represented by 4 species belong to 3 genera and 3 families; Pteridophytes are represented by 11 species belong to 8 genera, 6 families; Gymnosperms are represented by 2 species belong to 2 genera and 2 families; Dicots are represented by 100 species belong to 88 genera and 42 families and, finally, Monocots are represented by 25 species belong to 22 genera and 11 families.

Table 7: Estimation of Plant groups in Umananda Island

Plant Group	Family	Genus	Species
Fungi (Macro)	03	04	04
Bryophytes	03	03	04
Pteridophytes	06	08	11
Gymnosperms	02	02	02
Dicotyledonos	42	88	100

It is interesting to note that Moraceae and Euphorbiaceae with 08 species each are the most dominant families among the dicots, and Asteraceae with 06 species, Fabaceae and Amaranthaceae with 05 species each and Caesalpiniaceae, Apocynaceae, Acanthaceae and Verbenaceae with 04 species each are other dominant dicot families of the Umananda Island. Among the monocots Poaceae is the most dominant family with 06 species, Araceae with 04 species and Arecaceae, Orchidaceae with 3 species each are other dominant families of monocot. Of the total, 125 species of the Angiosperms 59 species are herbs with 40 from dicot and 19 from monocot; 19 shrubs, all are from dicot, have been recorded. 31 species, all are from dicots are trees. 07 species from dicot and 3 species from monocot are climbers. 3 epiphytes and 3 palms are all from Monocot.

CONCLUSION

Considering the size of the Island (smallest inhabited River Island in the World) with only 4.7 hectare area is quite rich in Angiospermic flora. But, certain factors threatened the diversity of the flora and these are: (a) water level of Brahmaputra River increases during summer causes soil erosion specially in edges of the Island and washed out habitat of some plants, and (b) as the Island is a historical place and tourists used to visit the place, therefore, there is an increasing trends in several commercial activities. These factors not only disturb the biodiversity but also create problem for the food and shelter of the golden langur of the Island. Therefore, there is a need for urgent attention for the conservation of the vegetation and flora of Umananda Island.

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