

## PLANT DIVERSITY OF SONADIA ISLAND – AN ECOLOGICALLY CRITICAL AREA OF SOUTH-EAST BANGLADESH

M.S. AREFIN, M.K. HOSSAIN<sup>1</sup> AND M. AKHTER HOSSAIN

*Institute of Forestry and Environmental Sciences, University of Chittagong,  
Chittagong 4331, Bangladesh*

*Keywords:* Plant Diversity; Ecologically Critical Area; Sonadia Island; Mangroves.

### Abstract

The study focuses the plant diversity in different habitats, status and percentage distribution of plants in Sonadia Island, Moheshkhali, Cox's Bazar of Bangladesh. A total of 138 species belonging to 121 genera and 52 families were recorded and the species were categorised to tree (56 species), shrub (17), herb (48) and climber (17). Poaceae represents the largest family containing 8 species belonging to 8 genera. Homestead vegetation consists of 78% species followed by roadside (23%) and cultivated land (10%), mangroves (9%), sandy beaches (4%) and wetland (1%). The major traditional use categories were timber, food and fodder, fuel, medicine and fencing where maximum plant species (33% of recorded) were traditionally being used for food and fodder.

### Introduction

Sonadia Island at Moheshkhali of Cox's Bazar is situated in the southern-eastern coastal region of Bangladesh with partial regular inundations of saline water. The island covers an area of 10,298 hectares including coastal and mangrove plantations, salt production fields, shrimp culture farms, plain agriculture lands, human settlements etc. Ecosystem of this island was adversely affected due to increasing rate of anthropogenic disturbances. To protect the ecosystem of this island, it was declared as Ecologically Critical Area (ECA) in 1999 under section of the Bangladesh Environment Conservation Act, 1995 (MoEF, 2015). ECAs are ecologically defined areas or ecosystems affected adversely by the changes brought through human activities. This island is floristically composed of a number of mangrove and terrestrial plant species. The island is important not only as renewable resources but also as an essential in conservation of nature, wildlife, fish and environment of the island and the surrounding areas. The ECA needs special attention for environmental conservation in terms of both flora and fauna aspects. For this, a comprehensive list of the flora and fauna existing in Sonadia Island is essential. Moloney (2006) reported 60 vascular plants from Sonadia in the draft Sonadia Island ECA Conservation and Management Plan. There had been gradual changes in the ecological conditions due to increased anthropogenic interference. Since, no complete study was carried out throughout the period, it is completely unknown if any changes in the floristic composition of the critically endangered ecosystem has occurred in the last decade. Therefore, the present study was undertaken with the aim of assessing the plant resources of Sonadia Island, an ECA based on extensive field observations.

### Materials and Methods

#### *Study area*

Sonadia Island is located in the far south-eastern corner of Bangladesh at 21°N and 91°E, the site lies a few kilometers north of Teknaf Peninsula, north-west of Cox's Bazar town and is bounded by the Bay of Bengal on the West and East (Fig. 1).

<sup>1</sup>Corresponding author: Email: mkhossain2009@gmail.com  
DOI: <http://dx.doi.org/10.3329/bjpt.v24i1.33037>



Fig. 1. Location of Sonadia island in Moheshkhali upazila of Cox's Bazar district, Bangladesh.

The Island is separated from the mainland by the Moheshkhali channel and from Moheshkhali Island by the Bara Canal. The soil of this area is the admixture of sand and clay in varying proportion. The soil of the North part is clay and is inundated by sea water. The entire soil condition of the South part is almost sandy (DoE, 1999). The whole island has a mild temperature and high humidity. The summer begins from March and continues till the beginning of June. The annual average temperature in Cox's Bazar is 34.8°C and a minimum of 16.1°C. Sonadia Island is a gently sloping low-lying barrier island with an altitude range of 0-4 metres (DoE, 1999).

#### *Field visit, data collection and analysis*

A reconnaissance survey was conducted in the Sonadia island ECA prior to the field work to have a general idea of the site, topography, species composition, habitat condition and socio-economic status of the local people. The flora study methods include key informant interview, reconnaissance survey, and field data collection through whole area survey, homestead plant survey, and focused group discussion from October, 2015 to August 2016. Field work was scheduled in such a way that enable plant observation and specimen collections of unknown plant species during the flowering and fruiting time of maximum number of species.

A total 9 foot trails of different length (3-7 km each) in two villages (*Purbo para* and *Passchim para*) and 9 boat journey through the surrounding canals, rivers and sea shore (total 33 km (approx.) were made to record the flora of homesteads and mangrove forests of Sonadia island. Survey was continued until occurrence of new species. The observed plant species were identified and recorded in the field. Habitat and habit form were also recorded. Herbarium specimen of rare and unidentified plant samples with fertile material (flower, fruit and seed) were collected and prepared for identification after necessary processing. Plant specimens with only vegetative part were also collected for herbarium preparation in case of unavailability of fertile materials. Photographs of the characteristic plant species from suitable projection were taken to keep a digital record of morphological features of the plants. Along with verification of the local names, local use of the recorded plants was explored through focused group discussion in the two villages of Sonadia Island.

Herbarium specimens were identified by consultation with voucher specimens and taxonomists of Bangladesh Forest Research Institute as well as recognized references, viz. Prain (1903); Heinig (1925); Siddiqui *et al.* (2007) and Ahmed *et al.* (2008). The identified taxa were arranged alphabetically with species names.

## **Results**

### *Floristic composition*

A total of 138 plant species belonging to 121 genera and 52 families were identified from the Sonadia island (Table 1). Among the recorded 138 species, Poaceae appeared as the largest family with 8 species under 8 genera followed by Cucurbitaceae (7 genera and 8 species), and Mimosaceae (8 species and 6 genera) (Fig. 2). Most of the families (28 nos.) were represented by only 1 species each (Table 1).

### *Growth (habit) forms of the plants*

The recorded flora of Sonadia Island is grouped under tree, shrubs, herbs and climbers growth (habit) forms. Trees constitute the major category (56 species) of plant species followed by herbs (48 species), shrubs (17 species), and climbers (17 species) (Fig. 3). Number of tree species in Mimosaceae was maximum (5 genera and 7 species), whereas shrubs were maximum in Verbenaceae (3 genera and 4 species). In case of herbs and climbers Amaranthaceae (4 genera and 7 species) and Cucurbitaceae (7 genera and 8 species) were represented by maximum species respectively.

**Table 1. List of plant species recorded from Sonadia Island of Bangladesh.**

| SN | Scientific name  | Local name    | Family name    | Habit | Habitat               |
|----|--|---------------|----------------|-------|-----------------------|
| 1  | <i>Acacia auriculiformis</i> A. Cunn. ex Benth. & Hook.      | Akashmoni     | Mimosaceae     | T*    | Homestead, Roadside   |
| 2  | <i>Abelmoschus esculentus</i> (L.) Moench                    | Vandi         | Malvaceae      | H     | Cultivated            |
| 3  | <i>Acacia farnesiana</i> (L.) Willd.                         | Bilati Babla  | Mimosaceae     | T     | Homestead             |
| 4  | <i>Acanthus ilicifolius</i> L.                               | Hargoza       | Acanthaceae    | S     | Mangrove              |
| 5  | <i>Aegialitis rotundifolia</i> Roxb.                         | Nunia gach    | Plumbaginaceae | S     | Mangrove              |
| 6  | <i>Albizia lebbek</i> (L.) Benth.                            | Kala koro     | Mimosaceae     | T     | Homestead             |
| 7  | <i>Albizia procera</i> (Roxb.) Benth.                        | Sada koro     | Mimosaceae     | T     | Homestead             |
| 8  | <i>Alocasia macrorrhizos</i> (L.) G. Don                     | Mankachu      | Amaranthaceae  | H     | Homestead             |
| 9  | <i>Alternanthera philoxeroides</i> (Mart.) Griseb.           | Helencha      | Amaranthaceae  | H     | Cultivated, Roadside  |
| 10 | <i>Alternanthera sessilis</i> (L.) R. Br. ex Roem. & Schult. | Saci Shak     | Amaranthaceae  | H     | Cultivated            |
| 11 | <i>Amaranthus spinosus</i> L.                                | Katashak      | Amaranthaceae  | H     | Homestead             |
| 12 | <i>Amaranthus tricolor</i> L.                                | Lalshak       | Amaranthaceae  | H     | Homestead, Cultivated |
| 13 | <i>Amaranthus viridis</i> L.                                 | Datashak      | Amaranthaceae  | H     | Homestead, Roadside   |
| 14 | <i>Anacardium occidentale</i> L.                             | Kajubadam     | Anacardiaceae  | T     | Homestead             |
| 15 | <i>Areca catechu</i> L.                                      | Supari        | Arecaceae      | T     | Homestead             |
| 16 | <i>Argyrea capitiformis</i> (poir.) Oostr.                   | Voga Lata     | Convolvulaceae | C     | Roadside              |
| 17 | <i>Artocarpus heterophyllus</i> Lamak.                       | Kathal        | Moraceae       | T     | Homestead             |
| 18 | <i>Asystasia gangetica</i> (L.) T. Anders.                   |               | Acanthaceae    | H     | Roadside              |
| 19 | <i>Averrhoa carambola</i> L.                                 | Kamranga      | Averrhoaceae   | T     | Homestead             |
| 20 | <i>Avicennia alba</i> Blume.                                 | Sada Baen     | Avicenniaceae  | T     | Mangrove              |
| 21 | <i>Avicennia marina</i> (Forsk.) Vierh.                      | Moriccha Baen | Avicenniaceae  | T     | Mangrove              |
| 22 | <i>Avicennia officinalis</i> L.                              | Kalo Baen     | Avicenniaceae  | T     | Mangrove              |
| 23 | <i>Azadirachta indica</i> A.Juss.                            | Neem          | Meliaceae      | T     | Homestead             |
| 24 | <i>Bambusa vulgaris</i> Schrad.ex Wendl.                     | Baijja Bans   | Poaceae        | T     | Homestead             |
| 25 | <i>Basella rubra</i> L.                                      | Poi Shak      | Basellaceae    | C     | Homestead             |
| 26 | <i>Benincasa hispida</i> (Thunb.) Cogn.                      | Chal Kumra    | Cucurbitaceae  | C     | Homestead             |
| 27 | <i>Blumea lacera</i> (Burm.f.)                               | Kukur Muta    | Asteraceae     | H     | Roadside              |
| 28 | <i>Brassica juncea</i> (L.) Czern.                           | Rai Sorisa    | Brassicaceae   | H     | Homestead             |
| 29 | <i>Calotropis procera</i> (Ait.) R. Br.                      | Akanda        | Asclepiadaceae | T     | Homestead             |
| 30 | <i>Canavalia virosa</i> (Roxb.) Wight & Arn.                 | Kalo Shim     | Fabaceae       | H     | Homestead             |
| 31 | <i>Capsicum frutescens</i> L.                                | Morich        | Solanaceae     | H     | Homestead, Cultivated |
| 32 | <i>Carica papaya</i> L.                                      | Pepe          | Caricaceae     | S     | Homestead             |
| 33 | <i>Carissa carandas</i> L.                                   | Koromcha      | Apocynaceae    | S     | Homestead             |
| 34 | <i>Cassia fistula</i> L.                                     | Sonalu        | Caesalpinaceae | T     | Homestead             |
| 35 | <i>Casuarina equisetifolia</i> Forst.                        | Jau           | Casuarinaceae  | T     | Sandy beach, Roadside |

(Contd.)

| SN | Scientific name  | Local name     | Family name      | Habit | Habitat               |
|----|--|----------------|------------------|-------|-----------------------|
| 36 | <i>Catharanthus roseus</i> (L.) G. Don                 | Nyantara       | Apocynaceae      | H     | Homestead             |
| 37 | <i>Ceiba pentandra</i> (L.) Gaertn.                    | Burma Simul    | Bombacaceae      | T     | Homestead             |
| 38 | <i>Cicca acida</i> (L.) Merr.                          | Orboroi        | Euphorbiaceae    | T     | Homestead             |
| 39 | <i>Citrus aurantifolia</i> (Christm. & Panzer) Swingle | Lebu           | Rutaceae         | T     | Homestead             |
| 40 | <i>Citrus grandis</i> (L.) Osbeck                      | Jambura        | Rutaceae         | T     | Homestead             |
| 41 | <i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai      | Tormuj         | Cucurbitaceae    | C     | Cultivated            |
| 42 | <i>Clerodendrum inerme</i> (L.) Gaertn.                | Bonjui         | Verbenaceae      | S     | Roadside              |
| 43 | <i>Cocos nucifera</i> L.                               | Narikel        | Arecaceae        | T     | Homestead             |
| 44 | <i>Colocasia esculenta</i> (L.) Schott                 | Kachu          | Araceae          | H     | Homestead             |
| 45 | <i>Commelina benghalensis</i> L.                       | Kanchira       | Commelinaceae    | H     | Cultivated            |
| 46 | <i>Corypha umbraculifera</i> L.                        |                | Arecaceae        | T     | Homestead             |
| 47 | <i>Crotalaria juncea</i> L.                            | Junjuni        | Fabaceae         | H     | Roadside              |
| 48 | <i>Cucumis melo</i> L.                                 | Bangi          | Cucurbitaceae    | C     | Cultivated            |
| 49 | <i>Cucumis sativus</i> L.                              | Khira          | Cucurbitaceae    | C     | Cultivated            |
| 50 | <i>Cucurbita maxima</i> Duch. ex Lamk.                 | Misti Kumra    | Cucurbitaceae    | C     | Homestead, Cultivated |
| 51 | <i>Curcuma longa</i> L.                                | Halud          | Zingiberaceae    | H     | Homestead             |
| 52 | <i>Cynodon dactylon</i> (L.) Pers.                     | Durbagass      | Poaceae          | H     | Roadside              |
| 53 | <i>Cyperus javanicus</i> Houtt.                        | Kucha          | Cyperaceae       | H     | Roadside              |
| 54 | <i>Dalbergia spinosa</i> Roxb.                         | Churilla kanta | Fabaceae         | C     | Mangrove              |
| 55 | <i>Delonix regia</i> Rafin.                            | Krishnachura   | Caesalpinaceae   | T     | Homestead             |
| 56 | <i>Dendrocalamus giganteus</i> Wall. ex Munro          | Budhum bans    | Poaceae          | T     | Homestead             |
| 57 | <i>Dioscorea bulbifera</i> L.                          | Pagla alu      | Dioscoreaceae    | S     | Homestead             |
| 58 | <i>Eclipta alba</i> (L.) Hassk.                        | Kesaraj        | Asteraceae       | H     | Roadside              |
| 59 | <i>Elaeis guineensis</i> Jacq.                         | Oil Palm       | Arecaceae        | T     | Homestead             |
| 60 | <i>Erythrina fusca</i> Lour.                           | Kata Mandar    | Fabaceae         | T     | Homestead             |
| 61 | <i>Eucalyptus camaldulensis</i> Dehnh.                 | Eucllyptus     | Myrtaceae        | T     | Homestead             |
| 62 | <i>Eupatorium odoratum</i> L.                          | Assam Gach     | Asteraceae       | H     | Cultivated            |
| 63 | <i>Excoecaria agallocha</i> L.                         | Gewa           | Euphorbiaceae    | T     | Mangrove              |
| 64 | <i>Ficus benghalensis</i> L.                           | Bot            | Moraceae         | T     | Homestead             |
| 65 | <i>Garuga pinnata</i> Roxb.                            | Bhadi          | Burseraceae      | T     | Homestead             |
| 66 | <i>Gmelina arborea</i> Roxb.                           | Gamar          | Verbenaceae      | T     | Homestead             |
| 67 | <i>Hedyotis corymbosa</i> (L.) Lam.                    | Khetpapra      | Rubiaceae        | H     | Roadside, Cultivated  |
| 68 | <i>Heliotropium curassavicum</i> L.                    | Hatisur        | Boraginaceae     | S     | Mangrove              |
| 69 | <i>Heliotropium indicum</i> L.                         | Hatisur        | Boraginaceae     | H     | Roadside              |
| 70 | <i>Hibiscus rosa-sinensis</i> L.                       | Joba           | Malvaceae        | S     | Homestead             |
| 71 | <i>Hopea odorata</i> Roxb.                             | Telsur         | Dipterocarpaceae | T     | Homestead             |
| 72 | <i>Hyptis suaveolens</i> (L.) Poit.                    | Tokma          | Lamiaceae        | S     | Roadside              |
| 73 | <i>Imperata cylindrica</i> (L.) P. Beauv.              | Chan           | Poaceae          | H     | Roadside              |

(Contd.)

| SN  | Scientific name                                       | Local name   | Family name      | Habit | Habitat                  |
|-----|---|--------------|------------------|-------|--------------------------|
| 74  | <i>Ipomea batatas</i> (L.) Lam.                       | Misti alu    | Convolvulaceae   | C     | Homestead,<br>Cultivated |
| 75  | <i>Ipomea pes-caprae</i> (L.) R. Br.                  | Sagorlata    | Convolvulaceae   | C     | Sandy beach              |
| 76  | <i>Ipomoea aquatica</i> Forsk.                        | Kolmi Shak   | Convolvulaceae   | C     | Homestead                |
| 77  | <i>Ipomoea fistulosa</i> Mart. ex Choisy              | Dolkolomi    | Convolvulaceae   | S     | Roadside                 |
| 78  | <i>Jatropha curcas</i> L.                             | Baghverenda  | Euphorbiaceae    | S     | Roadside                 |
| 79  | <i>Justicia gendarussa</i> Burm. f.                   | Jagmodon     | Acanthaceae      | H     | Roadside                 |
| 80  | <i>Lablab purpureus</i> (L.) Sweet                    | Sheem        | Fabaceae         | C     | Homestead                |
| 81  | <i>Lagenaria vulgaris</i> Seringe                     | Lao          | Cucurbitaceae    | C     | Homestead                |
| 82  | <i>Lagerstroemia speciosa</i> (L.) Pers.              | Jarul        | Lythraceae       | T     | Roadside                 |
| 83  | <i>Lannea coromandelica</i> (Houtt.) Merr.            | Bhadi        | Anacardiaceae    | T     | Homestead                |
| 84  | <i>Lantana camara</i> L.                              | Moggula      | Verbenaceae      | S     | Homestead,<br>Roadside   |
| 85  | <i>Launaea sarmentosa</i> (Wild.) Sch. Bip. ex Kantze |              | Asteraceae       | H     | Roadside                 |
| 86  | <i>Lawsonia inermis</i> L.                            | Mendi        | Lythraceae       | S     | Homestead                |
| 87  | <i>Leucaena leucocephala</i> (Lam.) de Wit.           | Ipil-Ipil    | Mimosaceae       | T     | Homestead                |
| 88  | <i>Leucas aspera</i> (willd.) Link.                   | Shetodhrona  | Lamiaceae        | H     | Roadside                 |
| 89  | <i>Leucas cephalotes</i> (Roth) Spreng.               | Bara-halkus  | Lamiaceae        | H     | Roadside                 |
| 90  | <i>Lindernia ciliata</i> (Colsm.) Pennell             | Bhui         | Scrophulariaceae | T     | Roadside                 |
| 91  | <i>Ludwigia adscendens</i> (L.) Hara                  | Kesra-dum    | Onagraceae       | H     | Roadside                 |
| 92  | <i>Luffa cylindrica</i> M. Roem.                      | Dundul       | Cucurbitaceae    | C     | Roadside                 |
| 93  | <i>Lumnitzera racemosa</i> Willd.                     | Kirpa        | Combretaceae     | T     | Mangrove                 |
| 94  | <i>Lycopersicon esculentum</i> Mill.                  | Tomato       | Solanaceae       | H     | Homestead,<br>Cultivated |
| 95  | <i>Mangifera indica</i> L.                            | Aam          | Anacardiaceae    | T     | Homestead                |
| 96  | <i>Mimosa pudica</i> L.                               | Lojjaboti    | Mimosaceae       | H     | Roadside                 |
| 97  | <i>Moringa oleifera</i> Lamk.                         | Shajna       | Moringaceae      | T     | Homestead                |
| 98  | <i>Musa paradisiaca</i> L.                            | Kola         | Musaceae         | H     | Homestead                |
| 99  | <i>Neolamarckia cadamba</i> (Roxb.) Bosser.           | Kadam        | Rubiaceae        | T     | Homestead                |
| 100 | <i>Opuntia dillenii</i> Haw.                          | Foni Monsha  | Cactaceae        | C     | Homestead                |
| 101 | <i>Oryza sativa</i> L.                                | Dhan         | Poaceae          | H     | Cultivated               |
| 102 | <i>Oxystelma secamone</i> (L.) Karst.                 | Dudhia kata  | Asclepiadaceae   | H     | Roadside                 |
| 103 | <i>Pandanus fascicularis</i> Lamk.                    | Keyakata     | Pandanaceae      | T     | Sandy beach              |
| 104 | <i>Pandanus foetidus</i> Roxb.                        | Keyakata     | Pandanaceae      | S     | Sandy beach              |
| 105 | <i>Paspalum vaginatum</i> Sw.                         |              | Poaceae          | H     | Cultivated               |
| 106 | <i>Passiflora foetida</i> L.                          | Jumka lata   | Passifloraceae   | C     | Homestead                |
| 107 | <i>Phoenix sylvestris</i> (L.) Roxb.                  | Deshi Khejur | Arecaceae        | T     | Homestead                |
| 108 | <i>Pithecellobium dulce</i> (Roxb.) Benth.            | Jilapi       | Mimosaceae       | T     | Homestead                |
| 109 | <i>Porteresia coarctata</i> (Roxb.) Tateoka           | Urigrass     | Poaceae          | H     | Mangrove<br>meadow       |
| 110 | <i>Portulaca oleracea</i> L.                          | Nuinnashak   | Portulacaceae    | H     | Mangrove<br>meadow       |
| 111 | <i>Psidium guajava</i> L.                             | Payara       | Myrtaceae        | T     | Homestead                |

(Contd.)

| SN  | Scientific name                                    | Local name     | Family name     | Habit | Habitat               |
|-----|--|----------------|-----------------|-------|-----------------------|
| 112 | <i>Psilotrichum ferrugineum</i> (Roxb.) Moq.-Tand. | Khetapada Shak | Amaranthaceae   | H     | Homestead, Roadside   |
| 113 | <i>Raphanus sativus</i> L.                         | Mula           | Brassicaceae    | H     | Cultivated            |
| 114 | <i>Ricinus communis</i> L.                         | Varenda        | Euphorbiaceae   | T     | Homestead             |
| 115 | <i>Samanea saman</i> (Jacq.) Merr.                 | Raintree       | Mimosaceae      | T     | Homestead             |
| 116 | <i>Senna tora</i> (L.) Roxb.                       | Terasena       | Caesalpiniaceae | H     | Roadside              |
| 117 | <i>Sida cordifolia</i> L.                          | Berela         | Malvaceae       | H     | Homestead             |
| 118 | <i>Solanum melongena</i> L.                        | Begun          | Solanaceae      | H     | Homestead             |
| 119 | <i>Sonneratia apetala</i> Buch.-Ham.               | Keora          | Sonneratiaceae  | T     | Mangrove              |
| 120 | <i>Spinacia oleracea</i> L.                        | Palon Shak     | Chenopodiaceae  | H     | Homestead             |
| 121 | <i>Spondias pinnata</i> (L. f.) Kurz.              | Amra           | Anacardiaceae   | T     | Homestead             |
| 122 | <i>Streblus asper</i> Lour.                        | Sheora         | Moraceae        | T     | Homestead             |
| 123 | <i>Suaeda maritima</i> (L.) Dumort.                |                | Chenopodiaceae  | H     | Roadside              |
| 124 | <i>Swietenia mahagoni</i> Jacq.                    | Mahogoni       | Meliaceae       | T     | Homestead             |
| 125 | <i>Synedrella nodiflora</i> (L.) Gaertn.           | Not known      | Asteraceae      | H     | Roadside              |
| 126 | <i>Syzygium fruticosum</i> DC.                     | Putijam        | Myrtaceae       | T     | Homestead             |
| 127 | <i>Tamarindus indica</i> L.                        | Tentul         | Caesalpiniaceae | T     | Homestead             |
| 128 | <i>Tamarix gallica</i> L.                          | Nona jau       | Tamaricaceae    | S     | Mangrove              |
| 129 | <i>Tephrosia purpurea</i> (L.) Pers.               | Bon-neel       | Fabaceae        | H     | Cultivated            |
| 130 | <i>Terminalia arjuna</i> (Roxb. Ex DC.)            | Arjun          | Combretaceae    | T     | Roadside              |
| 131 | <i>Terminalia catappa</i> L.                       | Kat Badam      | Combretaceae    | T     | Homestead             |
| 132 | <i>Thevetia peruviana</i> (Pers.) K. Schum.        | Halde Karabi   | Apocynaceae     | T     | Homestead             |
| 133 | <i>Thysanolaena maxima</i> (Roxb.) O. Kuntze       | Jahruful       | Poaceae         | H     | Homestead             |
| 134 | <i>Trichosanthes anguina</i> L.                    | Chichinga      | Cucurbitaceae   | C     | Cultivated, Homestead |
| 135 | <i>Typha domingensis</i> (Pars.) ex Steud.         | Hogla          | Typhaceae       | H     | Wetland               |
| 136 | <i>Vitex negundo</i> L.                            | Nil Nishinda   | Verbenaceae     | S     | Sandy beach, Roadside |
| 137 | <i>Vitex trifolia</i> L. f.                        | Nishinda       | Verbenaceae     | S     | Sandy beach, roadside |
| 138 | <i>Ziziphus mauritiana</i> Lamk.                   | Boroi          | Rhamnaceae      | T     | Homestead             |

[\* T- Tree, S-Shrub, H-Herb, C-Climber]

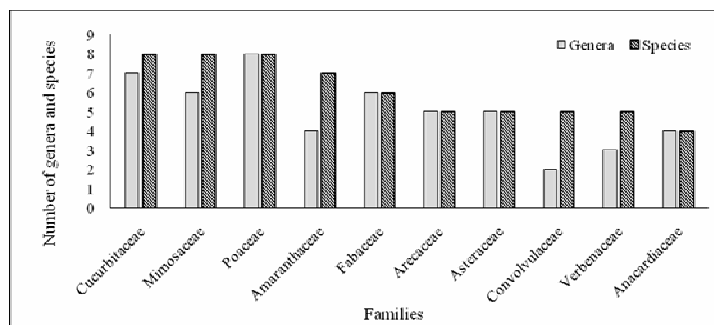


Fig. 2. Number of species belonging to dominant Family in Sonadia Island.

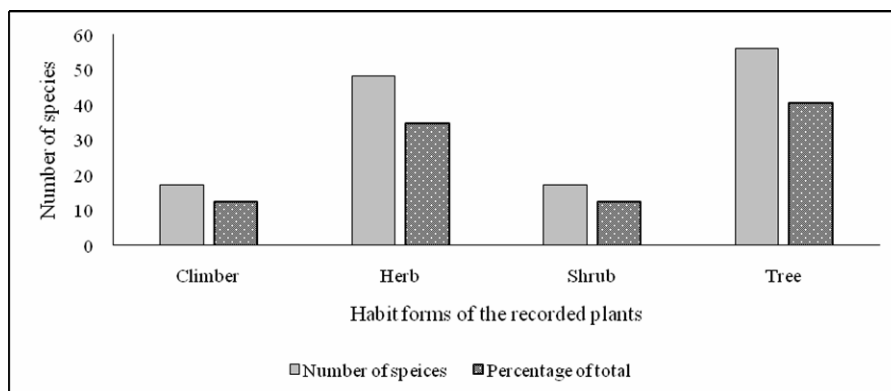


Fig. 3. Number of species belonging to habit form in Sonadia island.

#### *Major plant habitats in Sonadia Island*

The Sonadia Island supports vegetation growing in 6 broad categories of habitats including sand dunes or sandy beach area, homestead, mangrove, mangrove meadow, bounds or foot trail or roadside and cultivated land. Homestead represented 78 species constituting 53% of total species followed by 23% in roadside, 10% in cultivation firms, 9% in 10% in cultivation firms, 9% in mangrove, and 1% in wetland. Plants common in the sand dunes constitute 4% of total are species, in particular *Ipomea pes-caprae*, *Vitex trifolia*, *Pandanus foetidus* and *Casuarina equisetifolia*. Plants commonly occurring in the homesteads are *Acacia auriculiformis*, *Cocos nucifera* and *Eucalyptus camaldulensis* etc. *Avicennia officinalis*, *Avicennia alba* and *Acanthus illicifolius* appeared as very common in the natural mangrove forest, whereas in the plantations *Casuarina equisetifolia*, *Eucalyptus camaldulensis*, *Acacia auriculiformis* and *Sonneratia apetala* were commonly found.

#### *Traditional uses of the recorded plants*

Knowledge about the various uses of the available plants was gained through conversations made with the local peoples living within the island. Traditional use of the recorded plants indicate that most of the plants (33%) have food value as fruit, flower, seed and different parts of those plants are edible in raw or after processing. Plants also used substantially as fuel wood (18%), timber (11%), biological fence (9%), medicine (7%) etc. It is found that many medicinal plants, their medicinal values and uses are not known to local people. Plants that provide fodder, oils, weeds etc. are grouped under miscellaneous category which constitutes 11% of all recorded plant species.

#### **Discussion**

The study reveals that Sonadia island currently harbours 138 plant species (tree 56, shrubs 17, herbs 48, climbers 17) that belong to 111 genera and 55 families which is higher in comparison to Moloney (2006) that recorded only 60 vascular plants from Sonadia island (14 trees, 8 shrubs, 27 herbs and 11 climbers species). In the first report on the angiospermic flora of this land (Khan *et al.*, 1977) the number of species was for less. According to the people living in the island, vegetation coverage in mangrove forest was dense. The findings conform with the reports of Thompson and Islam (2010) who indicated 144 angiospermic plants from Saint Martin's Island of Cox's Bazar. Sandwip, another island of Bangladesh harbours much higher plants (438 vascular



plants) due to its comparatively larger area coverage and varied households with diversified domestic flora (Sajib *et al.*, 2016). The floristic records of different island's of Bangladesh also reported 149 species from Moheshkhali (Huq and Khan, 1984), 151 species from the same island (Rashid *et al.*, 2000), 91 species from Kutubdia island (Huq 1986), 98 plant species from Hatiya island (Huq 1988) and 37 species from Nijhum Dwip (Khan *et al.*, 1985) and 152 species from Nijhum Dwip (Uddin *et al.*, 2015).

The presence of some exotic tree species, i.e., *Acacia auriculiformis*, *Swietenia mahagoni* and *Eucalyptus camaldulensis* species was due to the plantations conducted by Bangladesh Forest Department and the local people. Major area of the island is occupied by natural mangroves, but encroachment is becoming a serious concern because of the conversion of forest lands to salt bed and shrimp cultivation. Jhau, the successful species in the sandy beaches of Cox's Bazar (Hossain, 2010) is also promising in Sonadia Island but illegal felling is a common threat in the island).

### Acknowledgements

The authors are grateful to the Research Cell authority of University of Chittagong for providing funds for field works. We are also grateful to the officers and field staffs of Chittagong Coastal Forest Division, Bangladesh Forest Department for helping in the field work. Thanks are due to Taxonomists of Forest Botany Division, BFRI and Dr. Mohammed Yusuf, Ex-Director of BCSIR for their supports in identification of the plant samples.

### References

- Ahmed, Z.U., Begum, Z.N.T., Hassan, M.A., Khondker, M., Kabir, S.M.H., Ahmad, M., Ahmed, A.T.A., Rahman, A.K.A. and Haque, E.U. (Eds). 2008. Encyclopedia of Flora and Fauna of Bangladesh, vol. 5-12. Asiatic Society of Bangladesh, Dhaka.
- DoE (Department of Environment). 1999. GIS and Cartographic Services – Final Report, Pre-Investment Facility Study: Coastal and Wetland Biodiversity Management Project (Project BGD/94/G41), Dhaka, Bangladesh.
- Heinig, R.L. 1925. List of Plants of Chittagong Collectorate and Hill Tracts. Darjeeling, India, 84 pp.
- Hossain, M.K. 2010. *Casuarina equisetifolia*- a promising species for green belt project of coastal and off-shore islands of Bangladesh. In: Zhong, C., Pinyopusarek, K., Kalinganire, A. and Franche C. (eds.), Improving Smallholder Livelihoods Through Improved *Casuarina* Productivity: Proceedings of the 4<sup>th</sup> International *Casuarina* Workshop, Haikou, China 21-25 March 2010. pp. 200–206.
- Huq, A.M. 1986. Preliminary studies on the anthropogenic flora of Kutubdia Island in Bangladesh. J Asiatic Soc. Bangladesh (Sci.) 12: 59-70.
- Huq, A.M. 1988. A Preliminary taxonomic report on the Angiospermic flora of Hatia Islan (Noakhali district) (Dicotyledons). Bull. Bangladesh Nat. Herb., Dhaka 1: 1–10.
- Huq, A.M. and Khan, M.S. 1984. A preliminary taxonomic report on the angiospermic flora of Maheshkhali Island-1 (Dicotyledons). Dhaka Univ. Stud. B 32: 19–31.
- Khan, M.S., Huq, M.A. Rahman, M.M. and Hassan, M.A. 1977. A preliminary report on the angiospermic flora of Sonadia island, Bangladesh. J. Asit. Sco. Bangladesh 3(1): 125–126.
- Khan, M.S., Huq, A.M. and Rahman, M.M. 1985. Studies on the angiospermic flora of Nijhum Dwip (Char Osman) in the Bay of Bengal. Dhaka Univ. Stud. B 33: 145–151.
- MoEF (Ministry of Environment and Forests) 2015. Fifth National Report to the Convention on Biological Diversity. Government of the People's Republic of Bangladesh, Dhaka, 164 pp.
- Moloney, L. 2006. Coastal and Wetland Biodiversity Management Plan BGD/ 99/ G31 Sonadia Island ECA Draft Conservation Management Plan.
- Prain, D. 1903 (Reprinted.1981). Bengal Plants. Calcutta, 1: 120 pp.

- Rashid, M.H., Rahman, E. and Rahman, M.A. 2000. Additions to the angiospermic flora of the Moheskhal island. Cox's Bazar. *Bangladesh J Plant Taxon* 7: 43–63.
- Sajib, N.H., Uddin, S.B. and Islam, M.S. 2016. Vascular plant diversity and their distribution pattern in Sandwip Island, Chittagong, Bangladesh. *J Biodivers Manage Forestry* 5: 2
- Siddiqui, K.U., Islam, M.A., Ahmed, Z.U., Begum, Z.N.T., Hassan, M.A., Khondker, M., Rahman, M.M., Kabir, S.M.H., Ahmed, M., Ahmed, A.T.A., Rahman, A.K.A. and Haque, E.U. (eds). 2007. *Encyclopedia of Flora and Fauna of Bangladesh, Vol. 11. Angiosperms: (Agavaceae - Najadaceae)*. Asiatic Society of Bangladesh, pp. 399.
- Thompson, P.M. and Islam, M.A. (Eds.). 2010. *Environmental Profile of St. Martin's Island*, United Nations Development Programme, Dhaka. Washington, DC: Island Press, pp. 112–117.
- Uddin, M.Z., Kibria, M.G. and Hassan, M.A. 2015. Assessment of angiosperm plant diversity of Nijhum Dweep. *Bangladesh J. Asiat. Soc. Bangladesh, Sci.* 41(1): 19–52.

*(Manuscript received on 6 February 2017; revised on 11 May 2017)*