

## MEDICO-BOTANICAL STUDIES OF SANDWIP ISLAND IN CHITTAGONG, BANGLADESH

NOOR HASSAN SAJIB AND S.B. UDDIN<sup>1</sup>

*Department of Botany, University of Chittagong, Chittagong 4331, Bangladesh.*

*Keywords:* Ethnobotany; Medicinal plants; Sandwip; Bangladesh.

### Abstract

A study of the plant diversity of Sandwip Island has been conducted during July 2008 to April 2011 in order to document plant species used as traditional herbal medicine. A total of 111 species under 93 genera of 53 families have been documented which are used for the treatment of 48 diseases/illness. The local people of the island mostly depended on herbal medicine for their primary health care. Twenty one recorded medicinal plant species are used for the treatment of various types of pain, 14 each for dysentery and rheumatism, 8 each for cough and haemorrhages, 7 for skin diseases, 6 for worms, 5 for boils, 4 each for jaundice and fracture, 3 each for chicken pox, fever and diabetes and 54 for other diseases.

### Introduction

Sandwip Island is an upazila in Chittagong district of Bangladesh with an area of 762.42 sq km (Banglapedia, 2006). Most of the people directly or indirectly depend on plant resources of the area for their livelihood. In some areas of the island people are mostly dependent on the surrounding plants for their food, medicine, tools and crafts, fishing and agricultural tools. Bangladesh though is a small country has a valuable heritage of herbal remedies. Due to very low side effect, the use of medicinal plants is getting importance day by day.

Over the past two decades several ethnomedicinal and ethnobotanical studies in Bangladesh have been carried out (Mia and Rahman, 1990, Uddin *et al.*, 2006; Yusuf *et al.*, 2006, 2007; Partha and Hossain, 2007; Rahman *et al.*, 2007; Roy *et al.*, 2008; Alom *et al.*, 2011; Faruque and Uddin, 2011; Chowdhury *et al.*, 2011; Mohiuddin *et al.*, 2012; Uddin *et al.*, 2012). However, there is very limited information (Mia and Rahman, 1990) on the ethno-medicinal plants used by the Sandwip island communities. This study aims to document ethno-medicinal plants used for the treatment of different diseases/illness and to prepare conservation strategy for the medicinal plants of the island.

### Materials and Methods

The ethnomedicinal data was documented following the direct observation, field interview and group interview from July 2008 to April 2011. A total of ten field trips were made for documentation. During the field interview, the information was noted in the documentation data sheet. All the information regarding plant species, biological forms, habitat, local names and uses was documented. Ethnomedicinal information was obtained through informal interviews following semi-structured and open-ended techniques (Alexiades, 1996) from knowledgeable persons particularly *Kabiraj* (local herbalist) and elderly people. All voucher specimens were collected during documentation and deposited in the Chittagong University Herbarium (HCU). The specimens were identified consulting with the experts, by comparing herbarium specimens and available literature (Hooker, 1872-1897; Prain, 1903; Heinig, 1925; Sinclair, 1956, Siddiqui *et al.*, 2007; Ahmed *et al.*, 2008, 2009; Rashid and Rahman, 2011, 2012).

<sup>1</sup>Corresponding author. Email: roben68@gmail.com

## Results and Discussion

A total of 111 medicinal plant species belonging to 93 genera under 53 families are used for the treatment of 48 diseases/illness. The scientific names, family names, local names, parts used, mode of use and uses are enumerated in Table 1. Asteraceae is used most frequently as per the number of species. The most frequently used species for the treatment of different diseases are *Acampe papilosa*, *Achyranthes aspera*, *Amoora rohituka*, *Azadirachta indica*, *Calotropis gigantea*, *Cassia alata*, *Chromolaena odorata*, *Clitoria ternatea*, *Coccinea grandis*, *Commelina benghalensis*, *Cynodon dactylon*, *Datura metel*, *Eclipta alba*, *Justicia adhatoda*, *Lawsonia inermis*, *Lygodium japonicum*, *Mikania cordata*, *Ocimum sanctum*, *Oroxylum indicum*, *Psidium guajava*, *Ricinus communis*, *Scoparia dulcis*, *Spilanthes calva*, *Swietenia mahagoni*, *Terminalia arjuna* and *Vitex negundo*.

Regarding life form, herbs were 41.44%, shrubs 16.22%, trees 29.73% and climbers 12.61%. The most utilized plant parts for the preparation of herbal medicine is leaf, constituting 40% followed by fruit, stem, bark, and roots amounting 14.4%, 11.2%, 7.2%, 6.4%, whole plant 4% and others (thorn, bulb, rhizome, flower, seed, tuber, petiole, bud and node) 16.8% respectively. Among the recorded medicinal plants to treat several diseases/illness 21 species are used to treat various types of pain, 14 each for dysentery and rheumatism, 8 each for cough and haemorrhages, 7 for skin diseases, 6 for worms, 5 for boils, 4 each for jaundice and fracture, 3 each for chicken pox, fever and diabetes and 54 for others.

The present study reveals that both external (27.34%) and internal (72.66%) methods of application of herbal medicine are prescribed. The dose and duration of application of these medicinal preparations vary from informant to informant. Most of the extracts are taken in the morning. It may be required 1-7 days to cure/control the diseases and in some cases it may take up to 3 months. Medicines administered orally include those claimed to be used mainly for treating fever, cough, diabetics, jaundice, worms, diarrhoea, dysentery and gastritis. On the other hand, medicines recommended to be applied externally include treating boils, skin disease, eye disease, ear-ache, body swelling, headache, bruising, fracture and rheumatism.

Mia and Rahman (1990) reported 26 ethnomedicinal plants from Sandwip where they have cited only two plants as fish poison with no medicinal uses, while the present study recorded 111 species. From the study it is revealed that the community of Sandwip is rich in knowledge of medicinal plant use information. In the present study 17 species have been found same from the previous study, of which 8 species have the same uses with the present study with additional medicinal use information of 3 species. The remaining 9 species have been found to be used for different diseases, but in previous study no medicinal uses of these species were reported. The present study identifies some rare medicinal plants, viz., *Abrus precatorius* L., *Acampe papilosa* (Lindl.) Lindl., *Cissus quadrangularis* L., *Oroxylum indicum* (L.) Vent, *Rauvolfia serpentina* Benth., *R. tetraphylla* L. and *Rhynchosyilis retusa* (L.) Bl. The biodiversity of the island is decreasing rapidly with the disappearing the land in the sea because of climate change. As a result, the island tradition of medicinal plant use information is at risk. On the other hand, the establishment of modern medicinal health centres is in progress in many villages of the Upazila that may gradually change the existing pattern of indigenous knowledge system of healthcare. In modern days, they are losing their previous glorious heritage of plant use knowledge in an alarming rate because of urbanization, rapid shrinkage and degradation of forests. On the other hand, present generation lost the interest to continue their parental profession as it does not provide them proper financial support for their livelihood. It is necessary conserve the threatened medicinal plants from extinction and to document plant use information before disappearing permanently.

Table 1. Enumeration of Ethnomedicinal species used by the people of Sandwip Island.

Scientific name	Family	Local name	Voucher Number	Parts used	Mode of preparation	Uses
1. <i>Abroma angusta</i> L.	Sterculiaceae	Ulotkombal	S303	Leaves	Juice	Tonic and digestive
2. <i>Abrus precatorius</i> L.	Fabaceae	Hongais, Kuch	S304	Seeds	External application	Poisoning by spine of string fish and in snake bite
3. <i>Acampe papillosa</i> (Lindl.) Lindl.	Orchidaceae	Rasna	S37	Leaves	Hot infusion	Ear-ache
4. <i>Acanthus illicifolius</i> L.	Acanthaceae	Kekanta, Hangoza	S305	Thorn	External application	Boils
5. <i>Achyranthes aspera</i> L.	Amaranthaceae	Apang	S66	Leaves	Juice	Rheumatism
6. <i>Acrostichum aureum</i> L.	Polypodiaceae	Churi dei	S140	Root	Juice	Jaundice
7. <i>Aegle marmelos</i> (L.) Correa	Rutaceae	Bel	S306	Fruit	Raw	Dysentery
8. <i>Aerides odorata</i> Lour.	Orchidaceae	Rasna	S36	Leaves and roots	Juice	Rheumatism
9. <i>Aerva sanguinolenta</i> (L.) Blume	Amaranthaceae	Raktapata	S307	Leaves	Juice	Stop bleeding
10. <i>Allium cepa</i> L.	Liliaceae	Piaz	S308	Bulb	Juice	Cough, digestive and earache
11. <i>Allium sativum</i> L.	Liliaceae	Rashun	S309	Bulb	Juice	To kill worms and as hair tonic
12. <i>Alocasia macrorrhizos</i> (L.) G. Don	Araceae	Mankachu	S310	Stem	Cooked stem with prawn	Itches
13. <i>Aloe barbadensis</i> Mill.	Liliaceae	Gritokumari	S311	Leaves	Juice	Worms, tonic and digestive
14. <i>Alpinia nigra</i> (Gaertn.) Burt.	Zingiberaceae	Tara	S3	Rhizome	Juice	Rheumatism and dysentery
15. <i>Alstonia scholaris</i> R.Br.	Poaceae	Chatim	S72	Stem and leaves	External application	Mother sits on stem and leaves of plant to encourage baby in breast feeding
16. <i>Amaranthus spinosus</i> L.	Amaranthaceae	Kantamairra	S68	Root	Juice	Leucorrhoea

Table 1 contd.

Scientific name	Family	Local name	Voucher Number	Parts used	Mode of preparation	Uses
17. <i>Aphanamixis pohystachya</i> (Wall.) Parker	Meliaceae	Royna, Rona	S46	Bark	Extract	Leucorrhoea and to increases sex in women
18. <i>Asparagus racemosus</i> L.	Liliaceae	Shatomuli	S312	Leaves	Juice with sugar	Carminative
19. <i>Azadirachta indica</i> A. Juss.	Meliaceae	Nim	S239	Young stems and leaves	Paste and hot infusion	Toothache, skin diseases and as insecticide
20. <i>Blumea lacera</i> (Burm. f.) DC.	Asteraceae	Kornuta	S146	Leaves	Juice	Stop haemorrhages and fever
21. <i>Boerhavia repens</i> L.	Nyctaginaceae	Punarnava	S313	Whole plant	Juice	Edema
22. <i>Bombax ceiba</i> L.	Bombacaceae	Shimul	S314	Root	Juice	Increase sex in male and clear bowels
23. <i>Borassus flabellifer</i> L.	Areaceae	Tal	S315	Young petiole	Juice	Rheumatism
24. <i>Bothriochloa pertusa</i> (L.) A. Camus	Poaceae	Goradubla	S8	Whole plant	Juice	Hemorrhages and fracture
25. <i>Brassica napus</i> L.	Brassicaceae	Sarisa, Horra	S316	Seed	Extract	Body pain
26. <i>Butea monosperma</i> (Lam.) Taub.	Fabaceae	Polash	S105	Seed	Juice	Worm
27. <i>Cajanus cajan</i> (L.) Millsp.	Fabaceae	Arhar, Arol	S42	Leaves	Juice	Jaundice
28. <i>Calophyllum inophyllum</i> L.	Clusiaceae	Hondal	S81	Node	External application	Headache
29. <i>Calotropis gigantea</i> (L.) R. Br.	Asclepiadaceae	Akando	S255	Leaves	A warm leaf	Rheumatism
30. <i>Carica papaya</i> L.	Caricaceae	Cokia, Pepe	S317	Latex of young fruit	Latex of young fruit	Worm and as digestive
31. <i>Cassia alata</i> L.	Caesalpinaceae	Daud, Dadmordon	S280	Leaves	Paste	Skin diseases
32. <i>Cassia fistula</i> L.	Caesalpinaceae	Honalu, Sonalu	S242	Leaves	Juice	Constipation

Table 1 contd.

Scientific name	Family	Local name	Voucher Number	Parts used	Mode of preparation	Uses
33. <i>Catharanthus roseus</i> (L.) G. Don.	Apocynaceae	Noyantara	S276	Leaves	Juice	Stomach-ache
34. <i>Celosia cristata</i> L.	Amaranthaceae	Morogful	S318	Leaves	Juice	Dysentery
35. <i>Centella asiatica</i> (L.) Urban	Apiaceae	Thankuni	S71	Leaves	Juice	Dysentery and fever of child
36. <i>Chromolaena odorata</i> (L.) King & Robinson	Asteraceae	Asamlata	S261	Leaves	Juice	Haemorrhages
37. <i>Cissus quadrangularis</i> L.	Vitaceae	Harvanga lata	S319	Whole plant	Juice	Fracture
38. <i>Citrus aurantiifolia</i> (Christm. & Panzer) Swingle	Rutaceae	Kagojilebu	S320	Fruit	Smoke inhaled	Cough
39. <i>Clerodendrum indicum</i> (L.) O. Kuntze	Verbenaceae	Binekutta	S170	Bark	Juice	Rheumatism
40. <i>C. inerme</i> Gaertn.	Verbenaceae	Bandulpata	S56	Leaves	Leaves	Dysentery
41. <i>Clitoria tarnetea</i> L.	Fabaceae	Oparajita, Nilkontha	S321	Flower	Extract	Fever and cough
42. <i>Coccinea grandis</i> (L.) Voigt.	Cucurbitaceae	Kelakachu, Telakucha	S57	Leaves and fruits	Juice	Diabetes
43. <i>Colocasia nymphaeifolia</i> Kunth.	Araceae	Biskachu. Jangli kachu	S322	Petiole	External application of petiole	Pain and itches
44. <i>Commelina benghalensis</i> L.	Commelinaceae	Kanaialata	S84	Stem and leaves	Juice	Boils and rheumatism
45. <i>C. paludosa</i> Blume	Commelinaceae	Kanaialata, Jatkansira	S83	Stem and leaves	Juice	Boils and rheumatism
46. <i>Crinum asiaticum</i> L.	Amaryllidaceae	Goron, Golrashun	S323	Bulb	Juice	Rheumatism
47. <i>Cucumis sativus</i> L.	Cucurbitaceae	Shasa, Hoa	S324	Fruit	Fruit	Gastritis

Table 1 contd.

Scientific name	Family	Local name	Voucher Number	Parts used	Mode of preparation	Uses
48. <i>Curcuma longa</i> L.	Zingiberaceae	Halud	S325	Rhizome	Paste	Skin diseases
49. <i>Cuscuta reflexa</i> Roxb.	Cuscutaceae	Sunmalata, Samalata	S59	Whole plant	External application of whole plant	Fracture
50. <i>Cynodon dactylon</i> Pers.	Poaceae	Dubla, Durba	S7	Stem and leaves	Juice	Stop bleeding
51. <i>Cyperus rotundus</i> L.	Cyperaceae	Kaiabeda	S25	Tuber	Juice	Dysentery
52. <i>Datura metel</i> Sims	Solanaceae	Dutra	S18	Stem and leaves	Juice	Fracture and rheumatism
53. <i>Eclipta alba</i> (L.) Hassk.	Asteraceae	Kalakeccha, Kesoraj	S76	Leaves	Juice, Paste	Jaundice and as hair tonic
54. <i>Erythrina indica</i> Lamk.	Fabaceae	Mandar, Madar	S326	Leaves	Extract	Anthelmintic
55. <i>Ficus hispida</i> L. f.	Moraceae	Boi	S281	Leaves	Leaves are used to chew	Abdominal pain
56. <i>Ficus racemosa</i> L.	Moraceae	Gajboy, Jaggadumur	S90	Fruit	Fruits	Cough and toothache
57. <i>Gmelina arborea</i> (Roxb.) DC.	Verbenaceae	Gamar	S327	Bark	Extract boiled with Crab's eye	To maintain the normal shape of breast.
58. <i>Hibiscus rosa-sinensis</i> L.	Malvaceae	Raktajaba	S199	Leaves	Juice	Dysentery
59. <i>H. schizopetalus</i> (Mast.) Hook. f.	Malvaceae	Orful	S197	Flower	Juice	Hair tonic
60. <i>Hydrocotyle sibthorpioides</i> Lam.	Apiaceae	Adamkipata	S69	Leaves	Juice	Eye infection
61. <i>Hygrophila auriculata</i> (K. Schum.) Heine	Acanthaceae	Kanta Alisa, Kulekhara	S61	Stem and fruit	Fried stem and extract	Chicken pox and impotence
62. <i>H. difformis</i> (L. f.) Bl.	Acanthaceae	Alisa, Kulekhara	S328	Stem	Fried stem	Chicken pox

Table 1 contd.

Scientific name	Family	Local name	Voucher Number	Parts used	Mode of preparation	Uses
63. <i>H. salicifolia</i> (Vahl) Nees	Acanthaceae	Bontil	S62	Leaves, Root and fruit	Extract	Gonorrhea and abdominal pain
64. <i>Hypis suaveolens</i> Poit.	Lamiaceae	Tokma	S329	Fruit	Cold infusion	Diuretic
65. <i>Justicia adhatoda</i> Nees	Acanthaceae	Basak	S64	Leaves	Juice	Cough
66. <i>Kalanchoe pinnata</i> (Lam.) Pers.	Crassulaceae	Sibbosonto, Pathorkuchi	S123	Leaves	Juice	Sedative and carminative
67. <i>Lawsonia inermis</i> L.	Lythraceae	Mehedi	S257	Leaves	Paste	Skin diseases and as hair tonic
68. <i>Leea crispa</i> Willd.	Leeaceae	Murka, Kaiya	S39	Bud	External application of buds	Finger pain
69. <i>Litsea monopetala</i> (Roxb.) Pers.	Lauraceae	Maggaloda	S88	Leaves and bark	Juice	Diarrhoea
70. <i>Lygodium japonicum</i> Swartz	Lygodiaceae	Lohachura	S137	Stern	Juice	Dysentery
71. <i>Mangifera indica</i> L.	Anacardiaceae	Aam	S103	Leaves	Juice	Dysentery and to reduce fat
72. <i>Marsilea minuta</i> (L.) Mant.	Marsileaceae	Maddachuai	S138	Leaves and stem	Juice	Eczema
73. <i>Mikania cordata</i> (Burm. f.) Robinson	Asteraceae	Tuhanna lata, Tufani lata	S73	Leaves	Juice	Haemorrhages and gastrics
74. <i>Mimosa pudica</i> L.	Mimosaceae	Sharmida, Lazzabati	S50	Whole plant	Decoction	Dysentery
75. <i>Mimosops elengi</i> L.	Sapotaceae	Bakul	S330	Flowers	Dry flowers	Worm
76. <i>Momordica charantia</i> L.	Cucurbitaceae	Korola	S331	Young fruit	Juice	Diabetes
77. <i>Moringa oleifera</i> Lamk.	Moringaceae	Sagina	S23	Root	Juice	Ear-ache
78. <i>Ocimum basilicum</i> L.	Lamiaceae	Tulsi	S278	Leaves	Juice	Cough and pneumonia of children

Table 1 contd.

Scientific name	Family	Local name	Voucher Number	Parts used	Mode of preparation	Uses
79. <i>O. sanctum</i> L.	Lamiaceae	Tulsi	S236	Leaves	Juice	Cough and pneumonia of children Jaundice
80. <i>Oroxylum indicum</i> (L.) Vent	Bignoniaceae	Thona	S244	Bark	Juice	Tumour, acne and rheumatism
81. <i>Phoenix sylvestris</i> (L.) Roxb.	Arecaceae	Khejur	S332	Spine	Extract	Skin diseases
82. <i>Phyllanthus acidus</i> (L.) Skiels	Euphorbiaceae	Horoli, Orbaroi	S333	Leaves	Juice	Diuretic, refrigerant, laxative, tonic and gastritis
83. <i>P. emblica</i> L.	Euphorbiaceae	Amlaki	S334	Fruit	Fruit	Diarrhoea in children
84. <i>P. reticulatus</i> Poir.	Euphorbiaceae	Cinkuitta, Cirkuti	S114	Branches of stem	Juice	Rheumatism
85. <i>Piper betle</i> L.	Piperaceae	Pan	S335	Leaves	Juice	Dysentery
86. <i>P. longum</i> L.	Piperaceae	Pipul	S5	Fruit	Juice	Hair tonic
87. <i>P. nigrum</i> L.	Piperaceae	Golmanich	S336	Fruit	Paste	Tooth-ache and dysentery
88. <i>Psidium guajava</i> (L.) Bat.	Myrtaceae	Piara, Gayum	S256	Leaves	Juice, extract	High blood pressure and anxiety
89. <i>Rauwolfia serpentina</i> Benth.	Apocynaceae	Sarpogondha	S337	Root	Juice	High blood pressure and anxiety
90. <i>R. tetraphylla</i> L.	Apocynaceae	Sarpogondha	S279	Root	Juice	Ear-ache
91. <i>Rhynchosytilis retusa</i> (L.) Blume	Orchidaceae	Shial leza orchid	S148	Leaves	Hot infusion	Rheumatism
92. <i>Ricinus communis</i> L.	Euphorbiaceae	Veron, Verenda	S338	Bark and tuber	Juice	Irregular menstruation
93. <i>Saraca asoca</i> (Roxb.) de Wilde	Caesalpiniaceae	Asoke	S106	Bark	Juice	Dysentery
94. <i>Scoparia dulcis</i> L.	Scrophulariaceae	Mesi, Bondone	S16	Leaves	Juice	Body pain
95. <i>Sesamum indicum</i> L.	Pedaliaceae	Til	S339	Fruit	Oil	



Table 1 contd.

Scientific name	Family	Local name	Voucher Number	Parts used	Mode of preparation	Uses
96. <i>Smilax ovalifolia</i> Roxb.	Smilacaceae	Kumairalata	S17	Leaves	Juice	Palpitation
97. <i>Solanum sisymbirifolium</i> Lam.	Solanaceae	Kanta begun, Kantokiri	S130	Thorn	Raw	Tumours
98. <i>Spilanthes calva</i> DC.	Asteraceae	Marichaful, Nakful	S240	Flower and stem	Stems and flowers	Dental pain
99. <i>Stephania japonica</i> (Thunb.) Miers	Menispermaceae	Musarralata, Chilihista	S48	Leaves	Leaves are chewed	Abdominal pain
100. <i>Streblus asper</i> Lour.	Moraceae	Horma, Horba	S91	Leaves	Extract	Dysurea
101. <i>Swietenia mahagoni</i> (L.) N.J. Jacquin	Meliaceae	Mehogoni	S153	Endosperm of fruit	Extract, infusion	Hot Endosperm extract is taken in the morning to treat diabetes
102. <i>Synedrella nodiflora</i> (L.) Gaertn.	Asteraceae	Chulkainna	S179	Branches of stem	Branches of stem are chewed	Branches of stem are chewed with <i>Piper betel</i> to treat tonsillitis
103. <i>Syzygium cumini</i> (L.) Skeel	Myrtaceae	Butigajam, Kalojam	S229	Bark	Juice	Dysentery
104. <i>Tagetes patula</i> L.	Asteraceae	Gendha, Ghada	S74	Leaves	Juice	Stop bleeding
105. <i>Tamarindus indica</i> L.	Caesalpiniaceae	Tentul	S340	Leaves	Juice, Poultice	Chicken pox, boils, rheumatism and as laxative
106. <i>Terminalia arjuna</i> (Roxb.) Wt. & Arn.	Combretaceae	Arjun	S286	Bark	Juice	Heart disease
107. <i>T. bellirica</i> (Gaertn.) Roxb.	Combretaceae	Bohera	S341	Fruit	Juice	Bronchitis
108. <i>T. chebula</i> (Gaertn.) Roxb.	Combretaceae	Horitoki	S342	Fruit	Juice	Constipation
109. <i>Trichosanthes dioica</i> Roxb.	Cucurbitaceae	Patol	S343	Fruit	Juice	Rheumatism
110. <i>Vitex negundo</i> L.	Verbenaceae	Ninda, Nishinda	S54	Leaves	Paste, Juice	Boils, hair tonic and dental pain
111. <i>Zingiber officinale</i> Roxb.	Zingiberaceae	Ada	S344	Rhizome	Raw	Abdominal pain

### Acknowledgements

The authors express their deep sense of gratitude to the informants for their help during the field work. Authors are grateful to Prof. M.K. Pasha, Department of Botany, University of Chittagong for his valuable suggestions during preparation of the manuscript, and to identify some critical specimens.

### References

- Ahmed, Z.U., Begum, Z.N.T., Hassan, M.A., Khondker, M.M., Kabir, S.M.H., Ahmad, M., Ahmed, A.T.A., Rahman, A. K.A. and Haque, E.U. (Eds). 2008 -2009. Encyclopedia of Flora and Fauna of Bangladesh. **6-10**. Angiosperms: Dicotyledons. Asiatic Society of Bangladesh, Dhaka.
- Alexiades, M.N. 1996. Protocol for conducting ethnobotanical research in the tropics. *In*: Alexiades, M.N. and J.W. Sheldon (Eds) Selected Guidelines for Ethnobotanical Research: A Field Manual. The New York Botanical Garden, Bronx, New York, pp. 5-15.
- Alom, M.N., Zohora, F. and Sultana, M. 2011. Ethnobotanical study of the Garo Tribe of Sherpur district, Bangladesh. *J. Taxon. Biodiv. Res.* **5**: 39-42.
- Banglapedia 2006. Sandwip upazila. Asiatic Society of Bangladesh, Dhaka. Website: <[http://www.banglapedia.org/httpdocs/HT/S\\_0070.HTM](http://www.banglapedia.org/httpdocs/HT/S_0070.HTM)>.
- Chowdhury, T., Uddin, S.B., Quraishi, D.H. and Mouri, N.J. 2011. An ethnobotanical survey of plants of Sylhet in Bangladesh. *Int. J. Current Res.* **12**(3): 31-35.
- Faruque, O. and Uddin, S.B. 2011. Ethnodiversity of medicinal plants used by Tripura community of Chittagong district of Bangladesh. *J. Taxon. Biodiv. Res.* **5**: 21-26.
- Heinig, R.L. 1925. List of plants of Chittagong Collectorate and Hill tracts. Darjeeling, pp. 1-84.
- Hooker, J.D. 1872-1897. The Flora of British India. Vols. **1-7**. (Ind. Repr. 1973), Bishen Singh Mahendra Pal Singh, Dehra Dun, India.
- Mia, M.M.K. and Rahman, M. 1990. Preliminary ethnomedicinal studies at Sandwip island of Bangladesh. *In*: Ghani, A. (Ed.), Traditional Medicine. Jahangirnagar University, Savar, Dhaka, pp. 104-108.
- Mohiuddin, M., Alam, M.K., Basak, S.R. and Hossain, M.K. 2012. Ethno-medico botanical study among the four indigenous communities of Bandarban, Bangladesh. *Bangladesh J. Plant Taxon.* **19**(1): 45-53.
- Partha, P. and Hossain, A.B.M.E. 2007. Ethnobotanical investigation into the Mandi ethnic community in Bangladesh. *Bangladesh J. Plant Taxon.* **14**(2): 129-145.
- Prain, D. 1903. Bengal Plants. Vols. **1 & 2**. Indian Reprint Edition 1963, Calcutta.
- Rahman, M.A., Uddin, S.B. and Wilcock, C.C. 2007. Medicinal plants used by *Chakma* tribe in hill tracts district of Bangladesh. *Indian J. Traditional Knowledge* **6**(3): 508-517.
- Rashid, M.E. and Rahman, M.A. 2011. Updated nomenclature and taxonomic status of the plants of Bangladesh included in Hook. f., The Flora of British India: Volume-I. *Bangladesh J. Plant Taxon.* **18**(2): 177-197.
- Rashid, M.E. and Rahman, M.A. 2012. Updated nomenclature and taxonomic status of the plants of Bangladesh included in Hook. f., The Flora of British India: Volume-II. *Bangladesh J. Plant Taxon.* **19**(2): 173-190.
- Roy, S., Uddin, M.Z., Hassan, M.A. and Rahman, M.M. 2008. Medico-botanical report on the Chakma community of Bangladesh. *Bangladesh J. Plant Taxon.* **15**(1): 67-72.
- 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., Ahmad, 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: Monocotyledons. Asiatic Society of Bangladesh, Dhaka.
- Sinclair, J. 1956. The Flora of Cox's Bazar. *East Pakistan Bull. Bot. Soc. Beng.* **9**(2): 84-116.
- Uddin, M.Z., Hassan, M.A. and Sultana, M. 2006. Ethnobotanical survey of medicinal plants in Phulbari Upazila of Dinajpur district, Bangladesh. *Bangladesh J. Plant Taxon.* **13**(1): 63-68.

- Uddin, M.Z., Hassan, M.A., Rahman, M. and Arefin, K. 2012. Ethno-medico-botanical study in Lawachara National park, Bangladesh. *Bangladesh J. Bot.* **41**(1): 97-104.
- Yusuf, M., Wahab, M.A. and Chowdhury J.U. 2006. Ethno-medico-botanical knowledge from Kauhkali proper and Betunia of Rangamati district. *Bangladesh J. Plant Taxon.* **13**(1): 55-61.
- Yusuf, M., Wahab, M.A., Yousuf, M., Chowdhury, J.U. and Begum, J. 2007. Some tribal medicinal plants of Chittagong Hill Tracts, Bangladesh. *Bangladesh J. Plant Taxon.* **14**(2): 117-128.

*(Manuscript received on 15 July 2011; revised on 25 January 2013)*