

Preliminary Survey on Some Mangrove Species Grown in Ye Chanpyin Area, Sittway District, Rakhine State

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Abstract

Mangrove forests are highly threatened throughout the world. Local societies along with their knowledge about the mangrove also are endangered. In the present study, local utilization patterns and perception of ecosystem changes is documented. Moreover, how information generated by ethnobiological research can be used to strengthen the management of the ecosystem is illustrated. This study was conducted in the Ye Chanpyin area situated at the northern part of Sittway District where mangroves have been degrading due to over-exploitation and extensive development of aquaculture. The study plants grown in Ye Chanpyin mangrove area were collected especially during the flowering and fruiting period. All the collected species have been identified and fully described with the help of photographs of habits. Uses of these species were also documented by interviewing the local people. With the help of the local people, mangrove plants were replanted around the costal area of Sittway District. To identify and to describe the morphological characters of the study species, to document and evaluate the local uses and to show how these ethnobotanical data in this area can be used to improve conservation and management of the area, the present survey was carried out. Result from the interview indicated that *Avicennia* spp. are dominant in this area and they are used most frequently as firewood and for construction. Bark of the *Ceriops decandra* (Griff.) Dind Hou. is used to dye the fishing nets and improve their durability, the bark of *Derris trifolia* Lour. is used as poison for catching fish. Medicinal uses of true mangrove species were rarely reputed but there were a few traditional uses for mangrove associates.

Key words: Mangrove species, Sittway District, ethnobotanical, conservation, Rakhine State

Introduction

Mangrove forests fulfill a number of well-documented and essential ecological functions in tropical and subtropical regions. They generate a variety of natural resources and ecosystem services that are vital to subsistence economies and sustain local and natural economies. Mangroves provide breeding, spawning, and hatching and nursery grounds for both coastal and offshore fish and shellfish stocks (Botkin & Keller, 2003). They also serve as a physical buffer between marine and terrestrial communities. For local people, mangrove supplies wood and products which are harvested directly within the mangrove forests. Rapid population growth and increase utilization of mangrove habitats threatens these communities.

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The survey site, Ye Chanpyin area, is located about ten miles northwest of Sittway, the capital city of Rakhine State that lies in the western most part of Myanmar. Sittway, formerly known as Akyab, is located between longitude 92° 28' 14" E and latitude 20° 02' 24" N on an estuarial island that was created by confluence of the Kalandan River, Mayu River and Lemyo River emptying into the Bay of Bengal. Plants grown in the study area were collected from June, 2007 to September, 2009 especially during the flowering and fruiting period. All the collected species has been identified and fully described with the help of photographs of habits. By interviewing the local people, uses of plants studied were presented in this paper. Most of the collected species are depleting in this area because of the over exploitation for firewood and mismanagement in the processes of meeting many human needs.

I would like to point out the maintenance of natural mangrove forests that provide many benefits to the mankind. Mangrove forest is harbor for many kinds of fishes, shrimps and crabs. Nowadays, government attempts to protect and conserve the mangrove areas in Myanmar.

Materials and Methods

Some mangrove species grown in the mangrove area at Ye Chanpyin area were collected from June, 2007 to December, 2009. To investigate their morphological characteristics, the vegetative and reproductive parts were collected, pressed and dried at the time of flowering and fruiting period. The collected fresh specimens were studied and identified with the available literatures (Hooker, 1885; Kirtikar & Basu, 1935; Backer, 1965 and Dassanayake, 1967). The photographs of the natural habits of each species were also taken to recognize the species easily. Local uses of each species were documented by interviewing the local people settled in this area. Knowledge of respondents on mangrove was assessed with ethnobotanical questions, aided by botanical photographs showing the habits of plants, leaves, fruits, flowers and seeds of each mangrove species. The test of the semi-structured questionnaires contained multiple choice and open-ended questions which covered ethnobotanical issues (Gazzaneo *et al.*, 2005).

Results and Discussion

Informants referred to the general mangrove forest as Lamu, Lame´ meaning *Avicennia* forest. A total of 23 plant species distributed in 15 families are documented in this study. Among the species, *Acanthus ebracteatus* L., *Acanthus illicifolius* L., *Aegiceras*

corniculatum (L.) BL., *Aegialitis rotundifolia* Roxb., *Avicennia alba* L., *A. marina* (Forsk.) Vlerth., *A. officinalis* L., *A. rumphiana* L., *Bruguiera gymnorhiza* (L.) Savigny, *Ceriops decandra* (Griff.) Ding Hou., *C. tagal* (Perr.) C. B Roxb., *Excoecaria agallocha* L., *Nypa fruticans* Wurm., *Rhizophora apiculata* Bl. *R. mucronata* Lamk., *Sonneratia alba* J. Sm., *Typha angustifolia* L. and *Xylocarpus granatum* Koen. are true mangrove species but *Clerodendrum inerme* (L.) Gaertner, *Crinum asiaticum* L., *Derris trifolia* Lour., *Sarcolobus globasus* Wallich. are mangrove associated species. The uses of these 18 true mangrove species and 5 mangrove associated species are presented in Table 1.

A total of 14 mangrove species are mainly used as firewood and charcoal. *Aegialitis rotundifolia* Roxb., *Ceriops tagal* (Perr.) C. B Roxb., *Rhizophora mucronata* Lamk. and *Sonneratia alba* J. Sm. are used as construction materials. *Bruguiera gymnorhiza* (L.) Savigny, *Ceriops decandra* (Griff.) Ding Hou., *Rhizophora mucronata* Lamk. and *Xylocarpus granatum* Koen. are used for house-post, cable-post, because their wood withstands attacks by termites. *Nypa fruticans* Wurm. and *Typha angustifolia* L. are useful for thatching.

Boats and furnitures are made of the stems and branches of *Avicennia officinalis* L. and *Xylocarpus granatum* Koen., *Avicennia officinalis* L., *Rhizophora apiculata* Bl. *Typha angustifolia* L. and *Xylocarpus granatum* Koen. are used for making household utensils. Barks of some mangrove are employed as dye. The barks of *Avicennia officinalis* L., *Bruguiera gymnorhiza* (L.) Savigny, *Ceriops tagal* (Perr.) Roxb., *Rhizophora apiculata* Bl., *R. mucronata* Lamk, and *Xylocarpus granatum* Koen. are used to dye the fishing nets for durability. The barks of *Avicennia alba* L., *A. marina* (Forsk.) Vlerth., *Derris trifolia* Lour. and *Excoecaria agallocha* L. are rubbed with water to make paste which are used as poison for catching fishes. The barks of *Avicennia officinalis* L. and *Bruguiera gymnorhiza* (L.) Savigny are used for tanning leather. *Nypa fruticans* Wurm. is used for sugar and alcohol production. The leaves of *Typha angustifolia* L. is used to repel insects.

A few species such as *Bruguiera gymnorhiza* (L.) Savigny, *Rhizophora mucronata* Lamk., *Sarcolobus globasus* Wallich. and *Sonneratia alba* J. Sm. are reported as medicinal plants in this study area. The bark paste of *Bruguiera gymnorhiza* (L.) Savigny. and *Xylocarpus granatum* Koen., leaves decoction of *Malastoma malabathricum* L. and *Xylocarpus granatum* Koen. are use for curing dysentery and diarrhea. *Crinum asiaticum* L. and *Derris trifolia* Lour are used for laxative and carminative. *Excoecaria agallocha* L. is used as purgative. Crushed leaves of *Acanthus illicifolius* L., root and stem of *Derris trifolia*

Lour. and *Sarcolobus globasus* Wallich. are used to remedy for rheumatism and anti-arthritis. A decoction of leaves and root of *Acanthus ebracteatus* L. and decoction of bark *Excoecaria agallicha* L. are used for asthma. Infusion of the bulb of *Crinum asiaticum* L. is used to cure for gonorrhoea and pounded bulb for wound and as an antidote for snakebite and poisonous insect-bite.

Both species of *Acanthus* provide shelter and food for small creatures. *Aegiceras corniculatum* (L.) Bl., *Aegialitis rotundifolia* Roxb., *Avicennia officinalis* L., *Bruguiera gymnorhiza* (L.) Savigny. *Ceriops decundra* (Griff.) Ding Hou., *C. tagal* (Perr.) C. B. Roxb., *Clerodendrum inerme* (L.) Gaertner, *Crinum asiaticum* L. *Excoecaria agallicha* L., *Xylocarpus granatum* Koen. stabilize the ground and provide shelter and food for small creatures. Common *Derris* and *Sarcolobus globasus* Wallich are interlocking with other trees to provide strength against coastal storms.

Because of fast colonized plants in wetland, *Melastoma malabathricum* L. and *Nypa fruticans* Wurmb. help to prevent soil erosion and to allow regeneration of vegetation in such place. Both species of *Rhizophora* are planted along the coastal fish pond to stabilize the banks. Being the fast growing plant on low tidal mudflats, *Avicennia alba* L., *A. marina* (Forsk.) Vlerth., *Sonneratia alba* J. Sm., stabilize the riverbanks and coasts, providing more favorable ground for other types of trees and plants. It is also used in replanting mangroves to protect coastlines. *Typha angustifolia* L. also stabilizes shorelines, preventing soil erosion, and also keeps down bottom sediments, making water not to be cloudy.

Table (1) Mangrove plant species with botanical names, families, parts used, common names and uses

No.	Scientific Name	Family	Parts used	Common Name	Uses
1	<i>Acanthus ebracteatus</i> L.	Acanthaceae	Leaves, root Roots, stem Seed Whole plant	Khaya phyu	expectorant, cough, asthma hypertension, skin diseases boils, hair loss, kidney stone
2	<i>Acanthus illicifolius</i> L.	Acanthaceae	Aerial parts Leaves Roots	Khaya	wounds, sore legs rheumatic pains, snake bite hypertension, snake bite, kidney stones
3	<i>Aegiceras corniculatum</i> (L.) Bl.	Myrsinaceae	Stem, branches	Pyu-pin	firewood, charcoal

No.	Scientific Name	Family	Parts used	Common Name	Uses
4	<i>Aegialitis rotundifolia</i> Roxb.	Plumbaginaceae	Wood	Toke pin	construction materials, firewood, charcoal
5	<i>Avicennia alba</i> L.	Avicenniaceae	Wood Bark	Tha-me` La-me`	husking paddy, rice powder, oil mill small pox, headache, fish poison
6	<i>Avicennia marina</i> (Forsk.) Vlerth.	Avicenniaceae	Wood Seeds	Tha-me` La-me`	similar to <i>A. alba</i> edible
7	<i>Avicennia officinalis</i> L.	Avicenniaceae	Wood Bark, root Wood	Tha-me` La-me`	household utensils, making boat, furniture and wharves. tanning, dye headache, pimple, boil, tumor firewood, charcoal
8	<i>Avicennia rumphiana</i> L.	Avicenniaceae	Seed Wood	Tha-me` La-me`	edible firewood, charcoal
9	<i>Bruguiera gymnorhiza</i> (L.) Savigny	Rhizophoraceae	Barks Wood Bark Fruit Leaves	Byu-U -talon	tanning leather, dyeing charcoal, poles diarrhea and malaria eye medicine vegetable
10	<i>Ceriops decandra</i> (Griff.) Ding Hou.	Rhizophoraceae	Bark Stem Branches	Bhaung taung- phyu	dyes, hemorrhages, firewood, charcoal post, poles, loon handle
11	<i>Ceriops tagal</i> (Perr.) C. B. Roxb.	Rhizophoraceae	Bark Wood	Madama myew	red dye firewood, charcoal construction and fishing materials
12	<i>Clerodendrum inerme</i> (L.) Gaertner	Verbenaceae	Leaves Root	Unknown	skin diseases and itches febrifuge or alternative
13	<i>Crinum asiaticum</i> L.	Amaryllidaceae	Leaves Bulb	Koyangyi	laxative, carminative, anti-arthritis gonorrhea, wound, antidote, pile, earache
14	<i>Derris trifolia</i> Lour.	Fabaceae	Root, stem Leaves	Mechaung nwe	laxative, carminative, anti-arthritis fish poison
15	<i>Excoecaria agallocha</i> L.	Euphorbiaceae	Latex Bark Root Stem	Unknown	fish poison purgative, pneumonia or asthma abortifacient charcoal

No.	Scientific Name	Family	Parts used	Common Name	Uses
16	<i>Melastoma malabathricum</i> L.	Melastomataceae	Leaves Root	Owe-poke	diarrhea, dysentery astringent, poultice for wound, ulcer gargle for toothache
17	<i>Nypa fruticans</i> Wurmb.	Arecaceae	Endosperm Leaves Inflorescences	Dahni	eaten raw for thatching, for sugar and alcohol production
18	<i>Rhizophora apiculata</i> Bl.	Rhizophoraceae	Bark Wood	Byu-chaw htaw phyu	dye for nets and ropes household articles, fuel wood
19	<i>Rhizophora mucronata</i> Lamk.	Rhizophoraceae	Bark Young shoot Wood	Byu-chaw htaw	dye, hemorrhage vegetable firewood, charcoal, construction materials, poles
20	<i>Sarcolobus globasus</i> Wallich.	Asclepiadaceae	Leaves	Kayein	rheumatism, vegetable
21	<i>Sonneratia alba</i> J. Sm.	Sonneratiaceae	Stem and Branches Leaves	Lamu	construction materials, firewood and charcoal vegetable
22	<i>Typha angustifolia</i> L.	Typhaceae	Plants Flower	Unknown	thatching materials, household utensils repel insects
23	<i>Xylocarpus granatum</i> Koen.	Meliaceae	Bark Wood	Ye' ohn	dye, dysentery, diarrhea mats, household utensils, boat building, house-post, loon handle, furniture

All the informants reported that construction and fuel wood are the primary uses of mangrove species. The *Avicennia* spp. and *Rhizophora* spp. are used in a mixture as poles for building huts and to construct fences and shelters. *Rhizophora* is famous for house construction because of their ability to grow long and straight. Mangroves are used particularly in marine aquariums to reduce nitrates and other nutrients in the water. Mangroves also appear in home aquariums.

Conclusion

Approximately 35% of mangrove area was lost during the last several decades of the twentieth century. The main cause of mangrove decrease is that the areas located along the strip of mangrove forest are being converted to shrimp ponds. Therefore, with guidelines of the local government, mangrove plants were replanted in coastal area in Sittway Township by governmental organizations and non-governmental organizations (NGOs).

Tropical coastal populations, particularly in developing countries, can highly depend on the mangrove ecosystem for multiple purposes. This statement can be elucidated by the results presented in this study, which shows that 90% of the respondents state that mangrove is very important for their livelihood.

A few medicinal uses of mangroves were reported in this area. The result of present research indicated that mangrove elements are essential to their lifestyle and have been incorporated insufficiently in the existing policy. The present study illustrates how data on ethnobotanical traditions with protection status can be used to improve conservation and management of the area.

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