SHORT COMMUNICATION

The preliminary study on some natural plant communities of the sandbars along eastern coast of peninsular Thailand

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Abstract

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The preliminary study on some natural plant communities of the sandbars along the eastern coast of peninsular Thailand

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Surveys on the natural plant communities on the sandbars along the eastern coast of the peninsular Thailand in three provinces, Nakhon Si Thammarat, Songkhla and Narathiwat, have been carried out. Most of the natural vegetation on these sandbars had been become extinct, except for some remnants, left as separated spots. Four sites of those remnants were explored in this preliminary study. The plant species composition investigation and the primary analysis on community type through the Braun-Blanquet method of the four remnants show some common characters. These characteristics suggest that, in the past, the same vegetation may have dominated the landscape along the sandbars lying parallel to the seashore of Peninsular Thailand.

Key words : plant communities, sandbars, Peninsular Thailand

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บทคัดย่อ

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การศึกษาเบื้องต้นของสังคมพืชตามธรรมชาติบางแห่งบนสันทรายตามชายฝั่งตะวันออกของเขตพรรณพฤกษชาติภาคใต้ของประเทศไทย

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การศึกษาสังคมพืชบางแห่งบนสันทรายที่ขนานตามแนวชายฝั่งตะวันออกในคาบสมุทรของประเทศไทยใน 3 จังหวัด ได้แก่ นครศรีธรรมราช สงขลา และ นราธิวาส พบว่า สังคมพืชตามธรรมชาติส่วนมากถูกทำลาย เหลือเพียงบางส่วนเป็นบริเวณขนาดเล็กในการศึกษาเบื้องต้นนี้ได้สำรวจสังคมพืชตามธรรมชาติส่วนที่เหลืออยู่บนแนวสันทรายเลือกสี่บริเวณที่อยู่แยกจากกันและอยู่ห่างกันในสามจังหวัด ผลการวิเคราะห์ในเรื่ององค์ประกอบพรรณพืช และชนิดสังคมพืชที่วิเคราะห์ตามวิธี Braun-Blanquet แสดงถึงลักษณะร่วมกันของสังคมพืชในสี่บริเวณนี้ พอจะอนุมานได้ในชั้นต้นนี้ว่า ลักษณะสังคมพืชตามธรรมชาติดังกล่าวเคยเป็นลักษณะสังคมพืชเด่นที่ต่อเนื่องเป็นผืนใหญ่ซึ่งเคยพบอยู่บนสันทรายที่ขนานตามแนวชายฝั่งของเขตพรรณพฤกษชาติภาคใต้ของประเทศไทย

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On the East Coast of Peninsular Thailand, where a shoreline of emergence stretches, lie many sandbars. These sandbars are parallel to the shore. Each one is an old beach deposit, lying inland in the form of low ridges or terraces (1.5-2.5 m high). Sediments deposited along the shoreline have produced these sandbars and offshore bars (Pongsaputra *et al*, 1991). Sedimentation from the rivers and ocean currents had taken place on the shallow sea floor along the shoreline of the East Coast in the past. In the Tertiary period, the peninsula had inclined leading to the emergence of the East Coast whilst the opposite site of the peninsula was submerged beneath the water. (Vithayarat, 1995).

These sandbars are unique habitats for plant communities, as they are topographically different from the swamp that separate these sandbars from the inland areas.

The sandbars are suitable for many human activities such as building, agriculture and industry on account of their good drainage. As a result, over 80% of the original vegetation has become extinct.

Physical characteristics

Soil

The soil type of the study areas is podzols (spodozol). (Classification of soils according to Burmham in Whitmore (1985)). The soil pH at the study sites is 4.5 - 5.5.

Climate

Peninsular Thailand has a tropical monsoon climate characterized by a distinct dry season from February to May and a high rainfall, affected by the south westerly wind from June to September and the north easterly wind, from October to January. (Pongsaputra *et al*, 1991).

Vegetation on podzols

According to Whitmore (1975, 1985), the vegetation occurring on the coastal sandbars is heath forest. It is the natural vegetation of the podzols that occurs in places where parent materials consist predominantly of quartz, e.g., beach sand, sandstone or quartzite. The greatest extent of heath forest in South-East Asia is in Borneo where it occurs around much of the coastline on raised terraces of poorly consolidated coarse, sandy, marine and riverine sedimentation left stranded by the fluctuating sea-level of the late

Pleistocene (Whitmore, 1985). Similar but less extensive terraces that also bear or once bore heath forest occur along the south coasts of Thailand and Cambodia (Whitmore, 1975,1985). Congdon (1982) mentions the heath forest in Thailand occurring in the Tarutao National Park in Satul, Peninsular Thailand. The heath forest found on Tarutao Island has, however, lower canopies and contains fewer species than typical heath forest as described by Whitmore (1975, 1985).

The aim of the project are to survey all the remnants of the original vegetation on these sandbars and offshore bars along the East Coast of Peninsular Thailand. The study was confined to the composition of the plant species, their investigation and analysis of the primary community type in Nakhon Si Thammarat, Songkhla and Narathiwat. The surveys were completed in Songkhla province. The only original remnant of vegetation on the Songkhla sandbars were found at Ban Ta-ling-chun, Chana district (Sridith, 2002). The surveys have been continued further along the coast of Narathiwat province and Cha-uad district of Nakhon Si Thammarat province.

Methods

I. Surveys

The surveys of the original vegetation along the coastal sandbars of the East Coast of Peninsular Thailand have been carried out in three provinces i.e. Songkhla, Narathiwat and Nakhon-Si Thammarat. The study sites are indicated on the map (Figure 1).

II. Flora and vegetation investigations

The plant collections were made at intervals over the selected study sites, in order to compile a plant species list of each site. Voucher specimens are deposited at PSU Herbarium. Samples of

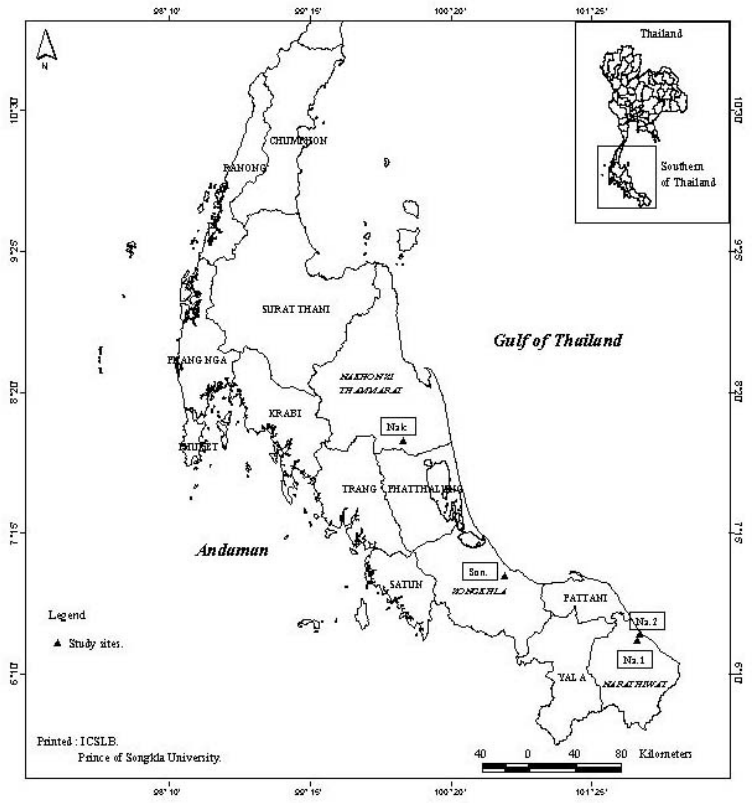

Figure 1. Map of peninsular Thailand showing the four study sites.

plant community type in each site were analyzed, using the Braun-Blanquet Method (Kent & Coker, 1994).

Results

Plant community types

The various types of plant community in each location have been analyzed to date, according to the Braun-Blanquet Method (Table 1).

Plant species composition

A species list of plants found in the study sites has been compiled (Table 2).

Discussion

In general, the vegetations of the four study sites have some characters in common. They are: low uniform canopies of trees; no trace of layering among trees; many tree species have small and sclerophyllous leaves, for instance *Syzygium gratum, Pouteria obovata, Rapanea porteriana*; the ground in some areas has a bryophyte cover; wiry climbers such as *Hoya diversifolia* are frequent; many epiphytes and photophytes occurring near the ground; myrmecophytes such as *Dischidia rafflesiana* are also often found. Furthermore, the parasitic plants e.g *Dendropthoe pentandra, Viscum articulatum* are abundant (see also Sridith, 2002). Such characteristics are in accordance with those of the heath forest (Whitmore, 1975,1985;Congdon, 1982)

The analysis of plant community types from each study site using the Braun-Blanquet method exhibits some common types in the plant communities e.g. *Melastoma malabathricum* ommunity; *Rhodomyrtus tomentosa* community; *Memecylon lilacinum-Vatica harmandiana* community. The first two communities are shrub communities while the other is a tree community. This suggests that the vegetations on the sandbars have some characters in common too. These characters make them unique among other kinds of vegetations nearby, such as peat-swamp forest, dry-evergreen forest, etc. Moreover, there are other communities of plants, though less common, that have been found in three out of four of the sites e.g. *Syzygium grande - Shorea roxburghii* communities. They are tree communities distributed as separated spots in the area where found. *Melaleuca* quinquenervia communities were found at Songkhla (Chana) and Nakhon Si Thammarat (Cha-uad). This Melaleuca plant indicates that the areas are disturbed, since *Melaleuca* quinquenervia is a secondary species often occurring in disturbed areas (Whitmore, 1975, 1985; Suzuki, 1999; Tomita *et al*, 2000). *Dipter-*

Table 1. The plant community types in each site.

Plant community types	Son.[1]	Nak.[2]	Na.[3]1	Na.[2]
Catunaregam tomentosa community	X		X	
Dipterocarpus chartaceus community	X	X		
Melaleuca quinquenervia community	X	X		
Melastoma malabathricum community	X	X	X	X
Memecylon lilacinum-Vatica harmandiana community	X	X	X	X
Rhodomyrtus tomentosa community	X	X	X	X
Schizea dichotoma-Doritis pulcherima community	X		X	
Glehnio-Spinificetum litorei community			X	
Syzygium grande-Shorea roxburghii community	X	X		X

[1] Son.= Songkhla (BanTa-ling-chan Village, Chana) ; [2] Nak.= Nakhon Si Thammarat (Cha-uad near Railway Station) ; [3] Na. = Narathiwat: Na.1= Ban Sai Khao; Na.2 = Ban Kok Payom

Table 2. List of plant species found in each study site.

Family	Species	Vernacular	Habit	Son.	Nak.	Na.1	Na.2
Anarcadiaceae	*Buchanania arborescens* (Blume) Blume	Khi kra tai	Tree	X	X	X	X
Annonaceae	*Desmos* sp.		Scandent	X		X	
Apocynaceae	*Cerbera manghas* L.	Tin pet sai	Tree	X			
	Cerbera odollam Gaertn.	Tin pet thale	Small tree	X			
	Rauvolfia verticillata (Lour.) Baillon	Chaek	Shrub	X			
	Spirolobium cambodianum Baill.	Phetchahueng takkat	Small shrub	X			
	Willughbeia coriacea Wall.	Khui	Shrub	X			X
Aquifoliaceae	*Ilex cymosa* Blume	Sai khi tai	Shrubby tree	X		X	
Asclepiadaceae	*Dischidia major* (Vahl) Merr.	Chuk rohini	Climber	X	X	X	X
	Tylophora flexuosa R.Br.	Cha muk pla lot	Climber	X	X	X	X
	Hoya diversifolia Blume	Yaan lin khwai	Climber	X	X	X	X
	Hoya parasitica (Roxb.) Wall. ex Traill	Nom phi chit	Climber	X	X	X	X
Celastraceae	*Eunonymus javanicus* Blume	Kra duk kai	Shrub	X	X	X	
	Pleurostylia opposita (Wall.) Alston	Daeng hin	Small tree	X	X	X	X
Clusiaceae	*Calophyllum pulcherima* Wall.	Tanghon	Small tree	X	X		X
	Garcinia cowa Roxb. ex DC.	Cha muang	Small tree	X	X	X	X
	Garcinia nervosa Miq.	Ma phut pa	Small tree	X	X		
	Garcinia merguensis Wight	Ka nuan	Small tree	X	X	X	
	Garcinia vilersiana Pierre	Pha wa bai yai	Small tree	X	X	X	X
Combretaceae	*Terminalia catappa* L.	Hu kwang	Tree			X	
Commelinaceae	*Commelina bengalensis* L.	Phak plap	Herb	X	X	X	X
	Cyanotis cristata Roem. & Schult.	Yaa hua rag noi	Herb	X	X	X	X
	Murdannia sp.	-	Herb	X			
Conneraceae	*Connerus semidecandrus* Jack	Thob thaeb khruea	Scandent	X			
Convolvulaceae	*Ipomoea pes-caprae* (L.) R.Br.	Phak bung thale	Creeper			X	

(to be continued)

Table 2. (continued)

Family	Species	Vernacular	Habit	Son.	Nak.	Na.1	Na.2
Cyperaceae	*Remirea maritima* Aubl.	Kok mari	Herb			X	
Davalliaceae	*Davallia denticulata* (Burm.f.) Mett. ex Kuhn	Nakkharat	Herb	X	X	X	X
Dennstaedtiaceae	*Pteridium aquilinum* var. wightianum (J.Agardh) K.M.Tryon	Chon yai	Herb	X	X		X
Dilleniaceae	*Dillenia hookeri* Pierre	San din	Shrub	X			
	Tetracera indica (Christm. & Panz.)Merr.	Yan pot	Climber	X	X	X	X
	Tetracera loureiri (Finet & Gagnep.) Pierre ex Craib	Rot sukhon	Climber	X	X	X	X
Dipterocarpaceae	*Dipterocarpus chartaceus* Symington	Yang wat	Tree	X	X		
	Dipterocarpus obtusifolius Teijsm. ex Miq.	kung	Tree	X			
	Shorea roxburghii G.Don	Phayom	Tree	X	X		X
	Vatica harmandiana Pierre	Sak hin	Tree	X	X	X	X
Ebenaceae	*Diospyros ferrea* Bakh.	Lam bit thale	Shrub	X	X	X	X
Ericaceae	*Vaccinium bracteatum* Thunb.	Thing thuat	Small tree	X			X
Euphorbiaceae	*Breynia vitis-idaea* (Burn.f.) C.E.C. Fish.	Kang pla thale	Shrub	X	X	X	X
	Chaetocarpus castanocarpus (Roxb.) ex Thwaites	Khi non	Shrub	X	X	X	X
	Euphorbia atoto G.Forst.	Nam nom ratchasi thale					X
	Phyllanthus oxyphyllus Miq.	Yai chung lan	Small tree	X	X	X	
Fabaceae	*Abrus precatorius* L.	Ma klam ta nu	Climber	X	X		
	Derris scandens (Roxb.) Benth.	Thao wan priang	Climber	X			
	Canavalia cathartica Thouars	Thua krapao	Climber			X	
	Crotalaria sp.		Herb			X	
Fagaceae	*Lithocarpus bennetii* (Miq.) Rehder	Ko mu	Tree				X

(to be continued)

Table 2. (continued)

Family	Species	Vernacular	Habit	Son.	Nak.	Na.1	Na.2
Goodeniaceae	*Scaevola taccada* (Gaertn.) Roxb.	Rak thale	Shruby tree	X			
Labiatae	*Gmelina phillipensis* Cham.	Song maeo	Small tree	X			
	Vitex pinnata L.	Tin nok	Small tree			X	
	Vitex rotundifolia L.f.	Khon thiso thale	Herb	X		X	
Lauraceae	*Neolitsea zeylanica* (Nees) Merr.	Ian	Shrub	X		X	
Liliaceae	*Dianella ensifolia* (L.) DC.	Ya nu ton	Herb	X	X	X	X
Loranthaceae	*Dendrophthoe pentandra* (L.) Miq.	Ka fak ma muang	Shrub	X	X	X	X
Melastomaceae	*Melastoma malabathricum* L.	Khlong khleng khi nok	Shrub	X	X	X	X
Memecylaceae	*Memecylon corticosum* Ridl.	Mai thao nang yat	Shruby tree	X	X	X	X
Myrcinaceae	*Ardisia crenata* Sims.	Ta pet ta kai	Shrub	X	X	X	X
	Rapane porteriana (A.DC.) Mez.	Rang ka thae	Tree	X		X	
Myrtaceae	*Baeckea frutescens* L.	Son sai	Shrubby tree	X	X		
	Rhodomyrtus tomentosa (Aiton) Hassk.	Phruat	Shrub	X	X	X	X
	Syzygium grande var. *grande* (Wight.) Walp.	Mao	Tree	X	X	X	X
	Syzygium zeylanicum (L.) DC.	Samet daeng bai mon	Shruby tree	X	X	X	X
	Syzygium gratum var. *gratum* (Wight.) S.N.Mitra	Samet chun	Tree	X	X	X	X
	Melaleuca quinquenervia (Cav.) S.T.Blake	Samet khao	Tree	X	X		
Ochnaceae	*Ochna integerrima* (Lour.) Merr.	Kamlang chang san	Shruby tree	X	X	X	
Olacaceae	*Olax scandens* Roxb.	Nam chai khrai	Scandent	X		X	
	Strombosia javanica Blume	-	Shrub	X		X	
Oleaceae	*Olea brachiata* (Lour.) Merr.	Ket san	Tree	X	X	X	

(to be continued)

Table 2. (continued)

Family	Species	Vernacular	Habit	Son.	Nak.	Na.1	Na.2
Orchidaceae	*Cymbidium findlaysonianum* Lindl.	Kare karon	Herb	X	X	X	X
	Dendrobium crumenatum Sw.	Wai tamoi	Herb	X	X	X	X
	Dendrobium secundum (Blume) Lindl.	Ueang praeng si fan	Herb	X	X		
	Doritis pulcherima Lindl.	Ma wing	Herb	X	X		
Pandanaceae	*Pandanus odoratissimus* L. f.	Pa nae	Tree	X		X	
Pittosporaceae	*Pittosporum ferrugineum* W.T.Ait.	Sum ton	Tree	X		X	
Poaceae	*Eragrostis gangetica* (Roxb.) Steud.	Ya krok	Herb	X	X	X	X
	Eriachne pallescens R.Br.	Ya nuat moen	Herb	X	X	X	X
	Isachne globosa (Thunb.) O.Ktze.	Ya pha rai	Herb	X	X	X	X
	Ischaemum barbatum (Munro) Stapf ex Ridl.	Ya yon hu	Herb	X	X	X	X
	Pterotis indica (L.) O.Kuntze	-	Herb	X	X	X	X
	Rhynchelytrum repens Wild.	-	Herb	X	X	X	X
	Spinifex littoreus Merr.	Ya loi lom	Herb			X	
Polypodiaceae	*Drynaria sparsisora* (Desv.)S.Morre	Kra tae tai mai	Herb	X	X	X	X
	Microsorum nigrescens (Blume) Copel.	Kra prog wao	Herb	X	X	X	X
	Myrmecophila crustacea (Copel.) Tagawa	Tan mangkon	Herb	X			
	Pyrrosia adnascens (G.Forst.) Ching	Fern ngu khiao	Herb	X	X	X	X
	Pyrrosia piloselloides (L.) M.G. Price	Klet nak kha rat	Herb	X	X	X	X
	Pyrrosia nummularifolia (Sw.) Ching	Bia mai	Herb	X	X	X	X
Psilotaceae	*Psilotum nudum* (L.) P.Beauv.	Wai ta noi	Herb	X			
Rubiaceae	*Catunaregam tomentosa* (Blume ex DC.) Tirveng.	Nam taeng	Shrub	X		X	
	Chassalia chartacea Craib	Yai klang	Shrub	X			
	Chassalia curviflora (Wall.)Thwaites.	Khem phra ram	Shrub	X			

(to be continued)

Table 2. (continued)

Family	Species	Vernacular	Habit	Son.	Nak.	Na.1	Na.2
Rubiaceae	*Guettarda speciosa* L.	Kong kang hu chang	Shrubby tree	X			
	Hedyotis sp.	-	Herb	X	X	X	X
	Ixora javanica (Blume) DC.	Khaem daeng	Shrub	X	X	X	X
	Prismatomeris tetrandra (Roxb.) K.Schum. var. *tetrandra*	Dug kai	Shrub	X	X	X	X
	Psychotria sarmentosa Blume	Dug kai yan	Climber	X	X	X	X
	Tarena sp.		Shrub	X	X	X	X
	Catunaregam tomentosa (Blume ex DC.) Tirveng.	Nam khet	Shrubby tree	X		X	
	Micromelum minutum (G.Forst.) Wight & Arn.	Mui chang	Small tree	X	X	X	
	Atalantia monophylla (DC.) Correa	Manao phi	Small tree			X	
Sapindaceae	*Mischocarpus sundaicus* Blume	Baek phrai	Small tree	X	X	X	
Sapotaceae	*Pouteria obovata* (R.Br.) Baehni	Nga sai	Tree	X		X	X
Schizaeaceae	*Lygodium microphyllum* (Cav.) R.Br.	Li phao yung	Herb	X	X	X	X
	Lygodium salicifolium C.Presl	Li phao yai	Herb	X	X	X	X
	Schizaea dichotoma (L.) Sw.	Tan san	Herb	X		X	X
	Schizaea digitata (L.) Sw.	Tan sai	Herb			X	X
Simaroubaceae	*Eurycoma longifolia* Jack	Pla lai phueak	Tree	X	X	X	X
Sterculiaceae	*Helicteres angustifolia* L.	Khi on	Shrub	X	X		
Theaceae	*Adinandra integerrima* T.Anderson ex Dyer	Phikun pa	Tree	X			
	Schima wallichii (DC.) Korth.	Mangtan	Tree				X
Tiliaceae	*Microcos paniculata* L,	Phlapphla	Small tree				X
Viscaceae	*Viscum articulatum* Burm.f.	Kafak tin pu	Shrub	X	X	X	X
Vittariaceae	*Vittaria elongata* Sw.	Wan hua la man	Herb	X	X	X	X

ocarpus chartaceus community is found only in Songkhla. It is characteristic of plant community found on sandbars in Songkhla. According to the present study, *Dipterocarpus chartaceus* may occur on the sandbars further north from Songkhla, but it has not been found yet on the sandbars further south (see Table 2).

Due to the community types found in these four study sites and the fact that all the study sites have common physical characteristic, it is evident that these remnants may represent the plant communities that dominated the sandbars over a large area in earlier times.

In considering the plant series found in the study sites, each site has many plant species in common e.g. *Syzygium grande* var. *grande; Syzygium gratum* var. *gratum; Buchanania arborescens; Vatica harmandiana; Ardisia crenata; Ochna intergerima; Diospyros ferea; Cymbidium finlaysonianum; Doritis pulcherima; Drynaria sparsisora*. On the other hand, some species so far, have only been collected from specific study sites e.g. *Dipterocarpus obtusifolius*, collected only from Songkhla; *Schizaea digitata* found only in Narathiwat. This may be due to the zoning gradient of plant communities on the sandbars since the selected study site may be part of any number of plant communities occurring on the sandbars. Therefore the species composition from the various zones is different. Another possibility is that the distribution pattern of plants in Songkhla and Nakhon Si Thammarat may differ from those in Narathiwat, which have distribution patterns rather like Malesian plants.

Conclusion

No major differences in plant species composition and community type were found between the sandbars next to the shore (sites: Son., Na.1 and Na.2) and the off-shore sandbar (site: Nak.).

The plant species composition investigation and the primary analysis on community type through the Braun-Blanquet method of the four remnants show some common characters between them. These characteristics suggested that, in the past, the same vegetation may have dominated the landscape along the sandbars lying parallel to the seashore of Peninsular Thailand.

Further study of the vegetation on the sandbars of Peninsular Thailand would provide a clearer impression of the composition of plant species there.

In any case, the details of community structure and more survey sites will be pursued in Narathiwat Province and Nakhon Si Thammarat Province. Surveys in other provinces of the eastern coast of Peninsular Thailand are planned. A vegetation map will be drawn up once the details of vegetation on sandbars on the eastern coast of Peninsular Thailand is completed.

None of the remnants of the plant communities in the selected study areas belong to a conservation area of any types (National Park; Forest Park; Wildlife Sanctuary; Non Hunting Area; Forest Reserved Area). Therefore, the study of vegetation on the sandbars is necessary before all the remnants disappear in the near future due to urban development, tourism and agriculture.

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