

MOLLUSCS FROM THE MARINE NATIONAL PARKS: SURIN AND LE-PAE ISLANDS, ANDAMAN SEA, THAILAND

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ABSTRACT

Marine molluscs were collected on the shore and by SCUBA diving at 10 m depth at Surin and Le-pae islands. The total record is 356 taxa, including 16 and 26 species from Surin and Le-pae Islands, respectively, added during this survey. The policy to conserve marine resources on these islands is discussed. Notes on local tribe inhabitants (Sea Gypsies) are included.

INTRODUCTION

Tantanasiriwong (1978, 1979), and Tantichodok *et al.* (1986) have studied mollusc diversity in the Andaman Sea, but the number of identified species is still low. The purpose of this study is to summarize previous records from Surin and Le-pae islands and add recent findings to this record. The implementation of a research program is also discussed.

MATERIALS AND METHODS

Surin and Le-pae islands (declared Marine National Parks under the Department of Forestry) are located off the coasts of Ranong and Satun province respectively (Fig. 1).

A survey was conducted at Surin Island during 24-26 February 1994. Shells were collected on the beach and by diving to a depth of 10 m.

On 11 May 1994, Phuket Marine Biological Center (PMBC), Andaman Sea Fisheries Development Center (AFDEC), and the Marine Fisheries Conservation Unit made a joint trip to Le-pae island to gather general information on fisheries and fishing communities. Shells were sampled on the beach, and collections by Sea Gypsies were recorded.

RESULTS

Mollusc diversity at Surin Islands

29 families and 53 species were collected and identified (Table 1). *Lambis chiragra* was the most common species encountered during diving in the coral reef areas, while *Trachycardium flavum* dominated on the beaches. The present survey has

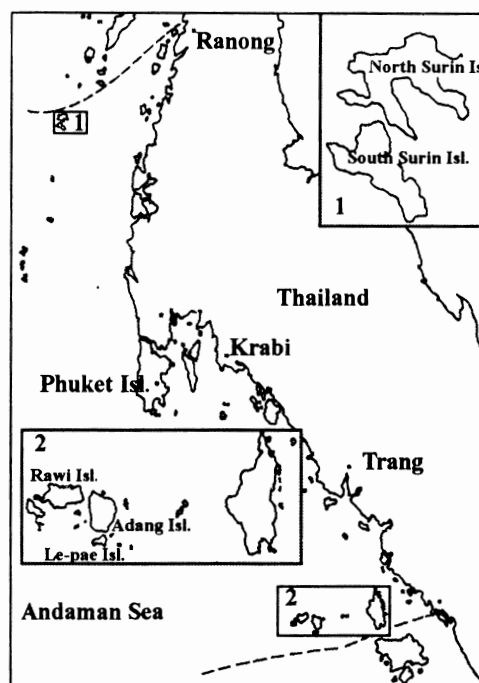


Figure 1. Map showing study areas, Surin and Lepae Islands, in the Andaman Sea of Thailand.

added 16 species to the known record.

Previous collections at Surin Islands were mainly from mangrove and coral reefs ecosystems. Tantanasiriwong (1978, 1979) and Nateewathana *et al.* (1981) reported 58 species of gastropods in 23 families, and 51 species of bivalves in 24 families (Table 1).

Mollusc diversity at Le-pae Island

35 families, and 60 species were collected, mainly on

the beach. (Table 1). The most abundant species was *Trachycardium flavum*. The present survey has added 26 species to the known record.

Tantichodok *et al.* (1986) previously recorded 130 gastropod species in 27 families and 75 bivalve species in 22 families (Table 1). The study was carried out in the nearby Tarutao Marine National Park. Most of the latter specimens are deposited at Department of Biology, Prince of Songkla University.

DISCUSSION

The Department of Fisheries has a policy to rehabilitate and conserve marine resources on these islands for sustainable use. Therefore, Fisheries Conservation Research Stations were constructed at Surin in 1991 and Le-pae in 1993. The policy is followed up by joint research programmes on fisheries and marine resources management. It has been a matter of concern to secure the livelihood of local inhabitants (Sea Gypsies) on these islands.

A group of Sea Gypsies live in Surin Marine National Park. There are 40 families with 300 members. They live on boats with leaf roofs. Ornamental sea shells are collected locally and sold to tourists visiting the islands. These people live a simple life without possibility of education since schools are lacking.

Another tribe of Sea Gypsy live on the Le-pae island. There are 152 families with 661 members. They seem to have higher living standard than those at Surin island. They earn their living from coconut plantations (2,000 Baht/year), and by fishing, especially for shells and lobsters. Fish traps, gill nets, bottom nets and long lines are used. Income from fishing is about 14,000-50,000 Baht/year. There is a school on the island.

Conservation and management action is needed because the diverse and beautiful coral reefs have been damaged by fishermen using dynamite to catch the reef fish. Additional damage to the fringing reefs has been caused by shell and coral collecting. Trawling vessels are known to transgress the 3 km fishing limit around the islands, destroying corals. However, conservation of the marine resources depends on community participation and understanding. Each person must show respect for the regulations if conservation projects are to become successful. The pressure can be taken off sanctuaries if harvesting is done outside the protected areas under community agreement and quota control.

Table 1. List of species collected at Surin Islands (A), Surin Marine National Park (B) (*cf.* Nateewathana *et al.* 1981), Le-pae islands (C), and Tarutao Marine National Park (D) (*cf.* Tantichodok *et al.* 1986).

	A	B	C	D
GASTROPODA				
ARCHAEOGASTROPODA				
Family Acmaeidae				
<i>Patelloida saccharina</i>	.	.	.	+
Family Angariidae				
<i>Angaria delphinus</i>	+	.	+	+
Family Haliotidae				
<i>Haliotis asinina</i>	+	.	+	+
<i>H. varia</i>	.	.	+	.
<i>H. ovina</i>	.	.	+	+
<i>H. planata</i>	.	.	.	+
Family Neritidae				
<i>Nerita albicilla</i>	.	+	.	+
<i>N. costata</i>	.	.	+	+
<i>N. planospira</i>	.	.	.	+
<i>N. polita</i>	.	.	.	+
<i>N. squamulata</i>	.	.	.	+
<i>N. chamaeleon</i>	.	+	.	.
<i>N. polita</i>	.	+	.	.
Family Patellidae				
<i>Cellana testudinaria</i>	+	.	+	.
<i>C. radiata radiata</i>	.	+	.	.
<i>Patella flexuosa</i>	.	.	.	+
Family Trochidae				
<i>Trochus niloticus</i>	+	+	+	+
<i>T. pyramis</i>	.	.	.	+
<i>T. maculatus</i>	.	.	.	+
<i>T. chloromphalus</i>	.	.	.	+
<i>T. sacellum rota</i>	.	.	.	+
<i>Camitia</i> sp.	.	.	.	+
<i>Clanculus denticulatus</i>	.	.	.	+
<i>Clanculus</i> sp.	.	.	.	+
<i>Gibbula pulcherrina</i>	.	.	.	+
<i>Monodonta canalifera</i>	.	.	.	+
<i>M. labio</i>	.	+	.	+
<i>Umboonium vestiarum</i>	.	.	.	+
<i>Ethalia</i> sp.	.	+	.	.
<i>Stomatella varia</i>	.	.	.	+
<i>Stomatella</i> sp.	.	.	.	+
Family Turbinidae				
<i>Turbo marmoratus</i>	+	.	.	.
<i>T. argyrostomus</i>	.	.	+	+
<i>T. chrysostomus</i>	.	.	.	+
<i>T. cinereus</i>	.	.	.	+
<i>T. petholatus</i>	.	+	.	+
<i>T. bruneus</i>	.	+	.	.

Table 1 continued				Table 1 continued					
	A	B	C	D		A	B	C	D
<i>Turbo</i> sp.	.	.	.	+	Family Cymatiidae				
<i>Astraea haematragum</i>	.	.	.	+	<i>Cymatium pileare</i>	+	.	.	+
<i>A. tuberosa</i>	.	.	.	+	<i>C. caudatum</i>	.	+	.	.
<i>Monilea smithi</i>	.	.	.	+	<i>C. pfeifferianum</i>	.	+	.	.
MESOGASTROPODA					Family Cypraeidae				
Family Architectonicidae					<i>Cypraea mauritiana</i>				
<i>Architectonica perspectiva</i>	.	.	.	+	<i>C. ebraneus</i>	+	.	.	.
Family Bursidae					<i>C. vitellus</i>				
<i>Bursa elegans</i>	+	.	.	+	<i>C. lynx</i>	+	+	.	.
<i>B. granularis</i>	.	.	.	+	<i>C. arabica</i>	+	.	+	+
<i>B. echinata</i>	.	+	.	.	<i>C. argus</i>	+	.	.	.
<i>B. rubeta</i>	+	.	+	.	<i>C. annulus</i>	.	+	.	+
Family Calyptraeidae					<i>C. caputserpentis</i>				
<i>Ergaea washi</i>	.	.	.	+	<i>C. caurica</i>	.	.	.	+
Family Cassidae					<i>C. cylindrica</i>				
<i>Cassis cornuta</i>	+	.	+	+	<i>C. erosa</i>	.	+	.	+
<i>Phalium bisulcatum bisulcatum</i>	.	.	+	.	<i>C. erroneus</i>	.	+	.	+
<i>P. glaucum</i>	.	+	.	+	<i>C. fimbriata</i>	.	.	.	+
<i>Casamaria ponderosa ponderosa</i>	+	.	.	.	<i>C. globulus</i>	.	.	.	+
Family Cerithiidae					<i>C. isabella</i>				
<i>Cerithium coralium</i>	.	+	.	.	<i>C. carneola</i>	.	+	.	.
<i>C. nodulosum</i>	.	.	.	+	<i>C. eglantina</i>	.	.	+	.
<i>C. patulum</i>	.	.	.	+	<i>C. onyx</i>	.	.	+	.
<i>Cerithium</i> sp.	.	.	.	+	<i>C. carneola</i>	.	.	+	.
<i>Rhinoclavis aspera</i>	.	.	.	+	<i>C. tigris</i>	+	.	.	.
<i>R. pharos</i>	.	.	.	+	Family Hipponicidae				
<i>R. vertagus</i>	.	+	.	+	<i>Hipponix conicus</i>				
<i>Rhinoclavis</i> sp.	.	.	.	+	<i>Hipponix conicus</i>				
<i>Semivertagus nesiticus</i>	.	.	.	+	Family Littorinidae				
<i>Clypeomerus brevis</i>	.	+	.	.	<i>Littorina scabra scabra</i>				
Family Conidae					<i>L. undulata</i>				
<i>Conus monile</i>	+	.	.	.	<i>Littorina</i> sp.				
<i>C. ebraneus</i>	+	.	.	.	<i>Nodilittorina pyramidalis</i>				
<i>C. leopardus</i>	+	+	.	.	<i>N. millegrana</i>				
<i>C. arenatus</i>	.	.	.	+	<i>Clithon peguensis</i>				
<i>C. aulicus</i>	.	.	.	+	Family Naticidae				
<i>C. coronatus</i>	.	.	.	+	<i>Polinices tumidus</i>				
<i>C. generalis</i>	.	+	.	+	<i>P. didyma</i>				
<i>C. nussatella</i>	.	.	.	+	<i>Sinum</i> sp.				
<i>C. textile</i>	.	.	+	+	<i>Natica lineata</i>				
<i>C. characteristicus</i>	.	+	.	.	<i>N. tigrina</i>				
<i>C. eburneus</i>	.	+	.	.	<i>Natica</i> sp.				
<i>C. emaciatus</i>	.	+	.	.	Family Ovulidae				
<i>C. bengalensis</i>	.	.	+	.	<i>Ovula ovum</i>				
<i>C. betulinus</i>	.	.	+	.	<i>Ovula ovum</i>				
<i>C. pennaceus</i>	+	.	.	.	Family Planaxidae				
<i>Conus</i> sp.1	.	.	.	+	<i>Planaxis nigra</i>				
<i>Conus</i> sp.2	.	.	.	+	<i>P. sulcatus</i>				
<i>Conus</i> sp.3	.	.	.	+	Family Potamididae				
					<i>Cerithidea cingulata</i>				
					<i>Telescopium telescopium</i>				

Table 1 continued	A	B	C	D	Table 1 continued	A	B	C	D
Family Strombidae					Family Fascioliariidae				
<i>Strombus listeri</i>	+	+	+	+	<i>Pleuroploca filamentosa</i>	.	.	.	+
<i>S. vittatus vittatus</i>	+	.	+	+	<i>P. trapezium</i>	+	.	.	+
<i>S. decorus decorus</i>	.	+	.	.	<i>Fasciolaria huntaria</i>	.	.	.	+
<i>S. plicatus columba</i>	.	+	.	+	<i>Latirus</i> sp.	.	.	.	+
<i>S. terebellatus terebellatus</i>	.	+	.	.	Family Marginellidae				
<i>S. gibberulus</i>	.	.	+	.	<i>Marginella ventricosa</i>	.	.	+	+
<i>S. luhuanus</i>	+	.	+	+	<i>M. elegans</i>	.	+	.	.
<i>S. aurisdianae</i>	.	.	+	+	Family Mitridae				
<i>S. lentiginosus</i>	.	.	.	+	<i>Mitra mitra</i>	+	.	+	.
<i>S. urceus</i>	.	.	+	.	<i>Subcancilla interlirata</i>	.	+	.	.
<i>Lambis truncata</i>	+	.	+	.	Family Muricidae				
<i>L. lambis</i>	+	.	+	+	<i>Chicoreus ramosus</i>	+	.	+	+
<i>L. chiragra chiragra</i>	+	.	+	+	<i>C. brunneus</i>	+	.	.	.
<i>L. scorpius scorpius</i>	+	.	+	+	<i>C. torrefactus</i>	+	.	+	.
<i>L. millepeda</i>	.	.	.	+	<i>C. axicornis</i>	.	.	.	+
<i>Terebellum terebellum</i>	.	+	.	.	<i>C. microphyllus</i>	.	.	.	+
Family Terebridae					<i>C. palmarosae</i>	.	.	.	+
<i>Terebra crenulata</i>	+	.	.	.	<i>Chicoreus</i> sp.	.	.	.	+
<i>T. dimidiata</i>	+	.	.	.	<i>Hexaplex</i> sp.1	.	.	.	+
<i>T. maculata</i>	.	.	.	+	<i>Hexaplex</i> sp.2	.	.	.	+
<i>Terebra</i> sp.	.	.	.	+	<i>Muculotriron serriaris longus</i>	.	.	.	+
<i>Cynguloterebra</i> sp.	.	.	.	+	<i>Cronia fiscillum</i>	.	.	.	+
<i>Myurella</i> sp.	.	.	.	+	<i>Drupa granulata</i>	.	.	.	+
Family Tonnidae					<i>D. morum</i>	+	.	.	.
<i>Tonna sulcosa</i>	+	.	+	.	<i>Drupella ochrostoma</i>	.	.	.	+
<i>T. dolium</i>	.	.	.	+	<i>Drupella</i> sp.	.	.	.	+
Family Turridae					<i>Morula spinosa</i>	.	.	.	+
<i>Lophiotoma acuta</i>	.	+	.	.	<i>M. squamosa</i>	.	.	.	+
<i>L. indica</i>	.	.	.	+	<i>M. uva</i>	.	.	.	+
<i>Turricula javana</i>	.	.	.	+	<i>M. anaxeres</i>	.	+	.	.
Family Turritellidae					<i>M. margariticola</i>	.	+	.	.
<i>Turritella terebra</i>	+	.	.	+	<i>M. marginalba</i>	.	+	.	.
<i>Neohaustator tsushimaensis</i>	+	.	.	.	<i>Morula</i> sp.	.	.	.	+
Family Xenophoridae					<i>Muricopsis orri</i>	.	.	.	+
<i>Xenophora corrugata</i>	.	+	.	.	<i>M. infans</i>	.	+	.	.
<i>X. calculifera</i>	+	.	.	.	<i>Purpura persica</i>	.	.	.	+
NEOGASTROPODA					<i>Thais alouina</i>	.	.	.	+
Family Buccinidae					<i>T. echinata</i>	.	.	.	+
<i>Cantharus undosus</i>	.	.	.	+	<i>T. hippocampus</i>	.	.	.	+
<i>C. fumosus</i>	.	.	.	+	<i>T. hippocastanum</i>	.	+	.	.
<i>Phos senticosus</i>	.	.	.	+	<i>T. rustica</i>	.	.	.	+
<i>P. roseatus</i>	.	+	.	.	<i>Trunculariopsis truncatus</i>	.	.	.	+
<i>Polia proteus</i>	.	.	.	+	<i>Murex trapa</i>	.	.	.	+
<i>Pusiosoma mendicaria</i>	.	.	.	+	<i>M. troscheli</i>	.	.	.	+
<i>Engina lineata</i>	.	+	.	.	<i>Rapana rapiformis</i>	.	.	.	+
<i>E. mendicaria</i>	.	+	.	.	Family Nassariidae				
<i>E. zonalis</i>	.	+	.	.	<i>Nassarius comptus</i>	.	+	.	.
					<i>N. globosus</i>	.	+	.	.
					<i>N. luridus</i>	.	+	.	.
					<i>N. olivaceus</i>	.	+	.	.
					<i>N. dorsatus</i>	.	.	.	+

Table 1 continued

	A	B	C	D
Family Olividae				
<i>Oliva arcata</i>	.	+	.	.
<i>O. buloui</i>	.	+	.	.

Family Turbinellidae

<i>Vasum tubiferum</i>	+	.	.	+
<i>V. terbinellus</i>	+	.	.	+

Family Volutidae

<i>Melo melo</i>	.	.	.	+
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**OPISTHOBRANCHIA
BULLOMORPHA**

Family Atyidae

<i>Atys naucum</i>		+		
<i>A. cylindricus</i>				+

Family Acteonidae

<i>Pupa sulcata</i>	.	+	.	
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Family Bullidae

<i>Bulla ampulla</i>	.	+	.	.
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Family Hydatinidae

<i>Hydalina velum</i>	.	.	.	+
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PULMONATA

Family Siphonariidae

<i>Siphonaria normalis</i>	.	+	.	.
<i>Siphonaria</i> sp.	.	.	.	+

**BIVALVIA
ARCOIDA**

Family Arcidae

<i>Arca avellana</i>	.	+	.	.
<i>Anadara nodifera</i>	.	.	.	+
<i>A. clathrata</i>	.	+	.	.
<i>Barbatia (Ustularca) bicolorata</i>	.	.	+	
<i>B. fusca</i>	.	.	.	+
<i>B. lacerata</i>	.	+	.	+
<i>B. virescens</i>	.	.	.	+
<i>B. helbingi</i>	.	+	.	.
<i>B. amygdalumtostum</i>	.	.	+	.
<i>Barbatia</i> sp.	.	.	.	+
<i>Trisidos semitorta</i>	.	+	.	.

MYOIDA

Family Gastrochaenidae

<i>Gastrochaena cuneiformis</i>	.	+	.	.
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Family Myidae

<i>Mya</i> sp.	.	.	.	+
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Table 1 continued

	A	B	C	D
Family Pholadidae				
<i>Pholas</i> sp.	.	.	.	+

MYTILOIDA

Family Mytilidae

<i>Botula cinnamonea</i>	.	.	.	+
<i>Botula</i> sp.	.	.	.	+
<i>Botulina coralliophaga</i>	.	.	.	+
<i>Lithophaga divaricalx</i>	.	.	.	+
<i>L. hanleyana</i>	.	.	.	+
<i>L. lima</i>	.	.	.	+
<i>L. malaccana</i>	.	+	.	+
<i>L. nasuta</i>	.	.	.	+
<i>L. obesa</i>	.	.	.	+
<i>L. teres</i>	.	+	.	+
<i>Brachiodontes variabilis</i>	.	+	.	+
<i>Septifer bilocularis</i>	.	+	+	+
<i>Modiolus agripetus</i>	.	.	.	+
<i>M. philippinarum</i>	.	.	.	+
<i>Perna viridis</i>	.	.	.	+

Family Pinnidae

<i>Pinna bicolor</i>		+	.	+
<i>Atrina pectinata</i>	.	.	+	+
<i>A. vexillum</i>	+	.	.	+

PTEROIDA

Family Gryphaeidae

<i>Hyotissa hyotis</i>	.	+	+	+
<i>Hyotissa</i> sp.	.	.	.	+

Family Isognomonidae

<i>Isognomon legumen</i>	.	+	.	+
<i>I. perna</i>	.	.	.	+
<i>I. isognomum</i>	.	+	+	+

Family Limidae

<i>Ctenoides annulatus</i>	.	+	.	+
<i>C. scrabra</i>	.	.	.	+
<i>Lima lima</i>	.	.	.	+
<i>L. orientalis</i>	.	.	.	+
<i>Limaria fragilis</i>	.	.	.	+

Family Limopsidae

<i>Limopsis multistriata</i>	.	+	.	.
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Family Malleidae

<i>Malleus albus</i>	.	.	.	+
<i>M. malleus</i>	.	.	+	+
<i>M. regula</i>	.	+	.	.

Family Ostreidae

<i>Crassostrea</i> sp.	.	.	.	+
<i>Saccostrea mordax</i>	.	.	.	+
<i>S. cucullata</i>	.	+	.	+

Table 1 continued

	A	B	C	D
Family Tridacnidae				
<i>Tridacna maxima</i>	+	.	.	+
<i>T. crocea</i>	.	+	+	+
<i>T. squamosa</i>	.	.	+	+
Family Veneridae				
<i>Gafrarium divaricatum</i>	.	.	.	+
<i>G. pectinatum</i>	.	.	.	+
<i>G. dispar</i>	.	.	.	+
<i>G. tumidum</i>	.	.	.	+
<i>Irus irus</i>	.	.	.	+
<i>Amiantis hagenowi</i>	.	+	.	.
<i>Callista chinensis</i>	.	+	.	.
<i>Lioconcha ornata</i>	.	+	.	.

Table 1 continued

	A	B	C	D
<i>Pitar hebraea</i>	.	+	.	.
<i>Timoclea marica</i>	.	+	.	.
<i>T. imbricata</i>	.	.	.	+
<i>Peryglypta crispata</i>	.	.	+	.
<i>Marcia optima</i>	.	.	.	+
<i>Paphia semirugata</i>	.	.	.	+
<i>Ruditapes philippinarum</i>	.	.	.	+
CEPHALOPODA				
NAUTILOIDEA				
Family Nautilidae				
<i>Nautilus pompilius</i>	+	.	+	+

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