



**SYSTEMATIC STUDIES OF CORAL REEF FISHES FROM THE
INDIAN OCEAN, PHUKET (THAILAND)**

by
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and
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ABSTRACT

An investigation of coral reef-fish fauna was performed from December 1976 to January 1978, around Phuket and several small offshore islands in the Indian ocean. Simple fishing methods were applied in the water less than 10 meters deep at mean tide. There were 230 species of 93 genera found in these locations. Collections included 36 families, most of which inhabited coral heads and crevices of the rocky bottom. The fauna, however, was composed of both resident and non-resident forms. The most common residents were from the families: Pomacentridae, Chaetodontidae, Labridae, Serranidae, Acanthuridae and Lutianidae. A complete collection of all the species inhabited the areas investigated was not possible, because of collecting and identification difficulties.

INTRODUCTION

Phuket is the largest island of Thailand, situated in the Indian Ocean on the west coast of the Peninsula between latitude 7° 50' N to 8° 10' N, and longitude 98° 10' E to 98° 20' E. Phuket Province also includes twenty-six small islands, and is one of the seventy-two provinces of Thailand. Phuket island itself is surrounded by sandy, pebble, and rocky coasts, except the area closed to the mainland which is more or less a mangrove habitat.

The problem of why the sea food supplies have decreased sharply is one of the most interesting topics discussed among Thai conservationists. Illegal means of fishing are causing the decrease of the fish fauna. Eventhough laws and regulations for conserving the natural environment and its communities have been erected, especially in the coral reef areas, fish and other fauna are still destroyed by illegal human activities; i.e. dynamiting, electric shocking, and poisoning. Such activities kill large amount,

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of coral reef fauna; large and small, adults and young. Even with the more efficient fishing gears, marine fish catches have decreased rapidly in number, because coral reefs which are not only their feeding and nursing grounds but also hiding places, have been destroyed.

A study of coral reef-fish fauna around Phuket island was conducted from December, 1976 to January, 1978, and it might be said that this was the first thorough study of coral reef-fish fauna in Thailand. Due to several factors; i.e. lack of manpower, budget, and some difficulties, incompleteness may be found. Many species, however, were identified as a new record for the fish fauna found in Thai waters. Although this is fundamental research; it is necessary so that one can solve important problems in related fields of study.

MATERIALS AND METHODS

Locality :

Three areas on the main island and one area on each of nine small islands were sampled. These areas are as followed: Ao Kata, Ao Nai Han, Ao Nai Yang, Ko Bon, Ko Hi, Ko Kaew Noi, Ko Kaew Yai, Ko Man, Ko Nok, Ko Racha Noi, Ko Racha Yai, and Ko Sirae, shown in Map I (Ao = Bay, Ko = Island). Fish fauna found from those sites are more or less rich and diverse, and of 230 species. There are both resident and non-resident forms which inhabit in the water of less than ten meters deep at mean tide. The principal habitats of these permanently submerged reefs are surface, crevice, and over hanging shelter. Coral heads are scattered on those reefs. Almost two hundred species of Scleractinia are reported from Phuket and adjacent areas (Ditliv, 1976). The most common genera are *Acropora*, *Astreopora*, *Montipora*, and *Anacropora*. The lower slope of the open reef, however, is covered by *Pavona*, *Favite*, *Favia*, etc.

Physical properties of sea water at three different localities (depth 0-20 meters) were studied by the Exploratory Fishing Unit, Department of Fisheries Thailand in 1976. The data showed that temperature, salinity, pH, and oxygen content did not vary significantly. (Table I)

Time :

Owing to the great influence of the southwest monsoon, the appropriate time for collecting specimens along the west coast of the Peninsula should be from December until March. Four collections were made as follows : January 2-9, 1976; February 13-14, 1976, February 17-27, 1977, and January 23-27, 1978.

Methods :

Simple fishing methods such as trapping, spearing, netting, etc. were applied in order to obtain fish specimens. Using SCUBA (Self Contained Underwater Breathing Apparatus) and hiring experienced local fishermen was necessary for doing field work.

The most effective tool for catching fish specimens was fine-meshed gillnet. Photographs of some species of fish and their habitats were also taken with underwater camera. This has become one of the necessary tools for studying living marine organisms.

RESULT

Total number of species, caught in the area of study both resident and non-resident forms, are 230 species, 93 genera, and 36 families. The most abundant groups are as follows : damsel-fish, butterfly-fish, wrasse, rock-cod, surgeon-fish, and snappers. Some families such as Serranidae, Lutianidae, and Scolopidae are economically important. The size of the fish however, was rather small. The number of species and genera collected of each family are shown below and also in Table 2.

LIST OF CORAL REEF -FISHES SPECIES

ACANTHURIDAE

1. *Acanthurus leucosternon* Bennett
2. *A. lineatus* (Linn.)
3. *A. nigricans* (Bl. & Schn.)
4. *A. triostegus* (Linn.)
5. *A. xanthopterus* Val.
6. *Ctenochaetus strigosus* (Bennett)
7. *Naso lituratus* (Bl. & Schn.)
8. *Naso* sp.
9. *Zebrasoma flavescens* (Bennett)
10. *Z. scopas* (Cuv.)

ANTENNARIDAE

1. *Antennarius hispidus* (Bl. & Schn.)
2. *Antennarius* sp.

APOGONIDAE

1. *Apogon auritus* Cuv. & Val.
2. *A. campbelli* Smith
3. *A. endekataenia* Bleeker
4. *A. fasciatus* (Shaw)
5. *A. frenatus* Val.
6. *Apogon* spp.
7. *Cheilodipterus quinquelineatus* Cuv. & Val.

BALISTIDAE

1. *Balistes aculeatus* Linn.
2. *B. stellatus* (Lacépède)
3. *B. undulatus* Mungo Park
4. *B. viridescens* (Bl. & Schn.)
5. *Hemibalistes chrysopterus* (Bloch)
6. *Monacanthus chinensis* (Bloch)
7. *M. sandwichiensis* (Quoy & Gaimard)
8. *M. spinosissimus* (Quoy & Gaimard)
9. *Monacanthus* sp.
10. *Odonus niger* (Rüppell)
11. *Oxymonacanthus longirostris* (Bl. & Schn.)
12. *Pseudobalistes fuscus* (Bl. & Schn.)

BLENNIIDAE

1. *Petrocirtes taeniatus* (Quoy & Gaimard)
2. *Petrocirtes* sp.
3. *Salarias dussumieri* Cuv. & Val.
4. *S. fasciatus* (Bloch)

BROTULIDAE

1. *Dinematichthys iluocoeteoides* Bleeker

CYNOGLOSSIDAE

1. *Paraplagusia bilineata* (Bloch)

CHAETODONTIDAE

1. *Anisochaetodon auriga* (Forskål)
2. *A. rafflesi* (Bennett)
3. *A. vagabundus* (Linn.)
4. *Chaetodon collare* Bloch
5. *C. falcula* (Bloch)
6. *C. guttatissimus* Bennett
7. *C. lineolatus* Cuv. & Val.
8. *C. lunula* (Lacépède)
9. *C. melanotus* Bl. & Schn.
10. *C. meyeri* Bl. & Schn.
11. *C. octofasciatus* Bloch
12. *C. ornatissimus* Cuv. & Val.
13. *C. pictus* Forskål
14. *C. plebeius* Cuv. & Val.
15. *C. semeion* Bleeker
16. *C. trifascialis* (Quoy & Gaimard)

17. *Chaetodon trifasciatus* Mungo Park
18. *Chelmon rostratus* (Linn.)
19. *Coradian chrysozonus* (Cuv. & Val.)
20. *Forcipiger longirostris* (Broussonet)
21. *Gonochaetodon triangulum* (Cuv. & Val.)
22. *Hemitaurichthys zoster* (Bennett)
23. *Heniochus acuminatus* (Linn.)
24. *H. singularis* Smith & Radcliffe
25. *Megaprotodon strigangulus* (Gmelin)
26. *Parachaetodon ocellatus* (Cuv. & Val.)
27. *Centropyge multispinis* (Playfair)
28. *Centropyge* spp.
29. *Pomacanthus annularis* (Bloch)
30. *P. imperator* (Bloch)
31. *Pygoplites diacanthus* (Boddaert)

DIODONTIDAE

1. *Diodon holacanthus* Linn.

ECHENEIDAE

1. *Echeneis naucrates* Linn.

EPHIPPIDAE

1. *Platax orbicularis* (Forskål)
2. *P. teira* (Forskål)

GOBIIDAE

1. *Acentrogobius ornatus* (Rüppell)
2. *Bathygobius* spp.
3. *Eleotriodes sexguttatus* (Cuv. & Val.)
4. *Gobiodon erythrospilus* Bleeker
5. *G. histrio* (Cuv. & Val.)

HOLOCENTRIDAE

1. *Holocentrus ruber* (Forskål)
2. *Myripristis mudjan* (Forskål)

LABRIDAE

1. *Anampses caeruleopunctatus* Rüppell
2. *A. meleagrides* Cuv. & Val.
3. *A. melanurus* Bleeker
4. *Anampses* sp.
5. *Bodianus axillaris* Bennett
6. *B. diana* (Lacépède)

7. *Bodianus mesothorax* (Bl. & Schn.)
8. *Cheilinus chlorurus* (Bloch)
9. *C. oxyrhynchus* Bleeker
10. *Cirrhilabrus cyanopleura* (Bleeker)
11. *Cirrhilabrus* sp.
12. *Coris variegata* (Rüppell)
13. *Epibulus insidiator* (Pallas)
14. *Gomphosus varius* Lacépède
15. *Halichoeres argus* (Bl. & Schn.)
16. *H. centriquadrus* (Lacépède)
17. *H. cyanopleura* (Bleeker)
18. *H. leparensis* (Bleeker)
19. *H. margaritaceus* (Cuv. & Val.)
20. *H. nigrescens* (Bl. & Schn.)
21. *H. notopsis* (Cuv. & Val.)
22. *H. scapularis* (Bennett)
23. *Hemigymnus fasciatus* (Bloch)
24. *H. melapterus* (Bloch)
25. *Labrichthys cyanotaenia* Bleeker
26. *Labroides bicolor* Fowler & Bean
27. *L. dimidiatus* (Cuv. & Val.)
28. *Macropharyngodon meleagris* (Val.)
29. *Stethojulis phekadopleura* (Bleeker)
30. *S. trilineata* (Bl. & Schn.)
31. *Thalassoma hardwickii* (Bennett)
32. *T. janseni* (Bleeker)
33. *T. lunare* (Linn.)
34. *T. melanochir* (Bleeker)
35. *Thalassoma* sp.

LUTIANIDAE

1. *Caesio chrysozonus* Cuv. & Val.
2. *Lutianus biguttatus* (Cuv. & Val.)
3. *L. bohar* (Forskål)
4. *L. decussatus* (Cuv. & Val.)
5. *L. fulviflamma* (Forskål)
6. *L. johni* (Bloch)
7. *L. kasmira* (Forskål)
8. *L. lutianus* Bloch
9. *L. sebae* (Cuv. & Val.)

MUGILIDAE

1. *Mugil crenilabris* Forskål
2. *M. seheli* Forskål
3. *M. vaigiensis* Quoy & Gaimard

MULLIDAE

1. *Parupeneus barberinus* (Lacépède)
2. *P. indicus* (Shaw)
3. *P. macronemus* (Lacépède)

MURAENIDAE

1. *Muraena (Gymnothorax) undulata* (Lacépède)
2. *M. (Priodonophis) moluccensis* Bleeker
3. *M. (Priodonophis) reticularis* (Bloch)

SCOLOPIDAE

1. *Scolopsis bilineatus* (Bloch)
2. *S. ciliatus* (Lacépède)
3. *S. dubiosus* Weber
4. *S. vosmori* (Bloch)

ORECTOLOBIDAE

1. *Chiloscyllium griseum* Müller & Henle
2. *C. indicum* (Gmelin)
3. *C. plagiosum* (Bennett)
4. *C. punctatum* Müller & Henle

OSTRACIIDAE

1. *Ostracion cubicus* Linn.
2. *O. nasus* Bloch

PLECTORHYNCHIDAE

1. *Plectorhynchus chaetodonoides* Lacépède
2. *P. orientalis* (Bloch)
3. *Pomadasys olivaceus* (Day)

PLESIOPIDAE

1. *Plesiops caeruleolineatus* Rüppell
2. *P. welas* Bleeker

PLOTOSIDAE

1. *Plotosus lineatus* (Thunberg)

POMACENTRIDAE

1. *Abudefduf assimilis* (Günther)
2. *A. aureus* (Cuv. & Val.)
3. *A. bankieri* (Richardson)
4. *A. bengalensis* (Bloch)
5. *A. bimaculatus* (Macleay)
6. *A. biocellatus* (Quoy & Gaimard)

7. *Abudefduf coelestinus* (Cuv. & Val.)
8. *A. curacao* (Bloch)
9. *A. leucogaster* (Bleeker)
10. *A. leucozona* (Bleeker)
11. *A. melas* (Cuv. & Val.)
12. *A. saxatilis* (Linn.)
13. *A. septemfasciatus* (Cuv. & Val.)
14. *A. sordidus* (Forskål)
15. *A. xanthonotus* (Bleeker)
16. *Abudefduf* sp.
17. *Amphiprion akallopisus* Bleeker
18. *A. bicinctus* (Rüppell)
19. *A. clarkii* (Bennett)
20. *A. ephippium* (Bloch)
21. *A. laticlavus* (Cuv. & Val.)
22. *A. percula* (Lacépède)
23. *A. polymnus* (Linn.)
24. *A. xanthurus* Cuv. & Val.
25. *Chromis caeruleus* (Cuv. & Val.)
26. *C. cinerascens* (Cuv. & Val.)
27. *C. dimidiatus* (Klunz)
28. *Chromis* sp.
29. *Dascyllus aruanus* (Linn.)
30. *D. reticulatus* (Richardson)
31. *D. trimaculatus* (Rüppell)
32. *Pomacentrus amboinensis* Bleeker
33. *P. bifasciatus* Bleeker
34. *P. coelestis* (Jordan & Starks)
35. *P. cyanomos* Bleeker
36. *P. dorsalis* Gill
37. *P. littoralis* Cuv. & Val.
38. *P. lividus* (Bl. & Schn.)
39. *P. melanopterus* Bleeker
40. *P. perspicillatus* Cuv.
41. *P. taeniurus* Bleeker
42. *P. tripunctatus* Cuv. & Val.

PRIACANTHIDAE

1. *Priacanthus tayenus* (Richardson)

SCARIDAE

1. *Callyodon rubrovidaceus* (Bleeker)
2. *Callyodon* spp.

SCORPAENIDAE

1. *Paracentropogon longispinis* (Cuv. & Val.)
2. *Parascorpaena armata* (Sauvage)
3. *Pterois volitans* (Linn.)
4. *P. zebra* Quoy & Gaimard
5. *Scorpaenodes guamensis* (Quoy & Gaimard)

SERRANIDAE

1. *Anthias squamipinnis* (Peters)
2. *Anyperodon leucogrammicus* (Cuv. & Val.)
3. *Cromileptes altivelis* (Cuv. & Val.)
4. *Epinephelus boelang* Bleeker
5. *E. boenack* (Bloch)
6. *E. caeruleopunctatus* (Bloch)
7. *E. merra* Bloch
8. *E. morrhua* (Cuv. & Val.)
9. *E. miniatus* (Forskål)
10. *E. pachycentrum* (Cuv. & Val.)
11. *E. summana* (Forskål)
12. *E. undulosus* (Quoy & Gaimard)
13. *Epinephelus* sp.
14. *Plectropoma maculatum* (Bloch)
15. *Grammistes sexlineatus* (Thunberg)
16. *Pogonoperca punctata* (Cuv. & Val.)
17. *Diploprion bifasciatum* (Kuhl & v.Hasselt)
18. *Promicrops lanceolatus* (Bloch)

SIGANIDAE

1. *Siganus corallinus* (Cuv. & Val.)
2. *S. javus* (Linn.)
3. *S. oramin* (Bl. & Schn.)
4. *S. virgatus* (Cuv. & Val.)
5. *S. vulpinus* (Schl. & Müller)

SILLAGINIDAE

1. *Sillago sihama* (Forskål)

SYNODONTIDAE

1. *Saurida gracilis* (Quoy & Gaimard)

TETRODONTIDAE

1. *Canthigaster solandri* (Richardson)
2. *Tetrodon borneensis* Regan
3. *T. nigropunctatus* Bl. & Schn.
4. *Tetrodon* sp.

THERAPONIDAE

1. *Therapon jarbua* (Forskål)

TRYGONIDAE

1. *Taeniura lymma* (Forskål)

ZANCLIDAE

1. *Zanclus canescens* (Linn.)

DISCUSSION

The population of coral reef fish studied are resident and non-resident forms. The resident ones usually belong to the coral reef community; while the latter passes through the reef, some remaining within the area for a short period of time. The number of specimens observed varied from one locality to another, and from one depth to another. This was due to their preferred food and their behavior. The anemone fish, for example, stay among the tentacles of a particular sea anemone which provides them food and shelter.

Specimens collected from reef areas were the young of economically important species, or the fish smaller than marketable size. They lived around coral heads, crevices, and overhang shelters. The adults move out to deeper water, but may come back for a visit once in a while. Fish species composition in a particular habitat varies from time to time. The species list of this report is incomplete, although it has been expanded over previous studies. It would be useful to continue this work, and needs to be studied however, for a longer period of time to make this list more complete.

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Table I
Some Physical factors at different depths

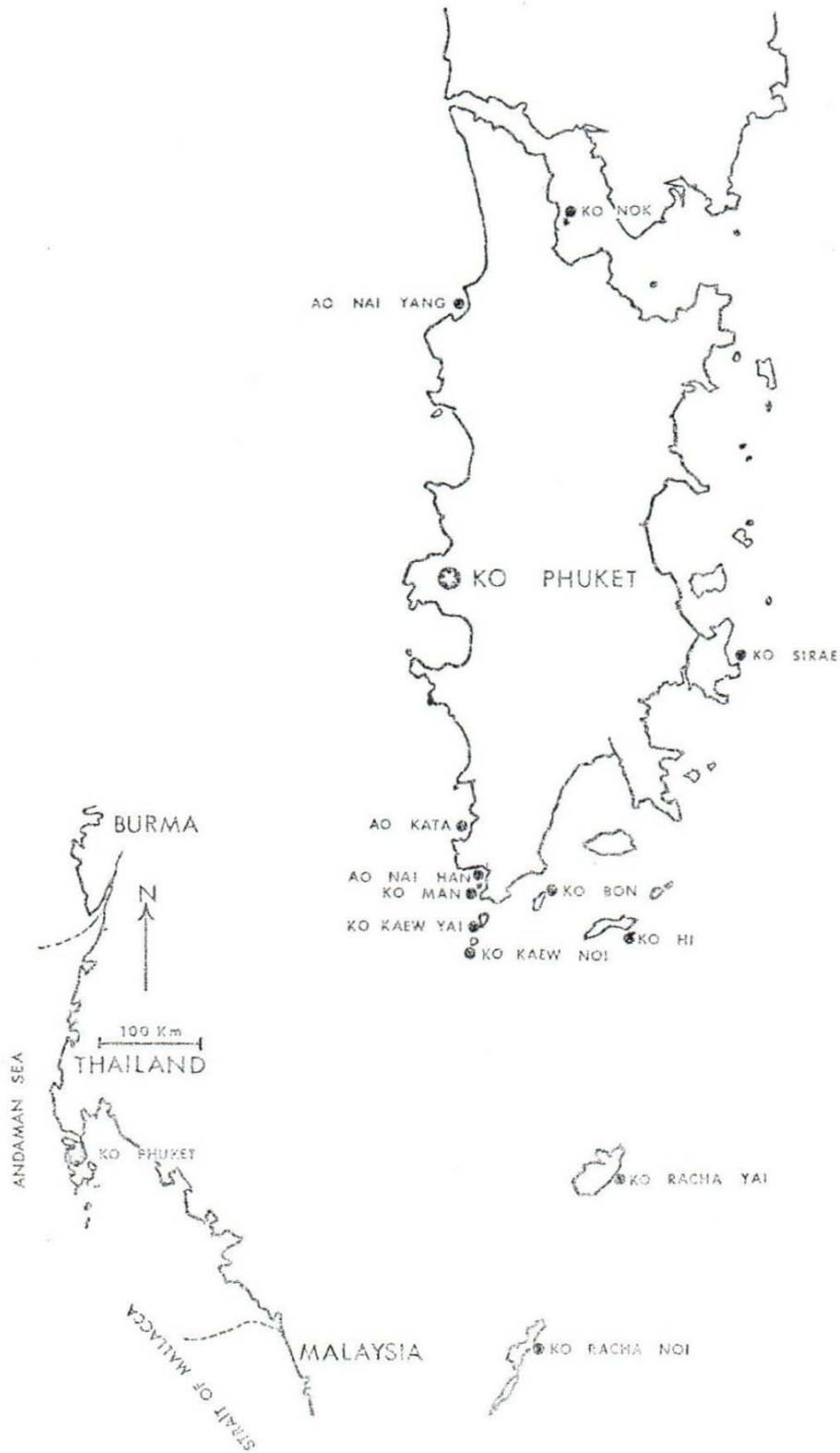
Date	Station no.	Depth m.	Water Temp °C	Salinity ppt.	pH	O ₂ ppm.
Jan. 3, 1976	394	00	26.76	33.06	8.04	3.94
	394	10	26.57	33.06	8.16	4.02
	394	19	26.53	33.10	8.13	3.99
Jan. 8, 1976	399	00	27.21	31.44	8.14	3.93
	399	10	27.33	31.53	8.15	3.91
	399	20	27.14	33.03	8.17	3.88
Jan. 11, 1976	393	00	26.91	32.37	8.14	4.03
	393	10	27.07	32.73	8.15	4.03
	393	20	27.11	32.89	8.16	4.02

Remarks

Station 393 — located at Lat. 7° 35' 00" N. Long. 98° 11' 00" E
 „ 394 — „ Lat. 7° 50' 30" N. Long. 98° 36' 00" E
 „ 399 — „ Lat. 7° 35' 00" N. Long. 98° 27' 00" E
 (Based on Anonymous, 1976)

Table II
Number of species and genera of coral reef fish families

Families	no. of species	no. of genera
1. Acanthuridae	10	4
2. Antennariidae	2	1
3. Apogonidae	7	2
4. Balistidae	12	6
5. Blenniidae	4	2
6. Brotulidae	1	1
7. Cynoglossidae	1	1
8. Chaetodontidae	31	13
9. Diodontidae	1	1
10. Echeidae	1	1
11. Ephippidae	2	1
12. Gobiidae	6	4
13. Holocentridae	2	2
14. Labridae	35	14
15. Lutianidae	9	2
16. Mugilidae	3	1
17. Mullidae	3	1
18. Muraenidae	3	1
19. Scolopidae	4	1
20. Orectolobidae	4	1
21. Ostraciidae	2	1
22. Plectorhynchidae	3	2
23. Plesiopidae	2	1
24. Plotosidae	1	1
25. Pomacentridae	42	5
26. Priacanthidae	1	1
27. Scaridae	2	1
28. Scorpaenidae	5	4
29. Serranidae	18	9
30. Siganidae	5	1
31. Sillaginidae	1	1
32. Synodontidae	1	1
33. Tetrodontidae	4	2
34. Theraponidae	1	1
35. Trygonidae	1	1
36. Zanclidae	1	1
	230	93



Map 1.- Map of the west coast of Thailand showing Phuket Island