Wilkinson, C. R. (ed.), 1994. Living Coastal Resources of Southeast Asia: Status and Management. Report of the Consultation Forum, Third ASEAN-Australia Symposium on Living Coastal Resources, Chulalongkorn University, Bangkok, Thailand, May 1994. Australian Institute of Marine Science, Townsville, Australia. Pp. 13-17 .

CORAL REEF FISHES OF THE ASEAN REGION

Chou Loke Ming, Maylene Loo
and Jeffrey Low

INTRODUCTION

Being one of the most productive ecosystems in the world, coral reefs support and maintain a high diversity and a large animal biomass. The diversity of reef fish and reef-associated organisms is high with both resident and visiting fish species being valuable to both artisanal and commercial fisheries. Coral reefs can potentially supply 12% of the world's fish catch. In the Philippines, reef fishes make up an estimated 25% of total fish catch, which is also the case in Sabah, East Malaysia. In Terengganu, West Malaysia, the percentage is as much as 30% during certain months.

Fishes form the major protein source in the region, with per capita consumption of fish being over half of all animal protein consumed. Thus, there is a heavy dependence on the seas for this resource. The high annual marine catch reported for the region is mainly from pelagic and demersal fish resources with direct contribution from coral reefs accounting for a smaller percentage of this catch. This however, underestimates the contribution of reefs to marine fisheries, as many fish caught elsewhere depend upon the reef for their existence.

In recent years, growing populations and rapid industrialisation have led to the degradation of coral reefs and other coastal habitats. Coastlines have been reclaimed or developed with the resulting sedimentation smothering once healthy reefs. Reef fisheries are over-exploited to feed growing populations, and are on the verge of, or have already, collapsed. Widespread use of destructive and highly intensive fishing methods such as dynamite and cyanide-poison fishing, muro-ami and small-meshed trawl nets have taken their toll. The reefs have not been allowed to recover from the onslaught of man's depredations.

STATUS OF CORAL REEF FISH IN ASEAN

The survey sites in each participating country were generally widespread except for Indonesia, where data were collected from only the western tip of Java. Due to the varying sizes of the countries, the locations studied in each country may vary in magnitude although some form of standardisation was done in categorising what constitutes a location. For example, Singapore's transects were the most concentrated in space, and were categorised as one location (Table 1).

Table 1. Number of sites and locations of reef fish visual census.

Country	No. of locations	No. of transects
Indonesia	7	214
Malaysia	8	70
Philippines	12	192
Singapore	1	80
Thailand	15	198

Using only the regional data archived at the Regional Database Centre in Bangkok, Thailand, the data were verified and standardised before any analysis was carried out.

A total of 787 species from 64 families were recorded from the five participating ASEAN countries. Philippines had the highest richness, comprising 83% of the total fish species occurring in the region (Table 2). Singapore's reef fish fauna was the poorest with only 111 species in 30 families. Only 34 species from 12 families were common across the region (Table 3).

Table 2. Number of families and species recorded from 5 ASEAN countries.

Country	No. of families	No. of species
Indonesia	34	307
Malaysia	29	173
Philippines	54	652
Singapore	30	111
Thailand	46	286

Table 3. Common reef fish species across the region.

Family	Species
Apogonidae	*Cheilodipterus macrodon*
	Cheilodipterus quinquelineatus
Chaetodontidae	*Chaetodon octofasciatus*
	Chelmon rostratus
	Coradion chrysozynus
Ephippidae	*Platex teira*
Grammistidae	*Diploprion bifasciatum*
Haemulidae	*Plectorhinchus chaetodontoides*
	Plectorhinchus picus
Labridae	*Cheilinus fasciatus*
	Halichoeres scapularis
	Hemigymnus melapterus
	Labroides dimidiatus
	Thalassoma lunare
Mullidae	*Upeneus tragula*
Nemipteridae	*Scolopsis bilineatus*
	Scolopsis ciliatus
	Scolopsis dubiosus
Pomacentridae	*Abudefduf sexfasciatus*
	Amblyglyphidodon curacao
	Amblyglyphidodon leucogaster
	Amphiprion clarkii
	Amphiprion ocellaris
	Dascyllus trimaculatus
	Hemiglyphidodon plagiometopon
	Neoglyphidodon melas
	Neoglyphidodon nigroris
	Pomacentrus moluccensis
Scaridae	*Scarus ghobban*
Serranidae	*Cephalopholis argus*
	Cephalopholis boenack
Siganidae	*Siganus canaliculatus*

Philippines recorded the highest number of unique species (294 species). Thailand and Indonesia had about the same number of unique species (50 and 42 respectively). No unique species were recorded from Malaysia (Table 4). The reefs of the region are dominated by the family Pomacentridae (damselfish), with 30% of the fish species in all countries belonging to this family. They also formed more than half of the 78 most abundant species across the region. Labridae (wrasses) were a distant second, comprising 15% of the reef fish found in ASEAN and 12% of the most abundant species.

Table 4. Number of unique reef fish species in each of the ASEAN countries.

Country	No. of families	No. of species
Indonesia	21	42
Malaysia	0	0
Philippines	42	294
Singapore	10	15
Thailand	24	50

With the expanding populations in the region and the demands for food and other economic benefits, the coral reefs of the region have become subjected to increasing human stress. While the economies are basically agricultural, industry is fast developing along with related pollution problems. The importance of coral reefs lies in their ability to provide consumable protein for man (about 10 to 15% of fish production is coral reef related). The resilience of coral reefs allows them to survive natural causes of destruction. However, man-induced stresses are posing a real danger to these important ecosystem. These stresses include siltation or sedimentation, destructive fishing practices such as blasting, the mining of corals, the collection of corals, fish and reef fauna for other purposes especially aquarium trade, tourism, and other pollution problems.

In the past, coral reef research in ASEAN has been limited by the lack of marine scientists. However, this is changing as more and more institutions within the region are focussing attention on coral reef research as seen in the participation of five of the ASEAN countries in the ASEAN-Australia Marine Science Project: Living Coastal Resources.

As a result of two phases of the project, the ASEAN-Australia database represents the largest baseline data on reef fish in the region. The standardised methodology and data storage procedures made comparison on a regional basis possible. However, several problems such as the taxonomy of the many reef fishes and inaccuracies in the methods still exist.

Even with these limitations, regional analysis showed a remarkable segregation of fish communities in the region, with fish communities of each country distinct from each other. It was also possible to differentiate between the fish communities of the Gulf of Thailand and the Andaman Sea. Monsoonal exposure was postulated as the most likely influential factor in the distribution of fish communities. Other factors include the geographical features (such as embayment), oceanic currents, and the reproductive adaptations of the fish species.

The ASEAN-Australia project has provided significant baseline data of the reef fishes of the region. More extensive surveys, in terms of geographic distribution and intensity (i.e. replicates), can provide better insights into the diversity of the fish communities. When coupled with studies on coastal activities, the fish data can allow development of management strategies to minimise impact on the coral reefs and their fisheries.

SUGGESTED READING

Aliño, P.M. 1994. Patterns in the distribution of reef-associated fish communities in the ASEAN region. In: Wilkinson, C.R., Sudara, S. & Chou, L.M. (eds.) **Proceedings Third ASEAN-Australia Symposium on Living Coastal Resources, Vol. 1, Status Reviews**, Chulalongkorn University, Bangkok, Thailand, May 1994, pp. 11-22.

Carpenter, K.E. 1977. Philippine coral reef fisheries resources. **Phil. J. Fish.** 17: 95-125.

De Silva, M.W.R.N. & Rahman, R.A. 1982. **Management plan for the coral reefs of Pulau Paya/Segantang group of islands.** Fac. Fisheries and Marine Science, Univ. Pertanian Malaysia and World Wildlife Fund, Malaysia.

Mathias, J.A. & Langham, N.P.E. 1978. Coral reefs. In: Chua, T.-E. & Mathias, J.A. (eds.) **Coastal resources of West Sabah.** Penerbit Univ. Sains, Malaysia. pp. 117-151.

Munro, J.L. & Williams, D.McB. 1985. Assessment and management of coral reef fisheries: biological, environmental and socioeconomic aspects. **Proc. 5th Int. Coral Reef Congr. Tahiti** 4: 543-581.

Chou Loke Ming, Maylene Loo and Jeffrey Low are all from the Department of Zoology, National University of Singapore.