

Biodiversity and Habitat Preferences of Living Sharks in the Southeast Asian Region

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Introduction

- Ebert et al. (2013), listed more than 500 valid species of living sharks in the world.
- Weigmann (2016), in his reviewed on biogeographical diversity of Chondrichthyans listed nine orders, 34 families, 105 genera and 509 species of living sharks.
- Within the Southeast Asia region, shark is one of the major contributors to the rich biodiversity in the region.
- According to Compagno (2002), the South China Sea and adjacent areas have a rich shark fauna with at least 136 species.
- Several look-alike species were also recorded during surveys conducted since 1990's such as reported by Ahmad Arshad et al. (2017), Krajangdara (2017), Robert et al. (2015) and others.

According to Compagno (2002), and Last and Compagno (2002) habitat occupied by sharks are categorized into three categories;

A: the marine continental and insular shelves (from fresh water lakes and rivers to 200m depth;

B: the continental and insular slopes below 200 meter and extending to 2000 meter depth; and

C: oceanic realm beyond the continental shelves, and above the slopes and ocean floor.

For this region, many species overlap two or more of these categories and can be placed in:

A: shelf to slope (SHS)

B: slope to oceanic (SOC)

C: shelf to oceanic (SHO)

D: shelf to semi-oceanic (SSO)

E: wide range of habitats (WRH)

F: euryhaline freshwater/shelves (SHF)

G: confined in oceanic (OCE)

H: continental/insular shelves (SHL)

I: continental/insular slopes (SLO) and

J: Confined in fresh water as obligate freshwater (FWO).

Methodology

This paper is based on field and lab work by the authors in the region from 1999 to 2018. It is also based on the accumulated information from published literatures that include journals, books, proceedings, unpublished technical papers and technical reports on research on taxonomy of elasmobranch in all countries. The main sources for this paper are from:

1. Monkolprasit (1984),
2. (Compagno, 2002)
3. Last and Compagno (2002),
4. Vidthayanon, (2002),
5. Yano *et al.* (2005),
6. White *et al.* (2006),
7. Fahmi (2010),
8. Last *et al.* (2010a),
9. Last *et al.* (2010b),
10. Ali *et al.* (2013),
11. Ebert *et al.* (2013),
12. Robert *et al.* (2015),
13. Weigmann (2016),
14. Krajangdara (2017),
15. Fahmi and Ebert (2017).

Result

Order/Family/ Common Name	No of Species	B	C	Indonesia	MY	MN	T	P	V
HEXANCHIFORMES (Cow And Frilled Sharks)	3	0	0	3	3	1	2	3	3
ECHINORHINIFORMES (Bramble Sharks)	2	0	0	0	0	1	1	1	0
SQUALIFORMES (Dogfishes) (Pending confirmation)	44	3	1	24	4	6	4	23	10
		1	1		1	1	2	2	
PRISTIOPHORIFORMES (Saw Shark)	1	0	0	0	0	0	0	1	0
SQUATINIFORMES (Angelsharks)	8	2	0	3	1	1	2	2	2
HETERODONTIFORMES (Bullhead Sharks)	1	1	1	1	1	0	1	1	1
ORECTOLOBIFORMES (Carpet Sharks)	20	8	8	16	9	9	10	8	10
LAMNIFORMES (Mackerel Sharks)	11	1	0	10	2	4	7	8	5
(Pending confirmation)						1		1	2
CARCHARHINIFORMES (Ground Sharks)	107	30	16	57	48	42	49	49	39
(Pending confirmation)				3		1	2	4	2
Total Species	196	45	26	114	68	64	76	96	70
Pending confirmation		1	1	3	1	3	4	7	4

Habitat Preferences for 196 species of sharks in SEA Region

Code	Habitat	No of Species	Percentage (%)
FWO	obligate freshwater	3	1.5
OCE	oceanic	9	4.6
SHF	euryhaline freshwater/shelves	3	1.5
SHL	continental/insular shelves	83	42.3
SHO	shelf to oceanic	16	8.2
SHS	shelf to slope	26	13.3
SLO	continental/insular slopes	48	24.5
SOC	slope to oceanic	1	0.5
SSO	shelf to semi-oceanic	5	2.6
WRH	wide range of habitats	2	1.0
Total		196	100

Discussion

1. The Southeast Asian Region are rich with shark species due to its position which covered many seas such as South China Sea, Gulf of Thailand, Sulu Sea, Philippine Sea, Celebes Sea, Flores Sea, Makassar Strait, Karimata Strait, Java Sea, Malacca Strait, Andaman Sea, Indian Ocean and western part of Pacific Ocean. Its coastal waters also comprise a rich ecosystem characterized by the existence of areas with extensive coral reefs and seasonal up-welling, as well as nutrient from land. These areas are suitable for breeding, pupping, nursing and growing of wide diversity of fish species including sharks.
2. Even though the recent number of sharks species recorded are 196 species, with new species and new record continuously discovered, the number will increase in future. Deep water species are mostly unknown due to limited research activities especially in Malaysia, Cambodia, Myanmar and Vietnam.
3. The dominant species of sharks in most countries are almost similar because most fishers using trawl nets except for Indonesia, the Philippines and Vietnam. Fishers in these countries also caught deep water sharks using longline and deep water gillnets while most fishers in other countries only fishing in the shallow coastal areas using trawl nets.

Conclusion

1. A total of 196 species of sharks from nine orders and 30 families have been recorded inhabiting this region from freshwater to deep ocean.
2. Deep water species are less due to limited research activities especially in Malaysia, Thailand, Cambodia, Myanmar and Vietnam. The number of species will increase in the future if more comprehensive research be conducted in deeper water.
3. Sharks habitats in the Southeast Asian region mostly located within continental/ insular shelves (SHL) and continental/insular slope (SLO) which are now heavily exploited by traditional and modern fishing gears.
4. Exploitation of juvenile sharks is a common phenomenon in all countries in the region especially as by-catch in trawls fishery. Since all countries have tropical multispecies fisheries, it would be impossible to focus on individual resources, or specific mono-species stock of fish. Management of fisheries resources in this region is now implemented as a whole.
5. All countries should take action to incorporate shark management measures within their national fisheries management policy and framework for sustainable utilization of this resource.

Terima Kasih

