

Community Structure Of Reef Fish In Eastern Luwu Water Territory

Henny Tribuana Cinnawara, Achmar Mallawa, Chair Rani, Rijal Idrus

Abstract: One bio-indicators the condition of coral reefs is a presence of reef fish. The purpose of research is to determine species composition, abundance, distribution and structure of reef fish communities in these waters. Data collection was conducted in April at six locations in the north and the south eastern Luwu. Mechanical Underwater Visual Census (UVC) and transect method (Line intercept Transec, LIT) with SCUBA equipment used for research data collection. Total reef fish species collected as many as 366 species belonging to 31 families, consisting of 150 species of fish target (fish consumption), 10 species of indicator fish (indicator species), 206 types of major fish. The most dominant indicator type of fish is *Chaetodon octofasciatus*, while the major dominant family Pomacentridae, Labridae, and Apogonidae. Diversity index values ranged from 2.145 to 3.408. Dominance index (C) is in the range of 0.056 to 0.298. The result is expected to be a reference literature as basic data for the management of reef fish, especially in the waters of eastern Luwu.

Index Terms: reef fish, community structure, water territory, indicator fish

1 INTRODUCTION

Eastern Luwu water territory was located in the curve of the Bone Bay in South Sulawesi. As common of the sea in Indonesia, Eastern Luwu water territory also need to be taken the existence of marine life, one of which is the structure of reef fish communities. The existence and sustainability of coral fish in Eastern Luwu, its need to be maintained for the present and future generations. One function of coral reef communities playing an important role in the flow of energy and maintain the stability of ecosystems is coral reef fish (Rani *et al.*, 2010)[9]. Furthermore, its a indicator that the conditions and variations of coral reefs habitat as a determinant of the distribution of reef fish. The fish that inhabit coral reefs are one of the aquatic biological resources very important for human and ecosystem sustainability of coral reefs itself. The purpose of study was determined the structure of reef fish communities in the water territory of Eastern Luwu. The absence of data on the structure of reef fish communities in Eastern Luwu water territory can be one idea to manage and the most appropriate to do in order to keep the existence and sustainability of reef fisheries, especially in Eastern Luwu region.

2. RESEARCH METHODS

Reef fish research method was used is an underwater visual census (Underwater Visual Census, UVC) to follow English *et al.*, (1994)[5] methods with few modifications. We were used SCUBA diving equipment, stationery underwater, roll meter, 50 meters transects were made parallel to the coastline, with a distance of observation as far as five meters left and right of the transect line. It has three replicate for each location. Transect lines were placed at a depth of 3 and 10 meters. The fish were encountered and enumerated types observed along the transect line. To complete the data, also observed by taking under water photos. Re-identification of fish also conducted follow methods development by Carpenter (1987) [4], Masuda *et al.* (1984)[7], Allen (1991)[3] and Allen *et al.*, (2005)[2]. Shannon-Wiener diversity index (H) and Dominance Index (C) is carried out following the method by Pielou (1975)[11] with few modifications. Research of reef fish in Eastern Luwu water territory and its surrounding was done at six sampling sites.

RESULT AND DISCUSSION

1. The Fish Types in Eastern Luwu Water Territory

During the research has been collected about 366 fish species representing 31 families. Reef fish can be grouped into three major groups namely; the target fish, indicators fish and major fish groups. For the target fish found as many as 150 of 16 families (41%). The indicator fish, we found 10 species from one family (3%). For major fish found 206 from 14 families (56%). Distribution of the number of species in each study site are presented in Table 2 and Figure 1.

Table 2. The Number of Indicator Fish, Target Fish, and Major Groups in Each Study Site in Eastern Luwu Water Territory.

STATIONS	LOCATION	Indicator	Major	Target	Total of Species
Station 1	Pasibone	3	24	20	47
Station 2	Pasibab-bab	1	38	38	75
Station 3	Pasimaeja-eja	1	39	28	68
Station 1a	Mangkase point	1	20	18	39
Station 2a	T. Waru-waru	2	37	23	62
Station 3a	Bulu Poloe	2	48	25	75
		10	206	150	366

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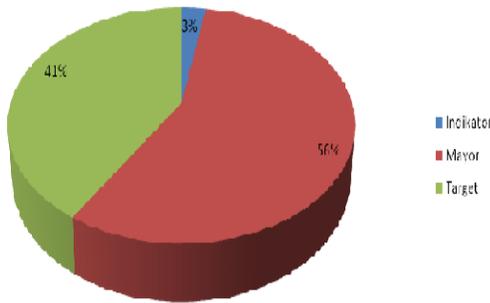


Figure 1. Composition Based on the Abundance of Reef Fish Species in Eastern Luwu Water Territory.

Target Fish

Based on the result of research, the group encountered the target fish consists of family Acanthuridae (3 types), Caesionidae (3 types), Carangidae (5 types), Centropomidae (1 types), Ephippidae (1 type), Haemulidae (1 type), Labridae (2 types), Lethrinidae (2 types), Lutjanidae (9 types), Mullidae (4 types), Nemipteridae (4 types), Scaridae (8 types), and Siganidae (6 types) (Table 4 and 5). Based on species composition and diversity of fish consumption, the results was higher when compared with the results of Adrim *et al.*, (2012)[1] in the Kendari water territory many as 31 species. This is lower when compared with the results of Makatipu *et al.*, (2010) who reported a total of 199 species of target fish. From these results suggested that reef fishing activities in the waters of Eastern Luwu relatively quite intensive and its the potential to be managed in a sustainable.

Table 4. Types of Indicator Fish and Its Abundance (individuals / 1500m²) (family)

No.	Family and Species	Station/Depth									
		1	2	3	4	5	6	1	2	3	4
		3	3	10	3	10	3	3	10	3	10
	Chaetodontidae										
1	<i>Chaetodon adiergastos</i>	2									
2	<i>Chaetodon kleinii</i>							2		2	
3	<i>Chaetodon octofasciatus</i>	7	7	3	4		4	4	9	5	2
4	<i>Chaetodon vagabundus</i>	2									
	Total of Individu	11	7	3	4		4	4	11	5	4
	Total of Species	3	1	1	1	0	1	1	2	5	2

Table 5. The Number of Species in Every Station from Group Major of Reef Fish in Eastern Luwu.

No.	FAMILY	Station/Depth																	
		Station 1			Station 2			Station 3			Station 4			Station 5			Station 6		
1	Apogonidae	3	3	10	3	10	3	3	10	3	10	3	10	3	10	3	10		
2	Balistridae		17	10	101	10		77		4	300	139							
3	Blenniidae	1	2	1	1			1		2	1	2	7						
4	Chaetodontidae	5	6	3			4	2		4		2							
5	Diodontidae																		
6	Gobiidae									1	1								
7	Holocentridae	3						1		4	5	1							
8	Labridae	39	33	33	31	43	11	20	18	55	11								
9	Lethrinidae							1											
10	Pomacentridae																		
11	Pomacentridae	1																	
12	Pomacentridae									3									
13	Pomacentridae	354	200	184	99	173	166	93	82	190	89								
14	Serranidae									1									
15	Tetraodontidae		1				2			2									
16	Zanclus																		
17	Zanclus	2				18	2		2	2	2								

Ta Fish Community Structure Diversity Index

The analysis of the diversity index at each station in Eastern Luwu water territory was showed that diversity results minor to moderate, with a station 5 at a depth of 10 meters (2.145) were low, and 3.408 at station at a depth of three (3) meters of the highest (Table 6)

Table 6. Shannon-Wiener diversity index (H) and Dominance Index (C) From Reef Fish in Eastern Luwu Water Territory.

NO	STATION	DEPTH	H'	C	H'	C
1	Station 1	3	2,416	0,173	Fair	Small
		3	2,910	0,137	Fair	Small
2	Station 2	10	3,237	0,079	Fair	Small
		3	3,408	0,056	High	Small
3	Station 3	10	2,925	0,123	Fair	Small
		3	2,904	0,119	Fair	Small
4	Station 1A	3	3,010	0,077	Fair	Small
		10	2,145	0,298	Low	Small
5	Station 2A	3	2,280	0,250	Low	Small
		10	2,357	0,197	Fair	Small
6	Station 3A	3				
		10				

Dominance Index

The index value indicates the dominance of the overall station dominance results (Table 6), the smallest of which 0.056 are at station 3 at a depth of 3 meters. The dominance of the largest index is 0.298 in the station 2A (Double A) at a depth of 10 meters.

C CONCLUSION

There are 366 species of reef fish from 31 families. Diversity of reef fish in Eastern Luwu water territory in the range of small to medium. This indicates the level of utilization of reef fish in Eastern Luwu quite high and dominance of reef fish in Eastern Luwu small. This mean no dominance of certain fish species at all observation sites in Eastern Luwu water territory.

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