

Figure 1. Sampling stations conducted in the coastal area (red circles) of Naikawaqa village (red star), Fiji Island. Green indicates natural mangrove forests and cyan means coral reef. Gray shows that sea floor is mud.

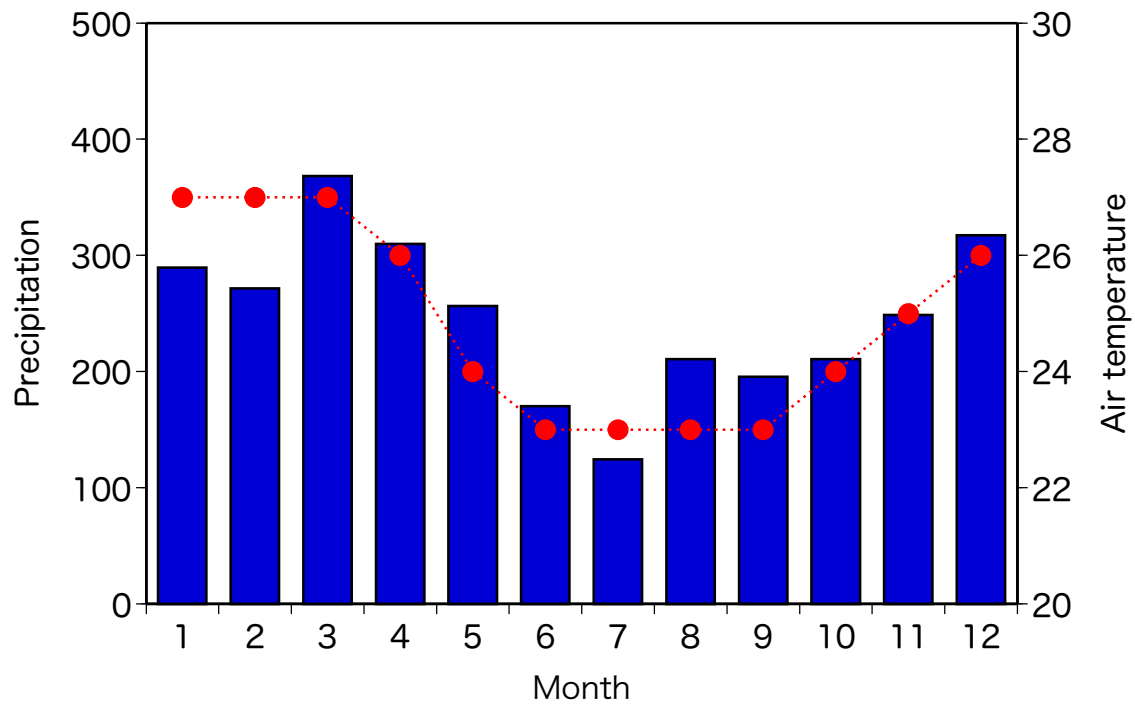


Figure 2. Monthly precipitation (mm' bars) and air temperature (°C: circles) at Suva, Fiji. Data from <http://www.weather.com>.

Table 1. A summary list of conversion factors or formulae from cell number or volume to carbon mass for micro- and meso-plankton. C: carbon (pgC), V: biovolume ( $\mu\text{m}^3 \text{ cell}^{-1}$ ), LV: lorica volume ( $\mu\text{m}^3 \text{ cell}^{-1}$ ).

Taxon	Conversion formulae	Source
Micro-plankton		
Centric or Pannae diatom	$\text{Log}_{10}\text{C} = 0.758*\text{Log}_{10}\text{V}-0.422$	Strathmann (1967)
Pannae diatom	$\text{Log}_{10}\text{C} = 0.758*\text{Log}_{10}\text{V}-0.422$	Strathmann (1967)
Dinoflagellate	$\text{C} = 0.760*\text{V}^{0.819}$	Menden-Deuer and Lessard (2000)
Ciliate	$\text{C} = 0.19*\text{V}$	Ota and Taniguchi (2003)
Meso-plankton		
Copepod and other mesozooplankton	$\text{C} = 0.06*\text{V}$	Parsons et al. (1984)
Gelatinous	$\text{C} = 0.003*\text{V}$	Parsons et al. (1984)

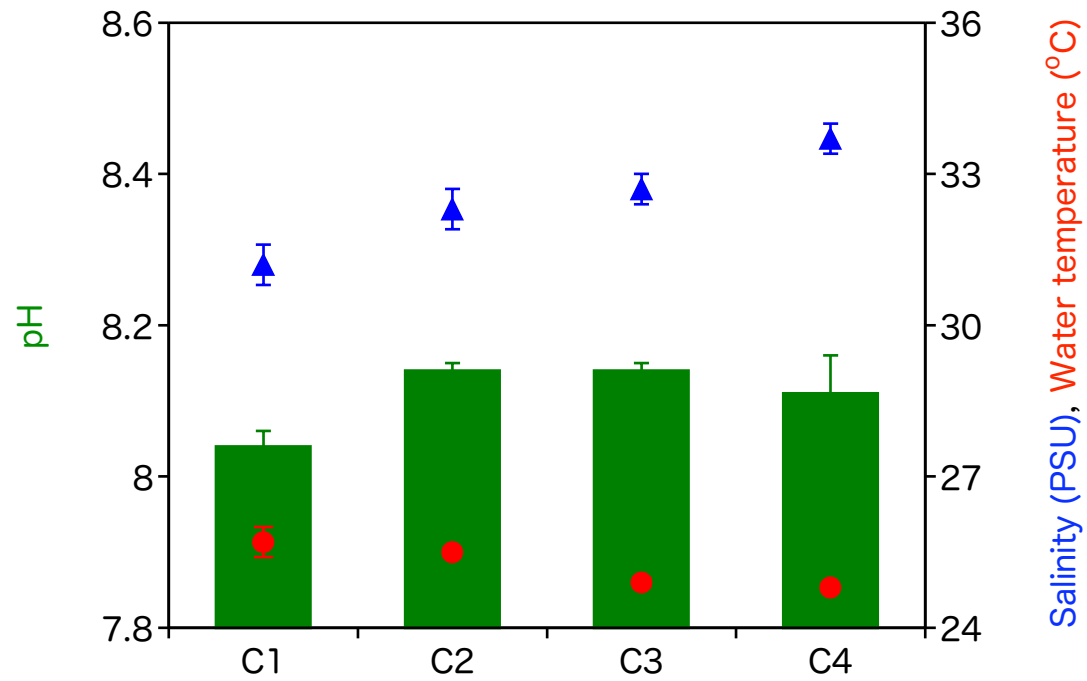


Figure 3. Water temperature (circles: °C), salinity (triangles: PSU) and pH (columns) at the coastal stations around Nikawaqa village. Bars show SD

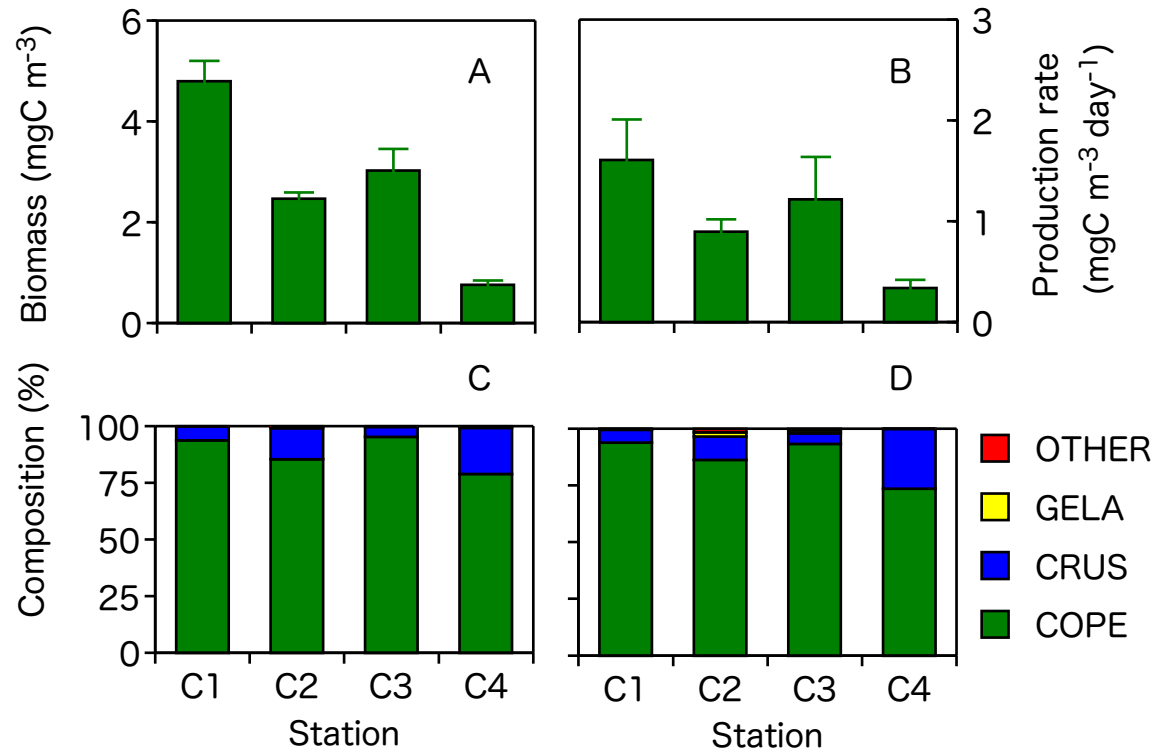


Figure 4. Carbon-based biomass (A), production (B) and its composition (C, D) of zooplankton community around the coastal area of Naikawaga village. Bars show SD. COPE: Copepods, CRUS: Other crustaceans, GELA: Gelatinous zooplankton, OTHER: Other zooplankton.

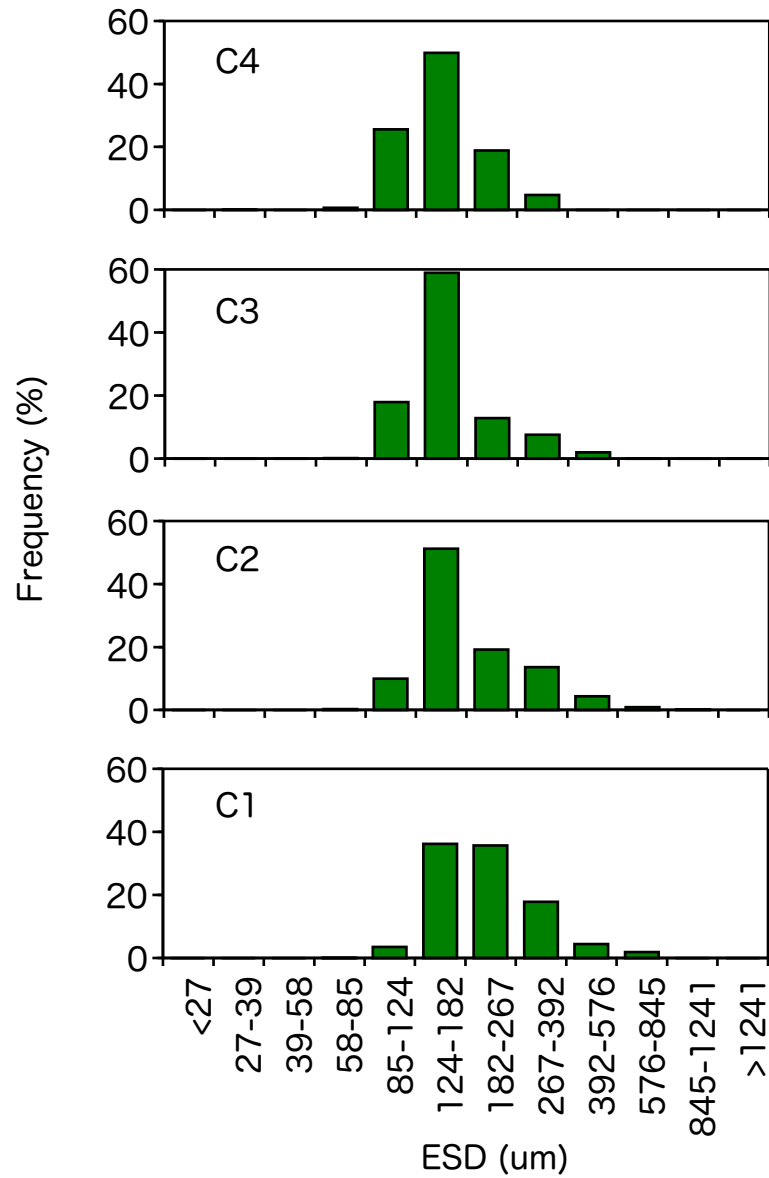


Figure 5. Size distribution (Equivalent Spherical Diameter: um) of zooplankton community around the coastal area of Naikawaga village.

Table 2. List of bivalve and fish species observed around the coastal area of Nikawanqa village. Mean market price is superimposed estimated from Annual Report (Department of Fisheries 2003, 2004). MR: Mouth of River. E: Estuary. CR: Coral Reef. ND: No data.

Species	Fijian name		Distribution			Price Fiji \$	
			MR	E	CR		
<b>Bivalves</b>							
Naticidae	タマガイ科						
<i>Polinices</i>	<i>flemingiana</i>	Drevula	ドレブア	○	○	ND	
Mytilidae	イガイ科						
<i>Modiolus</i>	<i>agripetus</i>	Kuku	クク		○	2.1	
Pinnidae	ハボウキガイ科						
<i>Atrina</i>	sp.	Civi	シビィ		○	ND	
Pteriidae	ウグイスガイ科						
<i>Pinctada</i>	<i>magaritifera</i>	Civa	シバ	○	○	4.3	
<i>P.</i>	<i>martensi</i>	Civaciva	シバシバ	○	○	0.6	
Ostreidae	イタボガキ科						
<i>Crassostrea</i>	<i>mordax</i>	Dio	ディオ		○	ND	
Cardiidae	ザルガイ科						
<i>Anadara</i>	<i>cornea</i>	Kaikoso	カイコソ		○	1.1	
Tridacnidae	シャコガイ科						
<i>Tridacna</i>	sp.	Vasuadina	バスアディナ			○	7.1
Veneridae	マルスダレガイ科						
<i>Gafrarium</i>	<i>pectinatum</i>	Qaqa	ガンガ		○	ND	
<i>G.</i>	<i>tumidum</i>	Qaqa	ガンガ		○	ND	
<i>Periglypta</i>	<i>puerpera</i>	Kaidawa	カイダワ			○	0.8
<b>Fishes</b>							
Muraenidae	ウツボ科						
<i>Muraenidae</i>	sp.	Uvuci	ウブチィ	○		ND	
Synodontidae	エソ科						
<i>Saurida</i>	<i>nebulosa</i>	Utimate	ウティマテ			○	ND
Mugilidae	ボラ科						
<i>Mugil</i>	<i>cephalus</i>	Kanase	カナゼ	○	○	4.3	
Hemiramphidae	サヨリ科						
<i>Hemiramphus</i>	<i>far</i>	Busa	ブサ	○		3.6	
Teraponidae	シマイサキ科						
<i>Terapon</i>	<i>jarbua</i>	Qitawa	ギタワ	○		3.8	
Apogonidae	テンジクダイ科						
<i>Pristicon</i>	<i>trimaculatus</i>	Tina	ティナ			○	ND
Carangidae	アジ科						
<i>Caranx</i>	<i>sexfasciatus</i>	Saqa	サンガ	○		4.5	
Leiognathidae	ヒイラギ科						
<i>Leiognathidae</i>	sp 1.	Kaikai	カイカイ	○		3.8	
<i>Leiognathidae</i>	sp 2.	Korokoro	コロコロ	○		ND	
<i>Leiognathidae</i>	sp 3.	Cebe	ゼンベ	○		ND	
Lutjanidae	フエダイ科						
<i>Lutjanus</i>	<i>gibbus</i>	Bati	バティ			○	4.0
<i>L.</i>	<i>fulviflamma</i>	Kake	カケ	○		○	4.3
<i>L.</i>	<i>fulvus</i>	Kakebota	カケボタ			○	ND
<i>L.</i>	<i>synagris</i>	Dadreu	ダドレウ			○	ND
<i>L.</i>	sp.	Kake	カケ			○	4.3
Lethrinidae	フエフキダイ科						
<i>Lethrinus</i>	<i>harak</i>	Kabatia	カンバチア			○	4.3
<i>L.</i>	<i>kattopterus</i>	Sabutu	サンプトゥ			○	5.7
<i>L.</i>	<i>nebulosus</i>	Kawago	カワゴ			○	6.0
<i>L.</i>	<i>obsoletus</i>	Kabatia	カンバチア			○	4.3
Nemipteridae	イトヨリダイ科						
<i>Scolopsis</i>	<i>temporalis</i>	Senibua	セニブア			○	ND
Gerreidae	クロサギ科						
<i>Gerres</i>	sp.	Matumatu	マトゥマトゥ	○		ND	
Mullidae	ヒメジ科						
<i>Upeneus</i>	<i>vittatus</i>	Ki	キィ	○		3.7	
Monodactylidae	ヒメツバメウオ科						
<i>Monodactylus</i>	<i>argenteus</i>	Jivijivi	チビチビ	○		ND	
Labridae	ベラ科						
<i>Cheilinus</i>	<i>chlorourus</i>	Draunikura	ドラニクラ			○	ND
<i>Cheilio</i>	<i>inermis</i>	Ogo	オゴ			○	4.1
Scaridae	ブダイ科						
<i>Scarus</i>	<i>rivulatus</i>	Karakarawa	カラカラワ			○	ND
<i>S.</i>	<i>ghobban</i>	Bobo	ボボ			○	ND
Siganidae	アイゴ科						
<i>Siganus</i>	<i>doliatus</i>	Nuka	ヌカ			○	5.0
<i>S.</i>	<i>punctatus</i>	Nuka	ヌカ			○	5.0
Sphyraenidae	カマス科						
<i>Sphyraena</i>	sp.	Ogo	オゴ	○		4.1	
Trichiuridae	タチウオ科						
<i>Trichiurus</i>	<i>japonica</i>	Beleti	ベレチィ	○		ND	
Balistidae	モンガラカワハギ科						
<i>Balistoides</i>	<i>viridescens</i>	Cumu	ズム			○	ND
Tetraodontidae	フグ科						
<i>Arothron</i>	<i>manillensis</i>	Cumucumu	スムスム			○	ND

Table 3. Fisheries fishes and bivalves in coastal area of Fiji island and Naikawaqa villege. Number in parenthes is percentage for fisheries species in Naikawaqa to those in Fiji island..

Coastal area	Fisheries resources			
	Fish		Bivalves	
Fiji island	105		27	
Naikawaqa				
Estuary	15	(14)	9	(33)
Coral reef	20	(19)	2	(7)
All area	33	(31)	11	(41)



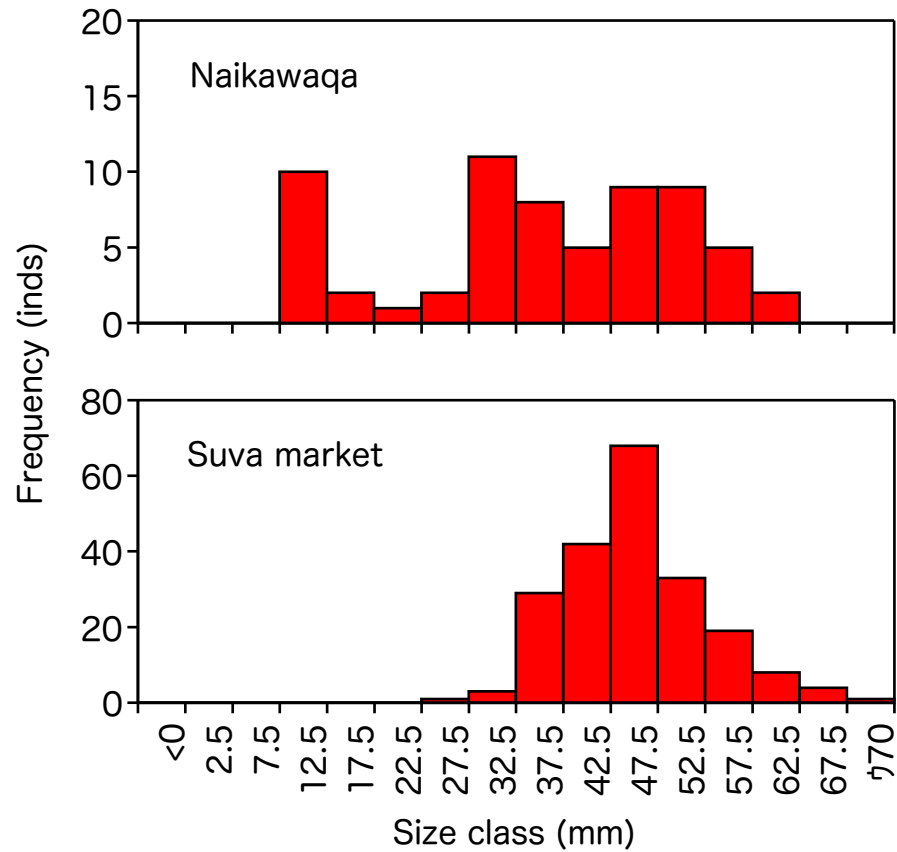
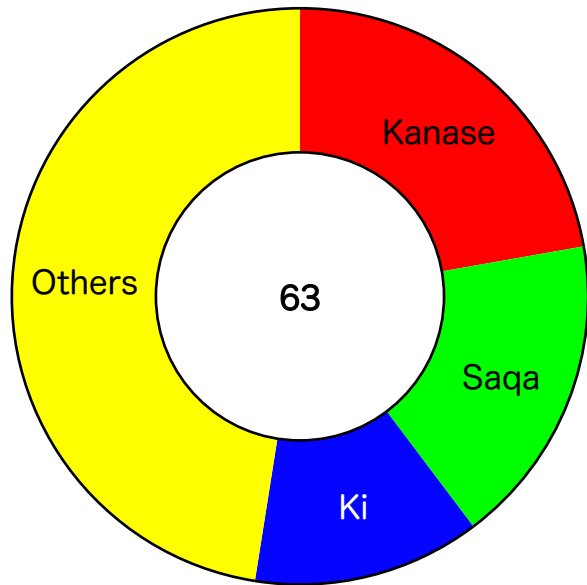
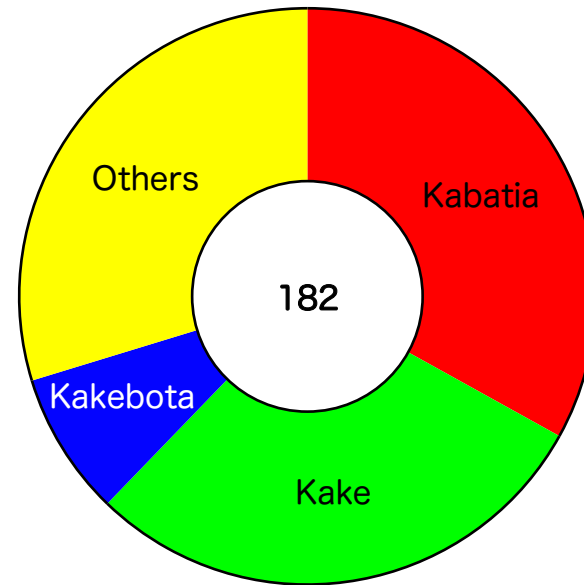


Figure 6. Size frequency of shell length (SL: mm) for ark shell *Anadara cornea* in coastal areas of Naikawaqa village and at Suva market during summer of 2006.



Estuary



Coral reef

Figure 7. Fish composition (%) captured at estuary (C1 and C2) and coral reef (C3 and C4) around the coastal area of Naikawaga village. Number in circle show total fishes captured.

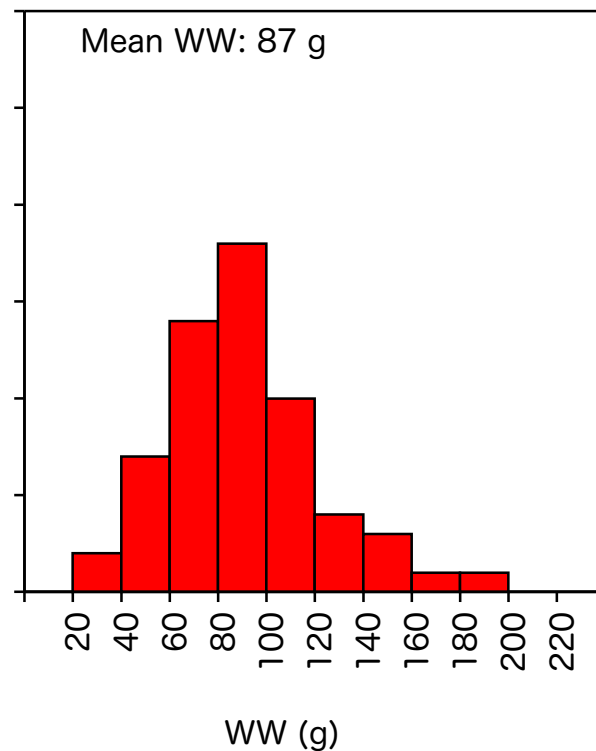
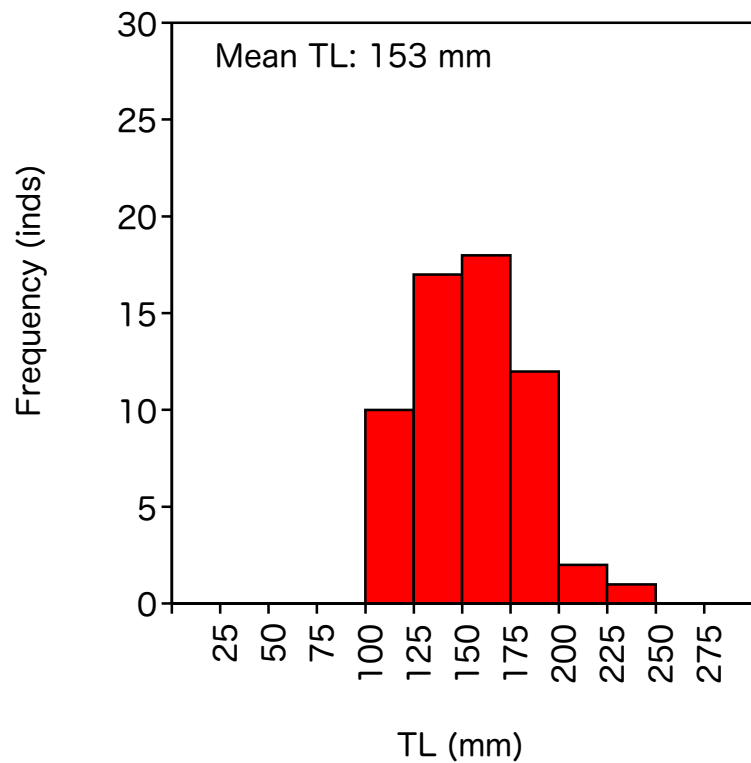


Figure 8. Size frequency of total length (TL: mm) and wet body weight (WW: g) for fishes captured by line fishing at coral reef of Naikawaqa village.

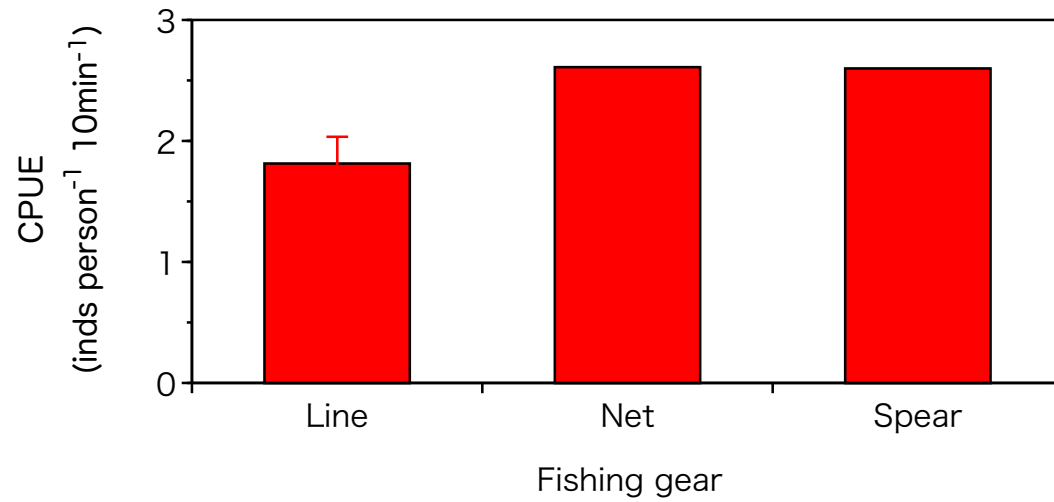


Figure 9. Catch per unit effort (CPUE) for line, net and spear in coastal areas of Naikawaqa village during summer of 2006. Bar shows SD.

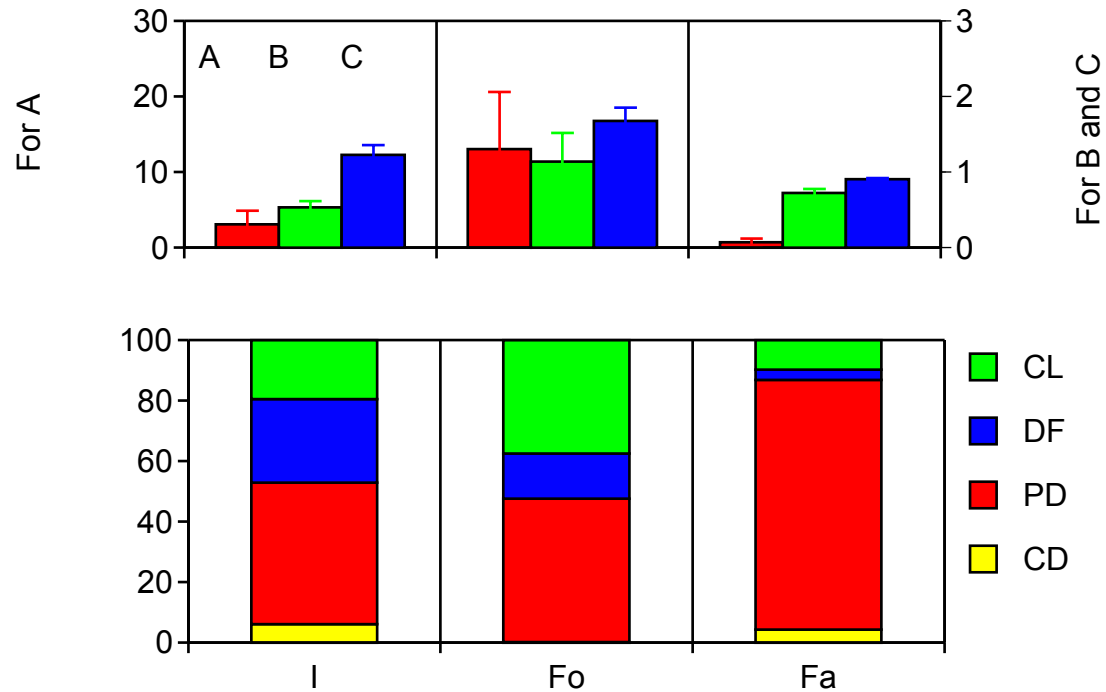


Figure 10. Microplankton biomass (A:  $\mu\text{gC/L}$ ), chlorophyll a concentration (B:  $\mu\text{g/L}$ ) and dry mass of suspended particles (C:  $\text{mg/L}$ ) and taxonomic composition of microplankton (lower) at initial (I) and final conditions (Fo: without clams, Fa: within clams). CD: Centric diatom. PD: Pannate diatom. NMF: Naked microflagellate. TMF: Thecate microflagellate. CL: Cilliate.

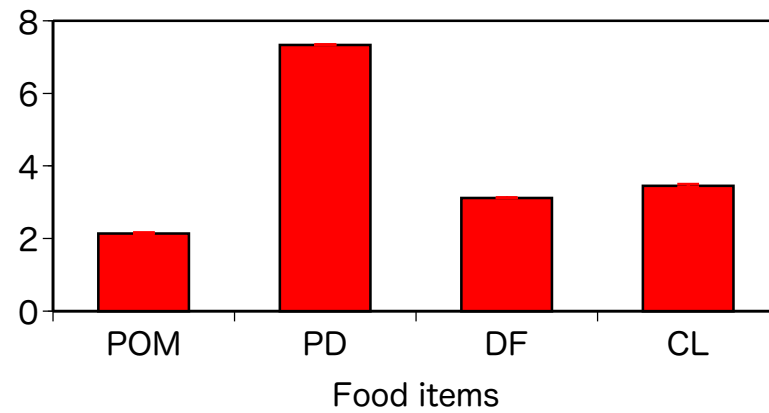


Figure 11. Ingestion rate ( $\text{mgDW}$  or  $\mu\text{gC animal}^{-1} \text{ day}^{-1}$ ) on each food item. POM: Dry weight of particulate organic matters. PD: Pannate diatom. DF: Dinoflagellate. CL: Cilliate.

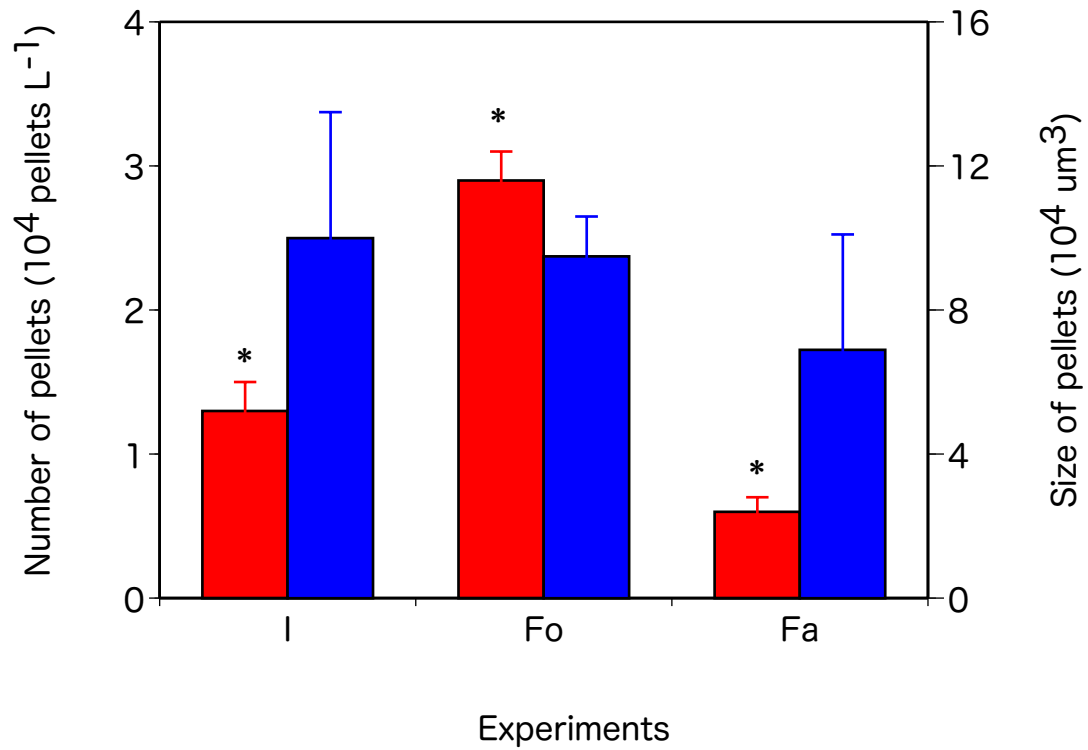


Figure 12. Density (Red: 10<sup>4</sup> L<sup>-1</sup>) and size (Blue: 10<sup>4</sup> um<sup>-3</sup>) of pellet-like particles at initial (I) and final point of experiment on feeding for clams (Fo: without clams, Fa: within clams). Bars show SD. \*: Significant difference to others at  $p < 0.05$ .

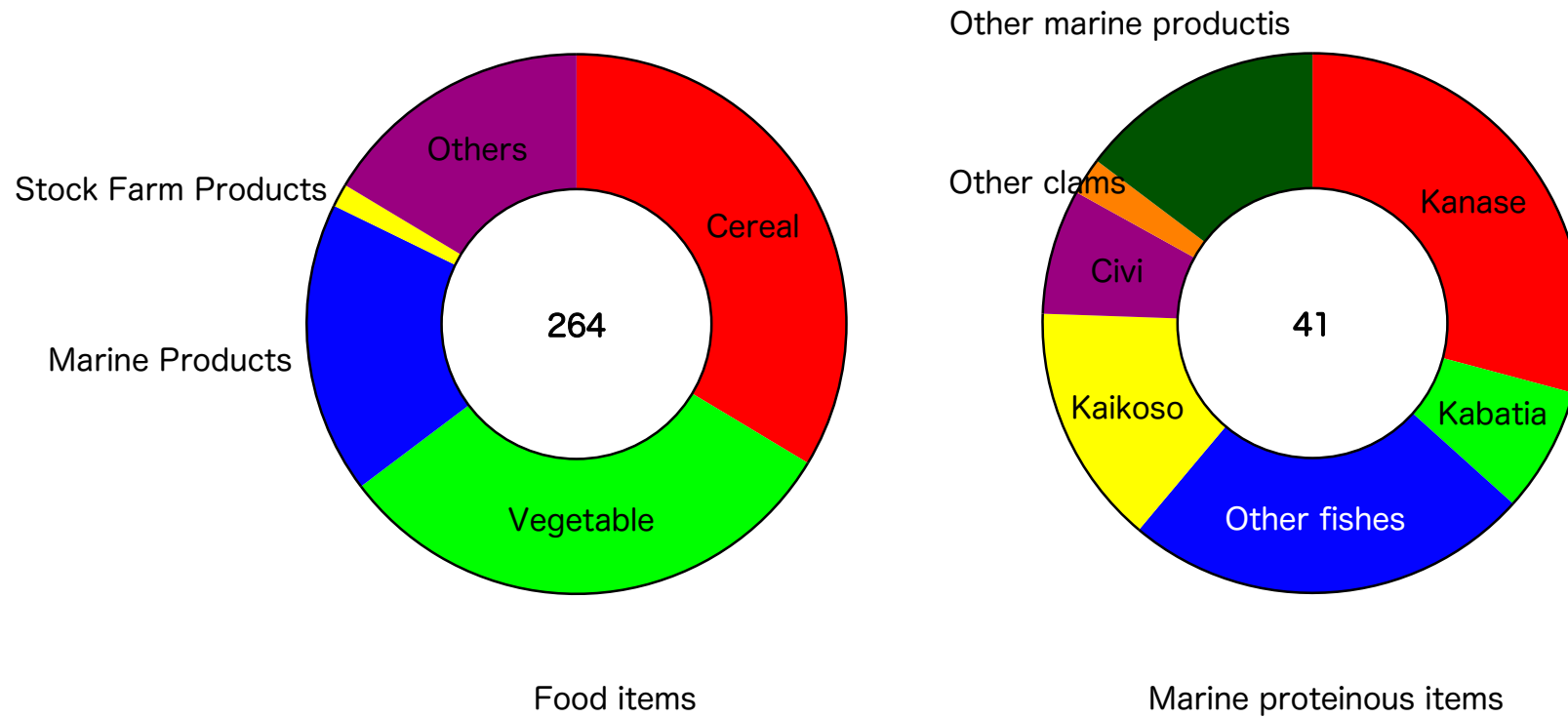


Figure 13. Composition of food items (Left: %) and marine proteinous items (Right: %) at all dishes in Naikawaga village. Number in circle show appearance of each item.