

## Seasonal Abundance of Prawn Species from Taunggoke Market, Taunggoke Township, Rakhine State

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### Abstract

Study period from June 2020 to May 2021. A total of eight prawn species belonging to two genera of two families were recorded from Taunggoke Myoma Sipintharyar market of Taunggoke township, Rakhine State. Monthly and seasonal abundance of prawns were studied. The prawn species were caught throughout the year round in the study period. Total catch quantity was 2,698.9 kg. In this quantity, *Panaeus semisulcatus* was the most abundant followed by *Panaeus merguensis*, *Panaeus monodon*, *Panaeus vannamei*, *Panaeus indicus*, *Macrobrachium rosenbergii* and *Panaeus esculentus* while the least abundant was *Macrobrachium malcolmsonii*. Total catch number of prawns was 70,991. In this number, *Panaeus vannamei* was the most abundant and *Macrobrachium rosenbergii* was the least. The total catch quantity and catch number of prawns was the highest in October and the lowest in April. Rainy season (June-September) was observed as the most abundance season for eight prawn species followed by cool season (October-January) and hot season (February-May) was the least abundance.

**Keywords:** catch quantity, catch number, seasonal abundance, Rakhine.

### INTRODUCTION

Rakhine State is situated on the western coast in Myanmar. The Maungtaw and Sittway border campus of Rakhine State earned \$13.387 million by exporting 1,136.97 tons of marine products in the 2020-2021 mini-budget period (<https://www.gnlm.com.mm>). Taunggoke township is a coastal township of the Thandwe District in the Rakhine State of Myanmar. In this District, the administrative center and principal town is Taunggoke Township. Taunggoke township has a moderately production of aquatic products ([https://en.m.wikipedia.org/wiki/taungup\\_Township](https://en.m.wikipedia.org/wiki/taungup_Township)).

Economically, fish and prawn species the key to export species in Myanmar for foreign currency. Export quantity increases year after year, to over 30 thousand metric tons that representing 105 million US\$ in 2005-2006; nearly 19 thousand metric tons that representing 89 million US\$ in 2006-2007; approximately 21,061.3 metric tons with the value of 109.744 million US\$ in 2007-2008 (Department of fisheries, 2008). Present research was carried out to seek the seasonal catch number, catch quantity, and abundance of prawn species in Taunggoke market, Taunggoke township.

### OBJECTIVES

The objectives of this study are

- to identify the prawn and shrimp species
- to compare the seasonal abundance of prawn species

### MATERIALS AND METHODS

#### Study site

The present study was carried out in Myoma Sipintharyar market, Taunggoke Township (18°51'40"N and 94°15'30"E) (Fig.1).

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## Study period

Study period lasted from June 2020 to May 2021.

## Methods

Specimens were fortnightly collected from the study site and bought 1kg per species. The study site was fortnightly visited to record the catch species, catch numbers and catch quantity to examine the seasonal abundance of prawn species of study area.

## Identification and classification

The morphological characters of the samples prawn species were recorded and photographed prior to preservation in 5% formalin. The preserved specimens were examined by counting rostral formula, and recording the present and absent of antennal and hepatic spines to identify. Identification of recorded prawn species were followed by Holthuis, 1980, Burukovskii, 1985 and De Bruin, Russel and Bogusch, 1995.

## Data analysis

Monthly changes and seasonal abundance of the population of each species were calculated and compared. The seasons were designated as rainy season (June-September), cool season (October-January) and hot season (February-May).

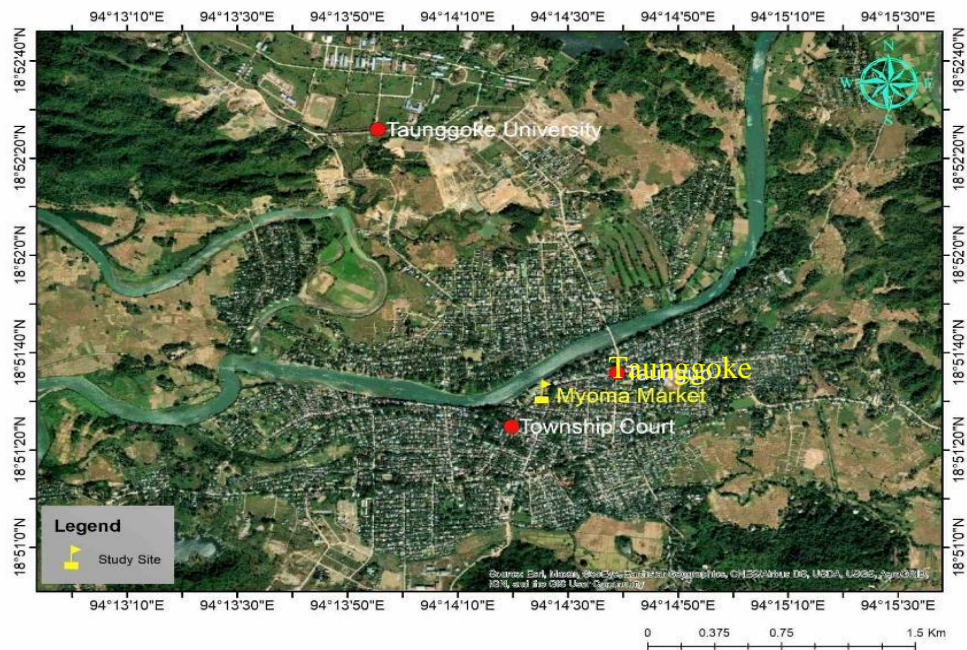


Fig 1. Map of the study area, Taunggoke Myoma Sipintharyar market, Taunggoke township

## RESULTS

A total of eight species belonging to two genera of two families were recorded from the Myoma Sipintharyar market of Taunggoke Township. The recorded prawn species were *Macrobrachium malcolmsonii*, *Macrobrachium rosenbergii*, *Panaeus esculentus*, *Panaeus indicus*, *Panaeus merguensis*, *Panaeus monodon*, *Panaeus semisulcatus* and *Panaeus vannamei*.

### Systematic position of the recorded prawn species

Phylum	- Athropoda
Class	- Malacostraca
Order	- Decapoda
Family	- Palaemonidae
Genus	- <i>Macrobrachium</i> Spence Bate, 1868
Species	- <i>Macrobrachium malcolmsonii</i> (Milne-Edwards, 1884)
Species	- <i>Macrobrachium rosenbergii</i> De Man, 1879
Family	- Panaeidae
Genus	- <i>Panaeus</i> Fabricius 1798
Species	- <i>Panaeus esculentus</i> Haswell, 1879
Species	- <i>Panaeus indicus</i> H. Milne-Edwards, 1837
Species	- <i>Panaeus merguensis</i> De Man, 1888
Species	- <i>Panaeus monodon</i> Fabricius 1798
Species	- <i>Panaeus semisulcatus</i> De Haan, 1844
Species	- <i>Panaeus vannamei</i> Boone, 1931

### Monthly abundance of prawn species in catch quantity (kg) of Myoma Sipintharyar Market

A total catch quantity of (2,698.94 kg) of eight prawn species was recorded from the market throughout the study period of June 2020 to May 2021. The recorded catch quantity of *Panaeus semisulcatus* (474.97 kg) was the most abundant followed by *Panaeus merguensis* (463.29 kg), *Panaeus monodon* (363.62 kg), *Panaeus vannamei* (329.03 kg), *Panaeus indicus* (291.74 kg), *Macrobrachium rosenbergii* (285.62 kg) and *Panaeus esculentus* (262.44 kg) while the least abundant was *Macrobrachium malcolmsonii* (228.23 kg) through the study period.

In the total recorded catch quantity of prawns, October (381.6 kg) was the most abundant and followed by September (364.5 kg), November (345.3 kg), August (330.8 kg), July (236.3 kg), June (184 kg), December and January (172.7 kg each), February (148.2 kg), March (134.6 kg), April (114.4 kg) and the least abundant was recorded in May (113.1 kg). *Macrobrachium malcolmsonii* was the most abundant in October (39.12 kg) and the least abundant in April (6.51 kg). *Macrobrachium rosenbergii* was the most abundant in September and October (48.9 kg each) and the least abundant in May (6.52 kg). *Panaeus esculentus* was the most abundant in September (39.12 kg) and the least abundant in May (9.78 kg). *Panaeus indicus* was the most abundant in October (48.9 kg) and the least abundant in May (9.78 kg). *Panaeus merguensis* was the most abundant in November (60.35 kg) and the least abundant in May (19.56 kg). *Panaeus monodon* was the most the abundant in October (50.14 kg) and the least abundant in May (16.3 kg). *Panaeus semisulcatus* was the most abundant in November (59.15 kg) and the least abundant in April (15.04 kg). *Panaeus vannamei* was the most abundant in October (45.64 kg) and the least abundant in April (16.3 kg) respectively (Table 1 and Fig.2).

### Monthly abundance of prawn species in catch number of Myoma Sipintharyar Market

A total catch number (70,991) of eight prawn species was recorded from the market throughout the study period. The recorded catch number of *Panaeus vannamei* (20,202) was the most abundant followed by *Panaeus indicus* (17,898), *Panaeus merguensis* (7,720), *Panaeus semisulcatus* (7,332), *Panaeus monodon* (5,613), *Macrobrachium malcolmsonii* (4,696) and *Panaeus esculentus* (4,030) while the least abundant was *Macrobrachium rosenbergii* (3,500) through the study period.

In the total recorded catch number of prawns, October (10,330) was the most abundant and followed by September (9,662), November (8,825), August (8,564), July (6,048), June (4,836), December and January (4,451 each), February (3,902), March (3,564), April (3,210) and the least abundant was recorded in May (3,148). *Macrobrachium malcolmsonii* was the most abundant in October (800) and the least abundant in May (133). *Macrobrachium rosenbergii* was the most abundant in September and October (600 each) and the least abundance in May (80). *Panaeus esculentus* was the most abundant in September (600) and the least abundant in May (150). *Panaeus indicus* was the most abundant in October (3,000) and the least abundant in May (600). *Panaeus merguensis* was the most abundant in November (1,006) and the least abundant in May (326). *Panaeus monodon* was the most abundant in October (769) and the least abundant in May (250). *Panaeus semisulcatus* was the most abundant in November (907) and the least abundant in April (230). *Panaeus vannamei* was the most abundant in October (2,800) and the least abundant in April (1,000) respectively (Table 2 and Fig.3).

Table 1. Monthly recorded catch quantity (kg) of prawn species in Myoma Sipintharyar market

Sr. no.	Species	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	April	May	Total
1	<i>M.malcolmsonii</i>	11.42	16.3	32.6	35.86	39.12	32.6	11.42	11.42	11.42	9.78	6.51	9.78	228.23
2	<i>M.rosenbergii</i>	13.04	16.3	39.12	48.9	48.9	42.38	16.3	16.3	14.68	13.4	9.78	6.52	285.62
3	<i>P.esculentus</i>	16.3	19.56	32.6	39.12	32.6	29.34	19.56	19.56	16.3	14.68	13.04	9.78	262.44
4	<i>P.indicus</i>	16.3	22.82	42.38	45.6	48.9	32.6	16.3	16.3	14.68	13.04	13.04	9.78	291.74
5	<i>P.merguensis</i>	32.6	48.9	52.16	48.9	57.38	60.35	32.6	32.6	29.34	26.08	22.82	19.56	463.29
6	<i>P. monodon</i>	19.56	32.6	45.6	48.01	50.14	48.15	22.82	22.82	20.12	19.56	17.94	16.3	363.62
7	<i>P.semisulcatus</i>	48.9	52.16	55.42	57.38	59.01	59.15	32.6	32.6	22.31	20.15	15.04	20.25	474.97
8	<i>P. vannamei</i>	26.08	27.71	30.97	40.75	45.64	40.75	21.19	21.14	19.36	17.95	16.3	21.19	329.03
Total		184.2	236.35	330.85	364.52	381.69	345.32	172.79	172.74	148.21	134.6	114.47	113.16	2698.94

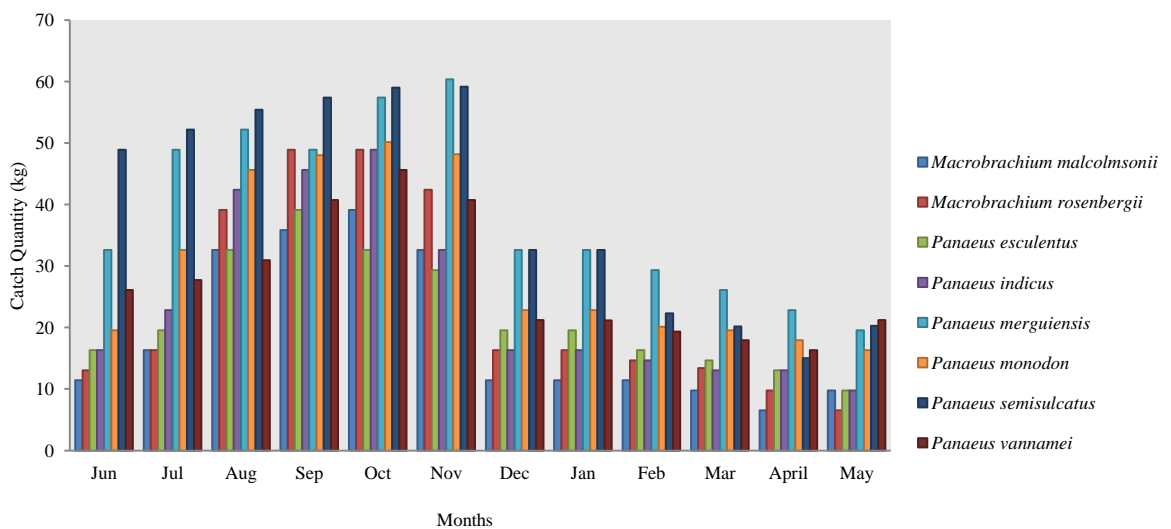


Fig 2. Monthly recorded catch quantity (kg) of prawn species in Myoma Sipintharyar market

Table 2. Monthly recorded catch number of prawn species in Myoma Sipintharyar market

Sr. no.	Species	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	April	May	Total
1	<i>Macrobrachium malcolmsonii</i>	233	333	666	733	800	666	233	233	233	233	200	133	4696
2	<i>Macrobrachium rosenbergii</i>	160	200	480	600	600	520	200	200	180	160	120	80	3500
3	<i>Panaeus esculentus</i>	250	300	500	600	500	450	300	300	250	225	205	150	4030
4	<i>Panaeus indicus</i>	1000	1400	2600	2798	3000	2000	1000	1000	900	800	800	600	17898
5	<i>Panaeus merguensis</i>	543	815	869	815	956	1006	543	543	489	435	380	326	7720
6	<i>Panaeus monodon</i>	300	500	699	736	769	776	350	350	308	300	275	250	5613
7	<i>Panaeus semisulcatus</i>	750	800	850	880	905	907	525	525	342	309	230	309	7332
8	<i>Panaeus vannamei</i>	1600	1700	1900	2500	2800	2500	1300	1300	1200	1102	1000	1300	20202
Total		4836	6048	8564	9662	10330	8825	4451	4451	3902	3564	3210	3148	70991

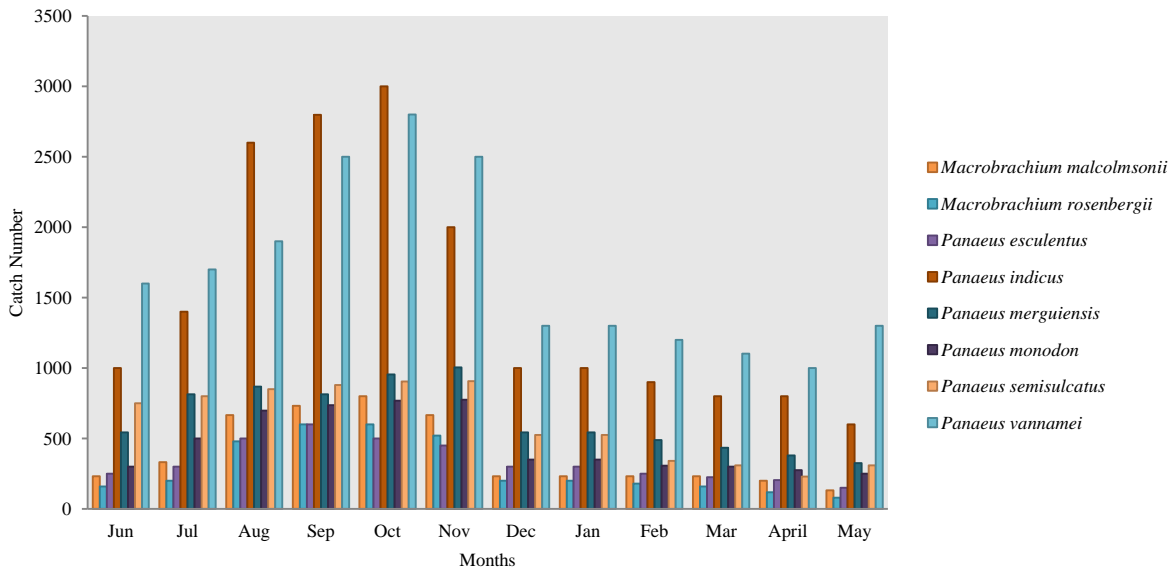


Fig 3. Monthly recorded catch number of prawn species in Myoma Sipintharyar market



A. *Macrobrachium malcolmsonii*



B. *Macrobrachium rosenbergii*



C. *Panaeus esculentus*



D. *Panaeus indicus*

E. *Panaeus merguensis*F. *Panaeus monodon*G. *Panaeus semisulcatus*H. *Panaeus vannamei*

Plate 1. Recorded prawn species from Myoma Sipintharyar Mark

### Seasonal abundance of catch quantity (kg) of prawn species in Myoma Sipintharyar Market

The seasons were designated as rainy season (June-September), cool season (October-January) and hot season (February-May). The total catch quantity of recorded prawns was found in rainy season (1,115.92 kg), followed by cool season (1,072.54 kg) and hot season (510.48 kg). *Macrobrachium malcolmsonii* was the most abundant in rainy season (96.18 kg), followed by cool season (94.56 kg) and the least abundant in hot season (37.49 kg). *Macrobrachium rosenbergii* was the most abundant in cool season (123.88 kg), followed by rainy season (117.36 kg) and the least abundant in hot season (44.38 kg). *Panaeus esculentus* was the most abundant in rainy season (107.58 kg), followed by cool season (101.06 kg) and the least abundant in hot season (53.8 kg). *Panaeus indicus* was the most abundant in rainy season (127.1 kg), followed by cool season (114.1 kg) and the least abundant in hot season (50.54 kg). *Panaeus merguensis* was the most abundant in cool season (182.93 kg), followed by rainy season (182.56 kg) and the least abundant in hot season (97.8 kg). *Panaeus monodon* was the most abundant in rainy season (145.77 kg), followed by cool season (143.93 kg) and the least abundant in hot season (73.92 kg). *Panaeus semisulcatus* was the most abundant in rainy season (213.86 kg), followed by cool season (183.36 kg) and the least abundant in hot season (77.75 kg). *Panaeus vannamei* was the most abundant in rainy season (125.51 kg), followed by cool season (128.72 kg) and the least abundance in hot season (74.8 kg) respectively (Table 3 and Fig.4).

### Seasonal abundance of catch number of prawn species in Myoma Sipintharyar Market

The total catch number of recorded prawns was found in rainy season (29,110), followed by cool season (28,057) and hot season (13,824). *Macrobrachium malcolmsonii* was the most abundant in rainy season (1,965), followed by cool season (1,932) and the least abundant in hot season (799). *Macrobrachium rosenbergii* was the most abundant in cool season (1,520), followed by rainy season (1,440) and the least abundant in hot season (540).

*Panaeus esculentus* was the most abundant in rainy season (1,650), followed by cool season (1,550) and the least abundance in hot season (830). *Panaeus indicus* was the most abundant in rainy season (7,798), followed by cool season (7,000) and the least abundant in hot season (3,100). *Panaeus merguensis* was the most abundant in cool season (3,048), followed by rainy season (3,042) and the least abundance in hot season (1,630). *Panaeus monodon* was the most abundant in cool season (2,245), followed by rainy season (2,235) and the least abundance in hot season (1,133). *Panaeus semisulcatus* was the most abundant in rainy season (3,280), followed by cool season (2,862) and the least abundant in hot season (1,190). *Panaeus vannamei* was the most abundant cool season (7,900), followed by rainy season (7,700) and the least abundance in hot season (4,602) respectively (Table 4 and Fig.5).

Table 3. Seasonal abundance of catch quantity (kg) of prawn species in Myoma Sipinthayar market

Sr. no.	Species	Rainy Season	Cool Season	Hot Season	Total
1	<i>Macrobrachium malcolmsonii</i>	96.18	94.56	37.49	228.23
2	<i>Macrobrachium rosenbergii</i>	117.36	123.88	44.38	285.62
3	<i>Panaeus esculentus</i>	107.58	101.06	53.8	262.44
4	<i>Panaeus indicus</i>	127.1	114.1	50.54	291.74
5	<i>Panaeus merguensis</i>	182.56	182.93	97.8	463.29
6	<i>Panaeus monodon</i>	145.77	143.93	73.92	363.62
7	<i>Panaeus semisulcatus</i>	213.86	183.36	77.75	474.97
8	<i>Panaeus vannamei</i>	125.51	128.72	74.8	329.03
Total		1115.92	1072.54	510.48	2698.94

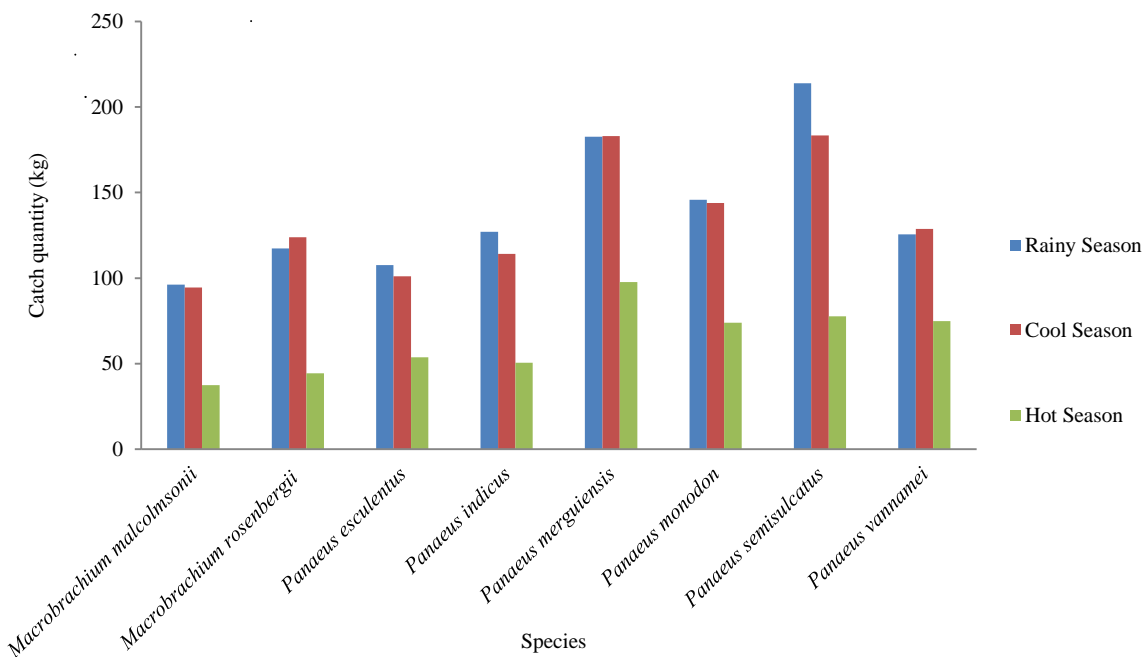


Fig 4. Seasonal abundance of catch quantity (kg) of prawn species in Myoma Sipinthayar Market

Table 4. Seasonal abundance of catch number of prawn species in Myoma Sipinthayar market

Sr. no.	Species	Rainy Season	Cool Season	Hot Season	Total
1	<i>Macrobrachium malcolmsonii</i>	1965	1932	799	4696
2	<i>Macrobrachium rosenbergii</i>	1440	1520	540	3500
3	<i>Panaeus esculentus</i>	1650	1550	830	4030
4	<i>Panaeus indicus</i>	7798	7000	3100	17898
5	<i>Panaeus merguensis</i>	3042	3048	1630	7720
6	<i>Panaeus monodon</i>	2235	2245	1133	5613
7	<i>Panaeus semisulcatus</i>	3280	2862	1190	7332
8	<i>Panaeus vannamei</i>	7700	7900	4602	20202
Total		29110	28057	13824	70991

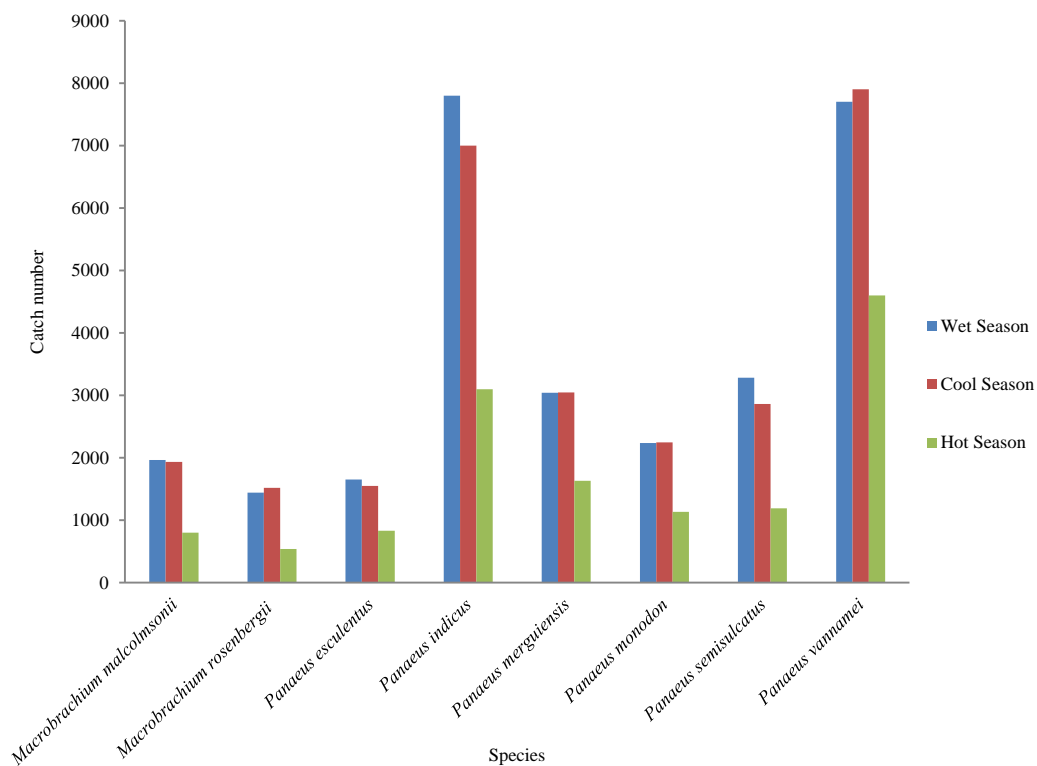


Fig 5. Seasonal abundance of catch number of prawn species in Myoma Sipinthayar market

### DISCUSSION

The present study was conducted in the Myoma Sipintharyar market of Taunggoke Township. A total of eight species belonging to two genera of two families were recorded from the Myoma Sipintharyar market. The recorded prawn species were *Macrobrachium malcolmsonii*, *Macrobrachium rosenbergii*, *Panaeus esculentus*, *Panaeus indicus*, *Panaeus merguensis*, *Panaeus monodon*, *Panaeus semisulcatus* and *Panaeus vannamei*.

Systematic studies of freshwater and marine shrimp and prawn species have been conducted by Khin Nwe Mu (1980) recorded a total of 10 species of fresh water prawns and nine species of brakish water prawns from the mouth of Ngawun river. Ohnmar (2001) studied the occurrence of prawns from Ngawun River in a segment of Pathein. A total of 10 species belonging to three genera of two families and one order were recorded. A total of five species



belonging to two genera under one family and one order were recorded in the present study. Thida Aye (2007) recorded nine species of freshwater prawns belonging to two genera of one family in Ngathaingchaung.

In the total catch quantity of (2,698.94 kg) of eight prawn species, *Panaeus semisulcatus* (474.97 kg) was the most abundant and the least abundant was *Macrobrachium malcolmsonii* (228.23 kg) through the study period. In the total recorded catch quantity of prawns, October was the most abundant (381.6 kg) and May (113.1 kg) was the least abundant. *Macrobrachium malcolmsonii* (39.12 kg) was the most abundant in October and the least abundant in April (6.51 kg). *Macrobrachium rosenbergii* was the most abundant in September and October (48.9 kg each) and the least abundance in May (6.52 kg). *Panaeus esculentus* was the most abundant in September (39.12 kg) and the least abundant in May (9.78 kg). *Panaeus indicus* was the most abundant in October (48.9 kg) and the least abundant in May (9.78 kg). *Panaeus merguensis* was the most abundant in November (60.35 kg) and the least abundant in May (19.56 kg). *Panaeus monodon* was the most abundant in October (50.14 kg) and the least abundant in May (16.3 kg). *Panaeus semisulcatus* was the most abundant in November (59.15 kg) and the least abundant in April (15.04 kg). *Panaeus vannamei* was the most abundant in October (45.64 kg) and the least abundant in April (16.3 kg).

This may be concluded that the total catch quantity of *Panaeus merguensis* (60.35 kg) in November was the most abundant in eight prawn species through the study period. The most abundance months were September, October and November and the least abundance months were April and May.

A total catch number (70,991) of eight prawn species were recorded from the market throughout the study period. The recorded catch number of *Panaeus vannamei* (20,202) was the most abundant and the least abundant was *Macrobrachium rosenbergii* (3,500) through the study period.

In the total recorded catch number of prawns, October was the most abundant (10,330) and the least abundant was recorded in May (3,148). *Macrobrachium malcolmsonii* was the most abundant in October (800) and the least abundant in April (133). *Macrobrachium rosenbergii* was the most abundant in September and October (600 each) and the least abundant in May (80). *Panaeus esculentus* was the most abundant in September (600) and the least abundant in May (150). *Panaeus indicus* was the most abundant in October (3000) and the least abundant in May (600). *Panaeus merguensis* was the most abundant in November (1,006) and the least abundant in May (326). *Panaeus monodon* was the most abundant in October (769) and the least abundant in May (250). *Panaeus semisulcatus* was the most abundant in November (907) and the least abundant in April (230). *Panaeus vannamei* was the most abundant in October (2,800) and the least abundant in April (1,000).

In the monthly abundance, the most abundance months were September, October and November and the least abundance months were April and May. The total catch number of *Panaeus indicus* (3000) in October was the most abundance in eight prawn species through the study period.

Amanat *et al.* (2021), "Centre of Excellent in Marine Biology", University of Karachi, Karachi-75270, Pakistan, recorded twelve species of prawns and noted that the most abundant season was the monsoon.

The total catch quantity of recorded prawns was found in rainy season (1,115.92 kg), followed by cool season (1,072.54 kg) and hot season (510.48 kg). In rainy season, *Panaeus semisulcatus* (213.86 kg) was the most abundance and *Macrobrachium malcolmsonii* (96.18 kg) was the least abundance. In cool season, *Panaeus semisulcatus* (183.36 kg) was the most

abundant and *Macrobrachium malcolmsonii* (94.56 kg) was the least abundant. In hot season, *Panaeus merguensis* was the most abundant (97.8 kg) and *Macrobrachium malcolmsonii* (37.49 kg) was the least abundant.

The total catch number of recorded prawns was found in rainy season (29,110), followed by cool season (28,057) and hot season (13,824). In rainy season, *Panaeus indicus* (7,798) was the most abundant and *Macrobrachium rosenbergii* (1,440) was the least abundant. In cool season, *Panaeus vannamei* (7,900) was the most abundant and *Macrobrachium rosenbergii* (1,520) was the least abundant. In hot season, *Panaeus vannamei* (4,602) was the most abundant and *Macrobrachium rosenbergii* (540) was the least abundant.

According to the seasonal catch quantity and catch number, rainy season is the most abundance season, cool season is moderate and hot season is the least abundance season due to the level of water body.

### CONCLUSION

A total of eight species belonging to two genera and two families were recorded. In the study period, the total catch quantity of *Panaeus semisulcatus* was the most abundant and *Macrobrachium malcolmsonii* was the least abundant among the eight species of prawns. The total catch number of *Panaeus vannamei* was the most abundant and *Macrobrachium rosenbergii* was the least abundant among the eight species of prawns. In the monthly abundance of catch quantity and catch number, the most abundant months were September, October and November and the least abundance months were April and May. In the seasonal catch quantity and catch number, rainy season was the most abundance season, cool season is moderate and hot season is the least abundance season in the study sites.

### Acknowledgements

I would like to acknowledge to Dr Theingi Shwe, Rector, Hinthada University, Dr Yee Yee Than, Pro-rector, Hinthada University, Dr Cho Kyi Than, Pro-rector, Hinthada University for their permission to submit this research. I would like to express my profound gratitude to Dr Aye Aye Than, Professor (Head), Zoology Department, Hinthada University for her encouragement to submit this research. My profound gratitude goes to Dr Moe Moe Kyaw, Professor, for her kindly support to conduct this research. Special thanks go to Dr Htun Htun Min, Assistant lecturer, Geology Department, Hinthada University, for providing facilities to use the map of the study area.

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