

Occurrence and Relative Abundance of Some Cephalopad Species from Nyaung Tan Jetty, Yangon Region

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Abstract

The present study was conducted from Fish Depot of Nyaung Tan Jetty, Pazundaung Township in Yangon Region. Investigation of recorded cephalopod species was collected twice a month throughout the study period. The study period lasted from June 2017 to February 2018. A total of 16 species belonging to seven genera, four families and three orders was observed in the present study. In the three orders, four families such as Sepiidae (43.75%), Loliginidae (31.25%), Octopodidae (18.75%) and Sepiolidae (6.25%) were recorded. In the present study, seven species of cuttle fishes, six species of squid and three species of octopuses were recorded, commercially as sea food for human consumption.

Keywords:

Introduction

Cephalopods literally means “heat foot” in Greek, the cephalopod’s head connects to its many arms. The basic cephalopod body plan includes two eyes, a mantle, a funnel and at least eight arms. The cephalopods are the most highly evolved and structurally different groups of mollusks. Cephalopods occur in all marine habits of the world Benthic forms were found coral reefs, grass flats, sand, mud and rocks.

About 109 species under 31 families of cephalopods are occurring in the Western Atlantic Ocean and adjacent areas. Cephalopods are purely marine in habit and there are about 800 living species. Some cephalopods have hard, internal structures, like the cuttle bone in the cuttlefish and the pen in the squid but in many octopuses, the head structure is completely lost. Only the chambered nautilus have an external shell. Fishermen sometimes call them ink fish, referring to their common ability to squirt ink (Jereb *et al*; 2010).

The cuttlefishes come under the orders Sepiida and are characterized by the presence of a shell, 10 circum oral appendages and the tentacles are retractile into pockets. Suckers have chitinous rings along their tentacles. The cuttlebone of cuttlefishes is unique and one of the features that distinguish them from their squid relatives. Cuttlefishes are caught for food in the Mediterranean, East Asia, and elsewhere. In East Asia, dried shredded cuttlefish is a popular snack food (Nateewathana, 2008).

The squids come under the order Teuthida. They have elongated tubular bodies and short compact heads. Two of the ten arms have developed into long slender tentacles and suckers with toothed horny rings. The shells are internal and are known as gladius or pen. Squid may be swift swimmers or parts of the drifting sea life (Roeleveld, 2002).

Octopuses are members of the order Octopoda. They have rounded bodies, bulging eyes and eight long arms. Tentacles are absent. Shell is reduced, vestigial, castilaginous or absent. Suckers are without chitinous rings and are set directly on the arms without stalks (Norman *et al.*, 1997).

Cephalopods are extremely important as food for human consumption and over 3 million metric tons are caught each year.

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Cephalopods have considerable economic importance to humans. Many species of squid and octopus are eaten. Nautilus shells are often used decoratively, and the internal shell of a cuttlefish or cuttlebone is sold in the pet trade as a calcium source for birds. Giant cephalopods such as squids and octopuses are also a great source of sea-monsters folklore (Siriraksophon *et al.*, 2001).

Taking this into consideration, the research work is conducted on the various kinds of some cephalopods collected from the Nyaung Tan Jetty, Pazuntang Township, Yangon Region.

The objectives of the present study are;

- to collect the various kinds of some cephalopod species
- to identify the morphological characters of cephalopod species
- to examine the monthly occurrence and relative abundance of cephalopod species in the study area

Materials and Methods

Study period

The study period lasted from June 2017 to February 2018.

Study site

The specimens were collected from Fish Depot of Nyaung Tang Jetty (96° 10' 35.13" E and 16° 46' 45.05" N) located in Pazundaung Township, Yangon Region.

Method

Specimen collection was made twice a month in the study area. Collected specimen were placed in the bucket covered with ice. They were transported from coasters to Fish Depot of Nyaung Tan Jetty, Yangon and preserved in Deep freezers. Some of the specimens are preserved in 10% formalin for identification. The morphology of the organs and systems were studied better in fresh specimens than the preserved ones. Under each specimen, the name of the species, and date of collection was also labeled for future reference. These fresh specimen were then taken by photographs and examined by using a compound microscope, hand lens, petridishes and other materials.

Identification of specimens

The identification of collected specimens was done according to Voss *et al.*, (1971), Norman (1997), Carpenter (2002) and Natewathana (2008).

Assigning status

$$\text{Relative abundance} = \frac{\text{No. of individual of a speciese}}{\text{Total no. of individual of all species}}$$

The status of cephalopod species was assigned based on the relative abundance as follows:

unCommon (uC) = having relative abundance less than 0.01

Common (C) = having relative abundance greater than 0.01 and less than 0.05

veryCommon (vC) = having relative abundance 0.05 and above

(Bisht *et al.*, 2004)



Figure (1) Map of study site (Source: Google Earth).



Figure (2) Nyaung Tan Jetty

Results

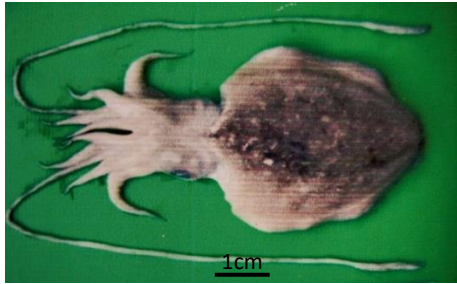
A total of 16 cephalopod species under seven genera, four families and three orders was recorded. They were collected and identified during the course of study from Fish Depot of Nyaung Tan Jetty, Pazundaung Township, Yangon Region.

They includes seven species from family Sepiidae (cuttle fishes), one species from family Sepiolidae (bobtail squid), five species from Loliginidae (squid) and three species from family Octopodidae (Octopus).

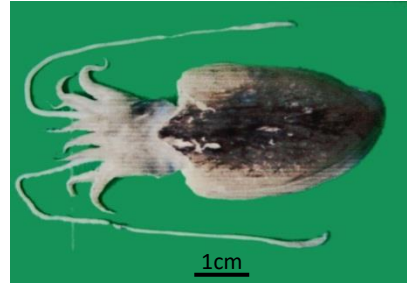
The highest number of species was found in December and the lowest number of species in June. The maximum numbers of individual in species *Loligo duvaucelii* and

L. singhalensis were recorded. The minimum numbers of individuals was observed in species *Sepia pharaonsis* and *S. vossi*.

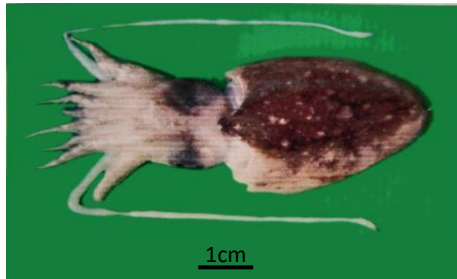
The percent composition of cephalopod species was found in family Sepiidae (43.75%) followed by Loliginidae (31.25%), Octopodidae (18.75%) and Sepiolidae (6.25%).



Sepia aculeata



Sepia esculenta



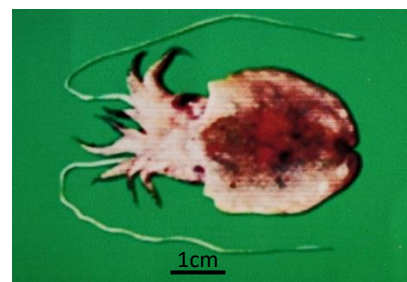
Sepia prashadi



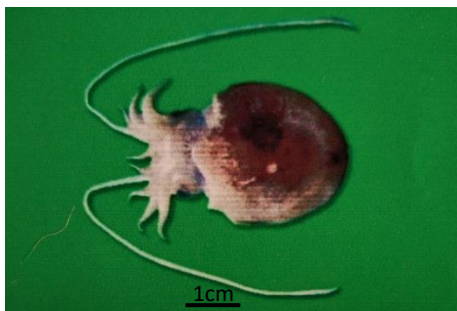
Sepia pharaonsis



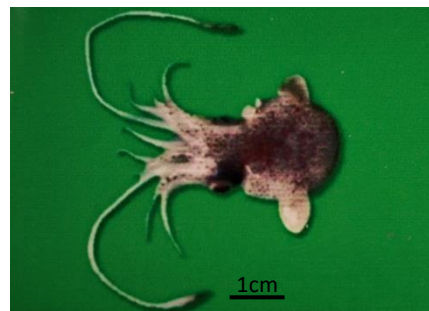
Sepia vossi



Sepiella inermis

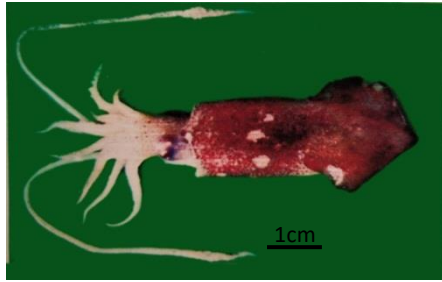


Sepiella japonica

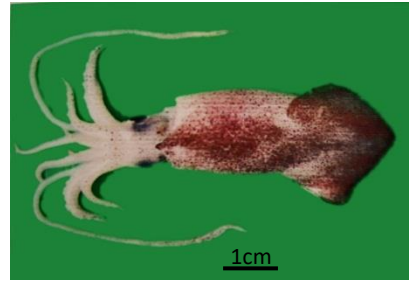


Euprymna berryi

Plate I. Recorded cephalopod species of order Sepiida



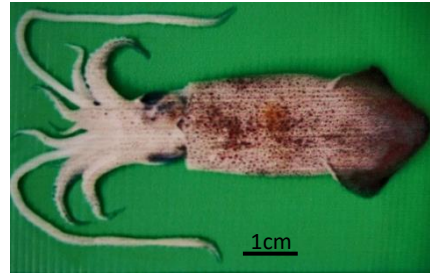
Loligo chinensis



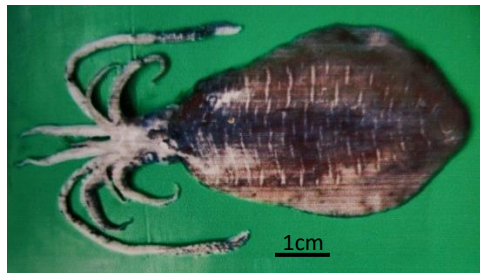
Loligo duvaucelii



Loligo singhalensis

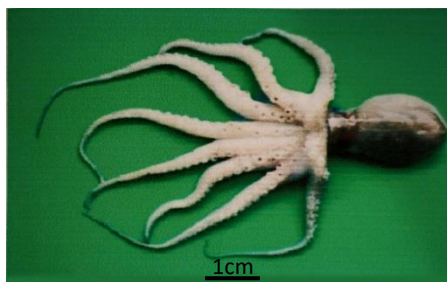


Loliolus uyii

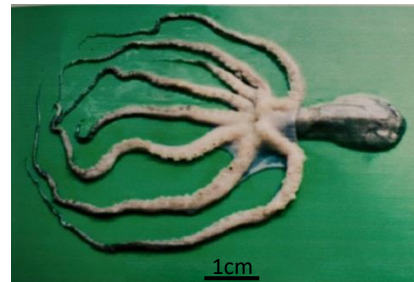


Sepioteuthis lessoniana

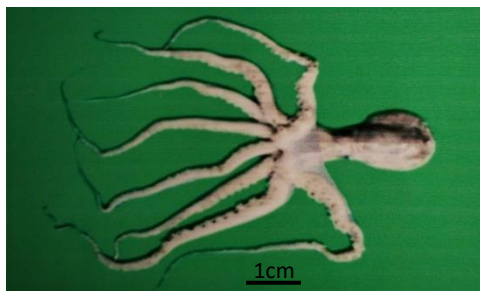
Plate II. Recorded cephalopod species of order Teuthida



Octopus dollfusi



Octopus membranaceus



Octopus rugosus

Plate III. Recorded cephalopod species of order Octopoda

Table (1) Recorded some cephalopod species

Order	Family	Sr. No	Species	Common name	Local name
Sepiida	Sepiida	1	<i>Sepia aculeata</i>	Needle cuttle fish	Lake-King-Mon-Gyi
		2	<i>S. esculenta</i>	Golden cuttle fish	Lake-King-Mon-Gyi
		3	<i>S. prashadi</i>	Hooded cuttle fish	Lake-King-Mon
		4	<i>S. pharaonsis</i>	Spineless cuttle fish	King-Mon-Kyar
		5	<i>S. vossi</i>	Voss cuttle fish	Lake-King-Mon-Phout
		6	<i>Sepiella inermis</i>	Spineless cuttle fish	Lake-King-Mon-Thale
	Sepiolidae	7	<i>Se japonica</i>	Japanese spineless cuttle fish	Lake-King-Mon-Thale
		8	<i>Euprymna berryi</i>	Double ear bobtail squid	Nar-Ywat-King-Mon
		9	<i>Loligo chinensis</i>	Mitre squid	King-Mon-Shale
		10	<i>L. duvaucelii</i>	Indian squid	King-Mon-Shale
Teuthida	Loliginidae	11	<i>L. singhalensis</i>	Long barrel squid	King-Mon-Shale
		12	<i>Loliolus uyii</i>	Little squid	King-Mon-Shale
		13	<i>Sepioteuthis lessoniana</i>	Bigfin reef squid	King-Mon-gan-too
Octopoda	Octopodidae	14	<i>Octopus dollfusi</i>	Marbled octopus	Ye ba wel
		15	<i>O. membranaceus</i>	Webfoot octopus	Ye ba wel
		16	<i>O. rugosus</i>	Common octopus	Ye ba wel

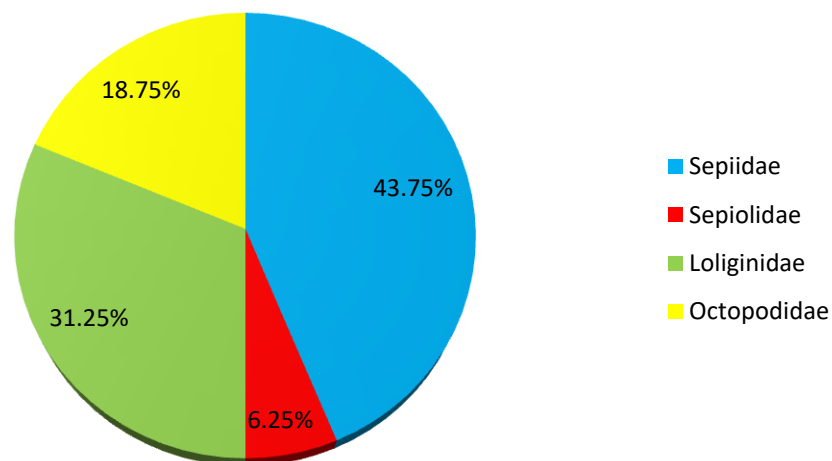


Figure (3) Percent composition of cephalopod species in different families of study area.

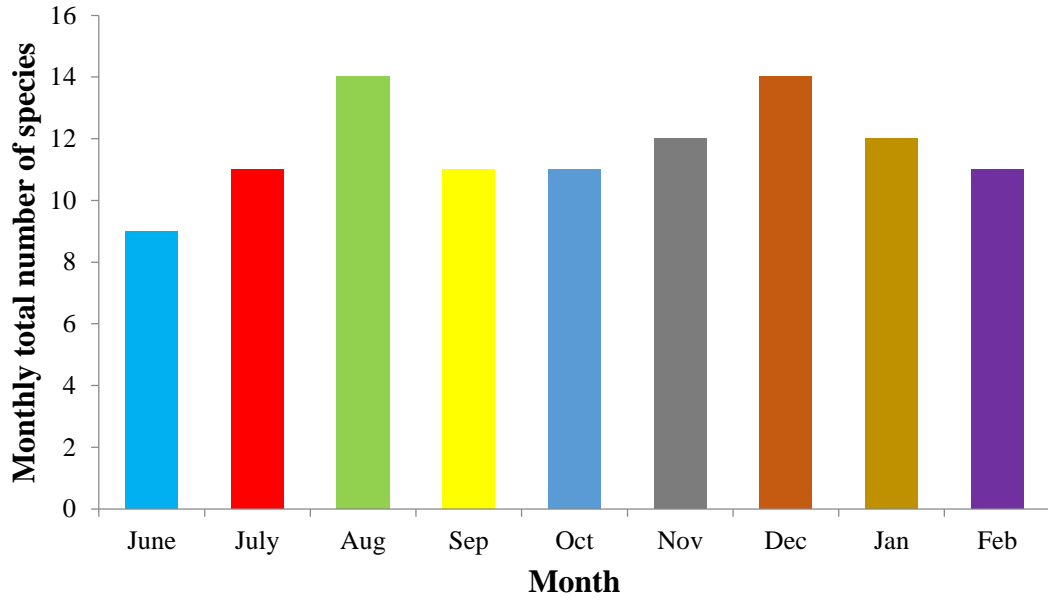


Figure (4) Monthly occurrence of cephalopod species during June 2017 to February 2018.

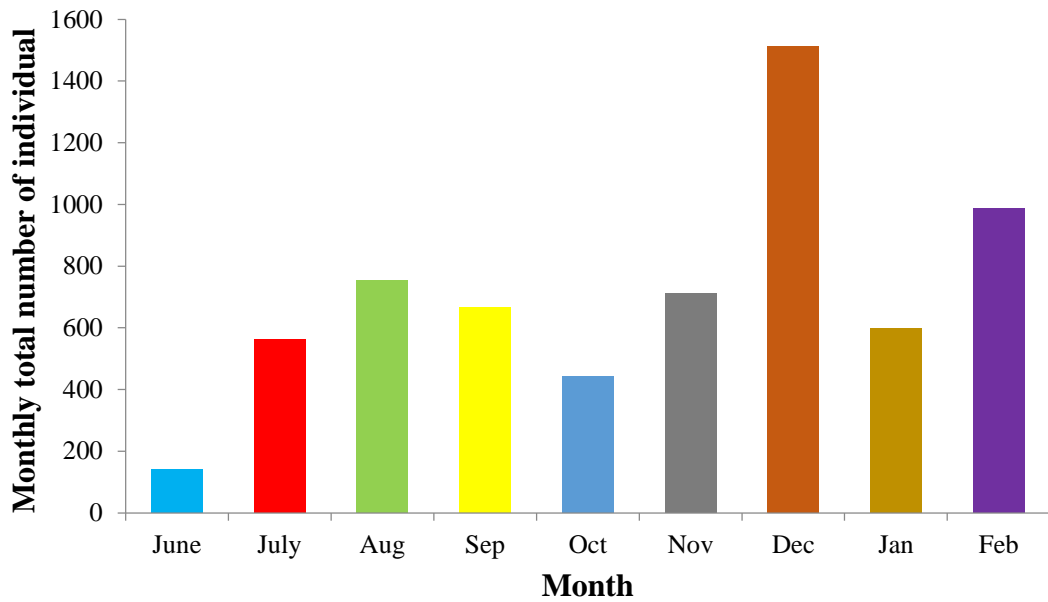


Figure (5) Monthly occurrence of cephalopod species during June 2017 to February 2018.

Table (2) Occurrence Abundance and Status of Cephalopod Species during June 2017 to February 2018.

No.	Species	Monthly number of individuals									No. of individuals	Relative abundance	Status
		June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb			
1	<i>Sepia aculeata</i>	10	15	30	20	-	15	-	10	-	100	0.0157	C
2	<i>S. esculenta</i>	-	10	12	15	5	5	30	31	36	144	0.0226	C
3	<i>S. prashadi</i>	2	5	3	-	5	-	-	10	-	25	0.0039	uC
4	<i>S. pharaonsis</i>	-	-	2	1	-	3	2	-	-	8	0.0013	uC
5	<i>S. vossi</i>	-	3	2	-	1	-	1	-	1	8	0.0013	uC
6	<i>Sepiella inermis</i>	5	10	5	-	5	-	10	-	6	41	0.0064	uC
7	<i>Se. japonica</i>	10	15	10	5	10	15	12	10	5	92	0.0144	C
8	<i>Euprymna berryi</i>	-	5	-	-	5	5	15	8	-	38	0.0060	uC
9	<i>Loligo chinensis</i>	50	100	150	-	200	200	100	100	-	900	0.1413	vC
10	<i>L. duvaucelii</i>	50	150	200	300	200	300	500	200	400	2300	0.3610	vC
11	<i>L. singhalensis</i>	-	150	300	200	-	100	500	200	300	1750	0.2747	vC
12	<i>Loliolus uyii</i>	-	100	-	100	-	50	300	-	200	750	0.1177	vC
13	<i>Sepioteuthis lessoniana</i>	-	-	5	10	-	5	15	10	12	57	0.0089	uC
14	<i>Octopus dollfusi</i>	5	-	10	5	7	-	5	8	10	50	0.0078	uC
15	<i>O. membranaceus</i>	3	-	15	2	2	5	3	2	1	33	0.0052	uC
16	<i>O. rugosus</i>	5	-	10	8	2	7	20	8	15	75	0.0118	C
Monthly Total number of individuals		140	563	754	666	442	710	1513	597	986	6371		
Monthly Total number of species		9	11	14	11	11	12	14	12	11			
uC (unCommon) = eight species				C (Common) = four species				vC (veryCommon) = four species					

Discussion

In the present study, a total of three orders, seven genera, four families, sixteen species was collected in Fish Depot of Nyaung Tan Jetty, Pazundaung Township, Yangon Region during the study period. Cephalopods from Indian Seas can be broadly divided into three orders, Squids (Order Teuthida), Cuttlefishes (Order Sepiida) and Octopus (Order Octopoda) (Mohamed, 2002). The same orders were collected in this study.

Out of four families, the percent composition of cephalopods species was observed in family Sepiidae (43.75%), followed by Loliginidae (31.25%), Octopodidae (18.75%), and Sepioidae (6.25%).

According to the study, seven species of cuttle fishes in family Sepiidae, *Sepia aculeata*, *S. esculenta*, *S. prashadi*, *S. pharaonsis*, *S.vossi.*, *Sepiella inermis*, *Sepiella japonica* were recorded.

The family Loliginiidae was included in five species such as *Loligo chinensis*, *L. duvaucelii*, *L. singhalensis*, *Loliolus uyii* and *Sepioteuthis lessoniana* in this study.

The family Octopodidae in this study was collected by three species of *Octopus dollfusi*, *O. membranaceus*, *O. rugosus*.

The family Sepiolidae in this study was represented only one species such as *Euprymna berryi*.

Cephalopods were found in all months of the year and particularly abundant in November to May (Voss *et al*; 1971). In the present finding, cephalopods were abundantly found in December, February, August and November.

In the genus *Loligo*, spawning concentration of species mostly occur between August and December along the Pacific Coast (Jereb *et al*; 2010). *Loligo chinensis*, *L. duvaucelii*, *L. singhalensis*, *Loliolus uyii*, *Sepioteuthis lessoniana* were found abundantly from August to December in this study.

In dominant species occurring in commercial catches are *Loligo duvaucelii*, *Sepia pharansis*, *S.aculeata*, *Octopus membranous* (Mohamed; 2012). In this study period, *Loligo duvacelii*, *L. singhalensis*, *L. chinensis*, *Loliolus uyii*, *Sepia esculenta*, *S. aculeata*, *Sepiella japonica* and *Octopus rugosus*. Among these collected species *S. pharaonsis* and *S. vossi* were rarely found in study period.

Commercially importance squids and cuttlefishes found in the South-East Asia countries included *Sepia aculeata*, *S. pharaonis*, *S. lucidas*, *S. brevimana*, *Sepiella inermis*, *S. japonica*, *Loligo chinensis*, *L. duvaucelii*, *L. edulis*, *L. singhalensis*, *L. affinis*, *Loliolus sumatremsis*, *Sepioteuthis lessoniana* (Siriraksophon *et al*; 2001).

Sepia aculeuta, *S.pharaonis*, *Sepiella inermis*, *Se.japonica*, *Loligo chinesis*, *L. duvaucelii*, *L. singhalensis*, *Sepioteuthis lessoniana* were collected during the study period. These species were found as commercially important squids and cuttlefishes in Myanmar. *Sepia lucidas*, *S. brevimana*, *Loligo edulis*, *L. affinis*, *Loliolus sumertremsis* were not found throughout the study period.

Octopus species were cosmopolitan being found in all warm and temperate sea. This species are marketed as fresh frozen dried salted and in a variety of other preparations for human consumption. The common octopus is a target species for many fisheries (Norman *et al.*, 1997). Three species of Octopus, *Octopus dollfusi*, *O. membranaceus* and *O. rugosus* were collected during the study.

The present study may provide some information regarding with the commercial production of cephalopod species. The results of this observation showed that the important squids, cuttlefishes and octopuses were commercially found as sea food for human consumption in Myanmar. Recently the natural condition of Myanmar coastal water is still fresh and healthy. Therefore, it favours the existence of diverse species of recorded cuttlefishes, squids and octopuses.

It is concluded that cephalopod species should be conducted in further investigation of the general ecology and economic importance of cephalopod species.

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