Original Article

Capture fishery profile of Diamondback squid *Thysanoteuthis rhombus* (Troschel, 1857) in Rizal, Palawan, Philippines

Niño Jess Mar F. Mecha*, Precious Joy S. Galicia, Alpha Jane Z. Delfin, and Hannah Mae T. Catalayban

College of Fisheries and Natural Sciences, Western Philippines University, Puerto Princesa City, Palawan, Philippines

**Corresponding author: njmf19mecha@gmail.com*

Received: 15 Oct. 2025|| Revised: 14 May 2026|| Accepted: 24 Aug. 2026 || Available Online: 02 Sep. 2026

How to cite:
Mecha NJMF, Galicia PSJ, Delfin AJZ, Catalayban HMT. 2025. Diamondback Squid *Thysanoteuthis rhombus* (Troschel, 1857) Fishery in Rizal, Palawan, Philippines. The Palawan Scientist. 18(Special Issue 1):in press. https://doi.org/10.69721/TPS.J.2026.18.SI1.02

ABSTRACT

The diamondback squid, locally known as "dalupapa," is a high-value marine species commonly landed in Rizal, Palawan, Philippines. However, essential fishing information remains limited. Hence, this study provides the first documentation of the *Thysanoteuthis rhombus* (Troschel, 1857) fishery, specifically its focused were on fishing operation, seasonality, bait types, monthly catch per unit effort, gear characteristics, and fishing grounds. Data were collected through face-to-face interviews using printed questionnaires from 16 respondents with more than five-year experiences for diamondback squid fishing. All data were processed and analyzed using MS Excel, while fishing grounds were mapped with QGIS software. Fishing operations typically begin between 0300H and 0500H and end between 1300H and 2300H, resulting in a total fishing duration of nine to 18 hours per day. These operations occur five to 10 days per month, totaling 54 to 126 hours of fishing time monthly. Commercial fishing vessels with 3.02 to 9.03 gross tonnage are equipped with 52-160 jig sets, capable of catching 35-400 individual squid. The fishing season spans from February to November, with peak activity occurring between May and September. Commonly used baits include *Rastrelliger kanagurta*, *Exocoetus* sp., and *T. rhombus* fins. Monthly CPUE ranges from 0.03 to 0.08 kg/js/hr. Fishing gear typically consists of two jiggers attached to a hanger, with a 545 m long mainline connected to three Styrofoam buoys. Most fishing grounds are located in the southern part of West Philippine Sea waters. Further research is recommended to deepen understanding of the diamondback squid fishery in Rizal, Palawan.

Keywords: fishing ground, giant squid, seasonality, West Philippine Sea, squid jig gear

INTRODUCTION

The diamondback squid, scientifically known as *Thysanoteuthis rhombus* (Troschel, 1857), is the sole species in the family Thysanoteuthidae (MFMRA 2020), belonging to the class Cephalopoda. Its name is derived

from its distinctive, large diamond-shaped fin that spans the entire length of the mantle (MFMRA 2020). It can grow to a maximum mantle length of 130 cm and weigh up to 30 kg (Roper and Jereb 2010; Carpenter and De Angelis 2014). This species inhabits tropical and subtropical oceanic waters around the world (Bower and Miyahara 2005; Miyahara et al. 2007; Sajikumar et al. 2020; Rajkumar et al. 2022; Kamaruzzaman et al. 2025), residing at depths of 600–800 meters during the day and ascending near the water surface at night for feeding and reproductive purposes (Nigmatullin et al. 1995; Bower and Miyahara 2005). *Thysanoteuthis rhombus* spends a significant portion of its life in pairs—male and female of similar size—typically for one year (Carpenter and De Angelis 2014). Its diet includes crustaceans, other pelagic squid, octopuses, and planktivorous fishes (Bower and Miyahara 2005; Sajikumar et al. 2020).

Although *T. rhombus* is globally distributed (MFMRA 2020), fishery information such as annual market demand for its mantle and fishing distribution has only been reported in Japan, the Maldives, India and Malaysia indicating that fishing activities are not well documented elsewhere (Bower and Miyahara 2005; Miyahara et al. 2007; Sajikumar et al. 2020; Rajkumar et al. 2022; Kamaruzzaman et al. 2025). In the Philippines, the only available information pertains to the origin of *T. rhombus* fishing, which began in Masbate and was later introduced to Negros Oriental and Cebu in 1988 (Lamayo et al. 2008). Dickson et al. (2000) also conducted experimental fishing from 1991 to 2000 in various parts of the country, including Calauag Bay in Quezon Province, Ormoc Bay in Leyte Province, and the West Philippine Sea (WPS). There is also documentation of *T. rhombus* fishing in the province of Marinduque, where small-scale fishers rely on it as a source of food and livelihood (De Chavez et al. 2021). More recently, Amihan and Daita (2025a, b) reported existing fishing operation including gear types, fishing distribution, and CPUE in the southern Tañon Strait, Cebu, Philippines.

In the province of Palawan, particularly in the municipality of Rizal, *T. rhombus* is also locally referred to as “dalupapa”, similar in Cebu (Amihan and Daita 2025a). It represents a new and emerging fishery in the region, as the fishing operation is conducted by larger fishing vessels using different gear designs in commercial open-water fishing grounds, which can contribute to the previous data of Dickson et al. (2000) and Amihan and Daita (2025a, b) on *T. rhombus* in the Philippines. Hence, this study was conducted to provide foundational data on the diamondback squid fishery in Palawan, specifically its focused were on fishing operation, seasonality, bait types, catch per unit effort (CPUE), gear characteristics, and fishing grounds.

METHODS

Study Site

This study was conducted in Sitio Sicud, Barangay Candawaga, Rizal, Palawan. Rizal is a municipality located in the southwestern part of Palawan, facing the WPS (Figure 1). Currently, this is the only area in Palawan with a higher concentration of active fishers—approximately 25 registered commercial fishing vessels with outriggers and around 70 fishers—engaged in *T. rhombus* fishing. The fishery began in 2017, when several fishers from Negros Oriental arrived aboard a vessel anchored in the area and introduced the techniques. These methods were subsequently adopted by a local fisher operating a 3-ton vessel previously used for catching smaller squid species. After a week of exploratory fishing, they successfully caught 25 individual *T. rhombus*, which encouraged many other fishers to adopt the diamondback squid fishing techniques.

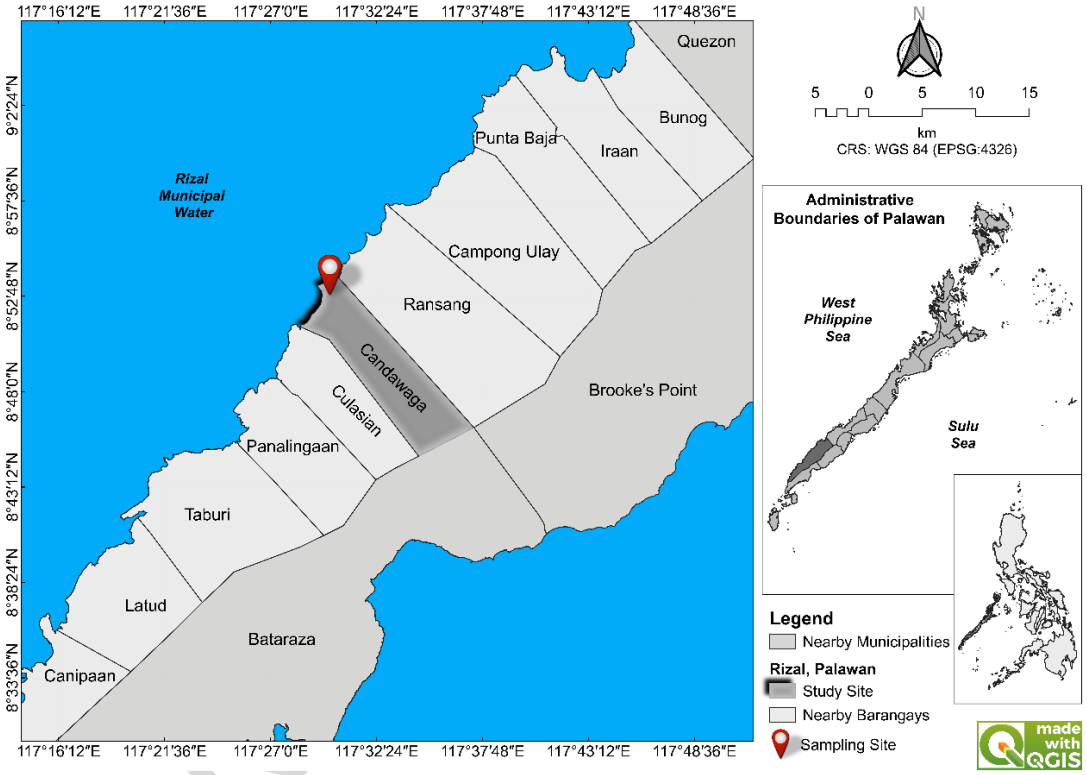


Figure 1. The administrative boundaries of Rizal, Palawan showing the location of study area.

Respondents and Data Collection

A total of 16 respondents with over five years of experience in *T. rhombus* fishing were interviewed in the area (Table 1) on December 2024. Among them, seven are both vessel owners and captains, one is solely a vessel owner, and eight are vessel captains. These respondents operate commercial fishing vessels with carrying capacities ranging from 3.02 to 9.30 gross tonnage (GT). Additionally, eight respondents utilize skiff boat to support their fishing operations, while the remaining eight operate without auxiliary support. The number of people onboard each fishing vessel ranges from three to nine, depending on the carrying capacity (Table 1).

Tabel 1. Profile of respondents based on fishing vessel type used in *Thysanoteuthis rhombus* fishing in Candawaga, Rizal, Palawan.

Respondent	Name of Fishing Vessel	Status of the Respondent	Number of Skiff Boat Support	Gross Tonnage	Number of People Onboard
1	Jeboy	Owner and Vessel Captain	1	5.11	4
2	Princess	Owner	0	6.35	3
3	Jasmine3	Vessel Captain	1	6.51	4
4	Mark ivan2	Vessel Captain	1	6.26	5
5	Precious joy1	Owner and Vessel Captain	1	5.04	4
6	Danelyn1	Vessel Captain	3	9.30	9
7	Bodek	Vessel Captain	2	5.19	5
8	Danelyn2	Owner and Vessel Captain	0	4.03	3
9	Princess mae	Owner and Vessel Captain	0	3.02	3
10	Jaira	Owner and Vessel Captain	0	3.02	3
11	Precious joy4	Vessel Captain	0	4.36	4
12	Princess Aira	Owner and Vessel Captain	0	5.58	4
13	Precious Joy2	Vessel Captain	2	5.43	7
14	Mark ivan5	Vessel Captain	0	3.42	4
15	Jericho	Vessel Captain	0	3.04	4
16	Eillish	Owner and Vessel Captain	1	6.64	4

Data were gathered through face-to-face interviews using a Tagalog-language survey questionnaire accompanied by a consent form. This includes the start and end time of fishing operations (in hours), total duration of fishing trips (number of days spent at the fishing grounds, including travel), number of jig sets deployed per vessel, and number of squid caught (both in individual count and total weight). It also covered fishing seasonality based on the number of boats operated per month, bait types, gear characteristics, and fishing grounds. Since fishers do not maintain proper records of their daily operations throughout the year, the data collected were based on a single-recall survey conducted on a monthly basis and assumed to remain constant across the year, particularly with respect to the number of jig sets and squid caught (both individual counts and equivalent total weight). Photos of fishers handling *T. rhombus* were also solicited for size reference (Figure 2).

Figure 2. The size of *Thysanoteuthis rhombus* in reference to the fisher's height (~165 cm) in Candawaga, Rizal, Palawan, Philippines.

Data Presentation and Computation

The data collected were encoded and computed using MS Excel to generate descriptive statistics such as frequency and count, which were then converted into graphical representations whenever applicable. The total daily fishing time (TDFT) per month were calculated by subtracting the start of fishing time (SFT) from the end of fishing time (EFT). The daily monthly fishing operation (DMFO) was based from fishers' information on the number of days a fishing vessel operated within a month. To compute the monthly fishing time (MFT), the TDFT was multiplied by the DMFO. Catch per unit effort (CPUE) was also computed based on the collected data, following the method of Morgan and Burgess (2005). In this approach, the monthly catch of *T. rhombus* (in kilograms, kg) was divided by the total number of jig sets (js), and subsequently divided by the MFT per fishing vessel per operation.

Meanwhile, the design of the jig set was documented through photographs and accompanied by a realistic illustration. Each component of the gear was labeled and provided with corresponding dimensions. The fishing grounds were plotted using coordinates obtained from vessel captains and processed through QGIS software, incorporating a submarine topography layer sourced from the OpenTopography website (https://portal.opentopography.org/raster).

RESULTS

Fishing Operation of *T. rhombus*

The fishing operations of 16 respondents for *T. rhombus* typically began between 0300H and 0500H, with the majority (56%) started at 0400H and 6 (37%) at 0500H (Figure 3). The end of operations varied widely, ranging from 1300H to 2300H, although some (37%) fishers preferred to conclude at 1400H and (19%) at 1800H. Overall, the total fishing duration per day ranged from 9 to 18 hours, with the majority (25%) of fishers operating for approximately 13 hours per vessel (Figure 3).

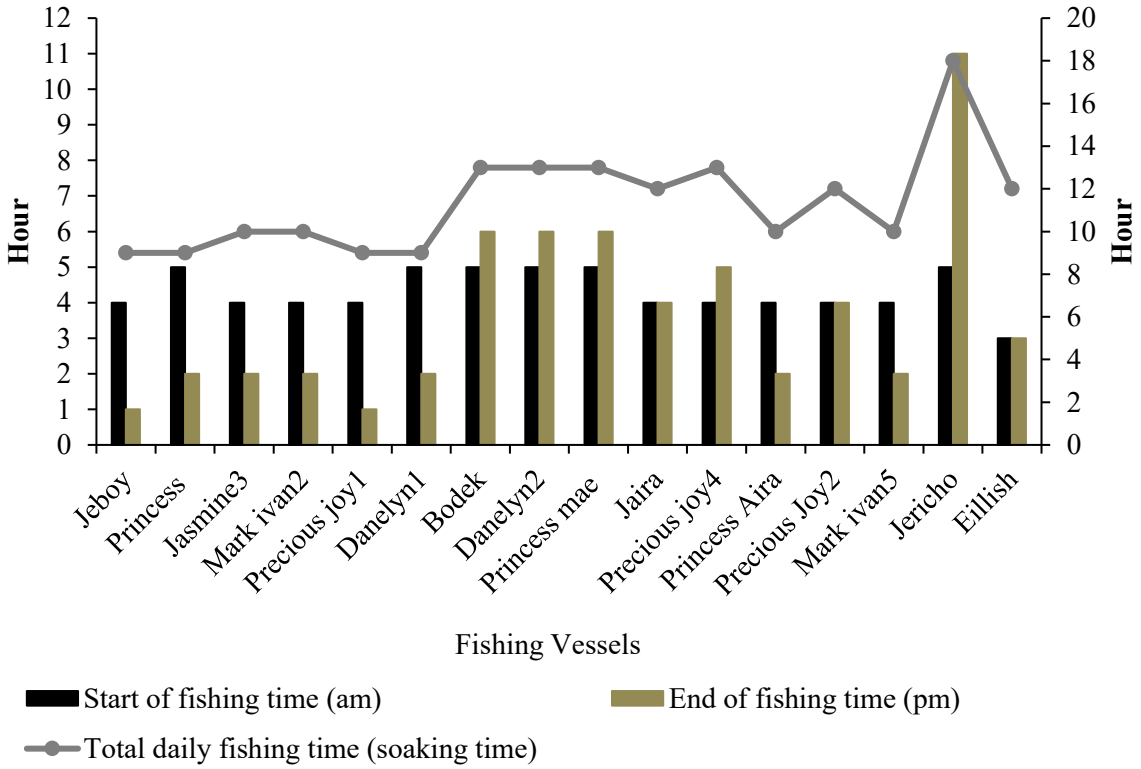


Figure 3. The fishing time of *Thysanoteuthis rhombus* fishery per fishing vessel in Candawaga, Rizal, Palawan, Philippines.

The fishing operations per vessel lasted between five and 10 days per month, with the majority (31%) reported eight fishing days, resulting in a total fishing time of 54 to 126 hours monthly (Figure 4). Meanwhile, the number of jig sets deployed per vessel ranged from 52 to 160, with most (31%) vessels used between 100 jig sets. This setup yielded catches of 35 to 400 individual *T. rhombus*, equivalent to 200 to 1,000 kg (Figure 5).

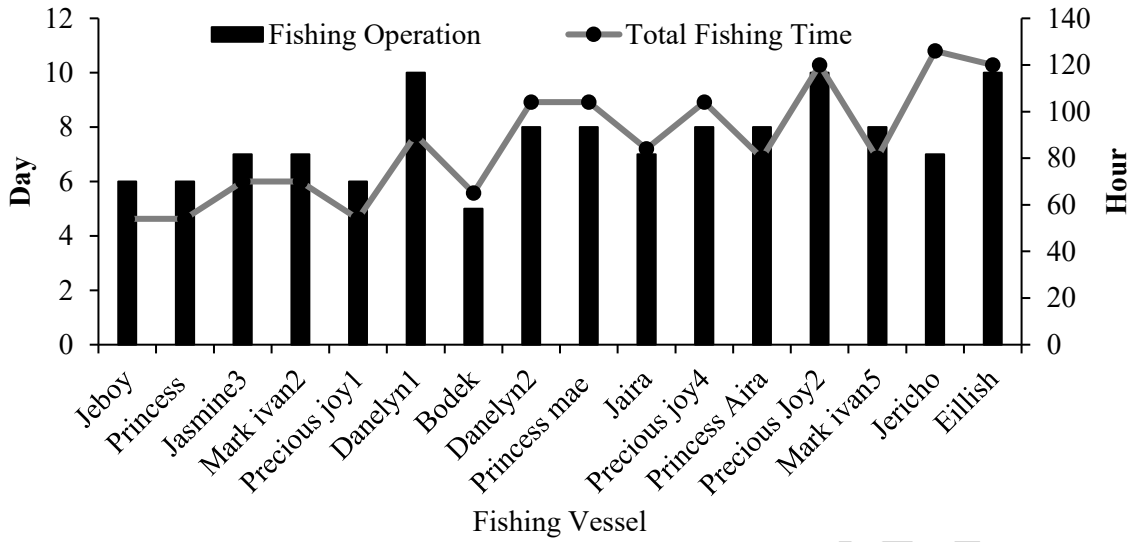


Figure 4. Total fishing operation (day) and monthly fishing time (hour) per fishing vessel in Candawaga, Rizal, Palawan, Philippines.

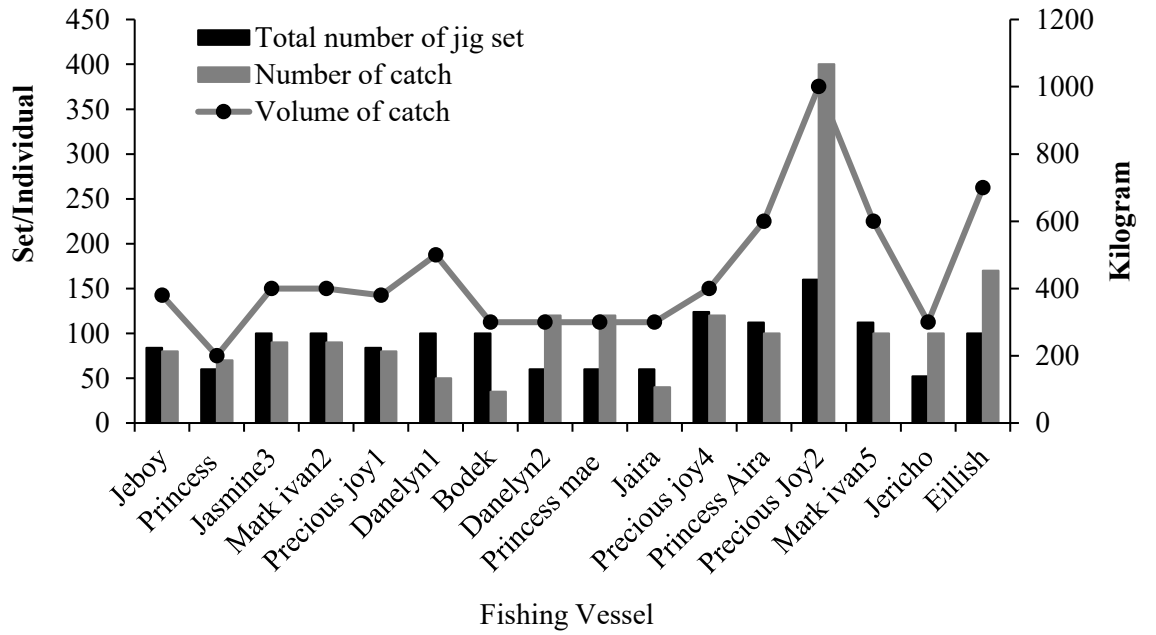


Figure 5. Number of the jig set and catches (individual and kg) per fishing vessel in Candawaga, Rizal, Palawan, Philippines.

Fishing Seasonality

There was an annual fishing seasonality of *T. rhombus* in Rizal, Palawan based on the number of fishing vessels operated which started every January (Figure 6). However, the peak season was observed from April to September (93% to 100% of fishers) and started to fall in October until December (Figure 6).

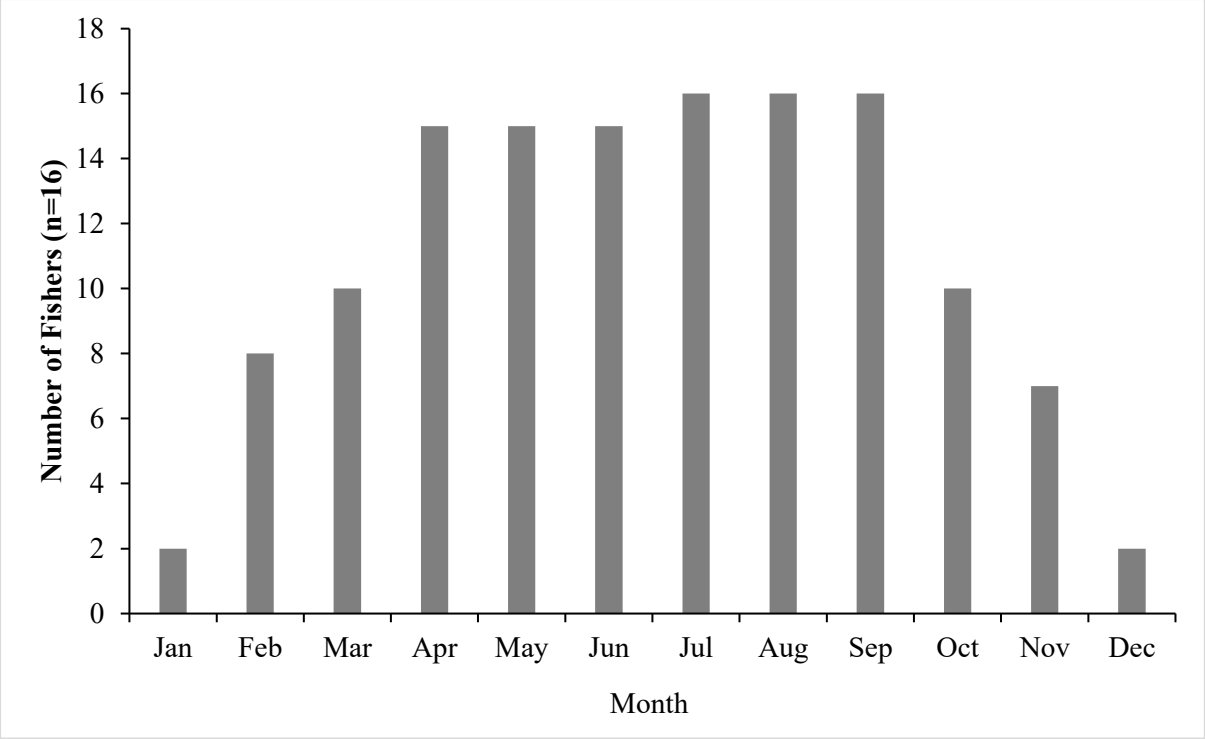


Figure 6. Fishing seasonality of *Thysanoteuthis rhombus* in Candawaga, Rizal, Palawan. (multiple response).

Type of Baits

There were three types of bait used by fishers in Candawaga, Rizal, Palawan to catch *T. rhombus*. These were *Rastrelliger kanagurta* (Cuvier, 1816), *Exocoetus* sp., and the fins of *T. rhombus* (Figure 7). Among baits, the *R. kanagurta* and the fins of *T. rhombus* were the most (56%) preferred by fishers, respectively.

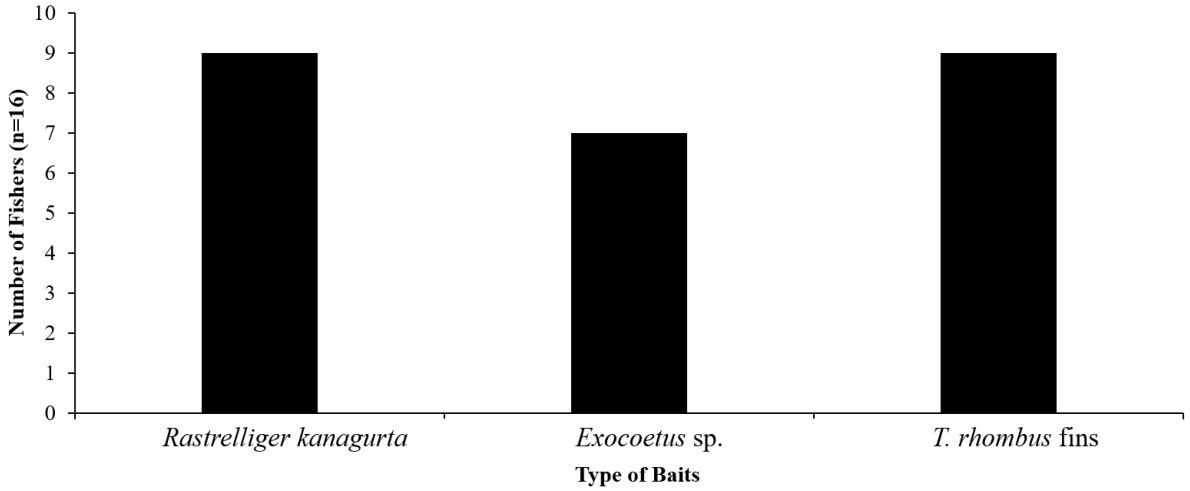
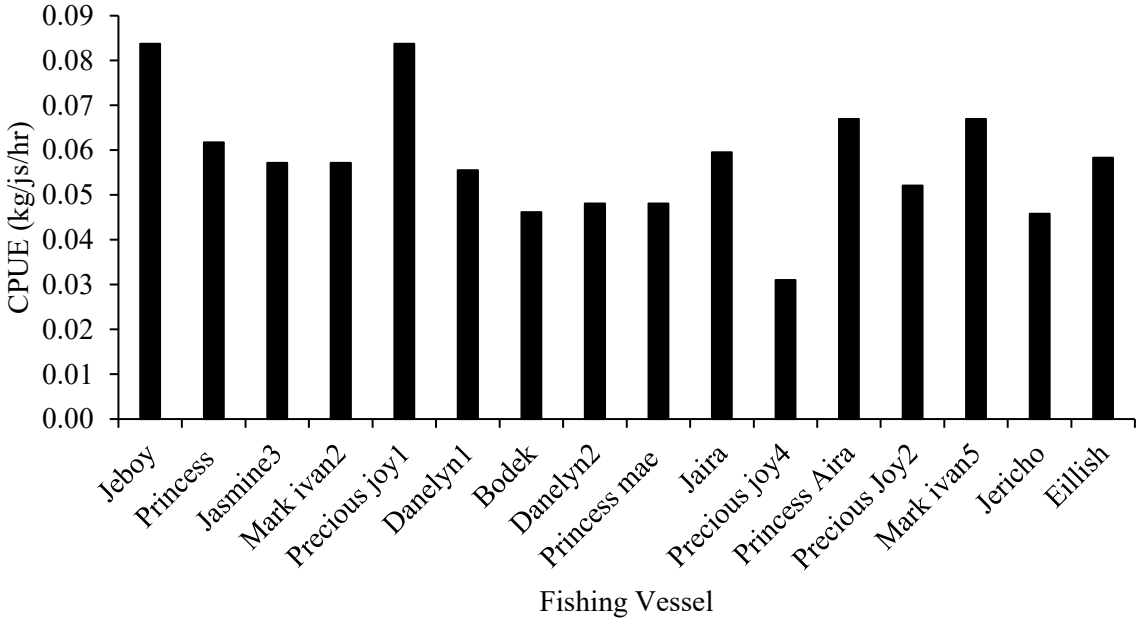


Figure 7. Type of baits for *Thysanoteuthis rhombus* fishing in Candawaga, Rizal, Palawan, Philippines (multiple response).

Catch-per-Unit Effort (CPUE)

149 The CPUE of *T. rhombus* fishing per vessel in Candawaga, Rizal, Palawan ranged from 0.03 to 0.08
150 kg/js/hr for 5 to 10 days fishing operation per month. However, majority (19%) of the fishers have 0.05 and 0.06
151 kg/jig/hr, respectively (Figure 8).



152
153 **Figure 8.** Catch-per-unit effort (kg/jig/hr) of *Thysanoteuthis rhombus* fishing per fishing vessels in Candawaga, Rizal, Palawan.

154 **Fishing Gear Characteristics**

155 The fishing gear used for *T. rhombus* fishing in Candawaga, Rizal, Palawan consist of two major parts
156 (Figure 9). These were the jig set and the squid jig. The jig set consists of a marker flag attached to a wooden pole
157 measuring 290 cm in total length, and a fixed steel bar sinker with dimensions of 45.7 cm in length and 4 cm in
158 diameter. The setup includes three Styrofoam buoys: two spherical (20.3 cm in diameter) and one rectangular
159 (24.4 cm in length, 12.7 cm in width, and 8.9 cm in height). One of the spherical buoys is used to attach the
160 wooden pole marker flag, the other is used as reserve, while the rectangular buoy is used as spool for the 545 m
161 mainline comprises of a nylon (#100, 1 mm), commercial flasher light, 21 cm steel hanger, rope line (#7, 7 mm),
162 swivel (swivel ball loop #0/3), and 4 and 5 m hanging line (nylon #140, 1.40 mm) and stainless clip. The squid
163 jig is consisted of steel (17.9 cm in length) with sinkers (12.7 cm in length and 1.9 cm in diameter) equipped with
164 an umbrella hook (7.6 cm in diameter) (Figure 9).

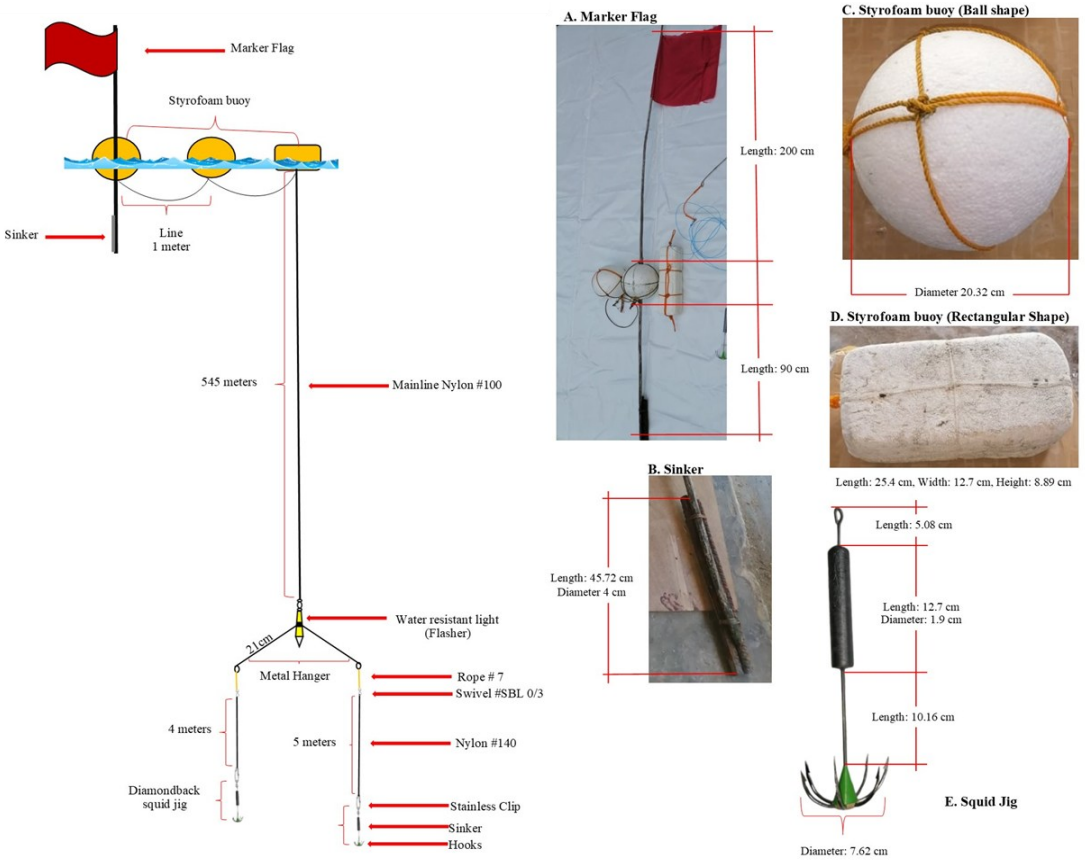


Figure 9. Illustration layout and parts of fishing gear used for *Thysanoteuthis rhombus* fishing.

Fishing Ground of *T. rhombus*

The fishing grounds of *T. rhombus* are distributed beyond the municipal waters of Rizal and Balabac, Palawan (Figure 10). Most (63%) fishing activities occur along the continental slope near Bataraza and Balabac, within the WPS, at depths ranging from approximately 1,000 - 3,250 m. Additionally, some fishers operate beyond the boundaries of the Philippine Exclusive Economic Zone (Figure 10).

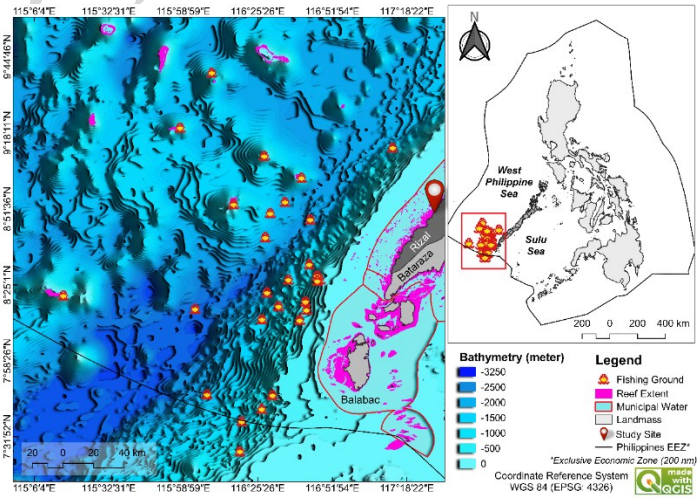


Figure 10. Distribution of *Thysanoteuthis rhombus* fishing ground in the southwest water of Palawan, Philippines.

DISCUSSION

Fishing Operation

The fishing operation for *T. rhombus* introduced by fishers from Negros Oriental in Candawaga, Rizal, Palawan are similar to those observed in Cebu (Amihan and Daita 2025a, b). According to Amihan and Daita (2025a), the fishing operation in Cebu were likewise introduced by fishers from Negros Oriental. These methods also align with operations documented in Japan (Bower and Miyahara 2005). Fishing operations typically begin at 0300H by baiting of all jig sets onboard followed by deployment from 0400H until 0500H. According to fishers, jig sets are deployed early in the morning to allow the gear to settle at depths exceeding 500 m, giving *T. rhombus* time to detect the bait before dawn. This approach coincides with the species' natural behavior of ascending near the water surface at night to mate and feed (Nigmatullin et al. 1995). Once all jig sets are deployed, fishers wait approximately five hours before checking for a catch. A catch is indicated when the buoy moves up and down or when the main buoy becomes submerged, prompting manual retrieval. Larger fishing vessels may redeploy jig sets with fresh bait to maximize effort. This process is repeated until around 1300H to 1500H, when all jig sets are hauled in regardless of catch due to the intense midday heat. After hauling, fishers begin dismantling and storing the *T. rhombus*, continuing until around 2300H.

Fishing operations for *T. rhombus* in Candawaga, Rizal, Palawan typically lasted five to 10 days per trip, with two to four trips conducted monthly. This resulted in a total fishing time of 54 to 126 hours, or approximately nine to 18 hours of operation per day per month. This duration is notably longer than the fishing operations in Cebu, which range from 8 to 12 hours per day (Amihan and Daita 2025a). The variation in fishing time is attributed to the extended process of dismantling and storing the catch, as fishers in Candawaga remain in their preferred fishing grounds to maximize effort and reduce expenses. In contrast, most fishers in Cebu return to port daily once the midday heat becomes unbearable, as their fishing grounds are located much closer to shore. However, some fishers in Cebu operating larger vessels also choose to stay in the fishing grounds to minimize travel-related costs (Amihan and Daita 2025a, b).

Meanwhile, the variation in the number of jig sets depends on the carrying capacity of the fishing vessel. Fishers engaged in *T. rhombus* fishing in Candawaga, Rizal utilize vessels ranging from 3.02 to 9.30 GT (see Table 1), which is considered an ideal size for commercial fishing in offshore waters, particularly in the WPS. Each vessel can carry between 52 and 160 jig sets, influencing catch volumes that range from 35 to 400 individuals per month, or 5 to 40 individuals per day, with individual weights ranging from 1 to 15 kg. In contrast, fishers in Cebu operate smaller vessels with capacities between 0.02 and 1.98 GT, which can accommodate only 4 to 10 jig

sets. These vessels typically caught 5 to 15 individuals per day, with an average weight of approximately 7 to 8 kg (Amihan and Daita 2025a).

Fishing Seasonality

Thysanoteuthis rhombus fishing in Candawaga, Rizal, Palawan operates year-round, although the majority of fishers conduct operations from March to September. These peak months of *T. rhombus* in the southern part of WPS align with observations from other regions in the Philippines, such as the Camotes Sea (Dickson et al. 2000), the Tañon Strait in Central Visayas (Amihan and Daita 2025b), and Ormoc Bay, Leyte (Dickson et al. 2000). In contrast, fishing seasonality in areas like Calauag Bay, Quezon Province is much shorter, lasting only five months from June to October (Dickson et al. 2000). Similar variations in fishing seasonality are also observed in Japan: in the Sea of Japan, the season runs from July to February; in Okinawa Prefecture, from November to June; and in Bonin Island, from November to March (Bower and Miyahara 2005). Although these reports provide insights into seasonal fishing patterns, there remains limited information explaining the environmental factors that influence catch rates. In Candawaga, Rizal, seasonality is primarily based on fishers' personal observations of their catch per month in a year, a method also noted in other studies (Bower and Miyahara 2005; Miyahara et al. 2007; Rajkumar et al. 2022; Amihan and Daita 2025a). Bower and Miyahara (2005) and Miyahara et al. (2007) suggest that the seasonality of *T. rhombus* is influenced by environmental conditions, particularly seawater temperature in specific fishing grounds. For instance, Miyahara et al. (2007) reported that catch rates off Hyogo Prefecture in the western Sea of Japan peak from September to October, coinciding with the presence of a cold-water mass in the area. Although peak season aligns with colder months in this study and other reports in the Philippines, high catch rates during warmer periods (March–April) merit investigation into the spatial and temporal migration of *T. rhombus* similar to the other species report (Samson 2019). A monthly assessment of length and weight variation in *T. rhombus* catches also merits further investigation to determine which fishing months yield larger and heavier individuals, which could serve as a reference for evaluating the condition of the wild population. It is also recommended to review fishers' reports on factors behind the low fishing season (October–February), especially the breeding of *T. rhombus* and the presence and abundance of its predator, *Xiphias gladius* (Linnaeus, 1758) (Abid et al. 2017).

Type of Baits

The three bait types used for *T. rhombus* fishing in Candawaga, Rizal is typically abundant in the area. Among them, *R. kanagurta* is the easiest to catch, while *Exocoetus* sp. is more difficult to obtain. The fins of *T. rhombus*, although commonly used, have low market value. In other areas such as Cebu, *R. kanagurta* and parts

of *T. rhombus* are also used as bait, along with *Selar crumenophthalmus* (Bloch, 1793), *Chanos chanos* (Fabricius, 1775), *Loligo* sp., *Mene maculata* (Bloch & Schneider, 1801), *Sardinella* sp., *Auxis* sp., and *Decapterus* sp. (Amihan and Daita 2025a). Among these, the most preferred baits are *T. rhombus* parts, *S. crumenophthalmus*, and *C. chanos*. Notably, *C. chanos* was used exclusively as bait in Japan (Bower and Miyahara 2005) and in the experimental fishing exploration conducted by Dickson et al. (2000) in the WPS.

Catch-per-Unit Effort (CPUE)

The monthly CPUE for *T. rhombus* fishing in this study ranges from 0.03 to 0.08 kg/js/hr, which is significantly lower than the CPUE reported in Cebu, ranging from 0.49 to 1.07 kg/js/hr per day (Amihan and Daita 2025a). Even when recalculated for daily operations, the CPUE in Candawaga, Rizal, Palawan remains lower at approximately 0.01 to 0.02 kg/js/hr. This low CPUE is attributed to longer fishing durations and the use of a higher number of jig sets. Fishing vessels in Candawaga deploy 52 to 160 jig sets, whereas vessels in Cebu typically carry only 4 to 10 (Amihan and Daita 2025a). Another contributing factor is the differences in how fishing time is computed across regions. According to Amihan and Daita (2025a), CPUE in diamondback squid fishing can vary due to multiple factors, including the behavior of the target species, gear characteristics, fishing operation, environmental conditions, and the spatial distribution of the wild stocks. To obtain more robust and reliable information on *T. rhombus* CPUE and the status of its wild population, extended and actual data collection over a longer period is strongly recommended. Additionally, the profitability of this fishing activity merits further investigation.

Fishing Gear Characteristics

The fishing gear used for *T. rhombus* fishing in Candawaga, Rizal, Palawan consists of two major components: the jig set, locally known as “palayaw,” and the squid jigs, referred to as “saranggat.” This gear setup is similar to those reported by Amihan and Daita (2025a) in Cebu and the experimental fishing conducted by Dickson et al. (2000) in the WPS, which were adaptations from Japanese fishing operation. The main differences lie in the number of Styrofoam buoys used, the length of the mainline, and the number and design of squid jigs attached to the mainline.

Unlike in this study, the jig set used in Cebu (Amihan and Daita 2025a) features only two Styrofoam buoys, with both the marker flag and mainline attached to a single buoy similar to the design described by Dickson et al. (2000). The differences in the number and configuration of buoys may be attributed to the size of *T. rhombus* caught in each area and the prevailing conditions of the fishing grounds. In Cebu, the fishing grounds are located within the more protected waters of the Tañon Strait, and the average catch size is smaller, ranging from 7 to 8 kg

(Amihan and Daita 2025a). In contrast, catches in this study reach up to 15 kg, and the fishing grounds are situated in the WPS, which is characterized by harsher environmental conditions. The relatively larger catches reported in this study may be attributed to fishing grounds targeting *T. rhombus* in open waters, where individuals are more likely to be at adult stages. In contrast, the species is known to migrate to shallower waters for spawning, with juveniles occurring higher in the water column (Nigmatullin et al. 1995; Bower and Miyahara 2005; Miyahara et al. 2007).

Additionally, the length of the mainline used by fishers in the study area can reach depths of up to 545 meters. According to local fishers, this depth has proven to be the active zone for *T. rhombus* in the WPS. In Cebu, where *T. rhombus* fishing has been reported since 1997, the mainline length typically ranges from 151 to 200 meters (Amihan and Daita 2025a). In contrast, experimental fishing conducted by Dickson et al. (2000) recorded catches at depths of 720 meters. These variations in mainline length across different regions suggest a vertical distribution behavior of *T. rhombus*, which has also been observed in Okinawa, Japan (Bower and Miyahara 2005; Miyahara et al. 2007). This behavior significantly influences catch rates during fishing operations, as documented in several studies (Miyahara et al. 2007; Amihan and Diata 2025a).

On the other hand, the metal hanger used by fishers in the study area to attach two squid jigs is a unique feature of the fishing gear which was not found in other studies (Dickson et al. 2000; Bower and Miyahara 2005; Amihan and Daita 2025a). According to the fishers, a metal hanger was inserted and tied to the flasher using a strip of an old bicycle inner tube. This gear set-up was the original design introduced by fishers from Negros Oriental. This metal hanger supports the squid jigs in a horizontal orientation, unlike the vertical arrangement of multiple squid jigs used in Cebu, which is an adaptation from Japanese fishing operation. Although the design of squid jigs varies across studies, there remains a gap in understanding which design yields the highest catch rate, particularly since no published research has been conducted in Negros Oriental to substantiate the findings of this study. Therefore, an experimental trial comparing different jig-set configurations is strongly recommended to determine the most effective design.

Fishing Ground of *T. rhombus*

Fishers in Candawaga, Rizal, Palawan primarily target *T. rhombus* in the southern part of the WPS, with most fishing activities concentrated along the continental slope between Bataraza and Balabac, Palawan, extending toward Malaysian waters (Figure 10). According to the fishers, the selection of fishing grounds was based on catch records. Once a particular area yielded catches, they marked it and returned during each *T. rhombus* season. These practices led to the expansion of *T. rhombus* fishing grounds from the eastern to the western part

of the WPS (Figure 10). Additionally, this section of the WPS was not included in the fishing expedition conducted by Dickson et al. (2000), which deployed jig sets from the northwest of Babuyan Islands to the western section of Linapacan, Palawan. Although a single *T. rhombus* was caught west of Mindoro during that expedition, this study suggest that *T. rhombus* distribution could be found in southern part of WPS, as indicated by the concentration of fishing activities in the area. According to some fishers in Candawaga, they also venture west of Quezon, Palawan, particularly when catch rates is low in their usual fishing grounds. This distribution is similar to the report of Amihan and Daita (2025b) in Cebu, where *T. rhombus* fishing grounds are widely distributed throughout the Tañon Strait, although certain areas show higher concentrations of fishing activity. According to Miyahara et al. (2007), the horizontal distribution and abundance of *T. rhombus* are strongly influenced by environmental conditions, especially water temperature driven by ocean currents. Although various oceanographic studies have been conducted in the WPS (Arceo et al. 2024), environmental monitoring in relation to *T. rhombus* fishing grounds in the southern WPS is highly recommended (Dickson et al. 2000). Such efforts could yield valuable insights into the species' habitat characteristics in tropical waters (Sajikumar et al. 2020), aiding in the identification of other potential fishing grounds across the Philippines. Conducting similar studies in other municipalities of Palawan, particularly in areas reporting *T. rhombus* landings, is strongly encouraged to broaden knowledge of the species' fishing ground distribution, which is essential for effective fisheries management.

FUNDING

This study received in-kind support from the Western Philippines University.

GENERATIVE AI STATEMENT

This study employed Copilot AI tool solely for coherence and grammar checking. No portion of the content was generated entirely by any AI platform.

ETHICAL CONSIDERATIONS

The study secured informed consent from all respondents prior to data collection, and participation in the interviews was entirely voluntary. No animals were collected or involved in this study.

DECLARATION OF COMPETING INTEREST

The authors declare that there is no competing interests to any authors.

ACKNOWLEDGMENTS

The authors extend their sincere gratitude to all participating respondents for their valuable contributions and for providing essential data that supported this study. Likewise, we extend our gratitude to the two anonymous reviewers for their critical comments and valuable suggestions that contributed to the improvement of this paper

REFERENCES

Abid N, Laglaoui A, Arakrak A, Bakkali M. 2017. The role of fish in the diet of swordfish (*Xiphias gladius*) in the Strait of Gibraltar. Journal of Marine Biological Association of the United Kingdom. 98(4):895-907. https://doi.org/10.1017/S002531541700011X

Amihan RS, Daita HAR. 2025a. Squid jig types, composition and CPUEs, utilized in diamondback squid (*Thysanoteuthis rhombus*) fishing along southern Tañon Strait, Philippines. Journal of Biodiversity and Environmental Sciences. 26(4):17-26.

Amihan RS, Daita HAR. 2025b. Fishing ground and seasonal availability of diamondback squid (*Thysanoteuthis rhombus*) along southern Tañon Strait: Local fishermen's insights. Journal of Biodiversity and Environmental Sciences. 27(1):61-70. http://dx.doi.org/10.12692/jbes/27.1.61-70

Arceo HO, Velos MJP, Nuñez MAC, Aliño PM, editors. 2024. The West Philippine Sea: State of the Coasts. University of the Philippines Marine Science Institute, Diliman, Quezon City, Philippines. 208pp. [accessed 2024 May 12]. https://msi.upd.edu.ph/downloads/wps-soc-2024/

Bower JR, Miyahara K. 2005. The diamond squid (*Thysanoteuthis rhombus*): a review of the fishery and recent research in Japan. Fisheries Research. 73(1-2):1–11. https://doi.org/10.1016/j.fishres.2005.01.020

Carpenter KE, De Angelis N, editors. 2014. The living marine resources of the Eastern Central Atlantic, Volume 1: Introduction, crustaceans, chitons and cephalopods. FAO Species Identification Guide for Fishery Purposes, Rome, FAO. p. 663. [accessed 2024 May 12]. https://www.fao.org/fishery/publication/31009/en?status=published

De Chavez P, Calderon GJ, Santos S, Vera Cruz E, Santos M. 2021. Vulnerability to Climate Change of "Giant Squid" (*Thysanoteuthis rhombus*) Fishery in Marinduque, Philippines. The Philippine Journal of Fisheries. 28(2):181-190. http://10.31398/tpjf/28.2.2021-0002

Dickson JO, Ramiscal RV, Magno B. 2000. Diamondback Squid (*Tysanoteuthis rhombus*) exploration in the South China Sea, Area III: Western Philippines. In Proceedings of the Third Technical Seminar on Marine Fishery Resources Survey in the South China Sea, Area III: Western Philippines, 13-15 July 1999. Southeast Asian Fisheries Development Center, Bangkok, Thailand. p. 32-38.

Kamaruzzaman YN, Jaafar TNAM, Ikhwanuddin MNM, Sharir S. 2025. First Record of the Diamondback Squid *Thysanoteuthis rhombus* Troschel, 1857 (Cephalopoda: Thysanoteuthidae) in the East Malaysian Coastal Waters. Journal of Fisheries and Environment. 49(2):103-113.

Lamayo RC, Cunado VD, Delan GG, Rica RV, Ilano AS, Lamayo MHA. 2008. Catch distribution and biological characteristics of diamondback squid off Northeast Cebu Island, Philippines. Journal of Agriculture and Technology Management. 11(1–2).

MFMRA (Ministry of Fisheries, Marine Resources and Agriculture). 2020. Maldives Diamondback Squid Fishery Management Plan 2020. Malé, Maldives. 32pp.

Miyahara K, Hirose N, Onitsuka G, Gorie S. 2007. Catch distribution of diamond squid (*Thysanoteuthis rhombus*) off Hyogo Prefecture in the western Sea of Japan and its relationship with seawater temperature. Bulletin of the Japanese Society of Fisheries Oceanography. 71(2):106-111.

Morgan AC, Burgess GH. 2005. Fishery-dependent sampling: Total catch, effort and catch composition. Food and Agriculture Organization of the United Nations. [accessed 2024 May 12]. https://www.fao.org/4/a0212e/A0212E15.htm.

Nigmatullin, CM, Arkhipkin AI, Sabirov RM. 1995. Age, growth and reproductive biology of diamond-shaped squid *Thysanoteuthis rhombus* (Oegopsida: Thysanoteuthidae). Marine Ecology Progress Series. 124:73–87.

Rajkumar M, Midun M, Thirumalaiselvan S, Rajkumar R, Saravanan R. 2022. A unique occurrence of large-sized diamondback squid *Thysanoteuthis rhombus* (Troschel, 1857) in the Gulf of Mannar. Indian Journal of Geo Marine Sciences. 51(07):650-653. https://doi.org/10.56042/ijms.v51i07.48858

Roper CFE, Jereb P. 2010. Cephalopods of the world. An Annotated and Illustrated Catalogue of Cephalopods Species known to date. Vol. 2. Myopsid and Oegopsid squids. FAO Species Catalogue for Fishery Purposes 2(4). 605pp.

Sajikumar KK, Sasikumar G, Venkatesan V, Alloycious PS, Jestin Joy KMJ, Karamathullah PS, Nataraja GD, Mohamed KS. 2020. Distribution, age and growth of the diamondback squid, *Thysanoteuthis rhombus* (Cephalopoda: Thysanoteuthidae) from the tropical Arabian Sea. Fisheries Research. 224:105478. https://doi.org/10.1016/j.fishres.2019.105478

Samson JRA. 2019. Spatial and temporal distribution, size composition, and abundance of Oval squid, *Sepioteuthis lessoniana* (Lesson 1830) in the coastal waters of Bolong, Zamboanga City, Philippines. The Palawan Scientist. 11:29-41. https://doi.org/10.69721/TPS.J.2019.11.1.03

ROLE OF AUTHORS: ***NJMFM*** *- Conceptualization, Methodology, Software, Validation, Formal Analysis, Writing-Original draft, Writing-review and editing, Visualization;* ***PJSG*** *- Validation, Investigation, Writing-Original draft;* ***AJZD*** *- Validation, Investigation, Writing-Original draft.* ***HMTC*** *- Validation, Formal Analysis, Writing-review and editing.*

Responsible Editor: Dr. Roger G. Dolorosa