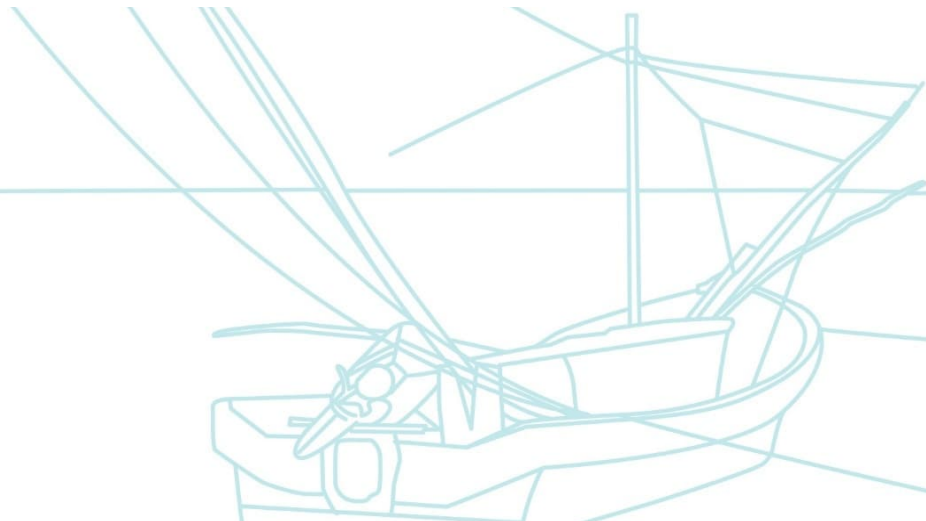




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Fishing monitoring by implementing PescaData, to determine octopus catches and the use of bait species in the octopus FIP in Yucatán, 2023 season.



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Abstract

The Octopus fishery in Mexico is in the first place worldwide, both for level of production and product value, being the state of Yucatan the largest producer in the country. The Octopus fishery in Yucatan was registered as a Fishery Improvement Project (FIP) in 2018 in order to be certified under the Marine Stewardship Council (MSC) standard. One of the main fishery challenges is to generate fishing information that allows improving the current fishery management as well as for the species that are used as bait. To advance in the achievement of these improvements, 17 people from four cooperatives and four fishing companies (eight Fishing Production Units) incorporated into the FIP were trained in the use of PescaData (PD) digital application, where fishers registered their catches, octopus biometrics, and use of bait information during the 2023 fishing season. The only registered fishing gear was the jimba. A total catch volume for both species of **788,687 kilos** was recorded for the six FPU. Small Vessels contributed with 360,666 tons (45.7%) of the total catch and Medium-Height Vessels with 428,021 (54.3%) of the total catch. The species with the highest catch volume was *Octopus maya* with 688,632 kilos (87.3%), only *O. americanus* catches were recorded by the MHV, with a total of 100,052 kilos (12.7 %) during the season 2023. The FPU used a total of 52,473 kg of bait where the mostly used species was the crustacean known locally as Ocol (*Ucides cordatus*) with 73.5% of the total followed by 26.4% of the spider crab or maxquil (*Libinia dubia*). All the bait used by the UoC belongs to legal and permitted species during the entire octopus season. However, it is important to identify and completely eradicate the use of non- permitted bait. Likewise, it is verified that the FPU incorporated into the FIP **did not use ETP species** such as the mitten crab (*L. polyphemus*), which is protected by NOM-059-SEMARNAT-2010, but its use in the octopus fishery in the state of Yucatan has been documented. The low profitability of octopus fishing affected both the SV fleet of the UoC and the UoA, since the majority of cooperatives and fishing companies reduced their fishing effort, limiting the number of fishing trips, and in some cases, restricting completely fishing trips during the entire 2023 fishing season.

Introduction

Mexico is one of the largest producers of octopus in the world, ranking third in 2016-2018. This fishery ranks seventh in the country's fishery production and in fourth place for its economic value. During the last ten years, the state of Yucatán has been the largest producer of octopus in the country (CONAPESCA, 2018). The species that are harvested in the state are the maya or red octopus (*Octopus maya*), the common or paton octopus (*O. americanus*, formerly known as *O. vulgaris*) (Avendaño et al., 2020), however, this last specie is not yet officially recognized by the Mexican federal government. The season for octopus fishing in the Yucatan Peninsula runs from August 1 to December 15 of each year.

The *O. maya* and *O. americanus* fishery generates 15,000 jobs and a commercial value of more than 27 million USD per year. Approximately 80% of the catch of this species is exported to Europe and Asia (Rosas et al. 2014). The octopus catch in the state of Yucatán is carried out by two types of fishing fleets, the smallest, which is the most numerous, with vessels between 18 and 29.5 feet in length, and the medium-sized fleet that uses vessels between 39.3 and 72.1 feet in length (DOF, 2014).

The octopus fishery requires large quantities of bait, mainly decapod crustaceans (crabs), which were traditionally obtained in the state of Campeche, such as maxquil (*Libinia dubia*), moro crab (*Menippe mercenaria*) and blue crab (*Callinectes sapidus*) (Solís-Ramírez, 1998; Markaida et al., 2015). The growth of the octopus fishery in recent years has led to an increase in the demand for

bait, with its availability and quality being a serious problem. Likewise, it has been documented in the state of Campeche that due to the high demand for bait, imports from neighboring states have been generated. Such is the case of the ocol or land crab (*Ucides cordatus*) that is extracted from the mangroves of Magallanes (Tabasco), the green crab (*Callinectes bellicosus*) from Paredón (Chiapas) or the maxquil that comes from Celestún (Yucatán) (Markaida et al., 2019). In addition to this problem, the use of the sea horseshoe crab (*Limulus polyphemus*) has been documented (Zaldívar-Rae et al., 2009; DOF, 2010; Munguía-Gil, 2010; Salas et al., 2011; Sandoval-Gío et al., 2016; Smith et al., 2017); despite being an illegal activity, as the Mexican Official Standard NOM-059-SEMARNAT-2010 categorizes this species as "endangered" and prohibits its capture (DOF, 2010). However, Munguía-Vega et al. 2023, through genetic analysis in different species of crustaceans used as bait in the octopus fishery, did not find any ETP species used as bait, in this fishery. In addition, since 2016, the International Union for Conservation of Nature has listed *L. polyphemus* on the Red List as a "vulnerable species" and emphasizes that its populations are in gradual decline (Smith et al., 2016).

This fishery was pre-assessed in 2018 under the [Marine Stewardship Council \(MSC\)](#) standard, identifying various areas of opportunity that require improvement in order to comply with the 28 performance indicators (PI). One of the main challenges of the octopus fishery is the generation of fishing information, which allows for more variables to be documented during the fishing task (date, fishing time, type of gear used, catch area, type of bait used, volume captured of the target species and biometric data of the organisms). This information will allow evaluating and designing strategies to improve the current management of the fishery, as well as that of the species that are used as bait.

Due to the fact that this fishery intends to obtain the certification of sustainable fishing by the MSC standard, during this 2022 octopus fishing season actions are being taken to improve the qualification of the ICs scored with qualifications below 60. These actions are mainly related to 1) the recording of fishing information through the [PescaData](#) (PD) digital logbooks and its analysis, to improve the capture strategy and not exceed the total allowable catch (TAC); 2) registration and identification of the species that are being used as bait to establish a management strategy; 3) promote with various government actors the updating of the octopus fisheries management plan and incorporate specific objectives, and 4) establish a system of random audits to verify compliance with sustainable practices among FIP members.

Since 2021, actions 1 and 2 mentioned above have been addressed through the digital tool PD to develop Octopus Fisheries Monitoring with the FPU incorporated into the FIP. PD is a free access mobile app, designed by and for people dedicated to small and medium-scale fishing, which allows the recording and storage of daily catches, as well as the expenses involved in the fishermen's days and the fisherwomen from Mexico, Latin America and the Caribbean.

PD records fishing logbooks and includes additional information to keep track of income and expenses on a daily basis. It has a market section in which its users can offer their products and services. It presents a specific section to add biometric data of the captures. It has an extensive list of marine species that shows the common name, scientific name and photo of the organism, making it easier for the fisherman to register the captured resource. It offers a specific section to record sizes, weight, sex and state of maturity of the captured specimens. Users have the possibility of managing a profile of the fishing organization to which they belong to find potential buyers. It is possible to register a user as an administrator of your cooperative/company in the dashboard to register/deregister fishermen and boats from your organization. The application has an internet page called PD Board in which it is possible to consult and download catch data from fishers of their respective fishing organization. PD tries to modernize the management of fishing

cooperatives through cutting-edge technology, combating the technological barrier of the sector and putting it at your fingertips for free.

Objective

Present the progress made during the octopus fishing season in Yucatan 2023 in terms of information and monitoring of octopus catches, the use of bait registered by the fishing production units incorporated into this FIP through the PD electronic logbooks.

Specific objectives of fishery monitoring

1. Record information on the quantities, costs and species of bait used by the UoC of the Octopus-FIP of Yucatan during the 2023 fishing season.
2. Record information on the quantities and species of octopus caught per fishing trip by the UoC's small and medium-sized vessels, during the 2023 fishing season.
3. Record biometric information of the captured octopus's species during the 2023 fishing season.

Methodology and results

Fishing monitoring

For fishing monitoring, the mobile application PD1 was used as a tool, which, within its multiple functions, serves as an electronic logbook to record fishing information in real time.

With the aim of implementing Octopus Fishing Monitoring during the fishing season 2023 in Yucatán, from July 24 to 26, 2023, 17 people from four cooperatives and four fishing companies (eight FPU) incorporated into the octopus FIP were trained on topics related to the FIP, sustainable fisheries, in the use of PD as an electronic logbook, and the octopus taxonomy in the region to give context to the importance of implementing Fisheries Monitoring appropriate (Table I). The importance of both the FIP and the octopus fishery having all the fishing information of its members, they were explained how to obtain and register the information of their vessels and fishing permits in the PD Dashboard, the filling and saving of fishing logbooks, recording information on the daily catches of octopus, the species of bait, the quantities used and their cost (ANEX II).

The FPU in the FIP registered 171 small vessels (SV), and 38 medium-height vessels (MHV) (Table II). The fishing cooperatives and their fleet are located in Celestún and the fishing companies are located in Puerto de Progreso, Yucatán, where their MHV fleet is also located. In the case of the SV, MASPESCA has them in Puerto de Progreso, PESMAR in Dzilam de Bravo and PROMARMEX has them distributed in the fishing municipalities of Celestún, Progreso (ports of Chuburná and Chicxulub) and Telchac, in the state of Yucatán (Figure 1).

1 <https://pescadata.org/>

Table I. Training in octopus fisheries monitoring with PD to octopus fishing organizations incorporated to the FIP for the 2023 season.

Fishing Production Units	Number of people trained	Date
PROMARMEX S.A. DE C.V.	1	24-26/07/23
MASPESCA S.A. DE C.V.	4	24-26/07/23
S.C.P.A.S. CAYO ARENAS	2	24-26/07/23
HULKIN S.A. DE C.V.	3	24-26/07/23
NOVELOS S.C. DE R.L. DE C.V.	2	24-26/07/23
PULMEMAR S.C. DE R.L. DE C.V.	2	24-26/07/23
CHICHAN CUCH S.C. DE R.L. DE C.V.	1	24-26/07/23
PESMAR S.A. DE C.V.	1	24-26/07/23
TOTAL	16	



Figure 1. Map showing the four coastal municipalities where the SV and MHV of the fishery production cooperatives and the fishery production companies are located.

During the 2023 octopus fishing season in the Yucatan Peninsula, there was a low fishing effort compared to previous years, this due to the low price of octopus and the high cost of inputs (fuel, bait, ice). The low price of octopus in the national and international market is influenced by various factors such as: the appreciation of the MXN versus the USD, full inventories from the previous season, decrease in demand from the main consuming countries due to economic instability, added to the supply of octopus from other countries, among others factors. The low profitability of octopus fishing meant that the SV were the most affected, since they go out fishing every day, so they have to recover the investment in a short time, unlike the MHV that have the capacity to stay for days necessarily at sea until they recover their investment, combined with its ability to have a greater range of movement to find better fishing spots. To give context to the

situation, Mexico reached a total octopus production of 26,869.49 tons in 2023, which is almost it produces each year in the Yucatan Peninsula alone (21,000 ±4,000 tons).

Although in the 2023 season the fleet registered in the UoC of the FIP was larger compared to previous years, it was the year with the lowest production (Table V). However, this will also be reflected in the total production of the UoA, since according to the preliminary report from CONAPESCA, in 2023 the maya octopus capture quota of 21,392 tons was not reached.

The low profitability of octopus fishing also affected the production of the FIP, since in most cooperatives and fishing companies they reduced their fishing effort of the SV, reducing the number of fishing trips, and in some cases, limiting fishing trips throughout the fishing season. Of 100% (209) of the boats, only 81% (170) boats went fishing during the 2023 season. Generally, it is normal for 100% to go fishing. Such was the case of the CHICHAN CUCH cooperative and the PESMAR company, which chose not to go fishing during the 2023 season, which is reflected in the null registration of fishing logbooks in table II. The low fishing effort carried out by the SV fleet is also reflected in the higher production that the MHV had of 428,021 kilos compared to the 360,666 kilos caught by the SV.

Table II. Number of logbooks and small vessels (SV) and medium-height vessels (MHV) registered by the FPU incorporated into the FIP’s UoC during the 2023 octopus fishing season in Yucatan.

Fishing Production Units	SV Information		MHV Information		Total fleet
	Number of SV	Number of logbooks	Number of MHV	Number of logbooks	Total logbooks
MASPESCA	6	592	12	40	632
PROMARMEX	51	392	26	43	435
CAYO ARENA	10	278	0	0	278
NOVELOS	9	167	0	0	167
PULMEMAR	5	461	0	0	461
HUL KIN	70	1,456	0	0	1,456
CHICHAN CUCH	1	0	0	0	0
PESMAR	19	0	0	0	0
TOTAL	171	3,346	38	83	3,429

The only registered fishing gear was the jimba, which is the regulatory fishing gear, it is highly selective and is described in the Management Plan (DOF, 2014). A total catch volume for both species of **788,687 kilos** was recorded for the six FPU. SV contributed a 45.7% of the total catch and MHV 54.3% of the total catch. The species with the highest catch volume was *Octopus maya* with 688,632 kilos (87.3%), only *O. americanus* catches were recorded by the MHV, with a total of 100,052 kilos (12.7 %) during the season 2023.

Based on the information on the total number of organisms and the total weight of the catch recorded per fishing trip, it was estimated that the average individual weight for *O. maya* was 710 grams caught, at an average depth of 11 meters. And for *O. americanus* it was 910 grams caught, at an average depth of 36 meters. Fishers monitors recorded 10,636 biometrics for both

species of octopus. Table III shows the catch data and biometric records by species, registered by each FPU in the FIP. According to the biometrics performed on both octopus's species, it turned out that 99% were of legal size (mantle length $\geq 11\text{cm}$) or legal weight (total body weight $\geq 0.450\text{ kg}$).

Table III. Record of catches for each species of octopus by the UoC, according to small vessels (SV) and medium-height vessels (MHV) and biometric information of each species. Mantle length (ML), number samples (n).

Species	Catches Information			Biometric information			Cost information
	SV catches (kg)	MHV catches (kg)	Total catches	Average weight (kg)	Average ML (cm)	Records (n)	Cost: MXN per kg
<i>Octopus americanus</i>	-	100,055	100,055	0.917	13.3	475	101.7
<i>Octopus maya</i>	360,666	327,966	688,632	0.71	12.23	10,161	78.8
TOTAL	360,666	428,021	788,687	-	-	10,636	-

Use of bait

PescaData bait monitoring

To achieve accurate compliance with this activity, the FPU recorded through PD the data on the bait they use for octopus fishing (species, volume, price) throughout the season. Simultaneously, a photographic record of the purchase notes and the bait is kept at the time of purchase (Annex I).

During the octopus fishing season, the FPU used a total of 52,473 kg of bait where the mostly used species was the crustacean known locally as mangrove-land or ocol (*Ucides cordatus*) with 73.5% of the total followed by 26.4% of the spider crab or maxquil (*Libinia dubia*) (Table IV). The ocol present a legally developed fishery with fishing permits, appearing in the national fishing charter (CNP, 2012), and in a scientific/binding document from the government authority for fisheries research (INAPESCA). The ocol generally caught in states such as Tabasco and Veracruz, a region where there are fishing permits to extract this species. This bait is transported frozen, fresh or live in containers to the Yucatan coast, where it is purchased almost daily directly by the SV, in the case of the EMAs, the company purchases the bait days in advance to stock the boat prior to the fishing trip. The maxquil is not yet regulated; however, it is a local fishing carried out by women in a traditional way, research fishing is being planned to determine the parameters. The cost of the bait varied according to various factors such as supplier, quality and date (pers. comm.), ranging from \$70.00 to \$85.00 MXN/kg (\$4.11 to \$5.00 USD). All the bait used by the UoC belongs to legal and permitted species during the entire octopus season. However, it is important to identify and completely eradicate the use of non-permitted bait. Likewise, it is verified that the FPU incorporated into the FIP **did not use ETP species** such as the mitten crab (*L. polyphemus*), which is protected by NOM-059-SEMARNAT-2010, but its use in the octopus fishery in the state of Yucatan has been documented.

Table IV. Information on the total amount of bait species used by the SV and MHV registered during the fishing monitoring of the octopus FIP in Yucatán.

Species used as bait in the 2023 season by SV and MHV of the octopus FIP							
No.	Common name	Specie	Quantity (kgs)	Relationship: bait (kgs)/octopus catch (kgs)	Average price (MXN/1kg)	Logbook numbers	%
1	Mangrove-land crab or Ocol	<i>Ucides cordatus</i>	49,192	0.08	76.72	2,523	73.5
2	Spider crab or Maxquil	<i>Libinia dubia</i>	3,281.22	0.07	79.15	906	26.4
Total			52,473	0.066	77.93	3,429	100

Table V. Comparison of indicators recorded by the UoC of the FIP in octopus fishing monitoring from the 2021 to 2023 season

Season	2021	2022	2023	Accumulated
Number of logbooks registered in the FIP	1,883	1,340	3,429	6,652
Kilos of octopus produced by the FIP	1,407,700	986,523	788,687	3,182,910
Kilos of bait registered in the FIP	86,330	29,129	52,473	167,932
Recorded octopus species	<i>O. maya</i> and <i>O. americanus</i>	<i>O. maya</i> and <i>O. americanus</i>	<i>O. maya</i> and <i>O. americanus</i>	<i>O. maya</i> and <i>O. americanus</i>
Bait species used	<i>U. cordatus</i> , <i>L. dubia</i> and <i>C. sapidus</i>	<i>U. cordatus</i> , <i>L. dubia</i> and <i>C. sapidus</i>	<i>U. cordatus</i> and <i>L. dubia</i>	<i>U. cordatus</i> , <i>L. dubia</i> and <i>C. sapidus</i>

Conclusions

1. The low profitability of octopus fishing affected both the SV fleet of the UoC and the UoA, since the majority of cooperatives and fishing companies reduced their fishing effort, limiting the number of fishing trips, and in some cases, restricting completely fishing trips during the entire 2023 fishing season.
2. The Octopus Fishery Monitoring Program in Yucatan will continue to be implemented during the next seasons through PD, incorporating the new FPU that would integrate into the FIP. This database will be shared with INAPESCA to improve its fishing analysis. In addition to this, a predictive model is being developed by COBI that will use the catch data of the UoC to predict the total catches of the UoA, that will be proposed to be used as a complementary tool by CONAPESCA to monitor and avoid surpassing the yearly quota.

3. The FPU incorporated into the FIP used only legal species and those allowed to be used as bait in the 2023 octopus fishery, all the bait information was registered in PD, likewise this organizations provided extra information that supported the registered logbooks, such as: tables of expenses for provisioning of both fleets, purchase notes and legible photos of the bait delivery (Annex I).
4. There wasn't records of the use of ETP species (for its acronym in English: Endangered, Threatened and Protected) by the FPU incorporated to the FIP or in the Yucatan coast during the 2023 fishing season, such as the horseshoe crab (*L. polyphemus*), which is protected both nationally by NOM-059-SEMARNAT-2010 (DOF, 2010), and internationally (Smith et al., 2016, 2017; Zaldivar-Rae, 2009).
5. Although PD is effective for recording information on the bait used for octopus fishing, it is recommended that it continue to be accompanied by photographic evidence along with the information in the logbooks to identify the species and support the veracity of the information, as it was implemented in the present monitoring.
6. The people trained in the use of PD from the FPU incorporated into the FIP showed great ease in acquiring the expertise to record their fishing information and in using the PD dashboard to share information.
7. The PD electronic logbook used as a tool to monitor the octopus fishery by the FPU incorporated into the FIP, proved to be extremely practical in terms of the ease of uploading, saving and downloading fishing information at any time and place.
8. PD proved to be a timely tool in terms of the short time required to record information and the possibility of immediate review by people involved in the issue such as CSOs, academics and/or government agencies, which in certain cases, like the octopus fishery, they require access to information promptly and accurately.
9. The people trained in the use of PD will continue to be monitored to implement the Octopus Fisheries Monitoring during 2024 season, in the same way new people from the new UFP that join the octopus FIP will be trained.

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Annex I. Photographic evidence of the FPU bait purchase in the 2023 season.



1, 2 & 3. Bait purchase notes (Ocol and maxquil) in August, September and October 2023, Municipality of Progreso and Celestun in Yucatan.
4. Fresh ocol prepared with ties ready to be used in octopus fishing in Celestun.
5 & 6. Reception of fresh bait (maxquil) for the Novelos, Cayo Arenas and Pulmemar fishing cooperatives in Celestun Yucatan

Annex II. Evidence of the Octopus Fisheries Monitoring Training with PescaData to the octopus FIP fishing organizations for the 2023.

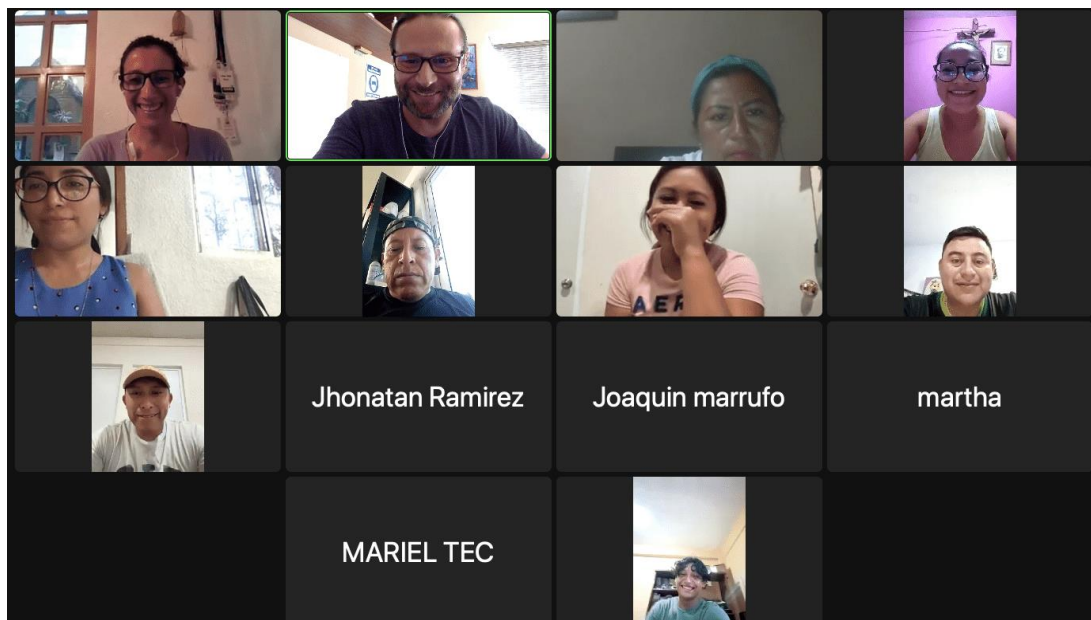


Figure 1. Screenshot of virtual training on Octopus Fisheries Monitoring for personnel from the UPPs incorporated into the FIP.

TRAINING OCTOPUS FISHERIES MONITORING WITH PESCADATA 2023 SEASON

AGENDA

Place: Zoom <https://us02web.zoom.us/j/9550690393> Platform

Date: July 24, 25 and 26, 2023, from 5:00 p.m. to 6:00 p.m. (Mexico City/Merida Time).

Particular objective: To provide the monitors of each fishing organization that participate in the FIP-Octopus with the necessary capacities to implement a Fishery/biological Monitoring of Octopus with [PescaData](#) in a correct and timely manner.

Dynamics of the sessions: Theoretical presentations of one hour and an hour and a half with spaces for questions.

DAY 1 (July 24, 2023)		
Timetable	Topic title	Speaker/Institution
SESSION I: GENERAL TOPICS		
17:00 - 18:00	<ul style="list-style-type: none"> ● Sustainable fishing ● FIP-Pulpo ● Fisheries Monitoring ● PescaData 	Lorena Rocha and Polo Bajaras (COBI)
DAY 2 (July 25, 2023)		
Timetable	Topic title	Speaker/Institution
SESSION II: OCTOPUS BIOLOGICAL INFORMATION		
17:00 - 18:00	Sexing octopuses Identification of Yucatan octopus species Biometrics (mantle length and weight) Sexual maturity in octopuses	Dr. Otilio Avendaño and Mtro. Celso Cedillo (UNAM)
DAY 3 (26 July 2023)		
Timetable	Title	Speaker/Institution
SESSION III: PESCADATA, DASHBOARD AND DIRECTORY		
17:00 - 18:30	PescaData- Sections of PescaData Registration of electronic logs Visualization of information in Dashboard Updating information in Directory	Mariel Tec (MASPESCA), Viviana Pech (PROMARMEX) and Lorena Rocha and Polo Bajaras (COBI)

Technical sheet for the collection and registration of octopus biometrics in PescaData

Prepared by: M. C. Marco Polo Barajas-Girón y BSC. Lorena Rocha-Tejeda

July 2023



Points to remember when uploading an octopus log in PescaData:
For **smaller boats** , a log per boat is uploaded daily for each day of fishing.

For **medium-height** boats, a log is uploaded per boat for each fishing trip.

The bait used must be recorded in each log (species, quantity in kilos and cost) As evidence of the registered bait, it is important to take a photo of the notes / purchase receipts and the bait purchased, and upload it to Google Drive in its folder corresponding to your fishing organization:

<https://drive.google.com/drive/folders/1Bbbj2oy36YXynaQrRiKLSkzKuoQbGeA7?usp=sharing> →

Characteristics to identify between species:


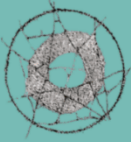


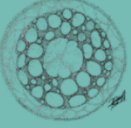
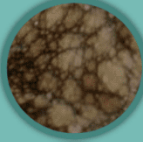

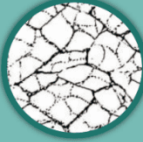


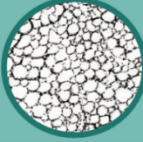
	Especie	Falso ocelo	Patrón dorsal	Patrón umbrella	Ventosas agrandadas
	<i>Octopus maya</i>			NO PRESENTA	En la 8ª y 9ª fila
	<i>Octopus hummelincki</i>			NO PRESENTA	?
	<i>Octopus insularis</i>	NO PRESENTA			En la 8ª y 9ª fila
	<i>Octopus americanus</i>	NO PRESENTA		NO PRESENTA	En la 7ª y 8ª fila

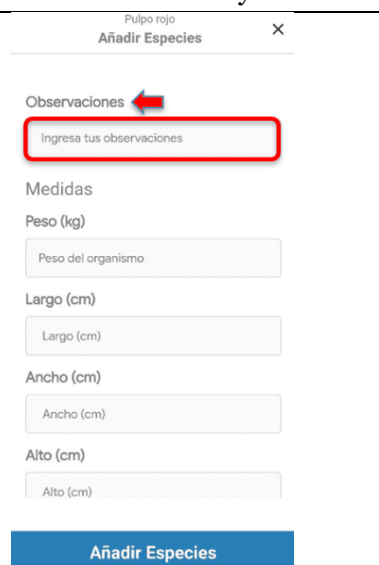
Figure 1. File with images and information of Dr. Otilio Avendaño y Biol. Celso Cedillo

In the log, within the section to add the species caught (PescaData), add in observations the characteristics by which you identified the species (Figure 1), for example:

- False Ocelo
- Dorsal pattern
- Umbrella pattern
- Enlarged suction cups

The common names of the species in PescaData are:

- Paton octopus (*O. vulgaris*)
- Red octopus (*O. maya*)
- Brazilian reef octopus (*O. insularis*)



1. To measure HEIGHT Dorsal mantle length (LMD) and total length (LT)→

- 1.1. Octopus extended with eyes up (dorsal part).
- 1.2. With a tape measure, measure from the middle of the eyes to the tip of the mantle, taking to the rigid part, without stretching the skin.
- 1.3. Write down the length in centimeters.

NOTE: it is measured in centimeters (cm), only the number is recorded in PescaData and the millimeters are pointed, for example: 13.5

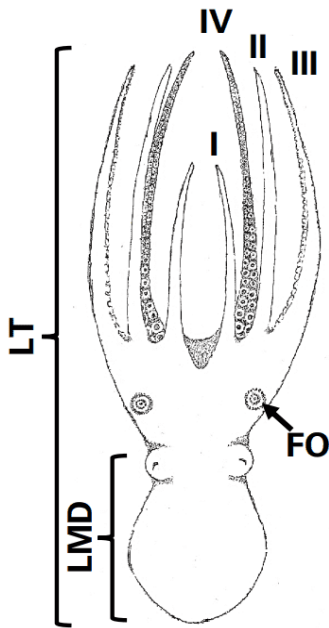


Image by Dr. Otilio Avendaño

LMD: Mantle length
LT: Total length
FO: False ocelo



Image by Dr. Otilio Avendaño



Image by COBI



Image by Dr. Otilio Avendaño

NOTE: Be careful not to measure stretched skin as seen in this photo.

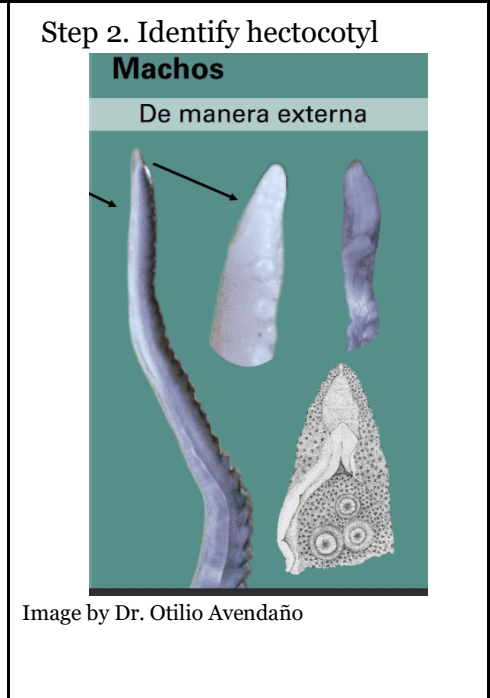
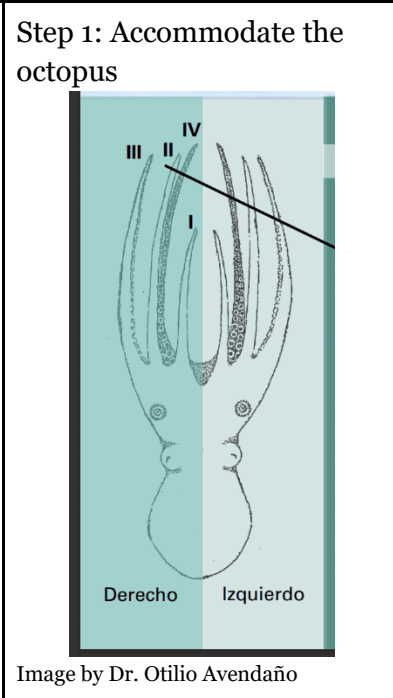
2. To measure the WEIGHT Total weight →gutted

- 2.1. Turn on the scales
 - 2.2. Place a container on the balance.
 - 2.3. Press the "Tare" or "Z/T" button to mark zeros.
 - 2.4. Choose an octopus at random, drain the excess water and place it in the container on the scale.
 - 2.5. Write down the weight in grams.
- NOTE: the whole octopus is weighed and recorded in kilos (Kg), only the number is registered in PescaData, for example: if an octopus weighs 855 grams it will be written: 0.855**



3. To do the SEXING between male or female




3.1. Place the octopus with the eyes upwards. 3.2. Count the third arm on the right side and check it. If it has a white channel (hectocotyl), then it is male, otherwise it is female. In case of being mutilated of the third arm, it will be undifferentiated, so no sex data will be put.



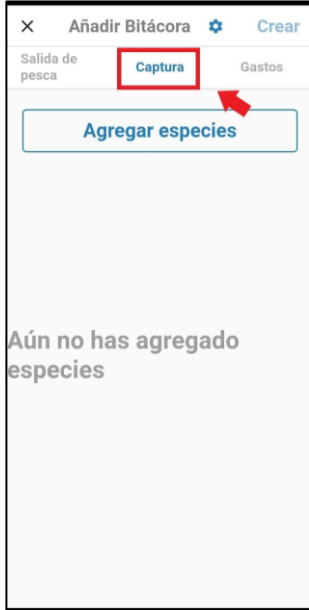
Hectocotilo



4. REGISTRATION OF MEASURES IN [PESCADATA](#)

<p>Step 1. Login to PescaData</p> 	<p>Step 2. Open a new log (+ sign)</p> 	<p>Step 3. Select desired options and click "Continue" (blue bar)</p> 
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Step 4. Select the "Capture" and "Add species" option



Step 5. Select the desired species



Step 6. In the "Measurements" section, record the devierated weight in the "Weight (kg)" option and enter LM in the "Length (cm)" section (number only)



5. REGISTRATION OF BAIT IN [PESCADATA](#)

Step 1. Press black circle with "+" sign to add more biometrics

Step 2. Scroll down to the "Did you use bait?" option., and slide the blue ball to the right to activate it.

Step 3. Record bait data. If different baits were used, add more records in the "+" sign

<p>Pulpo rojo Añadir Especies</p> <p><input type="checkbox"/> Falso ocelo, patrón dorsal red saturada</p> <p>Medidas Alto (cm) <input type="text"/></p> <p>Madurez Madurez ▾</p> <p>Datos de sexo <input checked="" type="checkbox"/> Macho <input type="checkbox"/> Hembra</p> <p><input style="display: none;" type="button" value="+"/></p> <p><input type="button" value="Añadir Especies"/></p>	<p>Pulpo rojo Añadir Especies</p> <p><input type="text"/></p> <p>*Profundidad (Metros) <input type="text"/></p> <p>¿Usaste carnada? <input checked="" type="checkbox"/></p> <p>*Tipo de carnada <input type="text" value="Okol"/></p> <p>*Cantidad de carnada <input type="text" value="2"/></p> <p>*Costo de carnada <input type="text" value="150"/></p> <p><input style="display: none;" type="button" value="+"/></p> <p><input type="button" value="Añadir Especies"/></p>	<p>Pulpo rojo Añadir Especies</p> <p><input type="text"/></p> <p>*Profundidad (Metros) <input type="text"/></p> <p>¿Usaste carnada? <input checked="" type="checkbox"/></p> <p>*Tipo de carnada <input type="text" value="Okol"/></p> <p>*Cantidad de carnada <input type="text" value="2"/></p> <p>*Costo de carnada <input type="text" value="150"/></p> <p><input style="display: none;" type="button" value="+"/></p> <p><input type="button" value="Añadir Especies"/></p>
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