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Fishing monitoring by implementing PescaData, and characterization of bait species in the Octopus FIP in Yucatan, 2022 season



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COBI

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To Carolina Interian, Mariel Tec, Lourdes May, Cristina Alvarado and Manolo Sanchez from the company MASPESCA S.A. of C.V. To Viviana Pech, Denise Zapata and Ramiro Romero from the company EMPACADORA PROMARMEX de S.A. of C.V. To Margarita Novelo, Angel Novelo, Julian Novelo and Ricardo Novelo from Cooperative Cayo Arenas, who generated and shared the monitoring information to develop this report. To the team of the PescaData application that collaborated with the training and constant follow-up of the fishers involved in uploading the information. To the Ocean Stewardship Fund for the ITM grant and the Walton Family Foundation, for funding the improvements in the Octopus fishery in Yucatan, Mexico.

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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, the fishing production units (FPU) 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 2022 fishing season. Also, tissue sampling of bait species was conducted in 13 fishing communities off the Yucatan coast to identify them at species level through genetic analysis. This was complemented by photographic evidence and interviews with fishers in the field. Additionally, a water sampling from the coolers and refrigerators of the vessels that were fishing for octopus was carried out, to detect the trace of the bait species through an environmental DNA analysis (eDNA).

At the end of July 2022, a red tide event took place on the Yucatan coast, causing fewer small boats to go fishing during August (the first month of the fishing season), compared to normal seasons. During the fishing season, 1,340 fishing logbooks have been recorded through the PD application by FPU. A total catch of 986,523 kg of octopus has been recorded from the FPU, with *Octopus americanus* the most caught, since it is fished mainly by the medium-sized vessels that work in deeper areas and farther from the coast where the red tide may have less effect. The only species of bait recorded in PD by the FPU are the ocol (*Ucides cordatus*), maxquil (*Libinia dubia*) and blue crab (*Callinectes sapidus*), while through tissue samples and interviews the use of 10 different species was recorded along the entire Yucatecan coast, the most frequent species being the ocol, maxquil and blue crab. A collaboration is underway with two researchers from Arizona and Loyola Marymount University to analyzed 114 bait tissue samples through genetics and 18 water samples through eDNA. Also 104 interviews with fishers focused on the use of bait were completed.

Fisheries monitoring with PD has made it possible to obtain information on FPU catches throughout the 2022 season. No ETP species were recorded being used as bait in both the PD records and the tissue samples or interviews. The red tide has affected the octopus fishery on the Yucatan coast, and thanks to the records in PescaData, it is possible to document the occurrence of these kind of phenomena.

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 Mayan or red octopus (*Octopus maya*), the common or patón octopus (*O. americanus*, formerly known as *O. vulgaris*) (Avendaño et al., 2020) and the Brazilian reef octopus (*O. insularis*) (Lima et al., 2017), however, these last two species are 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.

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 (CI). 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](#) 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.

Objective

Present the progress made during the octopus fishing season in Yucatan 2022 in terms of information and monitoring of octopus catches, the use of bait registered by the fishing production units (FPU) incorporated into this FIP through the PescaData electronic logbooks, samples tissue, water samples and bait interviews.

Methodology and preliminary results

Fishing monitoring

- For fishing monitoring, the mobile application PescaData¹ was used as a tool, which, within its multiple functions, serves as an electronic logbook to record fishing information in real time.

¹ <https://pescadata.org/>

- In the month of July 2022, two virtual trainings were held to refresh the use of PescaData and octopus biometric data registration, where two people from each of the three fishing organizations incorporated into the FIP, at that time were trained: [Empacadora PROMARMEX](#), [MASPESCA S.A. de C.V.](#) and [Cooperativa Cayo Arenas](#). In November 2022, a face-to-face training was held in Celestún, Yucatán, with seven people from the FIP organizations that were recently incorporated: [Cooperativa Pulmemar](#), [Cooperativa Novelos](#), [Hul Kin S.A. de S.V.](#) These last three organization did not participate in fishing or bait monitoring, because their incorporation to the FIP and training was at the final stage of the fishing season.
- MASPESCA and PROMARMEX are located in the Port of Progreso, Yucatan, where their medium-height vessels (MHV) are also located. MASPESCA has its small vessels (SV) in the Port of Progreso, while PROMARMEX has them distributed in the ports of Celestún, Chuburná, Chicxulub and Telchac, in the state of Yucatán. The Cooperative Cayo Arenas is located in Celestún, the same place where its SV are located (Fig.1).
- At the end of July, a red tide event began on the coast of Yucatan, which was spread from the community El Cuyo to Chuburná (Fig. 1). To document the effects of this event on fishing, we conducted telephone interviews with 91 people involved in the value network of nine small-scale fisheries in Yucatan. The results are available in the “Impact of the red tide on the fishing communities of Yucatan during the summer of 2022” report (COBI, 2022).
- The red tide has caused a decrease in octopus catches due to the low presence of the species in the area. In the case of PROMARMEX, during almost the entire octopus fishing season, they have only operated with their MHV, which was reflected in the limited number of logbooks registered in PescaData (Table I) and the low volume of catch compared to the previous season that registered 1,718 logbooks. MHV logbooks are usually recorded per fishing trip which lasts between 15 to 20 days. On the other hand, MASPESCA has operated with both MHV and SV, however, the last ones have gone fishing for a few days in the first month of the season (12 days in August in total). After reducing the impact of the red tide in the region, the number of fishing trips increased. Cooperative Cayo Arenas operated with some of its SV during the entire season. Table I shows the summary of the information about the number of boats and logbooks registered for each fishing organizations. A total of 277 non-fishing records were documented in the logbooks by the three FPU, explaining the reason why it was not possible to fish. These records were more than in previous seasons and was mainly due to the red tide event.

Table I. Number of logbooks and vessels registered by the FPU incorporated into the FIP during the start of the 2022 octopus fishing season in Yucatan.

	SV Information		MHV Information		Total fleet
	Number of SV	Number of logbooks	Number of MHV	Number of logbooks	Total logbooks
MASPESCA	6	508	12	97	605
PROMARMEX	51	280	26	109	389
Cayo Arenas	10	346	0	0	346
TOTAL	67	1,134	38	206	1,340

- Due to this red tide event that occurred close to the coast, the catches have been mainly from MHV in deeper areas and farther from the coast or in the east Yucatan coast, where it seems that the red tide had minor damage. *Octopus americanus* was the species with the most recorded catches while *O. maya* has been captured in smaller proportions. 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). Fishers monitors performed and recorded 3,313 biometrics for both species of octopus. Table II shows the catch data and biometric records by species, registered by each FIP fishing organization. According to the biometrics performed on both octopus's species, it turned out that 99.5% were of legal size (mantle length $\geq 11\text{cm}$).

Table II. Record of catches for each species of octopus by the FPU incorporated into the FIP, according to small vessels (SV) and medium-height vessels (MHV) and biometric information of each species. Mantle length (ML).

	Catches Information			Biometric information		Cost information
	SV catches (kg)	MHV catches (kg)	Total catches	Average weight (g)	Avarage ML (cm)	Cost per kg
<i>Octopus americanus</i>	265	659,907	660,172	949 \pm 345	13.9 \pm 1.5	\$117 \pm \$11
<i>Octopus maya</i>	103,780	222,571	326,351	892 \pm 327	13.6 \pm 1.4	\$123 \pm \$14
TOTAL	104,045	882,478	986,523	-	-	-

Use of bait

PescaData bait monitoring

- To achieve this activity, the FPU registered the data of the bait they use for octopus fishing (species, volume, price, etc.) through the digital application PescaData throughout the season. They have also taken photographs of the purchase notes and the bait at the time of purchase (Annex I).
- During the octopus fishing season, The FPU used a total of 29,129 kg of bait where the mostly used species was the crustacean known locally as Ocol (*Ucides cordatus*) with 45.4% of the total followed by blue crab (*Callinectes sapidus*) and the spider crab (*Libinia dubia*) (Table III). The mangrove-land crab and the blue crab present a legally developed fishery with fishing permits, appearing in the national fishing charter (CNP, 2012), a scientific/binding document from the government authority for fisheries research (INAPESCA). The spider crab 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 \$60.00 to \$200.00 MXN/kg (\$3.5 to \$10.52 USD).

Table III. 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 2022 season by SV and MHV of the octopus FIP							
No.	Common name	Specie	Quantity (kgs)	Relationship: bait (kgs)/octopus catch (kgs)	Average price (MXN/1 kg)	Logbook numbers	%
1	Mangrove-land crab or Ocol	<i>Ucides cordatus</i>	25,088	0.06	87.00	483	45.4
2	Blue crab	<i>Callinectes sapidus</i>	3,618	0.06	89.00	247	23.2
3	Spider crab or Maxquil	<i>Libinia dubia</i>	422	0.11	155.00	333	31.3
Total			29,129	0.07	110.33	1,063	100

Bait sampling for genetic analysis and fishers' interviews

- To advance in the fulfillment of this activity, an exhaustive sampling was carried out from August 16th to 23th of the 2022 along the entire Yucatan coast, visiting 13 fishing communities in the state (Fig. 1). During this period, tissue samples were randomly collected from the bait that the fishers had on their boats when leaving or returning from fishing, both in SV and MHV. The samples were placed in conical tubes with drying spheres and later sent to the consultant that is carrying out the genetic analysis to corroborate the species. Likewise, photographic evidence was taken, and the data of these samples were recorded in a data base. The red tide event made it difficult to obtain the total number of bait tissue samples, thus a second sampling was done to complete the missing samples during October, when the octopus' fishery has been regularized. Part of these samples were collected by people trained to take tissue samples for genetic analysis (three people from the Cayo Arenas cooperative, one person from PROMARMEX and four people from MASPESCA) (Annex II).
- In addition, face-to-face interviews were conducted with fishers in each community about the use of bait in this fishery, with the help of an illustrated catalog of species with potential for use as bait. In this interview, the fishers were asked about some personal data, what species are being used as bait in octopus fishing and their origin (purchase, fishing, other). Table IV summarizes information about the number of tissue samples and interviews that were conducted in each community.

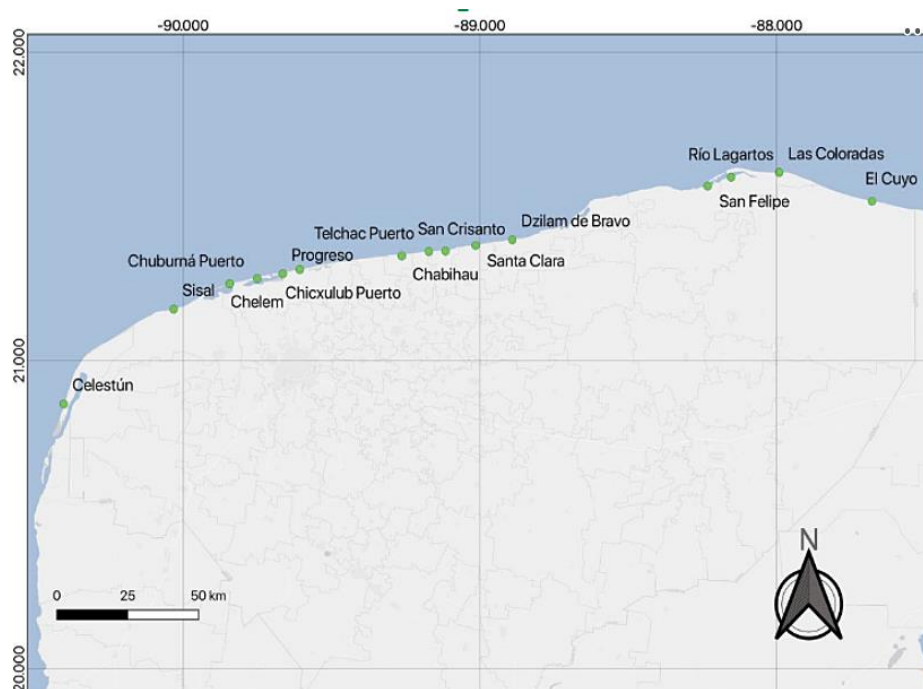


Figure 1. Map of the Yucatan coast that locates the fishing communities where samples and/or interviews were taken related to the bait used in the Octopus fishery during the 2022 fishing season (Source: Prepared by COBI).

Table IV. Number of tissue samples collected for genetic analysis of bait and interviews conducted in each of the fishing communities of the Yucatan coast, during the beginning of the 2022 octopus fishing season.

Community	Number of samples	Number of interviews
Celestún	15	12
Sisal	5	5
Chuburná	12	16
Chelém	5	2
Progreso	40	17
Chicxulub	6	3
Telchac	6	12
San Crisanto y Chabihau	5	8
Dzilam de Bravo	5	6
San Felipe	5	7
Río Lagartos	5	10
Las Coloradas	0	1
El Cuyo	5	5
TOTAL	114	104

- The bait species found in the genetic sampling along the Yucatecan coast were the Ocol with 56.3%, followed by the maxquil with 13.4%, and blue crab with 17%. Although there were also

records of other species with percentages of less than 7% each as spiny lobster heads (*Panulirus argus*), the mounstrito (unidentified species), stone crab (*Menippe mercenaria*), blue crab (*Cardisoma guanhumí*) and cave maxquil (unidentified species) (Fig. 2). All these species were identified visually, and photographic evidence was taken at the time of sample collection, however, the genetic analysis is being done by a Dr. Adrián Munguía (Arizona University) to confirm samples identity.

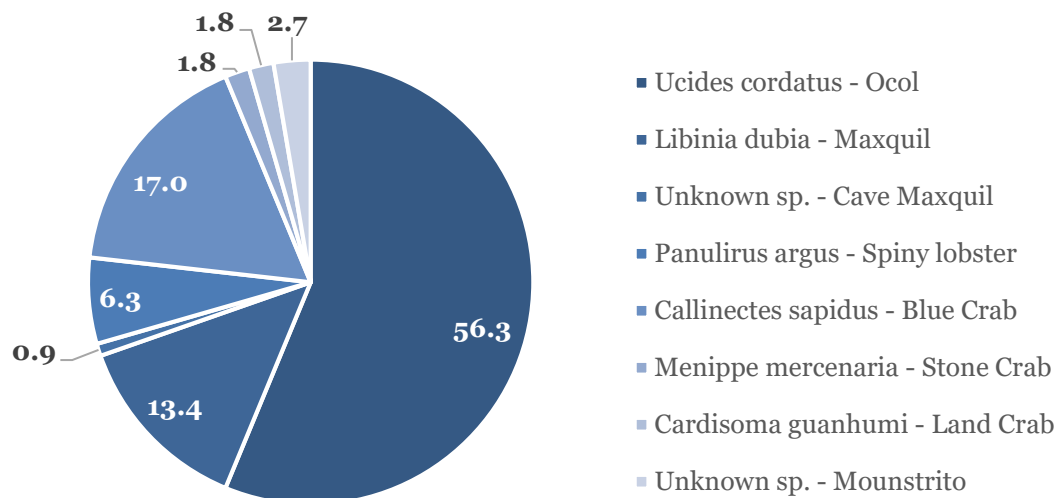


Figure 2. Species used as bait in octopus fishing in Yucatan during the 2022 season, according to genetic sampling. Values are shown as percentages.

- A total of 104 interviews were randomly conducted to fishers from both, the FIP and the octopus fishery in general and from the 13 fishing communities on the Yucatan coast, according to which the species most used as bait was the Ocol with 54.4%, followed by the Maxquil with 14.7%, Bulcai (*Diplectrum* sp.) with 10.3% and blue crab with 8.8%. Other species of crustaceans and fish were also mentioned with percentages lower than 6% (Fig. 3). It is worth to say that only one permit holder said that he had observed fishers bringing horseshoe crab (*Limulus polyphemus*) as bait. However, about 7% of the fishers interviewed commented that the horseshoe crab was used as bait a few years ago (approximately 5 years), however, recently it is no longer used due to greater vigilance and application of sanctions by government authorities and local surveillance committees to prevent its extraction and use, due to the protection status (in danger of extinction) of this species at national level.

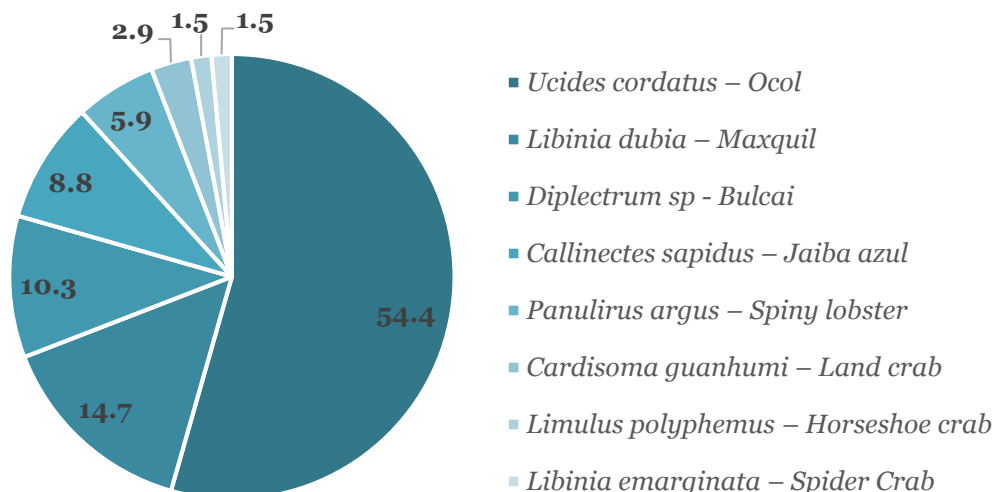


Figure 3. Species used as bait in octopus fishing in Yucatan during the 2022 season, according to interviews with fishers. Values are shown as percentages.

Detection of bait species by eDNA

- In November 2022, a sampling of water from the coolers and refrigerators of the octopus vessels was carried out, to detect the trace of the bait species that were present in the water through an environmental DNA analysis. This analysis is being carried out in collaboration with Dr. Demian Willette (Loyola Marymount University). Results are still in progress.
- 18 samples were obtained, 8 from SV and 10 from MHV. Samples were obtained from Celestún (4), Progreso Port (10), San Felipe (2) and Río Lagartos (2). Water samples were taken from the UoA and UoC. Seven people from the three FPU were trained in the collection of water and processing for the extraction of organic matter and fixation of samples to be analyzed by eDNA. The broth sampled contains genetic material from the species stored in the vessel's fridges. By this method it will be possible to identify if they used species not allowed as bait (Anex III).

Conclusions

1. The red tide has affected the octopus fishery on the Yucatan coast, and thanks to the records in PescaData, it is possible to document the occurrence of these phenomena.
2. The Octopus Fishery Monitoring Program in Yucatan will continue to be implemented during the next seasons through PescaData, incorporating the new FPU that are integrated into the FIP. This database will be shared with INAPESCA to improve its fishing analysis. In addition to this, a model is being developed that will use the catch data of the UoC to predict the total catches of the UoA.
3. The FPU incorporated into the FIP used only legal species and those allowed to be used as bait in the 2022 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. With the information collected through interviews, photographs and tissue samples, there are no 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 2022 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; Zaldívar-Rae, 2009).
5. Although PescaData 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.

Bibliography

- Avendaño, O., Roura, Á, Cedillo-Robles, C. E., González, ÁF., Rodríguez-Canul, R., Velaázquez-Abunader, I., et al. (2020). *Octopus americanus*: a cryptic species of the *O. vulgaris* species complex redescribed from the Caribbean. *Aquat. Ecol.* 54, 909–925. doi: 10.1007/s10452-020-09778-6.
- CNP: Carta Nacional Pesquera, (2012). Instituto Nacional de Pesca y Acuicultura (INAPESCA). 128 p.p. en el Diario Oficial de la Federación el 24 de agosto del 2012.
- COBI, (2022). Impact of the red tide on the fishing communities of Yucatan during the summer of 2022. Guaymas, Sonora, Mexico. 14pp.
- CONAPESCA, (2018). Secretaría de Agricultura y Desarrollo Rural, Comisión Nacional de Acuicultura y Pesca, Anuario Estadístico de Acuicultura y Pesca 2018, (CONAPESCA), México.
- DOF, Diario Oficial de la Federación, (2014) Acuerdo por el que se da a conocer el Plan de Manejo Pesquero de pulpo (*O. maya* y *O. vulgaris*) del Golfo de México y Mar Caribe. (SAGARPA, México), 28 de marzo de 2014. Tercera sección.
- DOF, Diario Oficial de la Federación, (2010). Norma Oficial Mexicana NOM-059-SEMARNAT-2010, Protección ambiental-Especies nativas de México de flora y fauna silvestres-Categorías de riesgo y especificaciones para su inclusión, exclusión o cambio-Lista de especies en riesgo (SEMARNAT-México), 12 de septiembre de 2016.
- Lima, F. D., Berbel-Filho, W. M., Leite, T. S., Rosas, C., & Lima, S. M. Q., (2017). Occurrence of *Octopus insularis* Leite and Haimovici, 2008 in the Tropical Northwestern Atlantic and implications of species misidentification to octopus fisheries management. *Marine Biodiversity*, 47(3), 723–734 pp.
- Smith DR, Beekey MA, Brockmann HJ, King TL, Millard MJ, Zaldívar-Rae JA., (2016). *Limulus polyphemus*. The IUCN Red List of Threatened Species 2016: eT11987A80159830.
- Smith DR, Brockmann HJ, Beekey MA, King TL, Millard MJ, Zaldívar-Rae J., (2017). Conservation status of the American horseshoe crab, (*Limulus polyphemus*): a regional assessment. *Rev Fish Biol Fish.* 27:135–175 pp.
- Zaldívar-Rae J, Sapién-Silva RE, Rosales-Raya M, Brockmann HJ., (2009). American Horseshoe Crabs, *Limulus polyphemus*, in México: Open Possibilities. In: Tanacredi JT, Botton ML, Smith D (eds.), *Biology and Conservation of Horseshoe Crabs*. New York (NY): Springer. 97–113 pp.

Annex I. Photographic evidence of the FPU bait purchase in the 2022 season.

NOTA DE REMISION Comoda Ocol

FECHA: 01/08/22
DIA: MES: AÑO:

SR: Jose Manuel Sanchez Gonzalez TELEFONO: 999 94 25
DOMICILIO: C. 5a y 1a Av. Industrial Portuario Yucapeta CODIGO POSTAL: 97900
CUIDADO: Progreso YUCATAN CONDOMINIO: Comoda

CANT.	ARTICULO	PRECIO	IMPORTE
13	Maspesa 1	\$110	\$1,430
14	Maspesa 2	\$110	\$1,540
11	Maspesa 3	\$110	\$1,210
13	Maspesa 4	\$110	\$1,430
14	Maspesa 5	\$110	\$1,540
15	Maspesa 6	\$110	\$1,650

80 kg Ocol

SUB-TOTAL: \$8,800.00

TOTAL: \$8,800.00

1

NOTA DE REMISION Chaman Ocol

FECHA: 01/08/22
DIA: MES: AÑO:

SR: Jose Manuel Sanchez Gonzalez TELEFONO: 999 94 25
DOMICILIO: C. 5a y 1a Av. Industrial Portuario Yucapeta CODIGO POSTAL: 97900
CUIDADO: Progreso YUCATAN CONDOMINIO: Comoda

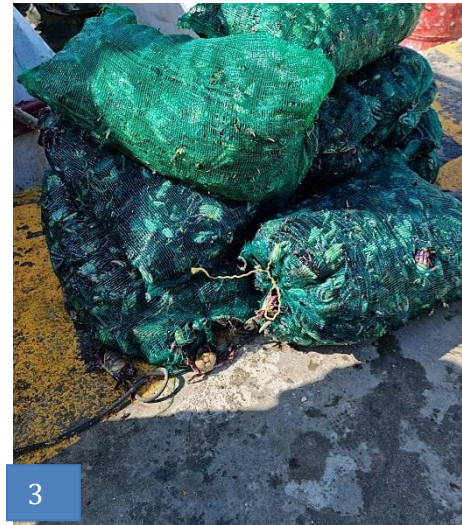
CANT.	ARTICULO	PRECIO	IMPORTE
15	Maspesa 1	1110	1,665.0
15	Maspesa 2	1110	1,665.0
15	Maspesa 3	1110	1,665.0
14	Maspesa 4	1110	1,554.0
15	Maspesa 5	1110	1,665.0
15	Maspesa 6	1110	1,665.0

89 kg

SUB-TOTAL: 14,770.00

TOTAL: 14,770.00

2



1 & 2. Bait purchase notes (Ocol) in August 2022, Municipality of Progreso in Yucatan.
3, 4 & 5. Reception of fresh bait in sacks, MASPESCA, Municipality of Progreso in Yucatan.
6, 7 & 8. Reception of fresh bait in sacks, PROMARMEX, Municipality of Progreso in Yucatan.

Annex II. Photographic evidence of the field visit to take samples of bait tissue for genetic analysis and interviews with fishers





12



13

1 & 2. Interviews about the use of bait to fishermen, Municipality of Celestún in Yucatán.

3, 4, 5 & 6. Sampling of tissue from the bait *in situ*, Municipalities of Celestún, Progreso and Río Lagartos in Yucatán.

7, 8 & 9. Training of the protocol for taking samples of bait tissue to Margarita Novelo, Ángel Novelo and Carlos Novelo from the Cooperativa Cayo Arenas, Municipality of Celestún in Yucatán.

10 & 11. Training of the protocol for taking samples of bait tissue to Mariel Tec, Carolina Interian, Cristina Alvarado and Carlos from MASPESCA, Municipality of Progreso in Yucatan.

12. Red tide in the community of Chicxulub, Municipality of Progreso in Yucatan.

13. Red tide and dead fish in the community of Dzilam de Bravo in Yucatan.

Annex III. Photographic evidence of the field visit to collect and train the staff of the FPUs in taking water samples to be analyzed by eDNA.



1. Training on the protocol for taking and processing water samples to be analyzed by eDNA to Mariel Tec, Carolina Interian, Cristina Alvarado and Kenia C. from MASPECA, Municipality of Progreso in Yucatán.

2 & 3. Ice from Fridge of the MASPECA vessel from where the water sample was taken to be analyzed by eDNA.

4. Training of the protocol for taking and processing water samples to be analyzed by eDNA to Margarita Novelo, Ángel Novelo and Carlos Novelo from the Cooperativa Cayo Arenas, Municipality of Celestún in Yucatán.

5 & 6. Kit to process and extract the organic matter contained in the water samples to be analyzed by eDNA. The broth in the bottle contains genetic material from the species stored in the MHV fridges and SV coolers.