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Species identification of swimming crabs fed by yellowfin tuna (YFT) during its high catch periods (2003-2004) in the western Indian Ocean

-Project to search for the keys to elucidate the causes of high YFT catches -

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Abstract

Recently we initiated to investigate identifying species of swimming crab bloomed during the high YFT catch period and fed by YFT in 2003-2004 in the western Indian Ocean and also in the waters around Maldives. This is one of the important keys to elucidate the causes of high YFT catch. Once the causes are cleared out, we can provide appropriate management advices to managers in order to conserve our important YFT resource. We currently investigate it in four locations, i.e., the Yaizu fishing port (Japan), Victoria fishing port (Seychelles), Spanish Purse Seiners and Maldives. We seek more cooperation for this investigation.

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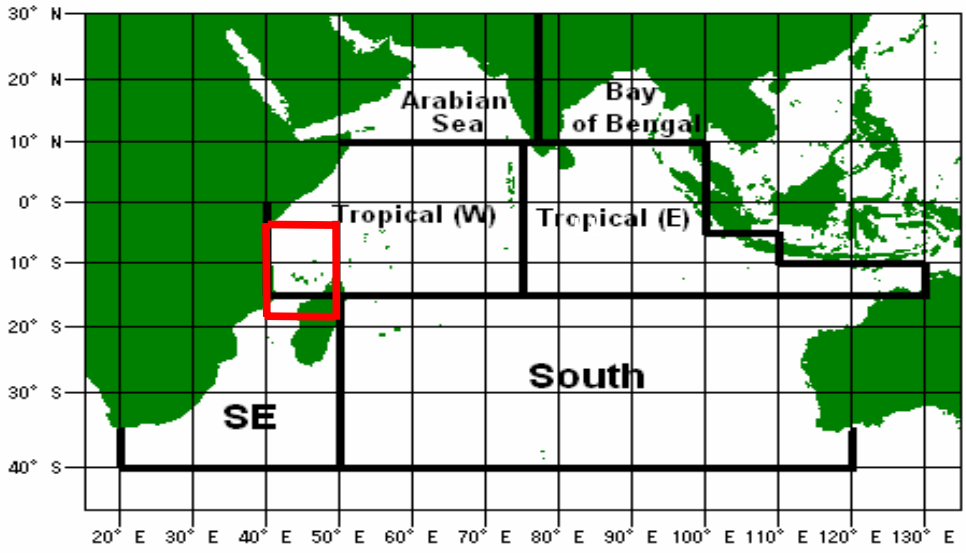
1. Introduction

During 2003-2004, historically high YFT catches were recorded by both longliners (LL) and purse seine fisheries (PS) in the western tropical waters of the Indian Ocean. Such high catches (450,000-500,000 t) easily exceeded more than 1.5 times of the MSY level (around 300,000 tons) (IOTC, 2005). Hence concerns on YFT fisheries managements have been rapidly growing in recent years (IOTC, 2004 and 2005). Thus, it is essential to elucidate the causes of such events in order to provide practical and effective management advices considering such high catches.

In general it is considered that there are four possible causes of such events, which might be integrated and intermingled by different levels, i.e., (a) ecological anomalies, (b) strong recruitments (cohort), (c) increase of catchabilities of fishing vessels & gears and (d) increase of fishing efforts (Nishida et al., 2005).

2. Blooming of swimming crab

Relating to the first factor (ecological anomalies), one of the significant phenomena was that the LL fishers observed abnormal amount of swimming crabs. According to Mr. Warashina, a veteran tuna scientist (Yaizu tuna fishing port branch, National Research Institute of Far Seas Fisheries), LL fishers observed abnormal amount of *some species* of swimming crab in YFT stomachs and even in the longline gears & boats themselves in the tropical western Indian Ocean around 40-50E and 10S-5N (Map 1) during the high YFT catch period in 2003-2004. It is noted that high YFT catch has been continued to in some months of 2005 and 2006.



Map 1 Area where high YFT catch and blooms of swimming crabs were observed by the Japanese LL

Similar events have been also observed in the central tropical waters around Maldives. It has been reported that some fishers observed abnormal amount of swimming crabs in their waters even recently.

Similar event but for southern bluefin tuna (SBT) LL was also observed in the waters off Western Australia (off Fremantle) which caused SBT high catch in the past according to Mr Warashina.

Besides swimming crabs Fonteneau *et al* (2004) reported that sudden blooming of *Natosquilla* was also observed and fed by young YFT caught by PS during its high catch period (2003-2004) in the same area (Map 1) in the western Indian Ocean. This event was also observed in the waters off Kenya according to Ms Nancy Gitonga, Director, Fisheries Department, Kenya.

According to Mr. Warashina (NRIFSF), in the last half century several high YFT catch events (or even extremely low YFT catch events) have been often observed not only in the Indian Ocean, but also in the Pacific and the Atlantic Ocean. Furthermore, high catch for other tuna species were also observed in the past. Causes of such events are considered to be different by each case. For our case from the view points of YFT fisheries and resources managements in this Indian Ocean, we need to put more efforts to elucidate mechanisms of such events to achieve our common goal, sustainable & optimum utilization of YFT resources.

3. Investigation of species ID for the swimming crabs

In general YFT usually feed small pelagic, crustaceans and cephalopods. But we have only fragmental information and there is no specific information on the prey for YFT in the whole Indian Ocean as there are no long-term, continuous and systematic samplings (data) and analyses for the YFT stomach contents except the recent THETIS project by IRD, France which cover mainly the western Indian Ocean. We plan to check their (THETIS) information later.

Under such circumstance, we started to investigate to identify the species of swimming crabs fed by YFT in the Yaizu tuna fishing port (Japan), Victoria fishing port (Seychelles), Maldives and Spanish Purse Seiners. The investigation is conducted through interviews to LL or PS fishers by showing the species identification sheets (see Appendix, p1-11), who exploited YFT during its high catch period in 2003-2004 in the western Indian Ocean. Table 1 show the survey form used in Seychelles and Box 1 shows the sample letter to YFT fisher to seek cooperation for this investigation used in Maldives.

Table 1 Survey form used in Seychelles

Identification of swimming crabs obserevd during high YFT catch period in 2003 and 2004 in the western Indian Ocean

No	Data of Survey	Boat Name	Flag Country	Gear used	Identification of swimming crab	ID No	Locations	Year/Month	Note
1									
2									

4. Preliminary results

We started this investigation recently and have a few preliminary results as below:

- According to Japanese YFT LL fishers operated in the western Indian Ocean during the high YFT catch period and returned to the Yaizu tuna fishing port, Japan, they identified it as No. 428 (*Lissocarcinus orbicularis*). They said that the shell length is about 5-6 cm (much larger than the ID picture one) and the body color is much darker than the one shown in the ID sheet. ID picture They said that they saw so many of this species which were even attached to the LL gears and boats.

- According to two different Taiwanese YFT LL boats operated in the Maldivian waters during the high YFT catch period in 2003-2004 which landed in the Victoria fishing port, Seychelles on June 21, 2006, they identified it as 424 (*carupa tenuipes*) and its shell length ranged from 2.5-5cm. They saw many of this swimming crab especially in January - March. They said that bigeye tuna also fed this crab.

5. Call for your cooperation

It will be very much appreciated if you can cooperate to help this survey using the survey forms and the ID pictures. If you can help us please contact Tom Nishida at tnishida@affrc.go.jp. We will provide the ID pictures (much better quality one than the one attached in this paper) and the data forms.

Box 1 A Sample letter to YFT fishers to seek cooperation to identify species of swimming crab (Maldives)

To yellowfin tuna fishers in the Indian Ocean

As you might know, there was extraordinary high catches of yellowfin tuna in the western Indian Ocean from 2003 to 2004 (and also in 2006). IOTC scientists are now investigating its causes.

In the high catch waters, some particular species of swimming crabs (feed of yellowfin tuna) were heavily observed particularly by the longline fishers. In the extreme cases such swimming crabs came to the longline gears and also to the boats. Some fishers in Maldives also observed.

We are now investigating species names of that particular swimming crab as they might be one of the causes of the high catch. In this connection could you please help to inform us if you know such species by identifying them in this color picture sheets. All swimming crabs in this sheet inhabit in the Indian Ocean.

If you can identify please inform (a) name, (b) locations, (c) time(year and month) and (d) other useful relevant information TO:

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Many thanks for your kind cooperation and we wish your good fishing!

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