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A survey of the availability of fish species in the landing centers of DhiQar Province, Iraq, during the period from 2005 to 2016

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Abstract - The current study was designed to evaluate the landing and distribution pathways of fish in DhiQar during the period from 2005 to 2016. This investigation was carried out to overview the location of the fish landing/entering centers, the source of supply and availability of fisheries organisms in DhiQar Province. Gill net, seine net, cast net and electro-fishing gears were used mainly for catching the freshwater fish. The total fish landing in the province during the above mentioned period was about 37427 tons. The maximum landed was about 4245 tons during 2016 which accounted for about 11% of the total catch. Out of thirteen freshwater fish species, 3 were marine fish species, the total landed fish was dominated by the less economically fish such as *Palaniza abu* which accounted for about 44 % of the total catch. Alternatively, the highly economically fish were landed in a less amount throughout the time studied. Seven native fish species were recorded during the study which made up of 67 % of the total catch. The alien species were 3 and made about 21 % of the total fish landed. Migratory species were occurred at the lowest level and formed about 12 % of the total catch. It could be concluded that most quantities of fish landings in the fish markets has always come from the captured fisheries, the rest were coming from aquaculture production.

Keywords: Landing centers, Fish species, DhiQar Province.

Introduction

The fishery sector has an important role as a main supplier of animal protein to the southern of Iraqi population. The total inland catch of fish in Iraq was in the region of 23600 tons, with more 60% of this catch found from the Mesopotamian marshes (Partow, 2001). The fisheries are usually believed to consist of two main components, namely freshwater capture fisheries and aquaculture. Various of biological aspects for economical fishes have been previously investigated by several workers (Nasir *et al.*, 1988; Mohamed *et al.*, 1998; Nasir, 2006; Al-Dubakel, 2011). Later, Mohamed *et al.* (2009) reported that the total of 4715 fishes of 15 species were recorded in Al-Hammar marshes from October 2005 to September 2006 and also suggested that the fish species divided into resident, seasonal and occasional groups. On the other hand, Southern Marshes of Iraq were suffering from different matters caused by the wars, pollution and the water flows in the main River systems of inland freshwater which have been decreased during recently as a result of wide damming in their upper reaches (FAO, 1999) which led to loss of their native aquatic flora and fauna. Duranceand and Ormerod (2007) suggested that the environmental factors play an important role on fish stock of the marshes such as the water temperature which controls migration and distribution of the fish.

Salinity might also affect the fish composition. Additionally, the population structure, distribution and movement are controlled by overlapping of living and non-living factors. Indeed, there are several of environmental variation to Iraq's coastal habitat due to long time tendency of damming of the Tigris and Euphrates rivers which decrease downstream flows and the draining of the large areas of the marshes in the Southern region of Iraq (FAO, 1999). These marshes form about 60% of the total fish catch and also provided as nursery areas for a number of commercial species (Regional Commission for Fisheries, 2017). However, the changes in the amount and location of fish, environmental conditions, labour, fuel, gear costs, other expenses and market needs affect the differences in the commercial catches between the years and between the regions (Nasir and Khalid, 2017). On the other hand, fishing effort is influenced by the price paid to fishermen making fishing vessels shifted from one fishery to another as a result of price motivation. However, the fisheries section has fish landing complex in the major landing places throughout the DhiQar Province.

Fish landing center plays a essential part in quick and smooth disposal of fresh fish and in this regard the fish landing centers of DhiQar Province may be the point of examination to survey the availability of fish species. Nevertheless, up to now no work has been made on this aspect of this place. The present work was therefore undertaken throughout the period from 2005 to 2016 to study the availability of species in fish landing centers which provide rough information concerning fish fauna available in this province. It also assists to establish the actual picture of species abundance of an area and to get the essential actions if necessary. This study, however, is also an attempt to propose several recommendations in order to improve the fishing in this region and provide details to the fisheries checking programme.

Data Collection:

The fish catch data were gathered from five marshes (Central Marshes, Al-Hammar Marshes, Al-Taar Marshes, Al-Fuhod Marshes and Al-Senaf Marshes) in DhiQar Province (Fig. 1) from 2005 to 2016 by Department of Livestock Services / Fisheries, Agricultural Affairs of DhiQar Directorate, Ministry of Agriculture.

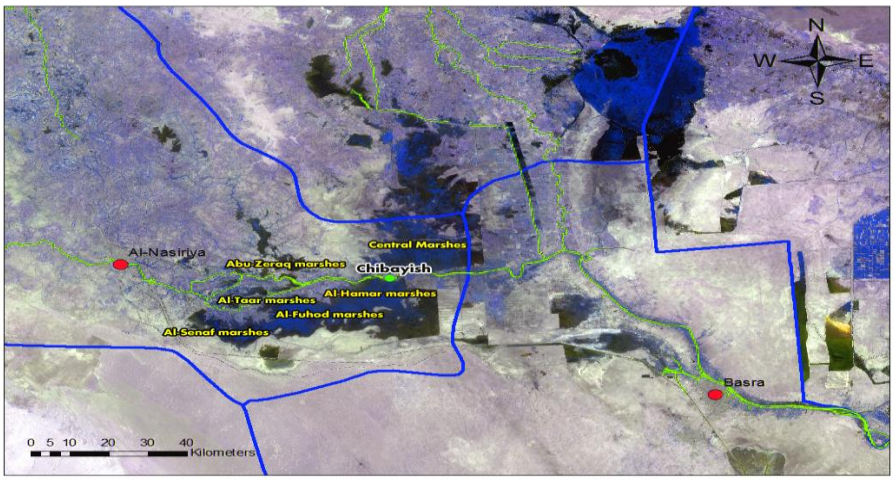

Figure 1. Map showing DhiQar Province and the marshes.

In addition, this work requested the fishing information from the fishermen. Commercial fishing was done in simple methods using small vessels and small technological gear. The fish were collected using seine net (20 m long with a 25 mm mesh), fixed gill nets (100 to 500 m long with 25 mm to 100 mm mesh size), cast net and electro-fishing gear were used by the fishermen. These fish were landed at Chabaish, Al-Fuhod, Shouokh market, Al-Aslaah, Germat Bani Saeed and city center in chilled form. Fish are normally auctioned to wholesalers. The chilled fish from landing places are sent to the main city places for selling in the fish market using buses, pickups and trucks.

Results

Fish landing center plays a vital role in quick and smooth disposal of fresh fish and in this regard the fish landing centers of DhiQar Province may be the point of observation to survey the status of fish and source of fish availability.

Thirteen fish species belonging to six families were found in the marshes of DhiQar Province by fixed different fishing gears during the period between 2005 to 2016 (Table 1). Seven native fish species was found throughout the study which made 67 % of the total catch. The alien species was 3 and made about 21 % of the total catch. Migratory species (*Brachirus orientalis*, *Palaniliza subviridis* and *Tenualosa ilisha*) were ranked at the lowest level and formed about 12 % of the total catch. Five tolerant species such as *Palaniza abu* (formerly known as *Liza abu*), *Cyprinus carpio*, *Coptodon zillii* (formerly known as *Tilapia zillii*), *Palaniliza subviridis* (formerly known as *Liza subviridis*), and *Carassius auratus* formed 78 % of the total catch. The percentage of sensitive species was 22 % (Fig. 2) which include by *Silurus triostegus*, *Crasiobarbus luteus* (formerly known as *Barbus luteus*), *Leuciscus vorax* (formerly known as *Aspius vorax*), *Mesopotamichthys sharpeyi* (formally known as *B. sharpeyi*), *Luciobarbus xanthopterus* (formally known as *B. xanthopterus*), *B. grypus* and *Tenualosa ilisha* (Table 1).

Table 1. Geographic origin and tolerance group of fish landed in DhiQar Province from 2005 to 2016.

Scientific Name	Local Name	Family	Origin	Tolerance
Leuciscus vorax (Heckel, 1843)	Shalik	Cyprinidae	Native	Sensitive
Barbus grypus (Heckel, 1843)	Shaboot	Cyprinidae	Native	Sensitive
Crasiobarbus luteus (Heckel, 1843)	Hemri	Cyprinidae	Native	Sensitive
Mesopotamichthys sharpeyi (Gunther, 1874)	Bunni	Cyprinidae	Native	Sensitive
Luciobarbus xanthopterus (Heckel, 1843)	Gattan	Cyprinidae	Native	Sensitive
Brachirus orientalis (Bloch & Schneider, 1801)	Mezlek	*Soleidae*	Migratory	Sensitive
Carassius auratus (Linnaeus, 1758)	*Kaezmeh*	Cyprinidae	Alien	Tolerance
Cyprinus carpio (Linnaeus, 1758)	Carp	Cyprinidae	Alien	Tolerance
Palaniliza subviridis (Valenciennes, 1836)	Biah	Mugilidae	Migratory	Tolerance
Palaniliza abu (Heckel, 1843)	Khishni	Mugulidae	Native	Tolerance
Silurus triostegus (Heckel, 1843)	Jerry	Siluridae	Native	Sensitive
Tenualosa ilisha (Hamilton, 1822)	Saboor	Clupeidae	Migratory	Sensitive
Coptodon zillii(Gervais, 1848)	Bultee	Cichlidae	Alien	Tolerance

The yearly landing of the fish species (tons) in DhiQar Province for the period 2005-2016 are illustrated in Figure (2). The percentage of the fish species landed during the period from 2005 to 2016 are shown in Figure (3).

The total fish landed was about 37427 tons. This inland fisheries throughout the period of the survey are based mostly on *P. abu* with 16420 tons (44% of the total) which consumed by local people with less marketable value (Figs. 2 & 3). As seen in Figure (3) that *B. grypus, B. luteus, M sharpeyi, L. xanthopteru, C. carpio, P. subviridis* and *T. ilisha* formed considerable part (36%) of the total catch from 2005 to 2016. These fish are more economically important with profitable prices and marketable value and consumed by the locals. Thus there is no significant fish processing industry. Some other remaining of the fish are not consumed by people (13%) have used for manufacturing animal feed. These fishes are *S. triostegus and L. vorax* (Table 1).

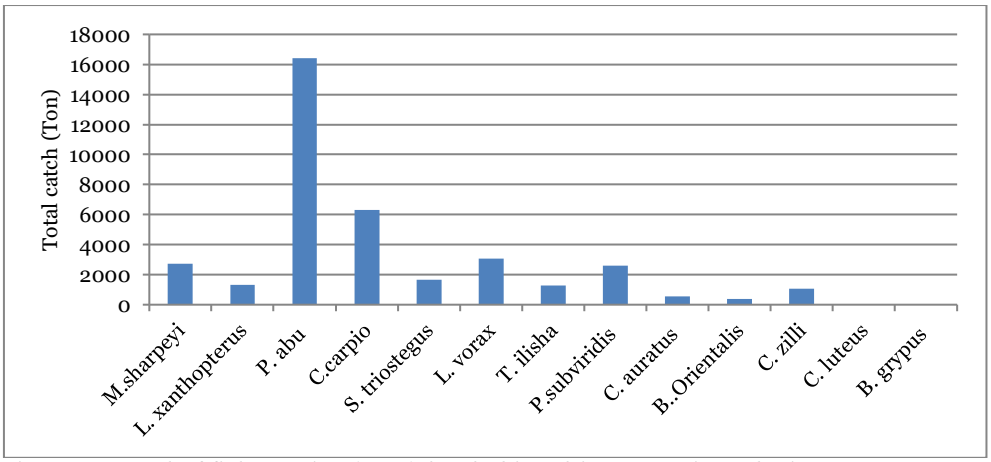

Figure 2. Total of fish species (tons) landed in DhiQar Province during 2005-2016.

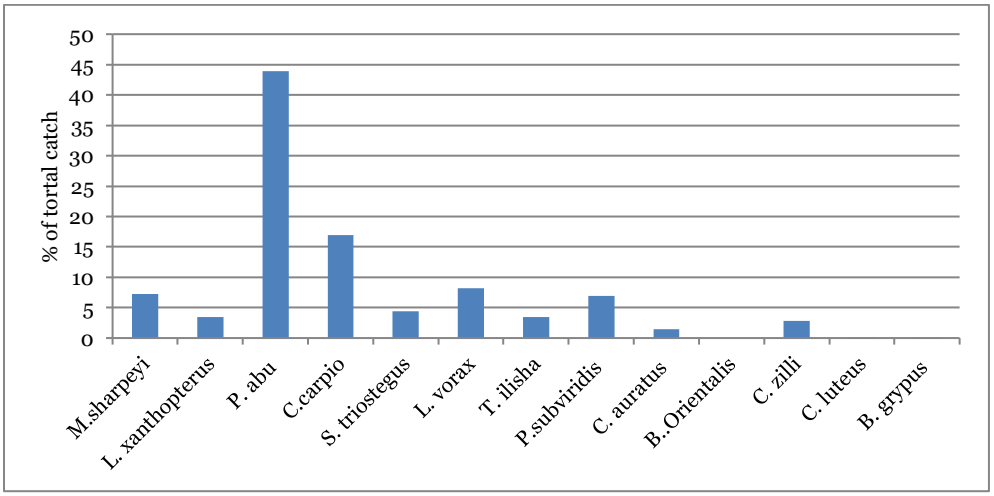

Figure 3. Percentage of the fish species landed in DhiQar Province from 2005 to 2016.

The annual catch of fish throughout the period from 2005 to 2016 are shown in Figure (4). The highest quantity of fish landed was found during 2016 (4245 tons) and the lowest was during 2006 (2480 tons). There is usually a high movement of fish between the different places of the country affecting by the supply and demand situation. The percentage contributions of landing of each year to the total landing during the period of the present study are given in Figure (5).

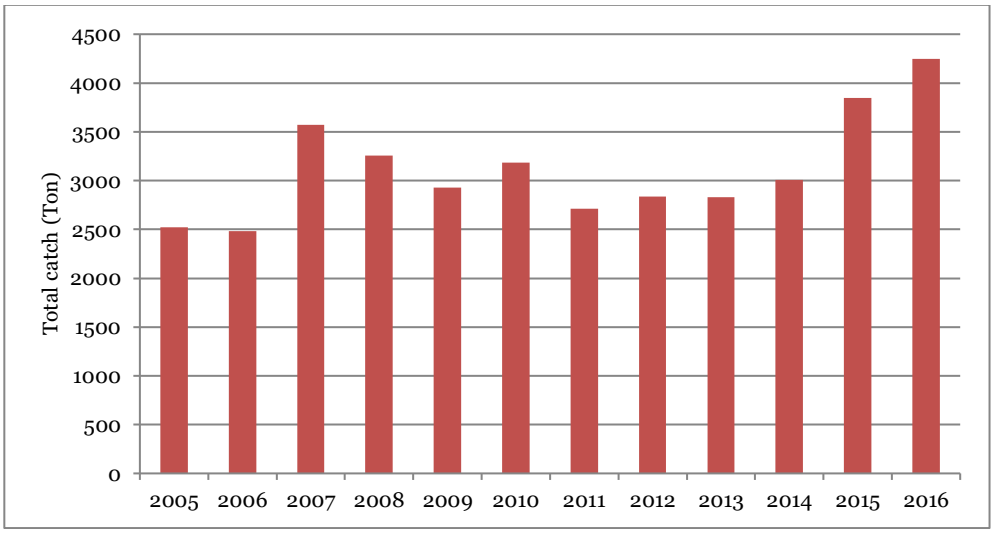

Figure 4. Fish species landed (tons) in DhiQar Province from 2005 to 2016.

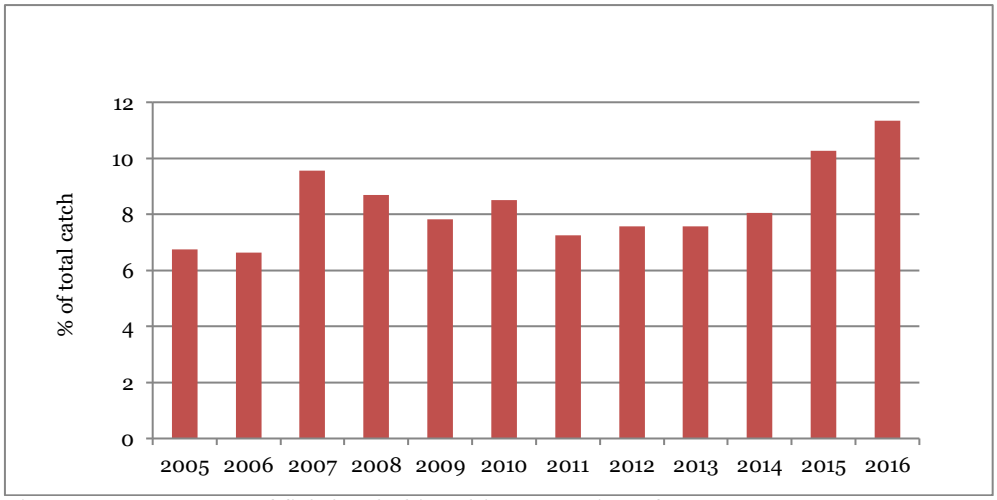

Figure 5. Percentage of fish landed in DhiQar Province from 2005 to 2016.

Discussion

Thirteen fish species belonging to six families (Table 1) were observed in the inland waters of DhiQar Province during the current study. On other hand, as *P.*

abu formed about 44% of total of fish catch (Fig. 3). This species is believed to be one of the important species for artisanal fisheries and is commonly consumed by locals since the marketable price reached 4,000 Iraqi Dinar/kilogram. However, Mohamed *et al.* (2009) also reported that *P. abu* was the most abundant species followed by *B. luteus*, *C. auratus*, *A. mossulensis* and *Aspius vorax*, respectively in the restored East Hammar Marshes.

The maximum volume of the freshwater fishes landings has always come from the capture fisheries, made up of 88.6% of the total production for all the study years, with the rest coming from marine fishes. The yearly changes in fish catch might be due to varying weather and other natural conditions, and market needs for fish. Some popular fish species, such as *S. triostegus*, *C. auratus* and *L. vorax* have had a stable increase in the catch in excess of the past 10 years. Nevertheless, other more economically important species, for instance *M. sharpeyi, C. luteus and L. xanthopterus* have suffered a steady decline in their catch. This experience caused some pressure on fishermen to meet the rising demand for those most economically fish.

On the other hand, because of continuous over fishing, low reproduction rates, and environmental conditions, the stock has not been able to recover fast enough to keep up with demand (Hilborn and Litzinger, 2009). The authorities in DhiQar Province have spent some efforts to decrease the pressure to some extend by restocking these species, but this appeared to be not sufficient to increase their population. Therefore, several fishermen attended to other fish species in order to make some earning from the fishing. Substantial problems raised from overfishing and illegal fishing, this needs to be consider into account as serious threats to the fish stock. However, the weather patterns, environmental conditions (natural or man-made) and market prices have also an important effect on the fish stock (Durance and Ormerod, 2007). In addition, the raise in water salinity and pollution level had also a significant impact on fish stock and consequently, the enforcement of the legislations for Environment Pollution Control in DhiQar province is essential.

It is also very important to highlight that, at the present time, the fishery sector gives direct employment to about 24,000 people in DhiQar Province. These fishermen work on seine net, fixed gill nets, cast net and electro-fishing gear, using a traditional fishing boats. In addition, there was considerable number of fishermen working on small unlicensed fishing vessels. Other employment opportunities have also generated in the supporting of this industry. There is usually a fairly high movement of fish between the different places in the province and the country, depending on the supply and demand circumstances. A significant amount of cultured carp fish, which is not considered in this investigation, is reached DhiQar from Waset and Babylon Provinces, both in live and chilled form. The live ones raised in cage culture. Occasionally the prices could differ largely hourly or from day to day. Therefore, the policy of DhiQar Province is to continue the fish production in order to provide the protein requirements for the general public. A careful inspection of the catches and aquaculture production are important approaches for protecting fish stocks and supporting the ordinary resources obtainable from DhiQar marshes' as the large fishing ground. Therefore, the results of the present work should be consulted for developing the landing sites in DhiQar Province and to provide an outline of the status of DhiQar's fish stock and identifying relevant research requirements.

Recommendations

- The fishermen must return back all the undersized live fishes to the water.
- A commercial fishing license is essential for both the fishermen and their boats.
- Fisheries department should work closely with other governmental authorities and the community to keep, maintain and manage the fish biodiversity.
- Monitoring of catches and aquaculture production are necessary steps for protecting fish stocks and keeping the ordinary resources obtainable in the marsh fishing areas.
- Selected fishing seasons and areas, fish size catch, number and size of fishing gear should legally be used to protect fish stock.
- Good training and education in fishing and aquaculture should be offered by the fisheries department to create skilled workers in order to improve fisheries and the aquaculture sector in the future.

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مسح أنواع الأسماك و مصائدها في مواقع الانزال في محافظة ذي قار، العراق خلال الفترة من 2005 إلى 2016

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المستخلص - صُممت الدراسة الحالية لتقييم مصائد الأسماك وتوزيع الأسماك ومصدر مصيدها في محافظة ذي قار خلال الفترة من 2005 إلى 2016. استخدمت وسائل الصيد كالشباك الخيشومية والكرفة والصيد الكهربائي (غير قانونية) لصيد الأسماك. بلغ مجموع الأسماك المسوقة في المحافظة خلال فترة الدراسة حوالي 37427 طن وكان الحد الأقصى حوالي 4245 طن خلال عام 2016 والتي شكلت حوالي 11٪ من إجمالي الصيد الذي تضمن ثلاثة عشر نوعاً من أسماك المياه العذبة وثلاثة أنواع من الأسماك البحرية وكانت اكثر الاسماك وفرة هو الخشني *Palaniza abu* إذ شكل 44٪ من الصيد الكلي وكانت الأسماك الاقتصادية اقل وفرة وسجل سبعة أنواع من الأسماك المحلية والتي شكلت 67٪ من الصيد الكلي. سجلت ثلاثة من أنواع الاسماك الغريبة وكانت نسبتها 21٪ من الصيد الكلي. فيما اسهمت الأنواع المهاجرة بـ 12٪ من مجموع المصيد الكلي. استنتجت الدراسة بأن معظم كميات الأسماك التي سوقت في اماكن بيع الاسماك في المحافظة كان مصدرها من المصائد الطبيعية، والمتبقي من مصادرها كان من الاستزراع السمكي.

الكلمات المفتاحية: مراكز الانزال، أنواع الأسماك، محافظة ذي قار.