

Commercial demersal marine species of Libya

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Abstract

This study concentrated on the commercial species of the Libyan coastal seas. There are 34 crustacean, 10 cephalopod and 5 sponge species, which are commercially important and have been recorded in this study. Information on trawlable and untrawlable areas was collected. The eastern area of Musrata is untrawlable; the best trawlable area is from the west of Musrata to the Tunisian–Libyan border. Two commercially important shrimp species *Penaeus kerathurus* and *P. longirostris* were also observed to be more abundant in this western area than in the eastern area. Cephalopods were recorded at all sampled stations. Further studies using trawl survey data are needed in Libyan waters in order to produce useful information on Libyan demersal species.

1. Introduction

Studies of marine organisms in the eastern part of Libya have been conducted since the beginning of the twentieth century (Stephenson 1923). The first map showing the locations of fishes and economically valuable sponges in the Libyan marine waters was also drawn up at the beginning of the twentieth century (Scordia 1937). A quantitative inventory of the different species of planktonic and benthic marine organisms along the Libyan coast was produced and further detailed studies were carried out (Pérès 1967; Sogreah 1977; Gashout *et al.* 1992, 2002).

Bottom-dwelling marine organisms are considered economically important in Libya. Some Libyans make their living from this marine wealth. Moreover, certain bottom-living marine animals are used as food and are considered commercially important, giving a strong support to the national economy. The trade in fishery products started in Libya in 1952 (Serbetis 1952).

Recently (1993–1994), the Marine Biology Research Centre (MBRC) staff, with a team of experts from the LIBFISH project and the Benthic Department at MRBC, has carried out a detailed trawl survey in Libyan marine waters. The objective of this project is to assess the fish stocks in these waters. Since there was an important output from this trawling study (Gashout *et al.* 2002), the aim of the present study is focused on the distribution of commercial fauna other than the demersal fish by-catch in Libyan waters (Lamboeuf *et al.* 1995).

2. Materials and methods

The commercial demersal marine fauna was collected by the MBRC Benthic Department staff in 1993–1994 during six cruises carried out by the LIBFISH Project; 108 stations,

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distributed all over the Libyan marine coastal waters, were visited. The coast was divided into 24 transect lines. In each line, seven different depths (25, 50, 75, 100, 150, 200 and 400 m) were chosen. However, the depth range from which the benthic animals were actually collected was 36–282 m (Table 1); this was determined by the trawlable and untrawlable grounds (Sogreah 1977; Contransimex 1977).

Table 1. Summary of trawling surveys in Libyan waters during 1993–1994

Cruise number	Trawling period	Area studied	Lat./long. (approx.)	Water depth (m)	Number of trawling stations		
					Proposed stations	Trawled stations	Sampled stations
I	13–27/6/93	Burdi–Ras-Lanuf	31°22'10"–23°06'33"	51–212	40	20	15
II	22–29/3/94	Tunisian border–Tripoli	34°53'54"–13°02'20"	62–210	26	25	20
III	11–23/4/94	Tunisian border–Musrata	33°31'18"–14°40'48"	36–150	94	60	28
IV	05–12/6/94	Musrata–Ras-Lanuf	31°55'18"–17°58'24"	113–248	59	12	5
V	15–20/10/94	Tunisian border–Musrata	32°33'21"–14°37'32"	40–85	70	27	27
VI	01–11/11/94	Tunisian border–Musrata	33°10'48"–12°14'60"	84–282	30	29	23
Total	13/6/93–11/11/94	Burdi–Tunisian border	34°53'54"–12°14'60" to 33°10'48"–23°06'43"	36–282	319	173	108

The bottom-trawling nets used in this study were of two kinds. The HVO (36×47 m) has a cod-end mesh size of 20 mm and is used on fishing grounds deeper than 100 m. The EXP (28×37 m) has a cod-end mesh size of 20 mm and is used on fishing grounds shallower than 100 m. The haul duration was set at 1 h. The swept areas were estimated to be 11.67 hectares for the HVO net and 9.24 hectares for the EXP net.

Most of the trawling was carried out during the daytime; however, some night trawls were carried out for comparison. At all stations, water temperature, depth and salinity were recorded. Trawling was repeated at the stations that gave a high yield of commercial species. The weight of the total catch was recorded, as well as the weight of each important commercial species of cephalopod and shrimp, in order to determine their biomass and distribution. The collected specimens were put into marked plastic bags (cooled to–10°C) for further laboratory studies.

3. Results

The 108 different stations were sampled during the six surveys along the Libyan coast (Table 1). A total of 176 different benthic species were identified: 34 crustacean species, of which four are of economic interest; 10 cephalopod species, of which six are of economic interest; and five species of commercial sponges. Table 2 shows that cephalopods were more

abundant during cruises III and VI. Moreover, the shrimp *Parapenaeus longirostris* was more abundant in deep water (>50 m), especially in cruises II, III, and VI. *Penaeus kerathurus*, which is common in shallow water (44 m; Gashout *et al.* 2002), was present at only one station (survey V; Tables 1 and 2). In these studies, three different regions were identified.

Cruise I covered the area between Ras Lanouf and Burdi near the Libyan–Egyptian border. This region had been prospected during the first trawl survey. The substrate in this region is mostly rocky, which makes it untrawlable. Only 20 hauls were carried out in this region, of which 15 were considered fruitful, e.g. when good quantities were caught. The total catch including fishes was 22,000 kg, of which, 12,000 kg were commercially important fishes, crustaceans and cephalopods (Lamboeuf *et al.* 1995).

Table 2. The distribution (in terms of stations positively sampled) of commercial demersal species during each of six different cruises

Macrobenthic species of economic value	Cruises					
	I	II	III	IV	V	VI
Cephalopods						
<i>Loligo vulgaris</i>	3, 6, 11, 19, 20	1, 2, 3, 5, 7, 9, 10, 11, 13, 14, 15, 16, 17, 18, 22, 23, 25	2, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 25, 26, 27, 30, 31, 33, 37, 40, 42, 45, 47, 48, 52, 57	–	1, 3, 11, 12, 15, 16, 17, 18, 19, 24, 25	1, 2, 3, 4, 5, 6, 9, 12
<i>Illex</i> spp.(totano)	3, 6, 9, 11, 13, 20	–	2, 4, 5, 6, 7, 10, 32, 57, 58, 60	1, 2, 9, 10, 12	–	7, 8, 9, 13, 14, 15, 17, 23, 24
<i>Sepia officinalis</i> <i>S. orbignyana</i>	1, 2, 3, 19, 20	–	2, 6, 7, 11, 15, 23, 26, 36, 37, 40, 47, 48, 58, 59, 60	1, 2, 10	13, 16, 18, 27	6, 14, 15
<i>Octopus macropus</i> <i>O. vulgaris</i>	2, 19	–	9, 15, 18, 21, 22, 26, 30, 33, 40, 45, 47, 48, 49, 50, 52	–	3, 10, 12, 13, 17	2, 7, 24
<i>Eledone cirrhosa</i> <i>E. moschata</i>	1, 2, 6,	2, 3, 5, 11, 13, 22, 23	5, 7, 15, 27, 59	1, 12	3	5, 6, 9, 12, 14, 15, 16, 17, 21, 24
Crustacea						
<i>Parapenaeus longirostris</i>	13	6, 9, 11, 16, 18, 19, 20, 22, 24	4, 5, 6, 7, 21, 52, 57	4	–	7, 8, 14, 16, 18, 23, 24, 28
<i>Penaeus kerathurus</i>	–	–	–	–	19	–
<i>Squilla mantis</i>	16	36, 27	–	–	7, 8, 9	28
Sponge spp.	3, 6, 7, 16	2, 4, 5, 13, 15, 25	1, 6, 7, 8, 17, 20, 26, 27, 40, 49, 50, 54	3	6, 10, 11, 13, 16, 19, 24	3

High diversity was recognized in this region (132 marine benthic animal species). The commercial cephalopods (*Octopus* and *Sepia*) were present at all the stations trawled in this region. In addition, *Parapenaeus longirostris* was also collected off Benghazi.

The second region covers the area between Ras Lanouf and Musrata and was surveyed by Cruise IV. The sea bottom in this region is also rocky, and it was possible to trawl only 12 out of 59 proposed stations. The benthic animals collected in this region were not abundant (21 different species). The collection was carried out at five deep stations (113, 197, 246, 248 and 282 m depths). Several species of crustaceans were collected, the most important of which was the commercial shrimp (*Parapenaeus longirostris*). The most important cephalopod species were of the genera *Sepia* and *Octopus*. In addition, there were five

commercially important sponge species: *Hippospongia communis*, *Spongia officinalis adriatica*, *S. officinalis mollissima*, *S. agaricina* and *S. zimocca* (grouped in Table 2).

The third region covers the area between Musrata and the Libyan–Tunisian border (Figure 1). The trawling in this region was covered by Cruises II, III, V and VI at lesser depths (41–100 m) and at greater depths (100–282 m). In order to cover this region, 220 different stations were proposed, but only 141 stations were trawled. In this region, 130 different species, such as cephalopods (of the genera *Octopus* and *Sepia*), sponges and shrimps were collected. This region appeared to be the most easily trawlable off the Libyan coast.

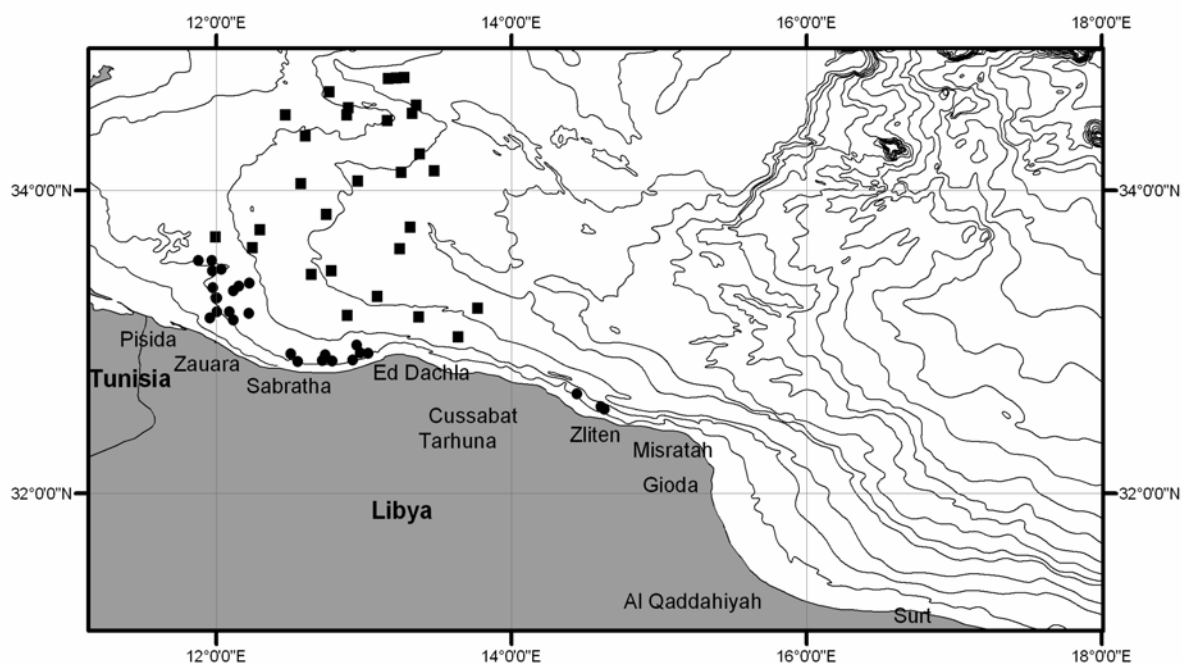


Figure 1. Trawl-survey region from Musrata to the Libyan–Tunisian border during 1993–1994 (Lamboeuf *et al.* 1995)

- (●) Stations surveyed during cruises II and III
- (■) Stations surveyed during cruises IV and V

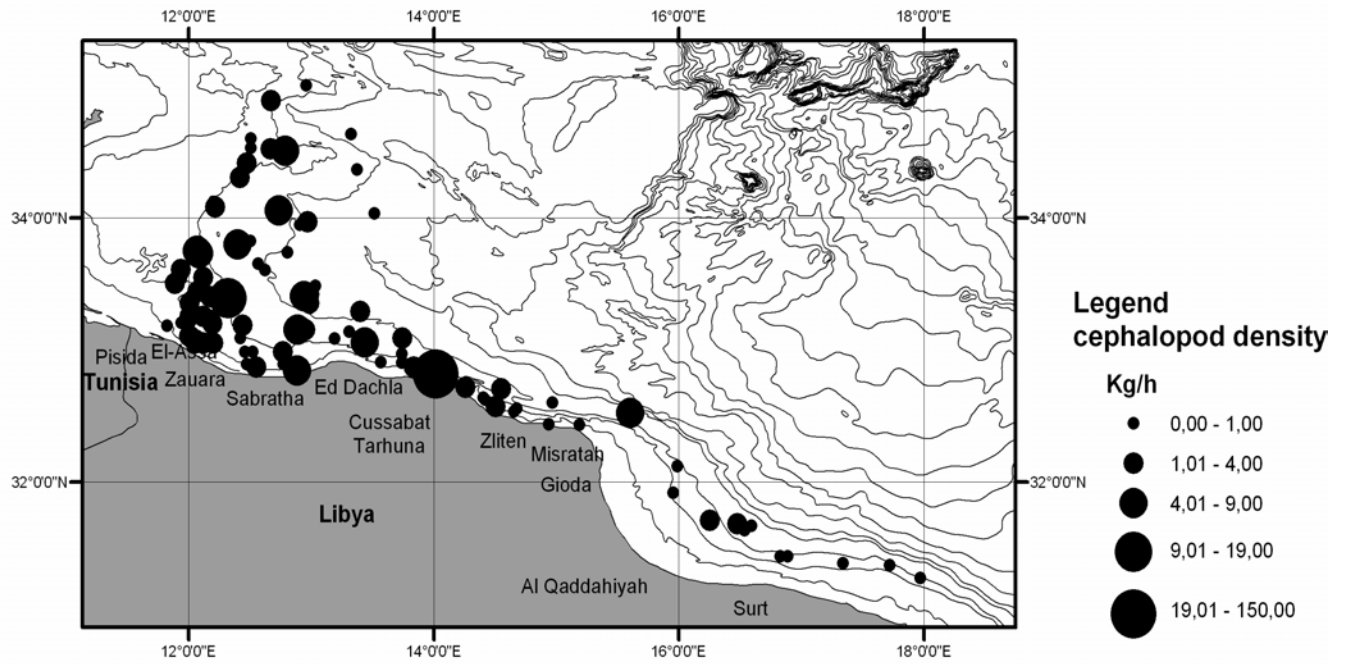


Figure 2. Cephalopod density (March–June 1994)

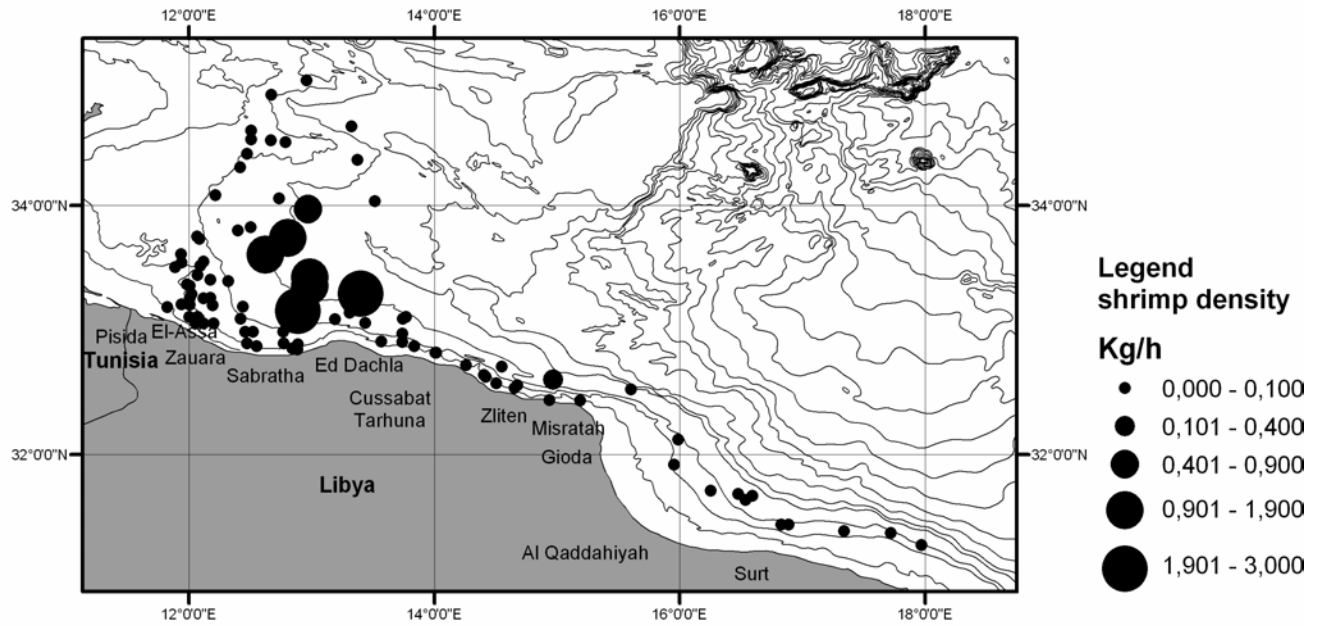


Figure 3. Shrimp density (March–June 1994)

4. Discussion and conclusions

In this study, the identification and distribution of 176 different macrobenthic animal species were determined. This study also indicated that the trawlable waters were between Musrata and the Libyan–Tunisian border. Trawling was limited in the Gulf of Sirte, off Benghazi, and El Gabel Akdar and in depths less than 200 m.

Comparing the results of this study with others (Instrupa 1975; Sogreah 1977; Contransimex 1977), the presence of cephalopods (of the genera *Octopus* and *Sepia*) at all stations studied was notable. However, the shrimp *Parapenaeus longirostris* was found only off Benghazi and from the Gulf of Sirte to the Libyan–Tunisian border. However, the shrimp *Penaeus kerathurus* was not recorded in the eastern waters, since it had already been well documented (Instrupa 1975; Contransimex 1977). This particular species was found between Musrata and the Libyan–Tunisian border, and at depths less than 100 m, as was also found by previous studies (Instrupa 1975; Sogreah 1977).

The presence of a large number of commercial cephalopod species (of the genera *Sepia* and *Octopus*), crustaceans (shrimp) and the five sponge species from Musrata to the Libyan–Tunisian border is in agreement with the previous studies (Azzouz 1969; Sogreah 1977). It was also clear from the present and the previous studies of Libyan waters that *Penaeus kerathurus* was found only in the western areas (Musrata to the Libyan–Tunisian borders). East of Musrata, this species was not recorded in this study, as also in previous studies (Instrupa 1975; Contransimex 1977).

It was obvious from this study that the waters to the east of Musrata, with the exception of certain places (Derna, Bumba, Benghazi) and shallow depths in the Gulf of Sirte (<200 m), were untrawlable. The best areas for trawling are those to the west, from Musrata to the Libyan–Tunisian border.

6. References

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