

1 INTRODUCTION

1.1 Objectives of the cruise

A planning meeting was held in Casablanca in July 1995 with participants from Morocco, Mauritania, Senegal, Gambia, Guinea Bissau, FAO and the Institute of Marine Research, Bergen. During this meeting the objectives and schedules of the programme were established.

The defined general objectives were to estimate and map the distribution and biomass of small pelagic fish stocks off NW Africa (Morocco, Mauritania, Senegal, the Gambia and Guinea Bissau) by hydro-acoustic methods and describe the hydrographic conditions there over a period of 60 days, in November-December 1995.

For Guinea-Bissau the agreed objectives were:

To map the distribution and produce biomass estimates for the main small pelagic fish species; sardinella *Sardinella aurita*, *S. maderensis*, horse mackerel *Trachurus trecae*, false scad *Decapterus rhonchus*, anchovy *Engraulis encrasicolus* and other pelagic fish.

To occupy standard hydrographical transects for temperature, salinity and oxygen at about 10°20' N and 11°40' N.

As a second priority if time permits a bottom trawl survey of the shrimp resources off Guinea Bissau should be made.

Catch sampling would comprise weight and number by species and length frequency distributions of the principal species.

The time allocated in the work plan for the survey in Guinea Bissau was 4 days.

1.2 Participation

Members of the scientific teams were:

GUINEA BISSAU:

Duarte BUCAL

Vittorino Assau NAHADA

Abel Julio SANTOS

SENEGAL:

Birane SAMB

Abdoulaye SARRE

Ibrahima SOW

Mor SYLLA

THE GAMBIA:

Asberr N. MENDY

Maimuna NDOW-CEESAY

Lamin JAWLA

Members of the scientific staff from the Institute of Marine Research were:

Gunnar SAETERSDAL, Oddgeir ALVHEIM, Martin DAHL and Bjarte KVINGE

1.3 Narrative

Figure 1 shows the course tracks and the fishing and hydrographic stations.

After departure from Dakar on 2 November work was started near the border between Guinea Bissau and Guinea in the afternoon of 3 November with course tracks spaced about 15 nm covering the shelf. A fleet of shrimp trawlers, some using beam trawls, were found along the slope at some 300 m depth south of about 11°N and the opportunity was used of taking three sampling hauls with bottom trawl (with tickler chain) in this area. The hydrographic profile in the south was occupied on 4 November and that in the north on 6 November. The acoustic survey showed only very low densities of pelagic fish over the shelf and there was little need for trawling for sampling. Time permitted two nights of test fishing for shallow water shrimp at 15-45 m depth in the north where a fleet of shrimp trawlers were operating. The survey in Guinea Bissau was completed on 6 November

Annex I shows the records of the fishing stations with the result of the sampling to species of all catches.

Annex II describes the instruments and the fishing gear used.

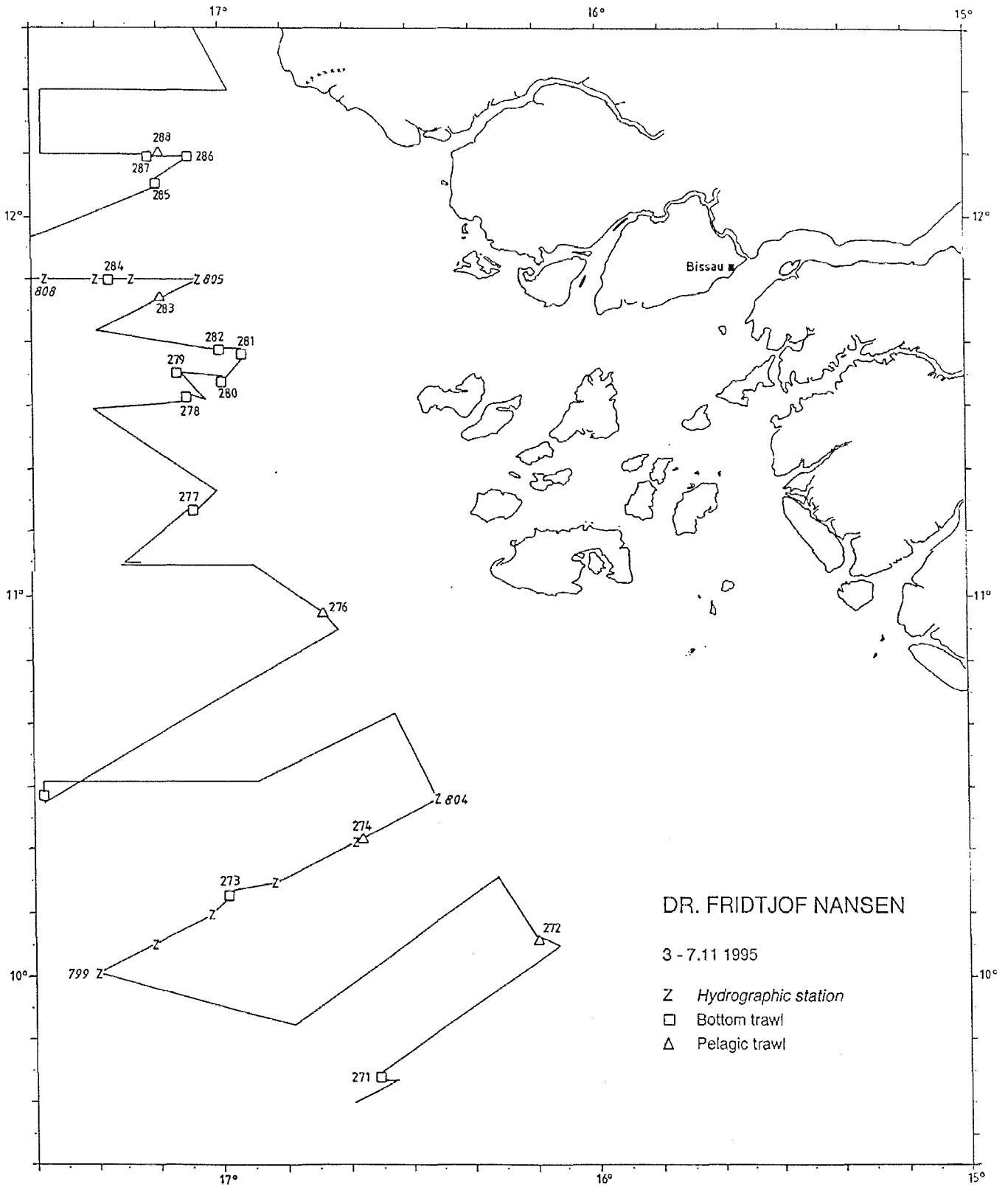


Figure 1. Course tracks and stations.

2 SURVEY RESULTS

2.1 Hydrography

Figure 2 shows the distribution of temperature, salinity and oxygen in the two profiles and Figure 3 sea surface temperature at 4 m of depth.

The oceanographical conditions found were those of the autumn season: a stable surface layer with a sharp thermocline at about 50 m with a range of about 10°C. The surface temperature was 28-29°C throughout. Dissolved oxygen content was relatively high at all depths sampled. The significance of this environment in terms of distribution of pelagic fish is its tropical character: a thin surface layer of low productivity which would not be favourable for pelagic fish except perhaps in inshore shallow waters which may have been enriched by river run-offs.

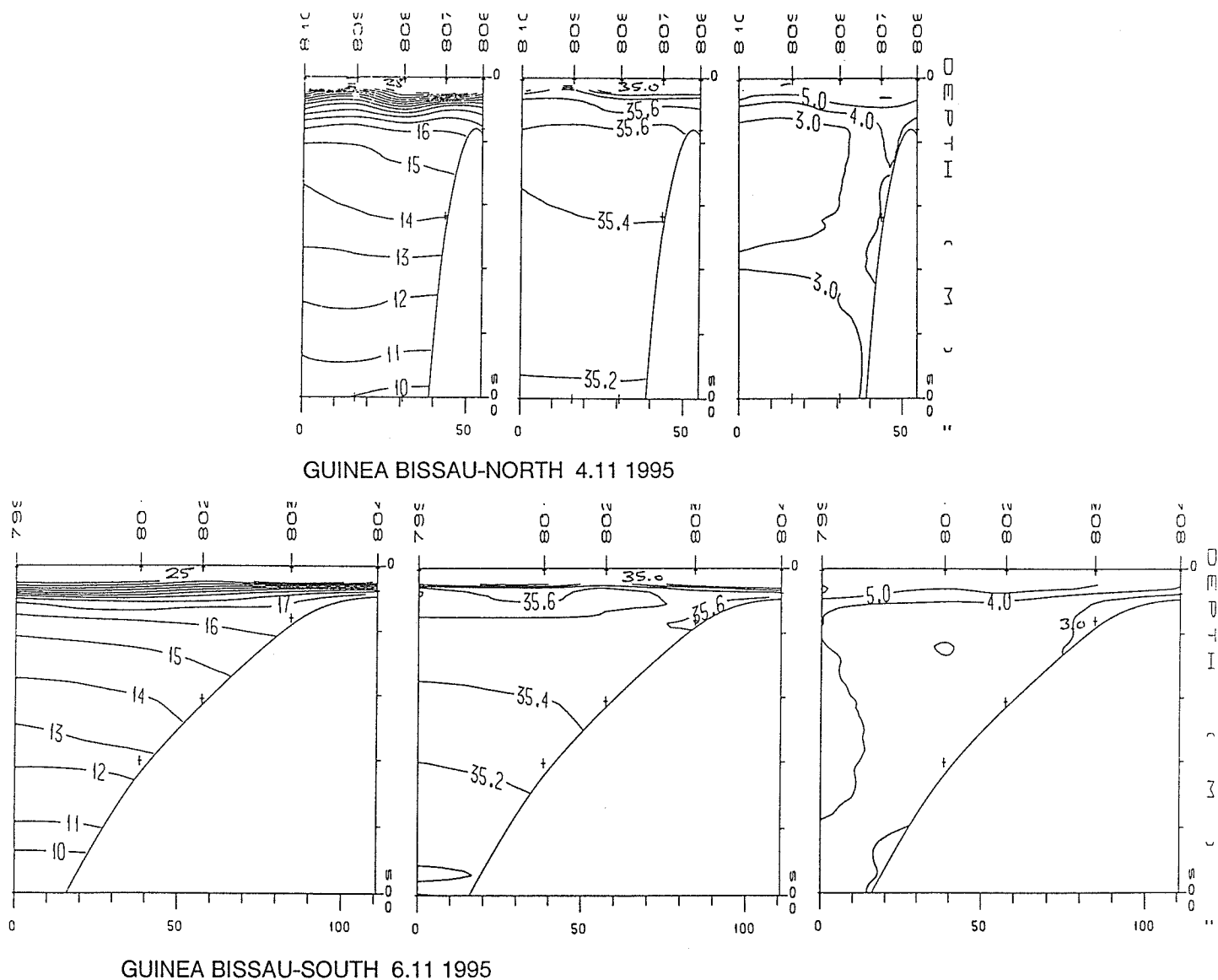


Figure 2. Hydrographic profiles with distribution of temperature, salinity and oxygen.

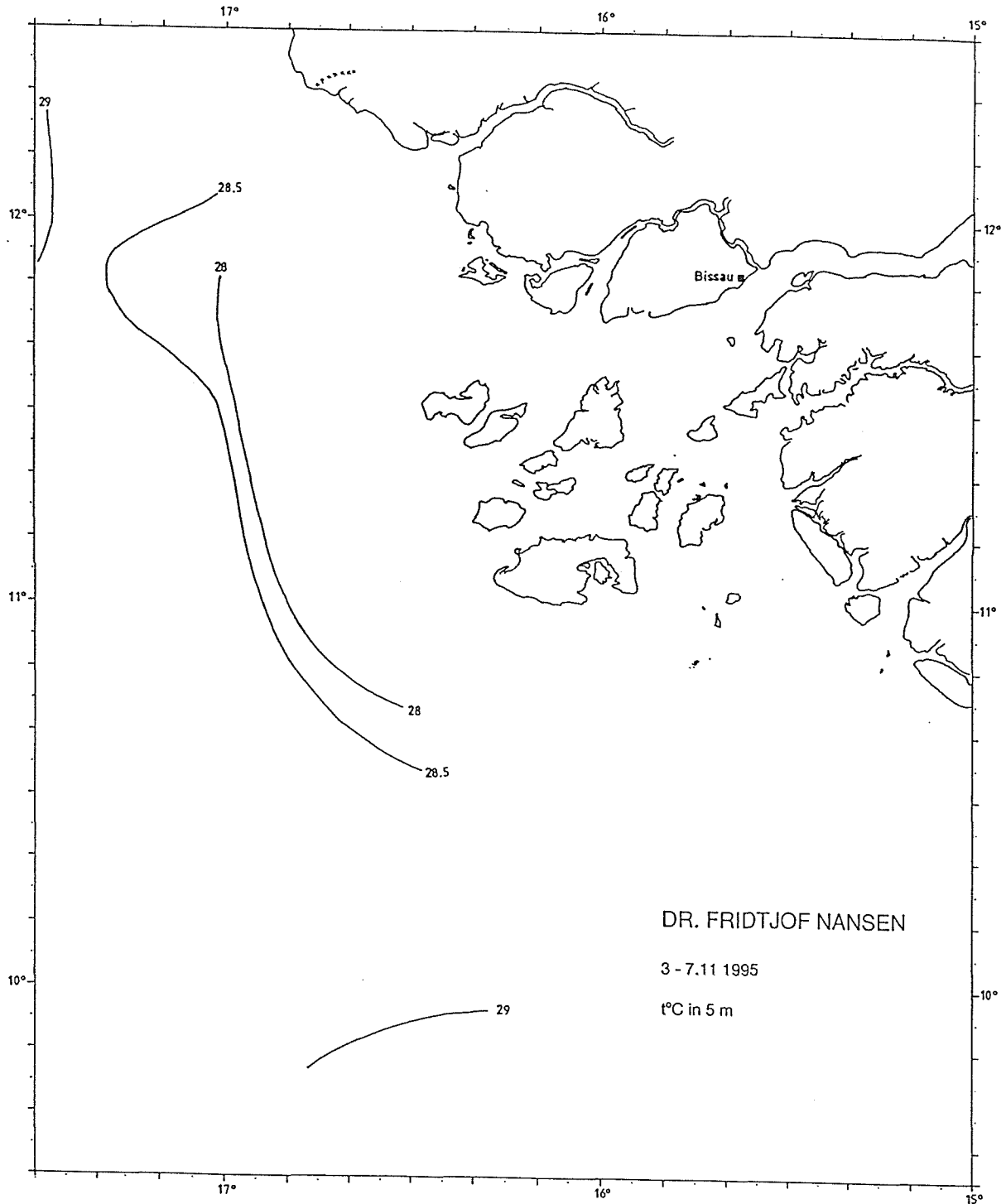


Figure 3. Sea surface temperature

2.2 Pelagic fish

Substantial densities of pelagic fish were not found in any part of the survey area. Figure 4 shows the part of the survey area within which pelagic fish were recorded, mainly limited to the shallow

inshore parts. Most of the recordings were solitary schools or small aggregations of carangids and similar species. The slightly denser spot in the north represent a limited school area of sardinella located at 15-25 m depth. Sardinella was found at this depth range in an almost continuous distribution off Casamance northwards past the Gambia into Senegal with highest density off the Saloum River estuary (see report for the Gambia-Senegal part of the survey). The school area off north Bijagos probably represented the southernmost extent of this distribution.

A biomass estimate of the small sardinella school area based on echo integration gives approximately 15 000 tonnes. The size of the sardinella (total length) was 20-25 cm.

The scattered distribution of the carangids does not provide a very reliable basis for biomass estimates, but very roughly these show about 90 000 tonnes.

Biomass estimates from previous 'Dr Fridtjof Nansen' surveys of pelagic fish on the Guinea Bissau shelf outside about 15 m depth range can be summarised as follows: (1000 tonnes)

	Mainly sardinellas	Carangids	Trigger fish
1981-82 (February-May)	20-90	20-400	350-590
1986 (September-November)	<30	100	200
1992 (March)	540	30	

The current estimates are similar to those of the 1986 September-November survey. It is seen that the estimates have varied considerably, with the highest from the late winter upwelling season. This is a reflection of the highly dynamic pelagic system in this region with seasonal movements in and out of the fish. The findings of any one survey should therefore be considered in relation to the season and to the results in adjacent neighbouring parts.

Pelagic fish in the very extensive inshore shallow waters of Guinea Bissau which could not be covered by the surveys are of course not included in the estimates.

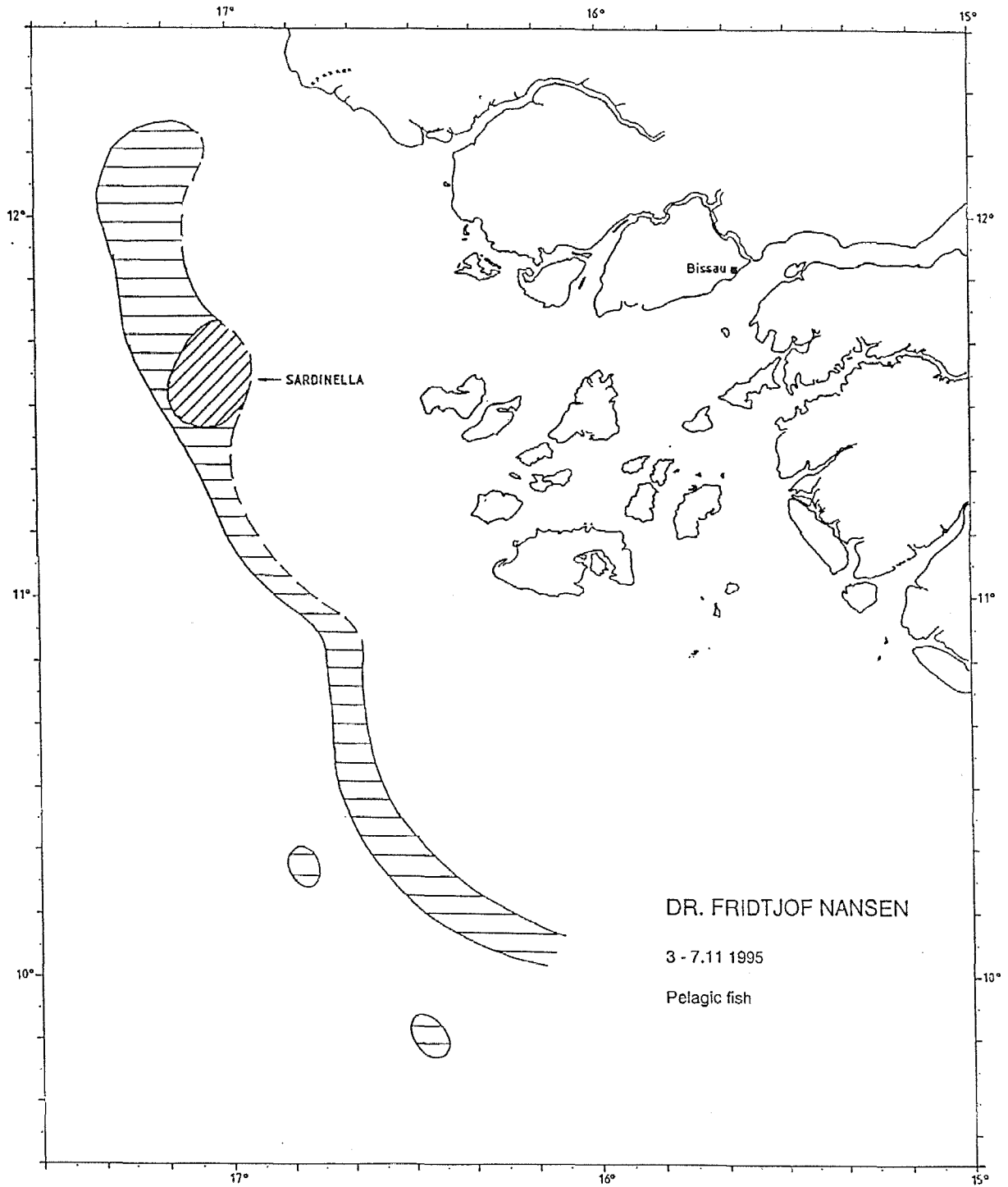


Figure 4. Areas within which pelagic fish were recorded.

2.3 Shrimp

A few test hauls were made for deep water shrimp in the wide slope region south of 11°N. Table 1 shows the catch rates (in kg/hour) of two daylight hauls at 250-300 m and a night haul at 600 m.

The principal species at the lower depths was the rose shrimp *Parapaeneus longirostris* with some golden shrimp *Plesionika martia*. At the deep station the main species was the striped red shrimp *Aristeus varidens* with a small part of scarlet shrimp *Plesiopaeneus edwardsianus*.

Table 1. Catches of deep water shrimp in a few slope hauls. Kg/hour.

ST.NO.	DEP.	Rose	Striped	Scarlet	Golden	Other
271	298	12.8				53.5
273	264	6.2			4.4	2593.9
275	629		7.0	0.4		66.3
MEAN		6.4	2.3	0.1	1.5	904.6

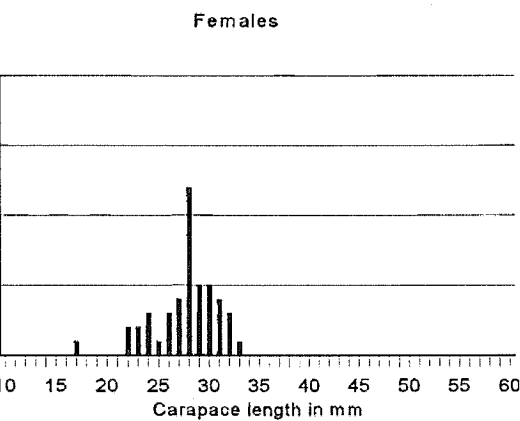
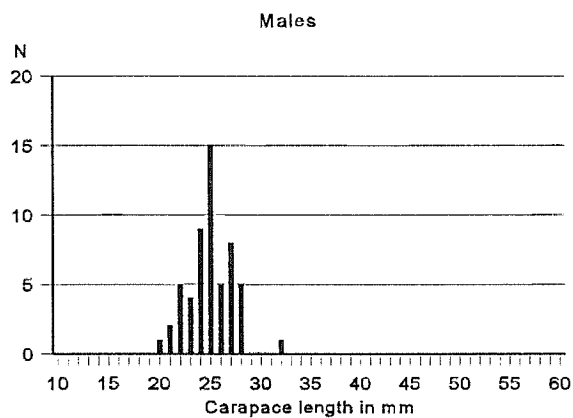


Figure 5a. Size composition of rose shrimp.

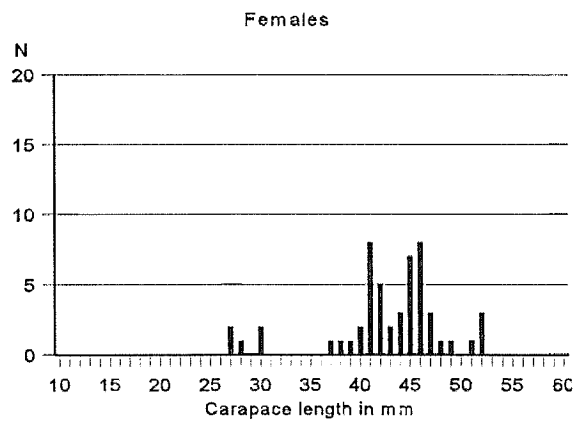
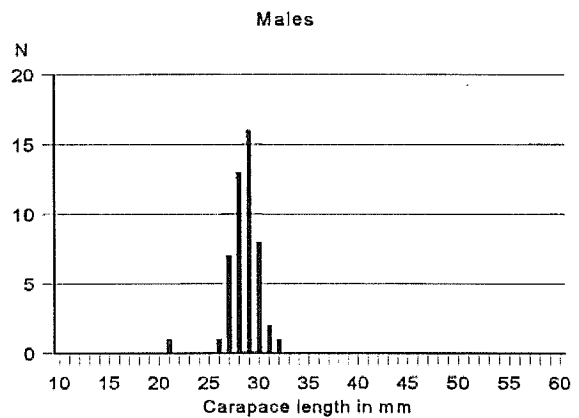


Figure 5b. Size composition of striped red shrimp.

Figure 5a and 5b show the size composition of the main species, rose and striped red shrimp. The latter was especially large sized.

The results of the test hauls made for shallow water shrimp at night time in the north are summarised in Table 2. A shrimp fleet was operating in the area. The pink shrimp *Penaeus*

notialis was the principal species with a few Caramote prawn *P. kerathurus* and some of the small sized Guinea shrimp *Parapenaeopsis atlantica*.

Table 2. Catches of shallow water shrimp in a few hauls. Kg/hour.

ST.NO.	DEP.	Pink	Caramote	Guinea	Other
278	43	0.9	0.02		2232.2
279	47	10.7	0.02	5.6	113.4
280	27	5.5	0.2	12.0	127.0
281	21			0.5	122.8
282	25	14.5			198.3
286	23	1.0		14.6	812.6
287	60	0.4		1.1	100.3
288	39				1216.6
MEAN		4.1	0.03	4.2	615.4

Figure 6 shows the size composition of the pink shrimp in the catches.

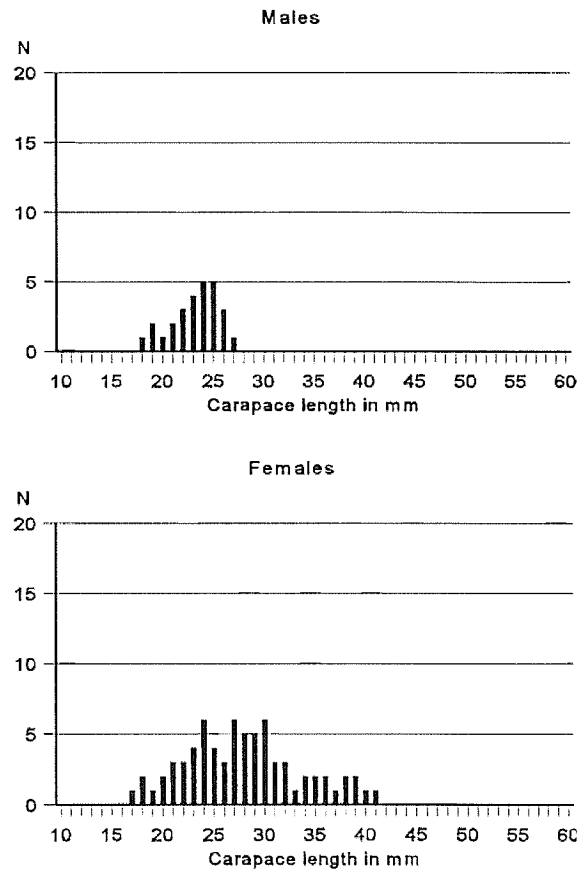


Figure 6. Size composition of pink shrimp.

