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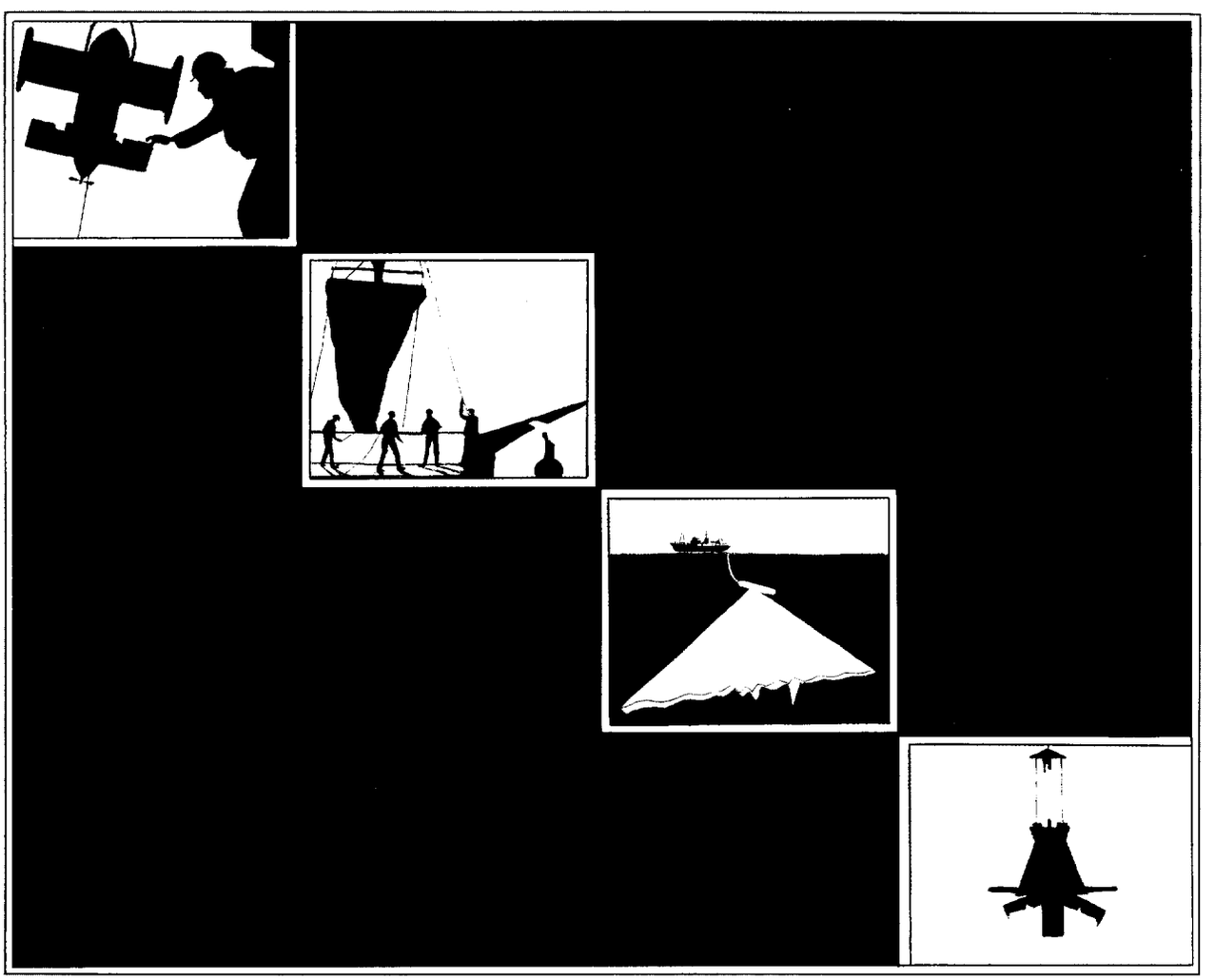

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ABSTRACT

The vertical and horizontal distribution of micronektonic biomass in the North Atlantic Ocean is described based on data from net sampling carried out by the biology department of the Institute of Oceanographic Sciences Deacon Laboratory during 1969-1988. The data, drawn from samples taken with Rectangular Midwater Trawls (RMT) 8, include vertical distribution data from various stations located between the Equator and 60°N, 20°-25°W. Samples were also taken at several stations in the vicinity of the Azores front; at five stations from off-Bermuda to 54°N including a series of repeated hauls at 1000m (42°N); at three other stations between 39°N and 46°N where seasonal fronts occur; at one station at 31°N 25°W and another at 47°N 19°W. Further data are derived from repeated hauls and a vertical series at 44°N 13°W and from two transects of oblique hauls. Total micronektonic biomass concentrations, based on wet displacement volume, throughout the top 1000m of the water column tended to be greatest close to the Equator at 20°W, near the N.W. African Upwelling area, and to the north of approximately 41°N. Relatively low biomass concentrations were recorded between 30°N and 40°N. Diel variation in biomass distribution mainly above 500-800m was recorded. Generally at deep-water stations a sharp decrease in micronektonic biomass concentration occurred below 1000m. Seasonal variation is discussed.

KEYWORDS
ATLN
BIOMASS
BIOLOGICAL DATA
DISCOVERY/RRS - cruises(1969-1988)
NEKTON
NORTH ATLANTIC
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INTRODUCTION

Although information is available on the distribution of total macroplanktonic or micronektonic biomass in the North Atlantic Ocean much of this relates to a relatively small number of stations or to limited areas of the water column, (see VINOGRADOV, 1968; DEEVEY and BROOKES, 1971; BOYD et al 1986). ANGEL and BAKER (1982) summarising preliminary data from Rectangular Midwater trawls (RMT 1+8) taken in the deep water column at three widely separated stations concluded that the macroplanktonic standing stock generally exceeds that of the micronekton and that there is an exponential decrease in macroplanktonic and micronektonic biomass at depths below 1000m. WISHNER (1980) concluded that benthopelagic planktonic biomass decreases exponentially with depth until just above the sea-floor where an increase may occur. ANGEL (1989) found that there were clear seasonal differences in the depth of the biomass maximum within the top 1000m at a series of stations in the vicinity of the Azores front.

During the last two decades the Institute of Oceanographic Sciences Deacon Laboratory (IOSDL) biology department has deployed opening/closing Rectangular Midwater Trawls (RMT) 1+8 to collect numerous macroplanktonic and micronektonic samples in the North Atlantic mainly over depth ranges between the surface and 1000/2000m, (exceptionally down to 4000/5000m). During the mid-late 1960's effort was concentrated on acquiring expertise in identifying species and in obtaining information on species distribution. As a result samples were often split up into major taxonomic groups and each of these preserved separately without total biomass measurements, based on wet displacement volume, having been obtained. However during the 1970's and 1980's biomass was more routinely measured, usually within several months of collection.

The provisional data set presented here, based mainly on samples obtained during 1969-1988, provides useful information not only on standing stock within the water column at various stations but also enables comparisons to be made between biomass profiles in widely separated geographic areas. This report, the first of two, presents micronektonic biomass profiles based on RMT8 catches. A second report will provide information on macroplankton biomass based on RMT 1 catches. It is hoped that the data set will provide a basis for future investigations.

MATERIALS AND METHODS-HORIZONTAL HAULS

Prior to the late 1970's the IOS midwater trawl (RMT1+8), (BAKER et al, 1973; ROE et al, 1980) has been deployed for the sampling of macroplankton and micronekton simultaneously. The nets are opened and closed acoustically via a net monitor which activates the release gear. Information on the depth of the net and its velocity is telemetered back to the ship. Since the late 1970's a multiple version of the RMT 1+8 has been used (ROE and SHALE 1979). Here three pairs of RMT1 + RMT8 nets are deployed within the same framework and can be operated in sequence at the required depth. The main logistic advantage is that there is considerable saving in ship time spent retrieving the nets. It also improves sampling strategies because the time spent between samples is greatly reduced.

At each station samples were taken systematically so that the whole water column between the near-surface and maximum depth was sampled. During the earlier cruises (1969-1972) day and night samples were taken to certain maximum depths (see Table 1). During later cruises this sampling strategy was continued except that, more usually, depths below 900m were sampled irrespective of the time of day. Generally nets were fished at 100m depth intervals in the top 900-1000m but at 200m, 250m or 500m intervals below this depth. Near-surface depth intervals were sometimes <100m.

Initially the samples were fixed in 5% formalin solution in seawater. Total displacement volume of most samples was measured several months later after initial shrinkage had occurred, except for those samples taken during the 1960's and early 1970's where volumes were either measured several years later or estimated from biomass values of separate taxa. Volumes were measured by first adding the sample to a known volume of fluid, then taking the measurement and subtracting the original volume from this. The samples were then transferred to Steedman's preserving fluid and sorted into major taxonomic groups.

In order to simplify the presentation of data in this report, the cruises are categorised into eight groups depending on geographic position and/or sampling strategy. These are described in subsections (i-viii) below and summarised in Fig. 1 and Table 1. At each station complementary Conductivity/Temperature/Depth (CTD) or Temperature/ Salinity/Depth (TSD) profiles were obtained and these will be summarised in a companion IOSDL data report.

(i) During 1969-74, at various times of the year, a series of horizontal hauls were taken at seven positions, approximately at 10° intervals of latitude between 0°N and 60°N and close to the 20°-25°W meridians, (Positions A-G). At each position samples were taken from the surface to a maximum depth of 2000-2500m, with the exception of the station at 18°N where the maximum depth was 1250m. For cruise reports see DAVID (1970), DAVID et al.(1971; 1972), FOXTON (1971) and THORPE et al.(1974).

(ii) To provide further information on vertical and horizontal distributions of taxa, during 1973-1979 samples were taken at several sites to maximum depths of 1500-3500m. These included one site in the Rockall Trough, two in the Porcupine Seabight, one site over the Azores/Biscay Rise, and one in oceanic water near Bermuda, (Positions H-L). For cruise reports see DAVID and SWALLOW (1973), ANGEL (1978) and HERRING et al..(1979).

(iii) During May/June 1981 (Cruises 120/121) five stations were worked near to the Azores front within the area 30°-35° N, 30° -34° W, (Fig. 1, Positions M-Q, maximum depth 1400-2300m). The front delineates the edge of what is believed to be the southern branch of the south-easterly flowing N. Atlantic Drift/Gulf Stream which meanders in the region studied possibly as a result of the influences of seamounts,(GOULD 1982, 1985; KASE and SEILDER 1982). Western Atlantic Water (WAW) can be distinguished from Eastern Atlantic Water (EAW) by the depth of the 15-16° C isotherm. To investigate changes in patterns of biomass distribution across the front one station was worked in the frontal zone (position O), one in WAW (M), one in EAW (Q), one in an eddy of EAW (P), which had pinched off from the meander a month earlier, and one in WAW inside one of the meanders (N). Details of sampling are given in cruise reports (FASHAM et al. 1981; ANGEL et al. 1981b).

During October/November 1980 prior to cruises 120/121 three stations were worked in the Azores front area to a maximum depth of 1100m (cruise 114, positions R-T). One station was worked in EAW (position T), and one in mixed EAW/WAW (S). In addition what was thought to be WAW was sampled but this was later found also to be mixed EAW/WAW (R). However, the data obtained from all these positions proved to be useful to provide a seasonal comparison with the more recently acquired data from the frontal area. For details of sampling see IOS Cruise Report No. 108 (ANGEL 1981a).

(iv) During March/April 1984 at 39°- 46°N, 14°-15°W samples were collected to maximum depths of 800-1400m in order to study changes in the structure of the oceanic community where hydrographic stratification in the epipelagic and upper mesopelagic zone periodically results in a series of weak fronts. Details of sampling are given in IOS Cruise Report No. 168 (ANGEL et al.1984). A series of hauls was taken in the vicinity of 39°N,

15°W and were repeated at the same position two-three weeks later (positions V,W respectively). A third series of samples was obtained at 45°-46°N, 14°W (U). The two series at U and V were affected by poor weather conditions which prevented sampling. However, the sampling at position W extended deep into the water column providing useful comparative data with other samples.

(v) During June/July 1985 samples were collected at the Great Meteor East, in the vicinity of 31°N 25°W to a maximum depth of 5000m, (Position X) as part of a study, commissioned by the Department of the Environment, on the vertical distribution of macroplankton and micronekton between the surface and the sea floor and on general environmental conditions. For details of sampling see ROE et al, (1986; 1987).

(vi) During June/July 1988 samples were collected at approximately 47°N 20°W (BIOTRANS site) to a maximum depth of 4500m, (Position Y). This cruise was undertaken as a prelude to the BOFS (Biogeochemical Ocean Flux sampling) programme. For details of sampling see IOSDL Cruise Report 175, (PUGH et al, 1988).

(vii) During April 1977 shallow and deep sampling was conducted close to 20°N, 21°W at broad depth horizons to a maximum of 3900m, (Position Z - see ANGEL and BAKER, 1982).

(viii) During April 1974 four series of repeated samples each at 100m, 250m, 450m and 600m respectively were taken over a 48hr period at 44°N, 12°-14°W close to the northern boundary of the subtropical gyre (Position 48HS - see ROE et al, 1984). In addition a series of vertical hauls were taken between the surface and 1000m at the same position (station 8507-8).

In this report the vertical biomass profiles at each station are illustrated by histograms of data standardised to mls per 10^3m^3 of water filtered. The average maximum depth is 2000m but exceptionally profiles are given down to 5000m. Night data for horizontal hauls are shaded. During some of the earlier sampling precise flow measurements were not made and for these samples flow has been standardised based on the duration of the haul assuming that the speed of the net was a constant 2 knots. The scales for the histograms vary between series according to the total volumes caught, rare occurrences are indicated with a + sign, (NS = No sample at this depth). Although the specimens were caught with opening/closing trawls some contamination of the deep samples may occur by leakage when the net is closed, either en route to or from its fishing

depths. However the profiles of biomass and species distribution based on these samples imply that the amount of contamination is very low.

BIOMASS DISTRIBUTION PATTERNS - HORIZONTAL HAULS

Total biomass profiles, expressed as wet displacement, volume (WDV), normalised to mls per 10^3m^3 water filtered are described below. Data values are given in Appendix 1.

(i) 20°-25°W (Positions A-G, Figs. 1-7)

Concentrations of micronektonic biomass tended to be relatively high at positions A and F, lower at B, and G and lowest at C-E. At position A, which is close to the N.W. African Upwelling area, daytime values in the top 600m were particularly variable, reaching maxima of >40 mls per 10^3m^3 in some hauls but not in others taken at similar depths (Fig.2. Appendix 1). At stations B-G above 1000m in daytime there was less variation in biomass between contiguous hauls but in some instances, deep and shallow maxima were recorded. By night there was some evidence for diel vertical migration in that maxima occurred in the surface 100-300m. Night data below 300m, available for positions A-G, indicated that at several stations there were also deep maxima varying between 800m and 1000m. At A,B,D,E day/night data for hauls below 1000m indicated a sharp decrease in biomass concentration.

Biomass profiles for fish, decapods and euphausiids are given in Figs. 3-5. Fish data for position A and for B (day) are not available. By day, at positions C-G fish biomass concentrations tended to be highest between 300m and 1300/1500m (Fig. 3.). By night at positions C, D, F fish biomass concentrations tended to be comparatively high in the surface 400m probably owing to diel vertical migration. Decapod data are available for B-E and G (Fig. 4). By day greatest biomass concentrations occurred at positions B and G with maxima at 400-800m and 600-1000m respectively. By night there was an increased biomass concentration within the surface 200/300m at most positions. Except at G values tended to decrease below 1200m. Euphausiids were found mainly at 200-800m by day with highest values of 1-2 mls per 10^3m^3. By night there was a clear increase in biomass concentration within the surface 300m.

Data on the percentage contribution of each taxon to the total biomass in each haul at positions A-G are limited. However those data for fish, euphausiids, decapods, siphonophores, mysids and amphipods at position D (30°N) are available and are shown in Figs. 6 and 7. By day siphonophore biomass tended to form a large proportion of the total

within the top 600m while that for euphausiids was important at 200-600m. Fish biomass comprised a relatively large percentage of the total at 400-1000m while decapods were important below 600m. The night percentage contribution diagram reflected upward diel migration of fish, decapods and euphausiids. Very little data are available on other taxa either because the original sample was not measured prior to sorting and further identification or because the various taxa were not sorted from the residue. Several samples from tropical and subtropical stations contained large aggregations of Pyrosoma in addition to the expected catch. These are marked with an asterisk in Appendix 1 where the total biomass values given exclude values for Pyrosoma).

(ii) Off-Bermuda, Azores/Biscay Rise, Porcupine Seabight, Rockall Trough (Positions H-L, Figs. 1, 8-24, 57b,59).

Concentrations of micronektonic biomass tended to be relatively high at positions I and J reaching maxima of >40mls per 10^3m^3 by day at 300-600m and 200-300m respectively. Values were lower at K and L and particularly low at H (Fig. 8) where daytime values, greatest at 900-1200m, did not exceed 15mls per 10^3m^3. Although the positions of J and K are at similar latitudes the former station was sampled in May and the latter in September thus any differences in biomass concentrations may have been the result of seasonal effects. Profiles for samples deeper than 2000m, available for position I, (Station 9801), together with those for X are given in Figs. 57b and 59. Values, tending to be low and decreasing exponentially with depth, are fully summarised by ANGEL and BAKER (1982) who also discussed in some detail the biomass profiles for various taxa throughout the water column. Standardised values for 24 repeated RMT8 hauls sampled at approximately 1000m at position I are given in Appendix 1. ANGEL et al (1982) calculated the standard deviation of the mean displacement volume concentrations as 28.03 $\pm$ 6.52 mls per 10^3m^3.

Biomass profiles for separate taxa, available only for positions I-L, except for euphausiids (H-L) are given in Figs. 9-16. By day the depth of the fish biomass maxima varied between stations but generally it was below 300m and maxima rarely exceeded 5ml per 10^3m^3. By night there was evidence for diel vertical migration by part of the population into the surface layers (Fig. 9).

Medusae biomass concentrations (Fig. 10) tended to be relatively high at positions I-J and varied throughout the water column sampled. Values were slightly lower at K and L. There was no clear evidence for diel vertical migration. Decapod biomass profiles (Fig. 11) were broadly similar at most stations with average daytime maxima rarely exceeding 2-3

mls per 10^3m^3. Generally by day this group were sparse in the surface 300m. By night concentrations were relatively high in the surface layers, an indication of diel vertical migration by part of the population. Euphausiid biomass concentrations (Fig. 12) were relatively low at H but higher at I-L. Generally by day except at I concentrations were low near the surface; the exceptionally large concentration near-surface at position I was a result of a swarm of Meganyctiphanes norvegica. By night there was a clear indication of diel vertical migration.

Siphonophore biomass (Fig. 13) was greatest at I-J. By day and/or night this group were recorded at most depths, daytime maxima tending to occur at 200-600m. At K-L biomass tended to be low near-surface by day and night. Mysid biomass profiles were relatively similar at I-L with maxima by day and night mainly at 600-1500m. Hardly any diel vertical migration was apparent. Chaetognath biomass profiles (Fig. 15) were similar for positions I-K. Concentrations were greatest by day and night within the top 900m of the water column with values rarely reaching 3 mls per 10^3m^3. Ctenophora, mostly Beroe were recorded intermittently (Fig. 16). There were no clear distribution patterns and further data are needed to assess their profiles.

Other taxa recorded intermittently included pteropods, tunicates and polychaetes. The former were particularly abundant within the surface 500m at I-L. By day maxima occurred at 400-500m (I - >20mls per 10^3m^3), 10-200m (J - >5mls per 10^3m^3), 200-300, 400-500m (K - >12mls per 10^3m^3). Night data for most positions indicated that diel vertical migration towards the surface had occurred. Tunicates, excluding Pyrosoma, were recorded intermittently by day and night mainly above 800m, at I-J with values of up to 6mls per 10^3m^3. Generally cephalopods were recorded intermittently mainly within the surface 900m at all positions. Polychaetes were important at position K.

The percentage contribution to the total micronekton of up to eleven taxa, day and night at positions I-L, is shown in Figs. 17-24. Important contributors to the total biomass included siphonophora and medusae which in some instances formed at least 40% of the total haul. The former tended to be important above 600m at I-J while medusae tended to be important below 710/800m. Other noteworthy taxa included pteropods, important at positions I (300-500m, day - see also ANGEL and BAKER, 1982)), J (10-100m, day and night), K, (10-500m, day) L (10-200m, day). Chaetognaths were relatively important at K (200-900m, night) and fish at L (300-900m, day).

Percentage contributions to the total biomass for hauls deeper than 900m have been described previously for I (HARGREAVES, 1985), K and L (HARGREAVES et al.,1984). At

position I (station 9801) important constituents of the biomass include fish (1500-2700m), medusae (800-1900m, 2300-3700m), decapods and mysids (2500-4000m).

(iii) Azores front (Positions M-Q, R-T, Rp1-Rp2, Figs. 1, 25-46)

Data from three stations worked in summer (M-Q), three in winter (stations R-T) and two sets of repeated samples within the surface 100m (RP1-RP2) has been described in detail (ANGEL, 1989). A summary will be given here.

During May/June 1981 concentrations of micronektonic biomass tended to be highest in EAW (position Q) and at the front station (O) but lowest in WAW (M - Fig 25). At all stations by day concentrations were consistently lower near the surface than in the mesopelagic zone. By day total biomass was greatest at approximately 500-1200m. By night there was strong evidence for diel vertical migration in that maximum biomass occurred in the surface 100-300m. At several stations there were also deep maxima. The increase in biomass in the top 50-100m coincided with the depth of the seasonal thermocline.

Biomass profiles for fish, Pyrosoma, decapods, euphausiids, siphonophores, mysids, chaetognaths and tunicates, excluding Pyrosoma, are given in Figs. 26- 33. By day at most stations across the front greatest fish biomass occurred below 500/600m whereas by night diel migration had resulted in relatively high biomass concentrations close to the surface. Highest fish biomass values were recorded in EAW and lowest in WAW. At the front station at night catches were particularly large in the surface 100m. Large aggregations of Pyrosoma were particularly abundant in the vicinity of the front; their distribution is shown in Fig. 27. Except at position O they occurred at varying depths between 500m and 900m by day and within the surface 300m by night. (Samples with large concentrations of Pyrosoma are marked with an asterisk in Appendix 1.) Decapods occurred mainly at 600-1100m by day whereas by night at least part of the population occupied the surface layers (Fig 28). Values were greatest at the front (O). By day relatively high biomass concentrations of euphausiids occurred mainly at 400-800m at the front and in EAW. By night maxima occurred at 50-200/300m at all positions (Fig. 29).

Siphonophores too were found at most depths above 1000m but there was considerable variation in biomass profiles across the front with values tending to be higher at the front and in EAW. By night clear maxima were recorded within the surface 100-200m. Mysid biomass concentrations were similar by day and night at the front and EAW stations, occurring mainly at 800-1200m, while values in WAW were lower; there was little

evidence for diel vertical migration (Fig. 31). Chaetognaths occurred throughout the water column, day and night from the surface down to at least 1100m. There was relatively little diel variation and values were lowest in WAW (Fig. 32). Tunicates represented mainly by salps were recorded by day and night mainly in the top 200m at M-N and P-Q (Fig. 33.). Data are not available for position O. Amphipods too were important near-surface at several positions. Pteropods, more prevalent in WAW than at other positions, occurred mainly in the surface 200m.

The percentage contributions to the total micronekton of eleven major taxa at positions M, O, P are shown in Figs. 34-39. At position M (WAW) fish tended to partly dominate the water column at 400-1100m day. At the front station (O) by day chaetognaths and siphonophores were important in the top 400m while below these depths although moderately important they were co-dominant with fish and, still deeper, with decapoda. By night the pattern changed slightly in that fish biomass concentration became important close to the surface while migration of decapoda into the 100-300m depth horizon had a similar effect. At position Q (EAW) by day siphonophore and tunicate biomass was important in the surface 200m At 200-400m siphonophores and chaetognath biomass concentrations formed a large contribution while below this fish were important. By night at position Q fish biomass concentrations were moderately important throughout the water column except within the surface 50m where siphonophores dominated the catch. Siphonophore, chaetognath and decapod biomass concentrations were maintained at moderate levels throughout the water column down to at least 1400m.

Biomass concentrations for winter stations at the Azores front (positions R-T) are given in Fig. 40. Values tended to be lower at the predominantly WAW station (R) than at the intermediate station (S) and the EAW station (T). The particularly high daytime concentrations at 500-800m (S) and at 600-700m (T) and by night at the surface 100m (S) are due to Pyrosoma (Fig. 41). Two series of repeated night samples at 50m at stations 10232 and 10241 (RP1 and RP2) gave average standing crops of 7.14 and 6.00mls per 10^3m^3 respectively, excluding Pyrosoma, (ANGEL 1989).

Profiles of biomass concentration for fish, decapods, euphausiids, siphonophores and chaetognaths are given in Figs. 42-46 respectively. Generally these profiles were broadly similar to those recorded in summer (M-Q) for WAW and EAW respectively but with exceptions summarised by ANGEL, 1989.

(iv) Cruise 146 (Positions U-W, Figs 47-56)

Concentrations of micronektonic biomass tended to be highest at the northerly station (U) with a clear maximum of >30mls per 10^3m^3 at 300-500m by day. At the two southerly stations (V,W) values rarely reached 19mls per 10^3m^3 by day, however at position V by night there was a clear maximum exceeding 60mls per 10^3m^3 within the surface 100m.

Information on the biomass of individual taxa are available only for positions U and V. Fish were important below 300m by day; by night part of the population had migrated into the surface 300-400m. Medusae were found at shallower depths at U by day (mainly below 200m) than at V (below 400m). By night, at position V particularly, there was a clear diel vertical migration. Decapoda were not recorded by day at U; as expected from previous hauls this group were found mainly below 600m by day and by night diel vertical migration was apparent (V). Euphausiid, siphonophore and mysid biomass profiles followed the pattern as seen previously except that mysid biomass resulting from diel vertical migration into the 200-600m depth horizon was particularly apparent. Profiles for chaetognaths, tunicates and pteropods are shown in Figs. 54-56.

(v) Great Meteor East, (Position X, Figs. 57,59)

Planktonic and micronektonic biomass distribution based partly on dry weight were described by ROE et al.,(1987). Generally biomass concentrations tended to be low. Most major taxa were represented in the hauls but as seen previously in subtropical areas swarms of Pyrosoma occurred in catches at 700-900m by day and in the upper 200m by night (Fig. 57a). The secondary maximum at 500-600 by night was also due to a large aggegation of Pyrosoma being sampled during vertical migration. Below 1000m there was an exponential decrease in biomass concentration (Figs. 57b, 59).

(vi) 47°N 20°W - BIOTRANS site (Points - Y, Figs. 58, 59)

Micronektonic biomass profiles were described by PUGH (1988). By day maximum biomass concentrations were recorded at 100-200 (26mls per 10^3m^3) and at 400-500m (67mls per 10^3m^3), the latter resulted from large concentrations of siphonophores. By night a maximum occurred at 700-800m. Most taxa were well represented in the top 1000m. Particularly large concentrations of amphipods and medusae were recorded by day at 200-300m and 700-800m respectively. Regression lines for biomass profiles at I, X and Y are given in Fig. 59.

(vii) Station 9541 (Position Z, Figs. 1, 60)

These data based on the sampling of 500m depth horizons were described by ANGEL and BAKER, (1982). Biomass profiles showed a maximum at 500-1000m and there was a gradual decline between 1000m and 2000m. Below this depth the decline in biomass continued erratically. ANGEL and BAKER estimated that 60% of the micronekton occurred in the upper 900m of the water column.

Fish tended to form a large component of the biomass in the top 2000m (20-50%). Decapoda were prevalent throughout the water column below 500m (up to 70%). Siphonophores and chaetognaths were important contributors to the total biomass within the surface 500m (25-30%)

(viii) 48 hour series (Position 48HS1, 48HS2, Fig 1, 61-62)

Concentrations of micronektonic biomass for the series of samples taken at four depths of 100m, 250m, 450m and 600m are given in Fig. 61,(note change of scale for 100m and 250m hauls). Diel variation in biomass concentrations is most apparent at 100m depth with relatively low daytime biomass concentrations of <5mls per 10^3m^3 having been recorded in at least half of the hauls whereas by night values of >9mls per 10^3m^3 were more usual. The first day series at 250m are incomplete but generally in the two series values were relatively high often exceeding 100mls per 10^3m^3. Further, at 250m, values were lower during the first series of night hauls but for the second series were broadly similar to those by day. Many species were recorded at these depths at night but were absent from them by day. For a full discussion see ROE et al, (1984) who reported significant differences between populations from day and night hauls at 100m. Average day and night values declined between 450m and 600m and the effects of diel vertical migration were less apparent. Profiles for the vertical series at the same position are given in Fig. 62.

MATERIALS AND METHODS - OBLIQUE HAULS

A series of oblique RMT 8 hauls were taken between the surface and 1000m across two different lines of stations in the North Atlantic (Fig.63). These were as follows :-

(i) During February/ March 1973 twelve oblique hauls were taken across an east-west transect between the surface and 1000m at 32°N 16°-60°W (Stations 8262-8279).

(ii) During April/May 1978 one north-south line of hauls were taken to investigate the effects of a series of weak intermittent hydrographic fronts on species distribution. Eight (0-1000m) oblique hauls were taken between 42°N and 50°N, (stations 9792-9801).

Full details of the RMT8 net and sampling procedures are as described for the RMT8 horizontal hauls.

BIOMASS DISTRIBUTION PATTERNS OBLIQUE HAULS

Oblique 1. Station 8262-8279 (Fig.64)

Biomass concentrations in the 0-1000m hauls ranged from a minimum of 2mls per 10^3m^3 to a maximum of 12mls per 10^3m^3 tending to be slightly higher at 50°-54°W, however there was no clear change in biomass profiles from east to west.

Oblique 2. Stations 9792-9801 (Fig.65.)

Biomass concentrations in the 0-1000m hauls were higher than in the Madeira-Bermuda transect reaching average values of 18mls per 10^3m^3. There was no apparent change in biomass concentrations from north to south.

DISCUSSION

Although based mainly on single samples, the data are considered to be reasonably representative, the repeated samples at 1000m depth (Position 1- Appendix 1) having a 95% probability of being within a factor of two of the mean abundances (ANGEL et al.,1982). At position 48HS 1-2 (44°N 13°W) a clear pattern of temporal variation was apparent from repeated day and night hauls particularly at two discrete depths, (100-250m).

Horizontal tows are subject to less variability than oblique tows because the former sample large volumes of material within a narrow depth range whereas oblique tows sample smaller volumes over a broader depth range. Thus in the latter there is likely to be increased heterogeneity of material. Further the present data excludes active avoiders and so concentrations of micronektonic biomass may be underestimated.

The measurement of wet displacement volume presents a somewhat crude method for the estimation of biomass in that some taxa will tend to shrink after fixation and

preservation while others may tend to absorb preserving fluid. AHLSTROM and THRAILKILL (1963) observed shrinkage after fixation and preservation whereas WIEBE et al (1979) did not observe shrinkage in salps. In Fig. 66 is shown the amount of change in siphonophore biomass following preservation for several months (Pugh, personal communication).

The present data confirms previous data (ANGEL and BAKER 1982, ANGEL et al, 1982, ROE et al, 1984) that most of the micronektonic biomass occurs within the top 1000m of the water column and there is a sharp decrease in abundance profiles in the bathypelagic region below 1500m. It is expected that sampling error will be slightly higher in the deep mesopelagic and bathypelagic zones because of the decrease in abundance of fauna. Further, contamination from surface layers, although relatively low, may be of increasing importance the deeper the haul.

Estimates of the total micronekton standing crop beneath $1m^2$ sea surface within the top 1000m of the water column by day at each of the positions sampled, excluding large aggregations of Pyrosoma, are given in Fig. 67. Nighttime totals generally tend to be slightly higher than those of daytime. This is probably an artifact due to large quantities of micronekton accummulating near-surface as a result of diel vertical migration. ANGEL (1989), describing data from the Azores front (Positions M-T) concluded that day/night disparities were higher in the summer.

The highest concentrations of biomass estimated from the present data tend to occur in geographic zones of high productivity. The large standing crops, encountered close to the N.W. Africa upwelling area and to the north of 41°N in spring/summer were at least three times greater than in the subtropical region between 30°-40°N. Seasonal variation was apparent particularly at the northern stations. However it is not clear to what extent seasonal, or temporal, variation occurs in the southerly region (Position A). The unusually high measure of variability between repeated samples at A (see Appendix 1) leads one to suspect that sampling coincided with the movement of one or several oceanic fronts.

Important constituents of the micronektonic biomass at most stations were fish, siphonophores, euphausiids, medusae, decapods, chaetognaths, and mysids, several of these taxa tending to be dominant within given hauls. Extensive diel vertical migrations were undertaken by at least part of the population in most taxa except for mysids. Amphipods, pteropods and tunicates were important in some hauls occasionally forming a large percentage of the total biomass. For example Pyrosoma were particularly important at stations close to the Azores front and at Great Meteor East but much less so in colder waters to the north.

Estimates of day and night biomass within the surface 200m, 500m and 100m are given in Table 2A. Percentage day/night differences, much of which are attributable to diel vertical migration, are given in Table 2B. Despite the fact that, night-time surface biomass may be under- or overestimated as a result of sampling error, never-the-less it is possible to predict trends for the various positions in the north and south of the area. As expected from the levels of standing crop these provisional data suggest that flux of organic material is greatest in the north during summer, particularly in the surface 200m, and least in subtropical areas in winter.

In summary, these provisional data, although mainly based on single samples provide some insight into the levels of micronektonic standing crop at northern, tropical and subtropical stations and it is hoped that they will form some bases for further research. Comparisons with RMTI (macroplanktonic) data will be discussed in a separate report.

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We wish to thank numerous colleagues and students who have cheerfully assisted in the collection and measurement of material.

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TABLE 1. Horizontal hauls: summary of the main sampling positions in the northeastern Atlantic.

	STATION	POSITION (Lat/Long)	MONTH	YEAR	MAX DEPTH (m)	DAY/NIGHT
	8553-8568	00°N 22°W(A)	JUL/AUG	1974	2000	D &/or N
	7824	11 N 20 W(B)	MAR	1972	2000	D &/or N
	7089	18 N 25 W(C)	NOV	1969	1250	D & N
(i)	7856	30 N 23 W(D)	MAR/APR	1972	2500	D & N
	7406	40 N 20 W(E)	OCT/NOV	1970	2000	D & N
	7711	53 N 20 W(F)	MAY/JUN	1971	2000	D & N
	7709	60 N 20 W(G)	APR/MAY	1971	2000	D & N
	8281	32 N 64 W(H)	MAR	1973	3500	D &/or N
	9801	42 N 17 W(I)	MAY	1978	1500	D &/or N
(ii)	9791	50 N 14 W(J)	MAY	1978	1505	D &/or N
	10115	50 N 14 W(K)	SEP	1979	1500	D &/or N
	10105	54 N 13 W(L)	AUG/SEP	1979	1900	D &/or N
	10380	30 N 34 W(M)	JUNE	1981	2300	D &/or N
	10378	32 N 30 W(N)	JUNE	1981	1415	D & N
	10376	33 N 33 W(O)	MAY	1981	1700	D &/or N
(iii)	10382	33 N 33 W(P)	JUNE	1981	1400	D &/or N
	10379	35 N 33 W(Q)	JUNE	1981	1900	D & N
	10233	32 N 32 W(R)	NOV	1980	1100	D & N
	10222	30 N 30 W(S)	OCT	1980	1100	D &/or N
	10228	33 N 32 W(T)	NOV	1980	1100	D & N
	10232	33 N 32 W(RP1)	NOV	1980	65	N
	10241	33 N 32 W(RP2)	NOV	1980	110	N
	11050-11058	46 N 14 W(U)	APRIL	1984	800	D &/or N
(iv)	11036-11047	39 N 15 W(V)	MAR/APR	1984	1095	D &/or N
	11078-11095	39 N 15 W(W)	APRIL	1984	1405	D &/or N
(v)	11261	31 N 25 W(X)	JUN/JUL	1985	5000	D &/or N
(vi)	11794	47 N 20 W(Y)	JUN/JUL	1988	4500	D &/or N
(vii)	9541	20 N 21 W(Z)	APRIL	1977	3900	D &/or N
(viii)	8507-08	44 N 13 W(48hs) (1-2)	APRIL	1974	100,250, 450,600, 1000	D & N

Table 2A: Day and night estimates of micronektonic biomass, expressed as mls beneath $1m^2$, in the top 200, 500 and 1000m of the water column at positions B-Y. Differences between day and night values are also given. Biomass values for large aggregations of Pyrosoma are excluded.

		200m			500m			1000m		
		Day	Night	Diff.	Day	Night	Diff.	Day	Night	Diff
Statn	Posn.									
7824	B	3.2	3.7	+0.5	7.9	7.5	-0.4	16.9	17.3	+0.4
7089	C	0.9	2.7	+1.8	3.4	5.3	+1.9	8.0	9.3	+1.3
7856	D	1.8	3.8	+2.0	4.1	5.8	+1.7	6.6	8.6	+2.0
7406	E	0.8	1.9	+1.1	1.8	4.2	+2.4	5.6	6.3	+0.7
7711	F	4.9	14.3	+9.4	20.5	23.4	+2.9	29.5	39.4	+9.9
7709	G	3.0	2.3	-0.7	6.3	6.0	-0.3	13.6	16.2	+2.6
8281	H	0.9	2.1	+1.2	1.9	3.0	+1.1	5.2	5.6	+0.4
9801	I	2.6	6.3	+3.7	14.6	12.8	-1.8	25.6	27.9	+2.3
9791	J	5.7	6.8	+1.1	13.2	18.5	+5.3	23.1	25.8	+2.7
10115	K	1.6	9.4	+7.8	6.3	12.8	+6.5	14.1	21.6	+7.5
10105	L	0.7	3.9	+3.2	3.3	7.2	+3.9	9.0	13.6	+4.6
10380	M	0.4	0.9	+0.5	1.0	1.9	+0.9	2.7	4.0	+1.3
10378	N	0.7	2.1	+1.4	1.5	3.6	+2.1	4.3	6.0	+1.7
10376	O	1.7	5.4	+3.7	3.8	8.6	+4.8	7.8	12.4	+4.6
10382	P	1.3	2.3	+1.0	2.9	4.3	+1.4	6.9	7.3	+0.4
10379	Q	1.1	2.8	+1.7	2.5	4.8	+2.3	6.3	8.2	+1.9
10233	R	0.7	1.0	+0.3	2.1	3.4	+1.3	6.0	6.2	+0.2
10222	S	0.7	1.3	+0.6	2.4	3.4	+1.0	5.8	6.6	+0.8
10228	T	0.3	0.6	+0.3	2.4	3.1	+0.7	6.3	5.8	-0.5
11050-58	U	1.7	5.2	+3.5	8.9	11.6	+2.7	-	-	-
11036-47	V	1.7	6.4	+4.7	4.6	9.3	+4.7	-	-	-
11078-95	W	1.3	4.1	+2.8	4.0	6.7	+2.7	9.1	9.6	+0.5
11261	X	0.9	1.2	+0.3	1.6	2.9	+1.3	4.3	5.9	+1.6
11794	Y	3.3	2.8	-0.5	11.6	6.6	-5.0	17.6	14.8	-2.8

Table 2B: Day/night differences expressed as a percentage of the day totals within the surface 200m, 500m and 1000m. Winter stations (Nov.-Mar.) are indicated with an asterisk.

Station	Position	200m	500m	1000m
7709	G 60 N 20 W	-23	-4	19
10105	L 54 N 13 W	457	118	51
7711	F 53 N 20 W	192	14	33
9791	J 50 N 14 W	19	40	12
10115	K 50 N 14 W	487	103	53
11794	Y 47 N 20 W	-15	-43	-16
11050-58	U 46 N 14 W	206	30	-
9801	I 42 N 17 W	142	-12	9
7406	E 40 N 20 W	137	133	12
11036-47	V 39 N 15 W	276	102	-
11078-95	W 39 N 15 W	215	67	5
10376	O 33 N 33 W	217	126	59
10379	Q 35 N 33 W	154	92	30
10382	P 33 N 33 W	77	48	6
10228	S 33 N 32 W *	100	29	- 8
10378	N 32 N 30 W	200	140	39
8281	H 32 N 64 W *	133	58	8
10233	R 32 N 32 W *	43	62	3
11261	X 31 N 25 W	33	81	37
10380	M 30 N 34 W	125	90	48
10222	T 30 N 30 W *	85	41	14
7856	D 30 N 23 W	111	41	30
7089	C 18 N 25 W *	200	56	16
7824	B 11 N 20 W *	16	- 5	2

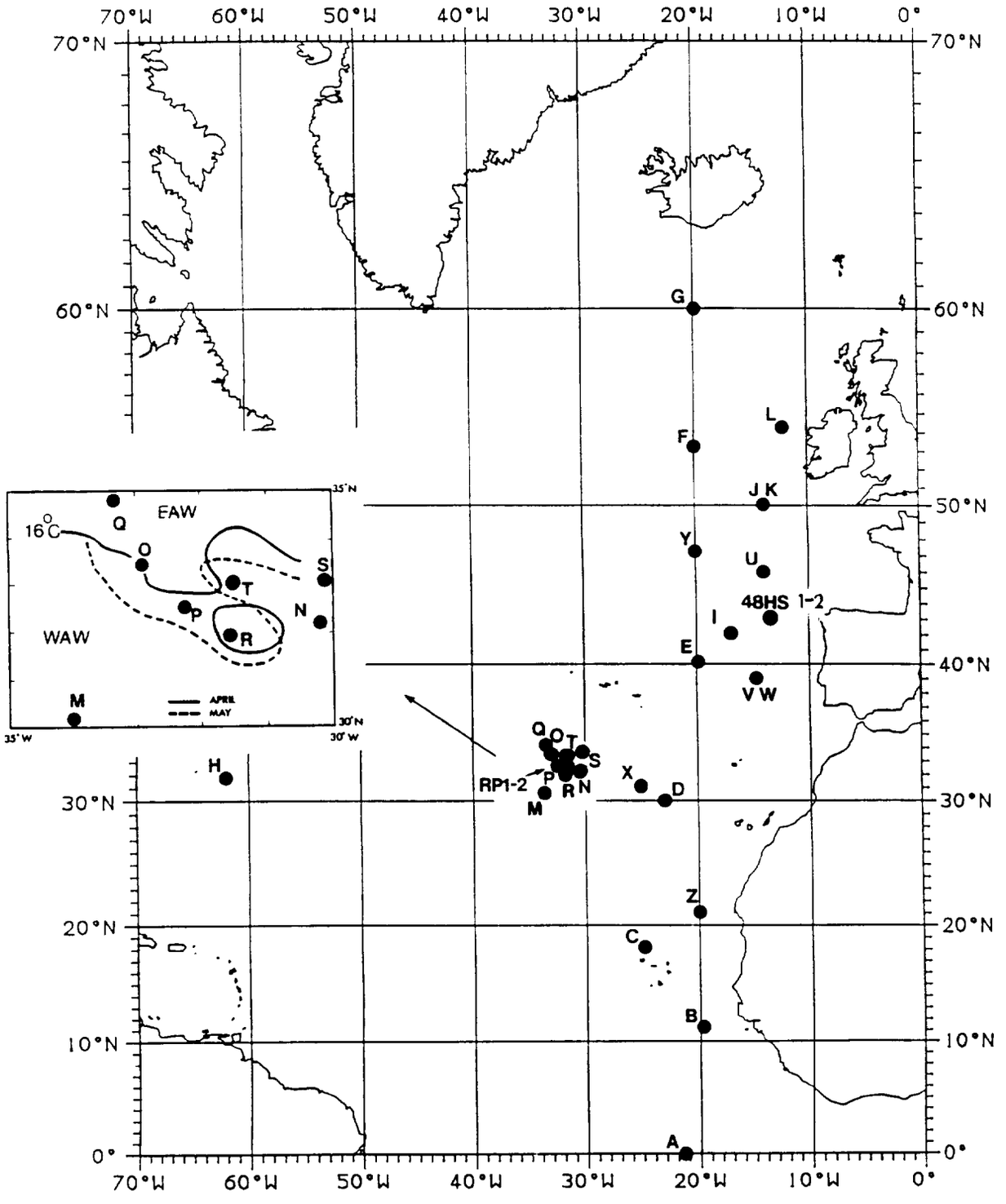

Fig.1. Station positions in the North Atlantic for which micronektonic biomass data are available. A-Z, 48HS1-2, RPT1-2 represent the position of RMT8 horizontal hauls. Inset: Position M-T at the Azores front which is defined by the location of the 16°C isotherm at 200m.

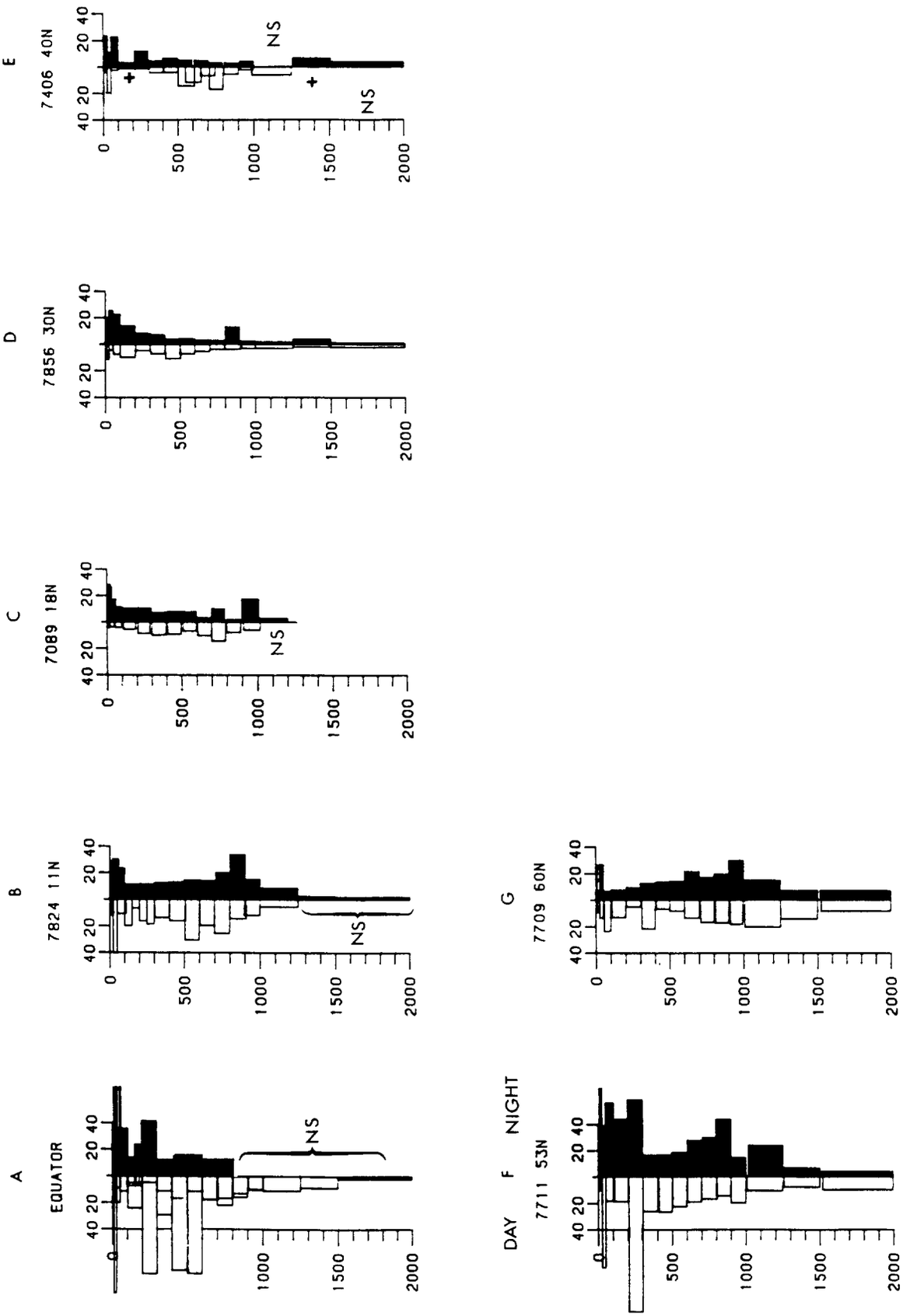

Fig. 2. Day and night profiles of total biomass, measured by wet displacement volume, from RMT8 samples taken at positions A-G. Values are standardised to mls. per $10^3 m^3$ water filtered. NS = No sample, + = relatively low value.

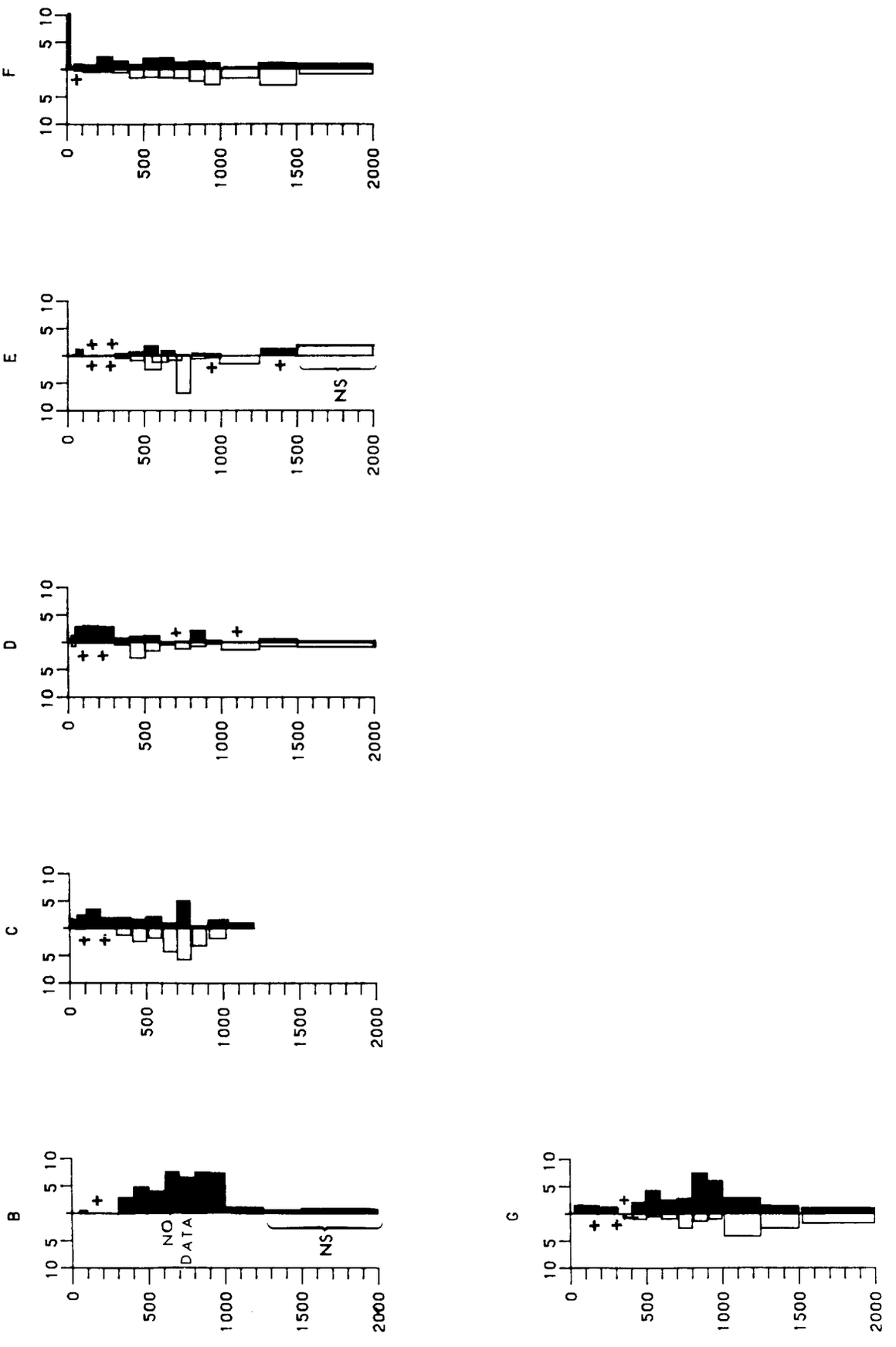

Fig. 3. Fish: day and night profiles of biomass at positions B-G (RMT8) see legend Fig. 2.

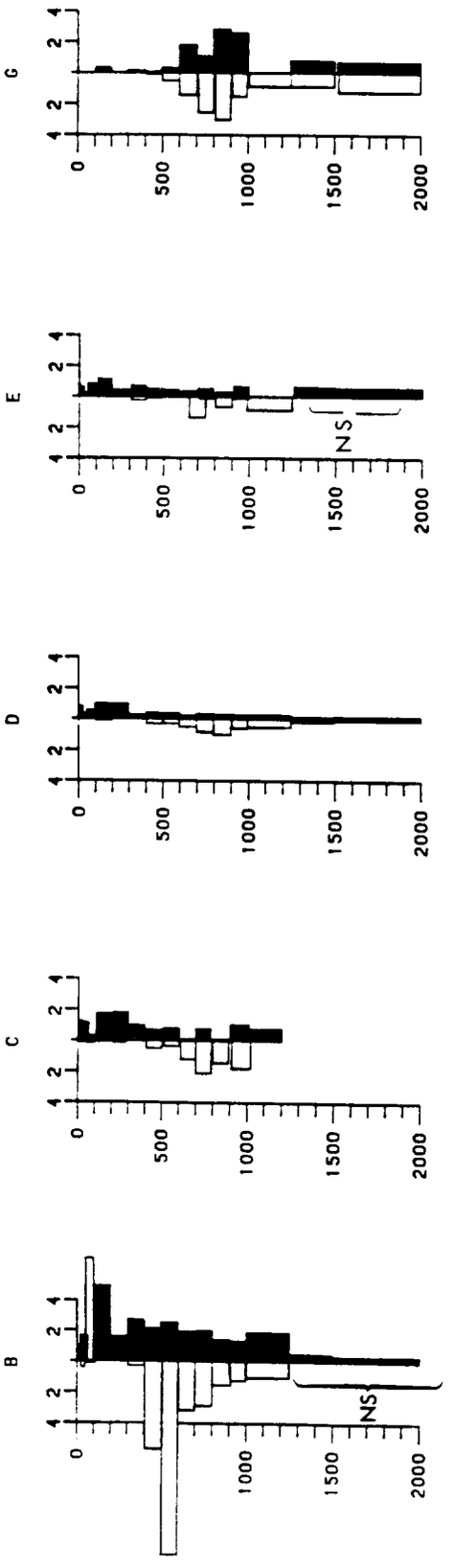

Fig. 4. Decapoda: day and night profiles of biomass at positions B-E and G (RMT8) see legend Fig. 2.

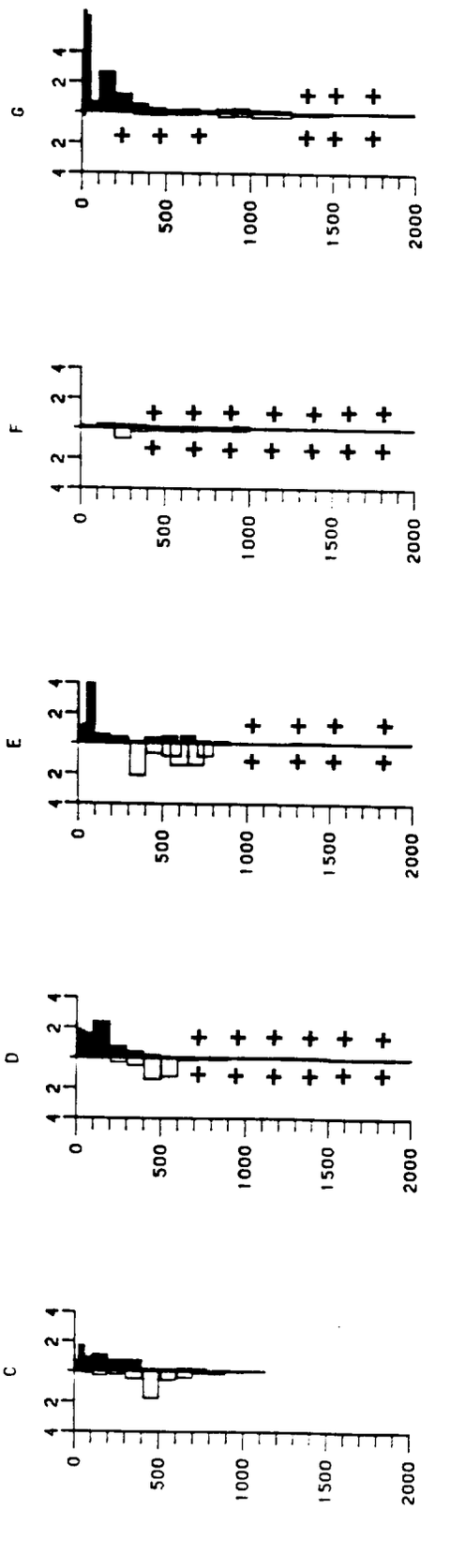

Fig. 5. Euphausiacea: day and night profiles of biomass at positions C-G (RMT8), see legend Fig. 2.

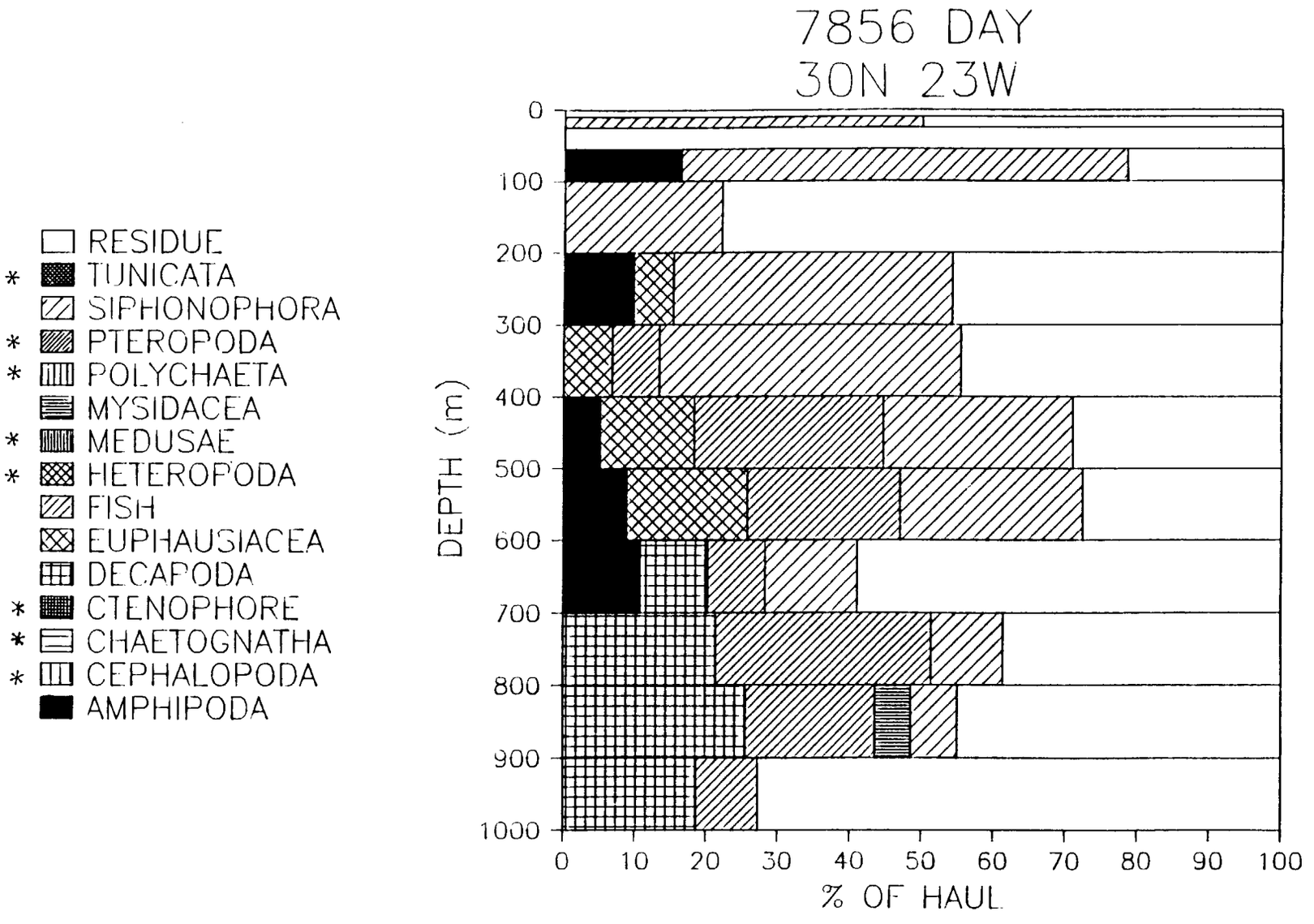

Fig. 6. Percentage contribution of taxa to the total biomass in each haul down to a maximum of 1000m depth at position D, (Day RMT8). Values <5% are not shown. * = insufficient data.

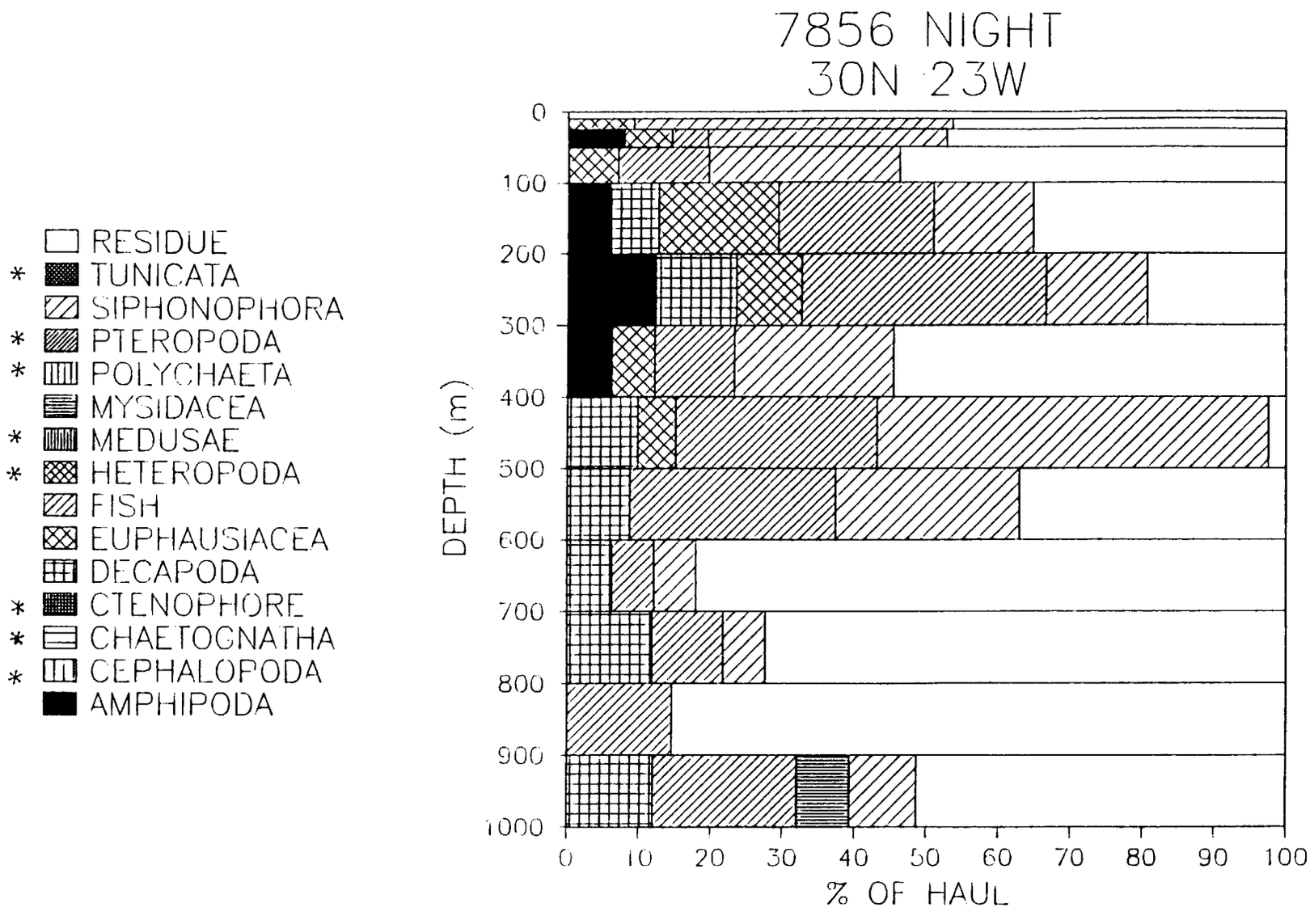

Fig. 7. Percentage contribution of taxa to the total biomass in each haul down to a maximum of 1000m depth at position D. (Night RMT8). Values <5% are not shown. * = insufficient data.

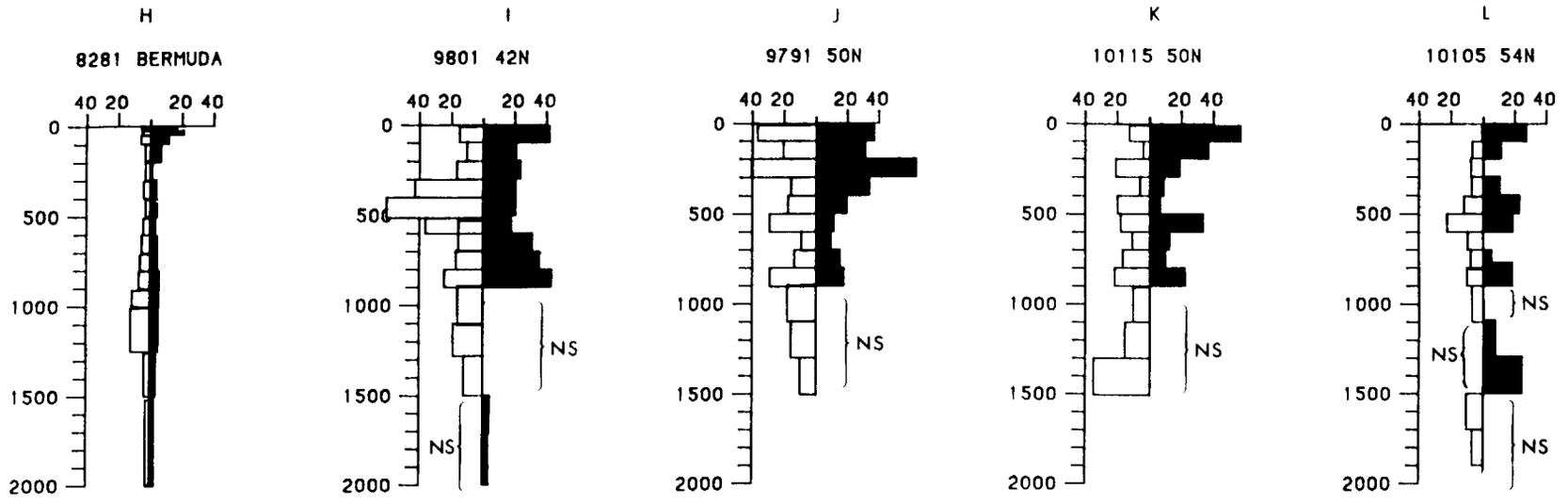

Fig. 8. Day and night profiles of total biomass, measured by wet displacement volume, from RMT8 samples taken at positions H-L. Values are standardised to mls. per $10^3 m^3$ water filtered. NS = No sample, + = relatively low value.

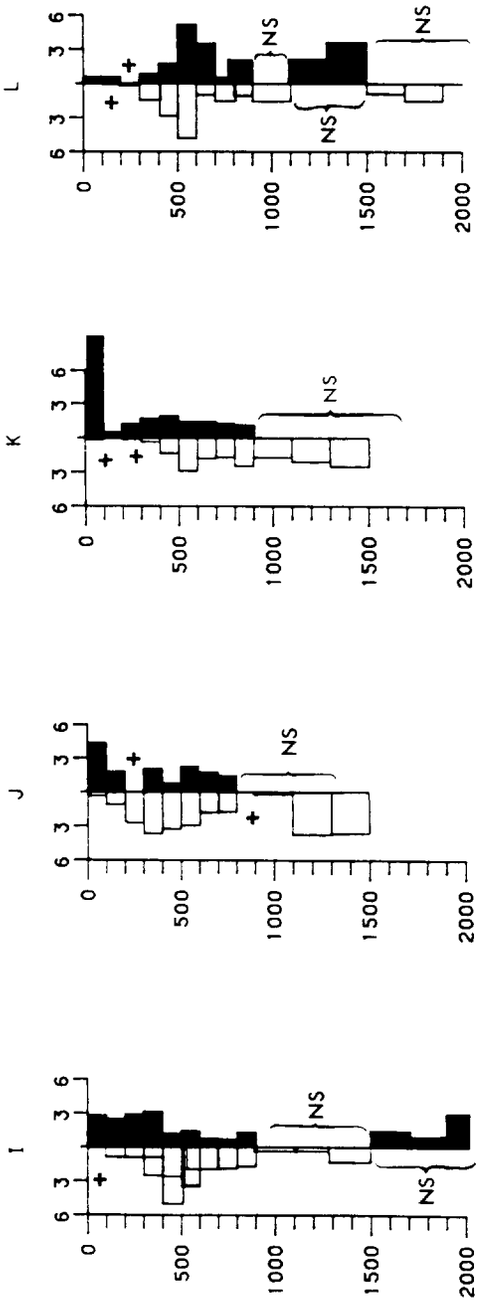

Fig. 9. Fish: day and night profiles of biomass at positions I-L (RMT8), see legend Fig. 8.

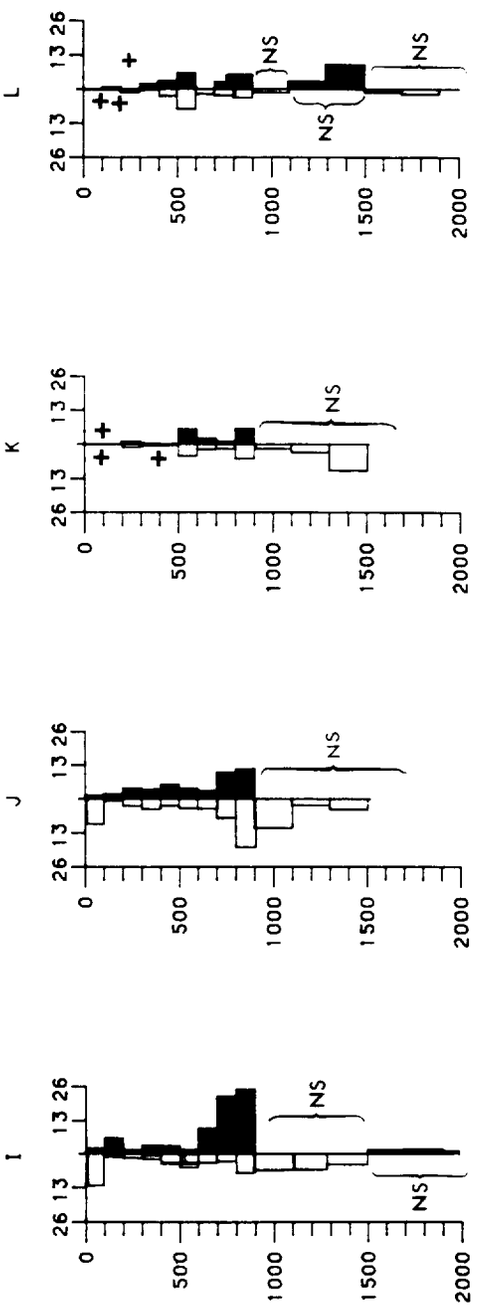

Fig.10. Medusae: day and night profiles of biomass at positions I-L (RMT8), see legend Fig. 8.

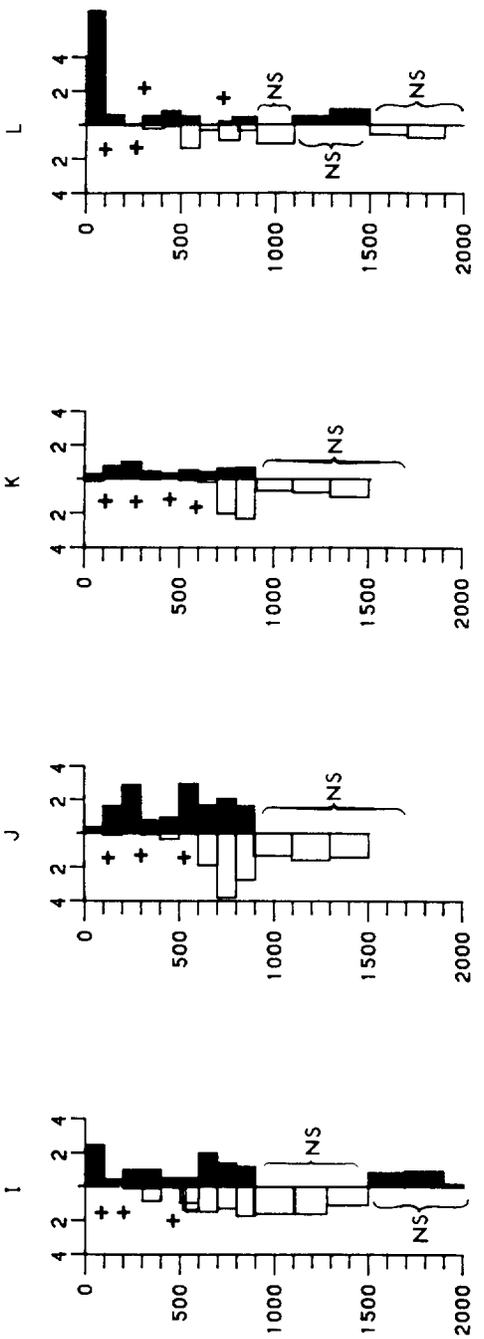

Fig. 11. Decapoda: day and night profiles of biomass at positions I-L (RMT8), see legend Fig. 8.

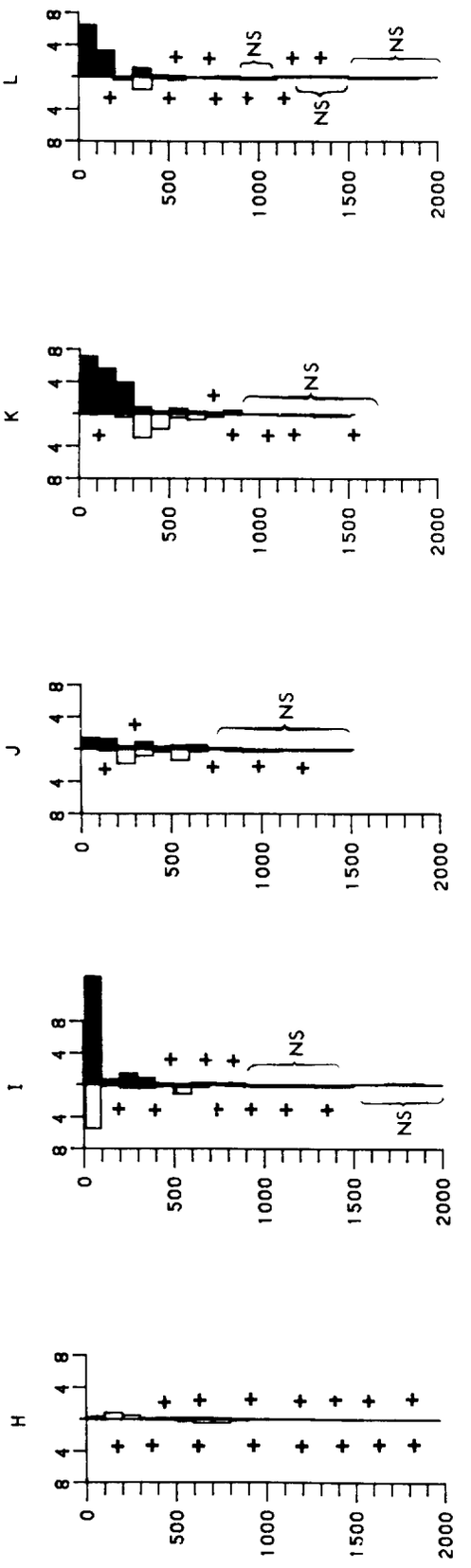

Fig. 12. Euphausiacea: day and night profiles of biomass at positions H-L (RMT8), see legend Fig. 8.

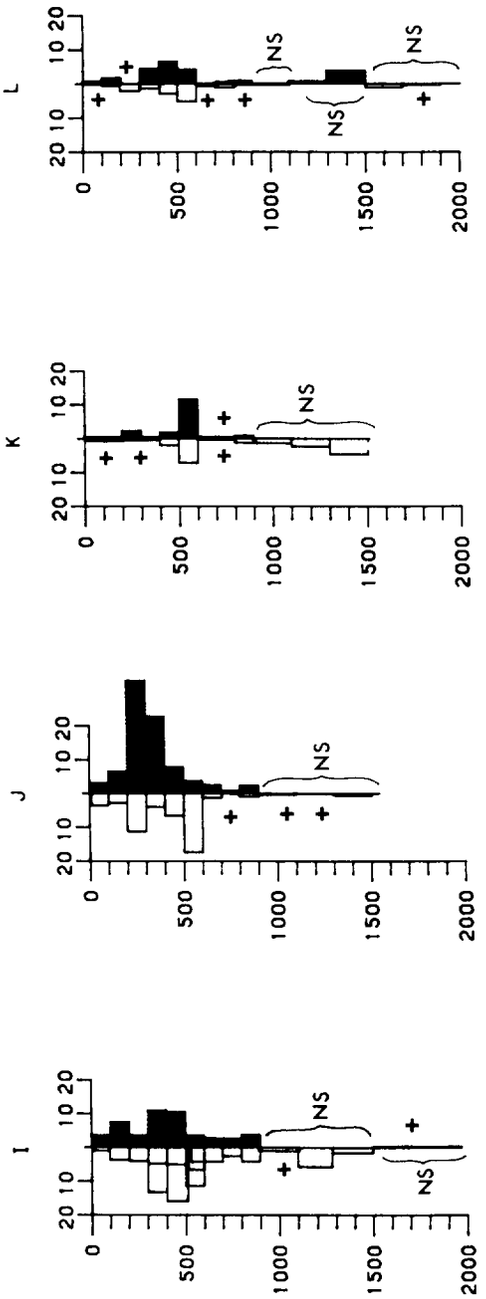

Fig. 13. Siphonophora: day and night profiles of biomass at positions I-L (RMT8), see legend Fig. 8.

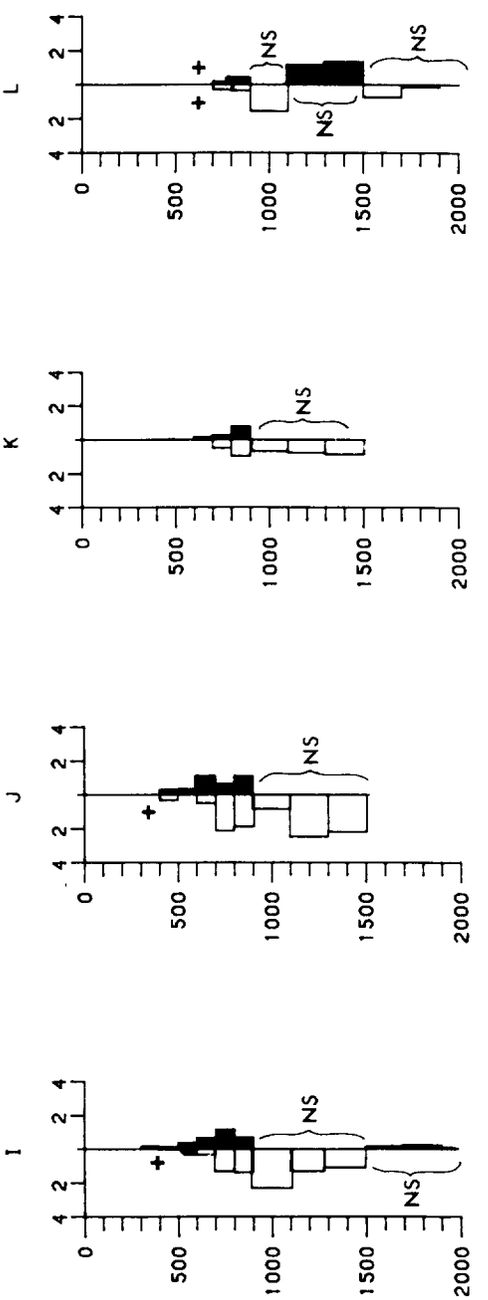

Fig. 14. Mysidacea: day and night profiles of biomass at positions I-L (RMT8), see legend Fig. 8.

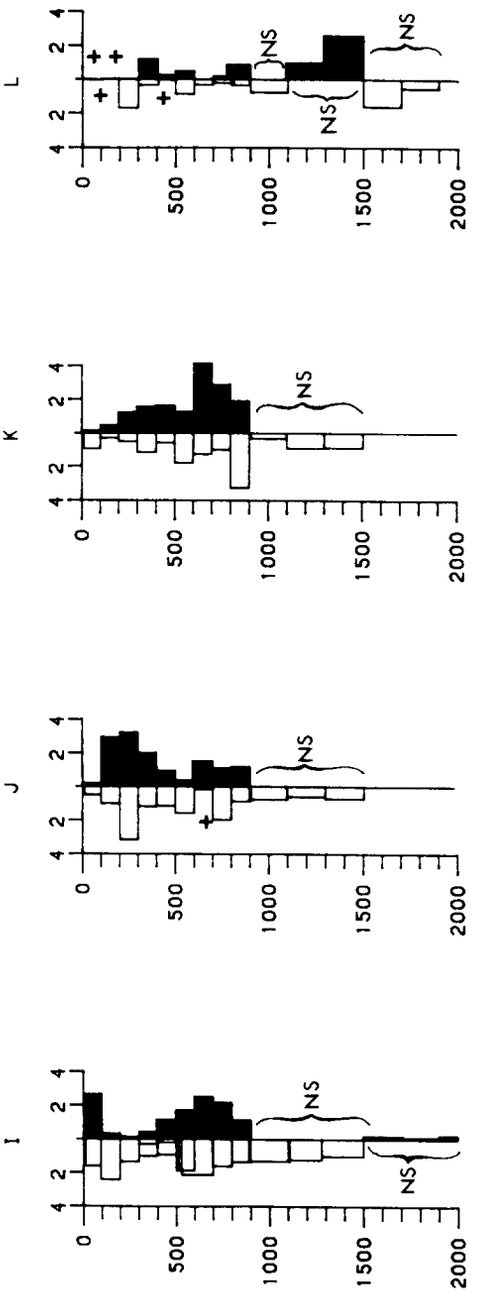

Fig. 15. Chaetognatha: day and night profiles of biomass at positions I-L (RMT8), see legend Fig. 8.

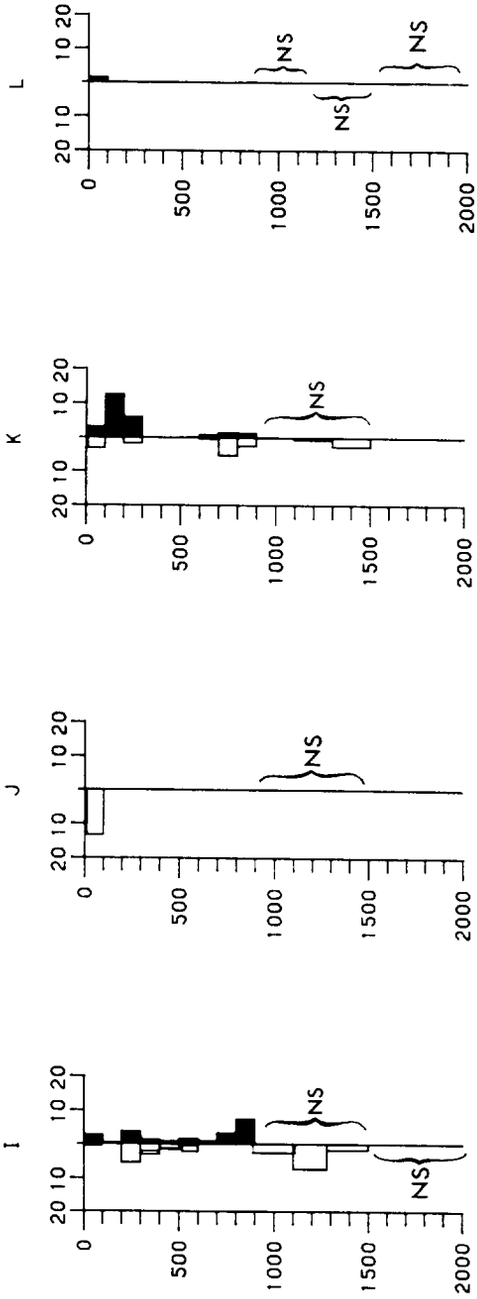

Fig. 16. Ctenophora: day and night profiles of biomass at positions I-L (RMT8), see legend Fig. 8.

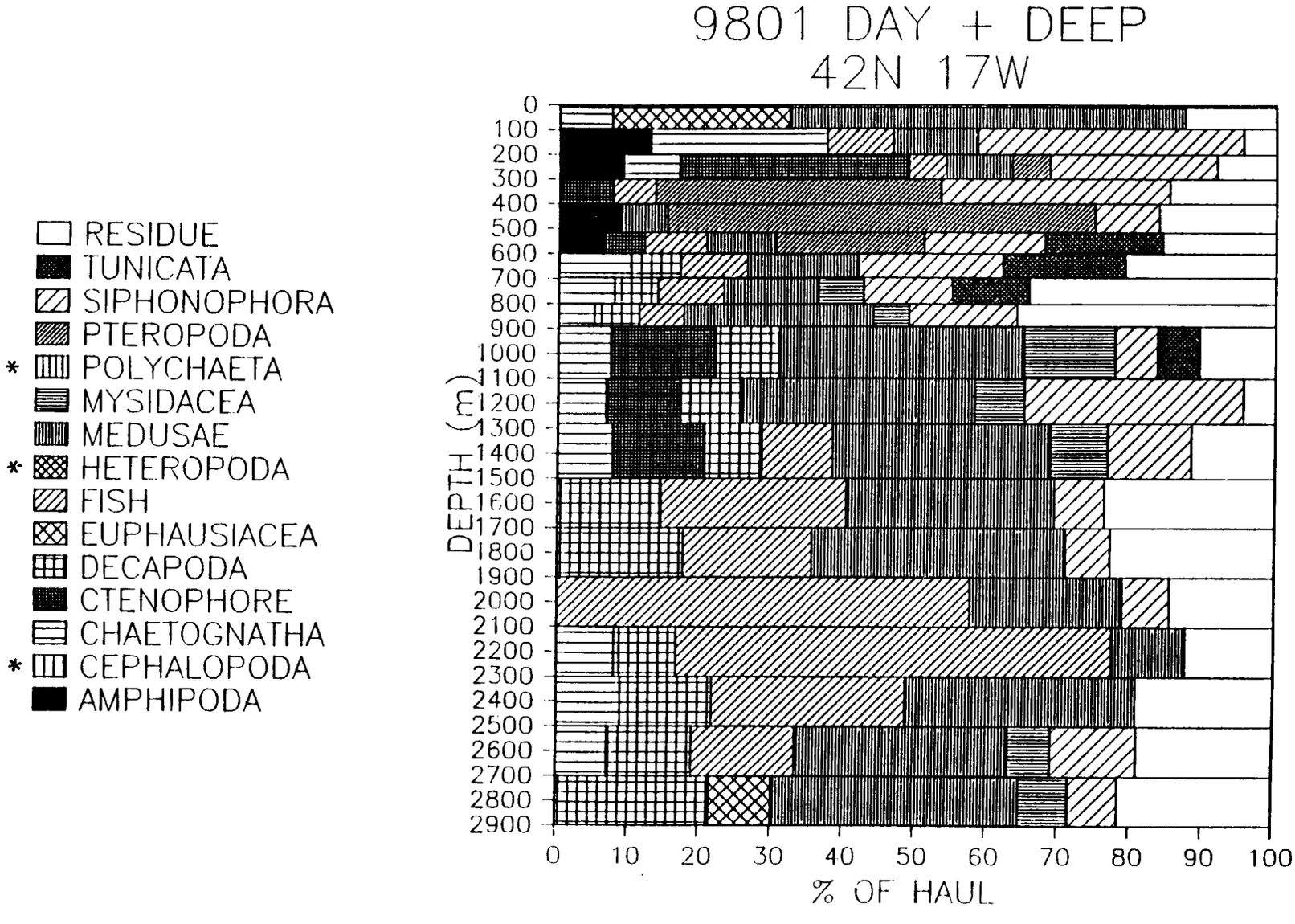

Fig. 17. Percentage contribution of taxa to the total biomass in each haul down to a maximum of 2900m depth at position I, (Day + Deep RMT8). Values < 5% are not shown. * = insufficient data.

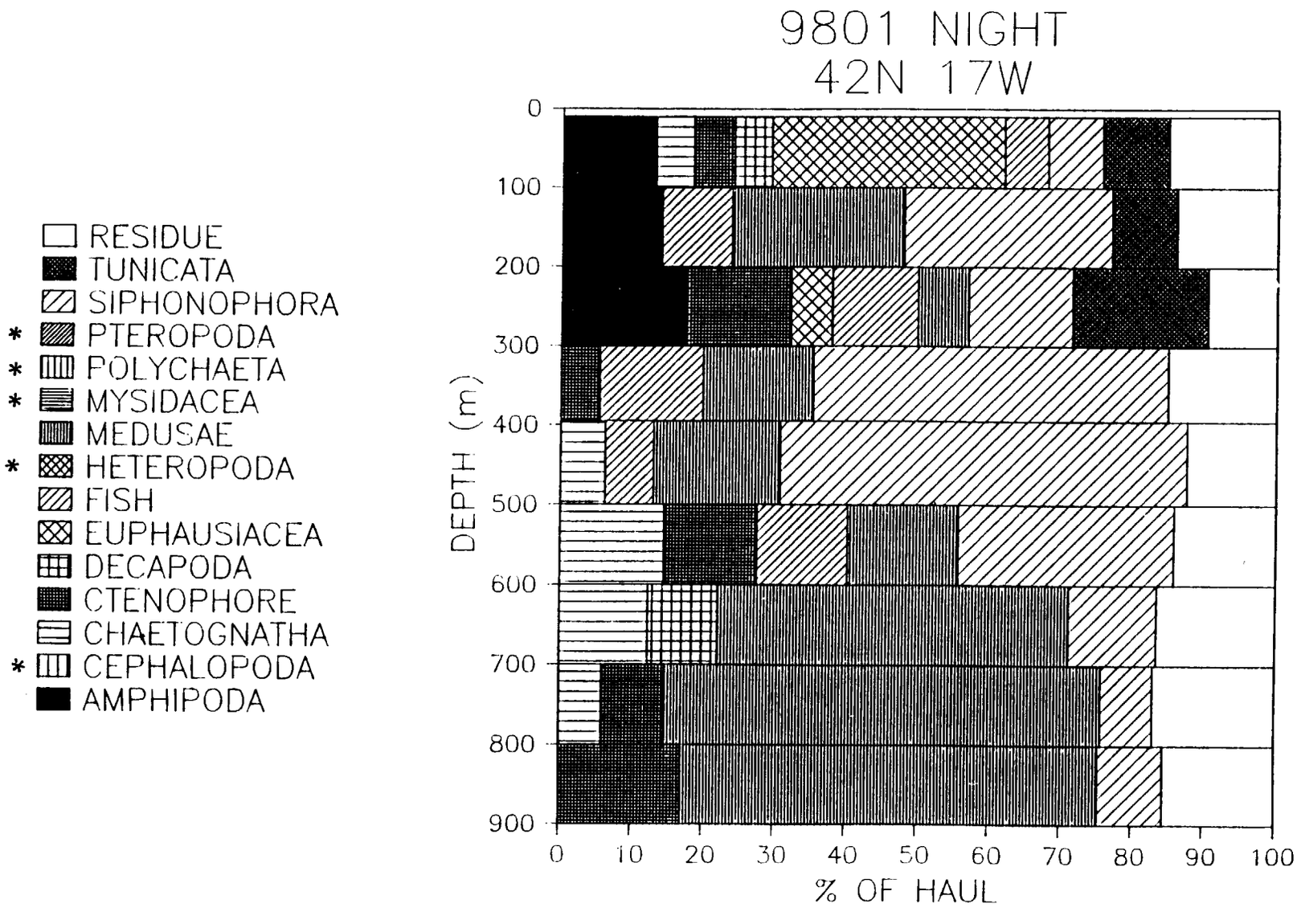

Fig. 18. Percentage contribution of taxa to the total biomass in each haul down to a maximum of 900m depth at position I, (Night RMT8). Values < 5% are not shown. * = insufficient data.

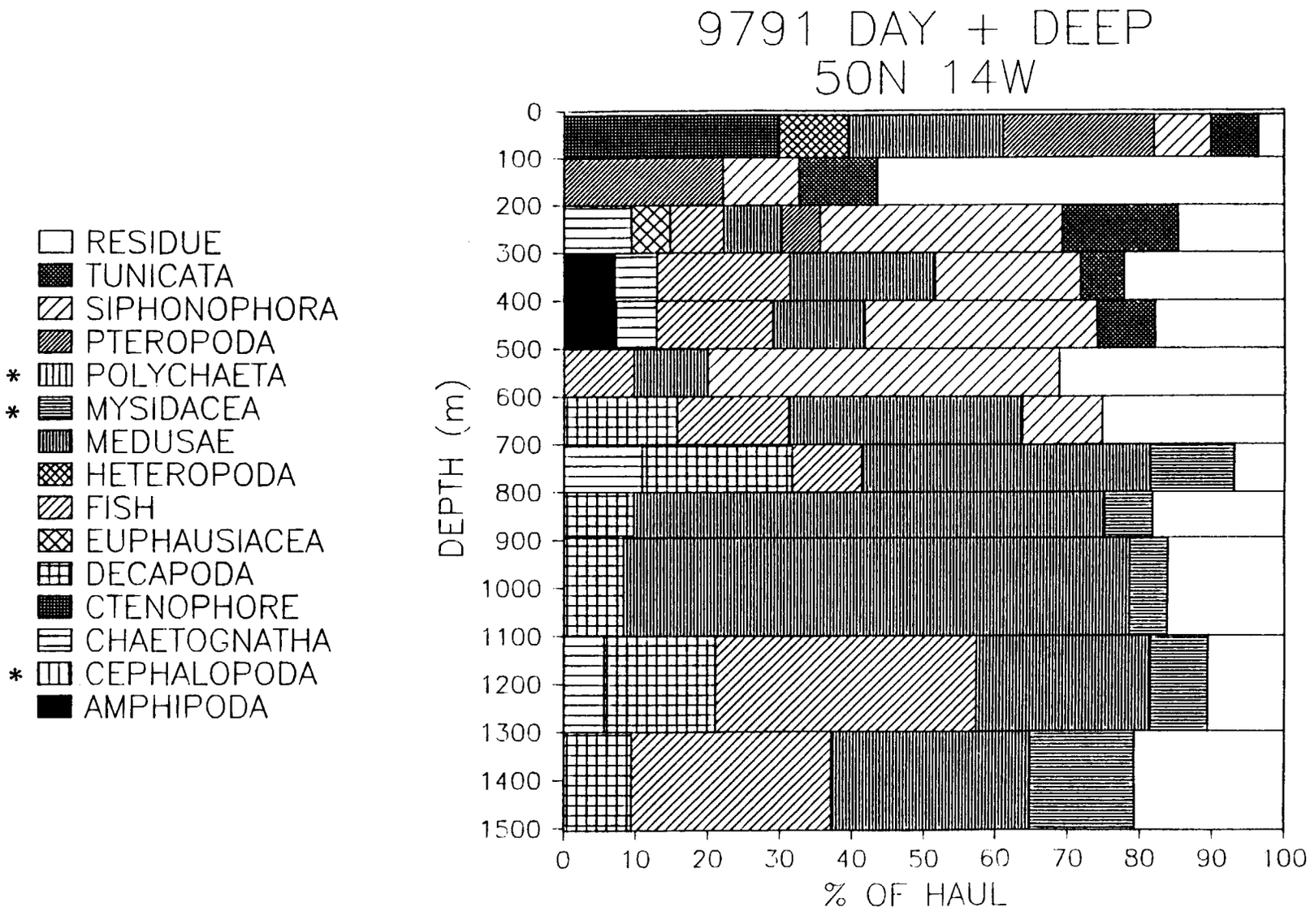

Fig. 19. Percentage contribution of taxa to the total biomass in each haul down to a maximum of 1500m depth at position J, (Day + Deep RMT8). Values <5% are not shown. * = insufficient data.

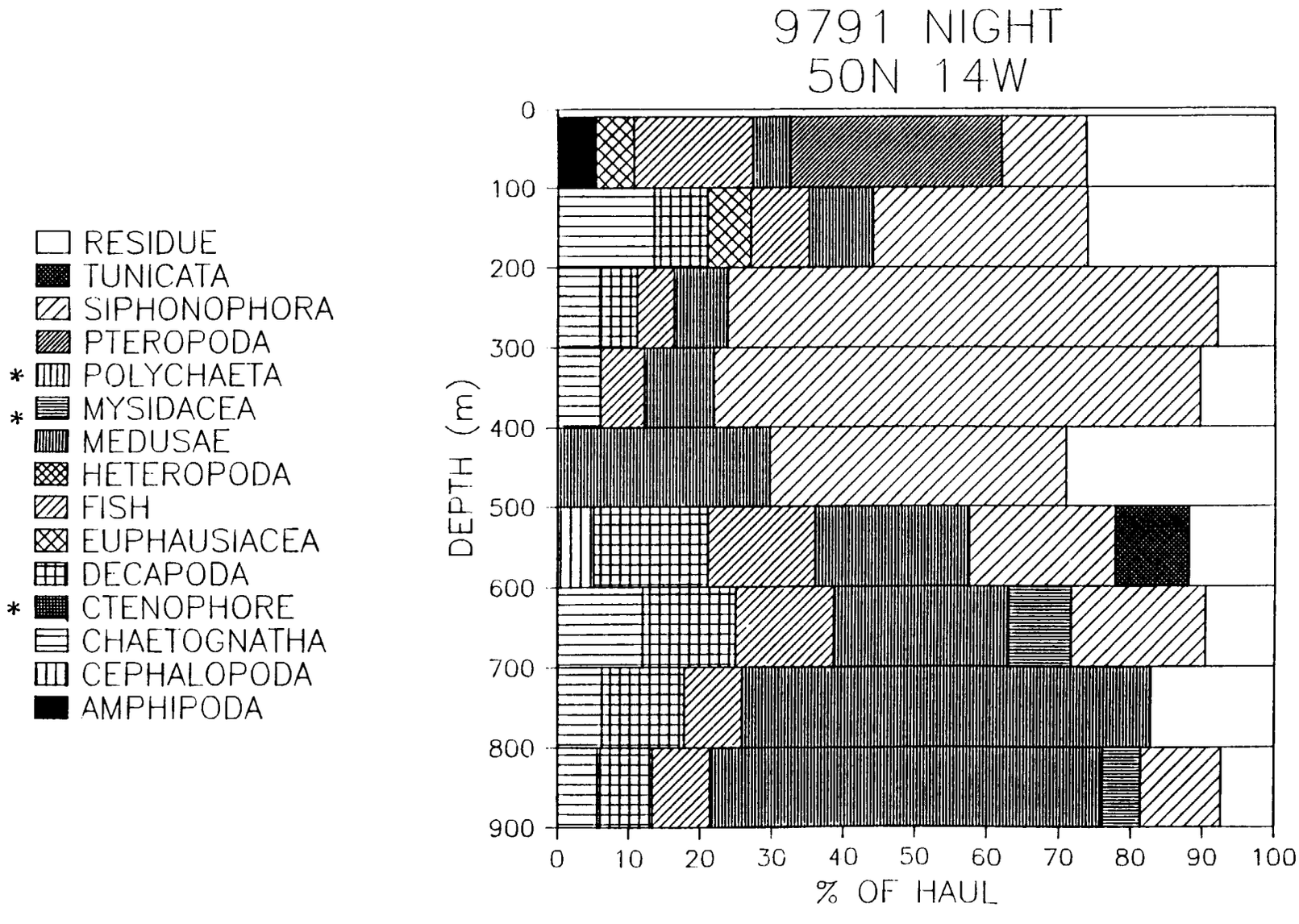

Fig. 20. Percentage contribution of taxa to the total biomass in each haul down to a maximum of 900m depth at position J, (Night RMT8). Values <5% are not shown. * = insufficient data.

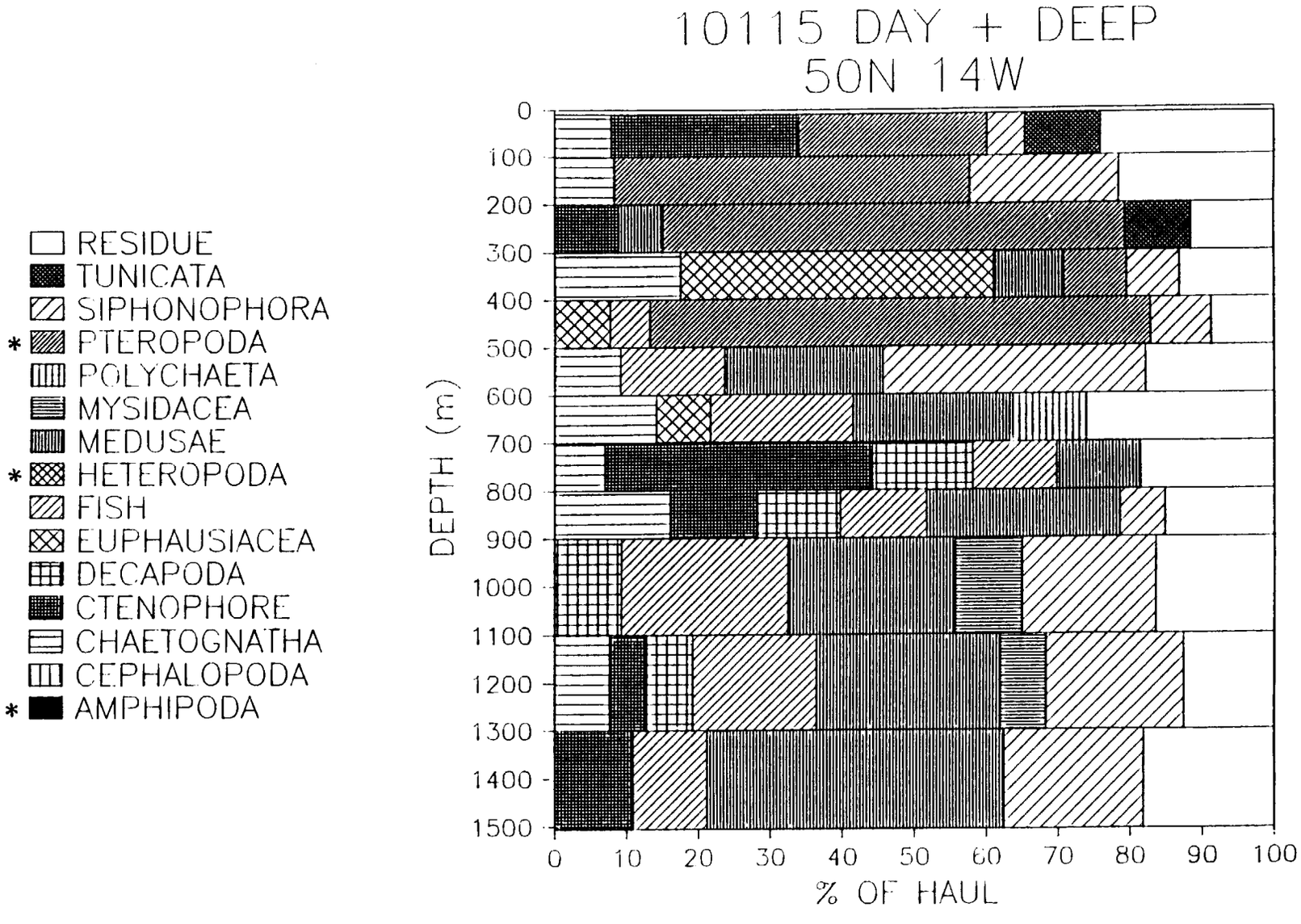

Fig. 21. Percentage contribution of taxa to the total biomass in each haul down to a maximum of 1500m depth at position K, (Day + Deep RMT8). Values <5% are not shown. * = insufficient data.

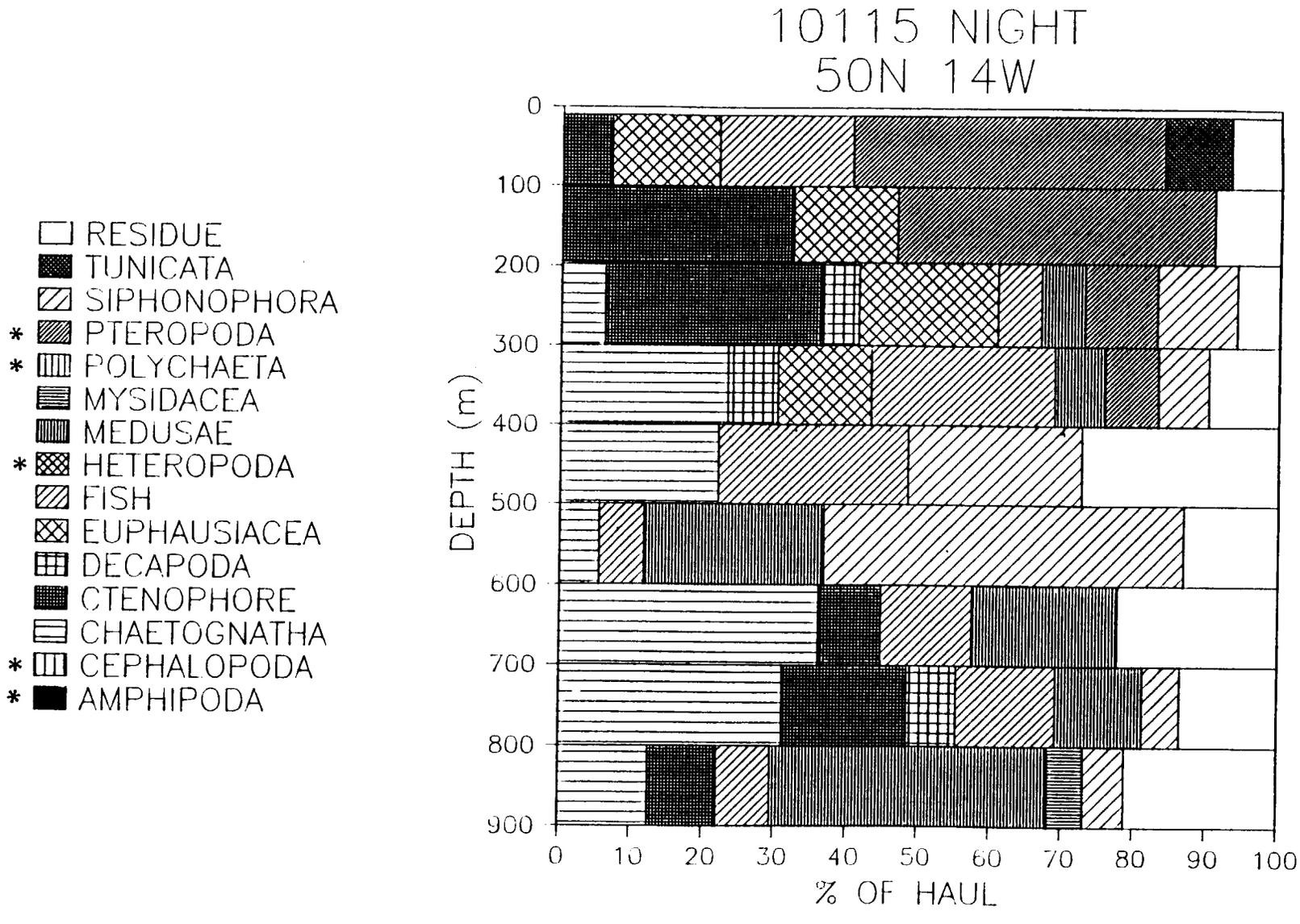

Fig. 22. Percentage contribution of taxa to the total biomass in each haul down to a maximum of 900m depth at position K, (Night RMT8). Values <5% are not shown. * = insufficient data.

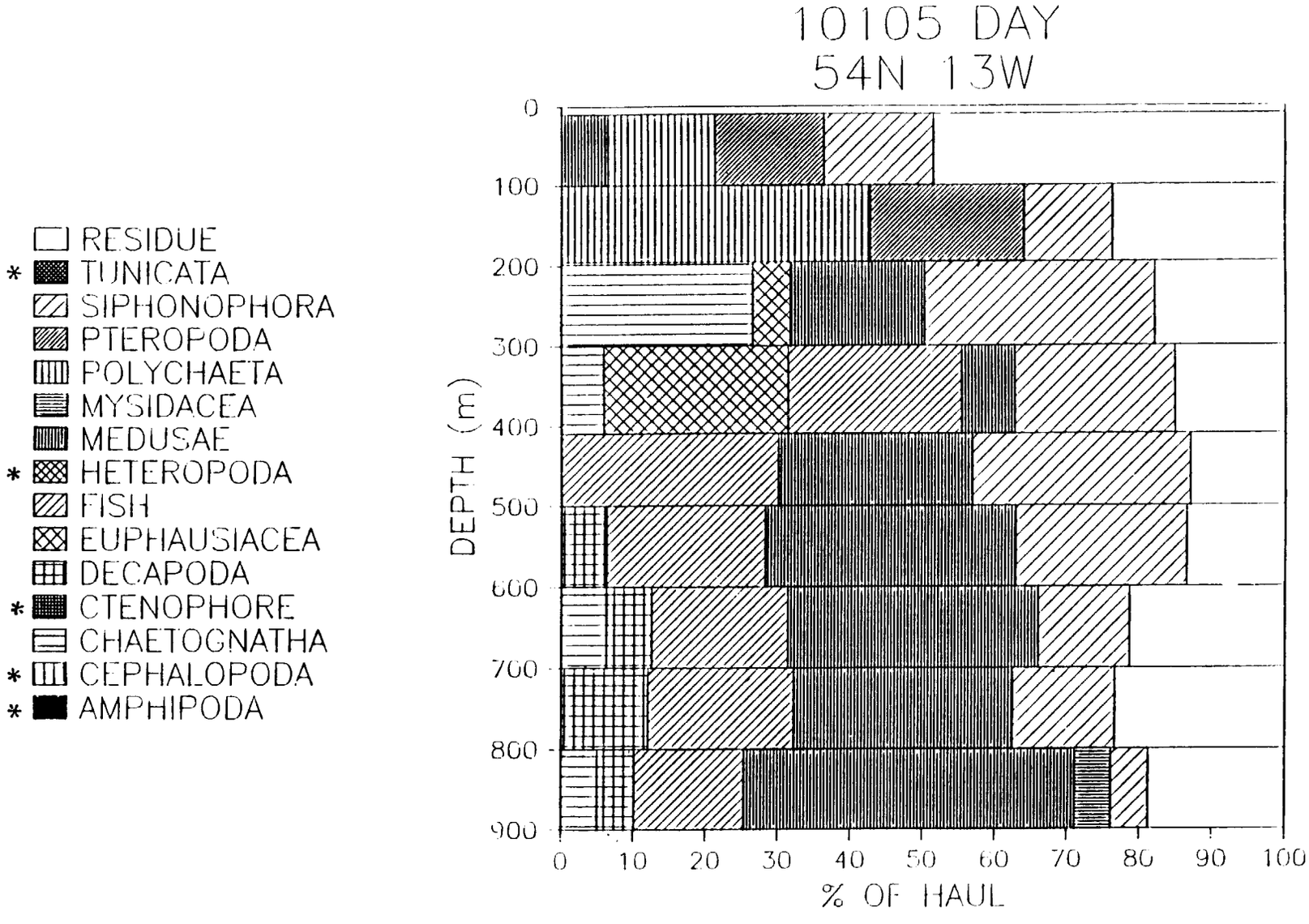

Fig. 23. Percentage contribution of taxa to the total biomass in each haul down to a maximum of 900m depth at position L, (Day RMT8). Values <5% are not shown. * = insufficient data

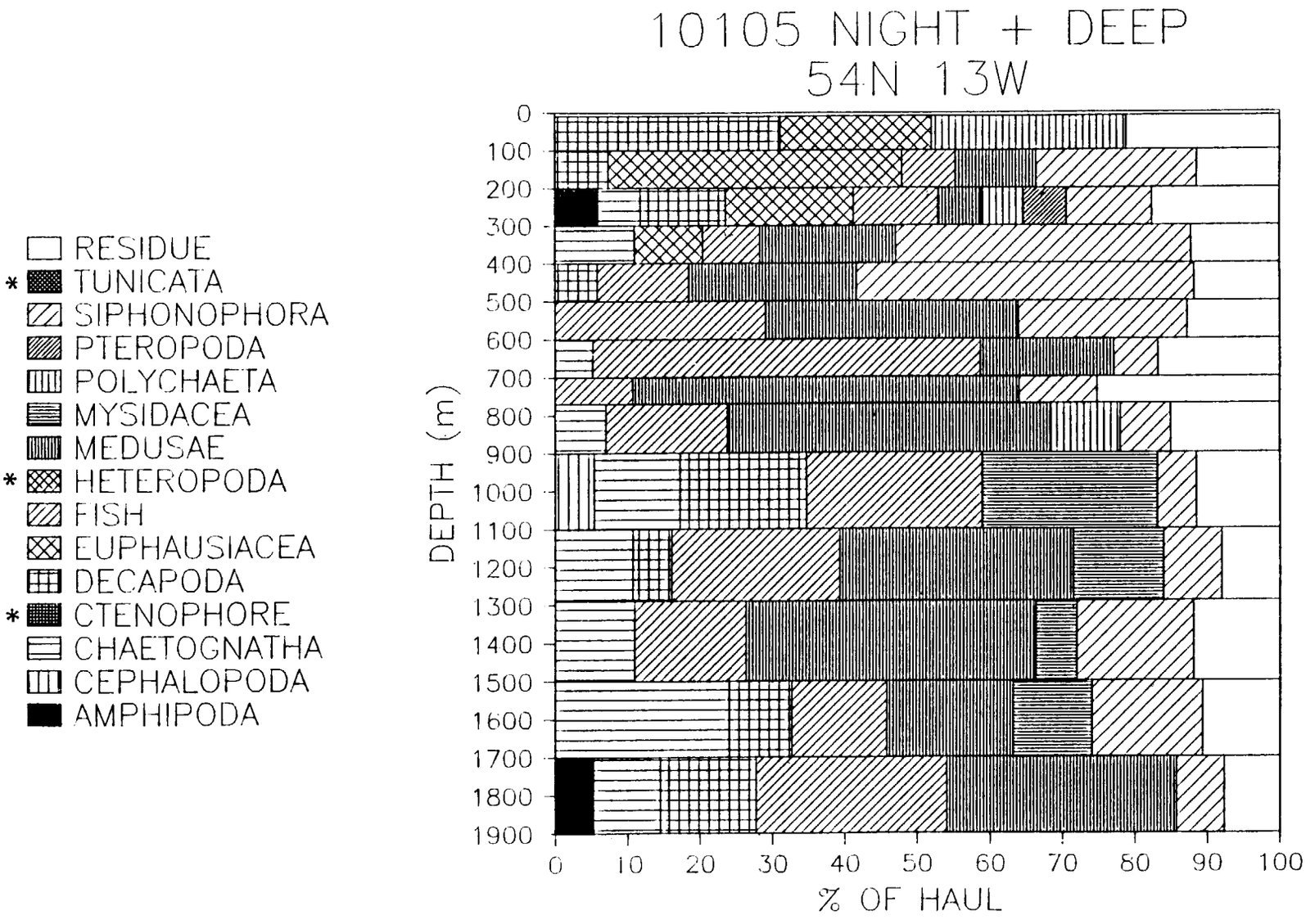

Fig 24. Percentage contribution of taxa to the total biomass in each haul to a maximum of 1900m depth at position L. (Night + Deep RMT8)
Values <5% are not shown. * = insufficient data

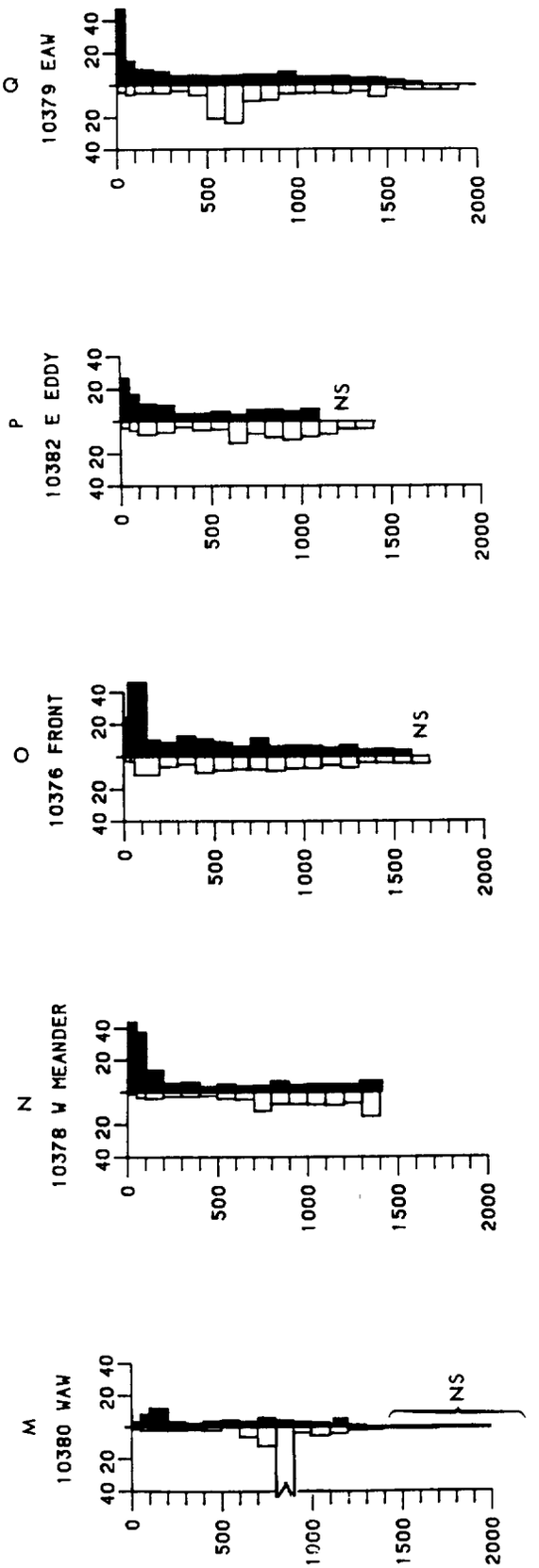

Fig. 25. Day and night profiles of total biomass, measured by wet displacement volume, from RMT8 samples taken at positions M-Q. Values are standardised to mls. per $10^3 m^3$ water filtered. NS = No sample, + = relatively low value.

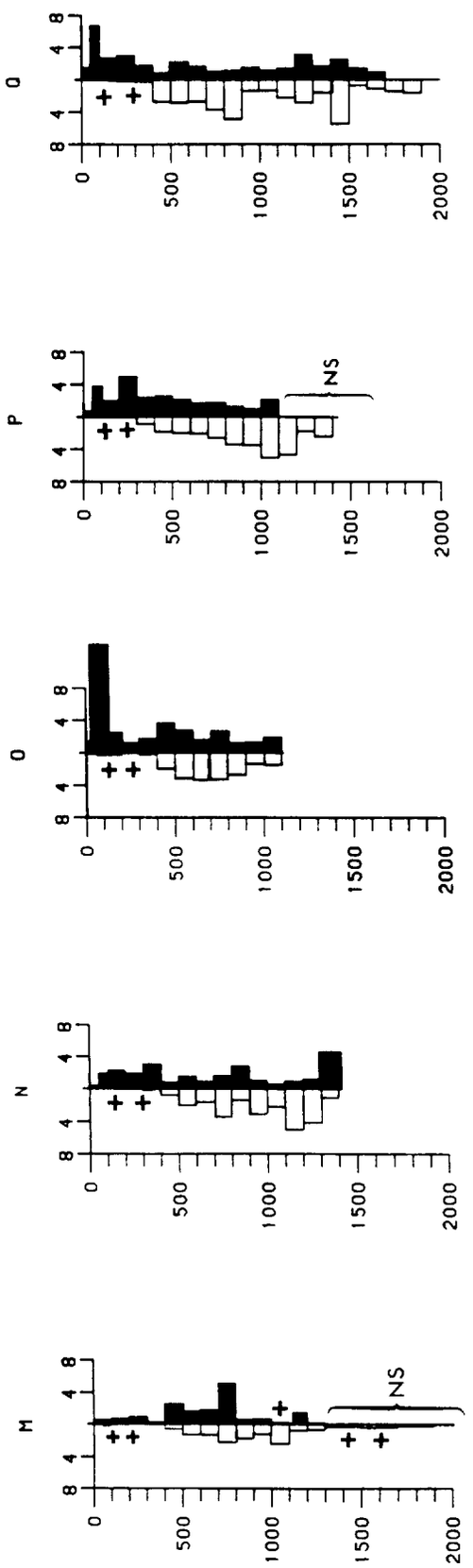

Fig. 26. Fish: day and night profiles of biomass at positions M-Q (RMT8), see legend Fig. 40.

Fig. 27. Pyrosoma: day and night profiles of biomass at positions M-Q (RMT8), see legend Fig. 25

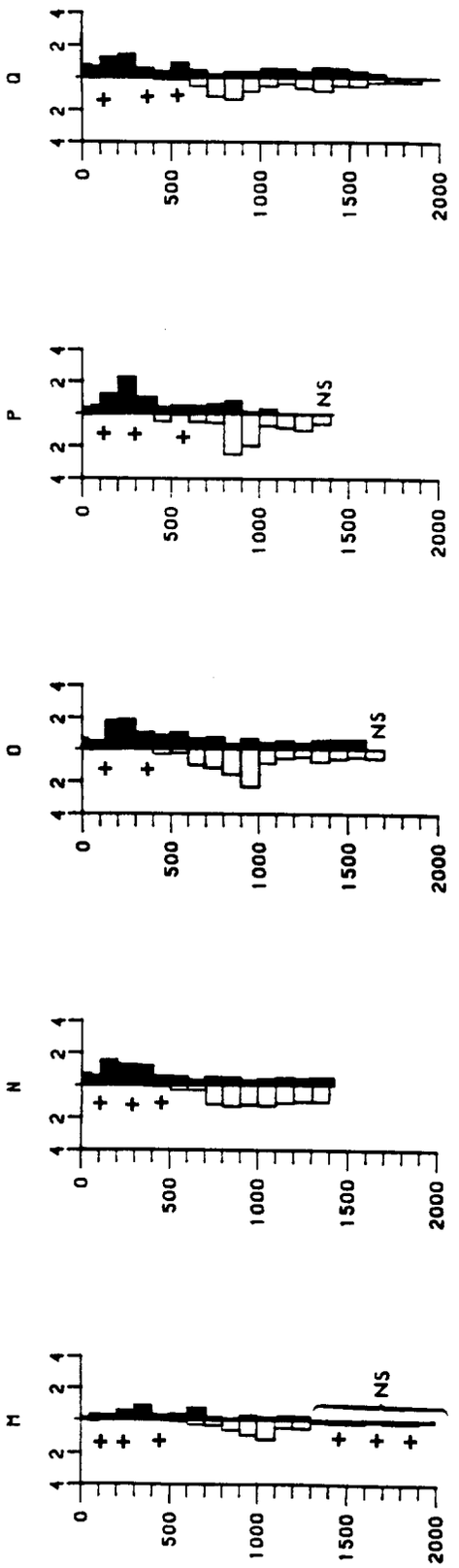

Fig. 28. Decapoda: day and night profiles of biomass at positions M-Q (RMT8), see legend Fig. 25

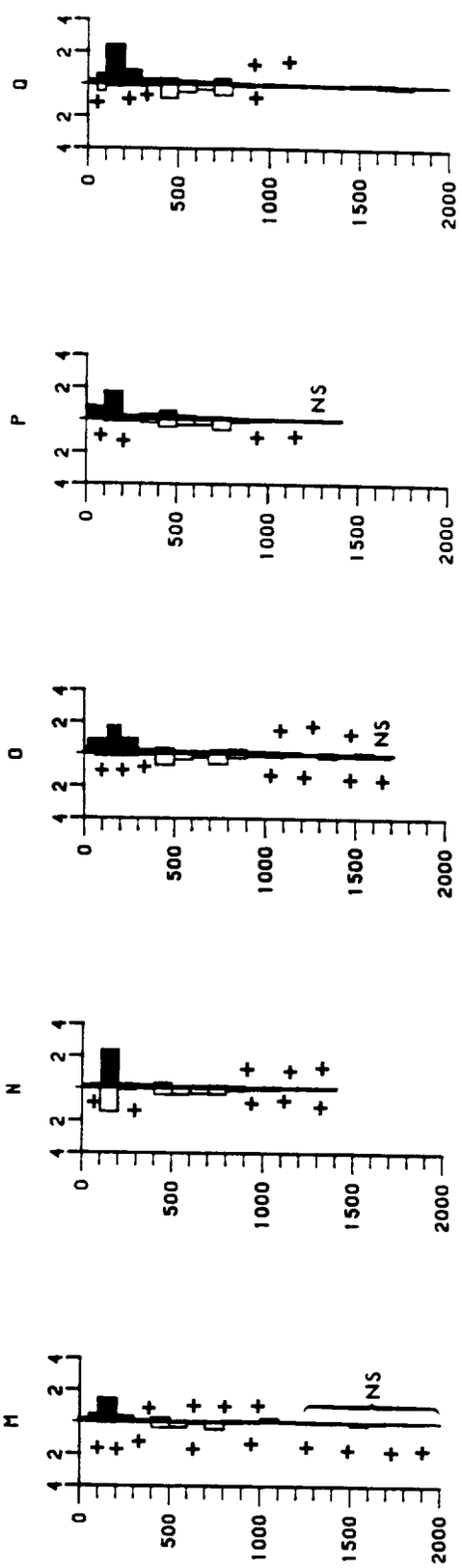

Fig. 29. Euphausiacea: day and night profiles of biomass at positions M-Q (RMT8), see legend Fig. 25.

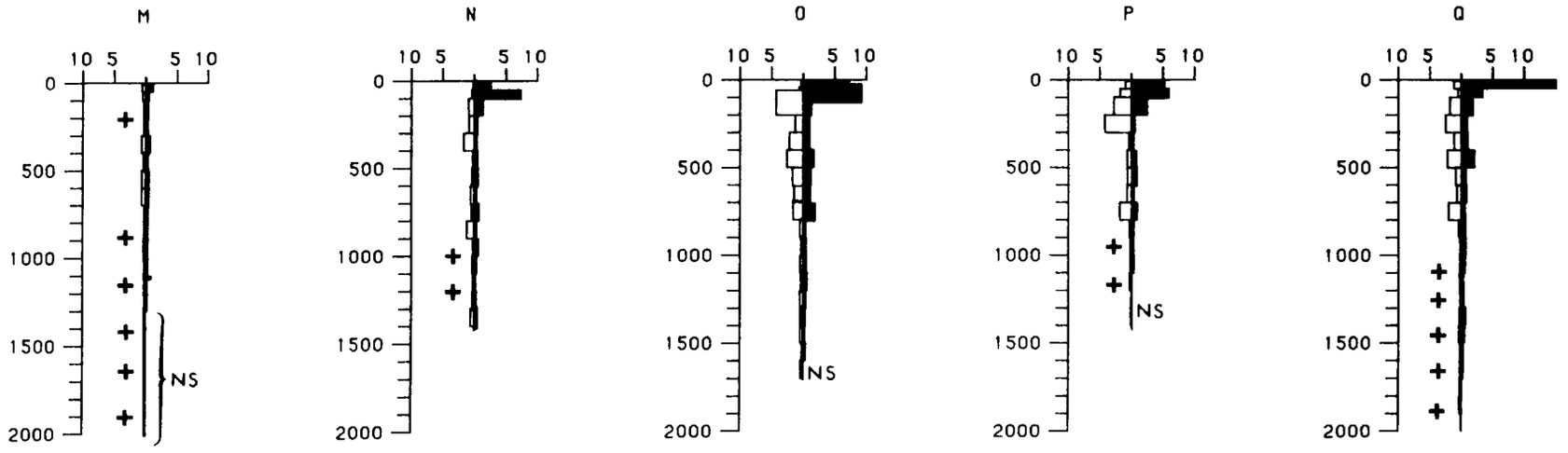

Fig. 30. Siphonophora: day and night profiles of biomass at positions M-Q (RMT8), see legend Fig. 25.

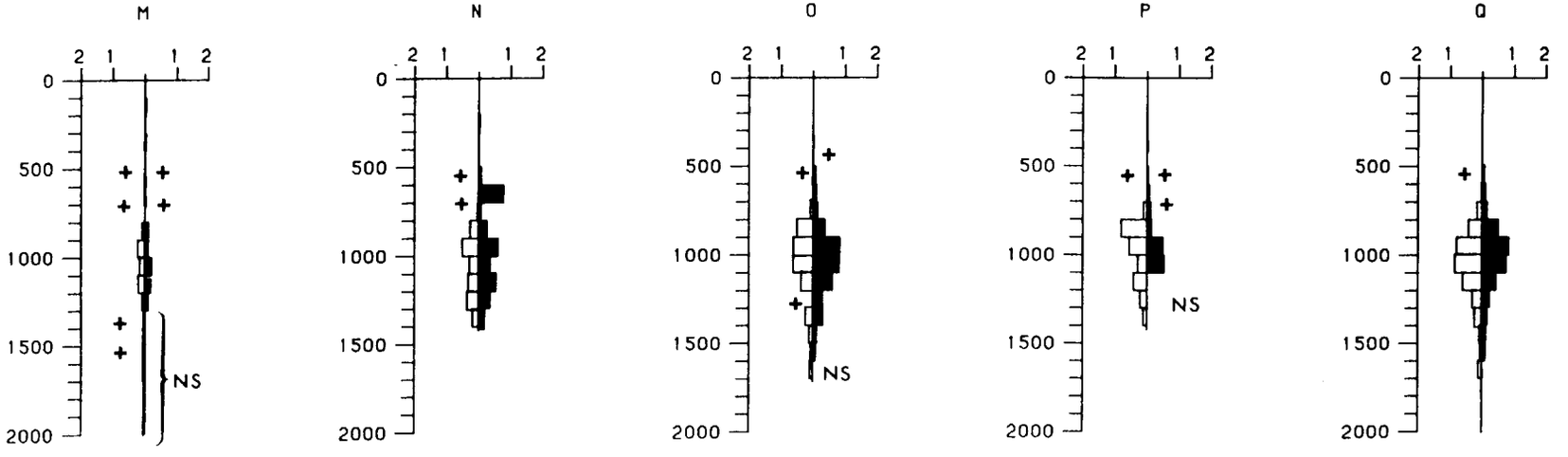

Fig. 31. Mysidacea: day and night profiles of biomass at positions M-Q, (RMT8) see legend Fig. 25.

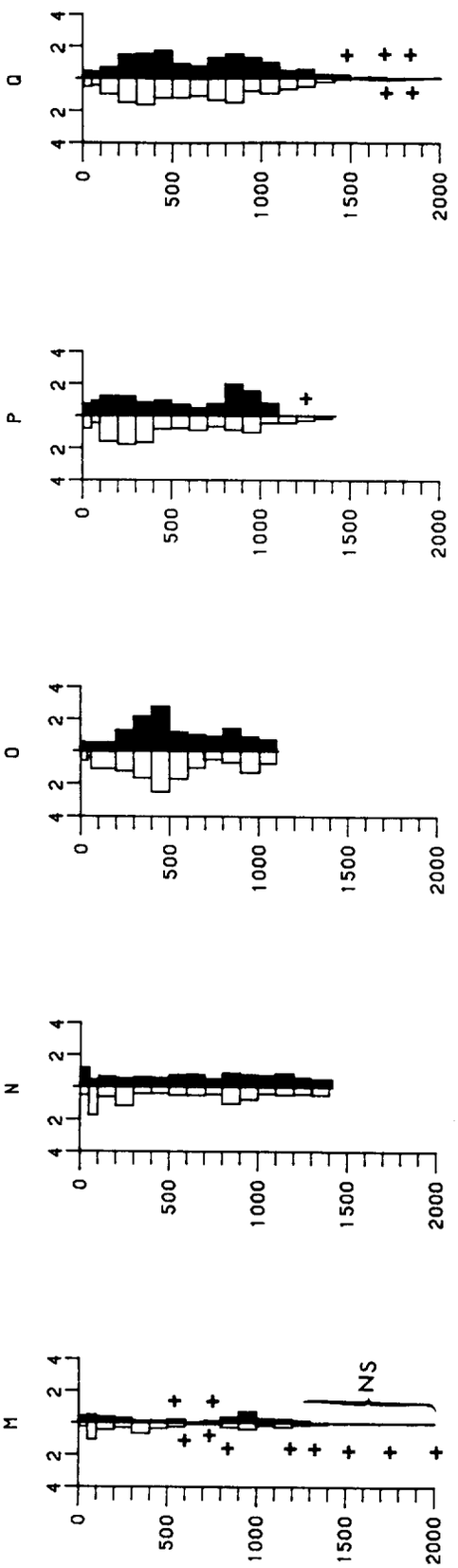

Fig. 32. Chaetognatha: day and night profiles of biomass at positions M-Q (RMT8) see legend Fig.25.

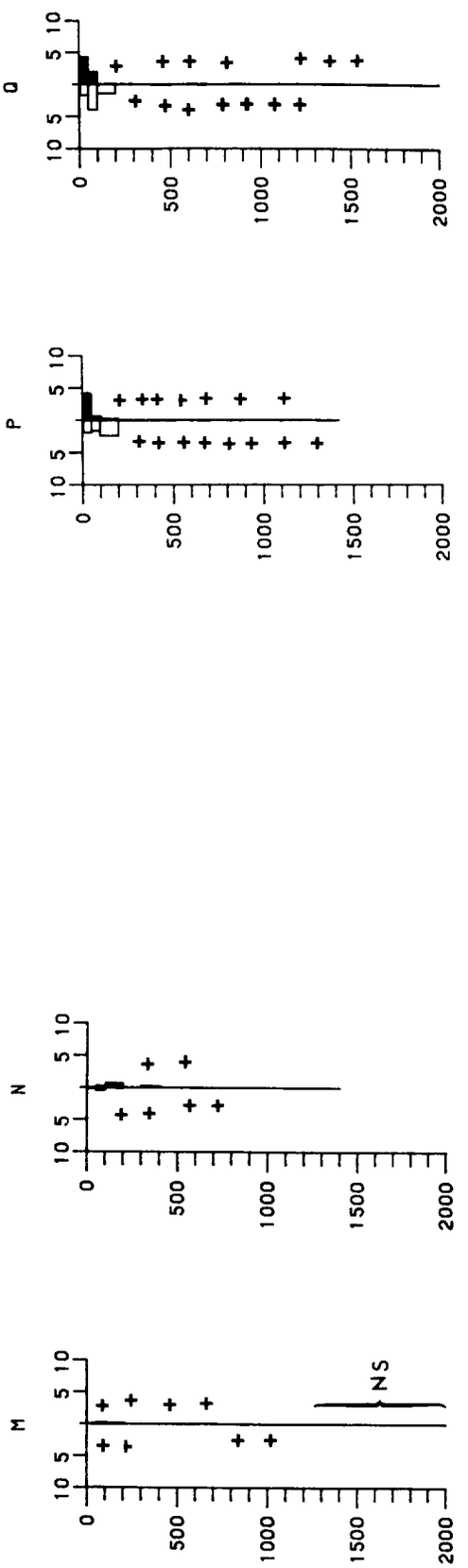

Fig. 33. Tunicates: day and night profiles of biomass at positions M-N, P-Q, see legend Fig. 25.

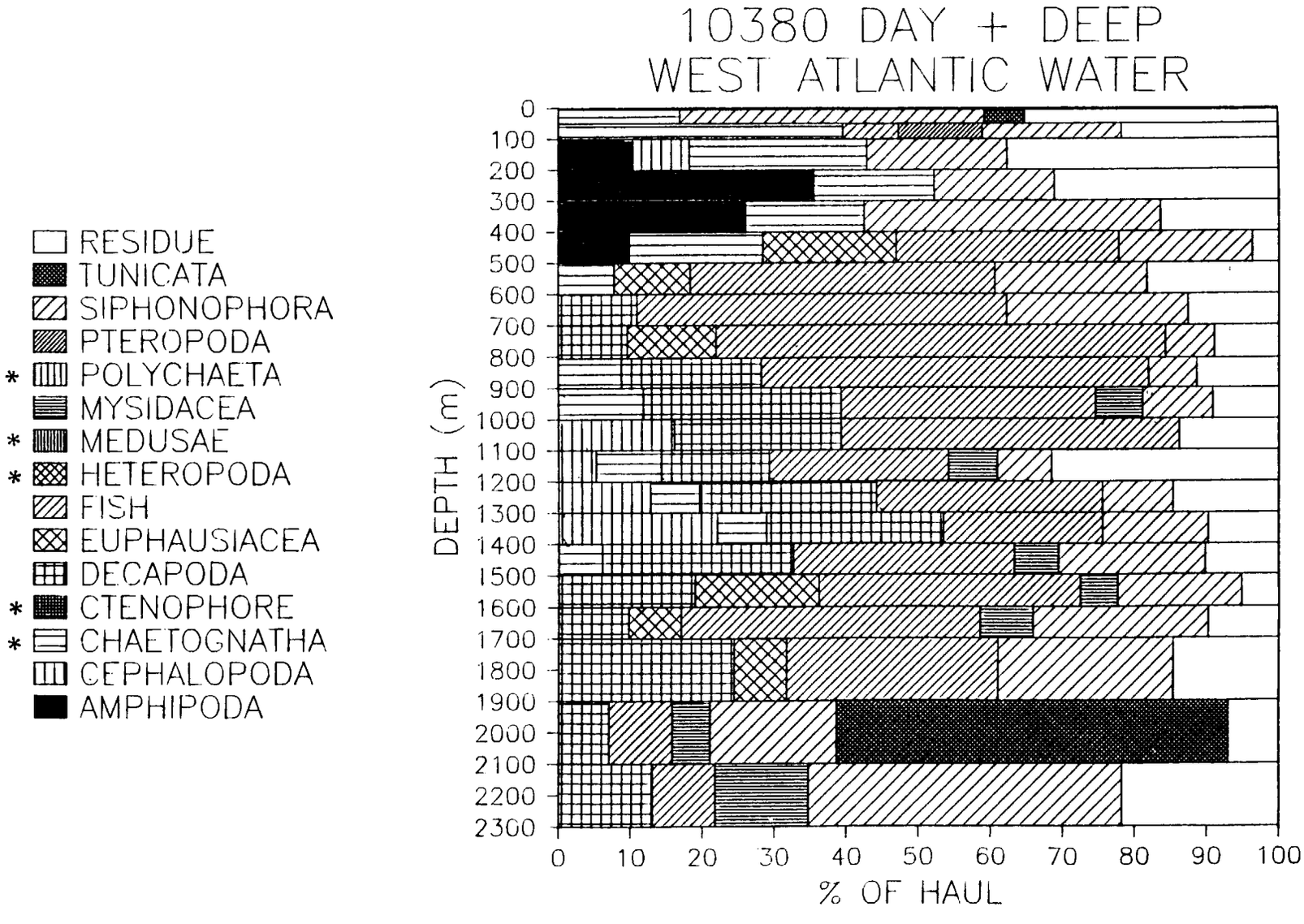

Fig. 34. Percentage contribution of taxa to the total biomass in each haul down to a maximum of 2300m depth at position M, (Day + Deep RMT8). Values <5% are not shown. * = insufficient data.

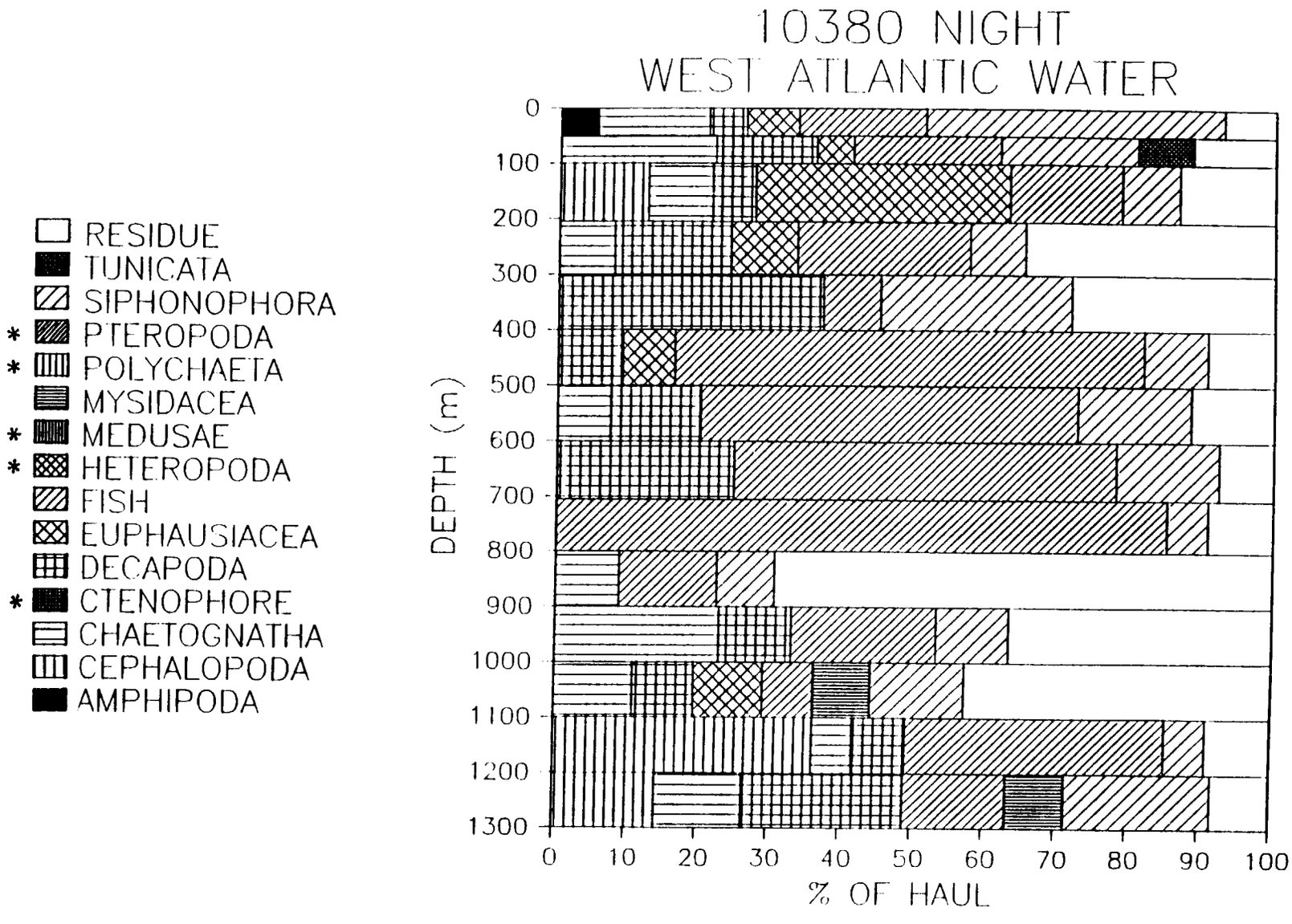

Fig. 35. Percentage contribution of taxa to the total biomass in each haul down to a maximum of 1300m depth at position M (Night RMT8). Values < 5% are not shown. * = insufficient data.

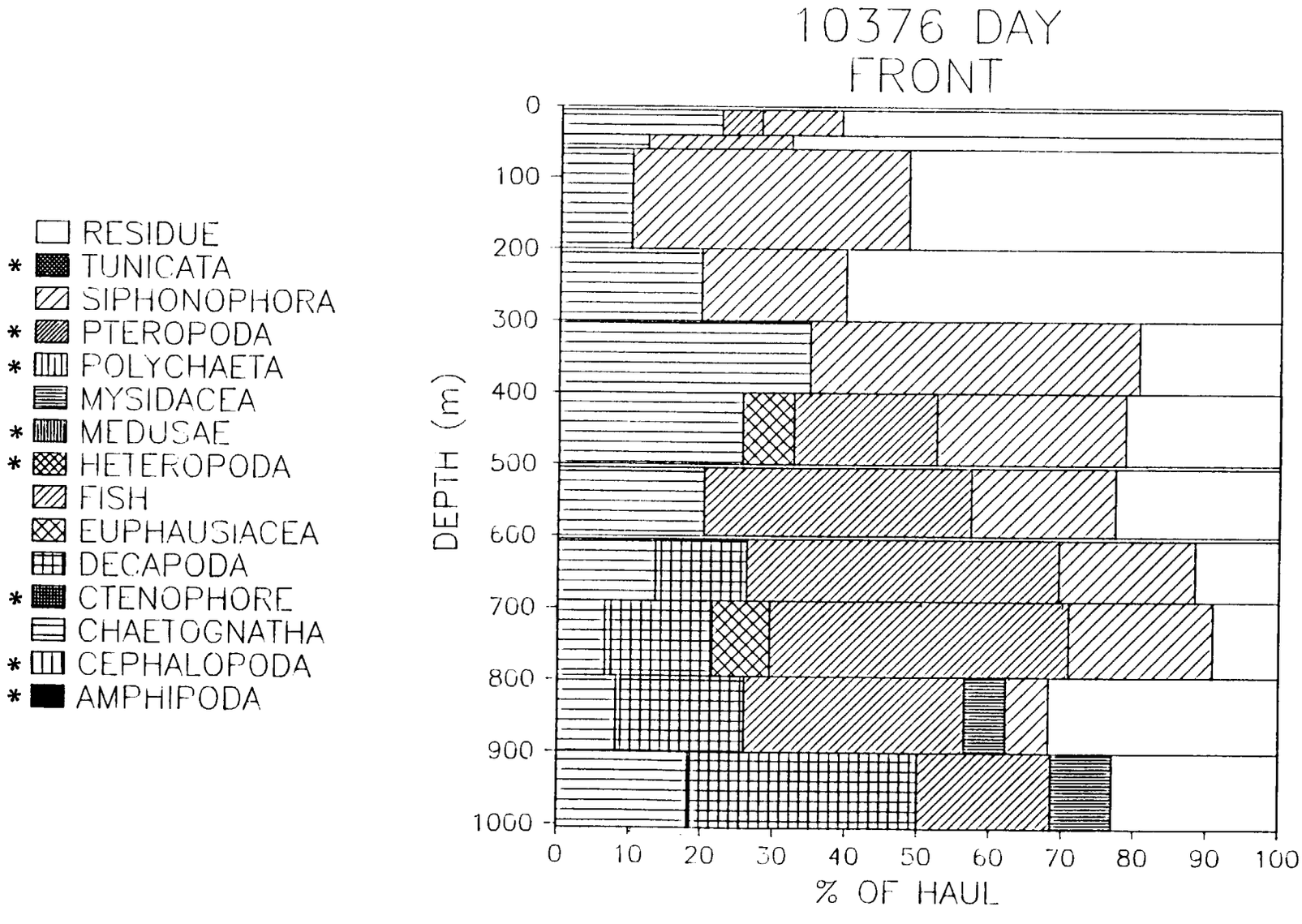

Fig. 36. Percentage contribution of taxa to the total biomass in each haul down to a maximum of 1000m depth at position 0, (Day RMT8). Values <5% are not shown. * = insufficient data.

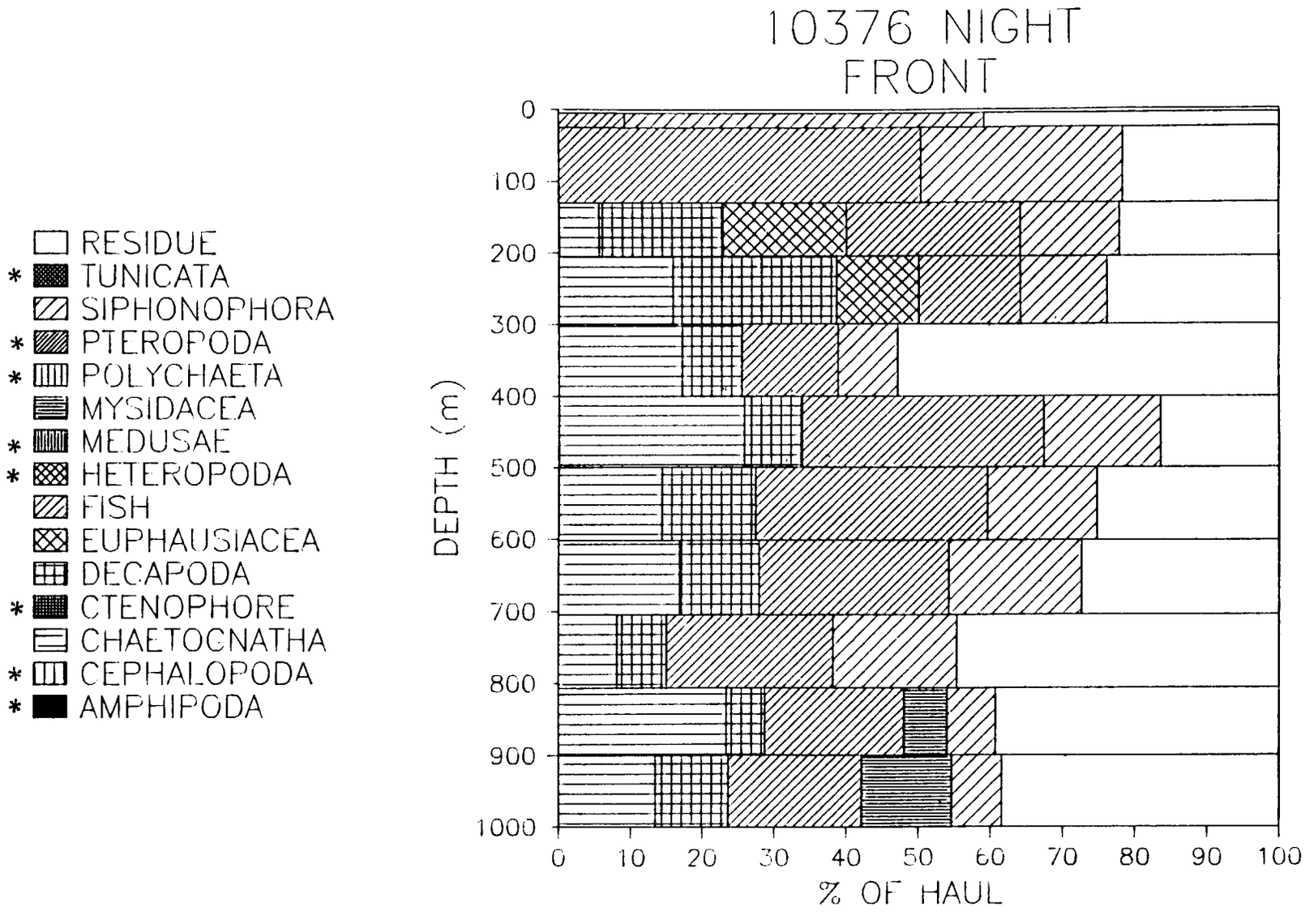

Fig. 37. Percentage contribution of taxa to the total biomass in each haul down to a maximum of 1000m depth at position O (Night RMT8)). Values <5% are not shown. * = insufficient data.

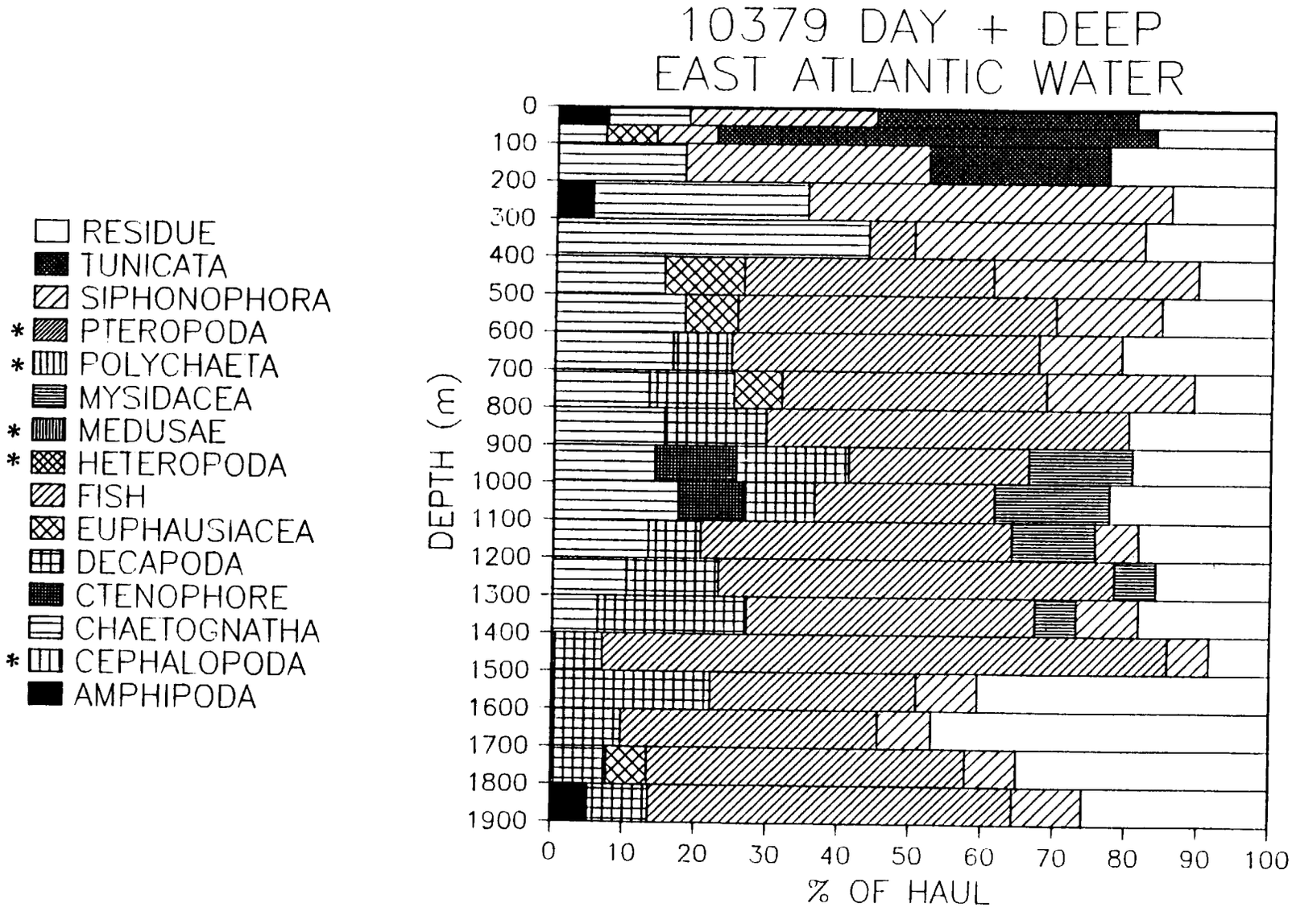

Fig. 38. Percentage contribution of taxa to the total biomass in each haul down to a maximum of 1900m depth at position Q (Day + Deep RMT8). Values <5% are not shown. * = insufficient data.

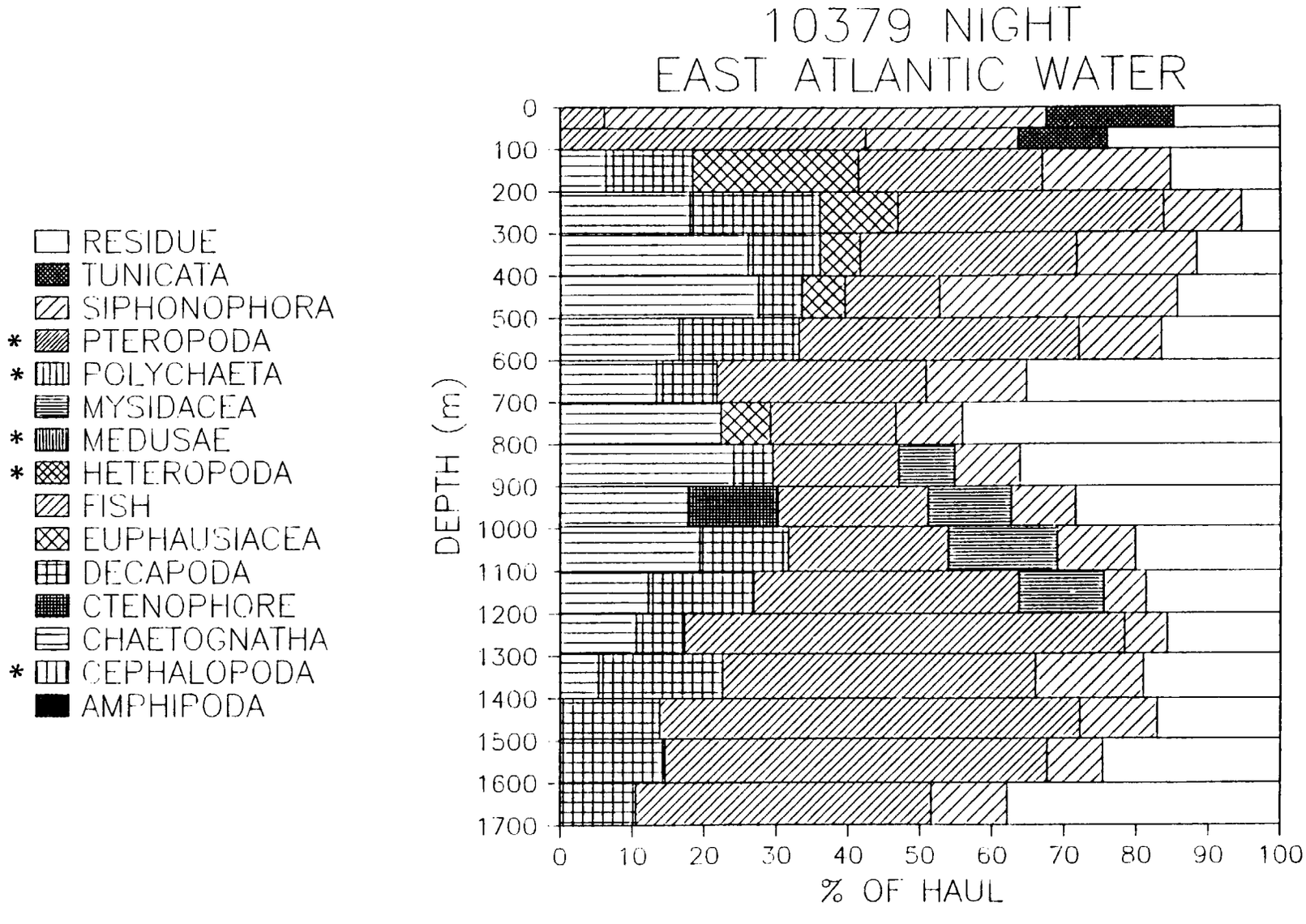

Fig. 39. Percentage contribution of taxa to the total biomass in each haul down to a maximum of 1700m depth at position Q (Night RMT8). Values <5% are not shown. * = insufficient data.

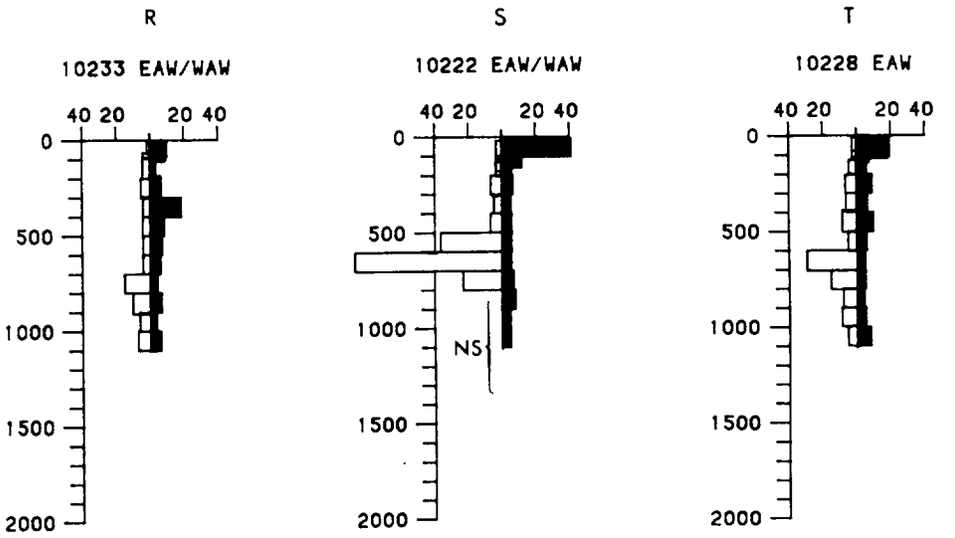

Fig. 40. Day and night profiles of total biomass, measured by wet displacement volume, from RMT8 samples taken at positions R-T. Values are standardised to mls. per $10^3 m^3$ water filtered. NS = No sample, + = relatively low value.

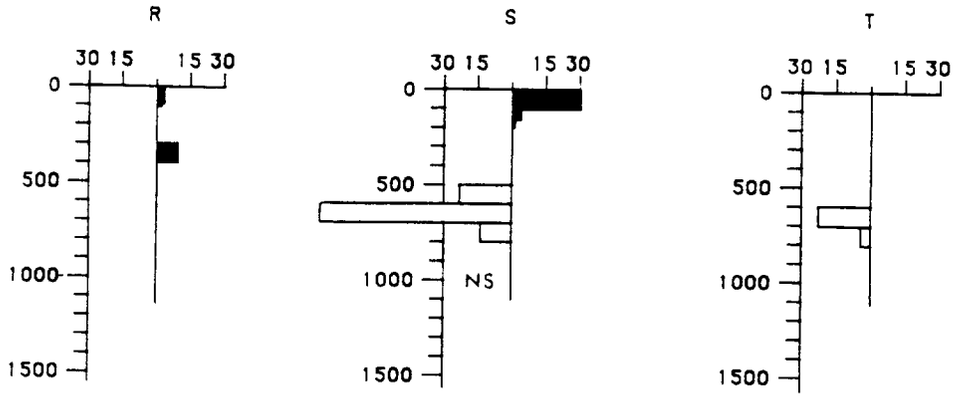

Fig. 41. Pyrosoma: day and night profiles of biomass at positions R-T (RMT8) see legend Fig. 40

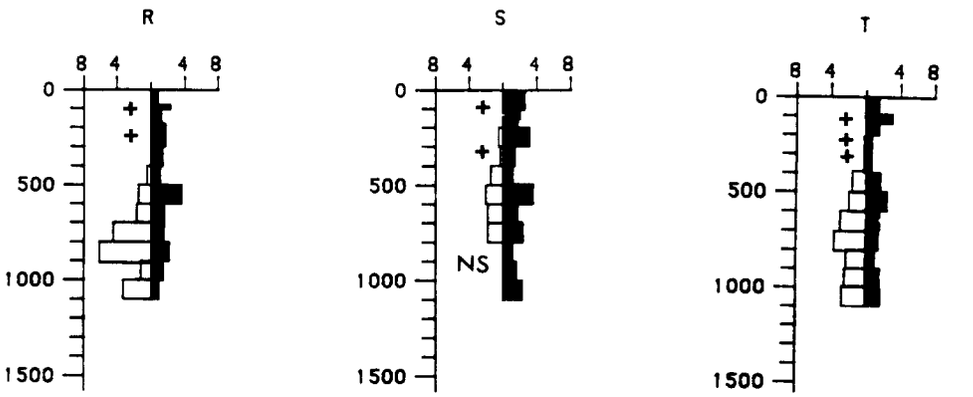

Fig. 42. Fish: day and night profiles of biomass at positions R-T, see legend Fig. 40.

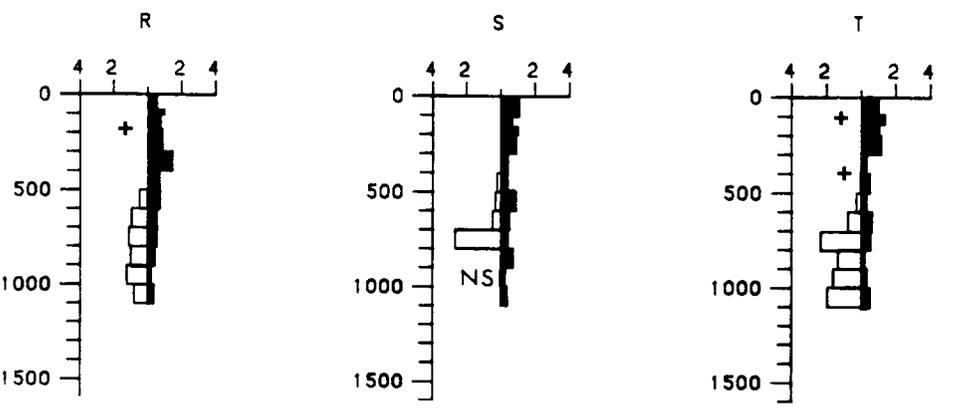

Fig. 43. Decapoda: day and night profiles of biomass at positions R-T (RMT8), see legend Fig. 40.

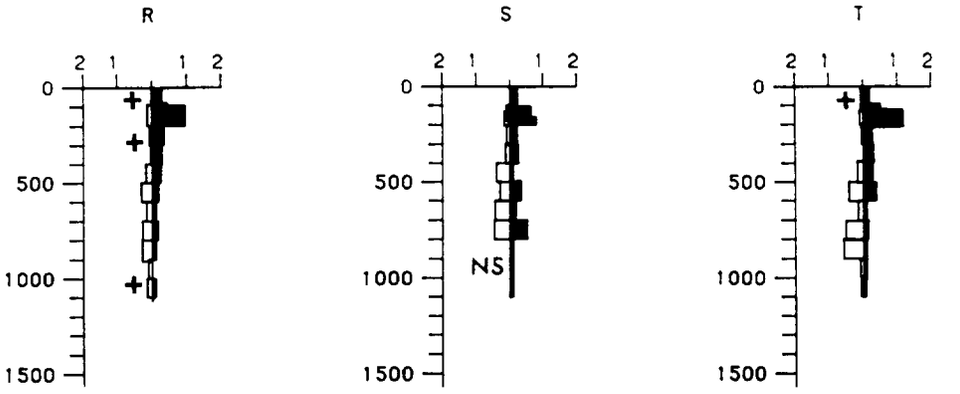

Fig. 44. Euphausiacea: day and night profiles of biomass at positions R-T (RMT8), see legend Fig. 40

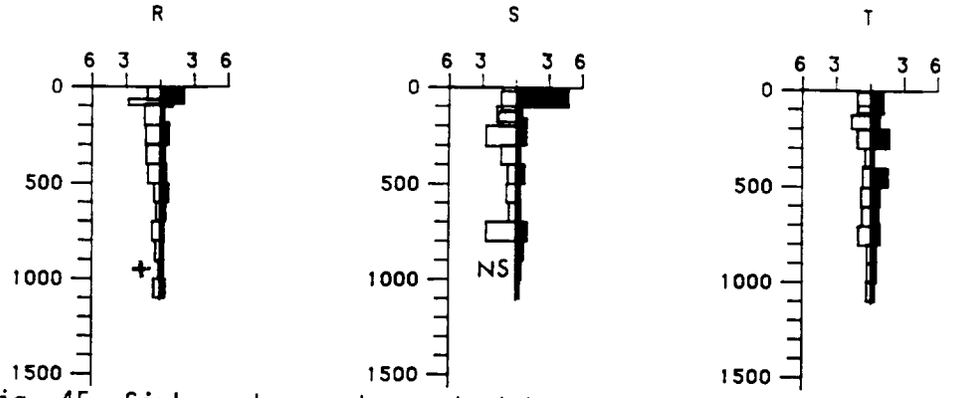

Fig. 45. Siphonophora: day and night profiles of biomass at positions R-T (RMT8), see legend Fig. 40

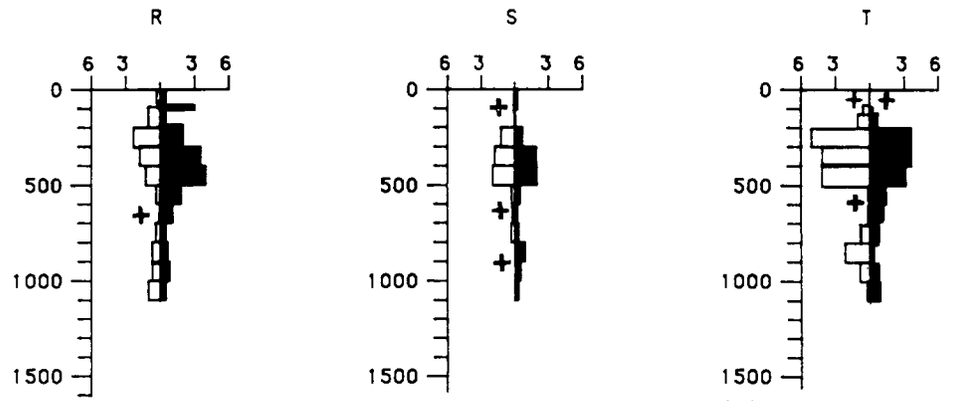

Fig. 46. Chaetognatha: day and night profiles of biomass at positions R-T (RMT8), see legend Fig. 40.

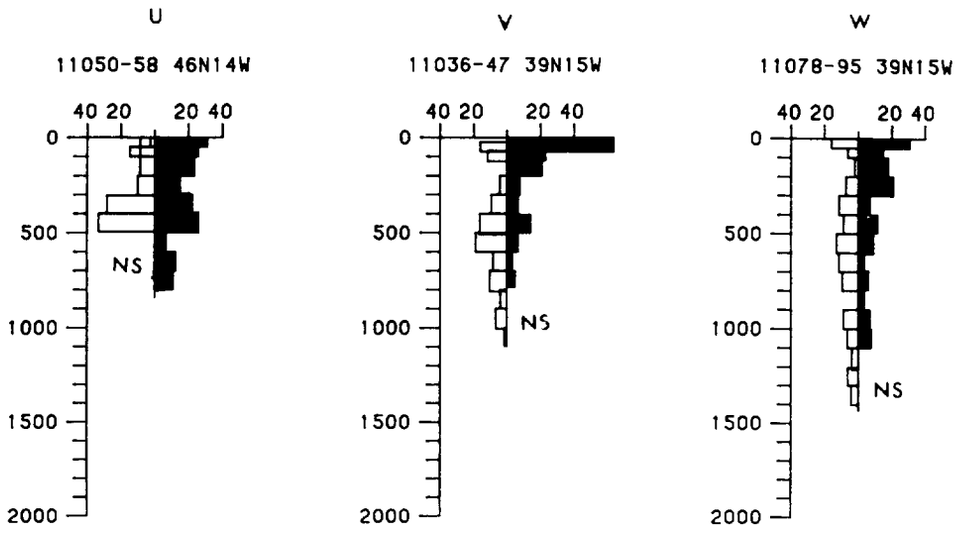

Fig. 47. Day and night profiles of total biomass, measured by wet displacement volume, from RMT8 samples taken at positions U-W. Values are standardised to mls. per $10^3 m^3$ water filtered. NS = No sample, + = relatively low value.

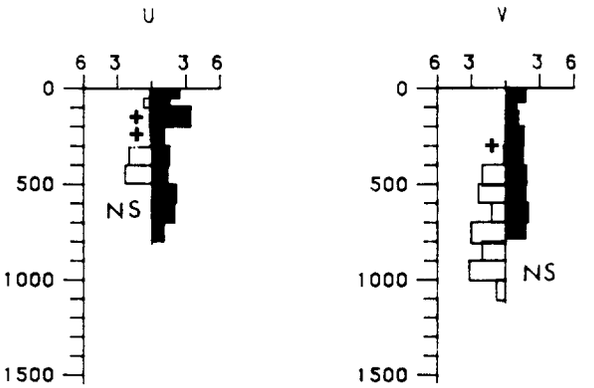

Fig. 48. Fish: day and night profiles of biomass at positions U-V (RMT8) see legend Fig. 47.

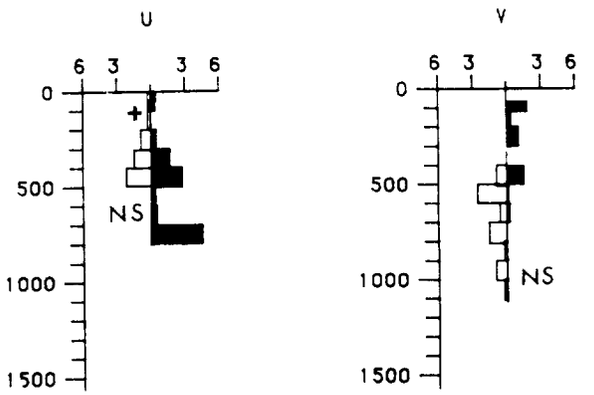

Fig. 49. Medusae: day and night profiles of biomass at positions U-V (RMT8), see legend Fig. 47.

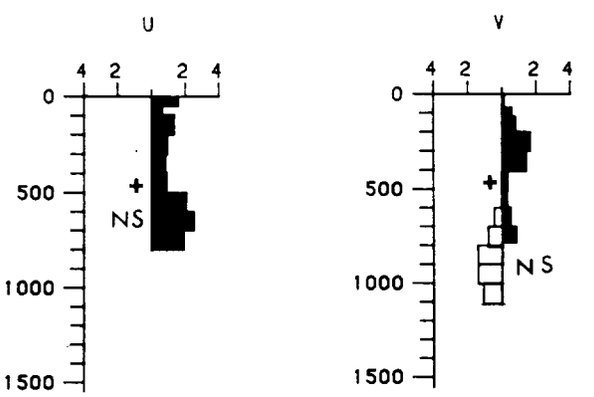

Fig. 50. Decapoda: day and night profiles of biomass at positions U-V (RMT8), see legend Fig. 47.

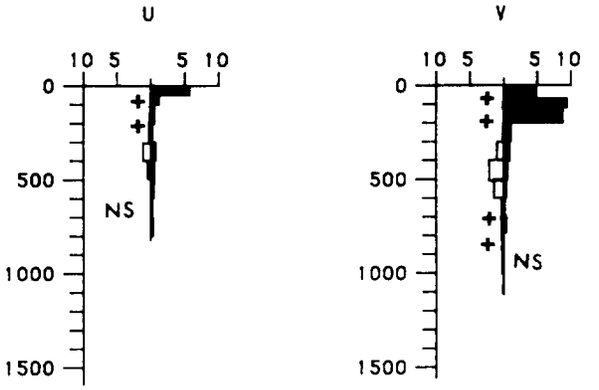

Fig. 51. Euphausiacea: day and night profiles of biomass at positions U-V (RMT8), see legend Fig. 47.

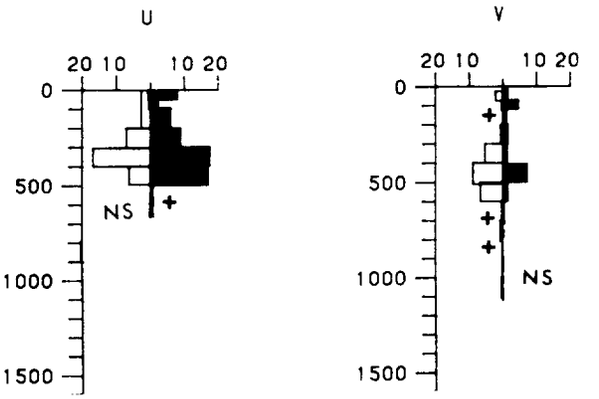

Fig. 52. Siphonophora: day and night profiles of biomass at positions U-V (RMT8), see legend Fig. 47.

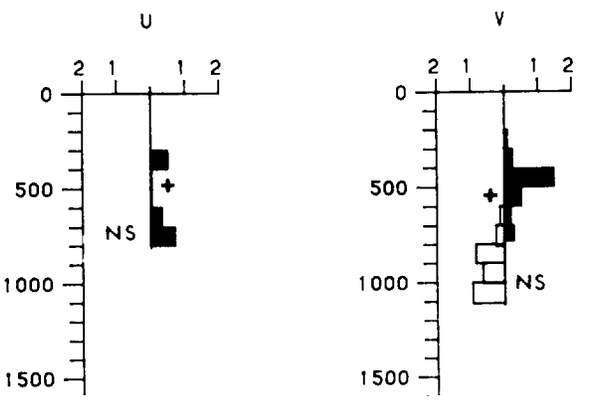

Fig. 53. Mysidacea: day and night profiles of biomass at positions U-V (RMT8), see legend Fig. 47.

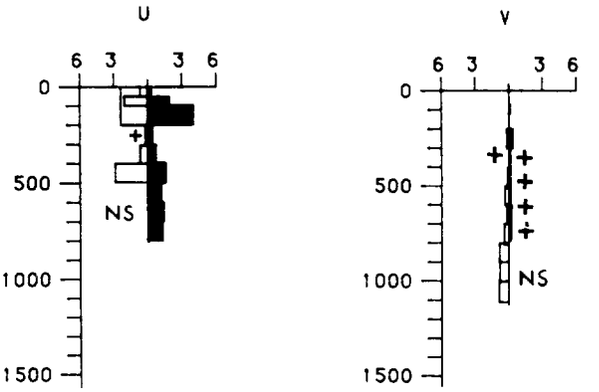

Fig. 54. Chaetognatha: day and night profiles of biomass at positions U-V (RMT8), see legend Fig. 47.

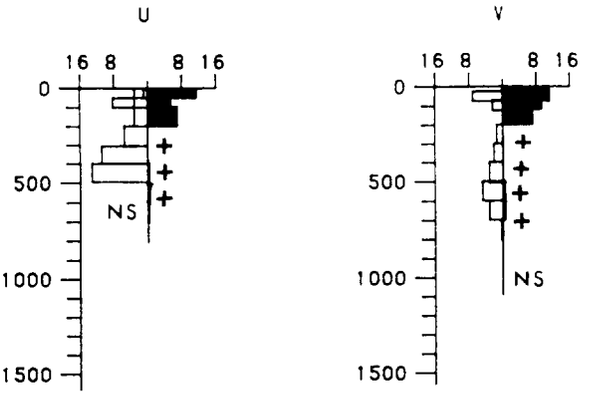

Fig. 55. Tunicata: day and night profiles of biomass at positions U-V (RMT8), see legend Fig. 47.

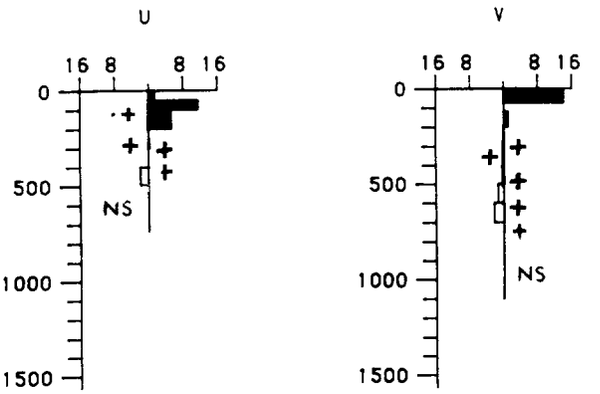

Fig. 56. Pteropoda: day and night profiles of biomass at positions U-V (RMT8), see legend Fig. 47.

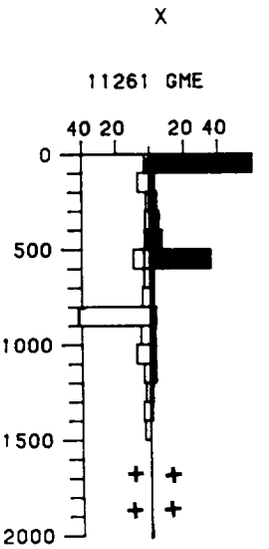

Fig. 57a. Day and night profiles of total biomass, measured by wet displacement volume, from RMT8 samples taken at positions X. Values are standardised to mls. per $10^3 m^3$ water filtered. NS = No sample, + = relatively low value.

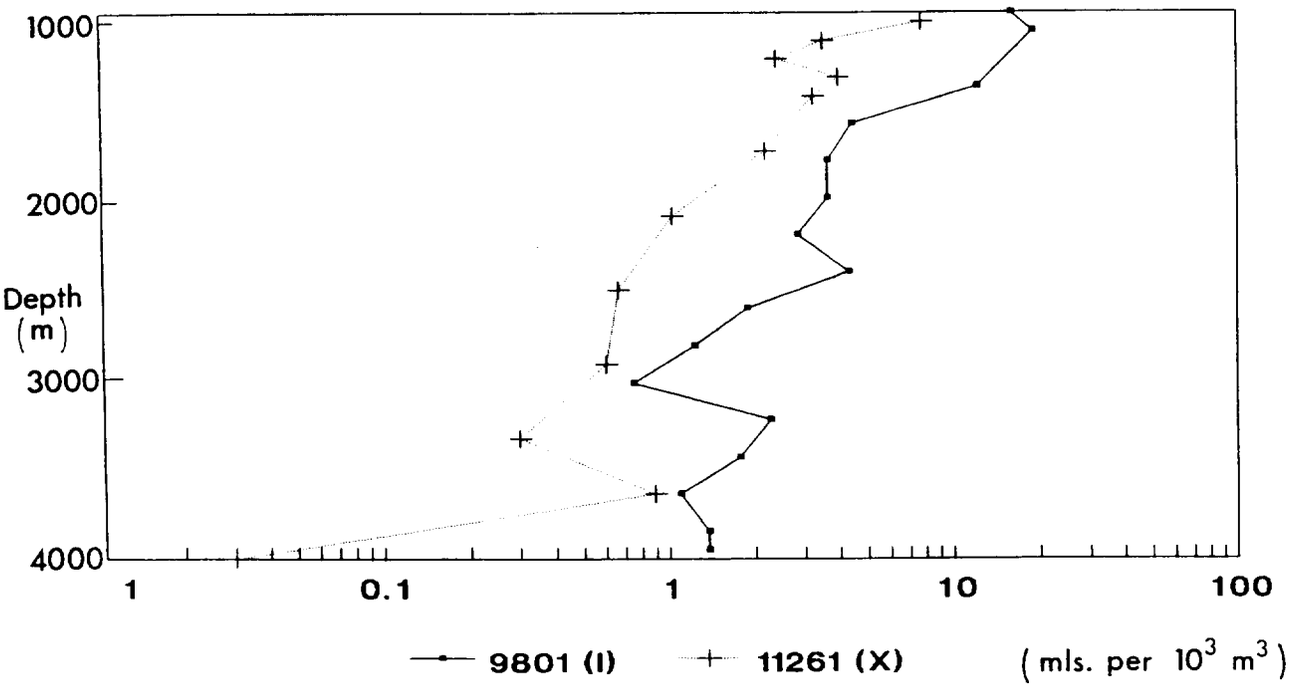

Fig. 57b. Biomass for deep samples at positions I and X.

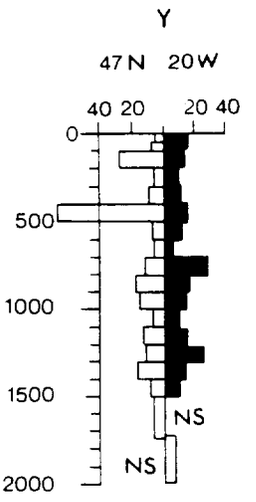

Fig. 58. Day and night profiles of total biomass, measured by wet displacement volume, from RMT8 samples taken at position Y.
Values are standardised to mls. per $10^3 m^3$ water filtered. NS = No sample,

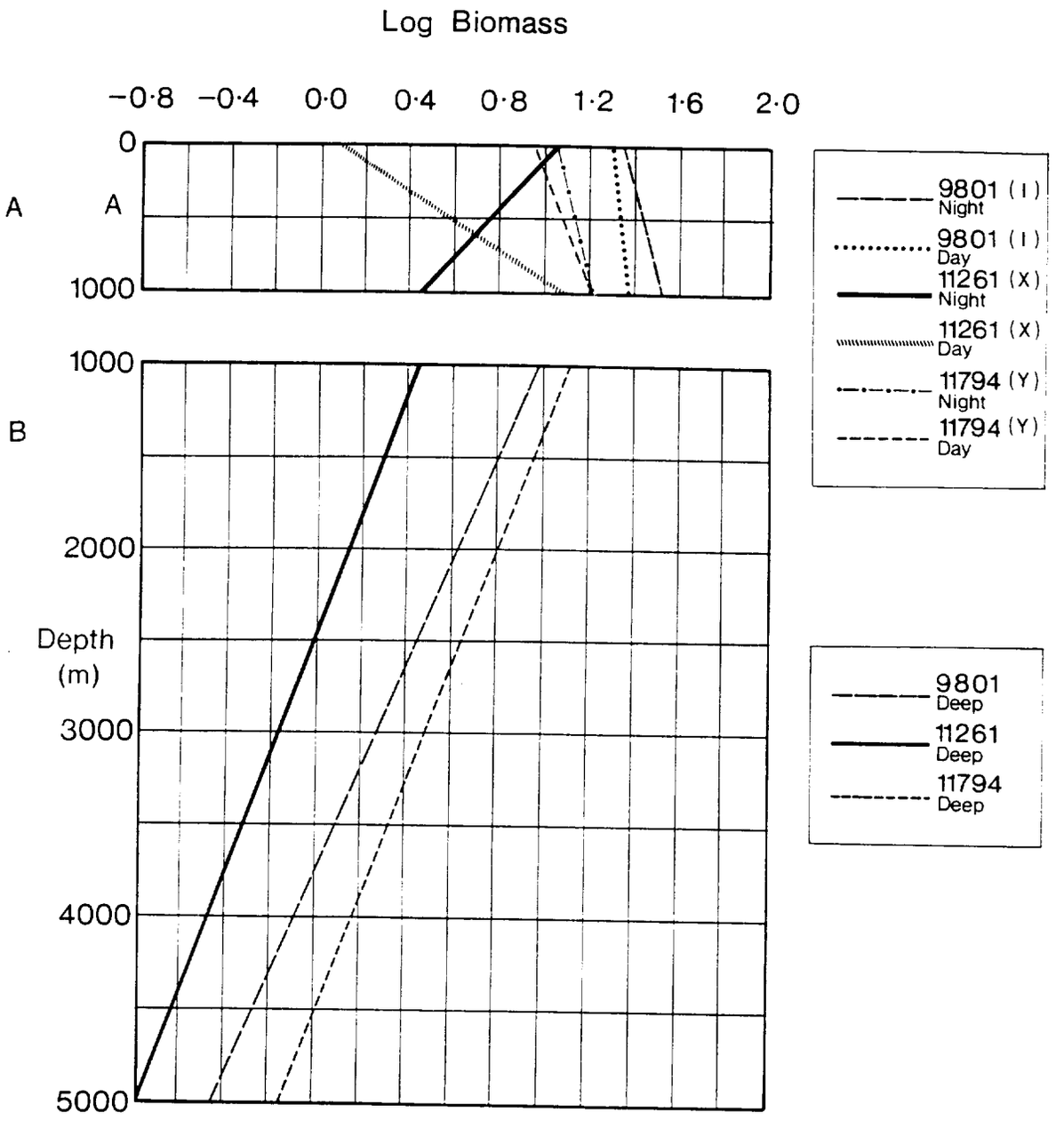

Fig. 59. Regression lines for micronektonic biomass at positions I,X,Y. A. Above 1000m. B. below 1000m.

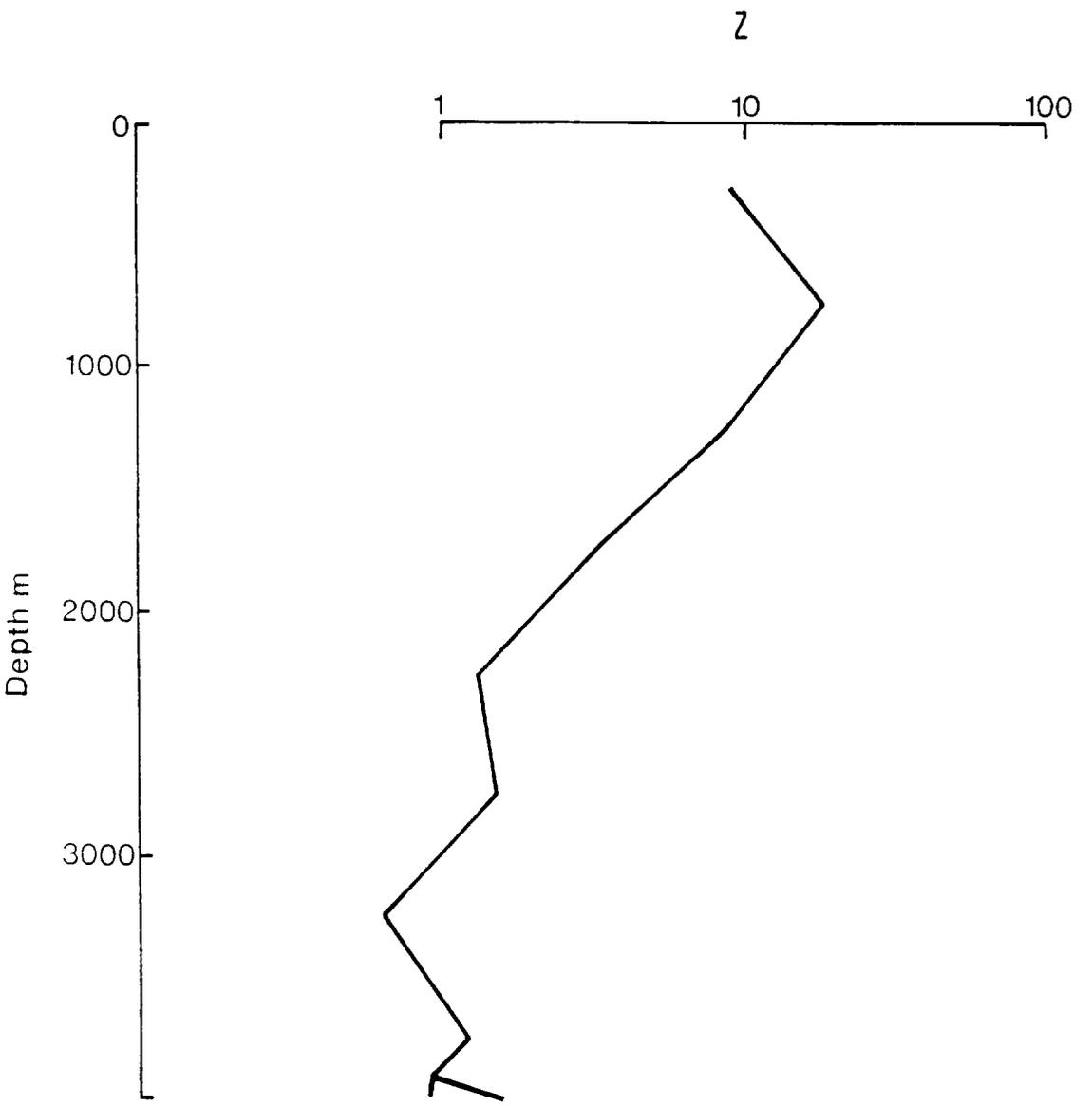

Fig. 60. Profiles for micronekton biomass at position Z (from Angel and Baker, 1982).

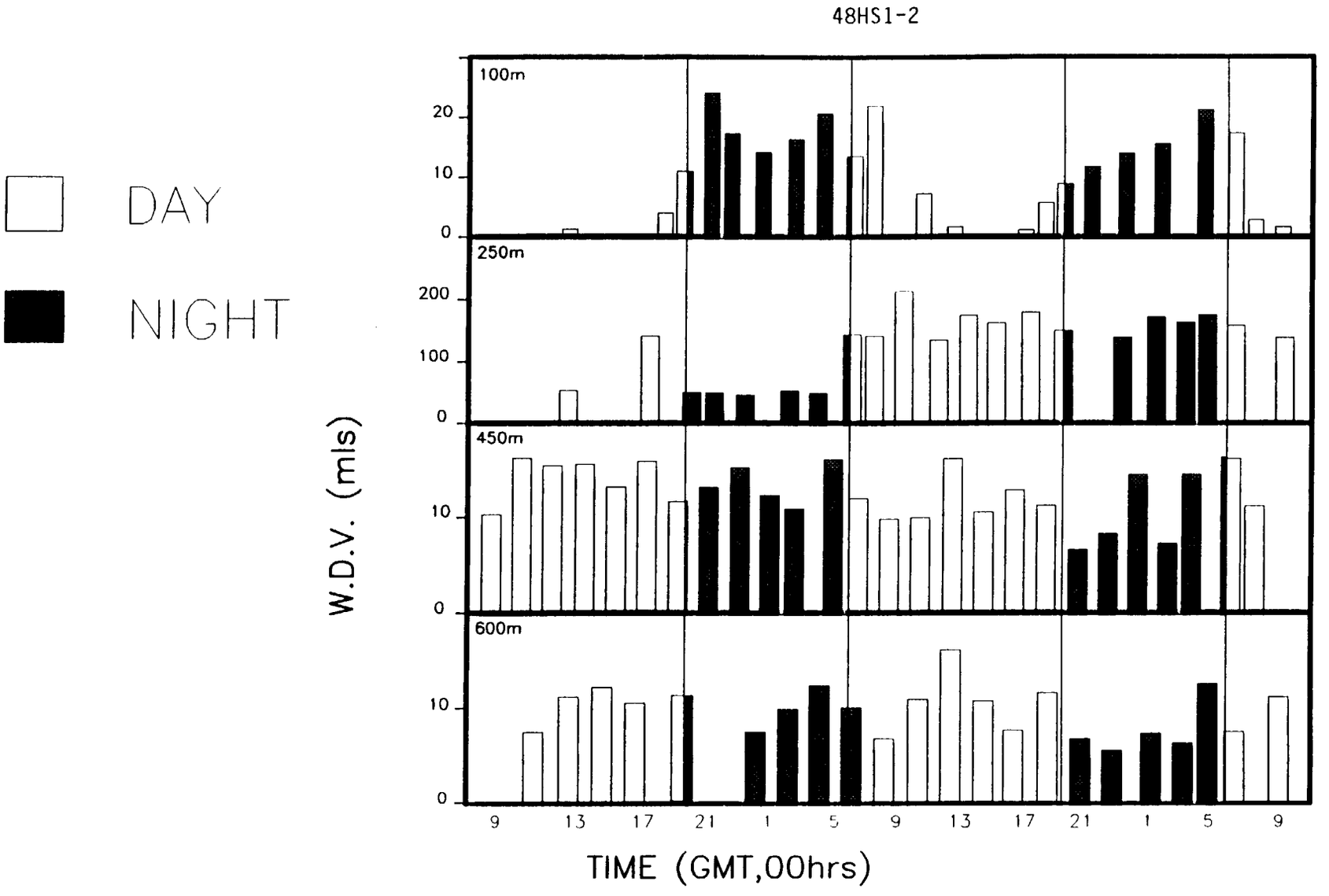

Fig. 61. Biomass profiles recorded during a 48 hr. period at each of four discrete depth ranges centred on 100m, 250m, 450m and 600m at 44°N 13°W (position = 48HS 1-2)

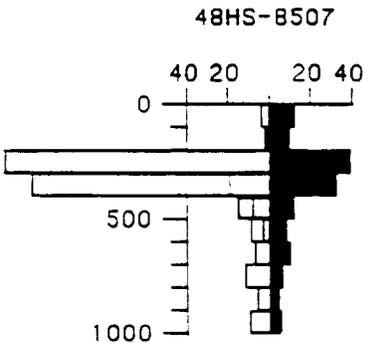

Fig. 62. Day and Night biomass profiles (mls per $10^3 m^3$) recorded from a vertical series of hauls at station 8507 (position 48 HS).

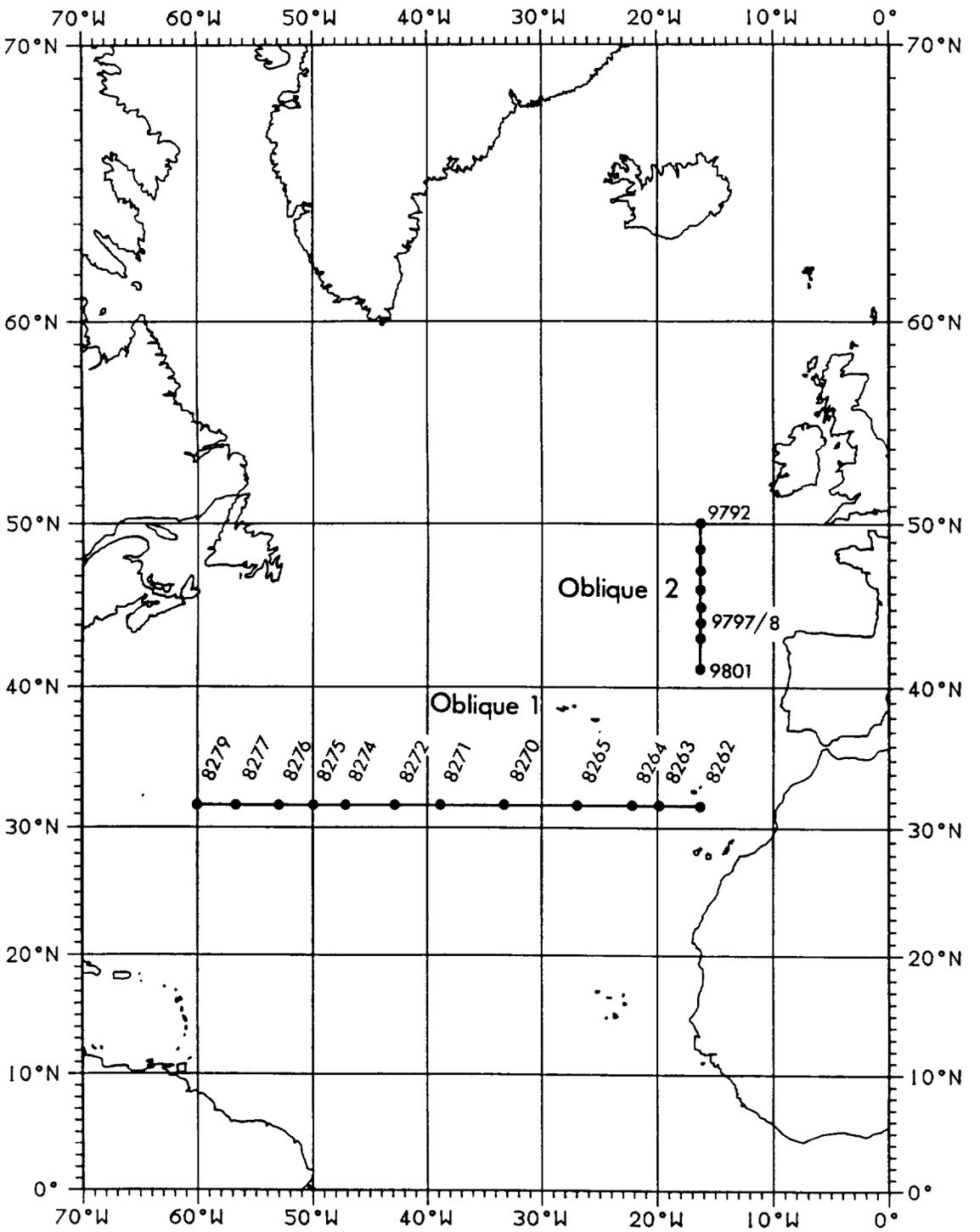

Fig. 63. Position of transects where a series of 0-1000m hauls were taken

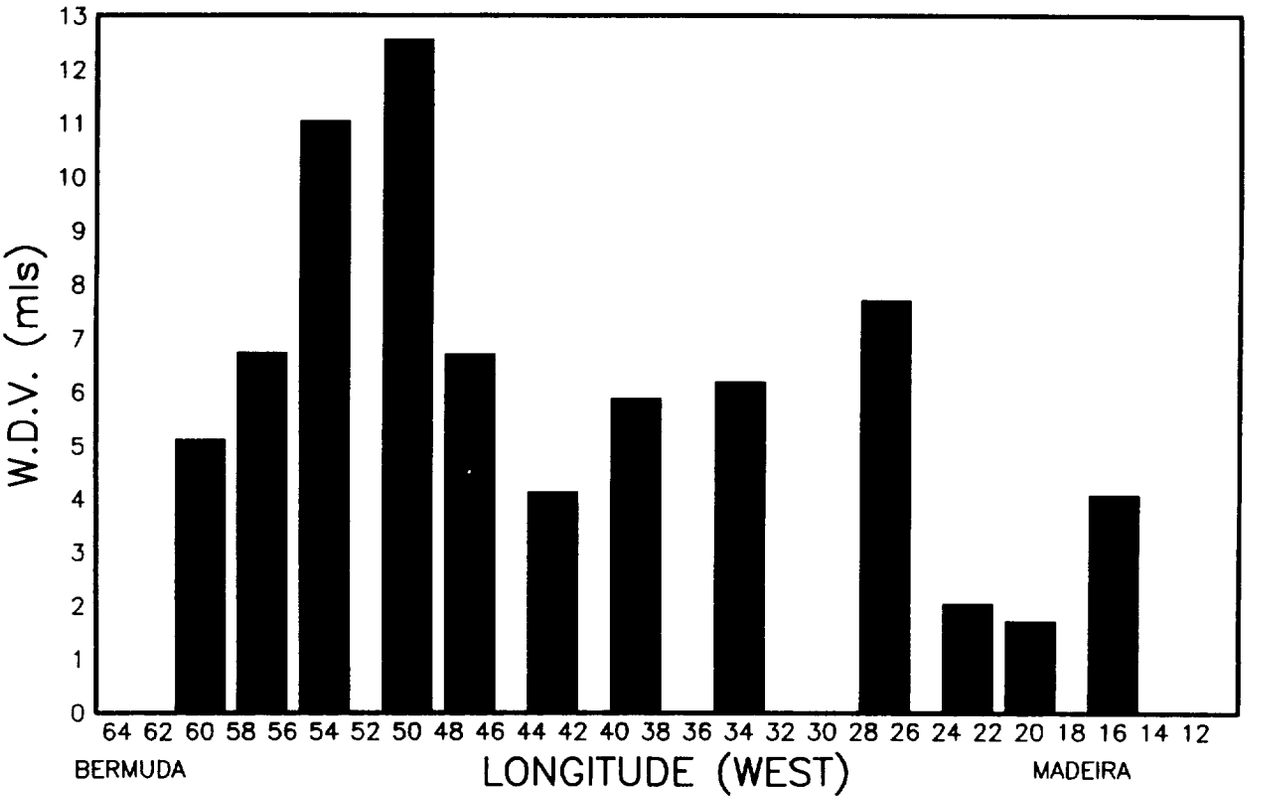

Fig. 64. Total biomass (mls) per $10^3 m^3$ water filtered in a series of 12 (0-1000m) samples taken along a transect at $32^{\circ}N$ between Madeira and Bermuda.

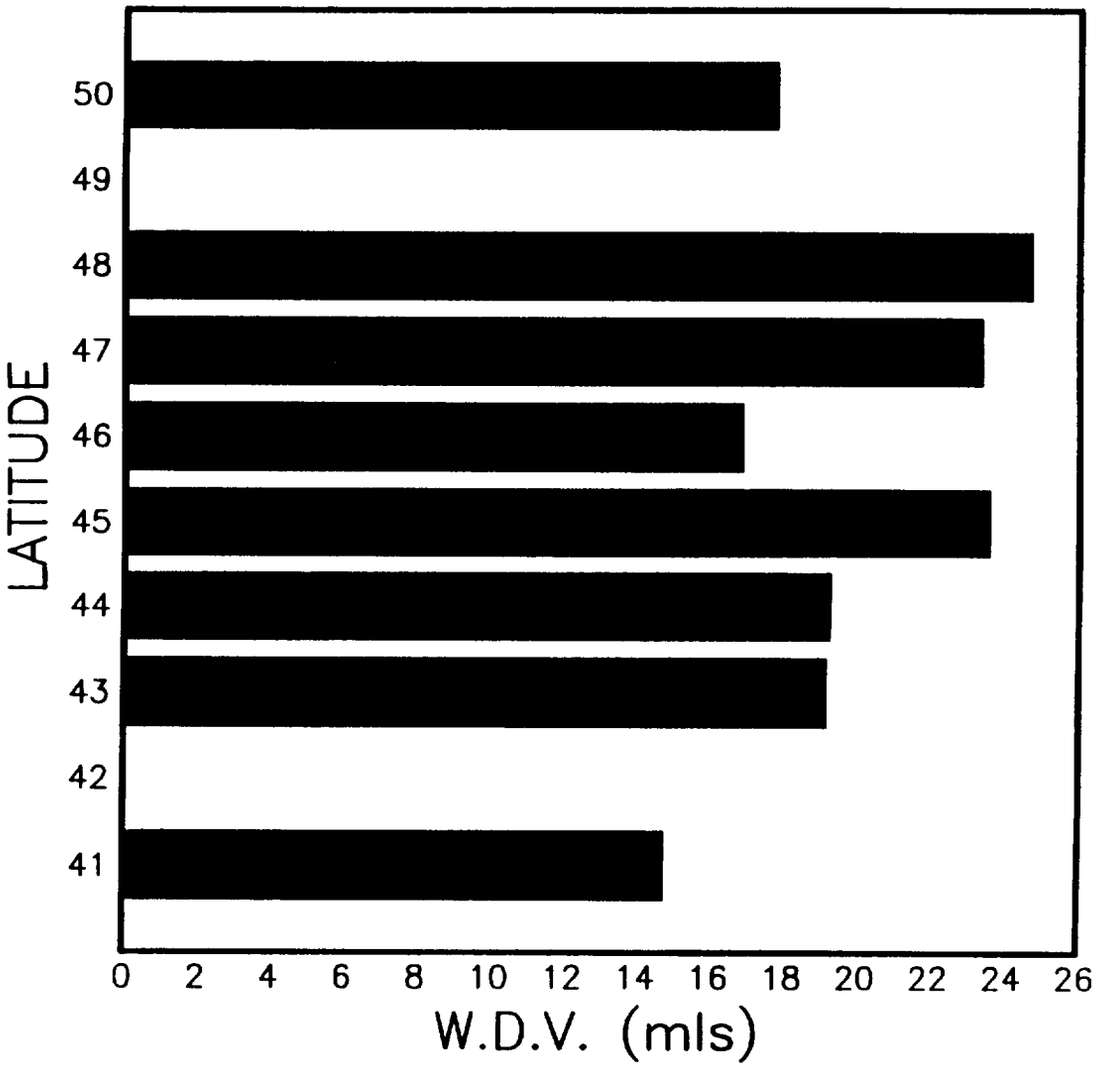

Fig. 65. Total biomass, (mls) per $10^3 m^3$ water filtered, in a series of (0-1000m) samples taken along the $17^{\circ}W$ meridian at 42 - $50^{\circ}N$.

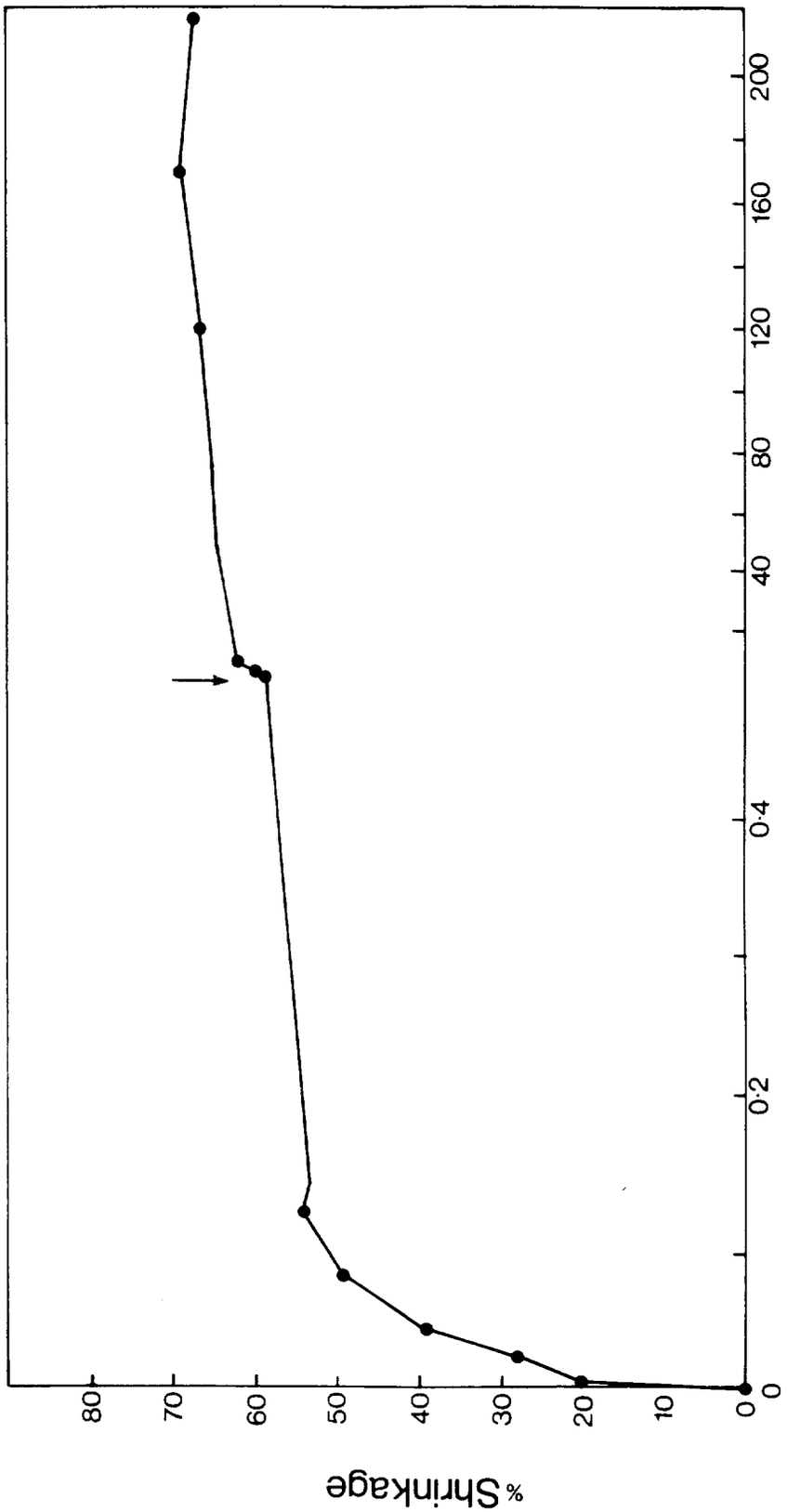

Fig. 66. Percentage shrinkage rates for preserved Siphonophora recorded during 200 days. Initially the material was preserved in a 5% formalin solution and later in Steedman's Preserving Fluid (indicated by arrow).

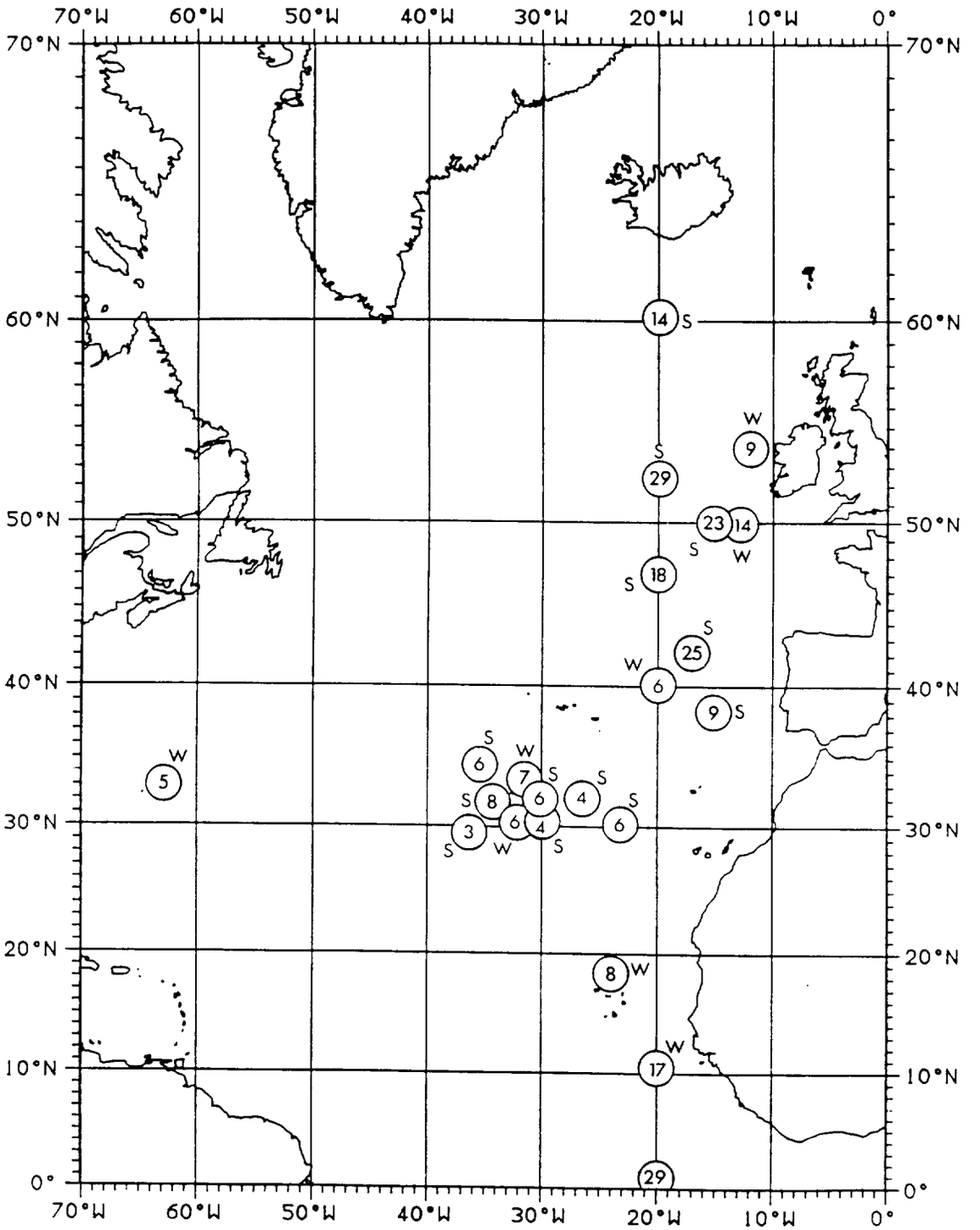

Fig. 67. Estimated biomass (mls. beneath $1m^2$ sea-surface) for positions sampled based on day data (0-1000m). S = Summer W = Winter

APPENDIX 1. Biomass values per $10^3 m^3$ at station positions A-Y, Oblique 1, Oblique 2. An asterisk indicates that the data exclude values for intermittently occurring Pyrosoma.

STATIONS:8553-8591 POSITION:0-3°N 21-23°W (A)
GEAR:RMT8

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3M^3	
855903	10	28	89.14	
856803	10	25	6.91	
855902	25	52	19.98	
856705	23	55	8.82	
855804	51	102	11.46	
856802	50	103	11.23	
855901	105	200	24.14	
856205	100	160	7.02	
856704	100	180	4.97	
856703	150	200	5.75	
856204	150	205	7.29	
855803	203	300	73.84	
856801	198	306	8.41	
855601	300	405	29.31	
856702	305	400	11.14	DAY
855802	400	500	71.25	
856503	400	500	16.65	
855301	505	600	73.84	
856701	505	600	11.25	
855302	605	700	17.71	
856502	600	705	17.43	
855801	700	800	21.86	
856501	700	800	16.54	
855603	805	900	15.64	
856301	805	900	12.80	
855602	905	1000	9.54	
856302	905	1000	10.10	
856001	1005	1250	10.88	
855904	1250	1500	8.55	
856002	1510	2000	2.02	
856304	12	25	28.85	
856209	10	33	454.78	
856303	25	50	146.25	
856211	25	60	116.90	
856306	44	104	35.88	
856212	48	104	27.57	
856506	104	150	11.82	
856208	102	152	13.94	NIGHT
856505	150	200	10.85	
856207	152	200	23.52	
856213	200	300	41.69	
856806	206	300	11.30	
856503	400	500	16.65	
856502	600	700	17.43	
856501	700	800	16.54	

STATION:7824 POSITION:11°N 20°W (B)
GEAR:RMT8

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3M^3	
782473	10	25	12.25	
782472	23	50	43.08	
782467	50	110	10.07	
782462	100	150	19.73	
782461	150	200	6.39	
782460	200	250	16.08	
782459	250	300	18.46	DAY
782432	305	400	13.39	
782430	400	500	15.91	
782410	505	600	30.09	
782406	605	700	8.25	
782417	700	800	26.40	
782434	800	910	14.23	
782439	895	1000	11.57	
782419	1000	1250	5.33	
782454	10	29	28.74	
782456	20	60	30.55	
782453	50	100	23.83	
782469	100	200	10.71	
782465	205	300	12.58	
782470	305	400	12.05	
782471	405	500	12.52	NIGHT
782437	500	600	14.67	
782422	610	700	14.24	
782401	710	800	20.25	
782414	805	900	34.08	
782402	900	1000	15.27	
782413	1000	1250	8.71	
782436	1250	1500	2.66	
782421	1500	2000	2.09	

STATION:7089 POSITION:18 N 25 W (C)
GEAR:RMT8

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3 M^3		
708931	10	20	4.44		
708930	20	50	3.54		
708920	55	100	4.06		
708919	112	194	5.32		
708925	210	290	8.55		
708918	210	300	6.99		
708929	305	400	9.77		
708940	305	400	6.60		DAY
708944	310	400	7.34		
708924	410	500	9.04		
708913	515	600	6.70		
708909	610	700	10.06		
708905	700	790	14.25		
708904	800	890	7.81		
708914	910	1020	5.92		
708928	10	25	28.57	*	
708927	25	60	21.07	*	
708926	49	100	10.82		
708923	110	200	10.53		
708903	210	300	10.76		
708911	300	400	6.38		
708922	410	500	8.23		NIGHT
708917	505	600	7.72		
708916	610	710	3.30		
708915	700	785	10.09		
708912	800	900	1.91		
708908	900	1010	17.43		
708932	1000	1250	2.98		

STATION:7856 POSITION:30°N 23°W (D)
GEAR:RMT8

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3M^3	
785626	10	25	11.57	
785625	25	50	*	PELAGIA SWARM
785624	55	100	7.45	
785618	102	203	9.81	
785617	205	300	4.76	
785611	305	400	7.05	
785602	405	505	10.84	
785616	500	600	7.32	
785610	600	700	5.50	DAY
785609	700	800	3.86	
785604	795	900	3.97	
785603	910	1000	3.29	
785650	1000	1250	3.12	
785651	1250	1500	2.02	
785654	1500	2000	2.31	
785680	2010	3000	0.44	
785639	10	25	20.26	
785638	25	50	25.84	
785637	50	100	22.96	
785622	100	200	14.31	
785621	205	300	8.55	
785615	300	400	7.39	
785608	405	500	4.06	
785620	500	600	4.41	NIGHT
785614	600	700	3.25	
785613	700	800	2.75	
785607	800	895	15.66	
785606	900	1000	2.30	
785648	1005	1250	1.68	
785652	1250	1500	4.15	
785657	1500	2020	0.96	

STATION:7406 POSITION:40°N 20°W (E)
GEAR:RMT8

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3M^3		
740617	10	25	4.15		
740615	25	50	16.90		
740616	50	100	4.11		
740601	110	205	1.18		
740602	210	300	1.53		
740609	310	400	4.44		DAY
740628	410	500	4.20		
740632	502	610	14.57	*	
740638	550	655	11.62	*	
740644	650	745	6.68		
740614	710	800	16.97		
740629	805	900	5.50		
740603	910	1000	2.12		
740633	990	1250	6.03		
748000	1250	1510	2.41		
740619	10	27	23.79		
740613	30	50	11.29		
740612	52	100	22.94	*	
740605	110	195	3.26		
740620	210	300	12.04		NIGHT
740626	310	400	4.44		
740631	400	500	6.53		
740625	500	590	5.00		
740624	610	700	4.94		
740618	700	790	3.06		
740611	810	900	2.67		
740606	910	1000	4.47		
740641	1260	1500	6.64		
740646	1500	2000	1.89		

STATION:7711 POSITION:53°N 20°W (F)
GEAR:RMT8M

STATION	DEPTH(m) UPPER	DEPTH(m) LOWER	STANDARDISED WDV(mls)/10^3M^3	
771118	10	25	10.09	
771117	25	50	68.63	
771116	50	100	18.21	
771115	110	200	18.63	
771111	205	300	103.13	
771107	300	400	25.88	
771106	410	500	26.33	
771110	505	600	22.44	DAY
771109	605	700	18.88	
771108	700	805	16.71	
771104	800	900	14.25	
771101	900	1000	19.66	
771140	1005	1250	10.36	
771147	1260	1500	7.61	
771139	1520	2000	9.63	
771143	10	25	352.30	
771142	25	50	38.67	
771124	50	102	56.03	
771131	100	200	43.65	
771123	200	300	58.24	
771103	310	400	16.29	
771138	400	500	16.56	NIGHT
771137	495	590	18.48	
771132	605	700	27.56	
771130	710	800	29.83	
771113	800	900	43.54	
771102	900	1000	14.32	
771165	1020	1250	23.60	
771156	1250	1500	6.78	
771161	1520	2000	6.13	

STATION:7709 POSITION: 60°N 20°W (G)
GEAR:RMT8M

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/$10^3 M^3$	
770959	10	25	8.98	
770958	25	50	13.33	
770933	55	100	23.48	
770901	110	200	12.95	
770902	205	300	4.92	
770974	310	400	21.51	
770907	410	500	6.53	
770927	500	600	8.01	DAY
770926	600	700	13.29	
770921	710	800	16.59	
770925	810	900	17.09	
770924	910	995	18.14	
770935	1010	1250	20.20	
770944	1260	1500	14.06	
770945	1525	2000	8.14	
770946	9	25	26.45	
770948	25	50	26.95	
770970	55	100	6.36	
770904	105	200	7.38	
770937	205	300	9.42	
770929	300	400	12.64	
770923	405	500	13.63	NIGHT
770903	495	590	14.17	
770936	600	700	21.68	
770928	705	800	17.11	
770922	800	900	19.62	
770917	900	1000	29.79	
770963	1000	1250	14.94	
770976	1250	1500	7.04	
770991	1520	2000	7.20	

STATION:8281 POSITION:32°N 64°W (H)
GEAR:RMT8

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3M^3	
828123	12	25	5.59	
828125	26	50	5.10	
828126	52	100	6.15	
828142	102	200	3.22	
828141	190	300	2.95	
828105	305	400	4.21	
828131	405	500	2.86	DAY
828115	510	600	4.34	
828111	600	700	5.16	
828110	710	800	6.14	
828109	805	900	6.45	
828103	910	1000	11.04	
828114	1010	1250	12.00	
828130	1260	1500	3.67	
828135	1520	2000	2.59	
828120	10	25	16.31	
828118	25	50	21.02	
828119	55	100	11.55	
828116	10	200	6.88	
828132	205	300	1.19	
828102	295	400	4.00	
828128	405	505	4.58	
828113	505	600	3.26	
828108	605	700	4.53	NIGHT
828107	700	800	4.75	
828106	800	900	5.30	
828101	905	1000	6.07	
828112	1000	1250	5.62	
828129	1250	1500	3.90	
828133	1490	2000	2.79	
828145	2005	2500	1.20	
828148	2500	3500	0.22	

STATION:9801 POSITION:42°N 17°W (I)
GEAR:RMT8

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3M^3	
980109	10	95	15.24	
980110	95	200	10.23	
980111	200	300	16.72	
980121	300	400	43.05	
980122	400	515	60.88	
980123	515	600	36.27	
980103	600	700	15.64	
980104	695	800	17.17	
980105	800	900	24.39	DAY
980118	890	1100	15.99	
980119	1100	1280	18.93	
980120	1280	1500	12.19	
980182	2100	2300	2.83	
980183	2300	2500	4.30	
980184	2500	2700	1.88	
980190	3300	3500	1.77	
980189	3500	3710	1.09	
980188	3700	3900	1.37	
980115	10	100	41.71	
980116	100	200	20.78	
980117	200	300	23.74	
980112	300	400	20.62	
980113	395	500	20.67	
980114	500	600	16.87	
980127	600	700	31.10	
980128	700	800	35.71	
980129	800	900	43.42	NIGHT
980160	985	1010	24.00	
980179	1500	1710	4.41	
980180	1690	1900	3.62	
980181	1900	2100	3.62	
980185	2700	2900	1.23	
980186	2900	3100	0.75	
980187	3100	3300	2.27	
980191	4300	4520	0.84	

STATION:9801 (HAUL 57-58) POSITION:41-42°N 17°W (I)
GEAR:RMT8 1000m REPEATS

STATION	STANDARDISED WDV(mls)/10^3M^3	
980157	75.75)	ESTIMATED DUE TO
980158	43.94)	LARGE-SCALE PELAGIA
980159	57.71)	CONTAMINATION
980160	24.00	
980161	25.57	
980162	21.26	
980163	21.38	
980164	24.46	
980165	28.52	
980166	37.54	
980167	37.90	
980168	42.11	
980169	21.95	
980170	31.55	
980171	43.65	
980172	26.16	
980173	28.69	
980174	33.18	
980176	32.93	
980177	19.58	
980178	26.39	

STATION:9791 POSITION:50°N 14°W (J)
GEAR:RMT8

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3M^3	
979105	10	100	36.66	
979106	100	200	20.63	
979107	200	300	40.66	
979114	300	400	15.87	
979115	400	500	17.67	
979116	500	600	29.32	DAY
979102	600	705	9.35	
979103	700	800	13.72	
979104	800	905	29.15	
979117	895	1100	18.02	
979118	1095	1300	15.83	
979119	1300	1505	10.12	
979111	10	100	36.99	
979112	100	200	31.41	
979113	200	300	63.42	
979108	300	400	33.85	
979109	400	500	19.54	NIGHT
979110	500	600	11.49	
979120	600	700	9.69	
979121	700	800	15.34	
979122	800	900	17.70	

STATION:10115 POSITION: 50°N 14°W (K)
GEAR:RMT8M

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3M^3	
1011515	10	100	12.72	
1011516	100	200	3.82	
1011517	200	300	20.94	
1011505	300	400	5.89	
1011506	400	500	19.91	
1011507	500	600	18.06	DAY
1011502	600	700	10.89	
1011503	700	800	16.86	
1011504	800	900	21.83	
1011518	900	1100	10.33	
1011519	1100	1300	15.53	
1011520	1300	1505	34.87	
1011521	10	100	56.75	
1011522	100	200	36.80	
1011523	195	300	18.88	
1011512	295	400	8.81	
1011513	400	500	6.58	NIGHT
1011514	500	600	33.47	
1011509	600	700	12.08	
1011510	700	800	9.68	
1011511	800	900	22.34	

STATION:10105 POSITION:54°N 13°W (L)
GEAR:RMT8M

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3M^3	
1010514	10	100	0.78	
1010515	100	195	6.58	
1010516	195	300	7.49	
1010508	300	410	7.05	
1010509	410	500	11.74	
1010510	500	600	22.36	DAY
1010505	500	700	9.49	
1010506	700	810	7.63	
1010507	800	900	9.77	
1010501	900	1100	6.87	
1010502	1090	1190	7.54	
1010503	1290	1500	24.32	
1010517	1500	1700	10.25	
1010518	1700	1900	6.77	
1010524	10	100	27.37	
1010523	100	200	11.44	
1010522	200	300	0.29	
1010521	300	400	10.47	
1010520	400	500	22.58	
1010519	500	600	18.66	
1010511	600	700	14.99	NIGHT
1010512	700	810	5.20	
1010513	770	900	18.13	
1010501	900	1100	6.87	
1010502	1090	1290	7.54	
1010503	1290	1500	24.32	

STATION:10380 POSITION:30 N 34°W°(M)
GEAR:RMT8M

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3M^3		
1038001	5	50	1.22		
1038002	50	100	2.25		
1038003	100	200	2.04		
1038021	200	300	1.99		
1038022	300	400	1.75		
1038023	400	500	2.11		
1039030	500	600	3.39	*	
1038031	600	700	2.97	*	
1038032	700	805	3.88	*	
1038008	800	900	3.43	*	DAY
1038009	900	1000	3.52		
1038010	995	1100	5.48		
1038005	1100	1200	4.11		
1038006	1200	1300	2.07		
1038007	1300	1400	1.82		
1038018	1400	1498	1.00		
1038019	1498	1600	1.22		
1038020	1600	1698	1.57		
1038033	1700	1900	0.91		
1038034	1900	2100	0.99		
1038035	2100	2300	0.55		
1038027	0	50	3.13		
1038028	50	100	2.08	*	
1038029	100	205	6.39	*	
1038015	200	300	3.48	*	
1038016	300	400	2.34		
1038017	400	505	3.81		
1038024	500	600	4.47		
1038025	600	710	3.47		NIGHT
1038026	705	800	6.13		
1038012	800	900	4.41		
1038013	900	1000	3.23		
1038014	1000	1100	2.72		
1038036	1102	1120	1.29		
1038037	1120	1200	5.25		
1038038	1200	1300	1.25		

STATION:10378 POSITION:32°N 30°W (N)
GEAR:RMT8

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3M^3		
1037801	5	50	1.33		
1037802	50	100	4.00		
1037803	100	200	4.09		
1037827	200	300	2.73		
1037828	300	400	2.74		
1037829	400	500	2.25		
1037814	500	600	4.01		
1037815	600	705	4.54		DAY
1037816	705	800	5.54	*	
1037811	800	900	7.34		
1037812	900	1000	7.48		
1037813	1000	1100	7.63		
1037824	1100	1202	8.46		
1037825	1200	1305	6.81		
1037826	1305	1400	15.00		
1037821	0	52	5.83		
1037822	52	105	14.21	*	
1037823	105	200	10.73	*	
1037818	200	310	5.52		
1037819	300	405	6.21		
1037820	400	498	3.40		
1037808	500	602	5.19		
1037809	602	700	3.76		NIGHT
1037810	700	800	4.24		
1037805	800	902	6.92		
1037806	902	1000	4.52		
1037807	1000	1100	5.12		
1037830	1097	1200	5.05		
1037831	1200	1295	4.69		
1037832	1290	1415	6.83		

STATION:10376 POSITION:33°N 33°W (O)
GEAR:RMT8

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3M^3	
1037603	5	40	2.70	
1037604	40	60	3.08	
1037605	60	200	11.21	
1037616	200	300	6.30	
1037617	300	400	4.73	
1037618	400	500	9.85	
1037613	505	600	8.40	
1037614	605	700	7.71	
1037615	690	798	7.84	DAY
1037628	795	900	8.77	
1037629	900	1005	7.29	
1037630	1005	1100	7.29	
1037625	1095	1205	5.29	
1037626	1205	1305	6.85	
1037627	1295	1400	3.74	
1037637	1400	1500	4.00	
1037638	1500	1600	4.13	
1037639	1600	1700	4.52	
1037631	5	25	14.57 *	
1037632	25	130	33.30 *	
1037633	130	205	10.12	
1037621	200	300	8.36	
1037622	300	400	12.74	
1037623	400	500	10.80	
1037610	500	602	8.42	
1037611	602	705	6.09	NIGHT
1037612	705	807	11.29	
1037607	800	900	6.21	
1037608	900	1000	6.72	
1037609	1000	1100	6.51	
1037634	1100	1200	5.26	
1037635	1200	1300	6.91	
1037641	1300	1400	4.06	
1037642	1398	1502	4.44	
1037643	1498	1600	3.78	

STATION:10382 POSITION:33°N 32°W (P)
GEAR:RMT8M

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3M^3		
1038226	5	50	3.89		
1038227	50	99	5.62		
1038228	97	200	8.25		
1038223	200	300	6.93		
1038224	300	400	3.55		
1038225	400	500	5.54		
1038214	500	600	4.88		
1038215	600	700	6.14	*	DAY
1038216	700	800	7.65		
1038211	800	900	9.88		
1038212	900	1000	11.45		
1038213	1000	1100	9.49		
1038202	1100	1200	7.92		
1038203	1200	1300	4.52		
1038204	1300	1400	4.55		
1038217	0	50	10.80	*	
1038218	50	100	17.40	*	
1038219	100	200	10.67		
1038220	200	300	9.90		
1038221	300	420	4.69		
1038222	405	500	4.74		
1038208	500	600	5.96		NIGHT
1038209	605	700	3.97		
1038210	700	800	7.07		
1038205	800	900	7.35		
1038206	900	1000	6.19		
1038207	1000	1100	7.73		
1038231	1080	1210	4.85		

STATION:10379 POSITION:35°N 33°W (Q)
GEAR:RMT8M

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3M^3		
1037901	5	50	4.31		
1037902	50	100	6.04		
1037903	98	200	4.97		
1037904	200	300	5.01		
1037905	300	400	3.65		
1037906	400	500	6.22		
1037930	500	600	6.66	*	
1037931	600	700	6.27	*	
1037932	700	800	10.24		
1037918	800	900	9.52		
1037919	900	995	5.64		DAY
1037920	995	1100	5.28		
1037914	1100	1200	5.19		
1037915	1200	1300	5.52		
1037916	1300	1410	4.10		
1037927	1400	1500	7.51		
1037928	1498	1600	2.25		
1037929	1600	1700	3.21		
1037939	1700	1800	3.20		
1037940	1800	1900	3.32		
1037911	0	50	20.06	*	
1037912	50	100	15.12		
1037913	100	200	10.09		
1037924	200	300	8.57		
1037925	298	400	5.89		
1037926	400	500	6.36		
1037921	495	600	5.77		
1037922	600	700	6.06		
1037923	700	800	6.52		
1037908	800	900	6.51		NIGHT
1037909	900	995	8.37		
1037910	1000	1100	5.01		
1037933	1100	1200	4.19		
1037934	1200	1300	5.47		
1037935	1295	1410	4.14		
1037941	1400	1500	4.39		
1037942	1495	1600	2.93		
1037943	1600	1700	1.86		

STATION:10233 POSITION:32°N 32°W (R)
GEAR:RMT8

STATION	DEPTH(m) UPPER	DEPTH(m) LOWER	STANDARDISED WDV(mls)/10^3M^3	
1023316	0	70	1.71	
1023317	65	97	4.13	
1023318	90	200	4.42	
1023301	200	303	5.40	
1023302	295	400	4.04	
1023303	400	490	4.22	DAY
1023304	500	600	4.04	
1023305	600	700	4.10	
1023306	700	805	15.09	
1023326	800	910	10.19	
1023327	900	1010	6.25	
1023328	1000	1100	7.29	
1023322	10	90	6.08 *	
1023323	80	105	7.30 *	
1023324	95	200	3.28 *	
1023319	185	300	6.53	
1023320	300	400	9.26 *	
1023321	400	500	8.47	NIGHT
1023310	500	600	7.23	
1023311	600	700	6.21	
1023312	700	800	4.33	
1023307	800	900	6.75	
1023308	900	1002	3.64	
1023309	1000	1100	6.06	

STATION:10222 POSITION: 30°N 30°W(S)
GEAR:RMT8M

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3M^3		
1022221	20	120	3.32		
1022222	100	180	3.19		
1022223	130	205	3.51		
1022210	200	305	6.36		
1022211	300	400	4.68		DAY
1022212	400	505	6.47		
1022207	500	600	6.70	*	
1022208	600	700	5.00	*	
1022209	700	800	9.60	*	
1022216	10	105	11.10	*	
1022217	105	160	5.07	*	
1022218	160	200	4.77	*	
1022213	200	300	6.58		
1022214	300	400	5.38		
1022215	400	500	6.08		NIGHT
1022204	495	600	5.97		
1022205	600	700	5.84		
1022206	700	800	7.21		
1022201	800	900	8.16		
1022202	900	1000	5.02		
1022203	1000	1100	5.19		

STATION:10228 POSITION:32°N 33°W(T)
GEAR:RMT8M

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3M^3		
1022815	15	57	2.61		
1022816	80	130	2.56		
1022817	128	200	4.39		
1022831	205	300	6.51		
1022832	300	400	6.17		
1022833	390	505	8.24		DAY
1022803	500	605	4.86		
1022804	600	705	6.75	*	
1022805	705	805	10.81	*	
1022828	800	900	7.85		
1022829	900	1000	8.76		
1022830	995	1100	5.35		
1022824	10	120	5.92		
1022825	90	140	7.57		
1022826	120	200	5.78		
1022821	200	300	9.11		
1022822	300	400	6.42		
1022823	400	500	9.99		NIGHT
1022809	500	600	6.19		
1022810	600	700	5.07		
1022811	700	800	5.14		
1022806	800	900	4.42		
1022807	900	1000	5.06		
1022808	1000	1100	7.99		

STATION:11050 POSITION:46°N 14°W (U)
GEAR:RMT8M

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3M^3	
1105601	0	50	2.73	
1105602	50	100	14.75	
1105603	100	200	8.60	
1105501	200	305	9.88	DAY
1105502	305	400	28.37	
1105503	400	495	33.25	
1105801	0	50	30.98	
1105802	50	100	25.77	
1105803	95	200	23.69	
1105701	200	300	15.15	
1105702	300	400	22.24	NIGHT
1105703	395	500	26.11	
1105001	500	600	6.58	
1105002	600	700	12.53	
1105003	700	800	10.94	

STATION:11036 POSITION:39°N 15°W (V)

GEAR:RMT8M

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3M^3	
1104701	0	50	15.89	
1104702	50	105	11.64	
1104703	105	180	2.95	
1104201	180	280	4.33	
1104202	280	380	9.39	
1104203	380	480	16.24	
1104001	470	565	18.77	DAY
1104002	565	660	8.30	
1104003	660	800	10.16	
1103601	790	890	3.95	
1103602	890	995	6.54	
1103603	990	1095	1.53	
1104501	0	50	56.00 *	
1104502	45	100	23.19	
1104503	100	180	20.91	
1103801	180	280	7.70	
1103802	280	385	6.78	NIGHT
1103803	385	470	14.12	
1103901	470	565	6.50	
1103902	565	660	3.41	
1103903	660	775	4.93	

STATION:11078 POSITION:39°N 15°W (W)
GEAR:RMT8M

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3M^3		
1109401	0	50	15.95		
1109402	50	100	6.20		
1109403	100	200	2.05		
1108801	200	300	7.28		
1108802	300	400	11.43		
1108803	400	498	8.60		
1108301	500	600	12.82		
1108302	600	700	11.50		DAY
1108303	700	800	9.41		
1108101	800	905	8.00	(est)	
1108102	900	1000	8.67		
1108103	1000	1100	6.41		
1109501	1100	1205	3.67		
1109502	1203	1298	6.11		
1109503	1298	1403	4.19		
1108601	0	50	30.91		
1108602	50	100	15.03		
1108603	100	200	17.84		
1107901	200	300	8.00	(est)	
1107902	300	400	6.85		
1107903	400	495	11.37		
1107801	500	600	8.96		NIGHT
1107802	605	695	3.64		
1107803	695	795	5.97		
1108501	800	900	3.45		
1108502	900	1000	6.82		
1108503	1000	1100	7.79		

STATION:11261 POSITION:31°N 25°W(X)
GEAR:RMT8M

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3M^3		
1126114	0	100	3.05		
1126129	2	25	0.32		
1126130	25	50	1.48		
1126131	50	100	1.36		
1126113	100	200	6.78		
1126112	200	300	2.04		
1126101	300	400	2.60		
1126102	400	500	1.34		
1126132	400	500	3.08		
1126103	500	600	3.41		DAY
1126133	500	600	9.56		
1126104	600	700	3.46		
1126105	700	800	4.44	*	
1126106	800	900	7.89	*	
1126115	900	1000	5.31		
1126116	1000	1100	7.72		
1126117	1100	1200	3.47		
1126126	1200	1300	2.39		
1126127	1300	1400	3.94		
1126128	1400	1500	3.22		
1126139	0	100	10.61	*	
1126173	0	25	8.67	*	
1126174	25	50	3.53	*	
1126175	50	100	6.41	*	
1126140	100	200	3.12	*	
1126141	200	300	4.41		
1126122	300	400	5.53		
1126123	400	500	7.46		
1126124	500	600	18.61	*	NIGHT
1126161	600	700	2.42		
1126162	700	800	2.34		
1126138	800	900	3.71		
1126119	910	1000	3.09		
1126120	1000	1110	3.48		
1126121	1100	1200	3.50		
1126166	1200	1300	1.61		
1126167	1300	1400	1.21		

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1126201	1500	1910	2.18	
1126202	1910	2315	1.03	
1126203	2310	2700	0.66	
1126204	2700	3110	0.60	
1126205	3110	3500	0.30	
1126206	3330	3910	0.89	
1126210	3900	4295	0.03	
1126211	4295	4720	0.08	
1126212	4720	5110	0.08	
1126225	5340	5375	0.08	
1126226	5375	5415	0.13	
1126227	5415	5430	0.51	DEEP
1126148	5132	5182	0.08	
1126147	5233	5279	0.22	
1126146	5325	5376	0.15	
1126154	5347	5388	0.03	
1126255	5388	5415	0.33	
1126156	5410	5425	0.18	
1126163	5345	5385	0.08	
1126164	5385	5410	0.42	
1126165	5410	5430	0.63	

STATION:11794 POSITION:47°N 20°W (Y)
GEAR:RMT8

STATION	DEPTH(m) UPPER	LOWER	STANDARDISED WDV(mls)/10^3M^3	
1179404	0	50	4.91	
1179405	50	100	7.52	
1179406	100	195	26.89	
1179425	200	305	5.35	
1179426	300	400	10.20	
1179427	400	490	67.39	
1179417	500	600	7.47	
1179418	600	700	6.64	
1179419	700	800	12.35	
1179401	800	900	18.06	
1179402	900	1000	15.05	
1179403	1000	1100	6.59	
1179435	1100	1200	13.04	DAY
1179436	1200	1300	12.04	
1179437	1300	1400	17.47	
1179456	1400	1500	8.92	
1179457	1500	1750	7.48	
1179458	1750	2000	6.39	
1179429	2000	2300	6.08	
1179430	2275	2505	2.88	
1179431	2500	2750	2.60	
1179465	2750	3010	2.01	
1179466	3010	3255	1.15	
1179467	3255	3500	8.97	
1179471	3490	3800	1.07	
1179449	10	100	14.41	
1179450	100	200	13.18	
1179451	200	300	9.88	
1179446	300	405	11.29	
1179447	405	505	17.32	
1179448	500	600	11.30	
1179438	600	700	6.59	
1179439	700	795	32.63	
1179440	795	900	16.09	NIGHT
1179409	910	1000	15.30	
1179410	1000	1115	9.62	
1179411	1115	1200	15.18	
1179421	1210	1315	25.71	
1179422	1305	1400	14.23	
1179423	1400	1500	9.42	
1179472	3800	4085	1.82	
1179473	4085	4450	1.82	

OBLIQUE HAUL:MADEIRA BERMUDA (OBLIQUE 1)
GEAR:RMT8

STATION	DEPTH(m) UPPER	LOWER	POSITION	STANDARDISED WDV(mls)/10^3M^3
8262	0	1000	32°N 16°W	4.10
8263	0	1000	32 N 20 W	1.73
8264	0	1000	32 N 23 W	2.05
8265	0	1000	32 N 27 W	7.72
8270	0	1000	32 N 34 W	6.21
8271	0	1000	32 N 39 W	5.89
8272	0	1000	31 N 43 W	4.14
8274	0	1000	31 N 47 W	6.72
8275	0	1000	31 N 50 W	12.57
8276	0	1000	31 N 54 W	11.05
8277	0	1000	32 N 57 W	6.75
8279	0	1000	32 N 60 W	5.12

OBLIQUE HAUL:NORTH EAST ATLANTIC (OBLIQUE 2)
GEAR:RMT8

STATION	DEPTH(m) UPPER	LOWER	POSITION	STANDARDISED WDV(mls)/10^3M^3
9792	0	1000	50°N 16°W	17.77
9793	0	1000	48 N 17 W	24.75
9794	0	1000	47 N 17 W	23.38
9795	0	1000	46 N 17 W	16.85
9796	0	1000	45 N 16 W	23.59
9797	0	1000	44 N 16 W	19.25
9798	0	1000	44 N 16 W	18.90
9799	0	1000	43 N 16 W	19.15
9801	0	1000	43 N 17 W	14.74
979002	0	1000	41 N 12 W	58.61
979003	0	1000	42 N 12 W	122.78