Distribution and composition of macrozoobenthic communities along a Victoria-Land transect (Ross Sea, Antarctica), with special emphasis on the peracarid crustacean fauna

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Introduction

The Victoria Land Transect Cruise with the italian research vessel "Italica", carried out in February 2004, was the first large-scale attempt to obtain benthic samples systematically along a latitudinal transect along the Antarctic Ross Sea shelf. Previous surveys emphasized on aspects of fisheries, from there wide-meshed nets were used only. During this cruise, a Rauschert-Dredge with a mesh size of 0,5 mm was used to obtain smaller macrozoobenthic specimens of the Ross Sea community, which were not obtained by preceding sampling. Cumaceans were examined in detail as an example of the small sized peracarids . Previously only 12 species were known from the Ross Sea, now the number of species increased to 33.

Methods

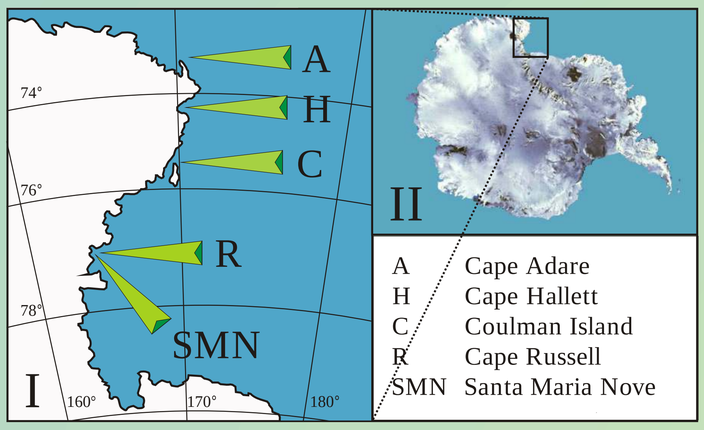

Fig. 1: Sample areas; I Ross Sea, II Antarctica

- A Rauschert-Dredge with a with of 0,5 m and a mesh size of 0,5 mm was used for obtaining the samples (sampling time 5 min.)
- Samples were fixed in 96% alcohol (additional samples fixed in 4% borax buffered formalin), sorted by taxon and counted for the study of community composition
- Sample areas as indicated in Fig. 1, each area was sampled along a depth transect from 100 m to 500 m

Results

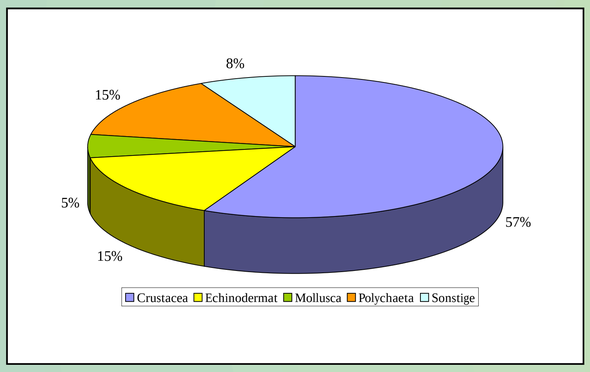

Fig. 2: Relative composition of higher taxonomical groups of th Rosss Sea fauna

- Distribution of higher taxa at sample areas: crustaceans (71-83%), polychaetes (12-16%), molluscs (3-7%), echinoderms (0-2%)
- Increased occurrences: Cape Adare molluscs 38%, Coulman Island polychaetes 63%
- In general total abundance increases with decreasing depth (Fig. 3)
- Exceptions to this rule is location Cape Russell, decreased abundance in shallow areas might be caused by iceberg scouring

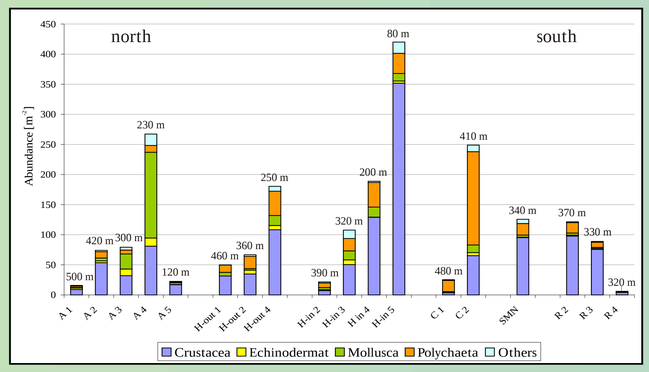

Fig. 3: Abundance [specimen m^{-2}] of higher taxonomical groups of the Rosss Sea fauna

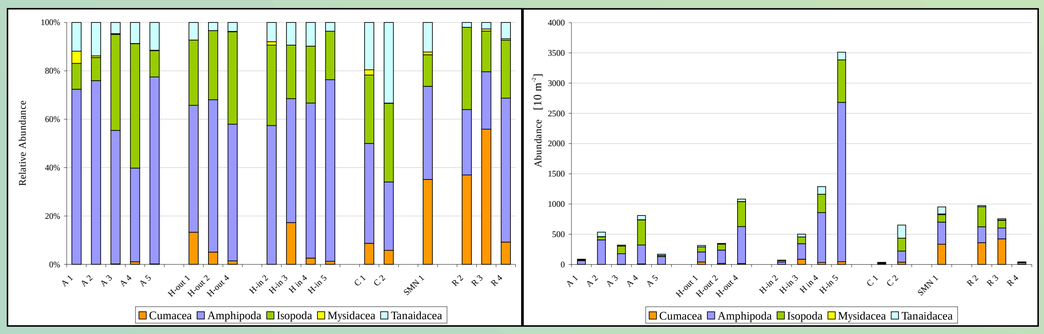

Fig. 4: Relative composition of peracarid taxons (left) and abundance (specimen 10 m^{-2}) of peracarid

- At the five sample areas, peracarids are dominated by amphipods (32-66%) followed by isopods (13-30%), cumaceans (< 1-35%), tanaids (4-28%)and mysidaceans (< 1-1%)
- At Cape Hallet and Coulman Island the portion of abundance of cumaceans displays an increase with decreasing depth in addition to an increase of general abundance at these locations

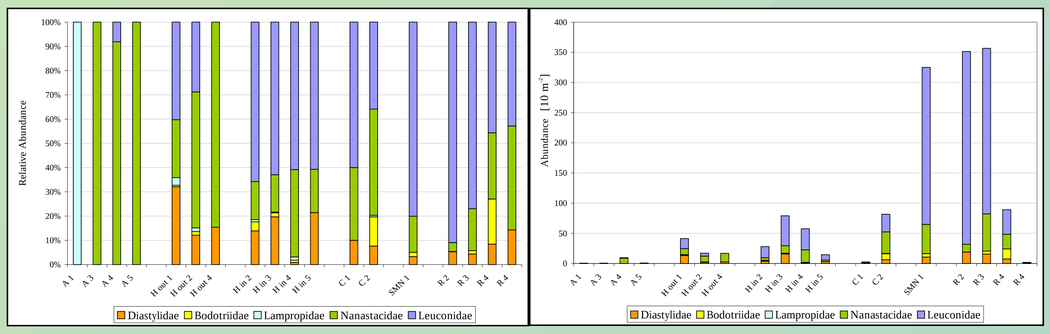

Fig. 5: Relative composition of cumacean families (left) and abundance (specimen 10 m^{-2}) of cumacean

- Distribution of the cumacean families: Leuconidae (8-85%), Nanastacidae (10-92), Dyastilidae (3-16%), Lampropidae (< 1-2%) and Bodotriidae (< 1%)
- Out of 29 collected species 21 were new to the Ross Sea
- The number of species recorded for the Ross increased from 12 to 33

Tab. 1: Ross Sea species, blue newly recorded

Taxon	Number
Lampropidae	
Hemilamprops cf. ultimaspei	7
Paralamprops sp.	3
Bodotriidae	
Cyclaspis gigas	17
Vaunthompsonia cf. laevifrons	148
Nanastacidae	
Campylaspis cf. antarctica	75
Campylaspis ledoyeri	8
Campylaspis cf. maculata	8
Campylaspis quadridentata	33
Campylaspis quadriplicata	19
Campylaspis sp. A	18
Campylaspis sp. B	50
Cumella australis	779
Cumella cf. emergens	43
Leuconidae	
Eudorella cf. gracilior	838
Eudorella cf. sordida	45
Eudorella sp. A	15
Leucon antarctica	1561
Leucon assimilis	171
Leucon intermedius	87
Leucon cf. parasiphonautus	1
Leucon cf. sagitta	276
Leucon sp. A	1099
Diastylidae	
Diastylis corniculata	6
Diastylis enigmatica	167
Diastylis helleri	44
Diastylis lecroyae	59
Diastylopsis goeki	7
Leptostylis antipus	43
Makrokylindrus inscriptus	1

Outlook

As shown by the study the number of cumaceans increased to 275% of the formerly recorded species. For the other peracarid taxa (especially for isopods and amphipods as the most common peracarids) similar results can be expected. Therefore biodiversity of the Ross Sea will prove to be considerably richer as supposed up to now.

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