

SHORT CRUISE REPORT

RV METEOR cruise 71/2, Eastern Mediterranean Sea

Dates: December 27, 2006 – January 15, 2007
Ports of call Heraklion (Greece) – Heraklion (Greece)
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General setting:

This expedition dealt with species composition, and with diversity and dominance patterns of benthic deep sea communities of the Levantine Basin SE of Crete. In every one of the two working areas of different depth and distance to the Cretan coast (area 1 very deep and adjacent to the coast, area 2 less deep and farther away) 3 stations were sampled for organisms of all size classes (Microbes and Nanofauna to Megafauna). Measurements of abiotic and biochemical parameters in the deep sea sediments will allow to correlate these data with biological factors using community based multivariate statistics.

Especially the hypothesis formulated (Kröncke, Türkay, Fiege, 2003, P. S. Z. N.: Mar. Ecol., **24**(3): 193-216) on the basis of the results of earlier investigations in the same area as to the correlation of benthic deep sea diversity and productivity to the coastal distance rather than to depth, caused by the higher significance of lateral transport of organic matter rather than the pelagic production was to be tested. If the results of the representative sampling confirm the mentioned correlation the hypothesis can be validated.

Narrative of the cruise

METEOR left Heraklion on December 27, 2006 at 14.00 UTC towards Kalilimeni on the south coast of Crete in order to get bunker. Kalilimeni was reached in the morning of January 28, 2007 at 05.30 UTC. After bunkering at sea Meteor left at 09.30 UTC and the vessel headed on a south-easterly course towards the first working area (Box 2) that was situated a distance of 120 nm in the Herodotus Abyssal Plain. Winds around BFT 5 from SE directions prevailed during the travel, the swell from the same direction was moderate.

Operations in the first working area (Herodotus abyssal plain) started on December 28, 2006 at 19.00 UTC with a multibeam mapping of the area which lasted until 02.30 UTC of the next day. Sampling began at 02.53 UTC with CTD-rosette and multi-net. Benthic sampling started at 07.00 UTC with the multi-corer. After 5 successful deployments, 8 deployments of the box corer followed. On December 30, 2006 at 06.24 UTC we moved to the second station in area 2 which was reached at 08.28 UTC and started with pelagic sampling with the CTD-rosette followed by butterfly watersamplers and the multiple net. At 23.35 a series of 5 multicorers started which was finished on December 31, 2006 at 08.43 UTC. During the work at the second station the wind had headed

northerly and increased to up to 7 Bft, diminishing again towards 3-4 Bft towards the end of the period.

On December 31, at 11.11 UTC work with towed gear started. At first the beam trawl was lowered and was back on deck at 20.17 followed by two deployments of the epibenthic sledge and subsequently another haul with the beam trawl. The last trawl was recovered on deck on January 2, 2007 at 13.56 UTC after which the vessel moved back to the second station in area 2 in order to take 8 box-corer samples,

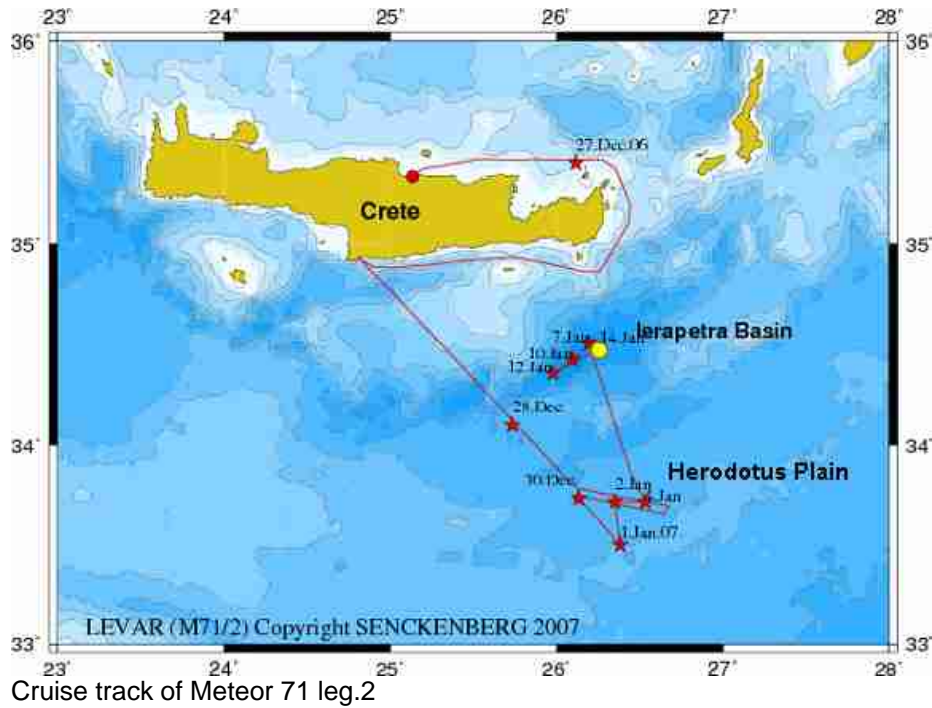
Station 3 in area 2 was reached 04.33 and the multicorer was deployed. Because of a malfunctioning of the gear its operation had to be stopped until its repair and we switched to pelagic sampling. CTD-rosette and multi-net were used during the whole day until 15.45 UTC, when the multi-corer was functional again and could be used. 6 deployments followed until January 4, 2007 when we switched to the box-corer in order to take the 8 last benthos samples in area 2 where work was completed with a supplementary CTD-rosette. Within this last period southwesterly winds up to 6-7 Bft and a westerly swell of 3 metres height at times made work difficult.

During the following night the ship changed position towards area 1 situated closer to the south coast of Crete, i. e. within the Ierapetra-Basin with depths exceeding 4000m. This new area was reached on January 5, 2007 at 02.33 when multibeam mapping started. this operation terminated at 13.17 UTC. Benthos sampling started with box-corners at 14.05 UTC. The 8 successful deployments ended on January 6, 2007 at 08.15. After that, pelagic work was undertaken until 17.56 UTC with the CTD-rosette followed by the multinet. After this, the epibenthic sledge was lowered from 19.54 UTC on. Two subsequent samples were taken with this gear until January 7, 2007 07.57 UTC. In the whole period until January 7 the sea was rough caused by the prevailing northerly winds of 6-7 Bft. When multicorer sampling started at 09.45 UTC weather began improving and the wind dropped considerably during the day. 6 multicorer samples were taken until January 8, 2007 02.25 UTC.

After having moved to a new position pelagic work started again at 02.57 UTC. CTD-rosette, butterfly water samplers and the multinet were used to collect samples and take measurements. At 15.33 UTC benthic work restarted with multicorer sampling. Altogether 5 deployments took place and were successful. After a short CTD-rosette sampling towed gear was set in action. on January 9, 2007 at 15.24 UTC when the beam trawl was lowered and safely recovered on January 10, 2007 at 03.19 UTC. Two deployments of the epibenthic sledge followed, ending at 13.22 UTC of the same day.

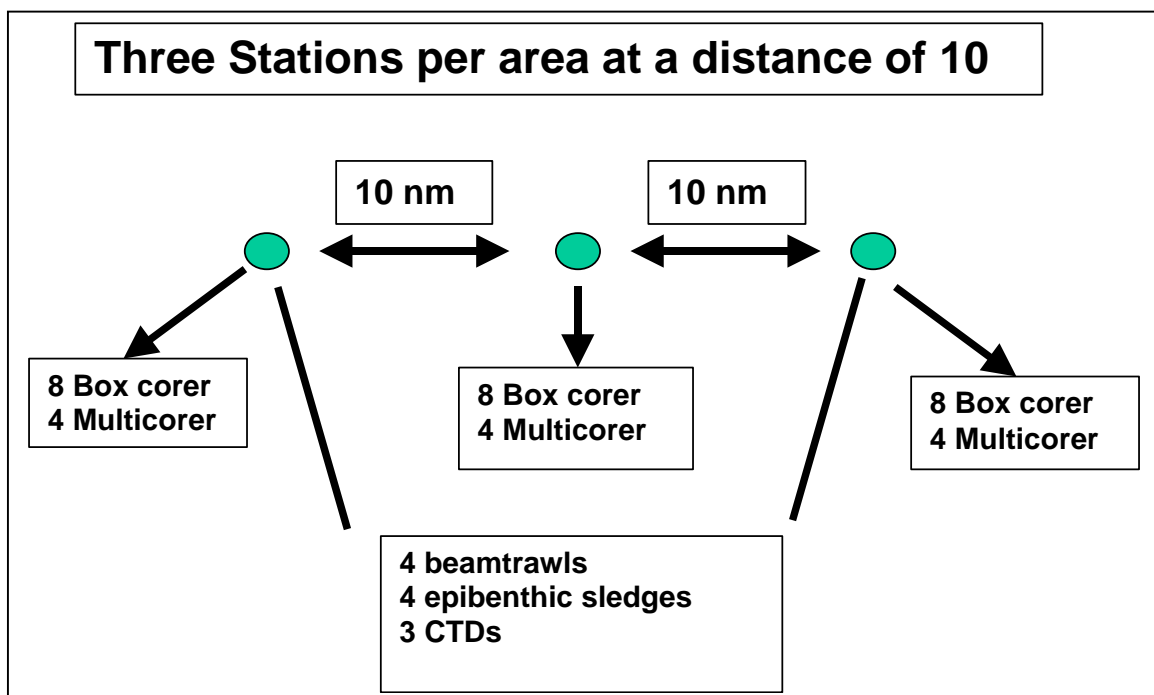
On the next position benthic operations started with 8 box-corer samples at 14.09 UTC and lasted until January 11, 2007 08.38 UTC. After that a series of pelagic samples were taken with CTD-rosette and multinet, returning again to the box-corer at 16.30 UTC for a full sampling series with 8 deployments. On January 12, 2007 at 10.15 UTC a new multicorer series started, covering 5 successful deployments. Benthic sampling was completed by 3 deployments of the beam trawl starting on January 13, 2007 at 00.14 UTC and ending on January 14, 2007 at 15.31 UTC. After this a short multinet sampling concluded the campaign.

The vessel headed towards Heraklion which was reached on January 15, 2007 at 08.15 local time.



Work programme and sampling scheme:

In each of the two working areas a short mapping with HYDROSWEEP allowed to locate the sampling positions. After this, the following gear was used per station: Multicorer (4 per station), Box-corer (8 per station), Epibenthic Sledge (4 per area), Beam-Trawl (4 per area), CTD (3 per area), multineets for plankton were used between benthic samplings.



Meio- and Nanofauna were recorded from multicorer samples. The meiofaunal organisms were anaesthetised with $MgCl_2$ before preservation in 4 % formaldehyde solution. For the analysis of the distribution of living foraminiferans the uppermost 10 cm of multicorer cores was sliced to 0.5 to 1 cm broad slices and stained with a Bengal-Rose Ethanol mixture. The Protozoology group examined the upper 5-10 mm of sediment under the microscope. Photographic and video-documentation played a major role in this endeavour.

The macrofauna-samples were sieved (minimum mesh size 0.3mm), preserved on board ship and analysed in the home laboratories. The number of eight parallel samples was necessary in order to assess the small scale variation of the diversity as recorded in the samples.

The box-corer samples serve for quantitatively estimating the abundance and species richness of the macrofauna. In contrast, the species richness of the macro-epibenthos can only be sampled with the epibenthic sledge. The samples of this last one were fixed in alcohol subsequent to sampling (not in formalin in order to make DNA-extraction possible).

The Megafauna was recorded with the help of a 2m-Beam-Trawl, which is a very efficient gear. For deep sea sampling a weight of 500 kg was inserted into the rope after 200 m have been paid out in order to minimise the angle of the rope. This saved considerable ships time as the rope length could be limited to 1.8 times depth.

The macrobenthos group will besides sampling determine TOC [=Total Organic Carbon] and Chlorophyll content in the sediments in the respective home laboratories,. TOC gives information on the ingress of organic material through sedimentation or lateral transport. The Carbon-Nitrogen (C/N) - ratio allows for first indications concerning the marine or terrestrial origin of the organic material. For measuring this parameter one multicorer core and a subsample from the box-corer were taken. These were sliced into 2 cm broad slices and deep frozen at $-20^{\circ}C$ for subsequent analysis in the home laboratory.