SO-250 KuramBio II
4. Weekly Report
(05.09. – 11.09.2016)

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45°12.9´N / 152°42.8´E

After our return from Tomakomai to the working area A4 at a depth of about 8700 m we could continue our work in the late afternoon of last Sunday. We first used the steaming time in our area permitted by the Russian authorities to map the seabed more precisely with the multi-beam echo sounder (but at full speed, which does not allow very high resolution). Then, back at station, we had to start with the multinet again, because the first trial had been interrupted last week in order to leave the station for Tomakomai due to the emergency. After this deployment we got the first sediment from depth 8700 m on deck by means of the large box corer (GKG), but it was full to the brim, and thus the surface of the sediment had been disturbed. For that reason we gave the GKG a second trial, however, with the same result and sediment up to the top of the gear. The first Multicorer (MUC) deployment did not release in the soft sediment and returned on deck empty, however, with muddy smears on the cores.

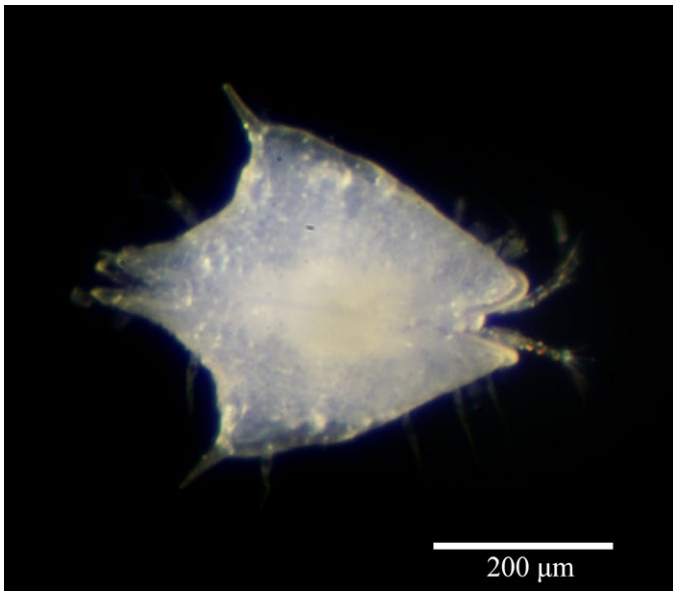

Figure 1: Seed shrimp (Ostracoda) of the genus Cytheropteron in dorsal view. This is the deepest record of an ostracod ever obtained. © Hayato Tanaka

We now know that the sediment in the central Kuril Kamchatka Trench has the consistency of soft serve ice cream, what makes sampling with coring devices difficult. That is because the devices require relatively resistant sediment in order to trigger the closing mechanism. We therefore changed our deployment strategy for the MUC and retrieved it at higher speed right after bottom contact without granting the otherwise often used few seconds for sediment penetration, in order to trigger the closing and avoid too deep sinking of the twelve cores. This strategy then brought us excellent material for sedimentology and meiofaunal research from depth 8700 m, and therefore we repeated this deployment once more. After additional three hours of veering and heaving, the MUC came on deck with a wonderful sample.

Figure 2: An EBS sample from 8700 m depth collected in the Kuril Kamchatka Trench during the KuramBio II campaign (working area A4). The benthos at this station was dominated by clams (Bivavia; white objects on the picture) and Foraminifera (Protista; brown stick-like creatures). © Marina Malyutina

All twelve cores were filled with sediment and there were still some 10 cm of overlaying bottom water, so that the sample was perfect and with an undisturbed sediment. Soon after a quick look into the cores, we recognized some small holothurians and worms on the sediment. In the laboratories we discovered a rich sample of copepods, nematodes and kinorhynchs, as well as, again another record, the deepest record of a benthic ostracod ever obtained (Fig. 1). This was very surprising, as it was previously assumed that ostracods cannot live at these depths, due to the enormous pressure (800 atmospheres) that requires enormous energy by the organisms to build up and maintain a calcareous shell. That is because free calcium carbonate would dissolve under such conditions. This sample was a great success. The following analyses of these samples in the labs back home will most certainly break additional records and bring us many more surprises.

The deployments of the epibenthic sledge (EBS) and the Agassiz trawl at 8700 m were also excellent

Figure 3: This ctenophore (*Beroe* sp.) was collected with a multi-closing plankton net in the working area A4 during KuramBio II. © Anastassia Maiorova

and brought - immediately visible to the eye - very large quantities of organisms, as depicted by the large quantity of small, white dots on the sieve that are shown in the picture. These are the shells of hundreds of minute bivalve molluscs that were sieved out from the muddy sample (Fig. 2).

On September 8th we reached the A3 region and after the deployment of CTD and the EM122 (echo sounder) we determined the position for the corers and towed equipment before we started deployment of the multinet. Besides collecting numerous interesting planktonic organisms, such as a comb jelly (Fig. 3), with this haul we were able to catch a large parasitic female isopod from the family Dajidae with her miniature dwarf male that was attached underneath her pleotelson (Fig. 5). These parasites usually infest decapod crustaceans. It is a rarity to sample these ectoparasitic organisms.

Until Saturday morning (September 10), we were able to work at this station, but then we had to weather a storm and stop the collection work. As we have no time to spare after the long journey back to Japan, we decided not to conduct the second AGT and EBS deployments in this area. Instead we mapped the hadal of the Kuril-Kamchatka trench in the region around the deepest of the planned sampling areas (A7) with the multi-beam echo sounder to retrieve even better topographic information (Fig. 6) in order to possibly shift this 9500 m station further to the southwest for saving

Figure 4: The tanaid crustaceans of the genus *Pseudotanais* was already collected frequently during the first KuramBio campaign and was also in the samples during this cruise, KuramBio II. © Magdalena Blazewicz

Figure 5: Parasitic isopods (Crustacea) of the family Dajidae collected at the Kuril Kamchatka Trench. Top: Female with male attached to the pleotelson (left); below: dwarf male. © Alexandra Petrunina

additional time. When we realized that the more western areas were shallower than hoped for we decided to stick to the originally planned 9500 m station. Once the weather was favorable enough again, we deployed the box corer at this depth. However, the signal from the contact of the gear with the ocean floor that we saw on our instruments on board casted doubt on the success of this deployment, as it looked like the box corer did not release and would return on deck empty. The contrary turned out to be the case. The gear brought a phantastic sample from the seafloor in 9500 m depth with a rich fauna, for example pogonophorans, derived polychaetes which feed chemosynthetically via symbiontic bacteria.

Meanwhile, we continued working in the laboratories on the first results for the cruise report. For example, of the tanaidacean crustaceans (Peracarida; Fig. 4) 212 specimens were sorted from EBS, AGT, and GKG samples collected at

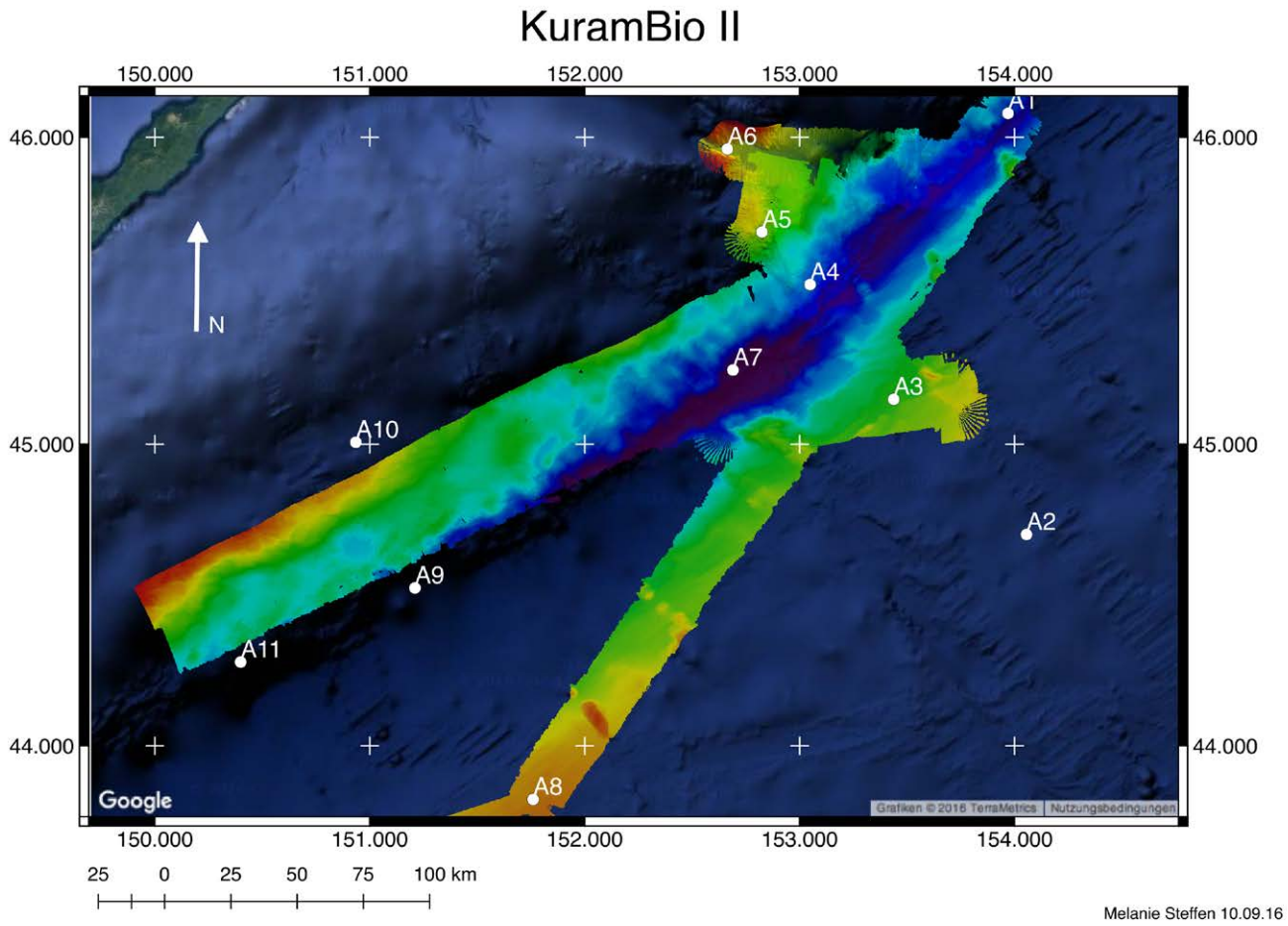

Figure 6: The new bathymetric data obtained during KuramBio II allows a more detailed view on the sea floor as compared to previous maps. © Melanie Steffen, Harbor City University Hamburg

the four areas sampled so far (A1, A5, A6, and A8). All of them were identified to family level. They represent all three known suborders, with clear dominance of Tanaidomorpha (90%). The most abundant family was the Pseudotanaidae (Photo) representing 35% of all tanaidaceans in our samples, followed by Akanthophoreidae (19%), Typhlotanaidae (10%), and Agathotanaidae (8%). Apparenty, at the abyssal area (A8: 5100-5200 m) Tanaidacea were much more abundant and diverse than at the deeper ones. Only at this area (A8) 65% of all sorted tanaidacans were found. Areas A1 (8191-8250 m) and A6 (6050-6228 m) were clearly less diverse, however, at each of these, a few specimens of the families Pseudotanaidae and Akanthophoreidae were also identified. Until now, DNA extractions were done from 96 specimens and the first PCR reaction using the COI marker is tested.

Everybody on board is well, though we all miss the German summer. With best wishes home, please keep some warmths for us upon return!

Angelika Brandt, Center of Natural History (CeNak), (expedition leader SO250) and all participants