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Pressemitteilung

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Fast and efficient as soon as they are dead: *Pyrosoma atlanticum*

Jellyfish-like creatures may play major role in the marine carbon transport system

13.05.2009, Kiel/ Southampton – As a fast and efficient means of transport, jellyfish-like organisms known as *Pyrosoma atlanticum* could play a major role in the marine carbon cycle.

In the May issue of *Limnology and Oceanography*, biogeochemists from the Leibniz Institute of Marine Sciences (IFM-GEOMAR) in Kiel, Germany, and the National Oceanography Centre in Southampton (NOCS), UK, report that dead bodies of the marine organism *Pyrosoma atlanticum* may be transporting much more carbon to the seafloor than phytoplankton or other jellyfish-like creatures.

Pyrosoma atlanticum are semi-transparent, barrel-shaped marine animals, about the size of a human thumb. They move through the water by drawing water in the front end and propelling it out the rear in a sort of jet propulsion. They belong to the group of thaliacean and consist of gelatinous substance like jellyfish. Swarming by millions in ‚hot spots' and also dying by millions like salps, *Pyrosoma atlanticum* may be transporting tons of carbon per year from the ocean surface to the deep sea.

In May 2006 off Ivory Coast (West Africa) the biogeochemists Mario Lebrato (IFM-GEOMAR) and Dr. Daniel Jones (NOCS) discovered thousands of moribund thaliacean carcasses at the seafloor, the majority in depths of more than 500 metres in the continental slope. When they analysed dried samples, they were surprised: “A third of the carcasses consists of carbon. This is the highest proportion of carbon that has been measured in gelatinous organisms”, states Mario Lebrato.

Lebrato and Jones explain the high proportion of carbon and the density of the creatures with their fast sinking. „They don't have the time to rot in the water column. That's why they reach the seafloor nearly in their original condition, including the carbon inside“, continues Lebrato. On the seafloor the scientists also observed sea urchins and bacteria feeding on the decomposing carcasses.

The occurrence and quality of the sinking event needs further investigation on a global scale. Lebrato: “If this massive sinking of *Pyrosoma atlanticum* bodies is a global phenomenon we will need to include the transport capacity of jellyfish-like organisms into future earth system model: By transporting carbon from the ocean surface to the deep sea they keep it very efficiently from re-entering the atmosphere.”

Lebrato and Jones are positive: Their scientific results will trigger a lot of research on the role of gelatinous zooplankton for the marine carbon cycle.

Background information:
The oceans play a major role in the Earth's climate system. Until now, they have inhibited the greenhouse effect by absorbing a third of the carbon dioxide (CO_2) emissions produced by human beings. In surface waters, tiny marine plants called phytoplankton use sunlight and carbon dioxide to grow. Animals (zooplankton) then consume the phytoplankton and incorporate the carbon. When phyto- or zooplankton die their biomass sinks and starts to decompose. During that process parts of the CO_2 can dissolve back into the oceans and return to the atmosphere as heat-trapping carbon dioxide. But: The faster the biomass sinks the bigger is the chance that it turns into sediment at the seafloor and thus binds the CO_2 permanently.

Original Work:
Lebrato, M., Jones, D. O. B., 2009: Mass deposition event of Pyrosoma atlanticum carcasses off Ivory Coast (West Africa), Limnology and Oceanography 54(4), 2009. 1197-1209, Online-publication: http://aslo.org/lo/toc/vol_54/issue_4/1197.pdf

Images:
Bild 1: http://www.ifm-geomar.de/fileadmin/ifm-geomar/fuer_alle/institut/PR/science/Pyrosoma_atlanticum.jpg
Bild 2: http://www.ifm-geomar.de/fileadmin/ifm-geomar/fuer_alle/institut/PR/science/Mario-Lebrato.JPG

Image Description:
Figure 1: Gelatinous carcasses of *Pyrosoma atlanticum* (left) and sea urchins (right) at the seabed at 700 metres next to an oil-pipeline. Photo: Lebrato/Jones
Figure 2: Mario Lebrato working in the laboratory at NOCS. Photo: Lebrato

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