

Light inside sponges

Fibre optic cables as light conductors are obviously not a recent invention. Marine sponges (Porifera), the phylogenetically oldest multicellular organisms, are able to transmit light inside their bodies by using amorphous siliceous structures.



The orange puffball sponge (*Tethya aurantium*) in its natural habitat, here in the Limski channel north of Rovinj (Croatia) in the northern Adriatic Sea. The sponges, which have many needle bundles, grow a few centimetres below the water surface. (Photo: University of Stuttgart/Zoology)

The discovery of photosynthetically active organisms inside sponges already attracted the attention of researchers around ten years ago. But no information existed on how these organisms were able to survive inside sponges without light. At the time, the marine biologists Elda Gaino and Michele Sara from Genoa (Italy) came up with the hypothesis that light might be transmitted inside

the sponge body. As part of the BIOTECmarin research project, marine zoologists at the University of Stuttgart and the Leibniz Institute of Marine Sciences at the University of Kiel have shown that living *Tethya aurantium* sponges use siliceous skeletal rods (spiculae) to transmit environmental light. Sponges without these spicules – for example the aspicular sponge *Aplysina aerophoba* – are not able to transmit light inside their body.

The researchers from Stuttgart and Kiel are therefore the first to demonstrate that living sponges use internal rods as light conductors, something that has previously only been possible on explanted single spicules after laser illumination. The results of the investigation were published at the end of October in the *Journal of Experimental Marine Biology and Ecology* in a paper entitled “Light inside sponges”.

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Further information

Prof. Franz Brümmer

University of Stuttgart

Institute of Biology, Department of Zoology

Tel.: +49 (0)711/685-65083

E-mail: franz.bruemmer(at)bio.uni-stuttgart.de