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Operational challenges in biological sampling underwater - A case study from the Red Sea

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ABSTRACT

Biological sampling underwater opposes different challenges compared to terrestrial sampling. This becomes clear by looking at a case study from the Red Sea, Egypt. Behavioral studies showed that Indo-Pacific bottlenose dolphins in the Red Sea (Hurghada, Egypt) rub themselves on specific soft corals and sponges. These soft-corals and sponges were examined for bioactive substances to see whether there could be a connection between the rubbing behavior and possible bioactive substances that could influence the dolphin's skin condition. [1]

Sampling of the sponges and soft corals brings different challenges up. To make sure that only organisms are sampled that are also accessed by the dolphins a great knowledge on the local area is needed. This is especially since behavioral studies are carried out long term which makes permanent underwater markers difficult to use. Additionally, the study area is frequently visited by divers which doesn't guarantee that markings or organism won't be affected by them.

Another aspect to consider is that how the sampling process affects the biochemical composition of the sponges and soft corals. From cutting of the sample until they are processed on the surface some time elapses which might cause differences in the metabolic pattern of the organisms.

Furthermore, taking samples from remote places such as specific reefs in the Red Sea makes it difficult to carry out all sample processing steps. E.g., usually, you won't have a -80° C freezer or liquid nitrogen available on the boat. This requires compromises in the sample processing as well taking of e.g., control samples.

This case study shows that biological sampling underwater requires thorough planning and that specific tasks can only be carried out by means of scientific diving.

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Digital Formats:

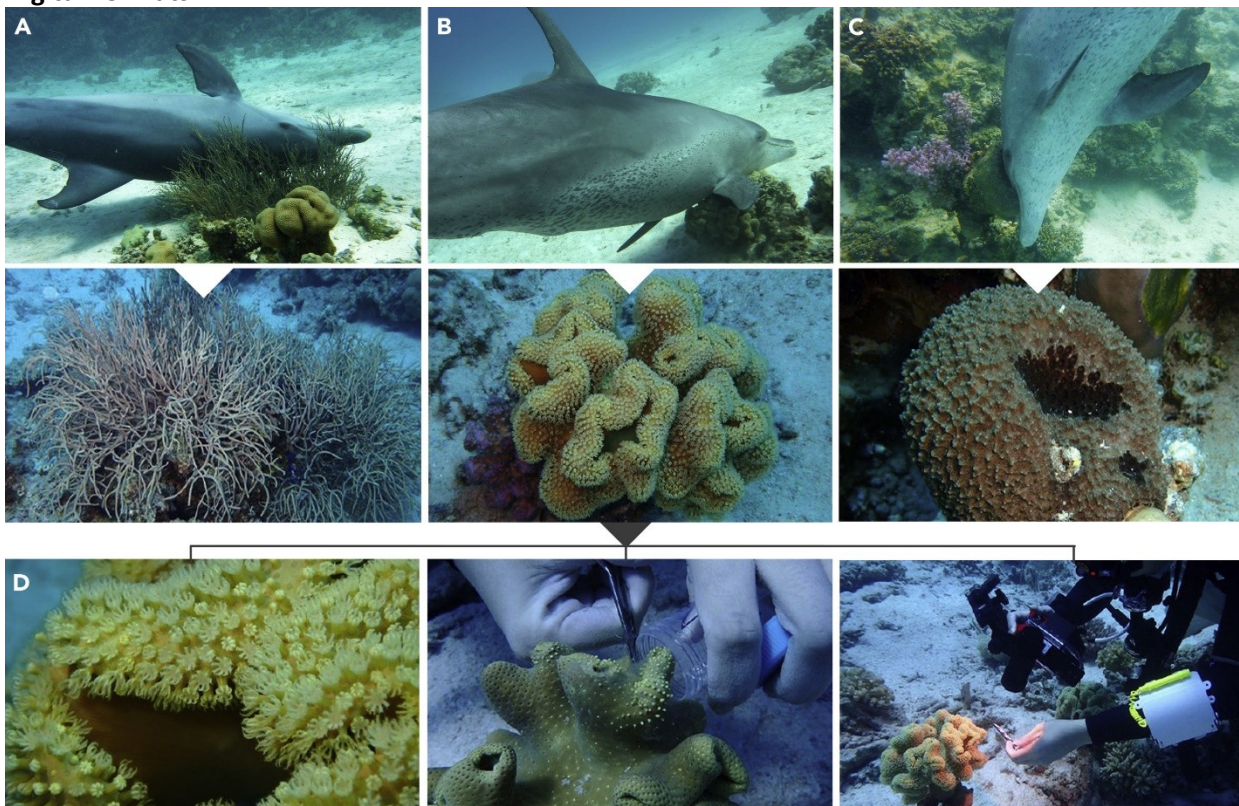


Figure 1: Observed rubbing behavior and sampled organisms: A) *Rumphella aggregata*, B) *Sarcophyton* sp., C) *Ircinia* sp.; D) Sampling process on the example of *Sarcophyton* sp. [1]

References:

[1] Morlock G. E., Ziltener A., Geyer S., Tersteegen J., Mehl A., Schreiner T., Kamel T., Brümmer F. (2022) *iScience*, 25, 6.