Tagging european sea bass with implantable archival tags: an experimental trial in tank

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Motivation: Implantable archival tags are electronic devices that can be surgically implanted in the peritoneal cavity of fish and collect data of the oceanographic environment experienced by them, like depth, temperature and light levels, as well as the fish body's temperature. The last ten years archival tagging studies have started taking place but there are big questions about the effects of tagging on fish behavior and physiology. This study aims to give some answers about healing rate and behavior of tagged sea bass

Methods: On 16 July 2009, a 64cm (FL) and weighting 3680g sea bass (*Dicentrarchus labrax*) individual that was kept in a large cement tank of an aquaculture breeding station was anaesthetized, tagged with a "wildlife computers Mk9" tag and released. (Mk9 cylindrical 73mm×18mm, 30g in air). The individual's behavior was observed carefully for the first hour after the tagging procedure. On 29 September 2009 the behavior of the fish was recorded with an underwater camcorder before it was deeply anaesthetized until death. In the lab, the incision healing rate and peritoneal cavity were studied. The tag was removed from the fish and the collected data were retrieved. Daily longitude and latitude of the fish posision were estimated using the provided software.

Results: No behavioral changes were noticed from the direct observations and video (Fig. 1). After 77 days, the biggest part of the surgical incision was healed and no peritoneal cavity damage was observed. The collected data were depth (from -4m to 1m), body temperature (from 0.4^{o} C to 38.6^{o} C), water temperature (from 14.9^{o} C to 37.6^{o} C) and light level (from 15 to 206 in relative values) (Fig. 2). The estimated longitude ranged from 20.65 E to 23.24 E and latitude from 36.00 N to 41.00 N.

Discussion: It is known that tag weight relative to the fish body weight is an important factor in determining the effects of the tag on behavior and mortality. It is widely accepted that tag/body ratio in air should not exceed 2% (Winter 1996). The ratio in this study was 0.82%. The handling of the fish and the surgical procedure were successful, since the fish survived, had normal behavior and the incision healing rate was satisfactory. The accurate coordinates of the breeding station are 21.89 E and 38.37 N. The estimated longitude ranges from -1.24 to +1.35 degrees and latitude from -2.37 to +2.63 degrees. According to "Wildlife Computers" longitude accuracy can be as good as ±0.5 degrees. For latitude the best accuracy can be ±1 degree and bad ±10 degrees. That means that we have good accuracy for 72,5 % of the days for longitude and for 55 % of the days for latitude. Future studies on sea bass archival tagging could take place at lagoon fish farms and the open sea.

Figure 1: On the top of the picture we can see the body of the tagged fish with the tag's stalk protruding.

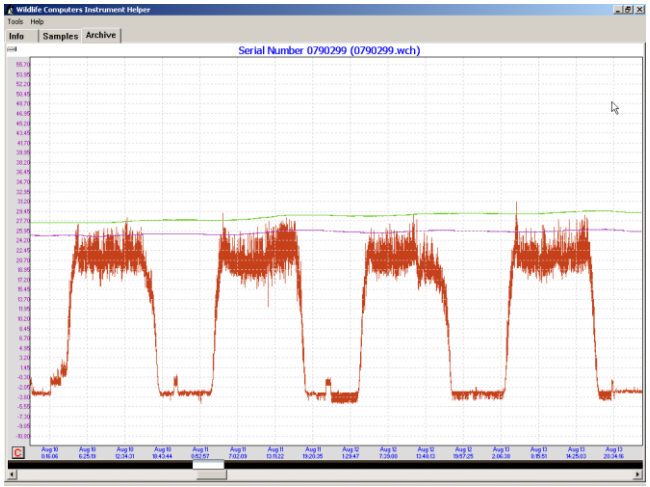

Figure 2: Graphical presentation of the collected data. Light level (red), fish body temperature (purple) and external (green) temperature channels.

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