Deep diving behavior observed in yellowfin tuna (

Yellowfin tuna (Thunnus albacares) are known to preferentially occupy the surface mixed layer above the thermocline and it has been suggested that they are physiologically restricted to water temperatures no more than 8 °C colder than surface waters. However, we here report for dive data acquired from a large yellowfin tuna which demonstrate for the first time that this species is indeed capable of making prolonged dives into deep cold waters. A yellowfin tuna (134 cm fork length) caught near an anchored fish aggregating device (FAD) in the Seychelles (Western Indian Ocean) was equipped with an internally implanted archival tag and released. The fish was recaptured 98 days later. As predicted for this species, this fish spent 85% of its time shallower than 75 m (maximum thermocline depth experienced by the fish) but, over the course of the track, it performed three deep dives to 578 m, 982 m and 1160 m. Minimum ambient water temperatures recorded at these depths were 8.6 °C, 7.4 °C and 5.8 °C respectively and varied by up to 23.3 °C from surface temperatures. The fish spent 8.3% of its time in waters more than 8 °C colder than the surface layer and daily experienced a wide range of sea temperatures (mode at 15-16 °C) and of temperatures of the gut cavity (mode at 6 °C). The reason for these dives can not be known. These depths and temperatures significantly exceed those reported in the literature so far and clearly demonstrate that this species has the physiological and behavioral ability to penetrate deep cold sections of the ocean.

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