

Physiological disturbances associated with sea turtle bycatch in Southern Brazil: Preliminary results

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Sea turtle bycatch in different types of fishing gear may cause high rates of post-release mortality, contributing for the rapid decline of endangered populations. Turtles that survive incidental capture may present sublethal effects such as physical injuries, physiological disturbance as well as behavioral and reflex impairment. This study is part of Tamar's initiative to reduce sea turtle bycatch and aims to evaluate the physical and physiological conditions of sea turtles immediately after being caught in three different types of gear: longline (targeting mahi-mahi), trawling and pair trawling. However, samples are still being processed and for this reason, only preliminary results are presented. Blood samples were withdrawn from the dorsal cervical sinus of eleven turtles, from which eight were *Caretta caretta*, two were *Chelonia mydas* and one was *Lepidochelys olivacea*. Six loggerheads were captured in longline and two in pair trawling; one green turtle was captured in pair trawling and one in trawling and the only olive ridley was captured in longline. All turtles captured were immature, with CCL between 40 and 81 cm (68.2 ± 11.91). The three individuals captured in pair trawling (two loggerheads and one green turtle) showed symptoms of drowning (lethargy, respiratory deficiency and foam in nares and mouth) and two of them died on board, a *C. caretta* and a *C. mydas*. Blood chemistry analyses revealed higher serum lactate (mean = 30.56 ± 4.86 mmol/L; N = 3) and glucose (mean = 224.33 ± 58.15 mg/dL; N = 3) levels for drowned turtles, especially for the ones that died on board. This might be explained by the fact that capture by trawling leads to forced submergence, which requires increased anaerobic metabolism, producing higher levels of lactate (for gluconeogenesis). Moreover, bycaught turtles struggle to get back to the surface to breathe and both, physical and physiological stress may prompt an increase in blood sugar. On the other hand, longline-captured individuals exhibited lower serum lactate (mean = 13.82 ± 5.30 mmol/L; N = 8) and glucose (mean = 113.14 ± 23.47 mg/dL; N = 8) levels if compared to pair trawling-captured turtles. Turtles captured by shallow-set longline also struggle to escape, however, sometimes they are capable of surfacing to breathe, while hooked. This is particularly true for turtles captured by longlines targeting mahi-mahi, like the ones from this study, once the gear is set to work very close to the surface. If the turtles were caught by longlines targeting tuna, the results would probably be different. No significant differences in serum ion levels were observed among bycaught turtles. The preliminary results presented here suggest that lactate and glucose serum levels might be used as biochemical predictors of delayed mortality of captured sea turtles. Additionally, under trawl conditions, the turtle must recover from any physiological disturbance before it is released back into the water.