

Measuring stress in a heartbeat in spiny dogfish

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Given the global threats facing shark populations, a comprehensive understanding of their stress physiology and reliable indicators of chronic stress are urgently needed to inform and refine conservation efforts. Such biomarkers of chronic stress can help us identify species that are more vulnerable to environmental and human-induced stressors, but also which populations around the world are currently experiencing most of these stressors. In this study, we measured several haematological parameters to elucidate effects of chronic stress on the oxygen-carrying capacity (haemoglobin, haematocrit), energy balance (glucose, lactate, β -hydroxybutyrate), and osmotic balance (osmolality, urea) in Pacific spiny dogfish (*Squalus suckleyi*). Oxygen consumption rates were quantified during and following a repeated stressor using intermittent respirometry. Additionally, small heartrate loggers were surgically implanted to track the sharks' heartrates during stress to give us a unique insight in the cardio-respiratory stress response of sharks. This new line of research will help us validate the use of promising new chronic stress biomarkers and may have wide-reaching applications for wildlife management and conservation.

Keywords

Spiny Dogfish; Chronic Stress; Heartrate Logger; Biomarker