Fly fishing in the Seychelles Archipelago and genetic connectivity of bonefish: implications for fisheries management

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The Republic of Seychelles in the Indian Ocean is highly dependent on tourism and fisheries for its economic sustainability. In 2016, this island state attracted over 300,000 guests, an increase of 10% from 2015. One of the growing ecotourism sectors is saltwater fly fishing, an industry that is based on catch-and-release fishing for a host of species, including bonefish. Bonefish (Albula spp.) have received significant research attention in the Pacific and Atlantic regions, with no research conducted in the Indian Ocean. Consequently, the impact of recreational fisheries remains unregulated, unreported and unknown. The project takes a multidisciplinary approach and aims to (1) characterise the fly fishing industry in the Seychelles with emphasis on bonefish using historical data and questionnaires from fishing companies, and (2) investigate genetic connectivity of bonefish throughout the Seychelles archipelago using next generation sequencing (RADseq). Our findings revealed that out of 330 registered recreational vessels, only 25 offer fly fishing. Moreover, the fly fishing sector is largely lodge- or yacht-based at the outer islands (e.g., Alphonse, Cosmoledo and Farquhar), with few independent guides based on the main island (Mahe) and nearby Praslin Island. In terms of species, giant trevally (Caranx ignobilis) and bonefish are the most targeted throughout the Seychelles. Preliminary genetic findings using mitochondrial cytochrome-b identified all bonefish samples as a single species (Albula glossodonta) and grouped all the locations from six Seychelles islands as one well-mixed population. RADseq analyses provide an improved interpretation of genetic connectivity. Expected outcomes of this study include a comprehensive understanding of the Seychelles fly fishing industry and improved knowledge on the stock structure of bonefish, which will assist with the management of this tourism-based fishery.