Checklist of coral reef fishes of Darvel Bay, Sabah, Malaysian Coral Triangle, with a note on the biodiversity and community structure

ABSTRACT

The Darvel Bay is a large semi-enclosed bay with spectacular natural land and seascape. The inward side of the Bay has only been recently known to be an important foraging ground for the endangered, threatened and protected (ETP) elasmobranch species, such as the Whale Shark and mobulid rays. Following a recent scientific expedition, we present a checklist of the coral reef fishes of Darvel Bay. A note on the biodiversity and community structure is presented, based on our analysis using diversity indices, univariate and multivariate approaches. Seven natural coral reefs comprising two fringing reefs and five patch reefs, were surveyed at 10 m depth using underwater visual census (UVC) and baited remote underwater video station (BRUVS) methods. A diverse list of 66 species of reef fishes from 17 families is recorded. However, this is overwhelmingly dominated by the small-sized omnivorous damselfish, family Pomacentridae (62%; N = 1485 individuals). Species richness and abundance were observed to increase at sites surveyed furthest from the coast within the Bay. Significantly distinct reef fish assemblages were observed between three priori groups, based on proximity to shore (ANOSIM, $R = 0.65$, $p < 0.05$). SIMPER analysis further revealed that 22 species of the total reef fish species recorded drive 76% dissimilarities between the groups. The pattern of the reef fish communities observed, reflected as a logseries distribution model, is that commonly found in disturbed habitats or habitats characterised by restricted resources in a community, where the dominant species takes up a high proportion of available resources. The ecological indices (Shannon-Wiener Diversity Index, 2.05; Simpson Index of Diversity, 0.79; Simpson Dominance Index, 0.20; and Pielou's Evenness Index, 0.43), all reflect the relatively low diversity and uneven species distribution of the reef fish community. We conclude that the present status of the coral reef fish community dominating Darvel Bay as having undergone a rapid shift in structure following intense and rampant fishing pressure, as reported by the media.