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DATA PAPER

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Six years of demography data for 11 reef coral species

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Abstract

Scleractinian corals are colonial animals with a range of life-history strategies, making up diverse species assemblages that define coral reefs. We tagged and tracked ~30 colonies from each of 11 species during seven trips spanning 6 years (2009–2015) to measure their vital rates and competitive interactions on the reef crest at Trimodal Reef, Lizard Island, Australia. Pairs of species were chosen from five growth forms in which one species of the pair was locally rare (R) and the other common (C). The sampled growth forms were massive (*Goniastrea pectinata* [R] and *G. retiformis* [C]), digitate

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(*Acropora humilis* [R] and *A.* cf. *digitifera* [C]), corymbose (*A. millepora* [R] and *A. nasuta* [C]), tabular (*A. cytherea* [R] and *A. hyacinthus* [C]) and arborescent (*A. robusta* [R] and *A. intermedia* [C]). An extra corymbose species with intermediate abundance, *A. spathulata* was included when it became apparent that *A. millepora* was too rare on the reef crest, making the 11 species in total. The tagged colonies were visited each year in the weeks prior to spawning. During visits, two or more observers each took two or three photographs of each tagged colony from directly above and on the horizontal plane with a scale plate to track planar area. Dead or missing colonies were recorded and new colonies tagged to maintain ~30 colonies per species throughout the 6 years of the study. In addition to tracking tagged corals, 30 fragments were collected from neighboring untagged colonies of each species for counting numbers of eggs per polyp (fecundity); and fragments of untagged colonies were brought into the laboratory where spawned eggs were collected for biomass and energy measurements. We also conducted surveys at the study site to generate size structure data for each species in several of the years. Each tagged colony photograph was digitized by at least two people. Therefore, we could examine sources of error in planar area for both photographers and outliners. Competitive interactions were recorded for a subset of species by measuring the margins of tagged colony outlines interacting with neighboring corals. The study was abruptly ended by Tropical Cyclone Nathan (Category 4) that killed all but nine of the more than 300 tagged colonies in early 2015. Nonetheless, these data will be of use to other researchers interested in coral demography and coexistence, functional ecology, and parametrizing population, community, and ecosystem models. The data set is not copyright restricted, and users should cite this paper when using the data.

KEYWORDS

competition, coral, demography, fecundity, growth, growth form, mortality, reef, *Scleractinia*, spawning, survivorship

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The complete data set and code are available as Supporting Information and are also available in Zenodo at https://doi.org/10.5281/zenodo.7517462.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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