The following supplement accompanies the article

Coral identity and structural complexity drive habitat associations and demographic processes for an increasingly important Caribbean herbivore

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Focal coral species

Porites spp. are characterized by short, relatively thick branches, 1-2 cm in diameter, which often grow to a nearly uniform length within a colony, thereby reducing the interstitial space among branches (Fig. 1). Recent genetic evidence suggests that there is no species-level distinction among three branching forms of *Porites* found in the Caribbean, which include *P. porites, P. furcata,* and *P. divaricata* (Prada et al. 2014), so we refer to them as *Porites* spp. throughout. *Millepora alcicornis* is not a scleractinian coral, but it has thin, reticulated calcareous branches which grow off of vertical plates (Fig. 1). Given the functional convergence between *Millepora* and the true stony corals (Lewis 1989), we refer to it as a coral in this study. *Agaricia tenuifolia* has thin, vertical plates of varying lengths and widths within a colony (Fig. 1).

Image analysis

After setting the scale in ImageJ using a known distance drawn on the quadrat, images were cropped to include only the focal coral. Next, we overlaid a grid of points spaced at 2.5 cm^2 and used a random number generator to select a point. Whatever interstitial space (crevice) the selected point intersected was measured using the freehand polygon tool to trace the two-dimensional outline of the coral branches/plates surrounding that crevice. We then calculated the area of this polygon using the Analyze->Measure tool to quantify the opening area of that crevice (i.e., the area in which a predator could attempt an attack).

We analyzed both the crevice opening size-frequency distributions and mean crevice size because the information contained in the distributions can be informative for comparing size data across coral species and reef locations (Bak & Meesters 1998), and was particularly relevant in our interpretation of refuge quality for different sized *Echinometra viridis*.

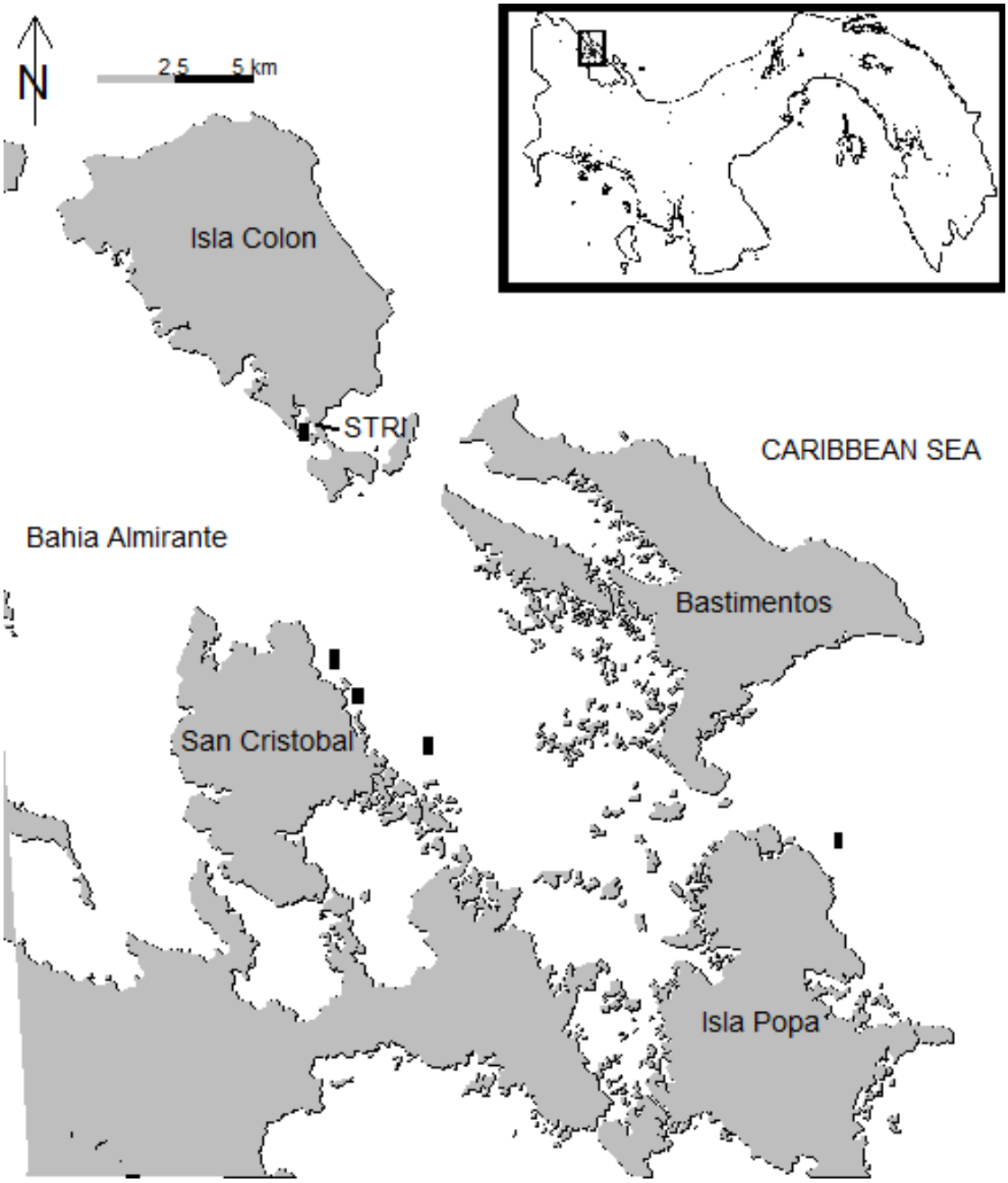

Fig. S1. Map of the study site, Bocas del Toro archipelago, with inset map of Panama. Study sites are black rectangles, with two reefs designated by a single rectangle in STRI Bay (STRI Bay East and STRI Bay West).

Fig. S2. Chain-line method to measure rugosity of an individual *Agaricia tenuifolia* colony. For scale, the quadrat in the background is 0.5 m on each side.

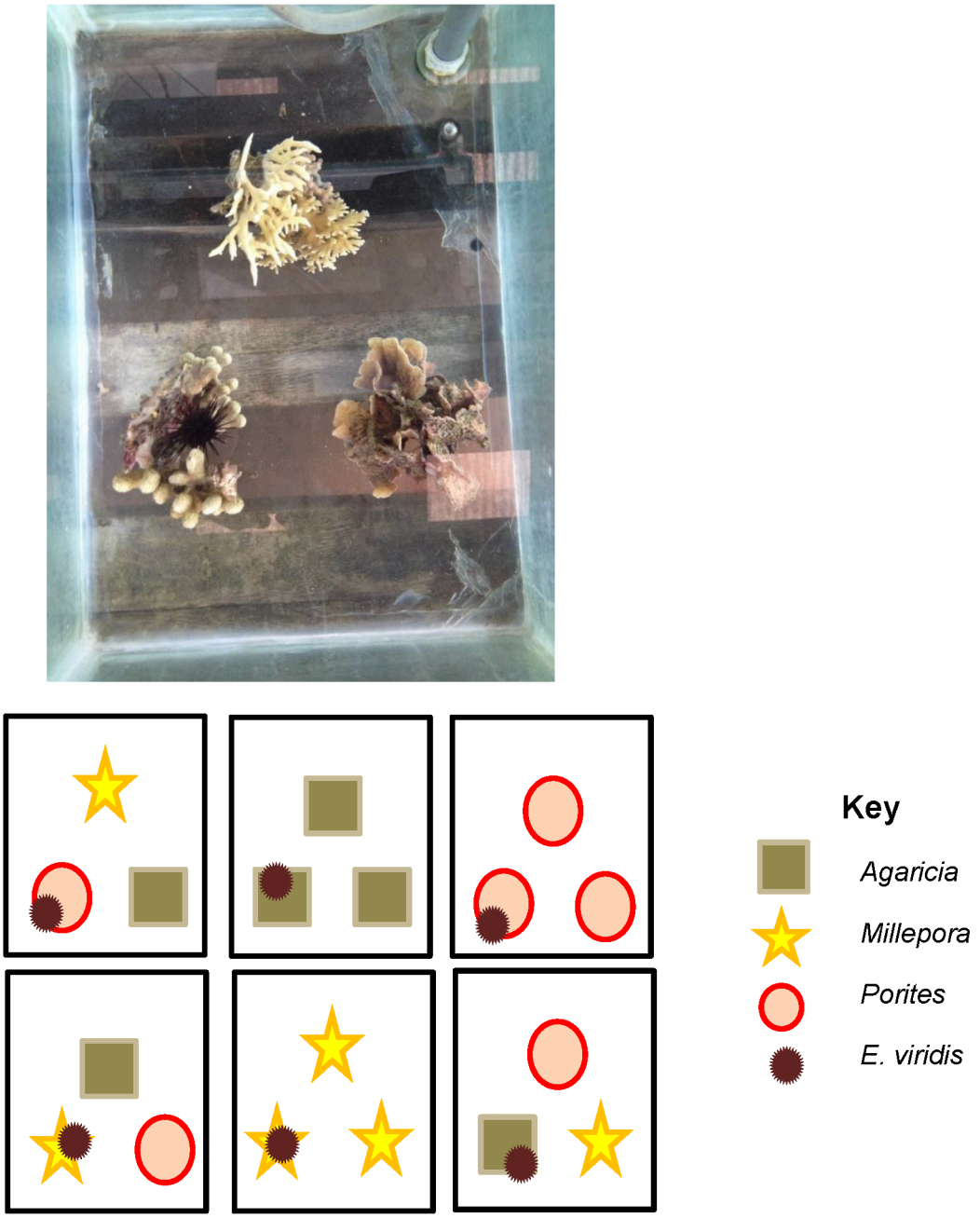

Fig. S3. Top: Experimental tank during habitat preference assay providing one *E. viridis* with a choice among three coral species. For scale, the shorter sides of the tank are 30 cm. Bottom: An example group of six tanks (one block) and how treatments and urchins were allocated in habitat preference assays. Urchins were initially placed on the fragment in the same position in the corresponding no-choice and choice tanks for each species. There were four blocks with this set up; water flowed from a separate head tank into each set of tanks within a block.

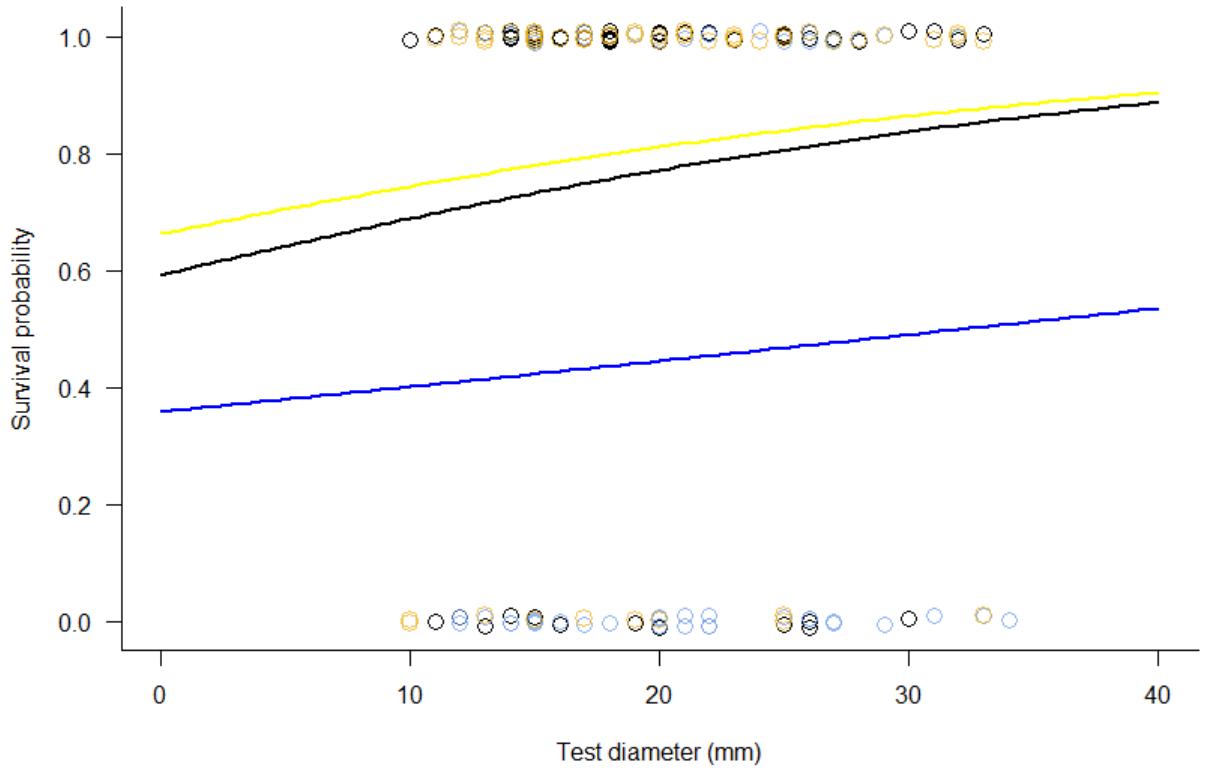

Fig. S4. Logistic regression showing survival probability of tethered urchins after 5 d on the reef based on urchin size. The points and the corresponding curve are plotted in black for *Agaricia*, blue for *Porites*, and yellow for *Millepora*.

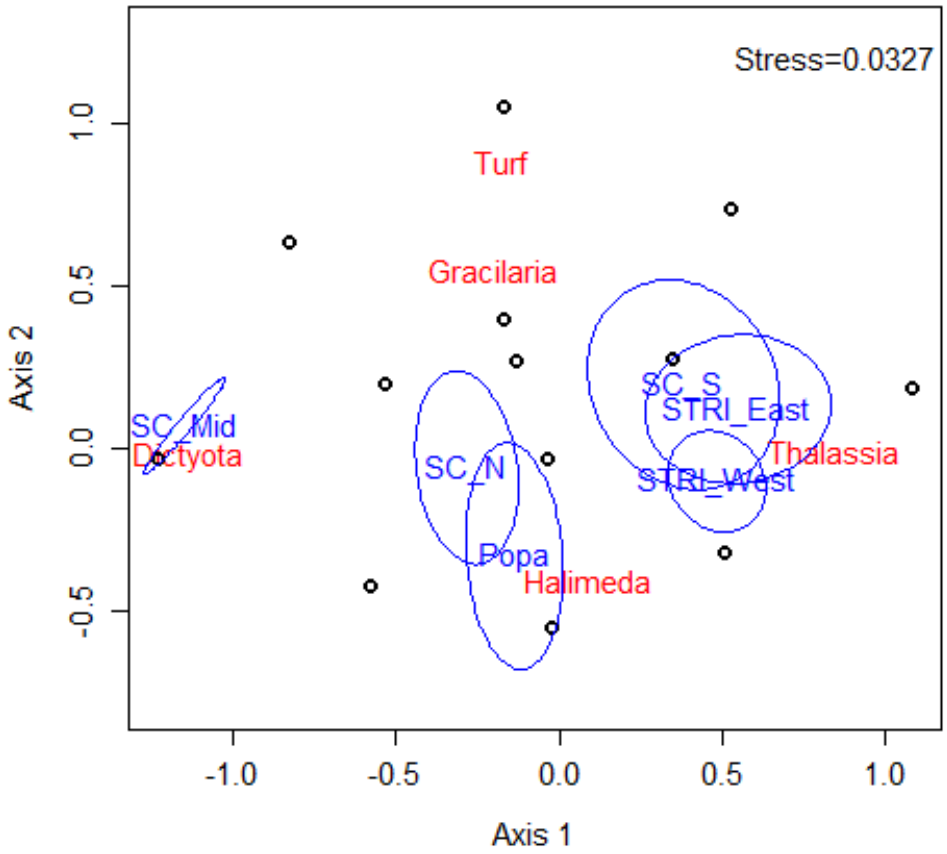

Fig. S5. nMDS ordination (*k*=2) of the algal communities observed in images of each coral species. Points represent each original algal community sample based on presence/absence data (identical communities are over-plotted), red letters show the location of each community member, and blue ovals show 95% confidence ellipses for each reef site (SC_Mid=San Cristobal Middle, SC_N=San Cristobal North, SC_S=San Cristobal South, Popa=Isla Popa), STRI_East=STRI Bay East, STRI_West=STRI Bay West).

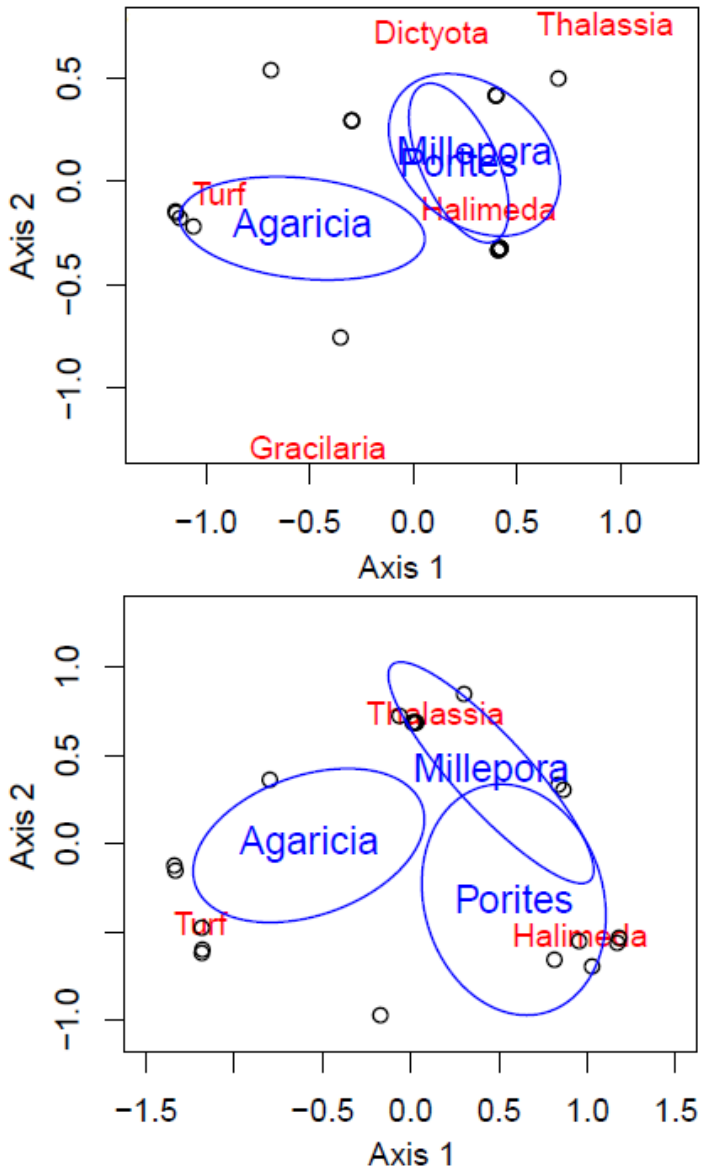

Fig. S6. nMDS ordination (*k*=2) of the algal communities observed in images taken at San Cristobal North (top) and San Cristobal South (bottom), two of the sites for which Coral was a significant factor in the separate PERMANOVA analyses. Points represent each original algal community sample based on presence/absence data (identical communities are over-plotted), red letters show the location of each community member, and blue ovals show 95% confidence ellipses for each coral species.

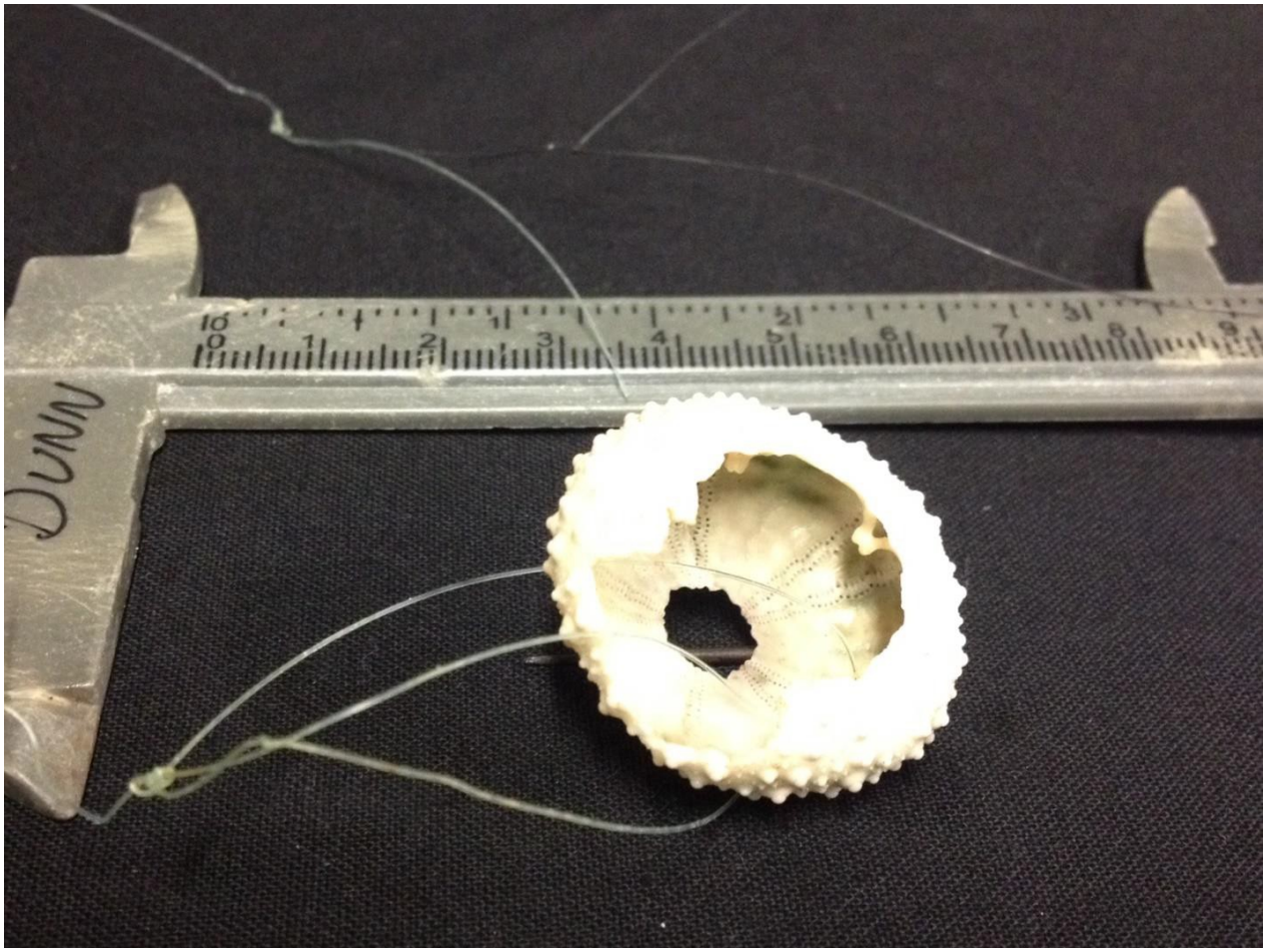

Fig. S7. Test of tethered *Echinometra viridis* recovered after 5 days on the reef with Aristotle's lantern and all soft tissues removed.

LITERATURE CITED

Bak RP, Meesters EH (1998) Coral population structure: the hidden information of colony size-frequency distributions. Mar Ecol Prog Ser 162:301–306

Lewis JB (1989) The ecology of *Millepora*. Coral Reefs 8:99–107

Prada C, DeBiasse MB, Neigel JE, Yednock B, Stake JL, Forsman ZH, Baums IB, Hellberg ME (2014) Genetic species delineation among branching Caribbean *Porites* corals. Coral Reefs 33: 1019–1030