

Supporting Information for

Evidence for microbially-mediated tradeoffs between growth and defense throughout coral evolution

Hannah E. Epstein¹, Tanya Brown², Ayomikun O. Akinrinade^{2,3}, Ryan McMinds^{1,4}, F. Joseph Pollock^{5,6}, Dylan Sonett⁷, Styles Smith⁵, David G. Bourne^{8,9}, Carolina S. Carpenter^{10,11}, Rob Knight¹¹⁻¹⁴, Bette L. Willis^{8,15}, Mónica Medina⁵, Joleah B. Lamb³, Rebecca Vega Thurber¹, Jesse R. Zaneveld^{2*}

¹*Department of Microbiology, Oregon State University, 226 Nash Hall, Corvallis, OR 97331, USA*

²*School of Science, Technology, Engineering, and Mathematics, Division of Biological Sciences, University of Washington Bothell, UWBB-277, Bothell, WA 98011, USA*

³*Department of Ecology and Evolutionary Biology, University of California, Irvine, CA 92697, USA*

⁴*Center for Global Health and Infectious Diseases Research, University of South Florida, 13201 Bruce B. Downs Blvd, MDC 56, Tampa, FL 33612, USA*

⁵*Department of Biology, Pennsylvania State University, 208 Mueller Lab, University Park, PA 16802, USA*

⁶*Hawai'i & Palmyra Program, The Nature Conservancy, Honolulu, HI, USA*

⁷*School of Pharmacy, University of Washington, Seattle, WA 98195, USA*

⁸*College of Science and Engineering, James Cook University, Townsville, Queensland 4811, Australia*

⁹*Australian Institute of Marine Science, Townsville, Queensland 4810, Australia*

¹⁰*Scripps Institution of Oceanography, University of California, San Diego, La Jolla, CA 92093, USA*

¹¹*Center for Microbiome Innovation, University of California, San Diego, La Jolla, CA 92093, USA*

¹²*Department of Pediatrics, University of California, San Diego, La Jolla, CA 92093, USA*

¹³*Department of Computer Science & Engineering, University of California, San Diego, La Jolla, CA 92093, USA*

¹⁴*Micronoma Inc., San Diego, La Jolla, CA 92121, USA*

¹⁵*ARC Centre of Excellence for Coral Reef Studies, James Cook University, Townsville, Queensland 4811, Australia*

*Jesse R. Zaneveld

Email: zaneveld@uw.edu

This PDF file includes:

Figures S1 to S4

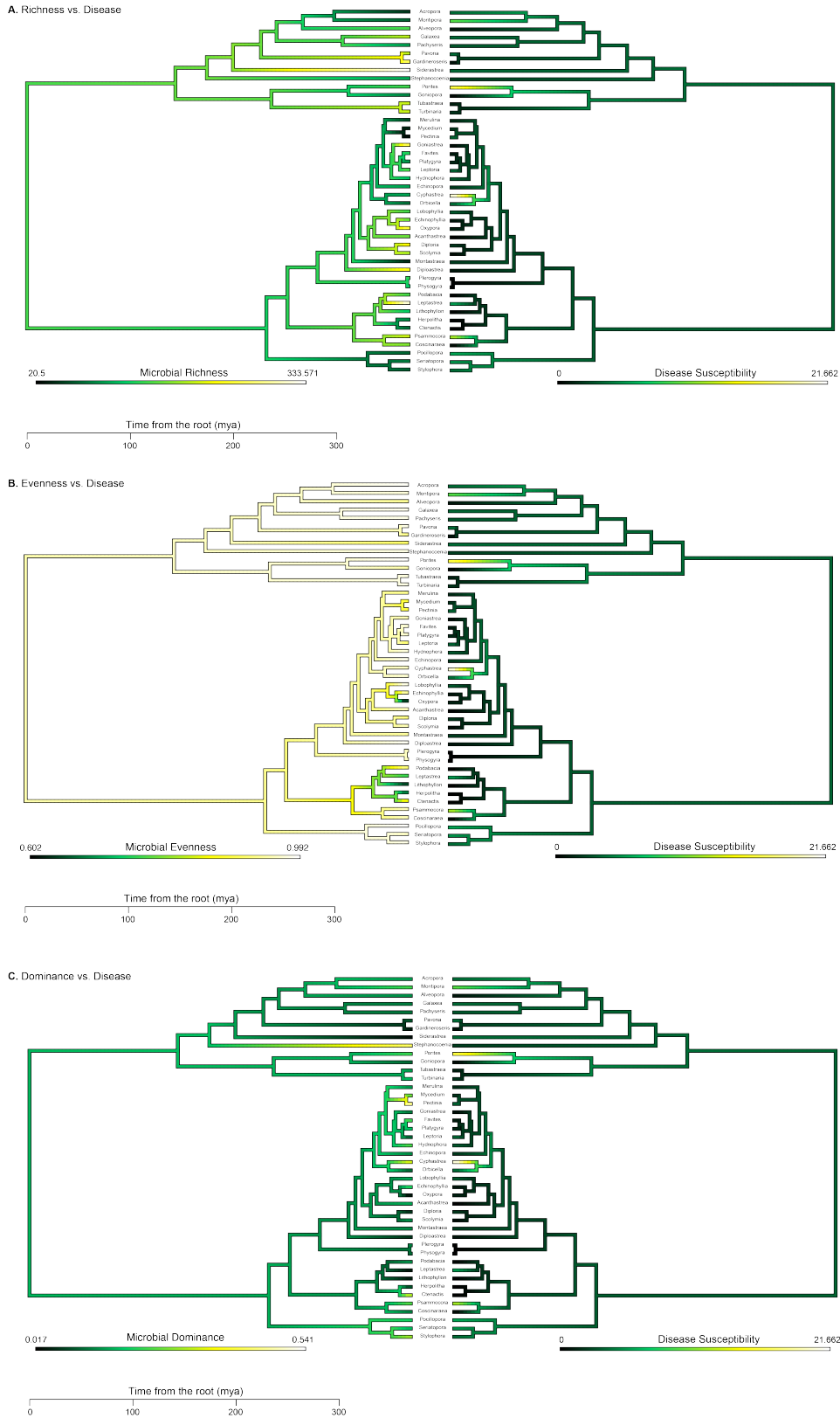


Fig. S1. Ancestral state reconstructions mirroring disease susceptibility and microbial alpha diversity metrics, including A) species richness, B) evenness (Gini Index), and C) dominance (Simpson's Index).

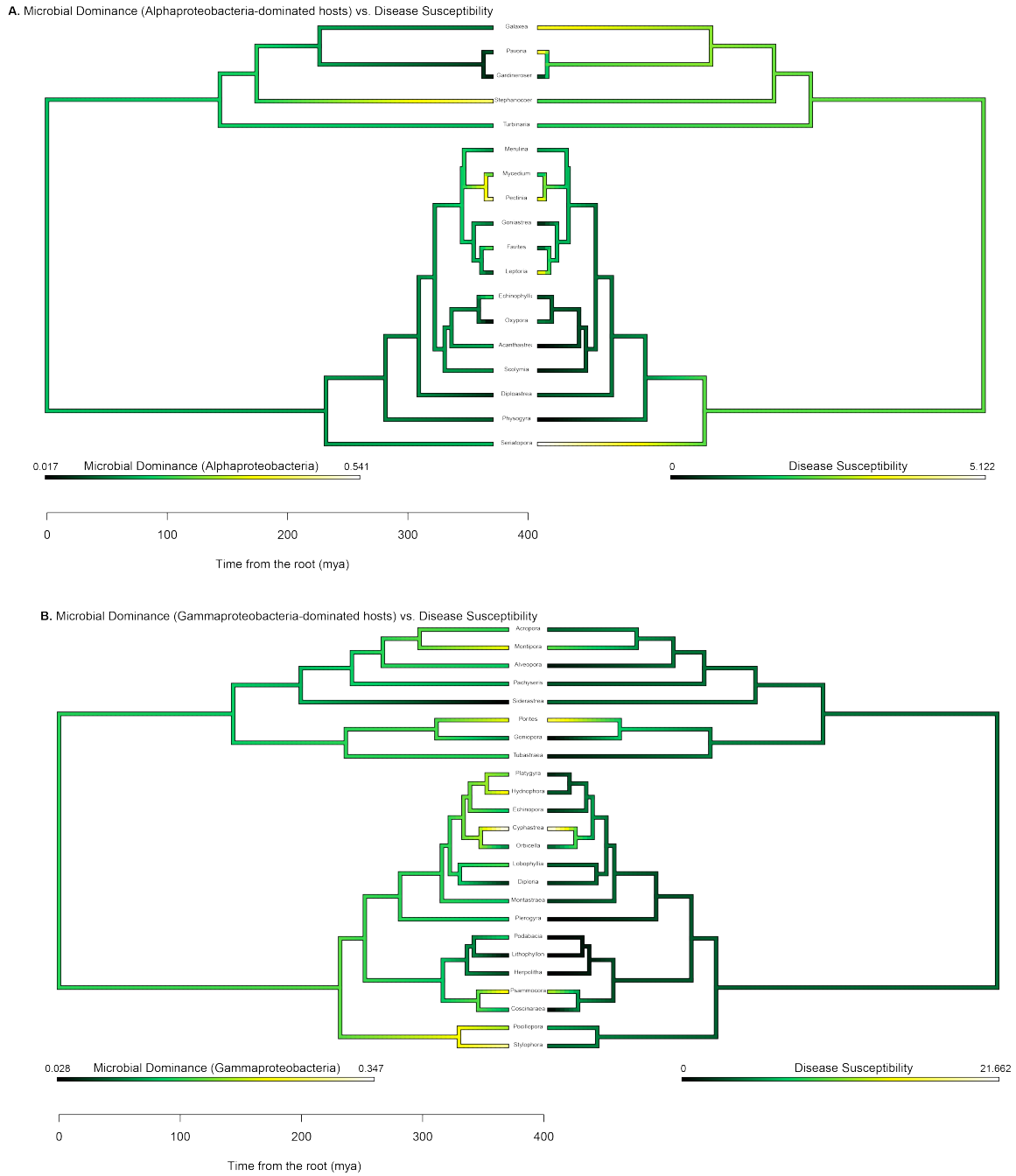


Fig. S2. Ancestral state reconstructions mirroring disease susceptibility and microbial dominance of A) Alphaproteobacteria only and B) Gammaproteobacteria only.

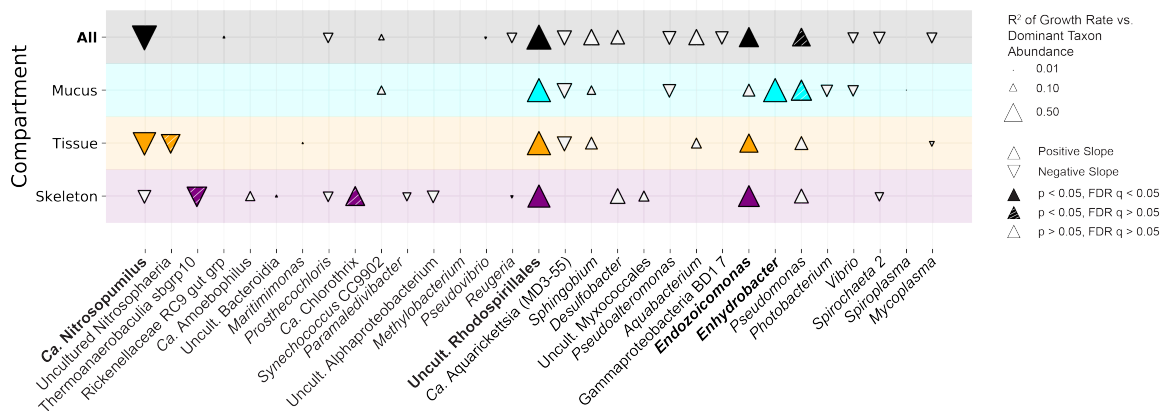


Fig. S3. Growth rate vs. dominant taxon abundance (zeros excluded). R^2 of the correlations between average coral host growth rate and dominant taxon relative abundance in corals only where each taxon is present (zero counts excluded). Arrow direction indicates a positive or negative correlation, filled arrows refer to significant correlations, striped arrows indicate nominally significant correlations (did not pass multiple comparisons) and open arrows indicate insignificant correlations. Size of the arrow represents R^2 value (See Supplementary Data Table 9b for details).

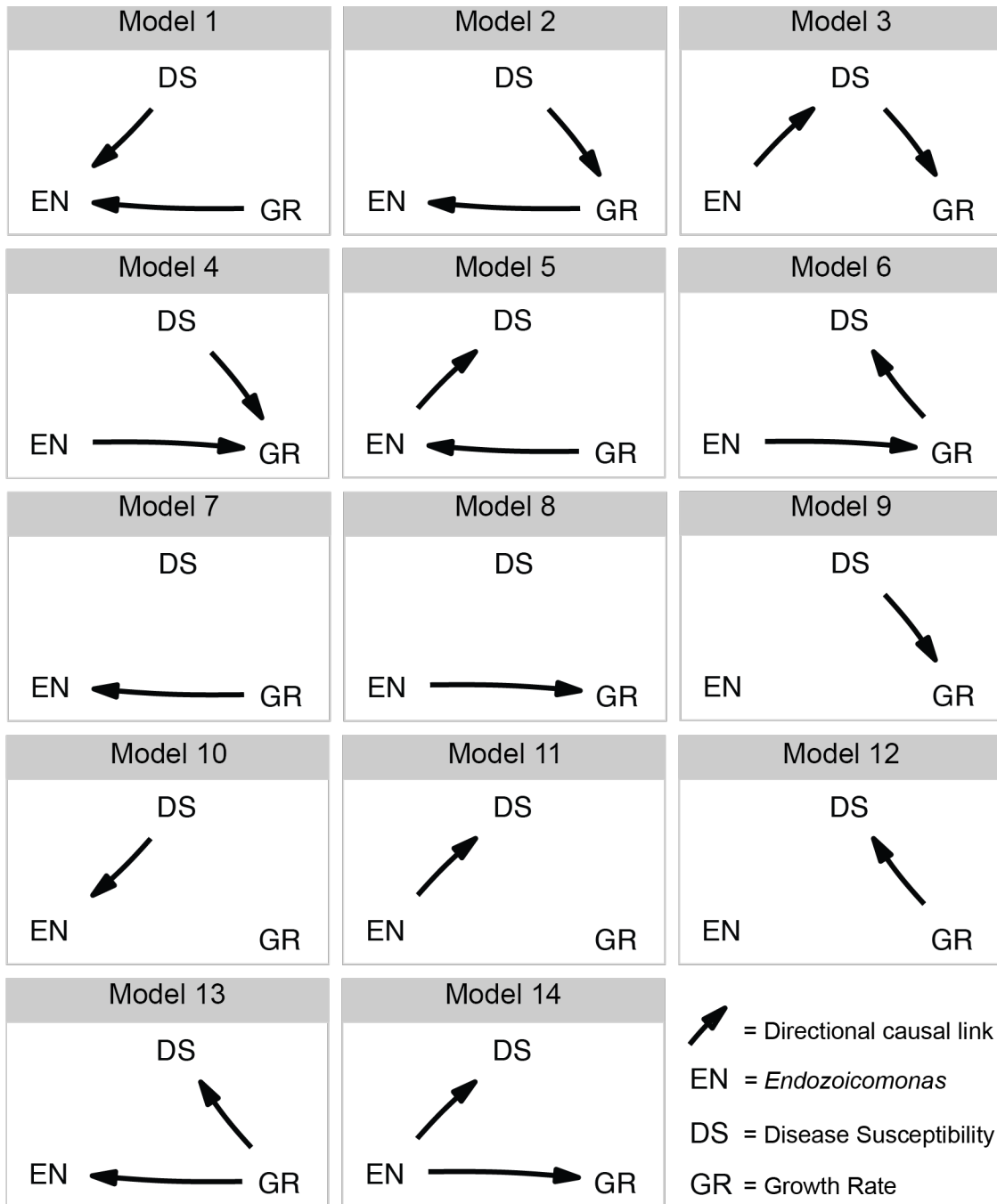


Fig. S4. Model selection for phylogenetic causality analysis. These models represent the fourteen plausible causality pathways that were used in the phylogenetic causality analysis. EN = *Endozoicomonas* relative abundance, DS = coral disease susceptibility, and GR = coral growth rate.