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Interactive comment on "Light-dependent calcification in Red Sea giant clam *Tridacna maxima*" *by* Susann Rossbach et al.

Anonymous Referee #1

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The manuscript investigates a common yet little known question on the light-dependency of iconic giant clams. Using experiments, Authors were able to show interesting results that showed congruence to the species' natural depth distribution.

Some explanations were provided regarding their results, but I think there is scope to expand their Discussion (e.g. how symbiont species may play a role in affecting depth distributions and affect calcification). The current manuscript depth peer review, as well as to provide more details on the mechanism of light-induced calcification and why there is a maximum light threshold before calcification rates drop could be further expounded.

Specific comments:

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Discussion paper

Abstract, Line 8: Tridacninae is the subfamily for giant clams. Please amend the first sentence.

Introduction, Line 15: Suggest to use Neo et al., 2017 - a review of species status, instead of Neo et al., 2015 that looks at ecological roles. Reference citation: Neo ML, CCC Wabnitz, RD Braley, GA Heslinga, C Fauvelot, S Van Wynsberge, S Andréfouët, C Waters, AS-H Tan, ED Gomez, MJ Costello & PA Todd (2017) Chapter 4. Giant clams (Bivalvia: Cardiidae: Tridacninae): A comprehensive update of species and their distribution, current threats and conservation status. In: Hawkins SJ, Evans AJ, Dale AC, Firth LB, Hughes DJ, Smith IP (eds.), Oceanography and Marine Biology: An Annual Review, Volume 55. Pp. 87–388. CRC Press: Boca Raton, FL.

Discussion, Section 4.1: Suggest Authors to look at the following papers to compare how locations of giant clams (sheltered versus exposed sites) can affect distribution. References: Militz TA, J Kinch & PC Southgate (2016) Population Demographics of Tridacna noae (Röding, 1798) in New Ireland, Papua New Guinea. Journal of Shellfish Research 34(2): 329-335. Neo ML, L-L Liu, D Huang & K Soong (2018) Thriving populations with low genetic diversity in giant clam species, Tridacna maxima and T. noae, at Dongsha Atoll, South China Sea. Regional Studies in Marine Science 24: 278–287.

Discussion, Section 4.2: Suggest Authors to refer to LaJeunesse et al., 2018 (Systematic Revision of Symbiodiniaceae Highlights the Antiquity and Diversity of Coral Endosymbionts) and symbiont-related papers on giant clams (e.g. DeBoer et al., 2012; Ikeda et al., 2017; Lim et al., 2019), and make inferences on how symbiont species may affect depth distribution with respect to light. References: DeBoer TS, AC Baker, MV Erdmann, Ambariyanto, PR Jones & PH Barber (2012) Patterns of Symbiodinium distribution in three giant clam species across the biodiverse Bird's Head region of Indonesia. Marine Ecology Progress Series 444: 117-132. Ikeda S, Yamashita H, Kondo S-n, Inoue K, Morishima S-y, Koike K (2017) Zooxanthellal genetic varieties in giant clams are partially determined by species-intrinsic and growth-related characteristics.

PLoS ONE 12(2): e0172285. Lim SSQ, D Huang, K Soong & ML Neo (2019) Diversity of endosymbiotic Symbiodiniaceae in giant clams at Dongsha Atoll, northern South China Sea. Symbiosis.

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