Text S1. Materials and methods

S1.1. Preparation of the primary polyps

This study used the heat-susceptible scleractinian reef coral *Acropora digitifera*, one of the most common acroporid corals on Okinawa Island, Japan (Loya et al. 2001, Nakajima et al. 2010). After collection, *A. digitifera* colonies were kept in an outdoor tank with running seawater at Sesoko Station. Gametes from all *A. digitifera* colonies were mixed for bulk fertilization for approximately one hour after spawning. Unfertilized eggs and lipids were removed with a pipette and fertilized eggs were divided into seven plastic bowls (6 L each). The eggs were gently stirred every 3–4 h to avoid clustering or attachment to the pails. Seawater changes and cleaning of the bowls were performed twice a day for four days. When performing seawater changes and pail cleaning (twice per day), coral embryos were carefully pipetted out using a 10 mL pipette and moved to a clean pail with filtered sea water (FSW). From the third day, FSW containing swimming larvae was gently poured through a PVC cylinder (20 cm length × 10 cm diameter) with a 150-µm mesh plankton net screen. Half of the cylinder was immersed into FSW in a plastic bowl to avoid exposure of the larvae to air. The larvae were concentrated in approximately 100 ml of the water retained in the PVC cylinder. The pail was then wiped with a sponge, rinsed with freshwater to remove lipid and mucus residues, rinsed with FSW, and refilled with new FSW. The sieve bottom of the PVC cylinder was lifted from the water, quickly transferred to a pail, and rolled to suspend larvae in the FSW of the clean pail.

Larval settlement was performed on 6-well plates, with each 15 mL well filled with 200 µl of FSW containing approximately 40 larvae taken with a pipette from the larval culture. The FSW was spread as widely as possible without reaching the edges of the well. Four hours after the addition of Hym peptide for settlement and metamorphosis inducement (Iwao et al. 2002), about 5 mL of FSW was gently added and unsettled polyps were removed. *Symbiodinium* ITS2 type A3 (isolated from the giant claim *Tridacna crocea*; obtained from the CCMP2457 culture at the National Center for Marine Algae and Microbiota, USA) was used to infect the primary polyps. The *Symbiodinium* culture was maintained in 1 mL of Daigo's IMK 100X medium (WAKO chemicals, Japan) mixed with 99 mL of sterilized seawater and kept at room temperature (27°C) under a 12:12 hour light:dark photoperiod. For infection, 1 mL of *Symbiodinium* solution from the culture and 1 mL FSW were added to each well. After 24 h, the *Symbiodinium* solution was removed via decantation, and the FSW was exchanged daily using a 10 mL pipette. The first signs of *Symbiodinium* infection were confirmed visually two days after induction of infection. Light was provided to the primary polyp cultures using an LED lamp that simulated the coral reef light wavelength spectrum (between 400 and 500 nm) (GrassyLeDio RX122, Volx Ltd., Japan), with an intensity of 190 µmol m^{-2} s^{-1} and a 12:12 hour light-dark photoperiod (light from 6:00 to 18:00 h).

S1.2. Aquarium experiment

One 10-L plastic aquarium (21 × 44 × 75 cm) with running FSW (318.7 ± 2.5 mL/min) from an cartridge-type inline filter system (pore size 1 µm) was used for each of the treatment combinations (aposymbiotic and ambient, aposymbiotic and heat, symbiotic and ambient, symbiotic and heat). The temperature of the aquariums was adjusted to 27 °C using a heater (Microsave power heater 200 W; Everes, Osaka, Japan) which was placed in each aquarium and regulated by a temperature controller (Thermo 300-RS, Everes, Osaka, Japan). To maintain stable

water temperatures for the treatments, the four aquaria were divided into two groups and placed in a container (21 × 85 × 122 cm) filled with FSW. Each group contained aquaria under the same symbiotic condition to reduce the risk of contaminating the aposymbiotic aquariums with *Symbiodinium*. The FSW in the container was cooled by a chiller (ZC-500E; Zensui, Osaka, Japan) and maintained at 23 °C. The chilling was necessary the FSW temperature rose above 27 °C in June. A water pump (MINI BOX, 2 W, Kotobuki, Osaka, Japan) was installed in each aquarium for proper seawater circulation and to ensure uniform temperatures within the aquarium.

All aquariums were subjected to a 12:12 hour light:dark photoperiod (light from 6:00 to 18:00 h) under LED lamps that simulated the coral reef light wavelength spectrum (between 400 and 500 nm) (GrassyLeDio RX122, Volx Ltd., Japan), with a light intensity of approximately 188 ± 6.6 µmol m^{-2} s^{-1}. Although the light intensity in the experiment was much lower than that in the natural environment, we considered this to be acceptable for our purposes because previous experiments conducted in the same laboratory reported that corals underwent positive growth rates even at light intensities of 150–160 µmol m^{-2} s^{-1} (Iguchi et al. 2012, Ohki et al. 2013, Iguchi et al. 2014, Kavousi et al. 2015, Sekizawa et al. 2017, Manullang et al. 2020). The temperature, light intensity, and salinity of each aquarium were measured daily at 15:30 h using a digital thermometer (Checktemp 1, Ref. HI98509, HANNA Instruments, Romania), quantum meter (QSL2100; Biospherical Instruments, Inc., San Diego, CA, USA), and digital salinometer (Waterproof Salinity Tester, Ref. HI98319, HANNA instruments, Romania), respectively. All measuring instruments were washed with Milli-Q water, dried with disposable wipes, and disinfected with alcohol after each measurement to avoid contamination of the aposymbiotic treatments with *Symbiodinium*. Additionally, the seawater temperature was recorded hourly using temperature loggers installed in each aquarium (HOBO Pendant® Temperature/Light 64 K Data Logger, Cape Cod, MA, USA). The experimental conditions of each aquarium are shown in Table S1. The well plates were rotated clockwise by one position inside each aquarium every day to minimize any changes in DNAm related to the well plate position within the aquarium (e.g., distance to light sources, heater, water pump, and aquarium corners).

Table S1. Mean and standard deviations of the experimental conditions in each treatment. Sample sizes are shown in the parentheses. Light intensity and salinity were measured manually once a day, and temperature was measured every hour using temperature loggers.

Treatment combination	**Light intensity (µmol m^{-2} s^{-1})**	**Salinity (ppt)**	**Temperature (°C)**
Aposymbiotic and Heat	186.0 ± 5.1 (11)	33.5 ± 0.2 (11)	32.0 ± 0.6 (259)
Aposymbiotic and Ambient	187.6 ± 5.3 (11)	33.3 ± 0.2 (11)	27.0 ± 0.4 (259)
Symbiotic and Heat	187.3 ± 6.8 (11)	33.6 ± 0.2 (11)	31.8 ± 0.4 (259)
Symbiotic and Ambient	183.4 ± 5.0 (11)	33.3 ± 0.2 (11)	27.2 ± 0.1 (259)

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