Habitat of the deep-sea anemone, *Cribrinopsis japonica*, with shrimp

- Does *Cribrinopsis japonica* establish a symbiotic relationship with shrimp? -

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We recently found *Cribrinopsis japonica* Tsutsui & Tsuruwaka, 2014 (Shinkai-hakutou-ginchaku in Japanese name) at the depth between 384 and 800 m in Toyama Bay, Sea of Japan. Since then, *C. japonica* has been reared under atmospheric pressure in the laboratory for seven years. *C. japonica* may use a fluorescent protein carried in its tentacles to lure shrimp (Tsutsui et al., 2016[*1]). However, the ecology of *C. japonica* in the deep-sea is hardly known. To elucidate the unknown ecology, we coupled one of the first long-term *in situ* studies of deep-sea organisms with complementary laboratory experiments. Our exploration of deep-sea benthos revealed that *C. japonica* inhabits the deepest areas of the sea floor at 1,960 m. Moreover, 80% of *C. japonica* in the deep-sea stayed together with the deep-sea shrimp. In the laboratory environment, when we added the same shrimp species which was observed *in situ* to the rearing tank with *C. japonica*, *C. japonica* stayed closer with the shrimp without attacking using the tentacles. It is rare to observe different animals together at one place or space since there are very few animals in the ocean floor at > 1,000 m depth in the Sea of Japan (Motokawa & Kajihara, 2017[*2]). In such depopulated environment, it is conceivable that *C. japonica* and the shrimp may receive benefit mutually or one side by establishing a 'symbiotic relationship.' We will elucidate their relationship in more details by studying the possible 'symbiosis' in the laboratory.

[*1] Tsutsui et al. (2016) Scientific Reports 6, 23493. DOI: 10.1038/srep23493
[*2] Motokawa & Kajihara (2017) Species Diversity of Animals in Japan, Springer. DOI: 10.1007/978-4-431-56432-4

Keywords: Sea anemone, *Cribrinopsis japonica*, deep-sea, *in situ* observation

Figure 1. *Cribrinopsis japonica* reared in the laboratory.

Figure 2. *Cribrinopsis japonica* and the shrimp observed in Toyama Bay, Sea of Japan (37°11′02″ N; 137°23′16″ E, depth 1,075 m).