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Is gene flow rare in *Isopora brueggemanni*? – Inference from the genetic assignment methods

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The scleractinian coral *Isopora brueggemanni*, which is distributed throughout the Ryukyu Archipelago (Okinawa Island, Miyako Island, and the Yaeyama Islands), is a hermaphroditic brooder. However, only a few planulae were released intermittently from colonies kept in running seawater tanks and no apparent periodicity of planula release was observed. Histological study suggests that some planulae might be produced through self-fertilization. Although this coral forms colonies with short stout branches, asexual reproduction via fragmentation occurs frequently under natural conditions.

Our previous study showed that the clonal structure and genetic diversity of each population of *I. brueggemanni* were very different, and that there was significant genetic differentiation among the populations. This is probably because gene flow via planulae dispersion is low due to low dispersal capacity of planulae or to predominance of asexual reproduction via fragmentation.

In this study, to estimate the extent of gene flow (connectivity) among populations of *I. brueggemanni*, we performed genetic assignment methods to detect migration over far shorter timescales using microsatellite markers.

We sampled *I. brueggemanni* from 19 populations at three sites in the Ryukyu Archipelago (three from the Kerama Islands, three from Miyako Island, three from Ishigaki Island, and ten from Sekisei Lagoon). A total of 313 colonies were genotyped using four microsatellite markers, IbTC2, IbTC13, IbAAT6 and IbAAT12. The number of genetically differentiated *I. brueggemanni* populations, K , was estimated by employing a Bayesian approach, implemented in the program *Structure* (Pritchard *et al.* 2000). F_0 immigrants in populations were estimated by employing a Monte Carlo resampling method, implemented in the program *GeneClass 2* (Piry *et al.* 2004) using data of genotyping.

The result of the genetic assignment methods indicated that there were very few numbers of immigrants at all sites (Kerama Islands; 3, Miyako Island; 4, Sekisei Lagoon; 17). Most populations were constructed by original members of the populations and most of the immigrants at Kerama Islands and Miyako Island have originated from Sekisei Lagoon. Although three populations of Kerama Islands were very close to each other, no immigrants originated from the neighboring populations were detected. The low number of immigrants among populations and maintenance of each population by its original members might be due to the unique mode of reproduction of the coral, though the direction of Kuroshio Current may also contributed to the isolation of the populations.

Modeling the transport of coral larvae within the Singapore Straits reveals potential external source reefs for the Southern Islands of Singapore

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Singapore's coral reefs have experienced significant anthropogenic impacts for at least three decades, mostly resulting from land reclamation activities. Nevertheless, the species richness of scleractinian coral communities around the Southern Islands is comparable to other more extensive reefs in the region. Little has been done, however, to protect the remainder of these reefs, which support a diverse array of marine life. Ongoing reef restoration efforts that are labour and cost-intensive may not be sustainable in the long run if there is no natural recruitment to replenish the populations. The nature of the marine environment provides many opportunities for exchange of genetic material between conspecifics of different