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P1

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Many scleractinian corals exhibit intraspecific variation in color and colony morphology. Several color morphs of *Galaxea fascicularis* have been described in Okinawan populations. Colonies of *G. fascicularis* have also been divided into three types (types S, H and M) based on the shape of tentacular microbasic p-mastigophore (MpM) nematocysts. Large microbasic p-mastigophores (MpM) in the acrosphere of tentacles were classified into two types, type I (S) which have a relatively thick capsule and a shaft about a half of the capsule length and type II (H) which have a relatively slender capsule with a shaft shorter than one third of the capsule length. Type S and H colonies possess type I (S) and type II (H) MpMs, respectively. Type M colonies possess both types of MpMs in their tentacles. On the other hand, colonies of *G. fascicularis* were divided into two types (Short or Long) based on the presence or absence of 290 bp deletion in a non-coding region of mitochondrial (mt)DNA. Since nematocyst shape might be controlled by nuclear genes, studies on the relationship between types based on tentacular nematocysts and those based on mtDNA might elucidate the relationship between morphotypes in the coral *G. fascicularis*.

We collected several polyps from each of 582 colonies at eight sites around Okinawa Island and two sites around Ishigaki Island. We observed tentacular nematocysts and analyzed genotypes of mtDNA of 392 colonies.

The relative abundance of types S, H, and M colonies, as well as composition of Long and Short mtDNA genotypes, varied among populations and an interesting geographical pattern was observed. Types S and H generally corresponded to Long (144 out of 148 colonies) and Short (168 out of 186 colonies) mtDNA genotype, respectively, although there were some exceptions. Type M colonies belonged to Long genotype (49 out of 58 colonies). Colonies of type M might be heterozygous at the gene locus responsible for determining the shape of tentacular MpM nematocysts. Since mtDNA is maternally inherited, it was hypothesized that majority of type M colonies might be produced via fertilization between eggs of type S colonies and sperm of type H colonies.

To test the above hypothesis we did artificial fertilization experiments using pairs of colonies of the same type or of different types. Fertilization rate was higher than 60% in 6 combinations between type H colonies and 3 combinations between type S colonies. When gametes from colonies of different types were mixed, fertilization occurred in one combination of female colony of type H and male colony of type S. However, no fertilization occurred in 7 combinations of female colony of type S and male colony of type H. The present results do not support the above hypothesis. We are now analyzing nuclear intron regions to distinguish morphotypes of *G. fascicularis*. These nuclear markers, together with the mitochondrial marker, may help us to understand the relationship among morphotypes of the coral.