

Anthropogenic stressors cause clonal populations and symbiont shifts in *Pocillopora damicornis*

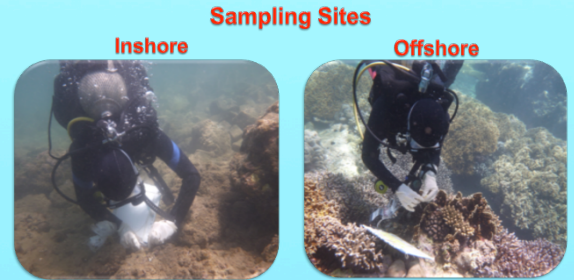
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BACKGROUND

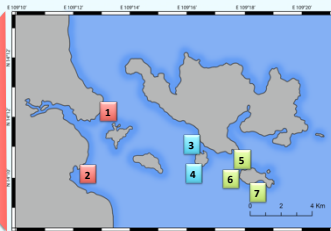
The most diverse, threatened and least studied reefs are found in Southeast Asia. In Vietnam 95 % of the coral reef are classified as threatened and 50 % as highly threatened. The coastal ecosystem faces environmental pressure from fast population growth and an emerging economy. Locally, some coral species appear healthy and are abundant in both stressed and intact reefs. However, stressed coral populations may show lower genetic diversity than intact ones.

This study aims to compare genetic diversity in *Pocillopora damicornis* between reefs exposed to chronic anthropogenic stressors and non-exposed reefs in Nha Trang, Vietnam. Additionally, we genotyped the algal symbionts (*Symbiodinium spp.*) within the corals to assess the presence of stress/non-stress resilient types.



METHOD

- A total of 176 colonies from 7 sites in the Nha Trang area were collected.
- Sites were chosen based on different exposures to permanent anthropogenic activities:

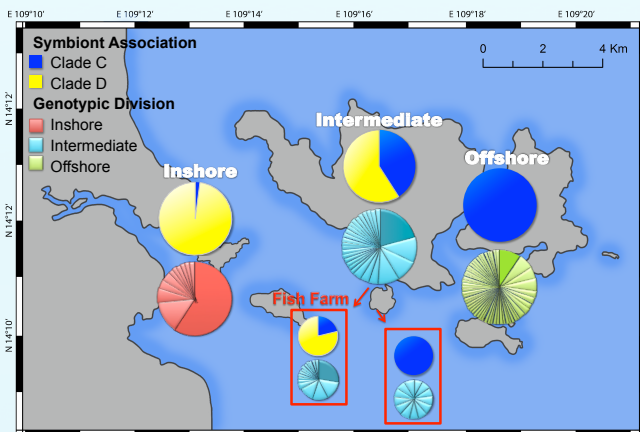


Sites	N	Location	Anthropogenic Activity	Protection*
1	28	Inshore	Port (<50 m) & Industries	0
2	21	Inshore	River outlet from agriculture & resort	0
3	40	Intermediate	Fish farms (<50 m)	1
4	13	Intermediate	None	2
5	32	Offshore	None	1
6	30	Offshore	Recreational Diving	3
7	12	Offshore	Recreational Diving	3

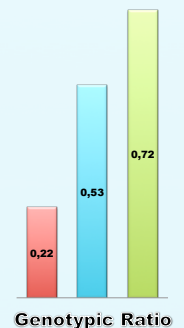
* Rated: 0 = none, 1= buffer zone, 2=habitat protection zone, 3= core zone

- 5 species specific polymorphic microsatellite loci were used for genotyping the host.
- Genotypic diversity was calculated: N_g/N (N_g = observed number of genotypes & N = total number of colonies collected per area).
- The symbiotic algae were identified by using the ITS2 region (rDNA, direct sequencing).

RESULTS & CONCLUSIONS



- High genetic connectivity between sites in Nha Trang.
- Surprisingly high dispersal rate of genetically identical clones between different sites.
- Significantly higher rate of genotypic clones in sites exposed to direct anthropogenic stressors (demonstrated by Genotypic Ratio).
- Lower genetic diversity in sites with continuous anthropogenic activities.
- Radical shift of symbiont associations (C → D) from less affected areas to stressed areas.



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